COMPARATIVE LIST OF

COLOR TERMS

A Report of the

INTER-SOCIETY *Color* COUNCIL

JANUARY, 1949

THE ISCC COMPARATIVE LIST OF COLOR TERMS

INDEX

This report is not intended as a final report on definitions; instead, it is meant to provide the basis for a thorough study of the subject among the member bodies of this Council, and lead to a revision of this list that will provide official definitions upon which all can agree.

Additional copies of this report may be obtained by delegates and members of the Inter-Society Color Council at one dollar per copy; by non-members at two dollars per copy. Checks should accompany all orders (for the Council has no paid staff to handle the extra correspondence that billing would cause).

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THE ISCC COMPARATIVE LIST OF COLOR TERMS

A cooperative project of the Member Societies and the
Inter-Society Color Council Subcommittee on Color Terms

Compiled by

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INTRODUCTION

From 1946 to 1948 the Subcommittee on Color Terms, including E. Q. Adams, J. G. Brennan, Harry Helson, E. I. Stearns, and S. M. Newhall, was engaged in arranging a new comparative list of color terms designed to include in convenient form the many contemporary usages of the member societies of the Inter-Society Color Council, and also the British usages reported by the Colour Group of the Physical Society. This project was undertaken in response to the request of the Executive Committee of the Inter-Society Color Council for a revision of the 1939 list in order to facilitate intercomparisons of up-to-date terms and definitions.

The outcome of this work has been not merely to present the current usages of the several groups concerned but to explicate the essential identities, similarities, and differences inherent in those usages. As a consequence, any interested person may turn to any color term and discover (1) the meaning of that term for a given society, (2) what societies have an identical definition of that term and hence generally unquestioned agreement with respect to it, (3) what societies have similar definitions of that term and hence a basis for developing agreement, (3) what societies have quite different usages for the term and hence the special need to guard against confusion, and (5) what societies use a different term or terms with a similar meaning. The above features may afford not only a step in the direction of better agreement among groups but also a practical reference manual for general use.

Instructions for using this comparative list of color terms are given on page iv.

COOPERATIVE ASPECT OF THE PROJECT

The general plan of the project was for the member societies to provide the Subcommittee with up-to-date lists of their color terms and definitions, for the Subcommittee to produce an efficient organization of this material, and for the Council itself to undertake the publication arrangements.

Letters, describing the projected revision of the 1939 list and requesting the assistance which would be indispensable to its success, were written in the Fall of 1946 to the chairmen and certain other members of delegations of all member societies of the Council. Assurance of cooperation was received from 100 percent of the group membership and the most important step in the project followed without undue delay. This step consisted of the assistance given to the Subcommittee by the member-body chairmen and other delegates in the task of securing the some 1550 currently used color terms and definitions. Without this basic information the successful completion of the project obviously would have been impossible.

After the individual lists of color terms and definitions were received by the Subcommittee they were typed in approximately the form in which they would appear in the finished listing and then returned to the respective member societies for checking and confirmation. After all the lists again had reached the Subcommittee they were combined to form the final comparative listing; and from that the final publication copy was typed.

Where possible, the chairmen of the delegations of the member societies were asked to be responsible for the terms and definitions of their respective groups As already indicated, however, other members of delegations, including certain members of the Subcommittee, cooperated in this work; and furthermore, there were several persons outside the Council who were exceedingly helpful in securing necessary information. The special contributions of all of these persons are acknowledged in the introductory paragraphs of the individual word lists of the respective member societies. These lists are given at the end of this manual.

ARRANGEMENT OF THE COMPARATIVE LIST

The main features of the new comparative listing may be described quite readily. There are really two lists. One of these is comprised of the original terms or color words supplied by each member society, the terms being arranged alphabetically within each member society and the member societies being arranged alphabetically by name. This straightforward individual listing of terms by member groups is, of course, a way of showing what terms each group uses. This simple individual listing (without definitions) will be found at the end of the manual. Inspection of this listing will show that some of the terms have been indented and some, not. This distinction corresponds to a breakdown which the various groups were requested to make with respect to the relative importance of the terms. Consequently, the indented terms may generally be considered as useful to workers in the given field but as not having sufficient acceptance or technical appropriateness to be as closely identified with the given group as the other (unindented) terms. For convenience these two classes are hereafter referred to as primary and secondary terms. Some groups did not make this distinction, and the basis of the differentiation varied considerably among those groups which made the breakdown. The basis for designating terms as primary and secondary terms for each member society is given in the introductory paragraph to the individual lists.

A much longer, more complex, unified listing of the terms with the definitions of all the member societies and the British Colour Group occupies most of the following pages. The problem of arrangement in this unified listing was not only to show the current usages but also to exhibit the similarities and differences in as concise and comprehensible a manner as possible. The best general approach seemed to be to take up one term and definition at a time, indicating in the same position in each definition which groups agreed or disagreed with the usage indicated by the given term and definition. This arrangement permits the reader to perceive at once how each term is employed and what groups employ a given term in identical, similar, and different ways, and also what groups have different terms which they employ in similar fashion. How this arrangement has worked out in practice will be evident from the following explanation.

1) Meaning of a given term. The term is given in capital letters and the definition on the following line. The initials of the member society employing that definition are given on the same line with the term. For example, the first entry in the unified list indicates that for ASTM the definition of ABSENCE-OF-BLOOM GLOSS is "Absence-of-bloom gloss is indicated by freedom from haziness bordering a high tint."

2) Term with identical definitions. When two or more member societies have identical definitions for a given term, the initials of all such member societies are listed on the same line with the term. For example, the term BLEACH, "To make white," is followed by the four sets of initials AATCC TAPPI TCCA osa, which means that these four member societies have the same definition for bleach.

NOTE: The initials osa are intentionally in lower case to indicate a relatively less important usage. Upper and lower case here in the unified list are indicative of primary and secondary usage respectively, and correspond to unindented and indented indications of the individual listing.

3) Term with similar definitions. The word "identical" was used literally in the above classification; only those definitions which are the same, word by word, are listed as identical. Definitions which may appear to mean the same but are expressed differently — even slightly — are listed as Similar. The initials of member societies having similar definitions for the given term are listed below the definition and following the abbreviation "Sim:". For example, below the AAPL definition of ACHROMATIC the abbreviation "Sim:" is followed by APA and USP-NF. This means that the latter societies have definitions for achromatic which are similar to, but not identical with, the AAPL definition.

4) Term with different definitions. The initials of member societies having different definitions for the given term are also listed below the given definition but following the abbreviation "Diff:". An example of this will be found below the IES definition of ABSORPTANCE where it may be seen that OSA has a different definition for that term.

NOTE: All similar and different definitions are given in their appropriate alphabetical locations in the list, regardless of the "Sim:" or "Diff:" indication of their existence.

5) Different terms with similar definitions. If one or more of the societies use a different term but with a similar meaning, this fact is noted by parentheses in the "Sim:" line. An example of this will be found below the OSA definition of ABSORPTANCE where the term Absorption Factor and the initials CGPS, IES are placed in parentheses. This means that these two societies have definitions for Absorption Factor which are similar to the OSA definition of ABSORPTANCE.

NOTE: Terms in this classification also will be found with their definitions in their appropriate alphabetical locations in the list.

Asterisks (*) and daggers (†) appear occasionally in the list. An asterisk indicates a usage which is new since publication of the 1939 word list or which was not listed in that list, while a dagger indicates a usage which had become obsolete by 1947. This treatment is incomplete.

The initials and names of the various color groups appearing in the comparative list of color terms are as follows:

Initials	Member Society	Delegation chairman
AAPL	The American Artists Professional League	Alon Bement
AATCC	American Association of Textile Chemists and Colorists	E. I. Stearns
ACS	American Ceramic Society	R. S. Hunter
AOCS[1/]	The American Oil Chemists' Society	G. Worthen Agee
APharA,NF	American Pharmaceutical Association, National Formulary	K. L. Kelly
APA	American Psychological Association	S. M. Newhall
ASTM	American Society for Testing Materials	M. Rea Paul
CGPS	Colour Group of the Physical Society (London)	
FPVPC	Federation of Paint and Varnish Production Clubs	Francis Scofield
IES	Illuminating Engineering Society	Norman Macbeth
OSA	Optical Society of America	D. B. Judd
SMPE	Society of Motion Picture Engineers	R. M. Evans
TAPPI	Technical Association of the Pulp & Paper Industry	A. H. Croup
TCCA	The Textile Color Card Association of the United States, Inc.	Margaret Hayden Rorke
USP	U. S. Pharmacopoeial Convention	K. L. Kelly

USES OF THE COMPARATIVE LIST

There are various specific uses to which the comparative list of color terms may be put, and some of these uses may or may not be obvious from what has already been said. (1) If one's purpose is merely to discover whether or not a given member society (or the British Colour Group) uses some given color term, one may look for that term in the individual list of terms of that member society. (2) Similarly, if one's purpose is to discover what series of color terms a given member society (or the British Colour Group) uses, he can get an idea by glancing through the list of that member society's terms. (3) If one's problem is to distinguish between terms which are rated as more important and less important to the given member society, this may be done by noting that in the listing of the member society's terms the less important ones are indented. (4) If one's object is to discover the meaning of a given term for a given member society, one looks in the main unified listing for that term with the given member society's initials following it, and then reads below the accepted definition. (5) If one wishes to know which member societies have the same meaning for a given term, one looks in the unified listing for the term and notes which member societies have their initials following the given term; the meaning the term has for these member societies will be represented by the accompanying definition. (6) If one wishes to know which member societies have a similar, though not identical, meaning for a given term, one simply notes which member societies have their initials following the abbreviation "Sim.". (7) If one wishes to know which member

1/ This association became an ISCC member body at the time the assembly of this list was near completion. The one color term which they asked to have defined was "Lovibond." See OSA definition, page 41.

societies have an essentially different meaning for the given term, one notes which member societies have their initials following the abbreviation "Diff:". (8) When the problem is to discover which member societies, if any, use a different term or terms to express a meaning similar to that of a given term, the different term or terms followed by the corresponding initials will be found in parentheses following the abbreviation "Sim:". All that has been said above with respect to the member societies applies also to the British Colour Group.

ADDENDA

Following completion of assembly and typing of this report, notice of two recent actions regarding nomenclature standardization have been received. The first concerns action taken by the International Commission on Illumination at its meeting in Paris, France, July 1948. The second concerns recommendations to the Council of the Illuminating Engineering Society, December 8, 1948, by the I.E.S. Committee on Nomenclature and Standards, Allan E. Parker, Chairman.

To make it possible to call attention to these most recently adopted or recommended definitions, they are included here with footnotes referring to this added section included for each term where it is defined by others in the main text.

I.C.I. DEFINITIONS

In the summer of 1948, the International Commission on Illumination recommended that the following terms, definitions, and symbols be adopted. These are listed in the order given in a mimeographed report of the meeting, supplied to the Inter-Society Color Council by Dr. Deane B. Judd, delegate representing the Optical Society of America and the National Bureau of Standards to the Paris conference of the I.C.I.

LUMINANCE
This term is to be used as equivalent to, and by preference in place of, the expression "photometric brightness," already defined by the C.I.E. (Symbol L or B).

LUMINANCE FACTOR
The ratio of the luminance of a reflecting or transmitting surface viewed from a given direction to that of a perfect diffuser receiving the same illumination (Symbol β).

DOMINANT WAVELENGTH
The wavelength of the spectrum colour that, when combined with specified achromatic light in suitable proportions, yields a match with the sample colour (Symbol λ d).

COMPLEMENTARY WAVELENGTH
The wavelength of the spectrum colour that, when combined with the sample colour in suitable proportions, yields a match with the specified achromatic light. (Symbol λ c).

EXCITATION PURITY)
COLORIMETRIC PURITY)
It is recommended that Excitation Purity be represented by the symbol P_e, and

be calculated by the one of the formulae

$$P_e = (y - y_w)/(y_d - y_w), \quad P_e = (x - x_w)/(x_d - x_w),$$

for which the numerator has the greater absolute value.

It is recommended that Colorimetric Purity be represented by the symbol P_c and be calculated by the formula:

$$P_c = P_e \cdot y_d/y.$$

(x, y, z) are the chromaticity coordinates (trichromatic coordinates) of the light to be specified, referred to the 1931 C.I.E. trichromatic system.

(x_w, y_w, z_w) are the chromaticity coordinates (trichromatic coordinates) of the achromatic reference point (which is taken to have zero purity). For self-luminous (primary) sources, these are the coordinates of the equi-energy point (0.3333, 0.3333, 0.3333). For light reflected from or transmitted by objects (x_w, y_w, z_w) are the coordinates of the source used to illuminate the object. This illuminant must be appropriately specified.

(x_d, y_d, z_d) are the chromaticity coordinates (trichromatic coordinates) of the point on the spectrum locus, or on the straight line joining its extremes, representing the light required to be mixed with light of chromaticity coordinates (x_w, y_w, z_w) to match the light to be specified.

CHROMATICITY
The colour quality of a stimulus defined by its trichromatic specification or by its dominant (or complementary) wavelength and purity taken together.

TRISTIMULUS VALUES
The amounts of the three matching or reference stimuli in a trichromatic system required to establish a match with the sample stimulus (Symbols X, Y, Z).

CHROMATICITY COORDINATES
The ratios of each of the three tristimulus values for a sample colour to the sum of the tristimulus values (Symbols x, y, z).

BRIGHTNESS OR LUMINOSITY (No agreement was reached on the term).

~~LIGHTNESS~~ HUE
The attribute of an object-colour perception that determines whether it is red, yellow, green, blue, purple, or the like.

LIGHTNESS
The attribute of an object-color perception that permits it to be classified as equivalent to some member of the series of greys ranging from black to white.

I.E.S. REVISION OF NOMENCLATURE

On December 8, 1948, the I.E.S. Committee on Nomenclature and Standards, A. E. Parker, Chairman, submitted to the Council of the Illuminating Engineering Society recommendations for certain revisions of the nomenclature published in ASA Z7.1-1942, Illuminating Engineering Nomenclature and Photometric Standards, prepared and issued by the I.E.S. (Numbers in revisions refer to the code numbers in the 1942 published standard.)

rrections from ISCC News Letter #82 May 1949

Agreement was reached within the nomenclature committee on practically all of the color terms about a year and a half ago, and definitions for these terms were submitted for the ISCC Color Terms Report by the I.E.S. representatives. These are included in the text of the present report. They are marked with an asterisk (*) to indicate that they are new since the last report. A few added color terms included in the committee's recommendations to the I.E.S. Council on December 8, 1948, but not previously submitted for inclusion in the present report, are listed below. Also listed are the detailed suggestions for revisions included in the I.E.S. committee's report. For final I.E.S. action the reader can be referred to a revision of ASA Z7.1-1942 which will be published following I.E.S. formal adoption of revision of their present report.

Certain of the revisions have been included in the body of our text, but where they were too extensive, or would change the alphabetization of this report (already in final typescript), they are referred to in the text by footnote references to the following lists, taken from the I.E.S. committee report.

Added Color Terms 1/

TRISTIMULUS VALUES (20.025): Color mixture data, especially when regarded as specifications of color, rather than as basic data for visual research or color computation.

CHROMATICITY COORDINATE (20.026): The ratio of any one of the tristimulus values of a sample to the sum of the three tristimulus values is a chromaticity coordinate. (This term replaces TRICHROMATIC COORDINATES, as given in the text for I.E.S.)

DOMINANT WAVELENGTH (Graphical Determination) (20.061): The wavelength corresponding to the intersection with the spectrum locus, of the straight line drawn from the reference point and extended through the point representing the sample.

COMPLEMENTARY WAVELENGTH (Graphical Determination) (20.062): The wavelength corresponding to the intersection with the spectrum locus of the straight line extended through the reference point from the point representing the sample.

Revisions of Nomenclature 2/

(Candle) 05.025 Candle, c: The candle is the unit of luminous intensity. The unit is based upon (1) assigning 60 candles per square centimeter as the luminance of a blackbody at the temperature of freezing platinum, and (2) deriving values for standards having other spectral distributions by use of the accepted luminosity factors.

1/ These terms are in addition to those marked new (with an asterisk) on the I.E.S. list, pages 89 - 90.

2/ The ASA code numbers are preceded by the present term, and followed by the revision.

(Illumination) 05.035 Illuminance, E etc. Illuminance etc.
Fine print: delete "also commonly" and second sentence.

(Footcandle) 05.040 Change abbreviation to "fc" and "illumination" to "illuminance" (3 times).

(Lux) 05.045 Change "illumination" to "illuminance" (3 times).

(Phot) 05.050 Change "illumination" to "illuminance" (once).

(Quantity of Light) 05.055 Luminous Energy (Quantity of Light), $Q = \int F \, dt$: Luminous energy (quantity of light) is the product etc.

(Brightness) 05.065 Luminance, B etc. Luminance (photometric brightness) is the etc. Fine print: Paragraph 2 change "brightness" to "luminance" (twice). Paragraph 3 Quotation marks around first "brightness" and change in second sentence "brightness" to "luminance."

(Units of Brightness) 05.070 Change "brightness" to "luminance" in title and four times in text.

(Stilb) 05.075 Change "brightness" to "luminance" (3 times). Delete second sentence of first paragraph of fine print.

(Lambert) 05.080 Change "brightness" to "luminance" (5 times).

(Foot Lambert) 05.085 Change abbreviation to "fL" and "brightness" to "luminance" (4 times).

(Brightness Ratio) 05.090 Change "brightness" to "luminance" in title and four times in text.

(Luminous Efficiency) 05.105 Change numerical values in third paragraph, third sentence to 0.00151 and 660 respectively. Delete next sentence.

(Radiant Flux) 10.015 Change "Φ" to "P" and delete "Alternate symbol, P".

(Radiant Energy Density) 10.020 Delete "energy" in title and second word of definition.

(Radiant Flux Density) 10.025 Change "Φ" to "P". Replace last sentence with "When referring to a source of radiant flux this is called <u>radiant emittance</u> and when referring to a surface on which radiant flux is incident this is called <u>irradiance</u>," Instead of "W" write "W or H".

(Radiant Intensity) 10.030 Change "Φ" to "P".

(Steradiancy) 10.040 Change "Steradiance" to "radiance" in title and once in text. Change "Φ" to "P". Insert after "dJ," "/" (to read $dJ/(dA \cos \theta)$). Delete second sentence of fine print.

(Irradiancy) 10.045 Delete.

(Temperature Radiator) 10.050 Change "radiancy" to "irradiance."

(Illumination) 05.035 Illuminance, E etc. Illuminance etc.
Fine print: delete "also commonly" and second sentence.

(Footcandle) 05.040 Change abbreviation to "fc" and "illumination" to "illuminance" (3 times).

(Lux) 05.045 Change "illumination" to "illuminance" (3 times).

(Phot) 05.050 Change "illumination" to "illuminance" (once).

(Quantity of Light) 05.055 Luminous Energy (Quantity of Light), $Q = \int F \, dt$: Luminous energy (quantity of light) is the product etc.

(Brightness) 05.065 Luminance, B etc. Luminance (photometric brightness) is the etc. Fine print: Paragraph 2 change "brightness" to "luminance" (twice). Paragraph 3 Quotation marks around first "brightness" and change in second sentence "brightness" to "luminance."

(Units of Brightness) 05.070 Change "brightness" to "luminance" in title and four times in text.

(Stilb) 05.075 Change "brightness" to "luminance" (3 times). Delete second sentence of first paragraph of fine print.

(Lambert) 05.080 Change "brightness" to "luminance" (5 times).

(Foot Lambert) 05.085 Change abbreviation to "fL" and "brightness" to "luminance" (4 times).

(Brightness Ratio) 05.090 Change "brightness" to "luminance" in title and four times in text.

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(Radiant Flux) 10.015 Change "Φ" to "P" and delete "Alternate symbol, P".

(Radiant Energy Density) 10.020 Delete "energy" in title and second word of definition.

(Radiant Flux Density) 10.025 Change "Φ" to "P". Replace last sentence with "When referring to a source of radiant flux this is called <u>radiant emittance</u> and when referring to a surface on which radiant flux is incident this is called <u>irradiance</u>," Instead of "W" write "W or H".

(Radiant Intensity) 10.030 Change "Φ" to "P".

(Steradiancy) 10.040 Change "Steradiance" to "radiance" in title and once in text. Change "Φ" to "P". Insert after "dJ," "/" (to read $dJ/(dA \cos \theta)$). Delete second sentence of fine print.

(Irradiancy) 10.045 Delete.

(Temperature Radiator) 10.050 Change "radiancy" to "irradiance."

(Lamp) 25.005 Add in fine print "By extension the term is also used to denote artificial sources that radiate in regions of the spectrum adjacent to the visible."

(Color Temperature) 25.030 Change note to read "Color temperatures should be assigned only for sources which have a chromaticity not greatly different from a blackbody at some temperature."

(Mean Horizontal Candlepower) 25.040 Add to fine print "For tubular sources, which are customarily mounted with their axis horizontal, mean equatorial candlepower is to be preferred."

(Regular or Specular Reflection) 30.080 Luminous reflectance; $r = F_r/F_i$: The luminous reflectance of a body is the ratio of the light reflected by the body to the light incident upon the body.

(Diffuse Reflection) 30.085. Present 30.080. (Replace with "Regular or Specular Reflection," as defined on page 60.)

(Regular Reflection Factor) 30.090 Regular luminous reflectance: The regular luminous reflectance of a surface or a body is the ratio of the regularly reflected light to the light incident upon the surface or the body.

(Diffuse Reflection Factor) 30.095 Diffuse Reflection: Diffuse reflection is that in which the incident energy is reflected in all directions.
The reflection from a body may be regular, diffuse or mixed. In most practical cases there is a superposition of regular and diffuse reflection.

(Reflection Factor, or Reflectance) 30.100 Diffuse Luminous Reflectance: The diffuse luminous reflectance of a surface or a body is the ratio of the diffusely reflected light to the light incident upon the surface or the body.

(Diffuse Transmission) 30.105 Luminous Transmittance; $t = F_t/F_i$: The luminous transmittance of a body is the ratio of the light transmitted by the body to the light incident upon the body.

(Regular Transmission) 30.110 Regular Transmission: Regular transmission is that in which the incident energy is transmitted without diffusion. In such transmission the direction of the transmitted beam of energy has a definite geometrical relation to the corresponding incident beam.

(Regular Transmission Factor) 30.115 Regular Luminous Transmittance: The regular luminous transmittance of a body is the ratio of the regularly transmitted light to the light incident upon the body.

(Diffuse Transmission Factor) 30.120 Diffuse transmission: Diffuse transmission is that in which the incident energy is transmitted by the body in all directions.
The transmission by a body may be either regular, diffuse or mixed. In many cases there is a superposition of regular and diffuse transmission.

(Transmission Factor) 30.125 Diffuse Luminous Transmittance: The diffuse luminous transmittance of a body is the ratio of the light diffusely transmitted by the body to the light incident upon the body.

(Absorption Factor) 30.130 Internal Luminous Transmittance; t_i: The internal luminous transmittance is the ratio of the light reaching the second surface of the body to the light which enters the surface where it is incident.

(Absorptance) 30.131 Luminous Absorptance; a: The luminous absorptance is the ratio of the light absorbed by the body to the light which enters the body.

(Isolux Line) 40.080 Change "illumination" to "illuminance."

(Isolux Diagram) 40.081 Change "illuminance" to "illuminance."

(Comparison of Sources) 40.090 Change "brightness" to "luminance."

(Photometric Tests) 40.095 Change (last sentence) "illuminants" to "light sources."

ADDED REFERENCES

In this report no terms standardized by groups other than ISCC member bodies or the CGPS, and the I.C.I. (pages v - vi) are included. Yet serious proposals regarding standardization of nomenclature have been made by others in this general field, particularly by Moon and Spencer, and by Adams. The following references will lead the reader to such proposals.

Adams, E. Q. Some Suggestions for the Nomenclature of Radiation, Optical Soc. Amer. Jour. 36, 429(L) (1946).

Moon, Parry and Spencer, D. E. Brightness and Helios, Illum. Engin. 39, 507-520 (1944).

Moon, Parry and Spencer, D. E. Photometric Nomenclature for the Post-War World, Illum. Engin. 42, 611-624 (1947).

A

ABSENCE-OF-BLOOM GLOSS ASTM
Absence-of-bloom gloss is indicated by freedom from haziness bordering a high tint.

ABSORB AAPL
The canvas in oil-painting or the paper in water-color is said to absorb when, owing to its grain or some flaw in its sizing, the colors cannot be perfectly laid on, but lose their intensity as soon as the surface is covered.

1/ABSORPTANCE IES
The absorptance of a body is the ratio of the light absorbed by the body to the light which enters it.
Sim: (absorptivity — CGPS, OSA)
Diff: OSA

———— OSA
Ratio of absorbed to incident flux.
Sim: (absorption factor — CGPS, IES)
Diff: IES

ABSORPTION BAND of a color filter SMPE
The part of a spectrum which is absorbed by a color filter.

1/ABSORPTION FACTOR CGPS (37)
The ratio of the luminous flux absorbed in a body (not reflected or transmitted) to the flux incident upon it. Also called absorptance.
Sim: IES, (absorptance — OSA)

———— —— IES
The absorption factor of a body is the ratio of the light absorbed by the body to the incident light.
$\alpha = F_a/F_1$
Note: The absorbed light is the difference between the incident light and the sum of the transmitted and reflected light.
Sim: CGPS, (absorptance — OSA)

ABSORPTIVITY CGPS (42)
The internal absorption factor of unit thickness of the absorbing material.
Sim: OSA, (absorptance — IES)

———— OSA
Difference between unity and transmissivity.
Sim: CGPS, (absorptance — IES)

ACCOMMODATION APA
Adjustment of the focus of the eye for a given distance.

ACHROMATIC AAPL
Achromatic means without any perceptible dominance of hue, as black velvet, white chalk, or an optical mixture of black and white in any value of gray.
Sim: APA, USP-NF (1)

———— APA
Lacking in hue and saturation and therefore falling in a series of colors which varies only in lightness or brightness.
Sim: AAPL, USP-NF (1)

———— USP-NF
1. Psychol. Lacking in chroma (i.e., hue and saturation), so as to fall in the series of colors which vary only in lightness.
2. Phys. Characterizing any optical system in which the final distribution of rays is wholly or substantially independent of their wave-lengths, for the range of wavelengths considered, i.e., which is corrected for chromatic aberration.
See also: Color
Sim. (1): AAPL, APA

ACHROMATIC COLOR APA
A visual quality characterized primarily by its degree of brightness or lightness, and exhibiting no hue or saturation.
Examples of achromatic colors are gray, black, white, clear, silver.
Sim: OSA, USP-NF, (achromatic colour or sensation — CGPS), (neutral — AAPL), (neutral color — SMPE)

———— —— OSA, USP-NF
Color perceived to have no hue.
Note: Examples of achromatic color perceptions are black, gray, white, silver, and "clear, colorless."
Sim: APA, (achromatic colour or sensation —CGPS), (neutral — AAPL), (neutral color — SMPE)

———— COLOUR CGPS (53)
Visual sensations devoid of the attribute of hue. Also called achromatic sensation.
Sim: (achromatic color — APA, OSA, USP-NF), (neutral — AAPL), (neutral color — SMPE)

ACHROMATIC LIGHT OSA
Light perceived as having no hue.
Sim: (achromatic stimulus — APA), (white light — SMPE)

*ACHROMATIC LOCUS IES
Qualities which may be acceptable reference standards under circumstances of common occurrence are represented in a chromaticity diagram by points in a region which may be called the achromatic locus.
Note: The boundaries of the achromatic locus are indefinite, depending on the tolerances in any specific application. Acceptable reference standards of illumination (commonly referred to as "white light") are usually represented by points close to the locus of blackbodies having temperatures higher than about 2000°K. While any point in the achromatic locus may be chosen as the reference point for the determination of dominant wavelength, complementary wavelength, and purity, for specification of object colors it is usually advisable to adopt the point representing the chromaticity of the luminator. Mixed qualities of illumination and luminators with chromaticities represented very far from the blackbody locus require special consideration. Having selected

1/ For I.E.S. revision, see p. x.

a suitable reference point, dominant wavelength may be determined by noting the wavelength corresponding to the intersection of the spectrum locus with the straight line drawn from the reference point through the point representing the sample. When the reference point lies between the sample point and the intersection, the intersection indicates the complementary wavelength.

Sim: (achromatic region – OSA)

ACHROMATIC POINT OSA

Point in the chromaticity diagram used as the basis for determination of dominant and complementary wave-lengths and for excitation purity because it represents the chromaticity of a color which is acceptable as achromatic under the conditions in which the colors are observed.

ACHROMATIC REGION OSA

The part of a chromaticity diagram that represents chromaticities that are perceived as having no hue under circumstances of common occurrence.

Note: The achromatic region includes portions of the chromaticity diagram on both sides of the Planckian locus for temperatures higher than about 2360°K. Any point in the achromatic region may be chosen as representative of achromatic for the determination of dominant wave-length, complementary wave-length and purity. For specification of object colors it is usually advisable to adopt the point representing the chromaticity of the illuminant. Mixed qualities of illumination and illuminants with chromaticities represented very far from the blackbody locus require special consideration.

Sim: (achromatic locus – IES)

*ACHROMATIC STIMULUS APA

A visual stimulus which characteristically evokes an achromatic color.

Also called neutral stimulus, or achromatic light.

Sim: OSA, (neutral stimulus – OSA), (white light – SMPE)

——— ——— OSA

Same as Achromatic Light.

ACHROMATOPSIA apa, osa

Type of monochromatism in which all colors are perceived as achromatic.

Also called achromatism, or total color blindness.

*ADAPTATION APA

The progressive adjustive changes in sensitivity which regularly accompany continued sensory stimulation or lack of stimulation. Cf. visual adaptation.

ADAPTOMETER APA

Any device for measuring the temporal course or momentary degree of sensory adaptation, in terms of fall or rise of threshold or sensitivity.

Dark adaptation is commonly measured in terms of the simple light threshold, the adaptometer consisting of a variable, measured light stimulus.

ADDITIVE MIXTURE CGPS (4)

The mixture of light stimuli in such a manner that they enter the eye simultaneously or in rapid succession, and are incident on the same area of the retina or enter in the form of a mosaic which the eye cannot resolve.

Sim: (additive synthesis – SMPE), (color mixture – APA, USP-NF, osa)

ADDITIVE PRIMARIES CGPS (6)

Certain dyes, pigments or other secondary or primary sources of light (e.g. monochromatic radiations) giving rise to stimuli predominantly confined to one part of the spectrum, which by additive mixture of the stimuli in varying proportions can be made to match a large range of colours. Generally three in number, a red, a green, and a blue.

Note: It is recommended that the term 'primaries' should be reserved for the dyes and pigments used in colour reproduction processes.

ADDITIVE PROCESS CGPS (185)

(Colour photography) A process of reproducing the colours of objects in a picture by means of the additive colour mixture of two or more additive primaries, the amounts of which at any point are controlled by colour separation images. Also called additive synthesis.

Sim: SMPE

——— ——— SMPE

A process for reproducing objects in natural colors, by means of the principle of additive synthesis. Usually, black-and-white positives, printed from negatives taken through the primary color filters, are projected or viewed in register by means of light beams of the same primary colors.

Sim: CGPS

ADDITIVE SYNTHESIS SMPE

The formation of a color by mixing light of two or more other colors. Any color may be formed by mixing light of three primary colors in the proper proportions. Some colors may be formed by mixing light of two colors.

Sim: (additive mixture – CGPS), (color mixture – APA, USP-NF, osa)

ADVANCING COLORS AAPL

There are warm colors (typically reds) which are perceived, or tend to be perceived, as leaving their picture plane or physical plane and approaching nearer to the observer.

AEOLOTROPIC MATERIAL OSA

Same as Anisotropic Material.

AERIAL PERSPECTIVE AAPL

The representation of space by gradations

of color that parallel the effect produced by various densities of air on the appearance of objects.

AFTER-IMAGE APA, osa
A prolongation or renewal of a sensory experience, ascribable to residual excitation after the external stimulus has ceased to operate.

AFTER-IMAGE, NEGATIVE APA
A sensory response which follows another and is dependent upon the prior stimulation, but which is of a quality antagonistic or complementary to the preceding experience.
That is, a visual after-image in which black and white relations are reversed and the colors are usually approximately complementary to those of the original response.

AFTER-IMAGE, POSITIVE APA
A sensory response which follows another in the absence of direct stimulation, and reproduces the qualities of the preceding experience.
Contrast with: Negative after-image, in which the qualities are reversed, or complementary. But the after-effect following a light pulse is preferably termed a positive after-image if it appears brighter than the surrounding field, and a negative after-image if it appears less bright. In this use, the terms positive and negative refer to brightness only, and not to the hue of the image. Cf. Purkinje after-image, which is positive in brightness and complementary in hue to the primary image.

ALABASTER GLASS IES
Alabaster glass is glass simulating natural Alabaster and having a gray or paraffin-like appearance. For a given thickness, it usually has less diffusion than Opal glass.
The true Alabaster appearance results from the internal structure of glass or proper composition, rather than from surface treatment or casing. An alabaster appearance can also be obtained by casing an Opal glass with Clear glass, and while this should be classed as a Cased glass, it is sometimes referred to as Alabaster.

*ALBEDO APA
The whiteness of a matte surface as evaluated in terms of its diffuse reflectance for daylight.

*ALBEDO PERCEPTION APA
The discrimination of surfaces according to their diffuse reflecting power or albedo regardless of the illumination under which they are seen.

ALYCHNE CGPS (67)
The locus in a trichromatic coordinate system of colours of zero luminance. It is a plane passing through the origin and lying wholly outside the boundary of realizable colours.

AMAUROSIS apa
Loss of sight due to defect of the optic nerve, which is not accompanied by any perceptible change in the eye itself.

AMBLYOPIA apa
Dimness of vision for which no organic defect in the refractive system of the eye has been discovered.
Found in total color-blindness, in albinism, in toxic conditions, and associated with excessive use of tobacco and various drugs.

ANALOGOUS COLORS AAPL
Analogous colors are colors which have some perceptible similarity or close relationship in respect to one or more of the attributes of color; as, closely related in hue, or in value, or in chroma. Usually the term refers to the relation of hues alone; as, reds and oranges are called analogous hues or colors, even when the values and chromas may be very dissimilar.

ANALOGOUS HARMONY AAPL
Any harmony produced by means of analogous colors.

ANGLE OF INCIDENCE apa
The angle between the path of an oncoming ray of light and the normal to the surface on which it impinges.

ANGLE OF REFLECTION apa
The angle between the path of a ray of light and the normal to the surface from which it is reflected.

ANGLE OF REFRACTION apa
The angle between the path of a ray of light and the normal to the surface of the medium by which it is refracted.

ANGLES OF DISPLACEMENT apa
The angles by which the respective eyes deviate from the direction occupied in the primary position.
The vertical displacement is the angle of the eye upward or downward from the primary position; the lateral displacement is the angle to right or left.

ANISOTROPIC MATERIAL OSA
Material in which the velocity of propagation of radiant energy depends upon direction.
Same as Aeolotropic Material.

ANOMALOSCOPE APA
The spectral apparatus for the determination of color deficiency by the use of the Rayleigh equation (Nagel).

ANOMALOUS TRICHROMATIC VISION CGPS (85)
A form of defective colour vision in which three stimuli are required for colour matching, but the proportions in which they are matched differ significantly from those required by the normal trichromat.
Note: There are three forms of anomalous trichromatism—protanomalous, deuteranomalous and tritanomalous vision. They cover the ranges of defective colour vision lying between normal trichromatism and complete protanopia, deuteranopia or tritanopia, respectively.

Also called anomalous trichromatism, partial dichromatism, hence anomalous trichromat.
Sim: (anomalous trichromatism – OSA, apa)

ANOMALOUS TRICHROMATISM apa, osa
Form of trichromatism in which some of the proportions of colorimetric primaries required to match various colors are beyond normal limits.
Anomalous trichromatism may be either protanomaly, deuteranomaly, tritanomaly, or some irregular form.
Sim: (anomalous trichromatic vision – CGPS)

ANTIQUE GLASS IES
Antique glass is glass of relatively smooth surface having a slight degree of non-uniform diffusion due to the intentional presence of bubbles, striae, fissures, etc.

APERTURE-COLOR PERCEPTION OSA
Perception of color as filling an aperture in a screen.
Note: An aperture-color perception is non-located in the sense that it may be near the plane of the screen or indefinitely far behind it, but it tends to be seen close to a plane perpendicular to the line of sight. It has a filmy, soft character in contrast to a surface-color perception which has a hard character corresponding to an exact location in space.
Sim: (film color – APA)

APPARENT CANDLEPOWER IES, osa
The apparent candlepower of an extended source of light measured at a specified distance is the candlepower of a point source of light which would produce the same illumination at that distance.

APPARENT LUMINOUS REFLECTANCE osa
Same as Directional Luminous Reflectance.

ARMY SOLUTIONS USP-NF, osa
Standard solutions permitting a color to be specified by giving the concentration required to produce a match; the coloring materials of the principal solutions are cobalt chloride, ferric chloride, and copper sulfate.

ARTIFICIAL DAYLIGHT osa
An illuminant that has an energy distribution similar to that of any of the phases of daylight.

ARTIFICIAL LIGHT SMPE
Light (visible radiation) having the same (or nearly the same) spectral composition as direct solar radiation (plus daylight – in practice produced by selectively absorbing some components of the light emitted by artificial sources.

ASYMMETRICAL LIGHT DISTRIBUTION IES
An asymmetrical light distribution is one in which the curves of vertical distribution are not the same for all planes.

ATTRIBUTES OF COLOR APA
The chromatic colors have the attributes of hue, saturation and brightness or lightness; but the achromatic colors do not have those of hue and saturation. All colors do have the general attributes of duration and extent, but these are rarely mentioned.
Also called dimensions of color.

ATTRIBUTES OF SENSATION APA, osa
The fundamental, intrinsic characteristics of simple sensory response, generally recognized as quality, intensity, duration, and extensity; clearness or attensity sometimes also being included.

AUBERT-FÖRSTER LAW APA
A generalization from the Aubert-Förster phenomenon, namely, that visual acuity for a near object in the periphery is greater than for a similar distant object, even though the latter is large enough to subtend the same visual angle as the near object.

AUBERT-FÖRSTER PHENOMENON APA
Small near objects can be recognized over a larger portion of the retina than larger, more distant objects that subtend the same visual angle.

B

BACK GREY aatcc
A term used in printing to describe cloth which is placed on the printing machine between the blanket and cloth to be printed to prevent the cloth to be printed from being soiled by color which penetrates through the blanket.

BALANCE AAPL
A synonym for equilibrium. In a picture we say that the composition is well-balanced, or that the groups of figures have balance when the work is harmonious and when the lights and shades are in equal masses.

BARRE, BARRY AATCC, TCCA
Having bars or streaks across the fabric, that is in the direction of the filling yarns.

BARRIER-LAYER CELL osa
Same as Photovoltaic Detector.

BASIC STIMULUS CGPS (65)
The standard visual stimulus (usually achromatic) used to determine the units of the reference stimuli of any trichromatic system.

BEAM-SPLITTER SMPE
An optical system so arranged as to reflect or transmit two or more portions of a light-beam along different optical axes. Such a device is frequently used in the production of color separation negatives.

BEER'S LAW OSA
Radiant transmittance of a solution is a function of the product of the concentration by the thickness of the layer.
Note: Beer's law can apply only to solutions in which the solvent has zero absorptivity, and does not apply even to

all such solutions. Furthermore, it is expected to apply only to irradiation of solutions by energy restricted to a wavelength range within which the solution is a nonselective absorber.

BEZOLD-BRÜCKE PHENOMENON APA
A hue shift due to change of luminance of chromatic stimuli and independent of wavelength and purity. With increasing luminance, colors around red and green become either yellower or bluer, according to their location in the chromatic cycle.

BIAXIAL CRYSTAL OSA
Polarizing crystal having two directions in which the two rays are propagated with the same velocities.
Note: Neither ray formed by a biaxial crystal obeys Snell's law.

BINOCULAR COLOR MIXTURE APA
The presentation of different color stimuli to corresponding areas of the two retinas, resulting in a single fused impression. This effect occurs only under special conditions; often the effect is rivalry, especially when the two stimuli are very different in their separate effects.

BINOCULAR FLICKER APA, osa
Flicker evoked by rapidly alternating presentation of stimuli to the right and left eyes, usually in such a manner that the gaps in the stimulus presented to one eye are filled by the stimulus presented to the other.

BINOCULAR FUSION APA, osa.
The combination of two images, falling upon the two retinas, into a single visual impression.
The images may be alike, or may differ to some degree in form and color.

BINOCULAR RIVALRY APA
Same as retinal rivalry.

BINOCULAR VISION APA, osa
Vision with the two eyes operating conjointly, usually with fixation of both on the same objective point.
In general, characterized by a single perception of the objects fixated, but in certain conditions by doubling or by rivalry. An important factor in perception of space, giving projection and relif.
Contrast with monocular vision.

BIPACK SMPE
A unit consisting of two superposed films or plates sensitive to different portions of the spectrum, and intended to be exposed one through the other.

BLACK AAPL
The ideal black is obtained in the total absence of reflected light. In practice we have to be content with a fairly near approach.
Sim: APA, CGPS, USP-NF, osa
Diff: cgps

*——— APA, osa
An achromatic color of minimum lightness (maximum darkness) which represents one limit of the series of grays, and which is the complement or antagonist of white, the other extreme of the gray series. Though typically a response to zero or minimal stimulation, black appears always to depend upon contrast.
Sim: AAPL, CGPS, USP-NF
Diff: cgps

——— CGPS (56)
A visual sensation, arising from some portion of a luminous field, of extremely low luminosity.
Sim: AAPL, APA, USP-NF, osa
Diff: cgps

——— cgps (128)
(Ordinary speech) Not coloured and very dark.
Diff: AAPL, APA, CGPS, USP-NF, osa

——— USP-NF
One of the unique visual qualities correlated (1) with a minimal visual stimulus in a portion of the visual field while the surrounding field is occupied by a high degree of achromatic stimulus or (2) with a minimal visual stimulus following a high degree of achromatic stimulus.
3. One of the psychological unique colors.
Sim: AAPL, APA, CGPS, osa
Diff: cgps

BLACK BODY CGPS (75)
A secondary source which is completely absorbing at all visible wavelengths.
Diff: (blackbody — IES, OSA), (full radiator — CGPS)

BLACK CONTENT CGPS (114)
(Ostwald system) B in the equation, W+B+C=1, which Ostwald considered interprets the appearance of all related colours.
Diff: OSA

——— ——— osa
Difference between unity and greater of the two spectral reflectances in the ideal Ostwald surface color-matching the sample.
Diff: CGPS

BLACK LIQUOR aatcc
A very dark colored liquid used formerly quite extensively as an iron mordant in conjunction with Logwood for the dyeing of Logwood Black on pure silk. It is in reality an impure ferrous acetate solution and is sometimes known as pyrolignite of iron.

BLACKBODY IES
A blackbody is a temperature radiator of uniform temperature whose radiant flux in all parts of the spectrum is the maximum obtainable from any temperature radiator at the same temperature.
Such a radiator is called a blackbody because it will absorb all the radiant energy that falls upon it. All other temperature radiators may be classed as non-blackbodies. They radiate less in some or all wavelength intervals than a blackbody of the same size and the same temperature.

Note: The blackbody is practically realized in the form of a cavity with opaque walls at uniform temperature and with a small opening for observation purposes. It is variously called standard radiator, complete radiator, or ideal radiator.
Sim: (complete radiator – OSA), (full radiator – CGPS)
Diff: (black body – CGPS)

——— OSA
Same as Complete Radiator.
Sim: IES
Diff: (black body – CGPS)

*BLACKBODY LOCUS IES
The locus of chromaticities of blackbodies having various temperatures is the blackbody locus.
Sim: OSA

——— ——— OSA
Same as Planckian Locus.
Sim: IES

BLACKBODY RADIATION apa
Radiant energy emitted from a theoretically non-selective incandescent radiator, and having the spectral distribution given by Planck's law, i.e., a distribution determined solely by the temperature of the radiating body.

BLACKBODY TEMPERATURE OSA
Same as Brightness Temperature.

BLEACH AATCC, TAPPI, TCCA, osa
To make whiter.
Diff: SMPE, astm

——— astm
(noun) An extension of a chromatic paint with a white pigment. Both pigments usually are in the form of a paste prepared by dispersing the pigment in oil.
Diff: AATCC, SMPE, TAPPI, osa

——— SMPE
1. (v.t.) To destroy color by chemical means; in photography by chemical action (usually oxidation) to convert the silver of an image into a silver salt.
2. (v.t.) By suitable means to restore or remove an image thus treated, generally leaving the gelatin film toned and/or tanned.
3. (n.) A chemical reagent used for bleaching.
Diff: AATCC, TAPPI, TCCA, astm, osa

BLEACH-OUT PROCESS SMPE
A process for making color-prints from a color transparency, by use of a support coated with a mixture of dyes, each of which is capable of being decolorized by exposure to light in a different portion of the spectrum, or by subsequent chemical action controlled by a photographic image.

BLEED AATCC, TCCA
A color is said to bleed when some of the coloring matter passes from the fabric into a liquid, usually water, in contact with it. It bleeds into another fabric when the coloring matter is transferred to the second, usually white, fabric, through the action of a solvent.
Sim: (bleeding – astm)
Diff: (bleeding of color – SMPE)

BLEEDING astm
The diffusion of coloring matter through a coating from the substrate; also, the discoloration arising from such diffusion.
Sim: (bleed – AATCC, TCCA)
Diff: (bleeding of color – SMPE)

BLEEDING OF COLOR SMPE
The diffusing of dye away from a dye-image; most noticeable where dark areas adjoin light areas in a picture.
Diff: AATCC, astm, TCCA

BLENDED COLORS AAPL
The effect obtained by the passing of one color or tone to another by means of imperceptibly graduated shades or tints.

BLENDING APA
A gradual or imperceptible change from one color to another.

BLIND SPOT APA, osa
An irregular area in the retina which is not sensitive to light-stimulation because it lacks rods and cones.
The blind spot is around 6.5° of visual angle in diameter and is situated about 15° to the nasal side of the center of the retina, corresponding to the place of exit of the optic nerve. The blind spot explains the substantial gap in the temporal side of the monocular visual space.
Sometimes called Mariotte's spot, from its discoverer.

BLOOM (BLOOMY) AATCC, TCCA
Bright and rich in color when viewed overhand.
See: Overhand
Diff: FPVPC

——— FPVPC
An appearance characteristic of high-gloss surfaces where the high-lights have a hazy border.
Diff: AATCC, TCCA

BLOTCHY AATCC
Having relatively large (over 1 inch in diameter) irregular patches of a color somewhat different from that of the rest of the fabric.
Diff: TCCA

——— TCCA
Having irregular patches of a color somewhat different from that of the fabric.
Diff: AATCC

*BLUE APA, osa
1. The hue attribute of visual sensations typically evoked by stimulation of the normal human eye with radiation of wavelength approximately 476 millimicrons.
2. Any hue predominantly similar to that to that of the typical blue. (The complement of yellow.)
Sim: USP-NF
Diff: FPVPC

—— FPVPC
A pigment (or dye) producing the color of blue.
Diff: APA, USP-NF, osa

—— USP-NF
1. The hue attribute of visual sensations typically evoked by stimulation of the normal retina with radiation of wave-length approximately 476 millimicrons (mμ).
2. Any color manifesting a hue predominantly similar to that of blue (1). (The complement of yellow.)
3. One of the psychologically unique colors.
Sim: APA, osa
Diff: FPVPC

BLUE ARC PHENOMENON APA, osa
The pair of luminous blue or purple arcs which sometimes appear to the practiced observer as connecting a somewhat decentered stimulus object with the projected locus of the blind spot.
The phenomenon is attributed to secondary stimulation of retinal receptors lying along the course of the originally excited nerve fibers.

BLUE-SIGHTED APA, osa
Displaying a heightened color sensitivity (congenital or acquired) for blue.

BLUE-YELLOW BLINDNESS APA
A rare type of partial color-blindness, or dichromasy, in which blue and yellow stimuli are confused because the color gamut is reduced to reds, greens and grays.
Cf. Tetartanopia and tritanopia.

BLUING aatcc
Bluing is resorted to for improving the whiteness of material. It is carried out by the treatment of material with a non-substantive blue or violet dye or pigment.

BLURRY AATCC, TCCA
Having uncertain, that is, not clear, outlines.

BLUSHING FPVPC
A whitening, accompanied by loss of gloss, usually in lacquers. The commonest cause is absorption of water before the film is hard.

BODY-COLOR AAPL
Water-color drawings are said to be executed in body-color when the color is laid on thick and mixed with Chinese white, in contradistinction to the older method of water-color, in which the colors are laid on in transparent washes. Generally speaking a color is said to have body when it possesses the quality of covering the canvas when thickly laid on.

BOLOMETER OSA
Device used to measure irradiance by means of the temperature coefficient of resistance of an electrical conductor.
Note: Platinum is the most frequent choice of conductor.

BOUGUER'S LAW OSA
Equal layers of a transparent material absorb equal fractions of each kind of energy entering them.
Note: Sometimes incorrectly called Lambert's Law.

BREWSTER'S LAW OSA
Light reflected from the surface of a dielectric material by Fresnel reflection such that the reflected and refracted beams are at right angles is completely plane polarized.
Note: Brewster's law is often stated in terms of the indices of refraction,
$$\tan \theta = n_1/n_2$$
which states that the tangent of the angle of reflection, θ, at which complete polarization occurs is equal to the ratio of the indices of refraction, n_1 and n_2, of the two media on either side of the reflecting surface.

BRIGHT AATCC, TCCA
Brilliant, vivid, lively in appearance, opposite of dull.
Sim: CGPS, cgps
Diff: APA

—— APA
Characterized by a relatively high degree of brightness.
Diff: AATCC, CGPS, TCCA, cgps

—— CGPS (152)
(Dyeing industry) Adjective applied to a dyestuff (or colour of material dyed with such dyestuff) which is capable of producing a highly saturated colour when applied in suitable strength. Opposite of Dull (153).
Sim: AATCC, TCCA, cgps
Diff: APA

—— cgps (130)
(When used to qualify colours in ordinary speech) Strongly coloured and light.
Sim: AATCC, CGPS, TCCA
Diff: APA

BRIGHTNESS AATCC, TCCA
The brightness of a color is its vividness, usually relative to some other similar color with which it is being compared.
Opposite of Dullness.
Sim: CGPS, cgps
Diff: APA, IES, OSA, TAPPI

*———— APA
That attribute of a film color or an illuminant color by reference to which it can be classed as equivalent to a member of the achromatic series ranging from very dim to very bright.
(For convenience in general discussion, brightness is sometimes generalized to cover the related term lightness.)
Sim: OSA
Diff: AATCC, CGPS, IES, TAPPI, TCCA, cgps

——— CGPS (148)
Comparisons:- Duller, brighter
(Dyeing industry) That colour quality, a decrease in which may be compared with the effect of the addition of a small quantity of neutral gray dye to the dyestuff, whereby a match cannot be made by adjusting the strength. Opposite of Dullness (147).
Sim: AATCC, TCCA, cgps
Diff: APA, IES, OSA, TAPPI

——— cgps (209)
(Artist painters) The term is usually employed to denote the relative intensity of hue and also to denote the relative psychological intensity of the different hues, thus red is usually considered to be brighter than blue. In this sense the word as used by the artist vaguely means that colour in a group which "attracts" the eye to the greatest degree. On the other hand, the lightest member of a series of greys would be called the brightest. He will also say "this is the brightest object in the subject matter," meaning the most luminous.
Sim: AATCC, CGPS, TCCA
Diff: APA, IES, OSA, TAPPI

1/ ———,B IES
Brightness is the luminous intensity of any surface in a given direction per unit of projected area of the surface as viewed from that direction.

$$B = dI/(dA \cos\theta)$$

Note: In the defining equation, θ is the angle between the direction of observation and the normal to the surface.
In practice no surface follows exactly the cosine formula of emission or reflection; hence, the brightness of a surface generally is not uniform but varies with the angle at which it is viewed. Brightness can be measured not only for sources and illuminated surfaces, but also for virtual surfaces such as the sky.
In common usage the term brightness usually refers to the intensity of sensation which results from viewing surfaces or spaces from which light comes to the eye. This sensation is determined in part by the definitely measurable "brightness" defined above and in part by conditions of observation such as the state of adaptation of the eye.
Sim: (luminance — CGPS, OSA, apa)
Diff: AATCC, APA, CGPS, OSA, TAPPI, TCCA, cgps

——— OSA
The attribute of the color perception of a luminous area that permits it to be classified as equivalent to some member of achromatic color perceptions ranging from very dim to very bright.
Note: The color perception corresponding to the night sky under usual observing conditions is near the bottom of this scale; that corresponding to the noon-day sun is near the top.
Sim: APA
Diff: AATCC, CGPS, IES, TAPPI, TCCA, cgps

——— TAPPI
As used in the manufacture of white paper, the reflecting power of an infinitely thick stack of material (reflectivity) measured to blue light of wavelength ~~450~~ 457 millimicrons under conditions of lighting and viewing recommended by the International Commission on Illumination, 1931, as standard. Working Definition is — Brightness of paper is the reflecting power as measured on the G. E. Reflection Meter using Filter No. 1, or as measured on any instrument giving identical results, the instrument being operated under conditions prescribed by and checking against standards furnished by the Institute of Paper Chemistry, Appleton, Wisconsin.
Diff: AATCC, APA, CGPS, IES, OSA, TCCA, cgps

BRIGHTNESS CONTRAST APA
A change in brightness in a given area of the visual field, due to very recent stimulation (in respect to luminance) of an adjoining or neighboring area, or of the given area.

BRIGHTNESS PURITY OSA
Same as Luminance Purity.

2/ BRIGHTNESS RATIO IES
Brightness ratio is the ratio of the brightnesses of any two surfaces. When the two surfaces are adjacent, the brightness ratio is commonly called the "brightness contrast."

BRIGHTNESS TEMPERATURE OSA
Temperature of a complete radiator whose luminance is the same as that of the body in question for some narrow spectral region.

BRIGHTNESS THRESHOLD, ABSOLUTE APA
The intensity of the least visual stimulus (of any specified wave-length composition) sufficient to evoke a brightness in excess of that of the adjacent unstimulated visual field.
The value is determined after complete dark adaptation but does not exclude the effect of processes normally active in the sense-organ.

†BRILLIANCE APA, OSA
That attribute of any color or visual sense-quality in respect to which it may be classed as equivalent to some member of a series of grays ranging from black to white.
Distinguish from brightness, which has reference solely to stimulus-magnitude.
Sim: (lightness — APA, CGPS, OSA)

BRILLIANT CGPS (194)
a. (Glass industry) As applied to glassware to which has been given decorative processes involving cutting. A glass of

1/ This I.E.S. term to be replaced by LUMINANCE, see pp. vi and viii.
2/ This term to be replaced by LUMINANCE RATIO, see pp. vi and viii.

high refractive index and spectral dispersion, having high surface reflection and transmission factors.
b. (Glass industry) As applied to uncut glassware. A colourless glass having high reflection and transmission factors.
Diff: USP-NF

——— USP-NF
Light strong, the opposite of dark grayish.
Diff: CGPS

BRONZY AATCC
Bronziness is a surface-reflected color which is different in hue from the body color.
Sim: FPVPC, TCCA, astm

——— astm
A metallic like color, usually quite different in hue from the body color, observed by viewing the surface in the general direction of specular reflection.
Sim: AATCC, FPVPC, TCCA

——— FPVPC, TCCA
Having a metallic surface appearance that partly obscures the body color of the material. Bronziness is usually yellowish, greenish, or reddish and complementary to the body color.
Sim: AATCC, astm

BROWN USP-NF
1. The hue attribute of visual sensations typically evoked by stimulation of the normal retina with radiation of wave-length approximately 593 mμ.
2. Any color which manifests a hue predominantly similar to that of brown, a mixture of red and dark yellow, dark orange. (The complement of greenish blue or blue.)

BULKY COLOR APA
Same as volume color.
Sim: (bulky-color perception — osa)

BULKY-COLOR PERCEPTION osa
Same as Volume-Color Perception.
Sim: (bulky color — APA)

C

CALLIER COEFFICIENT OSA
Ratio between the specular density and the diffuse density of a specimen.

CAMPIMETER APA
An instrument with a flat chart for mapping the sensibility of the retinal field.
In the campimeter, equal visual angles are represented by greater lengths as the distance from the fixation point increases, in accordance with the tangent function; contrasted with the perimeter in which the instrumental determinations are proportional to the visual angles.

CANDLE apa
The unit of luminous intensity of a source of light.
The international candle, agreed upon in 1909 is reproduced from any one of a number of carefully intercompared standard incandescent lamps, operated and used under specified conditions; the German Hefnerkerze (Hefner candle) is about 0.9 international candle.
Cf. Candle, New.
Sim: CGPS, IES, osa

——— CGPS (17)
The unit of luminous intensity. Defined as the luminous intensity of an internationally agreed standard source.
Sim: IES, apa, osa

1/ ———, c IES, osa
The candle is the unit of luminous intensity. The unit used in the United States is a specified fraction of the average horizontal candlepower of a group of 45 carbon-filament lamps preserved at the National Bureau of Standards, when the lamps are operated at specified voltages. This unit is identical, within the limits of uncertainty of measurement, with the International Candle established in 1909 by agreement between the national standardizing laboratories of France, Great Britain, and the United States, and adopted in 1921 by the International Commission on Illumination.
Note: The international agreement of 1909 fixed only the unit at low color temperature as represented by carbon-filament lamps. In rating lamps at higher temperatures, differences developed between the units used in different countries. The International Committee on Weights and Measures adopted in 1937 a new system of units based upon (1) assigning 60 candles per square centimeter as the brightness of a black-body at the temperature of freezing platinum, and (2) deriving values for standards having other spectral distributions by use of the accepted luminosity factors. It was planned to introduce the new units into use January 1, 1940, but this step has been deferred until further international comparisons of standards can be made.
Sim: CGPS, apa

———, NEW OSA, apa
As from 1st January 1948, the unit of luminous intensity will be such that the luminance of a complete radiator at the temperature of solidification of platinum shall be 60 units of intensity per square centimeter.
Note: This unit will be called the New Candle (Resolution of the Comité International des Poids et Mesures, Paris, June 1937).

CANDLEPOWER apa
Luminous intensity expressed in candles. Also called candle, e.g., "the intensity of a source is 60 candles," "the candlepower of a source is 60."
Sim: IES

———, cp IES
Candlepower is luminous intensity expressed in candles.

1/ For I.E.S. revision, see p. vii.

$$I = dF/d\omega$$

Sim: apa

CARBON PRINTING SMPE
A process for making prints in one or more colors by exposure of a bichromated and pigmented gelatin tissue to produce local insolubility of the gelatin, followed by the development of a relief image through the solvent action of warm water.

CARBON TRANSFER PROCESS SMPE
A process in which a relief image, produced in carbon printing, is transferred to another support from the one upon which it was developed.

CARDINAL STIMULI CGPS (66)
Four standard visual stimuli by means of which the three reference stimuli and the basic stimulus of any trichromatic system may be defined. Light of wavelengths 700, 546.1 and 435.8 mμ and Illuminant B have been adopted by the C.I.E.

CASED GLASS IES
Cased glass is glass composed of two or more layers of different glasses, usually a clear, transparent layer to which is added a layer of opal, opalescent, or colored glass. This glass is sometimes referred to as flashed, multi-layer, polycased, etc.

CAST AATCC, FPVPC, TCCA
Tendency toward, as "green cast," "red cast."

CHALKY AAPL
This is the color of chalk, i.e., high value and devoid of hue.
Diff: CGPS

——— CGPS (166)
(Paint and pigment industries) An excess of white (in a match supposed to be close).
Note: "Chalky" is an operational term peculiar to the Paint and Pigment Industries.
Diff: AAPL

CHARACTERISTIC CURVE IES
A characteristic curve is a curve expressing a relation between two variable properties of a luminous source, as candlepower and volts, candlepower and rate of fuel consumption, etc.

CHARPENTIER'S BANDS APA
A series of alternating light and dark bands which follow a moving slit-shaped stimulus presented against a dark visual field and which are due to fluctuations of visual excitation similar to those which give rise to after-images.

CHATTERS aatcc
A term used in printing to describe a defect in machine printing caused by a vibration of the doctor blade, resulting often from excessive high speed of machine operation.

CHEMICAL TONING SMPE
The process of converting the silver of a photographic image into a colored substance, or replacing it by a colored substance through the use of chemical reagents which are not dyes.

CHIAROSCURO AAPL (also, CHIAROOSCURO)
1. Chiaroscuro means the arrangement of the light and dark parts of a picture, usually with special reference to light and shade; as, Leonardo is noted for his handling of chiaroscuro.
2. Sometimes used to indicate pictorial art that employs only light and shade; as, he was skillful in the art of chiaroscuro.
Sim: cgps

†——— cgps (217)
(Artist painters) An obsolete word found in older text books, synonymous with light and shade.
Sim: AAPL

CHORD cgps (233)
(Artist painters) A combination of colours in a composition.

CHROMA AAPL
1. Chroma is the degree of perceptible difference between a chromatic color and an achromatic gray of the same value, as, the difference between a red geranium and a gray shingle house behind it.
2. The difference between chromatic colors other than value or hue considerations; as, the difference between a freshly painted vermilion red tea store and an old weather-beaten red barn.
Sim: APA, CGPS, FPVPC (1), OSA (1), USP-NF (1)
Diff: FPVPC (2) OSA (2), USP-NF (2)

——— APA
The dimension of the Munsell system of color which corresponds most closely to saturation.
Sim: AAPL, CGPS, FPVPC (1), OSA (1), USP-NF (1)
Diff: FPVPC (2), OSA (2), USP-NF (2)

——— CGPS (108)
(Munsell system) The estimated "colour" content of a chromatic colour considered as a subjective mixture of "colour" and grey, on a scale of equal sensation intervals extending from grey (chroma = 0). All colours of the same chroma contain the same amount of colourfulness whatever their value or hue. The maximum chroma obtainable depends on the hue and occurs at different value levels for different hues. The maximum possible chroma was originally taken as 10, but with improved pigments this has now been extended to 14 in the red, whilst it is only 6 in the blue-green.
Note: Chroma represents the amount of 'colourfulness' judged to be present, in contrast to saturation which represents the proportion judged to be present. Thus, if the saturation remains constant, an increase in lightness is accompanied by an increase in chroma, whereas for constant chroma the saturation decreases with increase in lightness.
Sim: AAPL, APA, FPVPC (1), OSA (1), USP-NF (1)
Diff: FPVPC (2), OSA (2), USP-NF (2)

——— FPVPC, USP-NF
1. Synonym for saturation.
2. Synonym for chromatic color.
Sim (1): AAPL, APA, CGPS, OSA (1)
Sim (2): OSA (2)

——— OSA
1. Same as Munsell Chroma (which see).
†2. Same as Chromatic Color.
Sim (1): AAPL, APA, CGPS, FPVPC (1), USP-NF (1)
Sim (2): FPVPC (2), USP-NF (2)

CHROMATIC AAPL
Chromatic means having some perceptible degree of chroma or difference from neutral gray.

CHROMATIC ABERRATION apa
In an optical system, the failure of rays of light from a given point to come to a focus at a point, owing to the fact that light from different parts of the spectrum is refracted unequally.
Sim: SMPE

——— ——— SMPE
A defect of a lens resulting in a difference in focal length for light of different colors.
Sim: apa

CHROMATIC ADAPTATION APA
The change in chromatic sensitivity, manifest in alteration of hue or saturation (or both), which is dependent on continued chromatic stimulation.

CHROMATIC COLOR APA
A color, or visual quality, which manifests hue and saturation, and therefore cannot be placed in an achromatic series.
Sim: OSA, USP-NF, (chromatic colour or sensation – CGPS)

——— ——— OSA
Color perceived to have a hue.
Sim: APA, USP-NF, (chromatic colour or sensation – CGPS)

——— ——— USP-NF
A color or visual quality which manifests hue and saturation, and therefore cannot be placed in the white-gray-black series.
Sim: APA, OSA, (chromatic colour or sensation – CGPS)

——— COLOUR CGPS (52)
Visual sensations possessing the attribute of hue. This is the sense of definition 2(c) of Colour (CGPS). Also called chromatic sensation.
Sim: (chromatic color – APA, OSA, USP-NF)

CHROMATIC CONTRAST APA
A change in hue or saturation (or both) in a given area of the visual field, due to the concomitant state of chromatic stimulation of an adjoining or neighboring area, or of the given area or its neighborhood at a closely preceding time.

CHROMATIC FLICKER APA, osa
A pulsating or flicker phenomenon, due to differences in either dominant wavelength or purity, or both, between stimuli of equal luminance, which are alternately applied to the same retinal area.
(Distinguished from flicker in general, which may involve also pulsations in brightness.)

*CHROMATIC VALENCE APA
A relative measure of the chromaticness-producing power of a chromatic stimulus, as evident in additive color mixture. When two chromatic stimuli are mixed in such proportions as to yield gray they are said to be equated in chromatic valence. When spectrum stimuli are equated in luminance they vary markedly in chromatic valence.

*CHROMATICITIES OF ICI STANDARD LUMINATORS IES
The chromaticities of the ICI standard luminators for colorimetry are indicated by the points A, B, and C in Fig. 16 on p. 15 in: A. C. Hardy, Handbook of Colorimetry.
Note: The trichromatic coordinates of the ICI standard luminators are:

	x	y
Luminator A	0.4476	0.4075
Luminator B	0.3485	0.3518
Luminator C	0.3101	0.3163

*CHROMATICITIES OF OTHER IMPORTANT LUMINATORS IES
The approximate chromaticities of various luminators are indicated by the following trichromatic coordinates:

	x	y
Sunlight	0.336	0.350
Average Daylight	0.313	0.328
North Sky Light	0.277	0.293
Zenith Sky	0.263	0.278
White Flame Carbon Arc	0.315	0.332
Daylight Fluorescent Lamp (6500°K)	0.313	0.329
White Fluorescent Lamp (4500°K)	0.359	0.363
White Fluorescent Lamp (3500°K)	0.404	0.396

The chromaticities of blackbodies at various temperatures are indicated by the blackbody locus in the figure cited in the definition of "Chromaticities of ICI Standard Luminators," and on page 678 of the Colorimetry Committee Report, J. Optical Soc. Amer., 1944, 34. The coordinates of a few of these points are:

	x	y
2600°K	0.4678	0.4122
2800°K	0.4515	0.4086
3000°K	0.4366	0.4039
3200°K	0.4230	0.3988

Note: The coordinates for many other temperatures are given in Table 29b of reference 4 listed under "ICI Standard Trichromatic Coordinates."

1/*CHROMATICITY apa
The aspect of the color stimulus which is specified by dominant wave-length and purity (alternatively complementary wavelength and purity) taken together.
Sim: CGPS, IES, OSA
Diff: USP-NF

——— CGPS (70)
The colour quality of a stimulus, without

1/ Also defined by I.C.I., 1948, see Addenda to Introduction, p. vi.

reference to the luminance, as defined by two of the trichromatic coefficients (usually x and y).
Sim: IES, OSA, apa
Diff: USP-NF

*———— IES
Chromaticity consists of dominant wavelength and purity (alternatively, complementary wavelength and purity for purples).
Note: Chromaticity is equivalent to the common concept of color quality, as distinguished from quantity, of light. Chromaticity may be specified in other ways than by dominant (alt. complementary) wavelength and purity. Since dominant wavelength and purity are dependent on the arbitrarily selected reference standard, some other and invariable manner of specifying chromaticity is desirable, especially for the specification of qualities of luminators.
Sim: CGPS, OSA, apa
Diff: USP-NF

———— OSA
The quality of color specified by dominant wave-length and purity (alternatively complementary wave-length and purity) taken together.
Note: Chromaticity is equivalent to the common concept of quality as distinguished from quantity of light. Chromaticity may be specified in other ways than by dominant (alternatively complementary) wave-length and purity, such as by the chromaticity coordinates (x, y) of the standard ICI coordinate system.
Sim: CGPS, IES, apa
Diff: USP-NF

———— USP-NF, † OSA
The chromaticity of a color is determined by the hue and saturation attributes of the color.
See also: Color.
Sim: (chromaticness – APA, OSA)
Diff: CGPS, IES, OSA, apa

1/CHROMATICITY COORDINATES OSA
The ratio of any one of the color-mixture data for a sample to the sum of the color-mixture data.
Note: Any pair of these three coordinates may be used to define a point in a plane representing the chromaticity of the sample. This term is sanctioned by usage only; the official term is Trichromatic Coordinate.
See also: ICI Standard Chromaticity Coordinates.
Sim: (trichromatic coefficients – CGPS), (trichromatic coordinates – IES)2/

*CHROMATICITY DIAGRAM apa
A plane diagram, each point in which represents a different combination of dominant wave-length and purity, and which is usually constructed in some form of triangle with colorimetric primaries represented at the corners.
The ICI standard chromaticity diagram is essentially a right triangle representing hypothetical primaries and the complete chromaticity gamut of the ICI standard observer.
Sim: IES, OSA

*———— ———— IES
A plane diagram formed by plotting one of the three trichromatic coordinates against another.
Note: Any four chromaticities (no one of which can be matched by a mixture of any pair of the others) may be represented by any four points on a plane (provided that no three of the points are on a single straight line). Assignment of the points representative of the four basic qualities determines completely the entire chromaticity diagram and the location of the point that represents any chromaticity for an observer of known characteristics such as the standard observer. Either rectangular or oblique coordinates may be used, the most common at present being the ICI (x,y)-diagram plotted in rectangular coordinates.
Sim: OSA, apa

———— ———— OSA
A plane diagram formed by plotting one of any set of three chromaticity coordinates against another.
Note: Any four chromaticities (no one of which can be matched by a mixture of any pair of the others) may be represented by any four points on a plane (provided that no three of the points are on a single straight line). Assignment of the points representative of the four basic qualities determines completely the entire chromaticity diagram and the location of the point that represents any chromaticity for an observer of known properties such as the standard observer. Either rectangular or oblique coordinates may be used, the most common at present being the ICI (x, y)-diagram plotted in rectangular coordinates.
See Maxwell triangle.
Sim: IES, apa

*CHROMATICNESS APA
The aspect of a color which is specified by hue and saturation taken together.
Sim: OSA, (chromaticity – USP-NF, † OSA)

———— OSA
The quality of a color perception specified by hue and saturation taken together.
Sim: APA, (chromaticity – USP-NF, † OSA)

CHROMATICNESS SCALE OSA
Series of colors that under controlled conditions are perceived to vary by uniform steps in chromaticness alone with other attributes of the perceptions constant.

CHROMATOPSIA apa
An abnormal state of vision in which colorless objects appear colored.
For example, yellow after santonin, red after snow-blindness.

CHROMESTHESIA apa
See Colored Hearing.

1/ Also defined by I.C.I., 1948, see p. vi.
2/ For I.E.S. revision, see 20.026, p. vii.

CHROMOSCOPE SMPE
1. A viewing-device for obtaining superposed images of color separation positives.
2. A type of colorimeter using colors produced by the rotary dispersion of quartz as standards.

CIE osa
See ICI.

CLARITY OF COLOR AAPL
1. Clarity of color means clearness of color in contrast to muddiness.
2. In water color clarity means transparency.

CLEAN, CLEAR AATCC, FPVPC, TCCA
Free from a tendency to be dull, dingy, gray, dusty, or cloudy in appearance.
Sim: cgps

CLEAN cgps (229)
(Artist painters) Often used in the sense of the term pure (212). Unbroken colour. Opposite of dull, dirty, degraded, etc. Applied as much to a composition as to an individual colour.
Sim: AATCC, FPVPC, TCCA

CLEANER CGPS (161)
(Paint and pigment industries) A difference apparently due to the presence of less black than in the original sample. Opposite of Dirtier (160).

CLEANNESS ACS
Freedom of a colored object from grayness.

CLEAR CGPS (193)
(Glass industry) Sometimes, although rarely, used as the opposite of coloured. More often used as the opposite of opalescent or cloudy.

CLOUDY AATCC, TCCA
Blotchy, uneven color.

COAT AAPL
A layer of color of a uniform tint passed once over the surface of a canvas. A coat of paint is said to be thin when the ground or another coat can be seen underneath it.

COEFFICIENT OF UTILIZATION IES
Coefficient of utilization of an illumination installation on a given plane is the total flux received by that plane divided by the total flux from the lamps illuminating it. When not otherwise specified, the plane of reference is assumed to be a horizontal plane 30 inches (76cm) above the floor.

COLOR AAPL
1. In sensation and appreciation, color is a property of visible phenomena distinct from form, shape, size, and position; as, the colors of the spectrum. It should be noted that, according to exact definition, black, white and gray are colors.
2. Color is a sensation in the brain caused by the stimuli of light, or the memory of such a sensation.
3. Color is often used to indicate pigment, as yellow ochre water color, etc. This usage must be considered loose, though convenient. When one refers to yellow oil color, for example, he means a pigment which reflects a predominantly yellow light and is ground in an oil medium, or vehicle.
(as a verb) In common usage to color is to dye, or paint, or stain: to give color to something.
Sim (1,2): APA, ASTM, USP-NF, (color perception – OSA)
Diff (1,2): FPVPC, IES, OSA, (colour – CGPS, cgps)
Diff (3): APA, ASTM, FPVPC, IES, OSA, USP-NF, (colour – CGPS, cgps)

*—— APA
A sensory or perceptual component of visual experience typically characterized by the attributes of brightness or lightness, hue, and saturation; but in certain cases having zero saturation and so no hue.
Sometimes, however, the term is limited to those experiences which exhibit hue, as distinguished from the members of achromatic series.
Sim: AAPL (1,2), ASTM, USP-NF, (color perception – OSA), (colour – CGPS)
Diff: AAPL (3), FPVPC, IES, OSA, (colour – cgps)

—— ASTM
The aspect of the appearance of objects which depends upon the spectral composition of the light reaching the retina of the eye and upon its temporal and spatial distribution. Black, white, and gray are colors as well as red, yellow, green, blue, purple, and their intermediates. Mixtures or blends of these are also colors. The colors of objects have three attributes: hue, lightness, and saturation (which see).
Note: Appearance depends upon shape, gloss, transparency, and texture as well as upon color. The term color is sometimes loosely used in reference to material substances (pigments, stains, dyes) apart from their appearance.
Sim: AAPL (1,2), APA, USP-NF, (colour – CGPS)
Diff: AAPL (3), FPVPC, IES, OSA, cgps

—— FPVPC
The stimulus for color sensation, i.e., radiant energy of specified wave-length or of definite wave-length composition, or a particular surface or substance having selective (or non-selective) reflection, absorption, etc., of light. Syn. Color stimulus (prefd.) or radiant energy, pigment, etc., according to connotation.
Sim: (color stimulus – APA)
Diff: AAPL, APA, ASTM, IES, OSA, USP-NF, (colour – CGPS, cgps)

* —— IES
Color consists of the characteristics of light other than spatial and temporal inhomogeneities.

Note: Inhomogeneities, i.e., particular distributions and variations of light in space and time are not characteristics of light per se and characteristics of objects which are revealed by such variations, such as gloss, lustre, sheen, texture, sparkle, opalescence and transparency are not included among the color characteristics of objects.
Sim: OSA, (color stimulus — APA)
Diff: AAPL, APA, ASTM, FPVPC, USP-NF, (colour — CGPS, cgps)

——— OSA
The characteristics of light other than spatial and temporal inhomogeneities (light being that aspect of radiant energy of which a human observer is aware through the visual sensations which arise from the stimulation of the retina of the eye).
Sim: IES, (color stimulus — APA)
Diff: AAPL, APA, ASTM, FPVPC, USP-NF, (colour — CGPS, cgps)

———, COLOUR USP-NF
1. A qualitative component of visual experience characterized by the attributes of lightness, hue, and saturation, but in certain cases having zero saturation and (consequently) no hue.
Sim: AAPL (1,2), APA, ASTM, (colour — CGPS), (color perception — OSA)
Diff: AAPL (3), FPVPC, IES, OSA, (colour — cgps)

COLOUR CGPS (2)
(a) That characteristic of the visual sensation which enables the eye to distinguish differences in its quality, such as may be caused by differences in the spectral distribution of the light rather than by differences in spatial distribution or fluctuations with time.
(b) As (a), but applied directly to the stimulus or the source (primary or secondary) giving rise to the sensation. For brevity the stimulus is often referred to as the colour.
(c) That property of an object or stimulus, or quality of a visual sensation, distinguished by its appearance or redness, greenness, etc., in, contradistinction to whiteness, greyness, or blackness. (i.e. chromatic colour in contradistinction to achromatic colour — see Chromatic Colours and Achromatic Colours).
Sim: (color, — APA, ASTM, USP-NF), (color perception — OSA)
Diff: cgps, (color — AAPL, FPVPC, IES, OSA)

——— cgps (122, 207)
122(a) (Ordinary speech) General definition. A property of material objects, including sources of light, by which they are visually distinguished as possessing the qualities of redness, greenness, brownness, whiteness, greyness, etc.
122(b) (Ordinary speech) Restricted definition. As in (a), but restricted to the qualities of redness, greenness, brownness, etc., as opposed to whiteness, blackness, and greyness.
207. (Artist painters) Almost always used with reference to the effect of a given composition. Thus, "Turner's colour is magnificent in his The Evening Star." "So and so's colour is awful." Otherwise the term refers to any one possible colour. Most artists would describe any grey as a colour.
Diff: CGPS, (color — AAPL, APA, ASTM, FPVPC, IES, OSA, USP-NF)

COLOR ATTRIBUTES AAPL, USP-NF
Color attributes are the visual qualities of hue, value, and chroma, which, in various degrees, are perceptible in colors. For example one may say that chromatic colors are tridimensional because they can be measured in terms of the three color attributes.
Sim: APA

——— ——— APA
Hue, brightness or lightness, and saturation are the primary color attributes or color qualities.
Also called color dimensions.
Sim: AAPL, USP-NF

COLOR BALANCE AAPL
By color balance is meant that adjustment of color attributes and areas which gives an impression of composed and orderly relationships; as, the proper balance of small areas of strong colors against larger areas of weaker colors.
Diff: SMPE, (colour balance — CGPS)

——— ——— SMPE
That characteristic of a color photograph which compels an observer to ascribe to the over-all picture an appearance such as reddish, bluish, etc.
Diff: AAPL, (colour balance — CGPS)

COLOR BLINDNESS APA
A significant defect of color vision, usually congenital, and marked by a partial (dichromatism) or a total (monochromatism) loss of hue discrimination.
Sim: OSA, (defective colour vision — CGPS)

——— ——— OSA
Dichromatism and monochromatism.
Sim: APA, (defective colour vision — CGPS)

COLOR CHART AAPL
A cardboard rectangle containing value, chroma, and hue plans and the Table of Maximum Chromas that expedites the planning and selection of color charts.

COLOR CHIP FPVPC
A painted paper displaying the color to be expected when a liquid paint dries.

*COLOR CIRCLE APA
The closed, finite system of hues, including red, orange, yellow, green, cyan,

blue, purple, and magenta, which is characteristic of trichromatic vision.
Sim: (color cycle — USP-NF)

COLOR, CLASSES OF USP-NF
Colors may be divided generally into two distinct classes, chromatic and achromatic, depending upon whether they do or do not exhibit hue.

COLOR COMPARATOR OSA
Instrument designed for the comparison of colors.
Note: The widest use of color comparators is for the determination of the concentration of a known constituent in a solution; such instruments are sometimes called chemical colorimeters.

COLOR CONSTANCY APA
The relative independence of object colors of changes in illumination or of other viewing conditions.

*COLOR CONVERSION APA
Change in any dimension of color due to change in the conditions of viewing.

COLOR, CYCLE USP-NF
The closed finite system of chromatic colors or hues (including purples) which is characteristic of trichromatic vision.
Sim: (color circle — APA)

*COLOR DEFICIENCY apa
A general term for all forms of color vision which yield chromaticity-discrimination below normal limits.
Includes monochromatism, dichromatism, and anomalous trichromatism.
Sim: OSA, (defective colour vision — CGPS)

—— ——— OSA
Vision yielding chromaticity discrimination below normal limits.
Sim: apa, (defective colour vision — CGPS)

COLOR DEVELOPER SMPE
A substance or mixture of substances capable of reducing silver halides with the simultaneous production of an insoluble colored oxidation product in the regions of the silver deposit.

COLOR FASTNESS TAPPI
See: Fast

COLOR INTERVAL AAPL
The degree of visual difference between two colors measured in steps of hue, value, and chroma.

COLOR MIXTURE APA, USP-NF, osa
The presentation of two or more color stimuli to the same area of the retina effectively at the same time for the purpose of eliciting their combined effect.
Mixture may be accomplished in various ways such as simultaneous projection, rapid alternation, or diffusive combination of the several stimuli concerned.
Sim: (additive mixture — CGPS), (additive synthesis — SMPE)

COLOR-MIXTURE DATA apa
The amounts of the colorimetric primaries required to afford a match, at a photopic level of luminance, with an appropriately illuminated color sample.
Sim: IES, OSA

*—— ——— —— IES
The amounts of the primaries required to establish a match with the sample are color-mixture data.
Note: The amounts of the primaries mixed with the sample are recorded as negative quantities. Color-mixture data depend upon the choice of primaries and upon the individual observer for whom the match is satisfactory. Individual variations of color-mixture data are considerable.
Sim: OSA, apa

—— ——— —— OSA
The amounts of the primaries required to establish a match with the sample, either by addition of all three, or addition of one primary to the sample to match any pair of primaries, or the addition of any pair to the sample to match the remaining primary.
Note: The amounts of the primaries mixed with the sample are recorded as negative quantities. Color-mixture data depend upon the choice of primaries and upon the individual observer for whom the match is satisfactory. Individual variations of color-mixture data are considerable.
Sim: IES, apa

*COLOR-MIXTURE DATA FOR THE SPECTRUM IES
Color mixture data for spectrally pure stimuli.
Note: Such data have been adopted by the International Commission on Illumination. They are tabulated as functions of wavelength throughout the spectrum and are the basis for the evaluation of radiant energy as light.
Sim: OSA, (distribution coefficients — CGPS)

—— ——— —— — — ——— OSA
Color-mixture data for spectrally pure samples of various wave-lengths.
Note: The color-mixture data for the spectrum are fundamental to modern chemistry.
Sim: IES, (distribution coefficients — CGPS)

COLOR NEGATIVE SMPE
1. A negative photographic record of the color values of the original object as obtained through a single primary filter.
2. A negative photographic image in color.

COLOR NOTATION AAPL
Color notation refers to the use of symbols in some orderly fashion by which the attributes of color may be spoken of, or may be set down in a written formula. For example, if we say, "Five red, five, ten," or if we write 5R 5/10, using the formula HUE VALUE/CHROMA we mean by that the color sensation produced by an English vermilion or a red of the fifth value step and of the tenth degree of chroma in Munsell measurements.

See: Munsell color notation; color specification.

COLOR OF PULP AND PAPER TAPPI
Color is specified according to the standard observer and colorimetric coordinate system recommended in 1931 by the International Commission on Illumination.
See also: Reflectivity, spectral.

COLOR PERCEPTION OSA
A perceptual component of visual experience typically characterized by the attributes of brightness or lightness, hue, and saturation; but in certain cases having zero saturation and so no hue.
Sometimes, however, the term is limited to those experiences which exhibit hue, as distinguished from the members of achromatic series.
Sim: (color – AAPL (1,2), APA, ASTM, USP-NF), (colour – CGPS)

COLOR PHOTOGRAPHY SMPE
The subject which deals with attempts to reproduce objects in their natural colors by photographic means.

COLOR POSITIVE SMPE
1. A positive photographic (print) record of color values.
2. A positive photographic image in color.

COLOR PROCESS SMPE
A general term for any complete technique by which a color reproduction may be obtained.

COLOR PYRAMID csa
See Color Solid.

COLOR SCALE AAPL
An orderly arrangement of colors showing graduated change in some attribute or attributes of color; as, a value scale, a hue circuit.

COLOR SCREEN SMPE
1. A color filter.
2. A surface bearing a mosaic, either regular or irregular, of minute, juxtaposed, transparent elements of the primary colors, used in a screen-plate or screen-film process of color photography.

COLOR SENSATION APA, osa
Any elementary visual experience of a chromatic or achromatic nature which results from stimulation of the retina, as distinguished from the physical considerations descriptive of the stimulus.
More narrowly, those elementary visual experiences which exhibit hue.

COLOR SENSITIVITY, PHOTOGRAPHIC SMPE
The sensitivity of a photographic material to light of various portions of the spectrum.

COLOR SEPARATION SMPE
The obtaining of separate photographic records of the relative intensities of the primary colors in a subject in such a manner that a photograph in natural colors can be produced therefrom.
Sim: (colour separation – CGPS)

COLOR SHADES APA
Colors of brightnesses or lightnesses which are darker than median gray.
Contrast with Color Tints.

COLOR SOLID APA, USP-NF, osa
A symbolic figure in three dimensions, which represents the relations of all possible colors with respect to their primary attributes of hue, brightness or lightness, and saturation. Usually brightness (lightness) appears as the vertical axis of the figure, with hue and saturation represented in polar coordinates about the brightness axis, saturation being radial. The boundaries of the solid are actually irregular, but it is sometimes represented as a cylinder, a sphere, a spindle, or a double pyramid with a common (square) base.
Sim: (color solid, psychological – USP-NF), (color tree, sphere, or solid – AAPL)

COLOR SPECIFICATION SMPE
A description of a color made in such a way that the color sensation may be duplicated. This may be done either with the aid of a color analyzer or by the use of certain visual color matching devices, such as colorimeters or color comparators.
See also: color notation.

COLOR STANDARD AAPL
A color whose psychological dimensions have been accurately measured and specified.
Sim: FPVPC

—— ———— FPVPC
A material having essentially the general appearance characteristics of the sample to be tested, and, usually, an arbitrary numerical or other designation, to which the sample is to be compared. Color standards are frequently arranged in a continuously variable series.
Sim: AAPL

*COLOR STIMULUS APA
Radiant energy of any degree, wave-length, or composition within the ranges which are capable of adequate stimulation of retinal receptors.
The term is sometimes limited to adequate stimuli for hueful responses.
Color stimuli are sometimes specified in the psychophysical terms of luminance, dominant wave-length, and purity.
Sim: (color – FPVPC, IES, OSA)

† COLOR SURFACE APA
A plane section of the solid schematic figure that represents all possible color experiences, usually taken perpendicular to the axis of brightness variation, and representing all possible hues and saturations at a single brightness level.
Cf. Color Triangle

COLOR SYMBOLISM AAPL
The use of color by religions, cults, nations, political parties, etc., to signify, represent, or express particular qualities, attributes, or characteristics.

COLOR TEMPERATURE apa
The temperature of a blackbody or complete radiator, at which it yields a color matching that of a given sample of radiant energy. The blackbody colors form a single series of relatively unsaturated visual qualities, ranging from red, through orange, white, pale blues, and violets, as the temperature is increased. The temperature is measured on the absolute or Kelvin scale.
Sim: IES, OSA
Diff: (colour temperature – CGPS)

* —— ———— IES
The color temperature of a source of light is the temperature at which a blackbody must be operated to give a color matching that of the source in question.
Note: Color temperatures should be assigned only for sources which have a chromaticity not greatly different from a blackbody at some temperature.
Sim (without note): OSA, apa
Diff (without note): (colour temperature – CGPS)
Sim (with note): (colour temperature — CGPS)

—— ———— OSA
Temperature of a complete radiator whose chromaticity is the same as that of the body in question. Note 1: Expressed in degrees Kelvin.
Note 2: There is suggestion that this term be changed to Chromaticity Temperature.
Sim: IES, apa
Diff: (colour temperature – CGPS)

COLOR TINTS APA
Colors of brightnesses or lightnesses which are lighter than median gray.
Contrast with Color Shades.

COLOR TRANSPARENCY SMPE
A color photograph upon a glass or film support to be viewed or projected by transmitted light, as distinguished from a color photograph on paper or other opaque white support to be viewed by reflected light.

COLOR TREE, SPHERE, OR SOLID AAPL
A three-dimensional structure that shows all the colors in an orderly arrangement that is based on their hue, value, and chroma relationship to each.
Sim: (color solid – APA, USP-NF, osa)

*COLOR TRIANGLE APA
This is a chromaticity diagram which is (typically) in the form of an equilateral triangle with apices representing R, G and B primaries and the enclosed area representing all the chromaticities possible by additive mixture of the primaries. Characteristic of the color triangle is the adjustment of the primary scales so unit amounts will yield an achromatic mixture which is represented by the centroid of the triangle: and the relative amounts of the primaries necessary to yield each chromaticity are then indicated by corresponding distances on the triangle.
Sometimes called Maxwell triangle.
Sim: (Maxwell triangle – OSA)
Diff: OSA

—— ——— OSA
1. Same as Chromaticity Diagram
2. Same as Ostwald Color Triangle
Diff: APA

COLOR, UNIQUE USP-NF
A color which is not describable psychologically by reference to any other color. The seven unique colors are red, yellow, green, blue, black, white, and gray. The term is related to and developed from the concepts of "primary colors" and "fundamental colors" used by other writers, e.g., Stumpf, Titchener, Troland.
Sim: (primary hues – APA), (unitary hue – osa)

COLOR VISION APA
Vision with the response of chromatic color.

COLOR VISION, THEORY OF APA, osa
A theory as to the physiological mechanism underlying color phenomena, which is used to explain or coordinate the phenomena in question.
Cf. Young-Helmholtz theory, Hering theory, Ladd-Franklin theory, duplicity theory, trireceptor theory.

COLOR WEAKNESS apa, osa
A defect in color vision marked by diminished color sensitivity rather than actual loss of any hue.
Syn. Anomalous trichromatism.

COLOR ZONES APA, osa
Regions of the retina which have different characteristics as to chromatic response. For most individuals and usual conditions, the central portion shows full chromatic response, while red and green responses disappear at a moderately peripheral position, and blue and yellow fail toward the extreme periphery. The exact boundaries of any zone depend upon the extent, intensity, and chromatic power of the stimulus used; they vary also with the individual, and with the technique employed. Syn. Retinal zones.

COLOUR BALANCE CGPS (188)
(Colour photography) The relative adjustment of the overall intensities of the additive or subtractive primaries in a colour picture in order to give the best reproduction.
Diff: (color balance — AAPL, SMPE)

COLOUR SEPARATION CGPS (187)
(Colour photography) The obtaining of a set of photographic images of a subject intended to control the relative amounts of a set of additive or subtractive primaries in such a manner that the (additive or subtractive) mixture at any point matches the original subject. Usually photographs taken through filters confining the light to selected regions of the spectrum. (These represent only a partial

analysis, which may, however, be improved by masking)
Sim: (color separation – SMPE)

COLOUR TEMPERATURE CGPS (15)
The colour temperature of a light source is the temperature at which a full radiator would emit radiation of substantially the same spectral distribution in the visible region as the radiation from the light source and which would have the same colour.
Diff: (color temperature – IES, OSA, apa)

COLOUR THRESHOLD CGPS (92)
The luminance below which colour becomes no longer discernible. The level varies for different colours.

*COLORANTS apa
Substances which are used to produce color stimulus objects, such as dyes and pigments.
Sim: IES, OSA

*——— IES
Substances which are used to produce the colors of objects are colorants.
Note: Dyes, pigments, inks, paints, and all decorative coatings are colorants and only confusion results when they are called colors.
Sim: OSA, apa

——— OSA
Substances that are used to produce the colors of objects.
Sim: IES, apa

COLORED HEARING APA
A form of synesthesia that is manifested by the subjective occurrence of colors when certain sounds are heard.
Usually a given color or shape will be associated with some specific auditory quality.
Also called chromesthesia.

COLORED SHADOW PHENOMENON APA
An accentuated type of simultaneous contrast observed when two shadows are cast upon the same surface near each other by two lights of different color; when the shadows are made about equal, each one tends strongly to appear of a color complementary to that of the light which casts it, the general surface appearing of an indifferent color.
In case one of the lights is white, or achromatic, the shadow it casts is strongly of the color of the other light; a very moderate color-difference between the lights is usually sufficient.

*COLORIMETER APA
A color-matching instrument for equating a known color stimulus mixture to an unknown color stimulus, so that the latter is specified in terms of the former.
The colorimeter may be calibrated, or the specification may be transformed, to yield a measurement in terms of some standard system of colorimetry.
Sim: OSA, USP-NF
Diff: FPVPC

——— FPVPC
1. Apparatus by which the color of a sample may be compared with that of a standard.
2. An instrument for analysis by means of selective absorption of light of a specific wave length.
Note: This definition does not accord with the best usage, but is of common occurrence.
Diff: APA, OSA, USP-NF

——— OSA
Instrument in which an equivalent stimulus is set up for the unknown color which is then specified in terms of the equivalent stimulus. For obsolete meaning, see Color Comparator.
Sim: APA, USP-NF
Diff: FPVPC

——— USP-NF
An instrument for measuring colors in order that they may be specified in numerical or definite symbolic terms.
In one type the sample color is matched with a mixture of monochromatic and white lights; in another type by a mixture of three standard primaries.
Sim: APA, OSA
Diff: FPVPC

*COLORIMETRIC PRIMARIES APA
Any three color stimuli which correspond to the corners of a color triangle or are additively mixed to match an unknown color when making a colorimetric measurement.
Representative red, green and blue stimuli are most commonly used as colorimetric primaries; but theoretically any three color stimuli can be used if the color from no one can be matched by the color from the other two.
Sim: (instrumental stimuli — CGPS)

1/COLORIMETRIC PURITY CGPS (73a)
The ratio B_d/B, where B is the luminance of the sample stimulus and B_d is the luminance of a spectral stimulus (or of a suitable combination of extreme spectral red and extreme spectral violet) which, by additive mixture with the adopted achromatic stimulus, forms a match with the sample stimulus in both luminance and chromaticity according to the data for the standard observer.
Sim: IES, OSA, (luminance purity — OSA)

*——— ——— IES
The colorimetric purity of a sample is the ratio: the luminance of the single-frequency component (in the mixture with the reference standard matching the sample) to the luminance of the sample.
Note: In the case of any of the wide variety of purples, the luminance of the single-frequency component (which needs to be combined with the sample light to match the reference standard) is considered to be negative. The colorimetric purity of any purple is therefore negative.
Sim: CGPS, OSA, (luminance purity – OSA)

1/ Also defined by I.C.I., 1948, see Addenda to Introduction, pp. v - vi.

† ——— ——— OSA
Same as Luminance Purity.
Sim: CGPS, IES

COLORING AAPL
The general effect produced by the colors employed in a painting. When we say that the coloring of a picture is violent, bold, sad, fine, delicate, we refer to the sensation which the coloring produces in us.

COLORLESS AAPL
Colorless means without color; hence, invisible; as, the bottle seemed empty though it was filled with a colorless gas. Colorless should not be confused with transparent; a red glass might be transparent but would not be colorless.
Diff: (colourless — CGPS)

* COLORS OF OBJECTS IES
The color of an object is the capacity of the object to modify the color of the light incident upon it.
Note: In a strict sense, it is not legitimate to attribute a color to an object but only to the light reflected from it. The capacity of an object to modify the color of the light incident upon it corresponds to the common concept of the color of the object and may be so defined with the reservation just noted.

COLOURED CGPS (155)
(Dyeing industry) Material is coloured if it is not in the natural or bleached state and has been dyed, printed or pigmented. Opposite of Uncoloured (156).
Sim: cgps

——— cgps (123)
(Ordinary speech) The adjective is always used with the restricted meaning 122 (b), i.e., exhibiting redness, greenness, brownness, etc.
Sim: CGPS

COLOURLESS CGPS (191)
(Glass industry) Applied to glass in which no tinge of colour is noticeable when the thickness of the glass examined is that which is normally encountered in practice. Also called white or neutral.
Diff: (colorless — AAPL)

COMPARISON LAMP IES, osa
A comparison lamp is a lamp of constant but not necessarily known candlepower against which standard and test lamps are successively compared in a photometer.

1/ COMPARISON OF SOURCES IES
In comparing different luminous sources, not only should their light output be compared, but also their relative form, luminance, distribution and character of light.

*COMPENSATION APA
An effect of adaptation whereby shadows appear less dark and high luminances appear less bright or light.

COMPLEMENT AAPL
That which completes. Complementary hues are two hues that differ most radically from each other, such as red and blue-green, which are diametrically opposite on the hue circuit and which produce a neutral or gray when mixed in the right proportion.

COMPLEMENTARY AAPL
Two colors are said to be complementary to one another, when their combination, according to the laws of optics, produces white. Thus, red is the complementary color of green, while blue has orange for its complementary color, violet yellow, and reciprocally.

COMPLEMENTARY COLOR AAPL
Colors which are capable of producing a neutral gray upon additive mixture. Such colors are found opposite each other on the hue circle.
Sim: APA, CGPS (1), OSA, USP-NF
Diff: CGPS (2), cgps

——— ——— APA
One of any pair of chromatic color stimuli which, when mixed additively, give rise to an achromatic color.
The terms "complements" and "complementaries" are also in use. The singular is used for one member of the pair, e.g., yellow is the complement of blue, and the plural is used for the pair, e.g., red and blue-green are complements (or complementaries, or complementary colors).
Sim: AAPL, CGPS (1), OSA, USP-NF
Diff: CGPS (2), cgps

——— ——— OSA, USP-NF
Color that when combined with another color produces a mixture-color matching some agreed upon achromatic color.
Sim: AAPL, APA, CGPS (1)
Diff: CGPS (2), cgps

——— COLOURS CGPS (8)
(a) Additive. Any two colours which, by additive mixture, can be made to match an achromatic colour.
(b) Subtractive. Any two absorbing media which, by subtractive mixture, can be made to match an achromatic colour.
Sim (1): AAPL, APA, OSA, USP-NF
Diff (1): cgps
Diff (2): AAPL, APA, OSA, USP-NF, cgps

——— ——— cgps (221)
(Artists painters) Generally vaguely taken to mean a colour and its "opposite"; determined by observation of "after-images". More rarely interpreted as a pair of colours which, when occupying sectors of a disk spun on a colour top, yield a match to neutral gray.
Diff: AAPL, APA, CGPS, OSA

2/ *COMPLEMENTARY WAVE-LENGTH apa
The wave-length of the portion of the visible spectrum which, when combined with a color stimulus in suitable proportions to

1/ For I.E.S. revision, see p. x.
2/ Also defined by I.C.I., 1948, see Addenda to Introduction, p. v.

match an adopted achromatic stimulus, is the complementary wave-length of the color stimulus.

Sim: IES, OSA

[1]/ * ——— WAVELENGTH IES

The wavelength of light of a single frequency which when combined with a sample color in suitable proportions, matches the reference-standard light, is the complementary wavelength of the sample.

Note: The wide variety of purples, including nonspectral violet, purple, magenta, and nonspectral red colors, which have no dominant wavelengths are specified by use of their complementary wavelengths.

Sim: OSA, apa

——— WAVE-LENGTH OSA

The wave-length of the portion of the spectrum that, when combined with a sample color in suitable proportions, matches the adopted achromatic light is the complementary wavelength of the sample.

Sim: IES, apa

COMPLETE DIFFUSION IES

Complete diffusion is that in which the diffusing medium scatters the light incident upon it so that none is regularly reflected or transmitted and objects from which the light originally comes cannot be seen sharply defined by the reflected or transmitted light.

COMPLETE RADIATOR OSA

A radiator emitting energy not significantly different from that within a closed cavity uniformly heated to the same temperature.

Sim: (blackbody — IES), (full radiator — CGPS)

Diff: (black body — CGPS)

CONE, RETINAL APA

A type of minute structure found in the retina of the eye which constitutes a specific receptor for vision.

Distinguish from retinal rods, another visual receptor; the cones are without visual purple and are believed to operate for both chromatic and achromatic (gray) visual qualities at higher levels of illumination, the rods for achromatic only at low (twilight) levels; the rods and cones form the 2nd layer of the retina from the surface of the eyeball, lying just within the layer of pigmented cells; at the center of the retina the cones are long and slender and closely packed to the exclusion of rods; farther out they are shorter and thicker and interspersed among the more numerous rods, and their outer portion has become small and cone-shaped, whence their name; it is estimated that there are 7,000,000 cones in the human retina.

CONFIGURATED GLASS IES

Configurated glass is glass having a patterned or irregular surface. The surface configuration is usually applied during fabrication. Such glasses are not transparent and are somewhat diffusing.

Glasses falling under this classification are often referred to as pebbled, stippled, rippled, hammered, patterned, chipped, crackled, cathedral, etc., depending upon the particular type of surface.

CONJUNCTIVE WAVE-LENGTH OSA

On the chromaticity diagram, wave-length of the intersection of any straight line with the spectrum locus.

Note: Used chiefly in connection with iso-temperature lines.

CONSTANCY APA, osa

The phenomenon that perceptual objects retain to a greater or lesser degree normal appearance in relative (though not in absolute) independence of the local stimulus conditions.

Applied to the following properties: color — preservation of normal hue, saturation, and brightness under different illuminations; form — persistence of the shape of an object when, from geometrical optics, a change might be expected; magnitude — preservation of apparent size in spite of differences in the retinal image.

CONSTANCY HYPOTHESIS APA

The untenable hypothesis of a one-to-one correspondence between sensory stimulus and response.

This hypothesis is opposed to the phenomenon of perceptual constancy, which is the tendency to perceive objects and qualities as they 'really are', i.e., as they normally appear to be, rather than as they stimulate the receptor on specific occasions.

CONTAMINATION SMPE

The undesirable presence in one image of a color process of a colorant appropriate to another image.

CONTINUOUS SPECTRAL DISTRIBUTION OSA

Distribution of radiant energy (or flux) that is nowhere zero over a considerable spectral range.

Note: Thermal radiation yields a continuous spectral distribution.

Sim: (continuous spectrum — SMPE)

CONTINUOUS SPECTRUM SMPE

A spectrum, or section of a spectrum, in which radiations of all wavelengths are present; opposed to line spectra, or band spectra.

CONTRAST APA

Intensification or emphasis, by juxtaposition of stimuli, of two contrary or opposing mental data.

Contrast may be simultaneous, viz., between simultaneous impressions, or successive, viz., between impressions which closely follow each other.

CONTRAST, COLOR SMPE

The ratio of the intensities of the sensations caused by two colors. Sometimes the logarithm of this ratio.

1/ See I.E.S. revision, addition of COMPLEMENTARY WAVELENGTH (Graphical Determination), p. vii.

CONTRAST FLICKER APA
Flicker which is induced into a physically constant field by a neighboring flicker.

CONTRAST GLOSS ASTM
Contrast gloss is expressed as a fraction whose denominator is the apparent reflectance of the sample when illuminated in a direction other than perpendicular and viewed in the direction of specular reflection, and whose numerator is the same apparent reflectance diminished by the apparent reflectance of the sample identically illuminated but viewed perpendicularly.

CONTRAST OF COLORS AAPL
When two strips of paper of the same color but of different intensity are placed side by side that portion of the lightest strip which touches the darkest strip appears lighter than it really is, while the portion of the darkest strip which touches the lightest strip appears darker than it is. That is, the juxtaposition of colors changes their effect. Furthermore, each color has a tendency to assume the color complementary to the color next to it. The discovery of this law of the simultaneous contrast of colors is due to M. Chevreul. There is one remark to add: if two bodies contain a common color, the effect of their juxtaposition is to weaken the intensity of their common element. The laws of optics which regulate this simultaneous contrast of colors may be formulated thus: 1stly, Every color has a tendency to tinge the colors near it with its complementary color. 2ndly, If two objects contain the same color, the effect of their juxtaposition is to weaken the intensity of their common element.

CONTRAST-RATIO OSA
Ratio of the luminous reflectance of a layer of material backed by a non-reflecting (black) backing to the luminous reflectance of the layer backed by a backing (white) of some high known luminous reflectance.

COOL cgps (137)
(Ordinary speech) Of green or blue colour, or colours containing a marked predominance of green or blue.

COOL COLOR AAPL
Any color that produces in the observer a psychological impression of lack of heat or coolness is called a cool color; usually a color in which there are perceptible elements of blueness; as, the cool bluegreens of the watery depths.
Sim: (cool colour – cgps)

—— COLOUR cgps (224)
(Artist painters) The pure colours green, blue, violet (not purple) or colours which exhibit a marked predominance of these.
Sim: (cool color – AAPL)

COOL GREY cgps (226)
(Artist painters) A grey exhibiting slight predominance of green, blue, violet (not purple). Neutral grey itself would be considered cool.

CORRELATED COLOR TEMPERATURE OSA
Temperature of a complete radiator whose chromaticity is most similar to that of a body whose chromaticity is not represented on the Planckian locus.

† CORTICAL GRAY APA
A term applied to a median gray, in the theory that gray is a primary color-process due to activity in the cerebral cortex, which appears in the absence of retinal stimulation.

CRITICAL FLICKER FREQUENCY APA
The minimum number of alternations per second of two different visual stimuli (or the frequency of any periodically variable stimulus) upon the same retinal area which will permit a constant effect in visual experience, as if from an invariable stimulus, i.e., which will result in the elimination of flicker.
Cf. Flicker

CROCK AATCC, TCCA
In some localities a color is said to crock when the dye rubs off. In other localities a color is said to crock if it will bleed when wet. The words "rub" and "bleed" and derivatives should be used instead of crock to avoid misunderstandings.

CURVE OF HORIZONTAL DISTRIBUTION IES
A curve of horizontal distribution is a curve, usually polar, representing the luminous intensity of a lamp, or luminaire, at various angles of azimuth in the horizontal plane through its light center.
Note: It is recommended that in horizontal distribution curves there be indicated the relative positions of parts of the equipment affecting the symmetry of distribution.

CURVE OF LIGHT DISTRIBUTION IES
A curve of light distribution is a curve showing the variation of luminous intensity of a lamp or luminaire with angle of emission

CURVE OF VERTICAL DISTRIBUTION IES
A curve of vertical distribution is a curve, usually polar, representing the luminous intensity of a lamp, or luminaire, at various angles of elevation, in a vertical plane passing through its light center.
Note: Unless otherwise specified, a vertical distribution curve is assumed to be an average vertical distribution curve, such as may in many cases be obtained by rotating the unit about its axis, and measuring the average intensities at different angles of elevation. It is recommended that in vertical distribution curves, angles of elevation shall be counted positively from the nadir as zero, to the zenith as 180 deg. In the case of filament lamps, it is assumed that the vertical distribution curve is taken with the base of the lamp upward.

*CYAN APA
1. The hue attribute of visual sensations

typically evoked by stimulation of the normal human eye with radiation of wavelength approximately 494 millimicrons.
2. Any hue predominantly similar to that of the typical cyan.
The complement of red.

D

DALTONISM apa, osa
Same as color-blindness.
So called from John Dalton, 1766-1844, who was himself color-blind for red and green and published a description of his case.

DARK AATCC, FPVPC, TCCA, osa
Having the appearance of reflecting only a limited amount of light, tending toward black, opposite of light.
Sim: APA, USP-NF
Diff: cgps

—— APA
Characterized by a low degree of lightness (relatively high darkness).
Sim: AATCC, FPVPC, TCCA, USP-NF, osa
Diff: cgps

—— cgps (126)
(Ordinary speech) Diffusely reflecting a relatively small amount of the incident light.
Diff: AATCC, APA, FPVPC, TCCA, USP-NF, osa

—— USP-NF
Characterized by low value or lightness.
Sim: AATCC, APA, FPVPC, TCCA, osa
Diff: cgps

DARK ADAPTATION, DARKNESS ADAPTATION APA,osa
The increased visual sensitivity to light, sometimes manifest by increased brightness of a fixed stimulus, which is dependent on reduction or absence of light stimulation.

DARK-ADAPTED EYE APA, osa
An eye whose condition has been so modified by the withdrawal of general light stimulation that faint stimuli have become more effective.
Contrast with light-adapted eye. Cf. Adaptation.

DARK CLEAR SERIES AAPL
The colors in an Ostwald triangle between and including the full color and black. Each member of the dark clear series should exhibit for each value of luminance the maximum excitation purity permitted by the colorants in the coating.

DARKER CGPS (165)
(Paint and pigment industries) A difference apparently due to the presence of less white and more black than in the original sample, the amount of colour being the same. Opposite of Lighter (164)

DARKNESS USP-NF
Darkness is the opposite of lightness; it is the presence of black or gray. (This term is used chiefly in the adjective form, thus, dark, darker.)

DAY-BLINDNESS APA
A special condition, usually due to impairment (scotoma) of the central area of the retina, in which the individual sees better in dim light.,
Sometimes called nyctalopia which is a confused usage and had best be avoided. Contrast with night-blindness or hemeralopia.

DAYLIGHT SMPE
Total radiation from the sky and sun. For standardization of spectral quality, measurements are made at noon. The quality of daylight matches approximately that of a blackbody at 6500 degrees Kelvin.

DECOLORIZED CGPS (197)
(Glass industry) A colourless glass is said to be decolorized when a chemical agent is used in the glass batch to mask the colour which would otherwise be produced by the presence of an impurity.

DECORATED GLASS IES
Decorated glass is glass to which etchings, stains, enamels, etc., have been applied, primarily for decorative purposes.

DEEP cgps (131)
(When used to qualify colours in ordinary speech) Strongly coloured and dark.
Sim: USP-NF, (depth —ACS), (depth of color — AAPL)

—— USP-NF
Dark strong, opposite of pale.
Sim: cgps, (depth —ACS), (depth of color — AAPL)

DEEPER CGPS (159)
(Paint and pigment industries) A difference apparently due to the presence of less white than in the original sample. Opposite of Whiter (158).

DEFECTIVE COLOUR VISION CGPS (80)
The condition in which colour discrimination is significantly reduced in comparison with the normal trichromat.
Note: The forms of colour blindness can be divided into three main groups — dichromatic vision, anomalous trichromatic vision (all cases lying between normal trichromatism and complete dichromatism), and monochromatic vision. Also called colour blindness, colour deficiency.
Sim: (color blindness —APA, OSA), (color deficiency — OSA, apa)

DEGRADED COLOUR cgps (228)
(Artist painters) A colour containing much black or grey. Never used of pale or light colours.
Sim: (degraded colours — CGPS)

DEGRADED COLOURS CGPS (189)
(Colour photography) Colours in which the lightness is noticeably decreased as compared with a standard. (This term is often applied to a colour as reproduced, as compared with the original.)
Sim: (degraded colour — cgps)

DENSITOMETER OSA
Instrument designed especially to measure the densities of photographic deposits.

DENSITY CGPS (46)
The logarithm, to the base 10, of the opacity.
Also called optical density, photometric density.
Sim: OSA, SMPE

——— OSA
Logarithm of opacity, or negative logarithm of transmittance.
Note: Common logarithms (to the base 10) are customary.
Sim: CGPS, SMPE

——— SMPE
The logarithm to the base 10 of the opacity (for transparent materials). The logarithm of the reciprocal of the reflecting power (for reflecting materials)
Sim: CGPS, OSA

DEPTH ACS
Departure of a colored object from white and frequently associated with either concentration or efficiency of a coloring agent.
Sim: (deep — USP-NF, cgps), (depth of color — AAPL)

*DEPTH CONTRAST APA
Contrast between different depth levels as distinguished from classifical contrast which occurs between surfaces at the same depth level.

DEPTH OF COLOR AAPL
Depth of color means richness of color; as the decoration was noteworthy for its depth of color. The term usually refers to the rich quality of dark values of chromatic colors; as, Mr. X's canvas in dark reds and blues displayed a depth of color contrasting with Mr. Y's pale pink and baby blue tonality.
Sim: (deep — USP-NF, cgps), (depth — ACS)

DESATURATED COLOURS CGPS (190)
(Colour photography) Colours in which the saturation is noticeably decreased as compared with a standard. (This term is often applied to a colour as reproduced, as compared with the original.)

DEUTERANOMALOUS TRICHROMAT apa, osa
An individual having deuteranomalous vision, viz., deuteranomaly.

DEUTERANOMALOUS VISION osa
Same as Deuteranomaly.
Sim: CGPS

——— ——— CGPS (87)
A form of anomalous trichromatism in which more green is required in a mixture of red and green to match a spectral yellow than in the case of the normal trichromat. The relative spectral visual sensitivity does not differ noticeably from the normal. Hue discrimination is poor in the red to green region of the spectrum. Also called partial deuteranopia.
Sim: (deuteranomaly — apa, osa)

DEUTERANOMALY apa, osa
Form of trichromatism in which the luminosity function is within normal limits, but in which an abnormally large proportion of stimulus green is required in a red-green stimulus mixture in order to match a given yellow.
Sim: (deuteranomalous vision — CGPS)

DEUTERANOPE apa, osa
Observer having Deuteranopic Vision.

DEUTERANOPIA apa, osa
Form of dichromatism in which green and purplish red stimuli are confused, but a normal proportion suffices to match a given yellow, and the luminosity also is within normal limits.
Sometimes called green blindness.
Diff: CGPS

——— CGPS (83)
A form of dichromatism in which the relative spectral visual sensitivity does not differ noticeably from the normal and in which colours can be matched by a mixture of yellow and blue stimuli. Hence, Deuteranope. Also called green blindness.
Diff: apa, osa

DEUTERANOPIC VISION osa
Same as Deuteranopia.

DEVELOPED COLOR IMAGES SMPE
Color photographic images produced by direct development.

DICHROIC SMPE
Pertaining to the property of some selectively absorbing substances of varying color with layer thickness or concentration.
Sim: (dichroism — CGPS, OSA), (dichromatism — AATCC)
Diff: (dichroism (1) — AATCC)

DICHROIC FILTER SMPE
1. A semi-transparent mirror which selectively reflects some wavelengths more than others and so transmits selectively.
2. A filter transmitting two narrow regions of the spectrum.

DICHROIC MATERIAL OSA
Material exhibiting dichroism.

DICHROISM AATCC
1. The property of varying in shade, depending upon the polarization of the light illuminating the sample.
2. Same as Dichromatism.
Diff (1): CGPS, OSA, (dichroic — SMPE), (dichromatism — AATCC)
Sim (2): CGPS, OSA, (dichroic — SMPE)

——— CGPS (10)
A phenomenon exhibited by certain dyes or pigments, and characterized by a marked change of hue with change in the observing conditions. The chief instances are (a) appreciable change of hue with change in the colour temperature of the illuminant, and (b) appreciable change of hue with change in the concentration or thickness of the dye or pigment layer.

Sim: AATCC(2), OSA, (dichroic – SMPE), (dichromatism – AATCC)
Diff: AATCC(1)

——— OSA
Phenomenon whereby a selectively absorbing material yields a color in a thick layer perceived to have a hue very different from that yielded by a thin layer.
Sim: AATCC(2), CGPS, (dichroic – SMPE), (dichromatism – AATCC).
Diff: AATCC(1)

DICHROMAT apa, osa
Observer having dichromatic vision.

DICHROMATIC VISION CGPS (81)
A form of defective colour vision in which all colours can be matched by a mixture of only two suitably chosen stimuli.
Note: In dichromatic vision the spectrum is seen as comprising only two regions of different hue separated by an achromatic band. Dichromatic vision can be subdivided into three types – protanopia, deuteranopia, and tritanopia.
Also called **dichromatism**, hence dichromat.
Sim: (dichromatism – apa, osa)

——— ——— osa
Same as Dichromatism.
Sim: CGPS

DICHROMATISM AATCC
The property of varying in hue as the dye concentration is changed, or, in the case of a transmitting sample, varying in hue as the thickness of the transmitting sample changes.
Sim: (dichroism – AATCC(2), CGPS, OSA), (dichroic – SMPE)
Diff: apa, osa

———— apa, osa
Form of vision yielding colors which require in general two independently adjustable primaries (such as red and green, or blue and yellow) for their duplication by stimulus mixture.
Dichromatism may be either protanopia, deuteranopia, tritanopia, or some irregular form such as tetartanopia.
Sim: (dichromatic vision – CGPS)
Diff: AATCC

DIFFERENCE LIMEN APA
The small amount of difference between two compared stimuli which gives rise (statistically) to a perceived difference as often as it does not.
The difference limen is the same as the average just noticeable difference.
Also called, differential threshold, threshold of difference.

DIFFUSE DENSITY OSA
Logarithm of the reciprocal of the diffuse transmittance.
Note: Common logarithms (to the base 10) are customary

DIFFUSE REFLECTANCE OSA
Ratio of the flux reflected in a non-image-forming state to incident flux.
Sim: (diffuse reflection factor – IES), (luminous directional reflectance – ASTM)

DIFFUSE REFLECTION CGPS (29)
A special instance of preferential reflection in which the preference tends to zero. The luminance of a perfectly diffuse reflector is the same in all directions. Also called (Matt) Reflection.
Sim: IES

1/ ——— ——— IES
Diffuse reflection is that in which the incident light is reflected in all directions.
Note: The reflection from a body may be regular, diffuse, or mixed. In most practical cases there is a superposition of regular and diffuse reflection.
Sim: CGPS

1/DIFFUSE REFLECTION FACTOR IES
The diffuse reflection factor of a surface or a body is the ratio of the diffusely reflected light to the incident light.
Sim: (diffuse reflectance – OSA)

DIFFUSE TRANSMISSION CGPS (34)
As for Diffuse Reflection (29), mutatis mutandis.
Sim: IES

1/ ——— ——— IES
Diffuse transmission is that in which the transmitted light is emitted in all directions from the transmitting body.
Sim: CGPS

1/DIFFUSE TRANSMISSION FACTOR IES
The diffuse transmission factor of a body is the ratio of the diffusely transmitted light to the incident light.

DIFFUSE TRANSMITTANCE OSA
Transmittance of a turbid specimen for radiant flux incident perpendicular to the first surface of the specimen.

DIFFUSED ILLUMINATION IES, USP-NF, osa
Diffused illumination is that produced by either primary or secondary light sources having dimensions relatively large with respect to the distance from the point illuminated, and emitting or scattering light in all directions. It is characterized by relative lack of shadow. Diffused illumination may be derived principally from a single direction as in the light from a skylit window, or from all directions as in the open air.

DIFFUSING SURFACES AND MEDIA IES
Diffusing surfaces and media are those which break up the incident light and distribute it more or less in accordance with the cosine law, as for example, rough plaster and opal glass.

DIFFUSION CIRCLE apa
A circle of color in an optical system due to rays, emanating from a point source, which have not been brought into sharp focus because of chromatic aberration.
A diffusion circle is likely to show different hues at different distances from its center.

1/ For I.E.S. revision, see p. ix.

Sometimes called dispersion circle.

DIMENSIONS OF COLOR APA
Same as Attributes of Color.

DIMMING EFFECT APA
An enhancement or rejuvenation of either a chromatic or an achromatic adaptation effect (i.e., an after-image), which is brought about by "dimming" or reducing the luminance of the stimulating field against which the effect is seen.
The effect depends upon the degree of dimming.

DINGY AATCC, FPVPC, TCCA
Having a dull appearance.
Sim: (dull — AATCC, CGPS, FPVPC, TCCA, cgps)

DIRECT LIGHT AAPL
Direct light is visible energy falling straight from its source upon the eye or upon an object; as, the model sat in the direct light of the sun. Direct light is contrasted in meaning with reflected light.

DIRECT (Regular, Specular) REFLECTION CGPS(27)
Reflection of light without scatter characteristic of polished surfaces, taking place according to the laws of optical reflection.
Sim: (regular or specular reflection — IES)

DIRECT (Regular) TRANSMISSION CGPS (32)
As for Direct Reflection (27), mutatis mutandis.
Sim: (regular transmission — IES)

DIRECTIONAL LUMINOUS REFLECTANCE OSA
The luminous reflectance that an ideal perfectly diffusing surface would need to possess in order to yield the same luminance as the test specimen under the same illluminating and viewing conditions.
Note: Directional luminous reflectance depends upon the angular distribution of the incident light and upon the direction of view. For some angular conditions of illuminating and viewing, mirror and near mirror (glossy) specimens may appear much brighter than the ideal (white) surface, and for these conditions glossy specimens have directional luminous reflectances much greater than one.
Sim: (luminous directional reflectance —ASTM)

——— ——— TRANSMITTANCE OSA
Ratio of the luminance (candle per unit area) of the second surface of a light-transmitting specimen to the illuminance (lumen per unit area) of the first surface.

DIRTIER CGPS (160)
(Paint and pigment industries) A difference apparently due to the presence of more black than in the original sample.
Opposite of Cleaner. Also called duller.

DISCOLOURED CGPS (198)
(Glass industry) Describes the blackening exhibited by certain glasses when lamp-worked. Sometimes used to describe the development of colour in decolorized glass by the action of visible or ultra-violet light or X-rays.
See: Solarized (199)

DISCORD AAPL
This term may be used to denote any unpleasant element in a color scheme. A particular form of discord may be obtained by using colors out of their natural order of luminosity.
Sim: cgps
——— cgps (232)
(Artist painters) The opposite of harmony.
Sim: AAPL

DISK COLORIMETER OSA
Colorimeter providing for a color match with an unknown by using an adaptation of the Maxwell disk in which the disk itself is stationary but is viewed through a rotating wedge, prism, or mirror.

DISTEMPER AAPL
A method of coloring surfaces. In this method the colors are prepared with a solution of water and size, or for small surfaces, of water and gum. The method is mostly employed for coloring walls, and the distemper then consists of whiting, water, size, and the color required.

DISTINCTNESS-OF-IMAGE GLOSS ASTM
Distinctness-of-image gloss is indicated by the faithfulness with which the surface produces mirror images of objects.

DISTRIBUTION COEFFICIENTS CGPS (68)
The relative trichromatic coordinates of the spectral components of an equal energy spectrum. Denoted by $\bar{x},\bar{y},\bar{z}$, in the C.I.E. system and defined in a table of figures which represents the characteristics of the standard observer.
Sim: (color mixture data for the spectrum — IES, OSA)

——— ——— OSA
Same as Color-Mixture Data for the Spectrum.
Sim: CGPS

DOMINANT AAPL
A term used to describe the principal color or tone in a picture.

DOMINANT HARMONY AAPL
In its narrow sense it is equivalent to single-hued harmony and signifies a harmony of colors of one hue with or without the addition of neutrals. In its broader sense, it signifies a harmony possessing a dominant note or desirable bias, and in this sense every good harmony is a dominant harmony.

DOMINANT HUE cgps (204)
(Decorating trade) (a) The hue that governs a colour scheme.
(b) The prevailing colour in a blending of two colours, such as red or blue in purples, and blue or yellow in greens.
Also called predominant hue.

1/ DOMINANT WAVE-LENGTH apa
The wave-length of that homogeneous spectral

1/ Also defined by I.C.I., 1948, see Addenda to Introduction, p. v.

light which, when mixed with achromatic light in suitable amounts, will match a given sample color.
Sim: CGPS, IES, OSA, (wave-length, hue - USP-NF)

——— WAVELENGTH CGPS (72)
The wavelength of the spectral stimulus required to be mixed (added or subtracted in the colorimetric sense) with a standard achromatic stimulus in order to match the observed stimulus. A negative sign is used in front of the wavelength if subtraction is necessary, i.e., for purples. Also called Hue wavelength, Dominant hue.
Note: Since the preparation of this Report a Sub-Committee on Colorimetry of the British National Illumination Committee has recommended the use of an additional term 'complementary wavelength' defined as follows: "The wavelength of the portion of the spectrum which, when combined with the sample stimulus in suitable proportions, matches the adopted achromatic stimulus according to the data for the standard observer."
Sim: IES, OSA, apa, (wave-length, hue - USP-NF)

1/ * ——— ——— IES
The wavelength of light of a single frequency, which when combined in suitable proportions with the reference-standard light, matches a color, is the dominant wavelength of that color.
Note: Light of a single frequency is approximated in practice by the use of a range of wavelengths within which there is no noticeable difference of color. Although this practice is in principle ambiguous, the dominant wavelength is usually taken as the average wavelength of the band used in the mixture with the reference standard, matching the sample. Many different qualities of light are used as reference standards under various circumstances. Usually the quality of the prevailing illumination is acceptable as the reference standard in the determination of the dominant wavelengths of the colors of objects.
Sim: CGPS, OSA, apa, (wave-length, hue - USP-NF)

——— WAVE-LENGTH of a color OSA
The wave-length of the portion of the spectrum that, when combined with achromatic light in suitable proportions, matches the color.
Note: Many qualities of light are considered achromatic under some conditions. Usually the quality of the prevailing illumination is acceptable as achromatic and is used as the achromatic component in the determination of dominant wave-lengths of the colors of objects.
Sim: CGPS, IES, apa, (wave-length, hue - USP-NF)

DOUBLY REFRACTING CRYSTAL OSA
Polarizing crystal with appreciably different refractive indices for the ordinary and extraordinary rays.

DOWNHAND AATCC, TCCA
Viewed with the line of vision approximately perpendicular to the surface.

DOWNWARD FLUX IES
The downward flux is the flux from the source below the horizontal plane passing through its center.

DULL (DULLNESS) AATCC, FPVPC, TCCA
1. Opposite of bright or vivid.
2. Cloudy.
Sim: CGPS, cgps, (dingy - AATCC, FPVPC, TCCA)
Diff: astm

—— astm
A synonym for the term matte, used often for describing the surface of paints, coatings, etc.
Diff: AATCC, CGPS, FPVPC, TCCA, cgps

—— CGPS (153)
(Dyeing industry) Adjective applied to a dyestuff which is not capable of producing a highly saturated colour when applied in suitable strength. Also applied to the colour of a material dyed with such a dyestuff. Opposite of Bright.
Sim: AATCC, FPVPC, TCCA, cgps, (dingy - AATCC, FPVPC, TCCA)
Diff: astm

—— cgps
1. (133) (When used to qualify colours in ordinary speech) Weakly coloured and dark.
2. (227) (Artist painters) Desaturated colours of low lightness. Used as a synonym for dirty, degraded, impure, heavy, generally dark and greyish. The opposite of pure, clean, brilliant, intense, vivid.
Sim: AATCC, CGPS, FPVPC, TCCA, (dingy - AATCC, FPVPC, TCCA)
Diff: astm

DULLNESS CGPS (147)
Comparison: - Duller
(Dyeing industry) That colour quality, an increase in which may be compared with the effect of the addition of a small quantity of neutral grey dye to the dyestuff, whereby a match cannot be made by adjusting the strength. Opposite of Brightness.

DUOCHROISM AATCC
The property of possessing a different shade by reflected light and by transmitted light.

DUOTONIC AATCC
Possessing a different shade or bloom viewed overhand and downhand.

DUPLICITY THEORY APA, osa
The doctrine that visual sensation rests upon two distinct receptoral mechanisms present in the retina, the rod and the cone systems, respectively; the rod-system is supposed to be responsible for vision at low or twilight illumination levels and to

1/ See I.E.S. revision, adding DOMINANT WAVELENGTH (Graphical Determination), p. vii.

yield an achromatic result in consciousness; the cone system is supposed to mediate daylight and complete color vision, but to be inactive under twilight conditions. The theory was formulated by von Kries in 1894.

DUSKY USP-NF
Dark and weak, opposite of brilliant.

DUSTY, DUST-TONE
Having the appearance of being uniformly covered with dust.

DYE DENSITY SMPE
1. The logarithm to the base 10 of the visual opacity of an area in a finished dye image.
2. The density of a dye deposit as measured by light of the complementary color.

DYE IMPURITIES SMPE
Pertaining to absorption of light by a dye in regions of the spectrum where the dye should transmit completely.

DYE MORDANTING SMPE
Broadly, the process of fixing a dye to a substance for which it has no affinity, by means of a second substance. More especially, in color photography, the treatment of a silver image so as to replace it in whole or in part with a substance having an affinity for dyes.

DYE TONING SMPE
The process of affixing dye to a silver image or of replacing a silver image by a dye image through the substitution of mordants and subsequent dyeing.

DYE UP SMPE
The process of letting a gelatin matrix absorb dye from a solution preparatory to transfer of the dye.

E

EFFECT AAPL
The impression produced in a picture by the arrangement of light and shade.

EFFICIENCY of a source of light IES, osa
The efficiency of a source is the ratio of the total luminous flux to the total power input. In the case of an electric lamp it is expressed in lumens per watt. In the case of a source depending upon combustion it may be expressed in lumens per thermal unit consumed per unit of time.

EGG SHELL FPVPC
A degree of gloss lying between flat and semi-gloss.

ELECTRIC DISCHARGE LAMP IES
An electric discharge lamp is a lamp in which light is produced by the passage of electricity through a metallic vapor or a gas enclosed in a tube or bulb.

ELECTRIC FILAMENT LAMP IES
An electric filament lamp is a light source consisting of a glass bulb containing a filament electrically maintained at incandescence.
Note: A lighting unit consisting of an electric filament lamp with shade, reflector, enclosing globe, housing, or other accessories, is also commonly called a "lamp." In such cases in order to distinguish between the assembled lighting unit and the light source within it, the latter is often called a "bulb."

ELEMENTS AAPL
The basic materials or factors on which all visual art is built, such as line, color, texture, shape, etc. The visual dimensions, quantities, qualities, or attributes of units.

ELEMENTS of a screen-plate or lenticular color film SMPE
The individual filter particles of a color-screen or the minute lenses of a lenticular film.

EMBOSSING SMPE
1. (v.t.) The process of impressing minute lens elements upon a film base to produce a lenticular color-film.
2. (n.) The lens elements collectively.

EMMERT'S LAW APA
The perceived size of an after-image is directly proportional to the distance from the observer to the plane upon which the after-image is projected.

ENAMELED GLASS IES
Enameled glass is glass which has had applied to its surface a coating of enamel. The enamel may be white or colored and may have varying degrees of diffusion.

EPISCOTISTER APA
A disk with adjustable open and closed sectors together with a mechanism for rotating it.
Used for adjusting or equating luminances and for the short exposure of visual material, esp. in the study of flicker.

EQUAL-AREA WEB IES
An equal-area web is a set of coordinates formed by the development of the lines of latitude and longitude of a sphere so that they may be drawn on a plane and still preserve the true area of all parts of the sphere. In the usual form, the lines of latitude become straight lines, equally spaced; the lines of longitude become sine curves convergent at the poles and equally spaced at the equator.

EQUAL ENERGY SOURCE CGPS (13)
A light source from which the amount of energy radiated is constant for the same wavelength interval throughout the visible spectrum.

EQUAL-GREYED COLOR CIRCLE AAPL
A color circle containing greyed colors which contain the same proportion of black, white, and pure color.

EQUAL-SHADE CIRCLE AAPL
A color circle containing shades of equal black content.

EQUAL-TINT CIRCLE AAPL
A color circle containing tints of equal white content.

ERYTHROGENIC RADIATIONS apa
Long-wave light stimuli which normally give rise to the experience of red.
Suggested by Ladd-Franklin to replace the physicist's equivocal term red.

ERYTHROPSIA apa
A type of chromatopsia or colored vision (usually following over-exposure to intense light) in which all objects appear tinged with red.
Cf. snow-blindness.

EVEN AATCC, TCCA
Uniformly colored over the surface.

1/ EXCITATION PURITY CGPS (73b)
The ratio of the distances, on a two-dimensional chromaticity diagram, from the adopted achromatic stimulus to the sample stimulus and to the stimulus lying on the spectrum locus or the straight line joining its extremes, which by additive mixture with the adopted achromatic stimulus can form a match with the sample stimulus.
Sim: IES, OSA

* ——— ——— IES
The excitation purity of a sample is the ratio: the distance from the reference point to the point representing the sample, divided by the distance along the same straight line from the reference point to the spectrum locus or the purple boundary, both distances being measured in the ICI chromaticity diagram.
Note: Excitation purity is usually indicated by the word purity, alone.
Sim: CGPS, OSA

——— ——— OSA
Ratio of the distance on the ICI standard chromaticity diagram between the achromatic point and the sample point to the distance in the same direction between neutral point and the spectrum locus or the purple boundary.
Note: Usually excitation purity is indicated by the word purity alone.
Sim: CGPS, IES

EXPOSURE OSA
Product of irradiance by time.

EXTINCTION COEFFICIENT CGPS (48)
The natural logarithm, to the base e, of the reciprocal of the transmissivity.

EXTRAORDINARY RAY OSA
The one of the two plane-polarized rays produced by a polarizing crystal that does not obey Snell's Law.

EXTRASPECTRUM HUE APA
A hue which is not characteristically evoked by any color stimulus in the spectrum.
Extraspectrum hues range from the extreme violet through the series of purples and magentas, and include the psychologically primary red itself.
Sim: (non-spectral color — OSA)

FADE, FADING TAPPI
See: Futigive
Sim: (fading — FPVPC)

FADED AAPL
A term applied to colors which have lost their freshness or brilliance. Some shades of colors when faded produce an excellent effect.

FADING FPVPC
Color change resulting from exposure to sunlight, or, less commonly, other agencies. Fading is characterized by loss of saturation, and, usually, increase in brightness.
Sim: (fugitive — AATCC, TAPPI, TCCA, osa)

FAINT USP-NF
Used with the hue name to describe very light, very weak volume color as faint pink, equivalent to pinkish white for a surface color.

FAST AATCC, FPVPC, TAPPI, TCCA, osa
Will not fade or change in color on exposure to some named or implied agency, such as light or laundering. Opposite of fugitive.

†FATIGUE, RETINAL APA
Depletion of the capacity of the retina to respond to light and color stimuli.
Postulated to explain negative after-images, successive contrast, etc.

*FATIGUE, VISUAL APA
Decreased quality for visual performance and/or characteristic eye sensations or feelings resulting from prolonged visual work.

FECHNER FRACTION OSA
Ratio of the smallest detectable increase in luminance to the luminance itself.

FECHNER'S LAW APA
The intensity of the sensory response is proportional to the logarithm of the stimulus intensity.
The logarithmic relation fails to hold experimentally, but a general principle of diminishing returns seems characteristic of all sensory response.

FECHNER'S PARADOX APA
If one views a stimulus field binocularly with a moderately light smoked glass covering one eye, the total impression becomes brighter the instant the covered eye is completely occluded.
The paradox is the fact that a brighter impression results when the stimulus light is reduced.

FIERY AATCC
Usually applied to an orange dyeing and signifying a bright reddish shade, particularly when viewed overhand.

FIGURE APA
Any group of visual impressions which is perceived as a unit pattern or object.

FILM COLOR APA
Color seen as a soft, non-substantial, indefinitely localized, and texture-free film,

1/ Also defined by I.C.I., 1948, see Addenda to Introduction, pp. v - vi.

viz., in the film mode of appearance.
Examples: Colors seen in spectroscopes, or filling apertures, the clear sky, etc.
Sim: (aperture-color perception -OSA(1))

FILM-COLOR PERCEPTION OSA
1. Same as Aperture-Color Perception.
2. Color perceived as belonging to a film such as a photographic film.
Sim(1): (film color —APA)

FILTER SMPE
A light-transmitting material (or liquid solution in a cell) characterized by its selective absorption of light of certain wavelengths. A so-called "neutral gray" filter absorbs light of all wavelengths to which the eye is sensitive to approximately the same extent and so appears without hue.

FILTER, COLORED osa
A plate which can modify the color of light by transmission.

FILTER CUT SMPE
The wave-length or spectral region at which the absorption of the filter varies rapidly with changing wave-length.

FILTER FACTOR, filter ratio SMPE
The ratio of the exposure required to produce a given photographic effect when a filter is used to that required without the filter. Many considerations, such as color sensitivity of the emulsion, quality of radiation, and the time of development influence the filter factor.

FILTER OVERLAP SMPE
The spectral region in which two or more given filters transmit light mutually.

FIRE AATCC
Bloom in a yellow dyeing or orange dyeing.

FLAT AAPL
A picture or scene which contains little contrast, i.e., is all about the same lightness or darkness or grayness, is said to be flat.
Diff: AATCC, FPVPC, TCCA, osa

—— AATCC, FPVPC, TCCA, osa
Having the appearance of a non-lustrous, diffusely reflecting or matte surface.
Diff: AAPL

FLAT LIGHTING AAPL
Flat lighting is relatively uniform lighting and may result in much or little contrast depending on the selective reflectances of the surfaces in the scene or picture on which the light falls.

FLICKER, FLICKER PHENOMENON APA, osa
A rapid periodic change perceived in a visual impression, due to a corresponding rapid periodic change in the intensity or some other character of the stimulus. Flicker disappears when the frequency of the stimulus-change exceeds a rate called the critical flicker frequency, which is about 25 to 30 cycles per second when each cycle consists of a moderately bright and a wholly dark half-period; the critical rate is somewhat higher at higher intensity-levels and somewhat lower for lower intensities; the rate is lowered with decrease in the intensity-difference between parts of the period.

FLICKER PHOTOMETRY apa, osa
A method of photometry in which two different color stimuli are alternately presented to the eye at a suitable rate; the stimuli are considered equal in luminance when the flicker is minimum.

FLIGHT OF COLORS APA, osa
The succession of chromatic images which follows an intense momentary stimulus viewed against a dark ground.

FLUORESCENCE OSA
1. Process by which a material absorbs radiant energy and re-emits it in the form of radiant energy of a different wavelength band, all or most of whose wavelengths exceed that of the absorbed energy.
2. The re-emitted energy.
Note: Fluorescence, as distinguished from phosphorescence, does not persist for an appreciable time after the end of the excitation process.

FLUORESCENT LAMP IES
A fluorescent lamp is an electric discharge lamp in which the radiant energy from the electric discharge is transferred by suitable materials (phosphors) into wavelengths giving higher luminosity.

FOOTCANDLE apa
A unit of illuminance representing the light-flux density incident at a surface each point of which is 1 foot from a point source of 1 candle.
Sim: IES, OSA

1/ ————, fc IES
The footcandle is the unit of illuminance when the foot is taken as the unit of length. It is the illuminance on a surface one square foot in area on which there is uniformly distributed flux of one lumen, or the illuminance produced at a surface all points of which are at a distance of one foot from a uniform point source of one candle.
Sim: OSA, apa

———— OSA
Illuminance of a surface one square foot in area receiving a uniformly distributed flux of one lumen.
Sim: IES, apa

FOOTLAMBERT apa
A unit of luminance equal to the uniform luminance of a perfectly diffusing surface which emits or reflects one lumen per square foot.
Sim: IES, OSA

1/ ————, fL IES
The footlambert is a unit of luminance equal to $1/\pi$ candle per square foot, or to the uniform luminance of a perfectly diffusing surface emitting or reflecting light at the rate of one lumen per square foot, or to the average luminance of any surface emitting or reflecting light at that rate.

1/ For I.E.S. revision, see p. viii.

Note: The average luminance of any reflecting surface in footlamberts is, therefore, the product of the illumination in footcandles by the reflection factor of the surface.
The footlambert is the same as the "apparent footcandle."
Sim: OSA, apa

——— OSA
Unit of luminance equal to $1/\pi$ candles per square foot, or to the uniform luminance of a perfectly diffusing surface emitting or reflecting light at the rate of one lumen per square foot, or the average luminance of any surface emitting or reflecting light at that rate.
Sim: IES, apa

FORM AAPL
A term used in painting and sculpture to denote the qualities of line as opposed to color. An artist who devotes himself especially to line may be said to prefer line to color.

FOVEA APA
A small ellipse-shaped depression in the central region of the retina, somewhat less than a degree of visual angle in maximum diameter, and characterized by the sharpest cone vision.
The fovea centralis is the normal center for visual fixation and attention.

FRESNEL REFLECTION OSA
Process by which radiant flux is reflected from an optically plane boundary between two transparent dielectrics (such as between glass and air).
Note: So-called because the formula relating the radiant reflectance and the relative index of refraction of the two dielectrics was first developed by Fresnel.

FRINGE SMPE
A defect of a color picture resulting from lack of registration of the component images. A fringe may be caused by parallax, error in printing registration, or by movement in the object which has taken place between the exposure of color-separation negatives.

FUGITIVE AATCC, TAPPI, TCCA, osa
Will fade or change color from relatively short exposure to some named or implied agency, such as light or laundering. Opposite of fast.
Sim: (fading - FPVPC)

FULL COLOR AAPL
The color shown at the apex of the Ostwald triangle. This color is meant to exhibit the maximum excitation purity permitted by the colorants in the coating.
Sim: CGPS
Diff: (fullcolor - osa)

—— COLOURS CGPS (111)
(Ostwald system) Surface colours which are produced with the maximum colourfulness obtainable.
Sim: AAPL
Diff: (fullcolor — osa), (ideal full colours — CGPS)

FULL COLOUR CONTENT CGPS (115)
(Ostwald sysyem) C, in the equation, W+B+C = 1, which Ostwald considered interprets the appearance of all related colours.
Diff: (fullcolor content — osa)

FULL RADIATOR CGPS (14)
A light source emitting radiation, the spectral distribution of which is dependent on the temperature only and not on the material and nature of the source.
Sim: (blackbody — IES), (complete radiator - OSA)
Diff: (black body - CGPS)

FULLCOLOR osa
Same as Semichrome.
See: Ostwald Color System.
Diff: (full color - AAPL, CGPS)

FULLCOLOR CONTENT osa
Difference between the two spectral reflectances characterizing the ideal Ostwald surface color-matching the sample.
Diff: (full colour content - CGPS)

*FUNDAMENTAL COLORS APA, osa
The several hypothetical colors corresponding respectively to the fundamental response processes or color vision theory.
Sim: (Primary colors - AAPL (3))

*FUNDAMENTAL RESPONSE CURVES APA
The set of three spectral sensitivity or mixture curves (usually plotted with relative luminosity as a function of wavelength) which represent the actual sensitivities of the fundamental response processes, according to tri-receptor theories of color vision.
The maxima of these response curves are believed to be about 450, 540 and 590 millimicrons, respectively.

*FUNDAMENTAL RESPONSE PROCESSES APA
The several hypothetical physiological processes, sensitivities, or excitations, which are believed to underlie the fundamental colors.

G

GELATIN FILTER SMPE
A filter in which gelatin is used as the vehicle for the absorbing material.

GENERAL COLOR AAPL
A term applied to the tonality of a whole picture.

GHOSTING astm
The appearance of a faint image on the inner of two sheets in contact with one another, caused by penetration of the colorant through the outer sheet.

GILDING AAPL
The art of applying gold either in leaf or dust to surfaces of metal, stone, or wood. The gold thus applied is itself termed, gilding. The art is one of great antiquity, but it is only in modern times that the method of applying a thin coating of gold has been discovered.

GLARE osa
The disturbance of the sensitivity of the eye, experienced when portions of the field of view have a brightness or intensity greatly in excess of that of the average for the field of view.

GLITTER APA
See: Sparkle

GLOBE IES
A globe is an enclosing device of clear or diffusing material; the chief uses of a globe are to protect the lamp, to diffuse or redirect its light, and/or to modify its color.

GLOSS FPVPC
1. The appearance characteristic of a surface which is determined by the spatial distribution of the reflected light.
2. A surface which reflects a substantial proportion of the incident light in a mirror direction.
Sim (1): (glossiness – APA, OSA)
Diff (1): tappi
Diff (2): tappi, (glossiness –APA,OSA)

——— tappi
Gloss is the reflecting power of a surface responsible for its shiny or lusterous appearance.
Note: In the paper industry gloss is variously associated with the glare or poor reading quality of paper, with good printing quality, or with the smoothness of a resinous or other special paper coating. A method of measuring gloss can be used to evaluate one of these properties only when the proper method of gloss measurement is used and when other properties of the papers being compared do not unduly effect their numerical gloss value.
Diff: FPVPC, (glossiness – APA, OSA)

GLOSSINESS APA
An attribute of the surface mode of appearance which ranges from matt to maximum. Low glossiness is characteristically evoked by reflection from rough diffusing surfaces and high gloss from smooth surfaces.
Sim: OSA, (gloss – FPVPC (1))
Diff: (gloss – FPVPC (2), tappi)

——— OSA
Attribute of surface mode of visual appearance ranging from matt to glossy.
Sim: APA, (gloss – FPVPC (1))
Diff: (gloss –FPVPC (2), tappi))

GLOW osa
A mode of appearance which is characteristically seen in self-luminous bodies, e.g., the appearance of an incandescent lamp filament or a flame.
Note: It is usually to be referred to a comparatively small area which presents very high brightness or chromatic purity, at least relatively to the rest of the visual field.
Sim: (illuminant color – APA), (illuminant-color perception – OSA)

GLOWING CCLOR osa
A color which presents a luminous or glowing mode of appearance to visual observation, e.g., the colors seen in flames, incandescent solids, the enclosing glassware of light-fixtures, mercury vapor lamps, etc.
Sim: (illuminant color –APA), (illuminant-color perception –OSA)

GONIOPHOTOMETER OSA
Device that measures directional reflectance and directional transmittance with collection of flux confined to a narrow range of angles, the central ray of which is variable over a wide range of angles relative to the gloss plane or the surface of the test specimen.

GOUACHE AAPL
Opaque water color or tempera.

GRAY AAPL
1. (n) In sensation gray is any color tending toward neutrality in hue, as the grays of the cloudy skies.
2. (a) Having a perceptible quality of grayness, having less than full chroma or intensity.
3. (v) To gray a color is to make it more neutral or less intense; as to gray a strong red to a brick red.
Diff: APA, FPVPC, USP-NF, (grey – AATCC, CGPS, TCCA, cgps)

*——— APA
An achromatic color of any lightness intermediate between the extremes of black and white. Gray is typically a response to an achromatic stimulus situation involving contrast.
Sim: FPVPC, USP-NF, (grey – CGPS, cgps, (neutral – AAPL), (neutral color – SMPE)
Diff: AAPL, (grey –AATCC, TCCA)

——— FPVPC, USP-NF
An achromatic color of any lightness between the extremes of black and white.
One of the psychologically unique colors.
Sim: APA, (grey – CGPS, cgps), (neutral – AAPL), (neutral color –SMPE)
Diff: AAPL, (grey –AATCC, TCCA)

GRAY KEY IMAGE SMPE
An image of neutral color occasionally printed in register with the images in tri-color inks or dyes. In the imbibition process, the gray key image is sometimes developed on the printing material by the ordinary photographic method.

GRAYBODY IES
A graybody is a temperature radiator whose spectral emissivity is less than unity and the same at all wavelengths.
Sim: (non-selective radiator – OSA)
Diff: (grey body – CGPS)

——— OSA
Same as Non-selective Radiator.
Sim: IES
Diff: (grey body – CGPS)

*GREEN APA, osa
1. The hue attribute of visual sensations typically evoked by stimulation of the normal retina with radiation of wave-length

approximately 515 millimicrons.
2. Any hue predominantly similar to that of the typical green. (The complement of red-purple or magenta.)
Diff: FPVPC, USP-NF

—— FPVPC
A pigment (or dye) producing the color green.
Diff: APA, USP-NF, osa

—— USP-NF
1. The hue attribute of visual sensations typically evoked by stimulation of the normal retina with radiation of wave-length approximately 508 millimicrons (mμ).
2. Any color manifesting a hue predominantly similar to that of the typical green. (The complement of red-purple.)
3. One of the psychologically unique colors.
Diff: APA, FPVPC, osa

GREY AATCC, TCCA
1. The older English spelling of gray.
2. Cloth as it comes from the loom or knitting machines before it is subjected to wet processing is sometimes said to be "grey" or "in the grey" condition. Sometimes called "greige" when applied to silk. Wool cloth in this condition is also termed "in the grease."
Diff: CGPS, cgps, (gray — AAPL, APA, FPVPC, USP-NF)

—— CGPS (57)
An achromatic sensation of luminosity intermediate between black and white.
Sim: cgps, (gray —APA, FPVPC, USP-NF), (neutral — AAPL), (neutral color —SMPE)
Diff: AATCC, TCCA, (gray —AAPL)

—— cgps (129)
(Ordinary speech) Not coloured and lying between black and white.
Sim: CGPS, (gray —APA, FPVPC, USP-NF)
Diff: AATCC, TCCA, (gray —AAPL)

GREY BODY CGPS (76)
Adjective applied to a secondary source which is partially absorbing at some or all visible wavelengths, but from which the reflected or transmitted light has the same chromaticity as that of the illuminant.
Diff: (graybody — IES, OSA)

GREYED COLOR AAPL
A greyed color is a color containing pure color and added black and white.
The terms "broken color," "tint shade" and "shaded tint" are equivalents.

GROUND APA
The unfocused surroundings and interstices of a figure or object, perceived as lying beyond and not belonging to the figure or object.
E.g., the background in a painting. Figure and ground are sometimes reversible, as when an interwoven black-and-white pattern may appear as a white figure on a black background, or vice versa.

H

HALF-TONE AAPL
A tone intermediate between two sharply-marked tones of different values.

HALO APA, osa
A narrow bright band which is observed surrounding the dark after-image of a bright stimulus.

HALO EFFECT aatcc
A term used in printing to describe an objectionable light colored effect noticeable on that part of the dyed ground immediately surrounding the printed areas, as when color discharge effects are being produced.

HARMONIC COLOR AAPL
This term is sometimes used to refer to a complementary color and other times in a more general sense to refer to a member of any pair of colors which harmonize with each other or go well together.

HARMONIOUS HUES AAPL
Adjacent or similar hues, such as blue-green, green, and green-yellow.

HARMONY AAPL
1. Harmony is a quality made manifest by diversity with a common factor; as, the grayed colors of evening, in which the various colors provide diversity and the grayness of the colors the common factor. Harmony is a requisite of good design and therefore the laws which require and control it are counted among the principles of design.
2. Harmony is the just adaptation of parts to the whole; as, the harmony of the rhythms of coordinated muscular action; the harmony of related divisions of dynamic space.
Sim: cgps

——— cgps (231)
(Artist painters) The term describes the pleasant effect of a combination or grouping of colours whether juxtaposed or otherwise in a given pictorial composition. No satisfactory theoretical analysis has been advanced to account for the aesthetic satisfaction derived from pictorial colour harmony. A combination of tones to form a colour chord (musical analogy).
Sim: AAPL

HEADLAMP OR HEADLIGHT IES
A headlamp or headlight is a lighting unit on the front of a vehicle intended primarily to illuminate the road ahead of the vehicle.

HEIGHTEN AAPL
To heighten a color is to increase its intensity; to heighten the tone of an engraving is to add to the intensity of the blacks, and so to make the whites stand out as strongly as possible.

HEMISPHERICAL CANDLEPOWER IES, osa
The (mean) upper or (mean) lower hemispherical candlepower of a lamp is the average candlepower of the lamp in the hemisphere considered. It is equal to the luminous flux in that hemisphere divided by 2π.

HEMISPHERICAL RATIO IES
Hemispherical ratio for a given lighting unit is the ratio of the luminous flux in the upper hemisphere to that in the lower hemisphere.

HERING AFTER-IMAGE APA, osa
The first positive after-image, or after-sensation, which occurs following a brief light stimulus.
It is bright and of the same hue as the original sensation.

HERING GRAYS APA
A set of 50 neutral gray papers, graded from extreme white to extreme black in steps which approximate subjective equality. The set represents the achromatic series of colors.

HERING THEORY OF VISION APA, osa
The theory proposed by E. Hering and modified by later writers, according to which color are due to three pairs of antagonistic processes in the optic system, one member of each pair being catabolic, the other anabolic, the pairs yielding respectively, white and black, yellow and blue, and red and green.
The two members of any one pair of colors are said to be antagonistic colors.

HETEROCHROMATIC PHOTOMETRY OSA, apa
Photometry of light of different chromaticities.

HETEROCHROMIC AATCC
Same as Dichromatism but can apply to samples having more than two shades as a function of change in concentration.

HETEROGENEOUS MEDIA OSA
Media exhibiting fine-grained variations, in composition or optical properties, that cause appreciable scattering of radiant energy.

HIDING POWER FPVPC
The ability of a paint to obscure a contrasting background, usually reported as square feet per gallon.

HIGH CGPS (195)
(Glass industry) Describes the pink, orange or brown colour of low saturation sometimes obtained in almost colourless glasses.

HIGH KEY AAPL
A picture or scene in high key is one which is predominantly quite light but contains a minor amount of quite dark detail. The contrast-range may be normal but the balance is light.

HIGH LIGHT AAPL
1. A high light is the lightest spot on an illuminated surface caused by specular reflection where the surface seems most intensely illuminated. High lights are most noticeable on smooth illuminated surfaces. Example, the high lights on the bottle showed the flickering colors of the firelight.
2. Loosely, high light is the term used to designate the most intensely illuminated spot or area of a surface though not caused by specular reflection. This use of the phrase, however, is not recommended.
3. In color nomenclature, high light is a term used to indicate the next step below white on a scale of values; as, black, low light, light, high light, white.

HOLMGREN TEST apa
A test of color-blindness which involves the matching of skeins of different-colored yarn with three standard skeins.

HOMOGENEOUS GLASS IES
Homogeneous glass is glass of essentially uniform composition throughout its structure. This term is used to distinguish the type from cased glass, which is composed of two or more layers of different compositions, rather than to appraise the glass on the basis of freedom from streaks, striae, etc.

HOMOGENEOUS MATERIAL OSA
Material all of whose infinitesimal elements of volume are identical in composition and optical properties.

HORNER'S LAW apa
A principle of the inheritance of color-blindness according to which the common types are transmitted from males to makes through unaffected females.

HOROPTER APA
The locus of all points in the binocular field of vision, the images of which fall upon identical points of the two retinas, viz., the images of which are normally seen as single.

HUE AAPL
1. Hue is the name of the attribute which distinguishes chromatic colors of the same value and chroma, or aside from value and chroma differences, with respect to some definite portion of the visible spectrum or with respect to those visual sensations produced by optical combination of the ends of the visible spectrum; for example, the hues of red, yellow, green, blue, blue-green, purple-blue, etc. may be seen in the spectrum, while the hue of red-purple, though non-exitent in the spectrum may be seen by optical combination of the ends of the visible spectrum. Simply, we distinguish, for example, a red and a blue which are equally dark and equally intense by the fact that the hue of one is red and the hue of the other is blue.
2. (Ostwald) The concept of hue used in the Ostwald system is synonymous with constant dominant wavelength under daylight (ICI Illuminant C).
Sim: AATCC, ACS, APA, ASTM, CGPS, OSA, USP-NF, cgps (1)
Diff: cgps (2)

—— AATCC
Hue is that attribute of certain colors by

which they can be classified as red, green, blue, yellow, purple, etc. White, black, and gray are not considered as being hues.
Sim: AAPL, ACS, APA, ASTM, CGPS, OSA, USP-NF, cgps(1)
Diff: cgps(2)

— ACS
That attribute of a colored object by which it is identified as red, green, blue, purple, or the like.
Sim: AAPL, AATCC, APA, ASTM, CGPS, OSA, USP-NF, cgps(1)
Diff: cgps(2)

— APA
The attribute of color which is typically determined by the dominant wave-length or predominant wave-lengths of the stimulus, and commonly referred to as red or yellow or green or blue or some intermediate.
Sim: AAPL, AATCC, ACS, ASTM, CGPS, OSA, USP-NF, cgps(1)
Diff: cgps(2)

— ASTM
The attribute which determines whether a color is red, yellow, green, blue, purple, or the like.
Sim: AAPL, AATCC, ACS, APA, CGPS, OSA, USP-NF, cgps(1)
Diff: cgps(2)

— CGPS (51)
That attribute of certain visual sensations by which we distinguish red, green, blue, yellow, purple, etc. from one another and by which the eye distinguishes different parts of the spectrum.
Sim: AAPL, AATCC, ACS, APA, ASTM, OSA, USP-NF, cgps(1)
Diff: cgps(2)

— cgps
1. (124) (Ordinary speech) The distinctions red, green, blue, yellow, purple, etc.
2. (208) (Artist painters) Not frequently employed by modern artists, but well recognized as meaning one of the principal colours in its purest form, as in the spectrum. The principal hues are red, orange, yellow, green, blue, violet, purple.
Sim (1): AAPL, AATCC, ACS, APA, ASTM, CGPS, OSA, USP-NF
Diff (1): cgps(2)
Diff (2): AAPL, AATCC, ACS, APA, ASTM, CGPS, OSA, USP-NF, cgps(1)

— OSA, USP-NF
The attribute of a color perception that determines whether it is red, yellow, green, blue, purple, or the like.
Sim: AAPL, AATCC, ACS, APA, ASTM, CGPS, USP-NF, cgps(1)
Diff: cgps(2)

HUE CIRCUIT AAPL
A progressively graded series of visually equidistant hues arranged in a circle.

HUE KEY AAPL
The hue of largest area or dominant hue determines the hue key of a composition and may be warm, temperate, or cool.

HUE SCALE OSA
Series of colors that under controlled conditions are perceived to vary by uniform steps in hue alone with other attributes of the perceptions constant.

HUE, VALUE, CHROMA AAPL
The artists' equivalents for the above are, respectively, color, value (in the narrow, gray-scale sense), intensity.

HUNGRY AATCC, TCCA
Lacking in strength and possibly brightness compared with some real or implied standard.

HYPERSENSITIZATION SMPE
The treatment of an unexposed photographic material by immersion in a solution, such as ammonia, to increase its sensitivity.

I

ICI OSA
Abbreviation for the International Commission of Illumination.
Note: The French title of the Committee (Commission Internationale de l'Eclairage) and its abbreviation CIE is also sometimes used, but rarely the German title (Internationale Beleuchtungskommission) or its abbreviation IBK.

*ICI CHROMATICITY DIAGRAM IES
The chromaticity diagram resulting from the usual manner of plotting the ICI standard trichromatic coordinates is shown in Chart No. 23 in: A. C. Hardy, Handbook of Colorimetry, and on page 668 of the Colorimetry Committee Report, J. Optical Soc. Amer., 1944, 34.

ICI STANDARD CHROMATICITY COORDINATES OSA
Chromaticity coordinates based upon the ICI standard color-mixture data.
Note: These values are designated by the symbols x, y, z.
Sim: (ICI standard trichromatic coordinates — IES)

*ICI STANDARD COLOR-MIXTURE DATA FOR THE SPECTRUM IES
The standard color-mixture data adopted by the ICI in 1931 are given in Table IV of ASA A7.1 - 1942, p. 19.
Note: These values, known also as distribution coefficients, are designated by the symbols $\bar{x}$, $\bar{y}$, and $\bar{z}$, and specify quantities of physically unobtainable red, green, and blue primaries. Since these data are used only as a basis for color specification, and not for the actual synthesis of three-color mixtures, the unrealizable character of the primaries is of no consequence. On the contrary, the choice of these primaries obtains important advantages. No negative values occur, and the values of $\bar{y}$ are identical with the standard luminosity data (Table I of ASA A7.1 - 1942, p.10) adopted by the ICI in 1924. The luminosity coefficients of the ICI standard color-mixture data are 0,650 lumens per watt, and 0.
Sim: OSA

— ——— — ——— ——— OSA
The color-mixture data adopted by the ICI in 1931.
Note: Sometimes for simplicity called simply the ICI Data. These values are designated by the symbols $\bar{x}$, $\bar{y}$, $\bar{z}$, and specify quantities of physically unobtainable red, green, and blue primaries.
Sim: IES

ICI STANDARD ILLUMINANTS FOR COLORIMETRY OSA
Three illuminants adopted in 1931 for colorimetric purposes by the ICI: illuminant A representative of gas-filled tungsten-filament lamps, illuminant B representative of noon sunlight, and illuminant C representative of average daylight.
Sim: IES, (standard illuminant — CGPS)

*ICI STANDARD LUMINATORS FOR COLORIMETRY IES
ICI Standard Luminator A consists of a gas-filled incandescent tungsten-filament lamp operating at a color temperature of 2848°K (c_2 = 14,350 micron degrees). ICI Standard Luminators B and C consist of Standard Luminator A combined with liquid filters the compositions of which are given in Recommendation 2 of the ICI.
Note: The nominal color temperature of Luminator B is 4800°K, similar to mean noon sunlight. The nominal color temperature of Luminator C is 6500°K, similar to average daylight. Tables of spectral energy distributions for the standard luminators were published by the ICI and in the four references listed under "ICI Standard Trichromatic Coordinates." These tables were based on the assumption that Luminator A (a gas-filled incandescent tungsten-filament lamp) has a spectral distribution of energy proportional to that of a blackbody at a temperature of 2848°K (c_2 = 14,350 micron degrees). The validity of that assumption has been questioned (W. E. Forsythe and E. Q. Adams, J. Optical Soc. Amer., 1945, 35, 108-113). Since the tabulated data are used much more frequently than the actual luminators, it might be better to consider that the standard luminators consist of a blackbody at 2848°K with respective filters, and that these luminators are merely approximated by use of gas-filled incandescent tungsten-filament lamps.
Sim: OSA, (standard illuminant — CGPS)

ICI STANDARD OBSERVER OSA
See Standard Observer, apa

*ICI STANDARD TRICHROMATIC COORDINATES IES
Trichromatic coordinates for the spectrum were adopted by the ICI in 1931.
Note: Proc. 8th Session, Commission Internationale de l'Eclairage, Cambridge 1931), pp. 19-29 (Table II). These values have been reprinted in several places.
1. T. Smith and J. Guild, Trans. Opt. Soc., 1932, 33: 73-130 (Table 3)
2. D. B. Judd, Jour. Optical Soc.Amer., 1933, 23, 359-374 (Table 2)
3. A. C. Hardy, Handbook of Colorimetry, Technology Press, 1936, (Table 24)
4. O.S.A. Colorimetry Committee, Jour. Optical Soc. Amer., 1944, 34, 633-688 (Table 28)
Sim: (ICI standard chromaticity coordinates — OSA)

IDEAL FULL COLOURS CGPS (112)
(Ostwald system) Surface colours which are produced with the maximum colourfulness that is theoretically possible. This is held to be accomplished by (a) complete absorption below a wavelength that has no complementary and complete reflection above it, or vice versa, and (b) complete absorption in a band between two complementary wavelengths and complete reflection outside the band, or vice versa.
Sim: (semichrome — osa)

IDENTICAL POINTS APA
Any pair of retinal points in the two eyes which, when the eyes are in the primary position, receive stimuli from the same objective point at infinite distance.

IDIORETINAL LIGHT APA, osa
Visual impressions of light which occur in the absence of adequate light stimulation, and are attributed to physiological process within the retina itself or in the brain.

*ILLUMINANCE apa
The density of light-flux incident upon a surface.
Common units of illuminance are the foot-candle, metercandle, and the lux, or lumen per square meter.
Sim: OSA, (illumination — CGPS, IES)

1/ ——— OSA
Luminous flux incident per unit area of surface.
Note: This quantity has commonly been called illumination in the past. Usual units are the lux, or lumen per square meter or meter-candle, and the footcandle.
Sim: apa, (illumination — CGPS, IES)

ILLUMINANTS A, B, AND C OSA
See ICI Standard Illuminants for Colorimetry — OSA

ILLUMINANT COLOR APA
Color seen as glowing, luminous, or belonging to an illuminant, viz., in the illuminant mode of appearance.
Commonly referred to a comparatively small area of high brightness, viz., brighter than white under similar conditions of viewing.
Examples: Color of perceived flame, tungsten lamp, neon sign, fluorescent fabric.
Sim: (glow — osa), (glowing color — osa), (illuminant-color perception — OSA)

ILLUMINANT-COLOR PERCEPTION OSA
Color perceived as belonging to a source of light.

1/ See I.E.S. revision for term ILLUMINATION (05.035), p. viii.

Note: An illuminant-color perception is one of the located modes of appearance, but for perceptions of high brightness the exactness of location decreases. The character of the perception is intermediate between that of surface-color and aperture-color.
Sim: (glow — osa), (glowing color — osa), (illuminant color — APA)

ILLUMINATION CGPS (21)
The luminous flux incident per unit area on one side of a surface or its equivalent (lumens per unit area). Also called Illuminance.
Sim: IES, (illuminance — OSA, apa)
Diff: OSA

1/ ———, E IES
Illumination is the density of the luminous flux on a surface; it is the quotient of the flux by the area of the surface when the latter is uniformly illuminated.

$$E = dF/dA$$

Note: The term illumination is also commonly used in a qualitative or general sense to designate the act of illuminating or the state of being illuminated. Usually the context will indicate which meaning is intended, but occasionally it is desirable to use the expression amount of illumination to indicate that the quantitative meaning is intended.
Sim: CGPS, (illuminance — OSA, apa)
Diff: OSA

——— OSA
The process as a result of which light is incident on a surface.
Diff: CGPS, IES

ILLUMINATION COLOR APA
Color seen as belonging to illumination distributed in space, viz., color in the illumination mode of appearance.
Examples: color of sunlight in a room, red light flooding a stage, etc.
Sim: (illumination-color perception -OSA)

ILLUMINATION-COLOR PERCEPTION OSA
A located mode of appearance resulting from an awareness of the distribution of the amount and chromaticity of illumination in space.
Note: An illumination-color perception is classed as a located, but not as an object, mode of visual appearance.
Sim: (illumination color — APA)

*ILLUMINATION FLICKER APA
Flicker seen as belonging to the illumination of the illuminated space rather than to the surfaces of objects seen in it.

ILLUMINATION, LAW OF apa
The principle that the illuminance of a surface varies directly as the luminous intensity of the light-source, inversely as the square of its distance, and directly as the cosine of the angle made by the light-rays with the perpendicular to the surface.

IMAGE, OPTICAL apa
The picture or reproduction of an object produced by a lens, reflector, or optical system, as a result of the focusing of the light emanating from each point in the object.

IMAGE, RETINAL APA
The optical image of external objects formed upon the retina by the refracting surfaces of the eye.

IMBIBITION SMPE
A process for producing a dye-image by mechanical printing. A dyed relief or differentially tanned matrix of some substance such as gelatin is brought into intimate contact with a moist absorbing layer such as gelatin, the dye diffusing from the matrix to the absorbing layer.

IMBIBITION MATRIX SMPE
A coating of gelatin or other colloid upon a support having an image capable of being dyed with water-soluble dye.

*INDIRECT COLORIMETRY IES
Color-mixture data for any sample can be computed from the data for the spectrum and the spectral distribution of the sample.
Note: The color of a nonselfluminous object can be computed from its spectral reflectance (or transmittance), the spectral distribution of the luminator, and the standard color-mixture data for the spectrum. These calculations consist of summing the products of these three groups of data, wavelength by wavelength, one complete calculation for each of the three primaries. Examples of such calculations are given in the last three references under "ICI Standard Trichromatic Coordinates" Tables of the products of the color-mixture data and the spectral distributions of the standard luminators have been published in the last four references listed under "ICI Standard Trichromatic Coordinates". Similar tables for many other luminators have been published in the last of those references and by E. Q. Adams and W. E. Forsythe, Denison University Bulletin, Journal of the Scientific Laboratories, 1943, 38, 52-68. Use of such tables eliminates needless repetitions of the multiplication of these frequently associated factors.
Sim: OSA

——— ——— OSA
Calculation of the color-mixture data for a sample from those of the spectrum and the spectral distribution of the sample.
Sim: IES

INDUCED COLOR APA
A color or change in color which appears in a given portion of the subjective visual field, due not to direct stimulation of the corresponding portion of the retina, but to concomitant stimulation of other portions.

1/ For I.E.S. revision (05.035), see p. viii.

INDUCING COLOR APA
A color-stimulus which induces a contrast effect.
Distinguish from induced color, the color that constitutes the effect.

*INSISTENCE APA
The impressiveness or attention-catching power of a color; associated especially with brightness of achromatic colors and saturation of chromatic colors. Advancing colors are likely to be more insistent than retreating colors.

INSTRUMENTAL STIMULI CGPS (60)
The three defined stimuli of a trichromatic colorimeter. Also called Matching stimuli; Primaries.
Sim: (colorimetric primaries – APA)

INTENSITY AAPL
Intensity is quite regularly used as a synonym for chroma or saturation. Intensity varies in degree from weak or zero to strong or maximum. Most artists do not use the term chroma.

INTERFERENCE COLORS SMPE
Colors resulting from the destruction of the light of certain wavelengths, and the augmentation of the light of others in a composite beam by interference. Colors of thin films and polarization colors by doubly refracting crystals in the polariscope are examples of interference colors.

INTERMEDIATE KEY AAPL
A composition in which the dominant value is approximately 4, 5, or 6.

INTERNAL ABSORPTION FACTOR CGPS (39)
The ratio of the luminous flux absorbed by a transparent body during a single passage from the first surface to the second surface (difference between the flux leaving the first surface and that reaching the second surface) to the flux leaving the first surface.

INTERNAL DENSITY CGPS (47)
The logarithm, to the base 10, of the reciprocal of the internal transmission factor.

INTERNAL TRANSMISSION FACTOR CGPS (38)
The ratio of the luminous flux reaching the second surface to the flux leaving the first surface, for a single passage through a transparent body.
Sim: (internal transmittance – OSA), (transmittance – IES)

INTERNAL TRANSMITTANCE OSA
Ratio of the flux coming up to the second surface of a specimen from the inside to that which has penetrated the first surface.
Sim: (internal transmission factor – CGPS), (transmittance – IES)

*INVARIABLE HUES APA, osa
The invariable hues are those which are independent of the Bezold-Brücke phenomenon, i.e., those hues which do not change with change in luminance of the stimulus.
Purdy's average values for the spectrum stimuli to the invariables are: 474, 506, 571 millimicrons, respectively.

IRIDESCENT cgps (144)
(Ordinary speech) Changing colour with position. Usually applied to colours produced by interference, refraction, or diffraction.

IRRADIANCE OSA
Radiant flux incident per unit area of a surface.
Note: The usual unit is the watt per square meter. This is the radiant analog of illuminance.
Sim: (irradiancy – IES)

1/IRRADIANCY, H IES
Alternate symbol, $\mathfrak{E}$. Irradiancy of an element of surface is the incident radiant flux per unit area, e.g., watt/cm^2.
$H = d\Phi / dA$
Sim: (irradiance – OSA)

IRRADIATION AAPL
The apparent enlargement of a bright object seen against a dark background, due to a stimulation of the retina by the bright light around the image.
Sim: APA
Diff: OSA

———— APA
The apparent excess in size of a visual stimulus of relatively high intensity, e.g., of a white stimulus figure on a black ground, as compared with an equal black stimulus figure on white.
Sim: AAPL
Diff: OSA

———— OSA
The process as a result of which radiant energy is incident on a surface.
Diff: AAPL, APA

ISCC-NBS COLOR DESIGNATION USP-NF, osa
Designation of a color by simple English words according to a method devised by the Inter-Society Color Council and worked out in detail at the National Bureau of Standards. The words used include a number of hue names plus the adjectives light, medium, dark, weak (grayish) medium strong, pale, moderate, dusky, brilliant, vivid, deep.

ISOCANDLE DIAGRAM IES
An isocandle diagram is a collection of isocandle lines-showing the distribution of candlepowers about a source of light. The isocandle lines are usually drawn for equal increments of candlepower.
Note: For a detailed description of the isocandle diagram and its uses, see article by Benford in General Electric Review, vol. 28, p. 271, April, 1925, and Transactions I.E.S., vol. 21, p.129, February, 1926. A clear and simple exposition of the isocandle system is given by Walsh in Illuminating Engineer (London), vol.26, p. 169, July, 1933.

1/ See I.E.S. revision for deletion (10.045), p. viii.

ISOCANDLE LINE IES
An isocandle line is a line plotted on any appropriate coordinates to show directions in space, about a source of light, in which the candlepower is the same. The line, for a complete exploration, is always a closed curve.

ISOCHROME SERIES osa
Series of colors having the same Ostwald hue and the same ratio of fullcolor content to white content. Same as Shadow Series.
Note: This series also has constant dominant wave-length and constant purity; the colors of the isochrome or shadow series therefore have identical chromaticities and vary only in luminous reflectance.
Diff: (isochromes – AAPL, CGPS), (psychological isochromes – CGPS)

ISOCHROMES AAPL
Isochromes are colors of equal pure color content. They are found in rows parallel to the WB side of the single-hued triangle.
Sim: CGPS
Diff: (isochrome series – osa)

——— CGPS (118)
(Ostwald system) Colours of equal full colour content. (This was the original meaning of the term, but in the literature it is frequently used as an abbreviation for 'psychological isochromes', which are more widely used.
Sim: AAPL
Diff: (isochrome series – osa)

1/ ISOLUX DIAGRAM IES
An isolux diagram is a collection of isolux lines showing the distribution of illuminance on a surface.

1/ ISOLUX LINE IES
An isolux line is a line, plotted on any appropriate coordinates, showing points of equal illuminance. The line, for a complete exploration, is always a closed curve.

ISOPAQUE CURVE SMPE
A line connecting a series of points of equal opacity. Such curves when applied to spectrograms may be used to demonstrate the color-sensitivity of photographic materials.

ISO-TEMPERATURE LINE OSA
Locus of points on a chromaticity diagram representing chromaticities that are more similar to the chromaticity represented by a certain point on the Planckian locus than to other neighboring Planckian chromaticities.

ISOTINT SERIES AAPL
Any of the several series of colors in an Ostwald triangle which are located in rows parallel to the dark clear series.
Sim: osa, (isotints – CGPS)

——— ——— osa
Series of colors having constant Ostwald hue and constant white content.
Sim: AAPL, (isctints – CGPS)

ISOTINTS CGPS (116)
(Ostwald system) Colours of equal white content.
Sim: (isotint series – AAPL, osa)

ISOTONE SERIES AAPL
Any of the several series of colors in an Ostwald triangle which are located in rows parallel to the light clear series.
Sim: osa, (isotones – CGPS)

——— ——— osa
Series of colors having constant Ostwald hue and constant black content.
Sim: AAPL, (isotones – CGPS)

ISOTONES CGPS (117)
(Ostwald system) Colours of equal black content.
Sim: (isotone series – AAPL, osa)

ISOTROPIC MATERIAL OSA
Material in which the velocity of propagation of radiant energy is identical for all directions.

ISOVALENT COLORS AAPL
A term in the Ostwald system which refers to colors having the same letter notation. In the Ostwald color solid, an isovalent circle passes through the twenty-four different hues at the same position in each triangle.
Sim: CGPS, osa

ISOVALENT COLOURS CGPS (120), osa
(Ostwald system) Colours of equal black and white (and colour) content.
Sim: AAPL

J

JET AATCC
A black resembling the color of black velvet, which is free from bronze and any tendency toward reddish, greenish, or other hue.
Sim: TCCA

— TCCA
A pure black which is free from bronze and any tendency toward reddish, greenish, or other hue.
Sim: AATCC

JUICY OR FAT COLOR AAPL
A technical effect, referring especially to oil paint and depending on the texture, condition, and application of the pigment. A juicy color is a heavy, oily, generously and somewhat roughly applied blob of paint.

JUST NOTICEABLE DIFFERENCE APA
The least difference in value between two compared stimuli which, in a given individual, gives rise to two different sensations. Abbreviated j.n.d.
Also called, just perceptible difference, least noticeable difference, minimal change.

K

KEY cgps (234)
(Artist painters) General level of lightness or pervasiveness of one hue (see tone). A painting may be said to be in a 'low' key, a 'golden' key, a 'high' key, etc.

1/ For I.E.S. revision, see p. x.

KIRCEOFF'S LAW OSA
Ratio of radiant emittance to radiant absorptance is the same for all surfaces at the same temperature.

L

LADD-FRANKLIN THEORY OF COLOR VISION APA
A theory which assumes that in the retinal nerve-endings the respective light-stimuli liberate red-, green-, and blue-stimulating substances from a complex photosensitive molecule, and that, of these, red and green, when present, unite to form a yellow-stimulating substance, which may in turn unite with blue to form a white-stimulating substance.
According to this schema blue and green, or blue and red, cannot so unite, and so do not individually disappear in the respective blue-green and blue-red (or purple) mixtures; dichromatic vision is explained by the assumption of a less highly developed molecule, and for the achromatic or colorless vision of the rods the original molecule is still more primitive.

LAKE SMPE
A pigment formed by the combination of an organic dye with a metallic compound or another dye with which it forms an insoluble precipitate.

1/ LAMBERT, L IES
The lambert is a unit of luminance equal to $1/\pi$ candle per square centimeter, and therefore, equal to the uniform luminance of a perfectly diffusing surface emitting or reflecting light at the rate of one lumen per square centimeter.
Note: The lambert is also the average luminance of any surface emitting or reflecting light at the rate of one lumen per square centimeter. For the general case the average must take account of variation of luminance with angle of observation and also of its variation from point to point on the surface considered.
The lambert has a magnitude suitable for expressing the luminance of bright sources of light, but for most other purposes the millilambert, mL, 0.001 lambert, is a preferable unit.
Sim: OSA, apa

——— OSA, apa
Unit of luminance equal to $1/\pi$ candles per square centimeter, or to the uniform luminance of a perfectly diffusing surface emitting or reflecting light at the rate of one lumen per square centimeter, or to the average luminance of any surface emitting or reflecting light at the rate of one lumen per square centimeter.
Sim: IES

LAMBERT'S LAW OSA
Flux reflected per unit solid angle is proportional to the cosine of the angle measured from the normal to the surface.
Note: Since the projected area varies inversely as the cosine of this angle, the radiance of a surface obeying Lambert's law is independent of the viewing angle. Such a surface is said to be a perfect diffuser.

2/ LAMP IES, osa
Lamp is a generic term for an artificial source of light.

LENTICULATION SMPE
Minute optical elements having the form of cylindrical or spherical lenses embossed into the support side of photographic film. They serve in the process of analysis and synthesis of images in an additive color process.

LEUCO-BASE SMPE
A white or slightly colored substance which, upon oxidation, sometimes accompanied by reaction with an acid or base, yields a more highly colored dye.

LEVEL aatcc
Same as Even.

LIFE TESTS IES
Electric filament lamps of a given type may be assumed to operate under comparable conditions only when their lumens per watt consumed are the same. Life test results, in order to be compared, must be either conducted under, or reduced to, comparable conditions of operation.

LIGHT, adj. AAPL
1. Used in reference to colors having values near white; as, pink is a light red.
2. Having little thickness and high in value; as, a light line.
Sim(1): AATCC, APA(a), TCCA, USP-NF, osa
Diff(1): AAPL(a2), cgps(a)
Diff(2): All definitions for the term, light.

———, adj. AATCC, TCCA, osa
Having the appearance of reflecting much light, opposite of dark.
Sim: AAPL(a1), APA(a), USP-NF
Diff: AAPL(a2), cgps(a)

———, adj. APA
Characterized by a relatively high degree of lightness.
Sim: AAPL(a1), AATCC, TCCA, USP-NF, osa
Diff: AAPL(a2), cgps(a)

——, adj. cgps (125)
(Ordinary speech) Diffusely reflecting a relatively large amount of the incident light.
Diff: AAPL(a), APA(a), AATCC, TCCA, USP-NF, osa

——— , adj. USP-NF
Characterized by high value, or lightness; the opposite of dark.
Sim: AAPL(a1), APA(a), AATCC, TCCA, osa
Diff: AAPL(a2), cgps(a)

LIGHT, n. AAPL
1. That form of radiant energy which acts on the retina of the eye and renders visible the objects from which it comes.
2. The quality which is possessed by the

1/ See I.E.S. revision, p. viii.
2/ See I.E.S. revision, p. ix.

most luminous part of the picture, drawing, or engraving in contradistinction to those parts which are relatively obscure and so said to be in shade.
3. The way in which the luminous portions of a picture are rendered.
Sim(1): APA(n), CGPS, OSA
Diff(1): IES, cgps(n)
Diff(2,3): All definitions listed for the term, light.

——, n. APA
Radiant energy of those wave-lengths which act as adequate stimuli to the visual sense.
Sim: AAPL(n1), CGPS
Diff: AAPL(n2,3), IES, OSA, cgps(n)

——, n CGPS (1)
(a) Radiant energy capable of stimulating the eye and causing the sensation of vision. Often extended to radiation near to the visible region of the spectrum, e.g., ultra-violet and infra-red light (deprecated). Light actually entering the eye may be more specifically referred to as the visual stimulus.
(b) Visual sensation.
Sim: AAPL(n1), APA(n)
Diff: AAPL(n2,3), IES, OSA, cgps(n)

——, n. cgps (206)
(Artist painters) The artist uses this term nearly always with reference to the effect of illumination awakened in the observer by a given composition. The impression, representation, or even illusion of a characteristic illumination within the picture space is the outcome of innumerable technical devices. Thus Vermeer's light is naturalistic and representational, whereas Turner's light is high imaginative, always dramatic, and frequently in defiance of natural laws, although it is always aesthetically logical and convincing. The term may be employed equally with regard to natural illumination, as of the light of Italian landscape compared with the light of the English landscape. The artist is very rarely interested in light other than as a pictorial device; that is, he is indifferent to the possibility of its measurement or analysis, nor does he care about the physical causes of the phenomenon.
Diff: All definitions listed for the term, light.

——, n. IES
For the purposes of illuminating engineering, light is visually-evaluated radiant energy.
Note: Light is psychophysical, neither purely physical nor purely psychological. Light is not synonymous with radiant energy, however restricted, nor is it merely sensation. In a general, nonspecialized sense light is the aspect of radiant energy of which a human observer is aware through the visual sensations which arise from the stimulation of the retina of the eye.
The present basis for the engineering evaluation of light consists of the color-mixture data, $\bar{x}$, $\bar{y}$, and $\bar{z}$, adopted in 1931 by the ICI. These data include the relative luminosity data adopted in 1924 by the ICI.
Sim: AAPL(n1), APA(n), CGPS, (luminous energy — OSA)
Diff: AAPL(n2,3), OSA, cgps(n)

——, n, OSA
The aspect of radiant energy of which a human observer is aware through the visual sensations which arise from the stimulation of the retina of the eye.
Diff: All definitions listed for the term, light.

LIGHT-ADAPTED EYE APA, osa
An eye which has been exposed to light stimuli of relatively high intensity and has so become relatively insensitive to lower intensities.
Cf. adaptation

LIGHT AND SHADE cgps (216)
(Artist painters) The artist would say that by these terms he meant the relative lightnesses of the different areas in the subject, or in the picture, considered independently of their colours (he very rarely uses the word hue.)

LIGHT CLEAR SERIES AAPL
The colors in an Ostwald triangle between and including the full color and white. Each member of the light clear series should exhibit for each value of luminance, the maximum excitation purity permitted by the colorants in the coating.

LIGHT COLORS AAPL
Colors which by the addition of white remain clear.

LIGHT RESTRAINING DYE SMPE
A dye used for impregnating a light-sensitive emulsion to prevent the deep penetration of light during exposure.

LIGHT SENSATION APA, osa
A kind of sensation whose adequate stimulus is light and whose receptor is the eye.

LIGHT WAVES APA
Luminous radiant energy, when regarded as an undulatory or wave-like phenomenon; or as a transverse electromagnetic disturbance.

LIGHTER CGPS (164)
(Paint and pigment industries) A difference apparently due to the presence of more white and less black than in the original sample, the amount of colour being the same. Opposite of Darker.

LIGHTNESS[1/] APA
That attribute of most object colors by reference to which they can be classed as equivalent to members of the achromatic series ranging from black to white.
Sim: ASTM, CGPS, OSA
Diff: USP-NF

1/ Also defined by I.C.I., 1948, see Addenda to Introduction, p. vi.

——— ASTM
The attribute which permits an object color to be classified as equivalent to some member of the series of grays ranging from black to white.
Sim: APA, CGPS, OSA
Diff: USP-NF

——— CGPS (59)
That attribute of visual sensations by which one surface is judged to reflect a greater or smaller proportion of incident light than another.
Note: The sensation of lightness is not to be confused with the sensation of luminosity, since an object in shadow may have a higher lightness but a lower luminosity than an object more strongly illuminated.
Under the same conditions of observation, when direct comparisons can be made, lightness can replace luminosity as one of the three independent attributes of visual colour sensations arising from secondary sources. In fact it is usual to consider hue, saturation, and lightness as the subjective colour attributes of secondary sources, and hue, saturation and luminosity as the subjective colour attributes of primary sources.....
Sim: APA, ASTM, OSA
Diff: USP-NF

——— OSA
The attribute of an object-color perception that permits it to be classified as equivalent to some member of the series of grays ranging between black and white.
Sim: APA, ASTM, CGPS
Diff: USP-NF

——— USP-NF
Lightness is degree of freedom from black or gray. (This term is used in the Pharmacopoeia and National Formulary chiefly in the adjective form, thus: light, lighter.)
Diff: APA, ASTM, CGPS, OSA

LIGHTS AAPL
The lights in a picture are those parts where the light falls with the most brilliance. A strong effect is obtained by making those parts to which it is desired to give prominence the lights of the picture.

LINE-SCREEN PROCESS SMPE
A color-screen process in which the screen is formed by a regular pattern or ruled lines.

LIMEN APA
Same as Threshold

LIVID COLOR AAPL
A leaden tint, blue, violet, or green, approaching to black.

LOCAL COLOR AAPL
The color which belongs to a special object. The romantic school extended this expression to mean the accurate presentation of site, costumes, and accessories. When Decamps represented for the first time the true Turks of Asia Minor instead of the conventional Turks with their garments decorated with a sun, he gave us an example of local color.
Diff: cgps

—— COLOUR cgps (230)
(Artist painters) The colour of an object viewed in average daylight at such a distance that its appearance is not modified by "aerial perspective." For example, leaves are green close at hand, but foliage is blue in the distance.
Diff: AAPL

LOCAL TONE AAPL
A term applied to the general tone covering a surface, the modelling which is obtained by means of dark touches, representing the shades, and light touches, indicating the light.

*LOCATED COLOR APA
A color in a mode of appearance which makes the stimulus object appear to be within definite limits of distance from the observer.
Sim: (located color perception — OSA)

LOCATED COLOR PERCEPTION OSA
A mode of appearance in which the stimulus object appears to be within definite limits of distance from the observer.
Sim: (located color — APA)

LOVIBOND COLOR SYSTEM OSA, AOCS 1/
Specification of a color by three numbers proportional to the densities of three glass colorants, a yellow, a red, and a blue colorant, required to modify a standard source (such as daylight) to produce a color match.

LOW CGPS (196)
(Glass industry) Describes the green or blue-green colour of low saturation sometimes obtained in almost colourless glasses.

LOW KEY AAPL
A picture or scene in low key is one which is predominantly quite dark but contains a minor amount of quite light detail. The contrast-range may be normal but the balance is dark.

LOWER REGISTER AAPL
Lower register is a term used to designate colors in the darker range of values as distinguished from the lighter range, usually relatively gray as well as relatively dark; as, in color the painting was restricted to the lower register.

LUMEN CGPS (19)
The unit of luminous flux. The flux emitted in unit solid angle by a uniform source having a luminous intensity of one candle.
Sim: IES, OSA, apa

——, lm IES, OSA, apa
The lumen is the unit of luminoux flux. It is equal to the flux through a unit solid angle (steradian) from a uniform point source of one candle, or to the flux

1/ See footnote, page iv.

on a unit surface all points of which are at unit distance from a uniform point source of one candle.

Note: For some purposes, the kilolumen, equal to 1000 lumens, is a convenient unit.

Sim: CGPS

LUMEN-HOUR, lm-hr IES

The lumen-hour is the unit of quantity of light. It is the quantity of light delivered in one hour by a flux of one lumen.

LUMINAIRE IES

A luminaire is a complete lighting unit consisting of a light source, together with its direct appurtenances such as globe, reflector, housing, and such support as is integral with the housing.

Note: The term luminaire is used to designate separable devices, such as completely equipped lighting fixtures, wall brackets, portable lamps, so-called removable units, or street-lighting units. It does not include permanent parts of a building, such as a ceiling or other structural element; and in street-lighting units the pole, post, or bracket is not considered a part of the luminaire.

1/ LUMINANCE CGPS (22)

The luminous intensity per unit orthogonally projected area of a surface or its equivalent in the direction of observation (candles per unit area).

Sim: OSA, apa, (brightness — IES)

2/ ———— OSA, apa

Luminous flux emitted, reflected, or transmitted per unit solid angle and unit projected area of the source.

Note: Usual units are the candle per square meter, the candle per square foot, the Lambert, the millilambert, and the footlambert. This quantity has commonly been called photometric brightness in the past.

Sim: CGPS, (brightness — IES) 2/

1/ LUMINANCE FACTOR CGPS (43)

The ratio of the luminance of a reflecting surface, viewed from a given direction, to that of a perfect white diffuser substituted for the surface. Also called Brightness factor, Lightness factor, Albedo.

Sim: (luminous directional reflectance — ASTM)

LUMINANCE PURITY OSA

Purity expressed as the ratio of the luminance of the spectral component to the luminance of the spectral and achromatic components taken together.

Sim: (colorimetric purity — CGPS, IES)

LUMINATION OSA

The process by which light is emitted from a source.

LUMINATOR OSA

An emitter of light.

LUMINOSITY AAPL

By the luminosity of a color we mean that quality which tends to make it remain visible when the light begins to fail. It may be natural or due to added white.

Diff: CGPS, OSA, apa, cgps

*———— apa

A measure of the visibility of brightness-producing capacity of radiant energy consisting in the ratio of photometric quantity to corresponding radiometric quantity in standard units (lumens per watt).

Sim: OSA, (luminous efficiency — IES)

Diff: AAPL, CGPS, cgps

———— CGPS

1. (54) That attribute of visual sensations which permits achromatic sensations to be arranged in a series (obtained, for example, by varying the intensity of an extended source), and a chromatic sensation to be classed as equivalent to a member of such an achromatic series. Briefly, the intensity of luminous sensation. Also called Brightness.

2. (302) (Decorating trade) Similar to 'tone,' but commonly considered to be partly bound up with surface textures and the transparency of the pigmented film.

Note: The use of this term appears to correspond more closely with the recommended meaning of luminosity than with lightness.

Sim(1): (brightness —APA, ASTM, OSA)

Diff(1): AAPL, CGPS(2), OSA, apa, cgps

Diff(2): AAPL, CGPS(1), OSA, apa, cgps

———— cgps (211)

(Artist painters) Luminosity is rarely employed by artists, but when used the meaning is either (a) that the colours throughout the painting are light, namely, that the painting was executed in a 'high key' with 'luminous tones', and that the painting (giving the observer the impression of a brilliantly lit subject) would be said to have 'luminosity'; (b) that the painting evoked in the spectator the recognition of the truthful representation of illumination.

Diff: AAPL, CGPS, OSA, apa

———— OSA

Ratio of photometric quantity to corresponding radiometric quantity in standard units (lumens per watt).

Sim: apa, (luminous efficiency — IES)

Diff: AAPL, CGPS, cgps

*LUMINOSITY COEFFICIENTS apa

The coefficients by which the color-mixture data for any color need to be multiplied so that the sum of the three products is the luminance of the color sample to be specified.

Sim: IES, OSA

*———— ———— IES

The three color-mixture data for any color may be multiplied by constants, known as luminosity coefficients, such that the sum of the three products is the luminance of the color.

Note: These coefficients may be interpreted as the luminances of unit amounts of each of the primaries.

1/ Also defined by I.C.I., 1948, see Addenda to Introduction, p. v.

2/ See I.E.S. revision for term BRIGHTNESS, p. viii.

Sim: OSA, apa

——— ——— OSA

The coefficients by which the color-mixture data for any color need be multiplied so that the sum of the three products is the luminance of the color.

Note: For a single set of primaries and a single observer these coefficients are the same for all sample colors and may be interpreted as the luminosities of the primaries. For the standard observer and primaries these coefficients are 0, 1, 0, all luminosity being associated with the $\bar{y}$—function.

Sim: IES, apa

*LUMINOSITY CURVE apa

Curve of photopic luminosity of spectrum stimuli through the visible range, plotted as a function of wave-length with maximum luminosity as unity. (Formerly called visibility curve.)

There is also a scotopic luminosity curve.

Sim: OSA

——— ——— OSA

Curve of luminosity of spectrally homogeneous lights, plotted relative to the maximum luminosity as a function of wave-length. (Formerly called visibility curve.)

Sim: apa

LUMINOSITY FACTOR, K IES

The luminosity factor for radiation of a particular wave-length is the ratio of the luminous flux at that wavelength to the corresponding radiant flux. It is expressed in lumens per watt.

$$K = F_\lambda / \Phi_\lambda$$

(In these terms luminosity replaces the word visibility formerly used.)

Sim: (spectral visual sensitivity — CGPS), (visual sensitivity — CGPS)

LUMINOUS AAPL

A term applied to brilliant and striking tones, bright canvases, and pictures in which the lights predominante over the shades.

Diff: APA, osa

*——— APA, osa

Characteristic of the illuminant mode of appearance, glowing, viz., having the appearance of emitting light.

Diff: AAPL

LUMINOUS DENSITY OSA

Luminous energy contained in a unit volume of space.

LUMINOUS DIRECTIONAL REFLECTANCE ASTM

Luminous directional reflectance (formerly luminous apparent reflectance) is the brightness of a specimen when illuminated and viewed in a specified manner, divided by the brightness that an ideally diffusing, completely reflecting white surface would have when illuminated and viewed in the same manner.

Note: A value of luminous directional reflectance is thus the traditional diffuse reflectance (ratio of flux reflected in a non-image-forming state to incident flux) that the specimen appears to have for specified conditions of illumination and observation. Both the spectral and the geometric characteristics of these conditions must be included in reporting a value of luminous directional reflectance. An actual specimen is never perfectly diffusing; hence its directional reflectance varies with changes in directions of illumination or view. Goniophotometric curves plotted as a function of direction of view are used to show how a specimen distributes reflected light in different directions. Values of directional reflectance may exceed unity, particularly if the direction of view coincides with that of specular reflection. Directional luminous reflectance can be measured directly only with apparatus whose spectral sensitivity is adjusted to the luminosity function.

Sim: (directional luminous reflectance — OSA), (luminance factor — CGPS)

1/LUMINOUS EFFICIENCY IES

The luminous efficiency of radiant energy is the ratio of the luminous flux to the radiant flux.

Note: Luminous efficiency is usually expressed in lumens per watt of radiant flux. It should not be confused with the term efficiency as applied to a practical source of light, since the latter is based upon the power supplied to the source instead of the radiant flux from the source. For energy radiated at a single wavelength, luminous efficiency is synonymous with luminosity factor.

The reciprocal of the luminous efficiency of radiant energy is sometimes called the "mechanical equivalent of light." The value most commonly cited is the minimum "mechanical equivalent," that is, the watts per lumen at the wavelength of maximum luminosity. The best experimental value is 0.00151 watt per lumen, corresponding to 660 lumens per watt as the maximum possible efficiency of a source of light.

Sim: (luminosity — OSA, apa)

——— ——— OSA

Same as Luminosity.

LUMINOUS EMITTANCE CGPS (920)

The luminous flux being radiated from unit area of a primary or secondary source (lumens per unit area).

Sim: OSA

——— ——— OSA

Luminous flux emitted per unit area of a source.

Sim: CGPS

1/ For I.E.S. revision, see p. viii.

LUMINOUS ENERGY OSA
Evaluation of radiant energy according to its stimulation of the brightness attribute of visual perception.
Sim: (light – IES)

LUMINOUS FLUX CGPS (18)
The amount of light being radiated.
Sim: IES, OSA, apa

——— ——, F IES
Luminous flux is the time rate of flow of light.
Sim: OSA, apa
Diff: CGPS

——— —— OSA, apa
Rate of transfer of luminous energy.
Note: The usual unit is the lumen.
Sim: IES
Diff: CGPS

LUMINOUS INTENSITY apa
Luminous flux emitted per unit solid angle about a source. The usual unit is the candle.
Sim: IES, OSA
Diff: CGPS

——— ——— CGPS (16)
The property of a light source which determines the amount of light radiated per unit solid angle in any given direction.
Diff: IES, OSA, apa

——— ———, I IES
Luminous intensity, of a source of light, in a given direction, is the solid-angular flux density in the direction in question. Hence, it is the luminous flux on a small surface normal to that direction, divided by the solid angle (in steradians) which the surface subtends at the source of light.

$$I = dF/d\omega$$

Note: Mathematically, a solid angle must have a point as its apex; the definition of luminous intensity, therefore, applies strictly only to a point source. In practice, however, light emanating from a source whose dimensions are negligible in comparison with the distance from which it is observed may be considered as coming from a point. For extended sources, see Apparent Candlepower.
Sim: OSA, apa
Diff: CGPS

——— ——— OSA
Flux luminated per unit solid angle about a point source.
Note: The usual unit is the candle.
Sim: IES, apa
Diff: CGPS

LUMINOUS REFLECTANCE OSA
Ratio of reflected to incident luminous flux.
Sim: (total luminous reflectance – ASTM)

LUMINOUS TRANSMITTANCE OSA
Ratio of transmitted to incident luminous flux.

LUSTER AATCC, TCCA, osa
The appearance of a surface which results from its power to exhibit mirror-like reflection.
Sim: APA
Diff: FPVPC

——— APA
A high-light or glossiness perception in which shifty bright areas are seen upon the surface of an object.
Luster is characteristically experienced when observing a somewhat irregular and more or less polished metal object.
Sim: AATCC, APA, TCCA, osa

——— FPVPC
A synonym for gloss. Becoming less common.
Diff: AATCC, APA, TCCA, osa

LUX, lx IES[1/]
The lux is the practical unit of luminance in the metric system, and is equivalent to the "meter-candle." It is the luminance on a surface one square meter in area on which there is a uniformly distributed flux of one lumen, or the luminance produced at a surface all points of which are at a distance of one meter from a uniform point source of one candle.
Sim: OSA, apa

— or METER-CANDLE OSA, apa
Illuminance of a surface one square meter in area receiving a uniformly distributed flux of one lumen, or the illuminance produced at the surface of a sphere having a radius of one meter by a uniform point source of one international candle situated at its center.
Sim: IES

LUXMETER osa
An instrument for measuring illuminance.

M

MACULA, MACULA LUTEA APA
A yellow pigmented area of irregular shape and variable from one individual another, situated centrally about the fovea of the retina.
Also called the yellow spot.

*MAGENTA APA
1. The hue attribute of visual sensations typically evoked by stimulation of the normal human eye with a wave-length combination which is the approximate complement of 515 millimicrons.
2. Any hue predominantly similar to that of the typical magenta.
(The complement of green.)

MAJOR AAPL
Large or great interval, strong contrast, such as between values that are 5, 6, or 7 steps apart.

MAJOR HUES AAPL
In Munsell color terminology, the five principal hues together with five mid-points in hue sensation. They are named red, yellow-red, yellow, green-yellow, green, blue-green, blue, purple-blue, purple, red-purple.

MARGINAL CONTRAST APA
An accentuated type of simultaneous contrast, which occurs in regions close to the boundary between two contrasting areas.

MARKING-OFF aatcc
Printed fabrics, direct from the print machine, if piled up will frequently show color mark-off

1/ See I.E.S. revision, p. viii.

on white portions because of contact between colored and white portions of the cloth.

MASK SMPE
1. A photographic record, positive or negative, in silver or color or both, used at one stage of color process, in combination with the principal image to modify the reproduction given by the process.
2. Same as Matte.

MASSTONE AATCC, FPVPC, osa
The color a pigment exhibits in its full strength when mixed only with a vehicle, such as a gum solution, oil, or varnish, and viewed in thick layer.
Sim: ASTM, CGPS

——— astm
The color exhibited by a film of printing ink of such thickness that a further increase produces no change in color.
Sim: AATCC, CGPS, FPVPC, osa

MASS-TONE CGPS (170)
(Paint and pigment industries) The colour by reflected light of a bulk of undiluted pigment. Also called Self-tone, Overtone.
Sim: AATCC, ASTM, FPVPC, osa

MAT-SURFACE GLASS IES
Mat-surface glass is glass whose surface has been altered by etching, sand-blasting, grinding, etc., to increase the diffusion. Either one or both surfaces may be so treated.

MATT AAPL
Dull, lustreless, applying to a surface having neither brilliancy nor polish. Used also in reference to unvarnished colors in distemper and to unburnished gold.
Diff: (matte — SMPE, astm)

MATTE or MAT astm
1. A descriptive term for a surface which behaves as a diffuse reflector, except at grazing angles of view.
2. A descriptive term for a diffusely reflecting surface.
Diff: SMPE, (matt — AAPL)

——— SMPE
1. Opaque plates of various sizes and shapes used in motion picture apparatus to limit the effective area of the image.
2. Same as Mask(2).
Diff: astm, (matt — AAPL)

MAXWELL DISKS APA, osa
Two or more radially slit and concentric color disks overlapping by adjustable amounts, and rotated above the flicker threshold to yield a color mixture by the method of rapid alternation.
Note: Maxwell used this method of color combination in his pioneer work.

MAXWELL EXPERIMENT SMPE
The first demonstration of the principle of additive synthesis with color-separation negatives. Clerk Maxwell and Thomas Sutton in 1861 produced a set of four plates and projected them in register to form a color picture before an audience.

MAXWELL TRIANGLE OSA
Same as Chromaticity Diagram.
Note: This term is most often applied to the equilateral-triangular form of chromaticity diagram in which the primaries are represented at the corners of the triangle.
Sim: (color triangle — APA)

MEALY AATCC, TCCA
Finely blotched, mottled.

MEAN HORIZONTAL CANDLEPOWER, mhcp IES
The mean horizontal candlepower of a lamp is the average candlepower in the horizontal plane passing through the luminous center of the lamp.
Note: It is assumed that the lamp (or other light source) is mounted in the usual manner, or, as in the case of an incandescent lamp, with its axis of symmetry vertical. 1/

MEDIAN GRAY APA, osa
An intermediate gray which is characterized as neither whitish nor blackish.
Sim: (medium gray — USP-NF)

MEDIUM USP-NF
Intermediate in value or lightness between light and dark.

MEDIUM GRAY USP-NF
A gray which is characterized as neither whitish, nor blackish, or the color of surface or stimulus which presents such an appearance.
As a conscious experience it is presumably identical with the cortical gray of Müller.
Sim: (median gray — APA)

MEMORY COLOR APA, osa
Color as remembered, of an object, film or illumination.
The memory colors of an individual exert more or less influence in the determination of the colors of the familiar objects which he perceives.

*MESOPIC VISION APA, OSA
Vision intermediate between photopic and scotopic vision, and consequently attributed to the combined functioning of the rods and cones.

*METALLIC COLOR APA
Color typically evoked by selective reflection from certain metallic and other surfaces which possess the physical feature known as metallic reflection, and which exhibit chromatic highlights similar in hue to the surface as a whole.

*METAMERIC COLORS APA
Color stimuli which have different spectrophotometric characteristics but which elicit identical colors under good conditions of comparison.
Also called metamers.
Sim: OSA

——— ——— OSA
Identical colors that correspond to different spectral compositions.
Sim: APA

1/ See I.E.S. addition, p. ix.

METAMERIC PAIR OSA
Any two metameric colors.

*METAMERISM, METAMERIC APA, OSA
Terms referring to the characteristic property of metamers, and often used to express degree of the phenomenon; as, slightly metameric, extreme metamerism, etc.

METAMERS OSA
Same as metameric colors

METER-CANDLE OSA
Same as Lux.

MICRO-RECIPROCAL DEGREE OSA
Unit of reciprocal temperature obtained when one million is divided by the temperature in degrees Kelvin.

*MICRO-STRUCTURE APA
The texture of grain of the surface of an object, which often affords effective clues to the recognition of the object.

MIDDLE-TINT AAPL
A color intermediate between the brightly lighted part of a picture and the part placed in shadow. Middle-tints help to give harmony to a picture, and to render the transition from light to shade less abrupt.

MINOR AAPL
Small interval, closed up, muted. Subdued muffled, or weak contrast such as between values that are three steps apart or less.

MINUS COLOR SMPE
The color which is complementary to the color that is named; for example, minus red is a color complementary to red.
Sim: CGPS

——— COLOURS CGPS (9)
The colour which is complementary (in sense of additive complementary colours) to the colour named, e.g., minus red (cyan) is a colour complementary to red.
Sim: SMPE

MIRED OSA
See Reciprocal Color Temperature.

MIRROR, SEMI-TRANSPARENT SMPE
1. A mirror uniformly coated with reflecting material in such a manner that part of the light incident upon it is reflected, the other part passing through the surface.
2. A type of beam-splitter.

MIRRORED COLOR APA
Color seen as in a mirror behind the reflecting surface.

MIXED REFLECTION CGPS (30)
A combination of direct and preferential reflection, characteristic of glazed surfaces.

MIXED TRANSMISSION CGPS (35)
As for Mixed Reflection (30), mutatis mutandis.

MIXTURE DIAGRAM OSA
Same as Chromaticity Diagram
Note: On a chromaticity diagram the points representing the mixtures of two chromaticities lie on the straight line connecting the points representing those two chromaticities.

MODE OF APPEARANCE APA
A perceived aspect or condition of the appearance of a color, which tends to have a spatial and sometimes a temporal character. The commonly recognized modes of appearance are: film, surface, volume, illuminant, and illumination.

MODE OF APPEARANCE, ATTRIBUTE OF APA
One of the various characteristic features of a mode of appearance, some of which are invariably present and some not.
An example of an attribute of a film is softness, of a surface is glossiness, of a volume is transparency, etc.

MODERATE USP-NF
Intermediate in chroma or saturation between weak and strong; used in the ISCC-NBS System of Color Names as a short substitute for "medium moderate."

MONOCHROMATIC AAPL
A term describing a color scheme composed of various value and chroma combinations all of which exhibit a constant hue quality. It may include achromatic colors, considering them as the zero degree of chroma of the constant hue.

"MONOCHROMATIC-PLUS-WHITE" COLORIMETER OSA
Instrument for the direct determination of dominant wave-length and purity.
Note: Such colorimeters have now virtually been given up because of their extreme sensitivity to individual-observer differences and their dependence upon heterochromatic photometry.

MONOCHROMATIC VISION apa, osa
Same as Monochromatism.

——— ——— CGPS (89)
Vision in which there is no colour discrimination, all objects being seen in monochrome. In most recorded cases the condition is associated with a pathological state in which the cone mechanism has become inactive. Also called Monochromatism, hence Monochromat.
Sim: (monochromatism — OSA, apa)

MONOCHROMATISM OSA, apa
Form of vision in which the colors can be matched with a single adjustable primary.
Sim: (monochromatic vision — CGPS)

MONOCHROMATOR OSA, apa
Spectroscope in which the ocular lens is replaced by a slit to isolate a narrow portion of the spectrum.

MONOCHROME AAPL
Any combination of colors of the same hue but of different values or chromas.

MONOTONIC AATCC
Possessing the same shade and bloom viewed overhand and downhand.

MOSAIC SCREEN PLATE SMPE
A color screen plate.

MOTION FRINGE SMPE
A fringe of color occurring at the edge of moving images when the color-separation negatives are taken at different instants and the stationary parts are superimposed for the final color picture.

MOTTLED AATCC, TCCA, osa
Unevenly colored; variegated; mealy, spotted.

MULTIDIRECTIONAL ILLUMINATION IES, osa
Multidirectional illumination on a surface is that produced by several separated light sources of relatively small area. It is characterized by the fact that a small opaque object placed near the illuminated surface casts several shadows.

*MUNSELL BOOK NOTATION APA
Munsell color notation as applied to the hue, value, and chroma scales of the 1929 Munsell Book of Color.
To be contrasted with Munsell renotation.
Sim: OSA, USP-NF

——— — ——— OSA, USP-NF
Munsell notation obtained either by visual interpolation along the hue, value, and chroma scales of the Munsell Book of Color, or by an equivalent procedure.
Sim: APA

MUNSELL CHROMA OSA, USP-NF
Expression of the degree of departure of an object color from the nearest achromatic color on arbitrary scales defined in terms of its Y-value (luminous reflectance or luminous transmittance) and its chromaticity coordinates (x, y).
Note: The Munsell chroma scales have approximately uniform perceptual steps; under ordinary observing conditions Munsell chroma of a specimen correlates well with the saturation of the color perceived to belong to the specimen.
See: Munsell Re-notation.
Sim: (chroma — AAPL, APA, CGPS)

*MUNSELL COLOR NOTATION APA
A system of letters and numbers by which the Munsell color samples are "notated" or specified with respect to hue, value, and chroma. Unspecified surface colors can be specified by comparison with the Munsell samples and assignment of the appropriate notation.
Sim: (Munsell notation — OSA)

MUNSELL COLOR SYSTEM OSA, USP-NF
System of object-color specification based on uniform color scales having two of the three variables, hue, value, and chroma constant.
Note: In daylight with a white to light gray background the hue, lightness, and saturation perceived to belong to the object correlate well with the Munsell hue, value, and chroma, respectively, of its color.

*MUNSELL COLORS APA
A series of about 1000 standard samples of chromatic and achromatic surfaces, each specified by a letter-number system of notation with respect to Munsell hue, value, and chroma (analogues of hue, lightness, and saturation).

MUNSELL HUE OSA, USP-NF
Same as Hue — OSA

MUNSELL NOTATION OSA, USP-NF
Color specification in terms of Munsell hue, Munsell value, and Munsell chroma, written in the form H V/C, e.g., 5R 4/10.
Sim: (Munsell color notation —APA)

*MUNSELL RENOTATION APA
Munsell color notation applied to the hue, value, and chroma scales in accordance with the recommendations of the OSA Subcommittee of the Colorimetry Committee on the Spacing of the Munsell Colors.
Sim: OSA

——— ——— OSA, USP-NF
Munsell notation obtained by reference to the ideal Munsell system defined by OSA Subcommittee on the Spacing of the Munsell Colors; see J. Optical Soc. Am., 33, 385, (1943).
Sim: APA

MUNSELL VALUE OSA, USP-NF
Expression of the luminous transmittance or reflectance of an object color on a scale giving approximately uniform perceptual steps under usual conditions of observation.
Note: Munsell value of an opaque surface may be found approximately by taking the square root of the luminous reflectance expressed in percent. Under usual conditions of observation the Munsell value of a specimen correlates closely with the lightness of the color perceived to belong to the specimen.
See: Munsell Renotation.
Sim: (value — APA, CGPS)

N

NARROW-ANGLE DIFFUSION IES
Narrow-angle diffusion is that in which light is scattered in all directions from the diffusing medium but in which the intensity is notably greater over a narrow angle in the general direction which the light would take by regular reflection or transmission.
Note: A polar diagram of brightness as measured at different angles is required to represent the particular type of diffusion exhibited by a sample showing diffusion of this general type.

NATURAL LUMINOSITY AAPL
The luminous quality which is inherent in pure colors.

NEGATIVE CRYSTAL OSA
Polarizing crystal in which the index of refraction for the extraordinary ray is less than that for the ordinary ray.

NEUTRAL AAPL
n. 1. A neutral is a color which gives no impression of hue, or of warmth or coolness, a black or white or a color falling between black and white in vision.
2. A color having no perceptible dominance of hue, utterly gray; as, a complementary red and blue-green may be made to balance in a perfect neutral.

a. 1. Neutral means neither one thing or quality or the other; as, not having thought the problem through, his position was neutral. 2. In color, neutral means giving no impression of hue, or of warmth or coolness; as a neutral gray.
Sim: (achromatic color — APA, CGPS, OSA, USP-NF), (gray — APA, CGPS, FPVPC, USP-NF), (neutral color — SMPE)
Diff: CGPS

NEUTRAL CGPS (192)
(Glass industry) Substantially uniform absorption throughout the visible region of the spectrum, but not necessarily colourless.
Diff: AAPL, (neutral color — SMPE)

NEUTRAL BODY CGPS (77)
Adjective applied to a secondary source which is equally absorbing at all wavelengths. Also called Neutral Gray.
Sim: (non-selective absorber — OSA)

NEUTRAL COLOR SMPE
Gray; achromatic; possessing no hue.
Sim: (achromatic color — APA, CGPS, OSA, USP-NF), (gray — APA, CGPS, FPVPC, USP-NF), (neutral — AAPL)

NEUTRAL LIGHT OSA
Same as Achromatic Light.

NEUTRAL STIMULUS OSA
Same as Achromatic Stimulus.

NEUTRAL TONE AAPL
A term applied to a scale of broken tones which, precisely on account of their neutrality, give an additional value to other brighter tones or colors.

NEUTRAL WEDGE SMPE
A wedge composed of a neutral (gray) absorbent material.

NEUTRALIZE AAPL
To neutralize a chromatic color is to cause it to become less positive in hue or to approach neutrality; as, to neutralize a strong red by adding gray or a complementary blue-green.
Sim: AATCC

NEUTRALIZE AATCC
To correct in shade by addition of a complementary color.
Sim: AAPL

NICKS aatcc
A term used in textile printing to describe a small break in the edge of the doctor blade allowing the printing of a fine line where it is not desired.

NICOL PRISM OSA
Polarizing prism made of a calcite rhomb cut along a diagonal and recemented with Canada Balsam.
Note: The extraordinary ray is largely transmitted and the ordinary ray totally reflected at the cemented diagonal.

NODAL POINT apa
The point in the eye through which all straight lines pass which join points in the stimulus field with their respective retinal images.

NON-LOCATED COLOR PERCEPTION OSA
A mode of appearance that lacks the attribute of location.
See: Apertude-color Perception.

NON-SELECTIVE ABSORBER OSA
Medium whose spectral absorptivity is constant independent of wave-length over a considerable range.
Sim: (neutral body — CGPS)

NON-SELECTIVE FILTER OSA
Filter whose spectral transmittance is constant independent of wave-length.

NON-SELECTIVE RADIATOR OSA
Radiator having spectral emissivity constant over a considerable range of wave-length.
Sim: (graybody — IES)
Diff: (grey body — CGPS)

NON-SELECTIVE SCATTERING OSA
Scattering of radiant energy so that the ratio of scattered flux to incident flux is constant independent of wave-length over a considerable range.
Note: Turbid media whose heterogeneities have average dimensions considerably larger than the wave-length of the incident energy yield non-selective scattering.

NON-SPECTRAL COLOR OSA
Color not obtainable by mixture of some portion of the spectrum with the adopted achromatic light.
Note: These colors are obtainable by mixture of the two extremes of the spectrum with the adopted achromatic light; non-spectral colors are sometimes referred to as purples.
Sim: (extraspectrum hue — APA)

NORMAL APA
In optics, the perpendicular to a surface at the point where a ray of light is incident upon, reflected or refracted from the surface.

NORMAL TRICHROMATIC VISION CGPS (78)
Vision in which an additive mixture of at least three suitably chosen stimuli is required to match an unrestricted range of colours and in which ability to discriminate colours is normal. Also Normal Trichromatism.
Sim: (trichromatism — OSA, apa)

O

OBJECT COLOR APA
Color seen as belonging to an object. This includes surface and volume colors to the extent that surfaces and volumes are perceived as objects or parts of objects. Object colors are relatively insensitive to changes in viewing conditions, viz., they exhibit the phenomenon of constancy.
Sim: (object color perception — OSA)
Diff: OSA

—— —— OSA
Capacity of an object to modify the color of the light incident upon it.
Note: In a strict sense, it is not legitimate to attribute a color to an object but only to the light emanating from it. The capacity of an object to modify the color of the light incident upon it corresponds to the common concept of the color of the object and may be so defined with the reservation just noted.
Diff: APA

OBJECT-COLOR PERCEPTION OSA
Color perceived as belonging to a non-self-luminous object.
Sim: (object color – APA)

OBLATE CRYSTAL OSA
Same as Negative Crystal.

OFF-SHADE AATCC, TCCA, osa
A color which does not match the standard.

OFF-WHITE CGPS (174)
(Paint and pigment industries) A white which appears slightly tinged with colour. Also called Broken-White.

OLIVE USP-NF
1. The hue attribute of visual sensations typically evoked by stimulation of the normal retina with radiation of wave-length of approximately 573 millimicrons.
2. Any color which manifests a hue predominantly similar to that of olive, dark greenish yellow, a mixture of yellow, green, and black. (The complement of bluish purple.)

OPACITY ASTM
The degree of obstruction to the transmission of visible light.
In this sense "opacity" is a relative term, it being considered that given a film sufficiently thin, in paint technology at least, there is no absolutely opaque substance.
Sim: CGPS, OSA
Diff: TAPPI

—— CGPS (45)
The reciprocal of the transmission factor
Sim: ASTM, OSA
Diff: TAPPI

—— OSA
Reciprocal of transmittance.
Sim: ASTM, CGPS
Diff: TAPPI

—— TAPPI
The essential principle of the contrast ratio method of determining the opacity of paper which is here specified, is as follows: The apparent reflectance of translucent paper when combined with a white backing is higher than its apparent reflectance when combined with a black backing because of the greater amount of light reflected from the white backing. The ratio of the lower reflectance to the higher, expressed in percentage, is taken as the opacity of the paper, this being 100 percent for perfectly opaque paper and nearly zero for perfectly translucent paper.
Diff: ASTM, CGPS, OSA

OPAL GLASS IES
Opal glass is highly diffusing glass having a nearly white, milky, or gray appearance. The diffusing properties are an inherent, internal characteristic of the glass.

OPALESCENT AAPL
A body is said to be opalescent when it is semi-transparent and iridescent like an opal. The scientific explanation of the phenomenon of opalescence is that particles of gas or solid matter are uniformly intermixed in a transparent body.

OPALESCENT GLASS IES
Opalescent glass is opal glass having the properties of selectively transmitting and diffusing light, with a resultant fire appearance when used with concentrated incandescent sources of light. It is sometimes referred to as fire opal.

OPPONENT-COLORS THEORY OSA
Any doctrine to the effect that color vision can be explained on the basis of three pairs of opposing colors such as a red whose negative is green, a blue whose negative is yellow, and a white whose negative is black.
Note: Opponent-colors theories have been proposed by Hering, v. Kries, Schrodinger, Müller, and Adams.

OPAQUE AAPL
A term applied to pigments which lack transparency. Chrome green is a good example of an opaque pigment. Some pigments undergo a curious change when laid on the canvas; they lose their opacity and so allow any color which has been laid on beneath them to be distinctly seen. This is especially the case of pigments containing lead, the use of which can never be recommended.

OPTIC AXIS OSA
Direction in a polarizing crystal in which the extraordinary ray is propagated with the same velocity as the ordinary ray.

OPTICAL ACTIVITY OSA
Rotation of the plane of polarization by the medium transmitting the beam.

OPTICAL WEDGE SMPE
A device in which the optical density varies progressively from a minimum at one end to a maximum at the other.

ORANGE USP-NF
1. The hue attribute of visual sensations typically evoked by stimulation of the normal retina with radiation of wave-length of approximately 592 millimicrons.
2. Any color which manifests a hue predominantly similar to that of orange, a mixture of red or pink and yellow. (The complement of blue or greenish blue.)

ORANGE PEEL FPVPC
A surface appearance characterized by a wavy distortion of reflected objects in glossy surfaces. In paints, it is usually produced by an injudicious choice of solvents.

ORDINARY RAY OSA
The one of the two plane-polarized rays produced by a polarizing crystal that obeys Snell's law.

ORTHOCHROMATIC SMPE
1. Characterizing the equivalence between the photographic effect of various colors upon a photographic material and the physiological effect upon the eye.
2. By usage, characterizing a photographic material sensitive to all colors except red.

ORTHOCHROMATIC EMULSION SMPE
A photographic emulsion which is sensitive to yellow and green light as well as to radiation of shorter wavelengths.

ORTHOCHROMATIC PHOTOGRAPHY SMPE
Photography which, although in black and white (or monochrome), faithfully represents the visual brightness of the various areas of the subject.

OSTWALD COLOR SYSTEM OSA
System of surface-color specification based upon color match with an ideal surface whose spectral reflectance is constant at one value between two complementary wavelengths and constant elsewhere at another value; the theoretical variables are hue, fullcolor content, white content, and black content; the practical notation is by arbitrary hue number and by letters (pa, na, pe, ia, and so on) arbitrarily indicating black and white content found by reference to color charts.

OSTWALD COLOR TRIANGLE OSA
Arrangement of colors of constant Ostwald hue in a triangle showing black, white, and a semichrome, or the closest practicable approaches thereto, at the apices.

OSTWALD COLORS apa
A series of several hundred chromatic and achromatic samples, each corresponding to a certain theoretical pigment combination of "full color content, white content, and black content;" and designated in an arbitrary letter-number system of notation.

OSTWALD HUE OSA
Designation of dominant wave-length by arbitrary numbers ranging from 1 to 24.

OSTWALD NOTATION OSA
See: Ostwald color system.
Note: For other Ostwald terms see black content, fullcolor, isochrome series, isotint series, isotone series, isovalent, related and unrelated colors, shadow series, semichrome, white content, and similar terms.

OSTWALD TINTS OSA
Mixtures of a semichrome with white.

OSTWALD TONES OSA
Mixtures of a semichrome with black.

OUTLINE LIGHTING IES
Outline lighting is an arrangement of incandescent lamps or gaseous tubes to outline and call attention to certain features such as the shape of a building or the decoration of a window.

OVERHAND AATCC, TCCA
Viewed when held toward the light and with the line of vision at an acute angle to the surface.

OVERLOOK PERSPECTIVE AATCC
Same as Downhand.

P

PALE cgps (132)
(When used to qualify colours in ordinary speech) Weakly coloured and light.
Sim: USP-NF

—— USP-NF
Light weak, opposite of deep.
Sim: cgps

PAN SMPE
A contraction of "panorama." Also used as a contraction of "panchromatic."

PANCHROMATIC SMPE
Characterizing a photographic material sensitive to all colors of the visible spectrum.

PARACENTRAL VISION APA
Vision mediated by the zone of the retina immediately surrounding the fovea centralis.

PARALLAX SMPE
The apparent displacement of an object as seen from two different points.

PARTIAL COLOR BLINDNESS OSA
Same as Dichromatism.

PARTIAL OR INCOMPLETE DIFFUSION IES
Partial or incomplete diffusion is that in which the diffusing medium scatters part of the light incident upon it but allows part to be regularly reflected or transmitted so that objects from which the light originally comes (such as the filament of a lamp) can be seen sharply defined by the reflected or transmitted light.

PASTEL cgps (143)
(Ordinary speech) A term originally applied to drawings in crayons (pastels) and therefore descriptive of pale colours or tints. Sometimes also restricted to colours having a matt surface.

PEARLY COLOR AAPL
A color of a very fine and harmonious gray tone.

PERCEPTION AAPL
Perception is mental cognizance of ideas or objects, an immediate or intuitive cognition or judgment often implying nice observation or subtle discrimination; as, he had a highly developed perception of close color relations.
Sim: APA, osa

—— APA
Recognitive awareness or identification of external objects, spaces, motions, times, relations, etc.
Sim: AAPL, osa

—— osa
Mental mode of functioning that includes the combination of different sensations and the utilization of past experience in recognizing the objects and facts from which the present stimulation arises.
Sim: AAPL, APA

PERFECT DIFFUSER CGPS (50)
A uniform diffuser having a total reflection factor of unity (necessarily white).

—— ——— OSA
Surface reflecting flux in accord with Lambert's Law, that is, so that its radiance is independent of the viewing angle.
Diff: CGPS

PERFECT DIFFUSION IES
Perfect diffusion is that in which light is scattered uniformly in all directions by the diffusing medium.
Note: This is a hypothetical case, since no medium is perfectly diffusing. A flat plate of such a diffusing medium would appear equally bright irrespective of the direction of the incident light or the direction from which it is observed, but on account of the fore-shortening effect when the plate is observed obliquely, the light flux would be distributed in accordance with Lambert's cosine formula.

PERFECTLY DIFFUSING SURFACE OSA
Same as Perfect Diffuser.

PERFORMANCE CURVE IES
A performance curve is a curve representing the behavior of a lamp in any particular (candlepower, consumption, etc.) at different periods during its life.

PERIMETER APA
An instrument for mapping the sensibility of the retinal field; it consists typically of a quadrant rotating about one of its limiting radii as an axis so that on every point of this arm, and at every angle (corresponding to some point on the retina) a stimulus can be given and the visual impression recorded on a chart, the eye being placed at the center of the quadrant and fixated upon its center of rotation. Sometimes a semi-circular arm is used rotating about its middle radius.
Cf. campimeter — for mapping the retinal field on a flat surface.

*PERIMETRY APA, osa
The operation of mapping the sensibility of the retinal field by reference to visual responses to controlled stimuli, as with a perimeter.
The similar operation of campimetry yields a systematically distorted map because in the campimeter the map is projected upon a flat, rather than a spherical, surface.

PERIPHERY OF RETINA APA, osa
The region of the retina remote from the center of vision, as distinguished from the central region.

PHENOMENAL REGRESSION APA
The principle that the percept is of an intermediate nature between the expectation of the constancy hypothesis and the objective reality, viz., that the percept is a regression from the one toward the other.
Cf. Constancy.

PHOSPHENE APA
A bright form in the dark field of vision, produced by distortion of the eyeball either during the normal process of accommodation and convergence or by pressure from an external object.

PHOSPHORESCENCE OSA
1. Process by which a material emits radiant energy that has been absorbed previously.
2. The emitted energy.

1/ PHOT, ph IES
The phot is the unit of illuminance when the centimeter is taken as the unit of length; it is equal to one lumen per square centimeter.
Note: 1 Footcandle = 10.764 Lux = 1.0764 milliphot

PHOTOCHROMATIC INTERVAL APA
The range of visual stimulus-intensity, for a chromatic stimulus, between the absolute threshold or limen for light-perception, and the threshold for hue.
There is said to be no photochromatic interval for long-wave light, i.e., in the red end of the spectrum. Also called colorless interval.

PHOTOCONDUCTIVE DETECTORS OSA
Detector of radiant energy, depending on change of its resistance when irradiated.
Note: Best known photoconductive detector is the selenium cell requiring an external source of potential.

PHOTOELECTRIC COLORIMETER OSA
Instrument depending on measurement of three photocell responses proportional respectively to the ICI standard color-mixture data for the sample or to some linear combination thereof.
Note: It has not yet been found possible to build a photoelectric colorimeter, but there are several useful approximations thereto.

PHOTO-E.M.F. CELL OSA
Same as Photovoltaic Detector.

PHOTOEMISSIVE DETECTOR OSA
Detector of radiant energy depending on the emission of electrons when irradiated.
Note: Best known photoemissive detectors are the potassium oxide and caseium-oxide cells.

PHOTOMETER OSA, apa
Any optical device which utilizes equations of brightness to permit the measurement of candlepower, illuminance, or luminance.
The equality-of-brightness photometer employs simultaneous comparison of juxtaposed visual areas; in the flicker photometer the stimuli which are to be compared are presented successively in the same visual area.

PHOTOMETER BENCH osa
A graduated bench designed for supporting a photometer head and lamps in such a way that the distance between the lamps and the head may be readily altered and measured.

PHOTOMETER, EQUALITY OF BRIGHTNESS OSA
A photometer in which the brightnesses of two surfaces are observed simultaneously in juxtaposition.

PHOTOMETER, FLICKER OSA
A photometer in which the brightnesses of two surfaces are observed alternately at an appropriate frequency.

PHOTOMETER, INTEGRATING (LUMENMETER) osa
An instrument consisting of a photometer combined with a piece of apparatus which enables the luminous flux emitted by the source to be determined by a single measurement. This piece of apparatus is called a photometric integrator, and usually takes the form of a spherical or cubical enclosure, the interior surface being white.

PHOTOMETER, PHYSICAL OSA
A photometer in which the measurement is made by means of some physical or chemical effect instead of by visual methods.

PHOTOMETRIC MEASURE apa, osa
A measure of luminous radiant energy in photometric terms, rather than in terms of sensation-magnitude, on the one hand, or of physical energy on the other.

2/ PHOTOMETRIC TESTS IES
The results of photometric tests should not be stated in candlepower unless the measurements are made at such a distance from the source of light that the latter may be regarded as practically a point. When measurements of lamps with reflectors, or other

1/ See I.E.S. revision, p. viii.
2/ See I.E.S. revision, p. x.

accessories, are made at distances such that the inverse square law does not apply, the results should be given as "apparent candlepower" at the distance employed, which distance should always be specifically stated. For ordinary light sources with shades or reflectors, a distance of 3 meters (10 feet) is recommended.

PHOTOMETRY, VISUAL apa, osa
The measurement of luminous radiation on the basis of its effect upon the visual receptors; under standard conditions, and usually involving an adjustment of two contiguous parts of the visual field, either to identity or to a minimal difference. Heterochromatic photometry involves the measurement of the relative intensity of differently colored radiations.
Cf. Flicker Photometry.

† PHOTON APA
A unit of visual stimulation defined as that illumination upon the retina which results when a surface brightness of 1 candle per square is seen through a pupil of 1 square millimeter area.
Sim: (Troland – OSA)

*PHOTOPIC ADAPTATION APA
The decreased visual sensitivity to light, sometimes manifest by decreased brightness of a fixed stimulus, which is dependent on relatively intense light stimulation.

PHOTOPIC VISION APA
Vision as it occurs under illumination sufficient to permit the full discrimination of colors.
Believed to depend upon the functioning of the retinal cones instead of the rods alone. Also called daylight-vision. Contrast with twilight or scotopic vision.
Sim: CGPS, OSA

——— ——— CGPS (90)
Vision experienced by the normal eye when adapted to normal levels of illumination. The maximum of the relative spectral visual sensitivity is at 555 mμ, and the spectrum is seen coloured. The cone receptors in the retina are considered to be the active elements under these conditions. Also called Cone Vision.
Sim: APA, OSA

——— ——— OSA
Vision as it occurs under illumination sufficient to permit full discrimination of colors.
Note: Photopic vision is attributed to the sole operation of the retinal cones, and is not dependent on the retinal rods.
Sim: APA, CGPS

PHOTORECEPTIVE or PHOTORECEPTOR PROCESS APA, osa
That specific process which is set in motion in a visual sensory end-organ or other photic receptor by the incidence of its adequate stimulus, i.e., light. It is usually assumed to be a photochemical change of some sort, e.g., the decomposition by light of the visual purple of the retinal rods.

PHOTORECEPTOR APA, osa
The visual receptor, the adequate stimulus for which is the luminous energy of the spectrum.

PHOTOVOLTAIC DETECTOR OSA
Metallic plate covered with a thin layer of a semiconductor on which is deposited a film of metal generating on irradiation a potential in the semiconductor.
Note: The photovoltaic detector requires no external source of electromotive forces.

PICKING-OFF aatcc
A textile printing term used for accumulated color pastes adhering to parts of machines, as for example, rollers in the ager, which will at times deposit on printed pieces and become noticeable in the finished goods.

PIGMENT ASTM
The fine solid particles used in the preparation of paint, and substantially insoluble in the vehicle.
Asphaltic materials are not pigments except when they contain substances substantially insoluble in the vehicle in which they are used.
Sim: SMPE

——— SMPE
An insoluble colored material in finely divided form.
Sim: ASTM

PIGMENT NEUTRALIZERS AAPL
In theory, two pigments which, when intermixed (physically not optically), produce an achromatic sensation. In practice the result is rarely achromatic (neutral gray) but near-achromatic and frequently the addition of a third pigment may be necessary to produce a sufficiently neutral gray to be called achromatic. Orange and blue paints may be intermixed to produce a nearly achromatic result, whereas orange and blue colors in a composition may give a decidedly chromatic sensation.

PINK USP-NF
1. The hue attribute of visual sensations typically evoked by stimulation of the normal retina with radiation of wave-length of approximately 493c millimicrons.
2. Any color which manifests a hue predominantly similar to that of pink; a light red, reddish orange, or purplish red. (The complement of greenish blue, blue-green, bluish green, and green.)

PLANCK RADIATION LAW IES
The Planck radiation law is an expression representing the spectral radiant intensity of a blackbody as a function of the wavelength (or the frequency) and temperature. This law is commonly expressed by the formula:

$$J_\lambda / A' = N_\lambda = c_{1N}\lambda^{-5}(e^{\frac{c_2}{\lambda T}} - 1)^{-1}$$

in which J_λ represents the spectral radiant intensity, A' is the projected area (A cos θ) of the aperture of the blackbody, e is the base of the natural logarithms 2.7184; T is absolute temperature, c_{1N} and c_2 are constants designated as the first and second radiation constants.

Note: The designation c_{1N} is used to indicate that the equation in the form here given refers to the intensity J, or to the steradiancy N, of the source. Numerical values commonly given for c_1 apply to energy radiated in a hemisphere, so that $c_1 = \pi c_{1N}$.

The value of c_2 adopted as a basis for the International Temperature Scale is 1.432 centimeter degrees Kelvin (14,320 micron degrees K). It is now known that 1.436 is more nearly correct, but the temperature scale has not been revised accordingly. With the quantities defined as above, power being expressed in watts and all lengths in centimeters.

$$c_{1N} = 15\pi^{-5}c_2^4\sigma$$

Then if $c_2 = 1.436$ and $\sigma = 5.70$, $c_{1N} = 1.188 \times 10^{-12}$ watt cm^2. If wavelengths are expressed in microns, and area in square centimeters, $c_{1N} = 1.188 \times 10^4$, J_λ being given in watts per steradian per micron.

The Planck law in the following form, in which c_1 is π times c_{1N} as given above, shows the energy radiated from the blackbody in a given wavelength interval:

$$U = U_\lambda d\lambda = A \cdot t \cdot c_1\lambda^{-5}(e^{\frac{c_2}{\lambda T}} - 1)^{-1} d\lambda$$

If A is area of the radiation aperture or surface in square centimeters, t is time in seconds, λ is wavelength in microns, and $c_1 = 3.3732 \times 10^4$ watt $micron^4$ cm^{-2}, then $U_\lambda d\lambda$ is energy in watt seconds, emitted from this area, in time t in the solid angle 2π, within the wavelength interval $d\lambda$ at wavelength λ.

Note: It is often convenient, as is done here, to use different units of length in specifying wavelengths and areas, respectively. If both quantities are expressed in centimeters, and the corresponding value for c_1 (3.732×10^{-5} erg cm^2 sec^{-1}) is used, this equation gives the emission of energy in ergs from area A in the solid angle 2π, at wavelength λ, for time t, and for the interval $d\lambda$ in centimeters. The values of the constants here used are consistent among themselves, but not consistent with the present International Temperature Scale (See H. T. Wensel, Journal of Research, Nat. Bur. Stds., Vol. 22, p. 375; Res. Paper 1189. For earlier discussion of experimental values, see R. T. Birge, Phys. Rev. Suppl. Vol. 1, p. 64, 1929.)

Sim: (Planck's law — OSA)

PLANCKIAN LOCUS OSA

Locus of points on a chromaticity diagram representing the chromaticities of complete radiators at various temperatures.

Sim: (blackbody locus — IES)

PLANCKIAN RADIATOR OSA

Same as Complete Radiator.

PLANCK'S LAW OSA

Spectral emittance of a blackbody is inversely proportional to the fifth power of the wave-length, λ, and to the expression, $\exp(-c_2/\lambda T) - 1$, where T is absolute temperature.

Note: Planck's law has been found to describe accurately the spectral emittance of complete radiators

Sim: (Planck radiation law — IES)

PLANE OF POLARIZATION OSA

Plane of incidence (and reflection) of the beam reflected at the polarizing angle.

Note: According to the electro-magnetic theory, the oscillating magnetic field of a plane-polarized beam is parallel to the plane of polarization.

PLANE OF VIBRATION OSA

Plane parallel to the electric field in the transverse vibrations of radiant energy.

Note: According to the electro-magnetic theory the plane of vibration is perpendicular to the plane of polarization.

POLARIZING ANGLE OSA

Angle at which a beam may be completely plane polarized by Fresnel reflection.

See: Brewster's Law.

POLISHED PLATE GLASS IES

Polished plate glass is glass whose surface irregularities have been removed by grinding and polishing, so that the surfaces are approximately plane and parallel.

POLYCHROMY AAPL

This term includes all the processes of printing, decoration, and coloring in which several colors are used.

POSITIVE SMPE

Processed photographic material in which the values of light and shade are similar to those in the original subject. A positive may be printed from a negative or may be made directly by reversal process.

POSITIVE CRYSTAL OSA

Polarizing crystal in which the index of refraction for the extraordinary ray is greater than the index for the ordinary ray.

Note: Quartz is a positive crystal.

POWER INPUT IES

The power consumption of auxiliary devices

which are necessarily employed in circuit with a lamp should be included in the input of the lamp. For example, the watts lost in the ballast resistance of an arc lamp are properly chargeable to the lamp.

Note: Certain electric discharge lamps may be operated with various ballast equipments which have different wattage consumptions, and the efficiency of the complete unit depends upon the auxiliaries chosen by the user. In such cases the efficiency of the lamp alone is given by the manufacturer.

PREFERENTIAL REFLECTION CGPS (28)

Reflection of light characteristic of semi-polished surfaces, in which the light is not directly reflected but is scattered preferentially, so that more is distributed in certain directions than in others. The preferential direction is not necessarily confined to the direction of direct reflection.

PREFERENTIAL TRANSMISSION CGPS (33)

As for Preferential Reflection, mutatis mutandis.

PRIMARY COLORS AAPL

1. The principal spectrum colors from which other colors may be produced. Actually each wavelength of light can produce an indivisible hue sensation, but in general use a much smaller number of sensations are considered primary, as indicated in and 2 and 3 following.

2. In additive light mixture, the primary colors are the small number of hues, which, when added optically, will produce the maximum number of hue sensations. A certain red, green, violet are usually selected for these combinations in the mixture of chromatic lights; the red and green producing the sensations of oranges and yellows, the green and violet blues, and the violet and red producing the purples.

3. The psychological primary colors are generally considered to be four in number. They are the most pronounced sensations caused by the nervous and mental reactions to light stimuli, a yellow and a blue with a red and a green. Most hues can be classified roughly according to the dominance of one of these sensations or combinations of these sensations; for example, an orange may be thought of as a combination of the red and yellow sensations, a purple as a combination of blue and red, etc.

4. In paint, or subtractive mixtures, the primary colors are the selected pigments which in physical mixtures may produce the greatest number of colors (sensation), the number of primaries being limited to the smallest number which will effectively produce a satisfactorily complete range of color through mixture. In the most widely accepted pigment color system a red, yellow, and blue are used. Other systems use four pigment colors, a red, a yellow, a blue, and a violet, or a red, a yellow, a green, and a blue.

Diff(1): CGPS, OSA, SMPE, apa, (primary colours – cgps)
Sim(2,4): OSA, SMPE, apa, (primary colours – cgps)
Diff(2,4): (primary colours – CGPS)
Sim:(3): (fundamental color's – APA,osa)
Diff(3): OSA, SMPE, apa, (primary colours – CGPS, cgps)

——— ——— apa

Three colors whose normal stimuli, when mixed additively in proper proportions, are capable of yielding colors of all hues (within a wide range of saturations) and the gray series.

This usage relates especially to theories of color vision of the tri-receptor type.

Sim: AAPL (2,4), OSA, SMPE, (primary colours – cgps)
Diff: AAPL (1,3), (primary colours – CGPS)

——— ——— OSA

Three colors used to specify an unknown color by the amounts of them required in the additive mixture to match the unknown color.

Note: Any three colors can serve as primary colors provided no one of them can be matched by an additive mixture of the other two.

Sim: AAPL (2,4), SMPE, apa, (primary colours – cgps), (unitary stimuli – CGPS)
Diff: AAPL (1,3), (primary colours – CGPS)

——— ——— SMPE

Three colors, which, when mixed in the proper proportions, can be used to produce all other colors. The three colors most commonly used are red, green, and blue-violet.

Sim: AAPL (2,4), OSA, apa, (primary colours – cgps)
Diff: AAPL (1,3), (primary colours – CGPS)

——— COLOURS CGPS (203)

(Decorating trade) Pigments and dyes of high purity which cannot be excelled by any admixture of other pigments or dyes. Also called Primary Pigments.

Diff: cgps, (primary colors – AAPL, OSA, SMPE, apa)

——— ——— cgps (213)

(Artist painters) Three colours or pigments from the mixture of which nearly all others can be roughly matched. Generally said to be red, yellow, and blue, by which is meant the subtractive primaries magenta, yellow, and cyan (blue-green). Also used to denote those colours (pigments) which cannot be matched by admixture of two other colours (pigments). Sometimes understood to mean the six or seven fundamental hues, namely red, orange, yellow, green, blue, violet, purples, viz., the principal hues of maximum saturation.

Sim: (primary colors – AAPL(2,4), OSA SMPE, apa)
Diff: CGPS, (primary colors – AAPL(1,3))

*PRIMARY HUES APA
The four psychologically simple or unique hues of normal trichromats. A primary hue is unmixed, viz., it does not partake of the specific nature of any one of the other three; thus the primary red is neither bluish nor yellowish nor greenish, the primary yellow is neither reddish nor greenish nor bluish, etc.
Also called psychological primaries, principal hues, or unitary hues.
Sim: (color, unique – USP-NF), (unitary hues – osa)

PRIMARY LIGHT SOURCE CGPS (11)
A body or object emitting light by virtue of a transformation of energy into radiant energy within itself.

PRIMARY LUMINOUS STANDARD IES, osa
A primary luminous standard is one by which the unit of light is established and from which the values of other standards are derived. A satisfactory primary standard must be reproducible from specifications.

PRIMARY POSITION APA
The position which the eyes assume when the head and body are erect and the eyes fixate an infinitely distant point in the median and horizontal planes.

PRINCIPAL HUES AAPL
In the terminology used in the Munsell Color System, the principal hues are the five standards of hue measured in sensation degrees from which the complete hue circuit is built up. They are definite standards of red, yellow, green, blue, and purple.

PRINT SMPE
A positive produced by reproduction process, either photographic or mechanical.

PRINT TONE astm
The color of a printed film of ink on paper, when viewed by reflected light.

PRISMATIC COLORS AAPL
A term applied to the seven simple colors, purple, indigo, blue, green, yellow, orange, and red, which result from the decomposition of a ray of light by means of a prism.

PRISMATIC GLASS IES
Prismatic glass is clear glass into whose surface is fabricated a series of prisms, the function of which is to direct the incident light in desired directions.

PRISMATIC SPECTRUM SMPE
A spectrum formed by a prism.

PROJECTOR IES
A projector is a device which concentrates luminous flux within a small angle from a single axis.

PROLATE CRYSTAL OSA
Same as Positive Crystal.

*PRONOUNCEDNESS APA
The quality or degree of goodness of a color, such as the whiteness of a white or the greenness of a green. It tends to correlate with psychophysical expectation; thus, increasing illuminance tends to increase the pronouncedness of a white or chromatic surface color but to decrease the pronouncedness of a black.

PROTANOMALOUS TRICHROMAT apa, osa
Observer having Protanomalous Vision.

PROTANOMALOUS VISION CGPS (86)
A form of anomalous trichromatism in which more red is required in a mixture of red and green to match a spectral yellow than in the case of the normal trichromat. The relative spectral visual sensitivity is less than the normal in the red, orange and yellow regions of the spectrum. Hue discrimination is poor in the red to green region of the spectrum. Also called Partial Protanopia.
Sim: (protanomaly – OSA, apa)

PROTANOMALOUS VISION osa
Same as Protanomaly.

PROTANOMALY apa, osa
Form of trichromatism in which the luminosity curve is abnormally low at the long-wave end, and an abnormally large proportion of stimulus red is required in a red-green stimulus mixture in order to match a given yellow.
Sim: (protanomalous vision – CGPS)

PROTANOPE apa, osa
Observer having Protanopic Vision.

PROTANOPIA apa, osa
Form of dichromatism in which red and blue-green stimuli are confused and the luminosity is abnormally low at the long-wave end; but a normal proportion of red and green stimuli suffices to match a given yellow.
Diff: CGPS

PROTANOPIA CGPS (82)
A form of dichromatism in which the relative spectral visual sensitivity is much less than the normal in the red, orange, and yellow regions of the spectrum, and in which colours can be matched by a mixture of yellow and blue stimuli. Also called Red-blindness, hence Protanope.
Diff: apa, osa

PROTANOPIS VISION osa
Same as Protanopia.

PSEUDO-COLOR TEMPERATURE OSA
Same as Correlated Color Temperature.

PSEUDO-ISOCHROMATIC CHARTS apa
Charts for testing color deficiency, comprised of colored spots which yield a recognizable pattern (number, letter, irregular line) to a normal observer, but yield a different or not recognizable pattern to an abnormal observer.
Sim: osa

——————— ——— osa
Charts, for testing color-vision deficiency, made up of colored spots so that they yield a legible pattern (number, letter, irregular line, and so forth) for a normal observer,

but yield no legible pattern for some observers having an abnormal type of vision.
Note: Well-known color-vision tests containing pseudo-isochromatic charts are those by Stilling, Ishihara, and Rabkin. There are also charts similar to the pseudo-isochromatic that yield a pattern for observers having a red-green defect in vision, but none, or a different pattern, for a normal observer.
Sim: apa

PSYCHIC BLINDNESS APA, osa
Inability to see due to some impairment of the cerebral cortex, the receptor being normal. Properly limited to psychogenic (hysterical) inability to see.
Distinguish from mind blindness — a condition in which one can see, but cannot understand or interpret (apperceive) what is seen.

PSYCHICAL RESPONSE OSA
Subjective aspect of the impulses in the sensory projection areas, and in the associational areas of the cortex.

PSYCHOLOGICAL ISOCHROMES CGPS (119)
(Ostwald system) Colours of equal ratio of full colour content to white content. Often referred to simply as 'isochromes'.
Diff: (isochrome series — OSA)

PSYCHOLOGICAL PRIMARIES APA
Same as Primary Hues.

PSYCHOPHYSICAL MEASUREMENTS OSA
Specifications of stimuli in terms of equality, or differences, of sensations experienced by human observers.

PURE cgps
1. (138a) (Ordinary speech) Free from colour (pure grey).
2. (138b) (Ordinary speech) Free from black or colour (pure white).
3. (138c) (Ordinary speech) Free from white or black (pure red, etc.)
4. (212) (Artist painters) Neither tending towards greyness nor extreme darkness. Most very light colours whether grey or not may at times be considered to be pure, especially when considered in combinations, viz., compositions. The colour of Fra Angelico is 'pure' and the colour of Watts is not pure. Also used as a synonym for vivid, brilliant, intense. Thus a pure red, a pure green. It will be observed that 'pure' colours in the artist's sense are chromatic or achromatic colours of a high level of lightness; also saturated colours.

PURE COLOR AAPL
By a pure color we mean any color containing no admixture of black and white. (The terms "full color" and "saturated" color may be regarded as exact equivalents of pure color.) For convenience, we also call pure color those colors which are not absolutely free from black and white, but which are as pure as we can reasonably expect to make them in actual practice.
Sim: APA

—— ——— APA
Any color stimulus which, like the spectrum colors, approaches the condition required for maximum saturation.
Sim: AAPL

PURE-COLOR CIRCLE AAPL
A pure-color circle consists of the colors of the spectrum together with the non-spectral purples unadulterated by added black or white and arranged round the circumference of a circle.
A good color circle will have the colors spaced so that equal intervals represent equal changes in hue.

PURITY AAPL
By the purity of a color we mean the proportion of pure color in it; that is to say, the degree of freedom from black and white.
The term "intensity" may be regarded as equivalent to purity, but would be better stated as hue intensity.
Diff: APA, IES, OSA

——— APA
A measure of the degree to which a color stimulus approaches the condition required for maximum saturation.
There are various measures of purity, but all of them are based on the ratio of the spectrum and achromatic components of the stimulus mixture.
Sim: IES, OSA
Diff: AAPL

* ——— IES
The relative luminances of the single-frequency and reference-standard components in the mixtures described in Dominant Wavelength and Complementary Wavelength determine and are specified by purity.
Note: Various scales of purity are used, all of which can be expressed as some mathematical function of the ratio of the components. Excitation purity, which is used so commonly that it is often designated as "purity" without qualification, is defined in "Excitation Purity."
Sim: APA, OSA
Diff: AAPL

——— OSA
The relative luminances of the spectrum and achromatic components in the mixtures mentioned in the definitions of dominant wave-length and complementary wave-length determine and are specified by purity.
Note: Various scales of purity are used, all of which can be expressed as some mathematical function of the ratio of the components.
See: Excitation Purity.
Sim: APA, IES
Diff: AAPL

PURKINJE AFTER-IMAGE APA, osa
The second positive visual after-sensation

which appears most plainly in the hue complementary to that of the primary sensation.

PURKINJE EFFECT CGPS (93)
The decrease in luminosity of reds and oranges relative to blues and greens as the illumination is reduced, associated with the change in the relative spectral visual sensitivity during the transition from the photopic to the scotopic state.
Sim: (Purkinje phenomenon – APA, OSA)

PURKINJE PHENOMENON APA
A phenomenon concerning the perceived brightness of different color stimuli, namely, that as the spectrum is darkened, the long-wave end darkens more rapidly than the short-wave end.
E.g., red brightens in an intense general illumination, blue in faint illumination. Concomitant dark adaptation is required, since the effect rests upon the transition from cone to rod vision.
Sim: OSA, (Purkinje effect – CGPS)

—— ———— OSA
Phenomenon concerning the luminosity of various kinds of radiant energy, namely, that as the eye changes from the light-adapted to the dark-adapted state the relative luminosity function shifts toward the short-wave end of the spectrum.
Note: This phenomenon was first reported by Purkinje in 1825.
Sim: APA, (Purkinje effect – CGPS)

PURPLE USP-NF
1. A series of hues which are distinctive and apparently simple, but which are due to combinations or mixtures of long and short wave-lengths of radiant energy within the visible spectrum and are not produced by stimulation with any single wave-length. (The complement of yellow-green.) About 560c mμ.
2. A group of colors psychologically referable to red and blue, and usually, black.
Sim: (purples – APA)

* PURPLE BOUNDARY IES
The straight line drawn between the ends of the spectrum locus is the purple boundary.
Note: Points on this line represent non-spectral violet, purple, magenta, and non-spectral red colors of maximum possible purity. The portion of the chromaticity diagram enclosed by the spectrum locus and the purple boundary includes the points that represent all physically possible colors.
Sim: OSA

—— ———— OSA
Straight line connecting the extremes of the spectrum locus on the chromaticity diagram.
Note: Points on this line represent non-spectral violet, purple, magenta, and non-spectral red colors of maximum possible purity. The portion of the chromaticity diagram enclosed by the spectrum locus and the purple boundary includes the points that represent all physically possible colors.
Sim: IES

PURPLES APA
A series of related hues, ranging between blue and red, and normally evoked by combinations or mixtures of long and short-wave radiations within the visible spectrum.
Sim: (purple – USP-NF)

Q

QUALITY cgps (220)
(Artist painters) This term is frequently employed to describe the aesthetic effect of a whole composition when discussing its colouring only. The term generally refers to effects arising from the technical procedure of pigment application which results in a certain surface texture. Painters have always been much concerned with the marked difference of effect produced by the relative transparency or opacity, uniformity, or brokenness of pigment applied to a surface. The impression of colour which is made upon the beholder by a painting is strongly affected by the nature of the technical means employed — thus it is commonly observed that the quality of the colours in the painting of the early Flemish School is of a peculiar clarity, richness, and enamel-like depth, since unequalled. Artists often use the word in relation to a single colour, as of the "quality of Titian's blue". The term is further used to describe a variety of colour perceptions which are difficult to analyse, but intensly felt nevertheless.

QUALITY OF RADIATION SMPE
An expression which refers to the spectral composition of the radiation. In both photography and in the viewing of colored pictures the quality of the radiation used is important.

1/ QUANTITY OF LIGHT, Q IES, osa
Quantity of light is the product of the luminous flux by the time it is maintained. It is the time integral of luminous flux.

$$Q = \int F dt$$

QUARTER-WAVE PLATE OSA
Plate of doubly refracting crystal cut perpendicular to its optic axis of such a thickness that the optical path lengths of the ordinary and the extraordinary rays differ by exactly one-quarter of a wave-length.
Note: A quarter-wave plate will transform circularly polarized waves into plane-polarized waves, and the reverse.

R

RADIANCE OSA
Flux radiated per unit solid angle and unit projected area of surface.
Note: The usual unit is the watt per steradian per square meter. This is the radiant analog of luminance.

1/ For I.E.S. revision, see p. viii.

Sim: (steradiancy — IES)

RADIANT DENSITY OSA
Volume density of radiant energy, or ratio of the radiant energy present in a given space to the volume of the space.
Sim: (radiant energy density — IES)

RADIANT EMITTANCE OSA
Radiant flux emitted per unit area of a source.
Note: The usual unit is the watt per square meter.

RADIANT ENERGY apa
Quanta of energy traveling through space in the form of electromagnetic waves of various lengths.
Sim: IES, OSA

——— ———, U IES
Radiant energy is energy traveling in the form of electromagnetic waves. It is measured in units of energy such as ergs, joules, calories, or kilowatthours.
Sim: OSA, apa

——— ——— OSA
Energy traveling through space in the form of electromagnetic waves of various lengths.
Sim: IES, apa

1/ RADIANT ENERGY DENSITY, u IES
Radiant density is radiant energy per unit volume, e.g., ergs/cm^3.

$$u = \underline{dU/dV}$$

Sim: (radiant density — OSA)

1/ RADIANT FLUX, P IES

Radiant flux is the time rate of flow of radiant energy. It is expressed preferably in watts, or in ergs per second.

$$P = \underline{dU/dt}$$

Sim: OSA

——— ——— OSA
Rate of transfer of radiant energy.
Sim: IES

1/ RADIANT FLUX DENSITY, W IES
Radiant flux density at an element of surface is the ratio of radiant flux at that element of surface to the area of that element; e.g., watts/cm^2. When referring to a source of radiant flux this also called radiancy.

$$W = \underline{d\,P/dA}$$

1/ RADIANT INTENSITY, J IES
The radiant intensity of a source is the energy emitted per unit time, per unit solid angle about the direction considered; e.g., watts/steradian.

$$J = \underline{d\,P/d\omega}$$

Sim: OSA

——— ——— OSA
Flux radiated per unit solid angle about a point source.
Note: The usual unit is the watt per steradian. In general, the radiant intensity of a source depends upon the direction from which it is observed. The average radiant intensity, however, may be defined at $1/\pi$ times the total flux radiated by a source.
Sim: IES

RADIANT POWER OSA
Same as Radiant Flux.

RADIANT REFLECTANCE CSA
Ratio of reflected to incident radiant flux.

RADIANT TRANSMITTANCE OSA
Ratio of transmitted to incident radiant flux.

RADIATION OSA
The process of causing radiant energy to be emitted from a source.

RADIATION TEMPERATURE osa
Temperature of a complete radiator having total radiant emittance equal to that of the body in question.

RADIATOR OSA
An emitter of radiant energy.

RATIO DIAPHRAGM CAP SMPE
A mask placed over a banded tricolor filter shaped to permit predetermined ratio of the different colors of light to pass through a filter for lenticulated film color photography.

RATIOMETER SMPE
Any device used to test the actinic equality of differently colored lights transmitted to the photographic material in making color separation negatives.

RAYLEIGH EQUATION apa, osa
Proportions of red and green stimuli required in a mixture to match a given yellow. Usually a spectrum red (670 mμ) is mixed with a spectrum green (535 mμ) to match a spectrum yellow (589 mμ).
The Rayleigh equation is used to differentiate normal, protanomalous, and deuteranomalous trichromats.

RAYLEIGH'S LAW OF SCATTERING OSA
Fraction of the incident flux scattered from the direction of rectilinear propagation is inversely proportional to the fourth power of the wave-length.
Note: Rayleigh's law applies to turbid media whose heterogeneities have average dimensions less than one-tenth the wavelength of the incident energy.

RECIPROCAL COLOR TEMPERATURE OSA
Reciprocal of color temperature usually expressed in micro-reciprocal degrees (abbreviated mired, or μrd).
Note: Reciprocal color temperature provides a more uniform chromaticity scale than does color temperature itself.

RECURRENT IMAGE APA
A visual, auditory, or other image which persistently returns.

RECURRENT VISION APA, osa
A succession of positive and negative after-images or after-sensations.
Cf. After-image.

*RED APA
1. The hue attribute of visual sensations typically evoked by stimulation of the normal human eye with any combination of long

1/ For I.E.S. revision, see p. viii.

and short-wave radiation which is visually equivalent to 494c millimicrons.
Long-wave radiation, from around 650 millimicrons to the end of the visible spectrum, normally evokes a series of reds which are scarcely distinguishable from the typical, extraspectrum red.
2. Any hue predominantly similar to that of the typical red.
The complement of blue-green or cyan.
Sim: USP-NF

— USP-NF
1. The hue attribute of visual sensations typically evoked by stimulation of the normal retina with radiation of wave-length approximately 493c millimicrons.
2. Any color which manifests a hue predominantly similar to that of the typical red. (The complement of blue-green or cyan. Primal red, which is tinged neither with purple nor orange, does not occur as a pure color, but may be got by adding some blue to spectral red, which is yellowish.)
3. One of the psychologically unique colors.
Sim: APA

RED-GREEN BLINDNESS apa, osa
A common form of partial color-blindness, or dichromatism, in which red and green stimuli are confused because they are seen as various saturations and brightnesses of yellow, blue, or gray.
Cf. Protanopia and deuteranopia.

RED-SIGHTED apa, osa
Displaying a heightened color sensitivity for red, or a tendency to see all objects tinged with red: due to (a) some unknown variation in the eye or nervous system, or (b) following prolonged exposure to the stimulus for the complementary green, or (c) sequent upon over-exposure to intensive light and possibly hemorrhagic.
(c) also called erythropsia.

REDIRECTING SURFACES AND MEDIA IES
Redirecting surfaces and media are those which change the direction of the light in a definite manner, as for example, a mirror or a prism.

REDUCED COLOR APA
Color seen as filling a small aperture in a (usually neutral) screen.

REDUCED EYE apa
A simplified schematic system designed to have the same optical properties as the average unaccommodated human eye.

REFLECTANCE OSA
Ratio of reflected to incident flux.
Sim: (reflection factor — CGPS, IES)

REFLECTED COLOR APA
Color seen as reflected from a perceived object.

REFLECTED LIGHT AAPL
1. Rays of incident light turned back or "rebounded" from a surface; as; the moon reflects the light of the sun.
2. In painting reflected light refers to the modification of color on those surfaces upon which light is reflected from nearby surfaces; as, the reflected light in the folds of drapery was influenced by the vermilion screen.

REFLECTION AAPL
A term applied to the portions of a body illuminated not by rays of direct light but by reflected rays. In an illuminated body there are three distinct parts, the light, the shade, and the reflection. The last is the part of an object plunged in a penumbra lighted by the rays proceeding from other bodies at some distance from the object and receiving the light directly.

REFLECTION FACTOR CGPS (31)
The ratio of the luminous flux reflected from a surface to the total incident flux.
Also called Reflectance.
Sim: IES, (reflectance — OSA)

1/ ——— ——— or REFLECTANCE IES
The reflection factor of a body is the ratio of the light reflected by the body to the incident light.

$$\rho = F_r/F_i$$

Sim: CGPS, (reflectance — OSA)

REFLECTIVITY CGPS (40)
The total reflection factor of a layer of material of such a thickness that there is no change of reflection factor with further increase in thickness.
Sim: OSA

——— OSA
Reflectance of a test specimen consisting of a layer of material of sufficient thickness that any increase would fail to change the reflectance.
Note: Reflectivity characterizes the material rather than simply a specimen.
Sim: CGPS

REFLECTIVITY, SPECTRAL TAPPI
Spectral reflectivity is usually expressed in the form of a curve giving reflectivity as a function of wave-length over the range 400 to 700 millimicrons. Reflectivity is the ratio, for the same geometry and wave-length of monochromatic light, of the amount of light reflected by the sample to that reflected from a pure and properly prepared surface of magnesium oxide. It is thus a relative quantity and is correctly termed apparent reflectivity, although in common usage it is simply referred to as reflectivity or reflectance.

REFLECTOR IES
A reflector is a device, the chief use of which is to redirect the light of a lamp by reflection in a desired direction or directions.

REFRACTOR IES
A refractor is a device, usually of prismatic glass, which redirects the light of a lamp in desired directions principally by refraction.

1/ For I.E.S. revision, see p. ix.

REGISTER SMPE
(v.t.) To cause to correspond exactly; to adjust two or more images to correspond with each other. Such correspondence may be required either in printing or in projection.

REGULAR DENSITY OSA
Logarithm of the reciprocal of regular transmittance.
Note: Common logarithms (to the base 10) are customary.

1/ REGULAR OR SPECULAR REFLECTION IES
Regular or specular reflection is that in which the angle of reflection is equal to the angle of incidence.
Sim: (direct (regular or specular) reflection – CGPS)

1/ REGULAR REFLECTION FACTOR IES
The regular reflection factor of a surface or a body is the ratio of the regularly reflected light to the incident light.
Sim: (specular reflectance – OSA)

1/ REGULAR TRANSMISSION IES
Regular transmission is that in which the transmitted light is not diffused. In such transmission the direction of a transmitted pencil of light has a definite geometrical relation to the corresponding incident pencil. When the direction of the light is not changed, the transmission is called direct.
Note: The transmission of light by a body may be regular, diffuse or mixed. In many practical cases there is a superposition of regular and diffuse transmission.
It should be noted also that transmission factor as defined below refer to the ratio of light emerging from the body concerned to the light incident upon it. Reflections at the surfaces, as well as absorption within the body, therefore operate to reduce the transmission.
Since transmission and reflection factors depend in general on the angle of incidence, this angle should be stated. If the angle is not given, incidence is assumed to be practically normal. Transmission and reflection factors frequently vary also with the quality of light used, and consequently, the quality of the light or the characteristics of the illuminant used should be specified.
Sim: (direct (regular) transmission - CGPS)

1/ REGULAR TRANSMISSION FACTOR IES
The regular transmission factor of a body is the ratio of the regularly transmitted light to the incident light.
Sim: (regular transmittance – OSA)

REGULAR TRANSMITTANCE OSA
Ratio of flux transmitted in an image-forming state to incident flux.
Sim: (regular transmission factor – IES)

RELATED COLOURS CGPS (110)
(Ostwald System) Two or more colours covering whole or part of the visual field, such as the colours of our normal surroundings.

RELATIVE COLORS AAPL
Colors which blend easily and produce harmonious tones.

RELATIVE LUMINOSITY FACTOR IES
The relative luminosity factor for a particular wavelength is the ratio of the luminosity factor for that wavelength to the value at the wavelength of maximum luminosity.
Sim: (visual sensitivity factor – CGPS)

RELIEF PROCESS SMPE
Any color process in which relief images are produced for the purpose of matrix printing.

RESIST AATCC, TCCA
A spot or portion of fabric showing less affinity for dye.
Diff: SMPE

——— SMPE
A coating used to protect certain portions of a surface upon which an image or design is to be produced by etching, dyeing, or other chemical or physical treatment.
Diff: AATCC, TCCA

RETICENCE AAPL
This is a useful term exactly opposite in meaning to luminosity.

RETINA APA
The innermost of the three coats of the eyeball, which receives the image formed by refraction at the cornea and lens, and serves as receptor organ for vision.
In the human retina 10 layers are distinguished, of which the layer or rods and cones, the second from the exterior, is the specific visual receptor.

*RETINAL FIELD APA
The extended mosaic of the rod and cone receptor elements of the retina, which forms something of an anatomical correlate of the stimulus field.

*RETINAL ILLUMINANCE APA, OSA
The illuminance of the retina, the usual units being the troland and the lux.

RETINAL IMAGE OSA
Pattern of radiant energy on the retina corresponding to external objects and formed by refracting surfaces of the eye.
Note: The retinal radiant-energy image is the immediate stimulus of a visual response process.

RETINAL OSCILLATIONS APA, osa
A variation in the state of excitation of the visual neural apparatus following a single momentary stimulation, which is experienced as a brief succession of alternating bright and dark phases, such as Charpentier's bands or recurrent afterimages.

RETINAL RIVALRY APA, osa
Alternation of sensations first from one eye and then from the other, when the two eyes are simultaneously stimulated by different colors or figures.

1/ For I.E.S. revision, see p. ix.

Also called binocular rivalry. Contrast with binocular fusion, in which the two impressions are fused into a single impression.

RETINAL ZONES APA, osa
Same as Color Zones.

RETINITIS PIGMENTOSA apa
A pathological condition of the pigmentary layers of the retina, accompanied by diminished color sensitivity (especially for blue), retracted color fields, and lowered power of dark adaptation.

RETREATING COLORS AAPL
These are cold colors (typically blues) which are perceived, or tend to be perceived, as leaving their picture plane or physical plane and withdrawing further from the observer.

REVERSAL PROCESS SMPE
One in which the original latent image is converted by processing to an image of opposite gradient.

RICH cgps (135)
(Ordinary speech) Strongly colouredd (either bright or deep).
Sim: (vivid — USP-NF)

RIDGWAY COLORS APA
An early system of 1115 pigment colors, chosen to represent by relatively equal steps, a wide range of variation in hue, saturation, and lightness.
Designed originally for naming the plumage colors of birds.

ROCHON PRISM OSA
Polarizing prism consisting of two calcite wedges cemented together so that the ordinary ray is undeviated, the extraordinary ray deviated from the direction of incidence.

ROD, RETINAL APA
A rod-shaped structure found in the retina of the eye which constitutes a specific receptor for vision.
The rods in the human eye are 0.04 to 0.06 mm. long and about 0.002 mm. in diameter.
Distinguish from retinal cones, another visual receptor; the rods contain visual purple and are believed to operate for achromatic (gray) visual qualities at low (twilight) stimulation-intensities, the cones for chromatic and achromatic at the higher levels of stimulation; the rods and cones form the second layer of the retina from the outside, lying just within the layer of pigmented cells; it is estimated that there are 130,000 rods in the human retina; at the center of the retina there are no rods, farther out they are more numerous than the cones.

ROD VISION APA
Sight or vision in which only rods function; the cones of the retina do not participate.
Also called twilight vision, scotopic vision.

ROTATORY DISPERSION OSA
Variation of optical activity with wavelengths.

RUB-OUT astm
A paste prepared by rubbing (mulling) a mixture of dry pigment and oil between a glass muller and a roughened surface of glass or stone.
Sim: (rubout — FPVPC)

RUBOUT FPVPC
A mixture of pigment and vehicle, produced with a spatula or muller, and used for the examination of the properties of a pigment.
Sim: (rub-out — astm)

RUTILANT AAPL
That which shines with a vivid brilliance. Stuffs, for example, may be said to be of a rutilant tone.

S

SAMPLE POINT OSA
Point in a chromaticity diagram representing the chromaticity of the sample.

SATINY AAPL
That which has the brilliance or lustre of satin. Thus we may say of a proof of a wood-cut, that it is of a satiny texture, or of a picture that the rendering of its flesh tints is satiny.

SATURATION AAPL
State of being saturated. In respect to color, saturation is a term indicating relative freedom from graying influences of neutrals, complements, or other unlike colors. Thus, a saturated red is an intense red.
Sim: APA, ASTM, CGPS, OSA, USP-NF, (chroma — CGPS)

——— APA
The degree to which any color possessing a hue differs from a gray of the same brightness.
Sim: AAPL, ASTM, CGPS, OSA, USP-NF, (chroma — CGPS)

——— ASTM
The attribute of any color possessing a hue which determines the degree of its difference from the gray of the same lightness.
Sim: AAPL, APA, CGPS, OSA, USP-NF, (chroma — CGPS)

——— CGPS (58)
That attribute of visual sensations which permits a judgment to be made of the proportion of colourfulness in the total sensation. Sensations of the same hue and luminosity can be arranged in a series of increasing saturation ranging from grey to that member of the series in which the hue appears most marked.
Ed. Note: This definition does not seem to differ from CGPS Chroma although it is intended to be different as indicated by explanatory note under CGPS Chroma (108).
Sim: AAPL, APA, ASTM, OSA, USP-NF, (chroma — CGPS)

——— OSA
The attribute of any color perception

possessing a hue that determines the degree of its difference from the achromatic color perception most resembling it.
Sim: AAPL, APA, ASTM, CGPS, USP-NF, (chroma – CGPS)

——— USP-NF
Saturation is that attribute of a chromatic color which determines its degree of difference from the achromatic color of the same lightness.
Sim: AAPL, APA, ASTM, CGPS, OSA, (chroma – CGPS)

SATURATION SCALE APA
A graduated series of color stimuli which under appropriately controlled conditions of observation, are perceived to vary by uniform steps in saturation alone.
Sim: OSA

——— —— OSA
Series of colors that under controlled conditions are perceived to vary by uniform steps in saturation alone with other attributes of the perceptions constant.
Sim: APA

SCALE cgps (219)
(Artist painters) Vaguely used to describe the range of colours in a composition.

SCATTERING SURFACES AND MEDIA IES
Scattering surfaces and media are those which redirect the light into a multiplicity of separate pencils by reflection or transmission, as for example, rippled glass.

SCOTOPIC ADAPTATION APA, osa
Like dark adaptation, but with more explicit reference to the part played by the rod-system of the retina.

SCOTOPIC VISION APA, osa
Vision which occurs in faint light, or in dark adaptation.
It is attributed to the operation of the retinal rods.
Also called scotopia.
Sim: CGPS

——— —— CGPS (91)
Vision experienced by the normal eye when adapted to very low levels of illumination. The maximum of the relative spectral visual sensitivity is shifted to 510 mμ, and the spectrum is seen uncoloured. The rod receptors in the retina are considered to be the active elements under these conditions. Also called Rod Vision, Twilight vision.
Sim: APA, osa

SCUMBLING AAPL
When the tints in a picture are too brilliant, they may be softened by blending them with a neutral tint, this neutral tint being laid on with a nearly dry brush. This process is called scumbling. In black and white drawing the hard outlines may be scumbled by being rubbed with the blunt end of the chalk or the stump.

SECONDARY COLORS AAPL
Secondary colors are three in number. Each of them is formed by the mixture of two of the three primary colors: thus orange from red and yellow, green from blue and yellow, and purple from red and blue.
Sim: (secondary colours – cgps)

——— COLOURS cgps (214)
(Artist painters) Those colours which are obtained by mixing any two of the primary colours. Thus orange, green, and purple are secondaries. (Nearly obsolete.)
Sim: (secondary colors – AAPL)

SECONDARY LIGHT AAPL
A term applied to a glimmer of light which is only accessory in the lighting of a painted scene. Thus if in a moonlit pasture a shepherd is seen advancing lantern in hand, this lantern, which throws a light over a part of the canvas, bears the name of a secondary light, as opposed to the rays of the moon which is the principal light in the picture.

SECONDARY LIGHT SOURCE CGPS (12)
A body or object transmitting or reflecting light falling on it from any other source (primary or secondary).

SECONDARY STANDARD IES, osa
A secondary standard is one calibrated by comparison with a primary standard. The use of the term may also be extended to include standards which have not been directly measured against the primary standards, but derive their assigned values indirectly from the primary standards.
Note: The photometric units are actually maintained in most laboratories by electric filament lamps serving as reference standards.

* SELECTED ORDINATE METHOD OF COLORIMETRIC CALCULATION IES
The numerous multiplications indicated in "Indirect Colorimetry" can be avoided by summing the spectral distribution data for specially selected, non-uniformly spaced wavelengths.
Note: Tables of wavelengths for the selection of these ordinates from spectral distribution curves have been published by F. T. Bowditch and M. R. Null, Jour. Opt. Soc. Am., 1938, 28, 500, and in Table XII of reference 4 under "ICI Standard Trichromatic Coordinates". Tables of wavelengths for the selection of ordinates from spectral reflectance and transmittance curves, assuming standard luminators A, B, and C, have been published in reference 3 listed under the same above-mentioned term. Similar tables for these and many other useful luminators have been published in reference 4 listed under the same term.
Sim: OSA

——— ——— ——— — ——— ——— OSA
A method of indirect colorimetry in which the usual numerous multiplications are

avoided by summation of the spectral distribution data at specially selected, non-uniformly spaced wave-lengths.
Sim: IES

SELECTIVE ABSORBER OSA
Medium whose spectral absorptivity varies with wave-length.

SELECTIVE RADIATOR OSA
Radiator having spectral emissivity that is different for different parts of the spectrum.

SELECTIVE SCATTERING OSA
Scattering of radiant energy so that the ratio of scattered flux to incident flux varies with wavelength.
See: Rayleigh's Law of Scattering.

SEMICHROME OSA
An ideal Ostwald color in which the two spectral reflectances differ by unity — the maximum possible amount; the greater being unity, the lesser, zero.
Same as Fullcolor.
Sim: (ideal full colours — CGPS)

SEMIGLOSS FPVPC
A degree of gloss lying between Eggshell and Full Gloss. It is characterized by a uniform blurring of reflected objects, rather than distortion.

SEMI-TRANSPARENT AAPL
A term used to describe the incomplete transparency of certain precious stones and fine pottery.

SENSATION APA
Primitive awareness, or uninterpreted conscious response to stimulation of a sense receptor.
Sim: osa

——— osa
Mode of mental functioning that is directly associated with stimulation of the organism.
Sim: APA

SENSITIZERS SMPE
Materials, usually dyes, used to increase the sensitivity of photographic emulsions to light of various wavelengths.

SEPARATION astm
In a wet paint film the separation of various chromatic pigments from the white pigment, usually because of difference in specific gravity.

SHADE AAPL
n. 1. Shade refers to the relative darkness of that side of an object which is turned away from a source of light; as, shade is distinguished from shadow in that shade occurs on the object which intercepts the light, while shadow is the darkness seemingly thrown on a surface by the intercepting object.
2. A shade of a color is the color at a lower than normal value; as, yellow is normally a light color, darker yellows are termed shades of yellow.
v. 1. To shade is to put in tone; as, to shade a drawing.
2. To shade is to blend, as to shade from dark to light.
Sim(n2): APA, CGPS, astm
Diff(n2): AATCC, ASTM, FPVPC, IES, TCCA, cgps
Diff(n1, v1, v2): All definitions listed for the term, shade.

—— AATCC, TCCA
1. Same as "color", as "dyed shade"; "printed shade"; often used to designate a color not greatly different from some particular color under discussion, as a lighter, yellower, or more vivid shade.
2. Shade is a term expressing any variation in color not attributable to variation in strength of dyeing. The "shade" of a green is commonly described as yellow or blue, light or dark, bright or dull; of a red as yellow or blue, etc.: of a yellow as green or red, etc. Sometimes "shade" relates only to hue or spectral character. Sometimes it relates also to brightness. The "shade" of a dyeing is the shade of its color and the "shade" of a dye is the shade of the color of dyeings made with it.
Sim: FPVPC, cgps (2, 3, 5, 6, 8)
Diff: AAPL, APA, ASTM, CGPS, IES, astm, cgps (1, 4, 7, 9)

—— APA
Any color darker, i.e., of a lower lightness, than median gray.
Sim: AAPL (n2), CGPS, astm
Diff: AAPL (n1, v1, v2), AATCC, ASTM, FPVPC, IES, TCCA, cgps

—— ASTM
A term descriptive of a lightness difference between surface colors, the other attributes of color being essentially constant. A lighter shade of a color is one that has higher lightness but approximately the same hue and saturation; and a darker shade is one that has a lower lightness.
Note: Primarily, the term "shade" is derived from shadow and designates a change in appearance analogous to that produced by a local reduction in illumination. It should, therefore, when strictly used, express only the change toward a darker color. Shade of a color has been defined by several authorities as the mixture of black with that color, thus establishing its opposite character to "tint", but by extension of its relative sense it has been frequently and widely used to include lighter shades by the use of the adjective "lighter" or "paler". Although such expressions apparently involve a contradiction, it is clear that while we may have a shade of a color, or darker color of the same sort, it is easy to conceive of another shade not quite so dark and therefore lighter.
Diff: All definitions listed for the term, shade.

—— astm
1. A general term used often as a synonym for color, but preferably referring to the deepening of any color:
a) by reducing only the luminance, or
b) by adding a black colorant.
2. A general term used often for describing a variation of a color, but preferably referring to any color which has been darkened:
a) by reducing only the luminance, or
b) by adding a black colorant.
Sim: AAPL(n2), APA, CGPS
Diff: AAPL(n1, v1, v2), AATCC, ASTM, FPVPC, IES, TCCA, cgps

—— CGPS
1. (220) (Decorating trade) A pure colour to which black has been added (analogy with shadows).
2. (178) (Printing industry) Verb. To shade; to modify a colour by mixture with a darker colour.
Sim: AAPL(n2), APA, astm
Diff: AAPL(n1, v1, v2), AATCC, ASTM, FPVPC, IES, TCCA, cgps

—— cgps
1. (177) (Printing industry) Any colour. This usage is commonly met with only in the expression "shade card". Analogous to Colour.
2. (176) (Printing industry) Any slight variation in hue, e.g., vermilion, orange 'shade', ultramarine, green 'shade'. A colour which does not quite match a standard is often said to be "off shade". Analogous to Tone.
3. (168) Paint and pigment industries) A slight variation from a standard colour (e.g., a 'shade' of blue). Analogous to Tone.
4. (167) (Paint and pigment industries) Any colour (as in shade-card). Analogous to Colour.
5. (139a) (Ordinary speech) A small variation from a particular colour.
6. (139b) (Ordinary speech) One of a variety of colours.
7. (149) (Dyeing industry) Comparisons:- Redder, Greener, Yellower, etc. 'Shade' corresponds to hue and comparisons of 'shade' to difference of hue. In practice, the Dyer varies the hue obtained by any given dyestuff by mixing with it a dye or dyes of different hue (but not one of complementary absorption, which would result in a change in dullness and not in hue).
8. (169) (Paint and pigment industries) Verb. To modify by mixture with other colours. Analogous to verb, to Tone.
9. (154) (Dyeing industry) Synonyms for any colour. Also called Tone or Colour..
Sim(1,4,7,9): Each other
Diff(1,4,7,9): All other definitions of shade
Sim(2,3,5,6,8): AATCC, FPVPC, TCCA, each other
Diff(2,3,5,6,8): All other definitions of shade.

—— FPVPC
(v.) To alter the color of a paint to more nearly approach a standard.
Sim: AATCC, TCCA, cgps(2,3,5,6,8)
Diff: AAPL, APA, ASTM, CGPS, IES, astm, cgps (1,4,7,9)

—— IES
A shade is a device, the chief use of which is to diminish or to intercept the light from a lamp in certain directions where such light is not desirable. Frequently the functions of a shade and a reflector are combined in the same unit.
Diff: All listed definitions for the term, shade.

——, FULL AATCC, TCCA
Further additions of the dye will not change the color materially.

——, HEAVY AATCC, TCCA
Full shade, opposite of light shade.

——, LIGHT AATCC, TCCA, osa
The color resulting from the use of a relatively small amount of dye. Opposite of heavy shade.

——, MEDIUM AATCC, TCCA
Intermediate between light shade and heavy shade.

——, MODE AATCC, TCCA
A color which is fashionable for a certain season.

——, PASTEL AATCC, TCCA, osa
Light shade.

SHADED AAPL
A term applied to tones and colors, the tints of which are delicately graduated.
Diff: AATCC, TCCA

—— AATCC, TCCA
Showing a gradation in color, for example, from selvage to selvage, or selvage to center of a piece.
Diff: AAPL

SHADOW AAPL
A darkened area seemingly thrown on a surface by a body intercepting light; as, the man's shadow fell through the doorway. In common usage the term shadow is often construed to include shade.

SHADOW SERIES AAPL
Any one of the vertical series of color shown in an Ostwald triangle. The members of each vertical series are meant to have constant excitation purity, and to differ only in luminance.
Sim: CGPS, OSA

—— —— CGPS (121)
Psychological Isochromes of the same hue. Any two colours of a shadow series may be made to match by illuminating one more strongly than the other. Colours of a shadow series have the same chromaticity (dominant wavelength and purity).
Sim: AAPL, OSA

—— —— OSA
Same as Isochrome Series.
Sim: AAPL, CGPS

SHEEN ASTM
Sheen is specular gloss at near grazing angles of incidence and reflection.
Sim: FPVPC(1)

—— FPVPC
1. The gloss of surfaces measured at angles near grazing.
2. Colloquial. A synonym for gloss.
Sim(1): ASTM

SHOT cgps (145)
(Ordinary speech) The appearance of fabrics so woven as to show different colours at different angles of view.
Sim: (shot color — AAPL)

SHOT COLOR AAPL
A color which varies according to the angle at which it is seen.
Sim: (shot — cgps)

SIGHT APA, osa
Same as Vision.

SIMPLIFIED SINGLE-HUED TRIANGLE AAPL
These are obtained by selecting at equal intervals six colors and four neutrals from the Ostwald single-hue triangle and arranging them in corresponding order. The members selected are those designated by the symbols, a, e, i, n, ea, ie, ni, ia, ne, and na.

SINGLE-HUED HARMONY AAPL
Any harmony produced by means of colors possessing a common hue with or without addition of neutrals.
The expression "dominant harmony" when used in its narrower sense is an equivalent expression.

SINGLE-HUED TRIANGLE AAPL
Any section made by cutting vertically through the Ostwald color solid in the plane of its neutral axis consists of two single-hued triangles.
The expression "monochromatic triangle" is an equivalent expression.

SKITTERINESS aatcc
An uneven shade effect, especially noticeable on solid shade unions. The unevenness of shade occurs from fiber to fiber, and thread to thread.

SNAPS aatcc
A term used in textile printing to describe short streaks which are intermittent and are caused by a particle of foreign matter lodging in the engraving and lifting the doctor blade momentarily.

SNELL'S LAW OSA
Product of the sine of the angle of refraction by the refractive index of the refracting medium is equal to the product of the sine of the angle of incidence by the index of refraction of the medium containing the incident beam.

SNOW-BLINDNESS APA, osa
A temporary abnormality of the color sense, in which all objects are tinged with red. Caused by long-continued exposure to very bright light, as in Arctic exploration, on glaciers, in telescopic observation of the sun, watching welding operations, etc.
Cf. Erythropsia.

SOBER AAPL
A term applied to a refined scheme of color, which produces a calm, tranquil impression upon the spectator.

SOFT GELATIN PROCESS SMPE
A process in which there is preferential dyeing of soft gelatin portions of the image.

SOLARIZED CGPS (199)
(Glass industry) Describes the change in colour or transmission factor to either visible or invisible rays of certain glasses after exposure to sunlight. The term artificial solarization is used when the source of light is not sunlight.

SOLID COLOR AATCC, TCCA
Uniform color.

SOLID OF LIGHT DISTRIBUTION IES
A solid of light distribution is a solid whose surface is such that the radius vector from the origin to the surface in any direction is proportional to the luminous intensity of the light source in the corresponding direction.

SOMBER AATCC
Same as dull.
Diff: (sombre — AAPL, CGPS)

SOMBRE AAPL
Dark. A term applied to schemes of color in which black predominantes.
Diff: CGPS, (somber — AATCC)

—— CGPS (205)
(Decorating trade) Of low lightness, high purity and warm hue, i.e., descriptive of dark shades of orange, red or purple. More often applied to a colour scheme.
Diff: AAPL, (somber — AATCC)

*SPARKLE, GLITTER APA
Changes of limited extent in color, especially in brightness, and involving movement.

SPECIFIC CONSUMPTION IES
The specific consumption of an electric lamp is its watt consumption per lumen. "Watts per candle" is a term formerly used in connection with electric incandescent lamps to denote watts per mean horizontal candle.

SPECKY AATCC, TCCA
Showing specks or small particles of matter of a different color from the rest of the fabric.

SPECTRAL CENTROID OSA
Average wave-length of radiant energy transmitted by a filter computed by weighting each wave-length by the products of the transmittance of the filter, the spectral distribution of the incident energy, and the luminosity.

SPECTRAL COLOR OSA
Color obtainable by mixture of some portion

of the spectrum with the adopted achromatic light.

SPECTRAL COMPOSITION OSA
Relative spectral distribution.
Sim: SMPE

SPECTRAL COMPOSITION of radiation SMPE
The specification of the relative energy at different wavelengths of radiation emitted by a source, or reflected or transmitted by a material; usually shown graphically as a spectral distribution curve.
Sim: OSA

SPECTRAL DISTRIBUTION OSA
The amounts of a radiant quantity for the various parts of the spectrum.
Note: The radiant quantity may be the radiant flux of a beam, the radiant energy obtained from a beam over a given time interval, the irradiance of a surface by one or more beams, the radiance of a surface from a fixed direction of reception, and so on.

SPECTRAL EMISSIVITY, ϵ_λ IES
The spectral emissivity of an element of surface of a temperature radiator at any wavelength is the ratio if its radiant flux density per unit wavelength interval (spectral radiancy) at that wavelength, to that of a blackbody at the same temperature.
Sim: OSA

——— ——— OSA
Ratio of the spectral radiant emittance of an incomplete radiator to that of a complete radiator at the same temperature.
Sim: IES

SPECTRAL RADIANT ENERGY, U IES
Spectral radiant energy is radiant energy per unit wavelength interval at wavelength λ, e.g., ergs/micron.

$$U_\lambda = dU/d_\lambda$$

SPECTRAL RADIANT INTENSITY, J IES
Spectral radiant intensity is radiant intensity per unit wavelength interval, e.g., watts/(steradian, micron).

$$J_\lambda = dJ/d_\lambda$$

SPECTRAL REFLECTANCE OSA
Ratio of reflected to incident radiant flux of narrow wave-length range.

SPECTRAL SENSITIVITY SMPE
The sensitivity of a light-sensitive material (or instrument, such as a photoelectric cell) to radiation of various wavelengths.

SPECTRAL TRANSMISSION of a filter SMPE
The extent to which a filter will transmit radiation of different wavelengths. Shown graphically as transmission, opacity, or density plotted against wavelength.

SPECTRAL TRANSMITTANCE OSA
Ratio of transmitted to incident radiant flux of narrow wave-length range.

SPECTRAL VISUAL SENSITIVITY CGPS (24)
The ratio of luminous flux to radiant energy flux at a given wavelength. Also called Spectral luminosity, etc.
Sim: (luminosity factor — IES)

SPECTROGRAM SMPE
A photograph of a spectrum.

SPECTROGRAPH OSA
Spectroscope in which the ocular lens is replaced by a photographic plate.

SPECTROMETER apa
A spectroscope fitted with a divided circle or wave-length drum for isolating or identifying wave-lengths or regions of the spectrum.
Sim: OSA

——— OSA
Spectroscope fitted with a divided circle, used to measure index of refraction of prisms.
Sim: apa

SPECTROPHOTOMETER apa
A combination monochromator and photometer used to measure spectral emittances, transmittances, or reflectances.
Sim: OSA, SMPE

——— OSA
Monochromator combined with a photometer for the measurement of spectral emittances, transmittances, or reflectances.
Note: The photometer may be visual or photoelectric.
Sim: SMPE, apa

——— SMPE
A spectroscope with a photometric attachment used to determine the relative intensity of two spectra or spectral regions.
Sim: OSA, apa

SPECTROSCOPE apa
An instrument for making a spectrum visible. The usual prism spectroscope consists of a slit, collimator, prism, and a second lens.
Sim: OSA
Diff: SMPE

——— OSA
Instrument permitting visual examinations of spectra, consisting of slit, collimator, dispersing element and second lens.
Note: An eye-piece, to magnify the spectrum, is often included.
Sim: apa
Diff: SMPE

——— SMPE
An instrument for forming a spectrum and measuring wavelengths in various regions throughout the spectrum.
Diff: OSA, apa

SPECTRUM apa
A band of radiant energy in which, after passing through a prism or being otherwise dispersed, energy of each wavelength is segregated and all components lie spread out in regular order.
Sim: SMPE

——— SMPE
An image of a source formed by light or other radiant energy through the medium of an optical device which refracts or diffracts the radiation of different wavelengths to different degrees. Throughout the visible spectrum of a continuous light

source the spectrum appears as a number of juxtaposed areas of color varying from red to violet, e.g., the rainbow.
Sim: apa

SPECTRUM COLOR OSA
Color of some part of the spectrum.
Sim: (spectrum colors — APA)

SPECTRUM COLORS APA
The series of saturated colors normally evoked by photopic stimulation of the retina with radiant energy of continuously different single wavelengths through the visible range.
Purple is not a spectrum color.
Sim: (spectrum color — OSA)

SPECTRUM LINE apa
Any one of the narrow lines, each representing light of a definite wave-length, which are observed in the solar and other spectra, certain groups of lines being characteristic of specific chemical elements.
These lines are characteristic of substances in the gaseous state, and appear bright when due to emission from these, or dark when due to absorption by them.

* SPECTRUM LOCUS IES
The locus of points representing the colors of the visible spectrum in a chromaticity diagram is the spectrum locus.
Sim: OSA

——— —— OSA
Locus of points on the chromaticity diagram representing the colors of the spectrum.
Sim: IES

SPECULAR GLOSS ASTM
Specular gloss is defined as one thousand times the ratio of the brightness of the sample when illuminated unidirectionally and viewed in the direction of specular reflection less the brightness of the sample when illuminated in the same direction and viewed normally, to the brightness of the ideal, completely reflecting, perfect mirror, similarly illuminated and viewed in the direction of specular reflection.
Note: When the source subtends at the sample a solid angle so small that a further decrease will not alter appreciably either the angular distribution of the reflected flux or its ratio to the incident flux, the illumination is called unidirectional.
Interchange of source and receptor is permissible.

SPECULAR REFLECTANCE OSA
Ratio of flux reflected in an image-forming state to incident flux.
Sim: (regular reflection factor — IES)

SPHERICAL CANDLEPOWER, scp IES, osa
The (mean) spherical candlepower of a lamp is the average candlepower of the lamp in all directions in space. It is equal to the total luminous flux of the lamp in lumens divided by 4π.

SPHERICAL REDUCTION FACTOR IES
The spherical reduction factor of a lamp is the ratio of the mean spherical to the mean horizontal candlepower of the lamp.
Note: In the case of a uniform point source, this factor would be unity, and for a straight cylindrical filament obeying the cosine law, it would be $\pi/4$.

SPLIT COMPLEMENTS AAPL
A schematic selection of three hues in which the second and third may be combined to produce the complement of the first; as, red, green, blue, in which the green and blue may be adjusted in area and strength to be equivalent to blue-green, the complement of red.

SPOTTY AATCC, TCCA, osa
Non-uniform over small areas, mottled.

STANDARD ILLUMINANT CGPS (61)
An agreed light source specified in such a way that its energy distribution is reproducible.
Note: The Commission Internationale de l'Eclairage (C.I.E.), also known as the International Commission on Illumination (I.C.I.), established three standard illuminants designated by A, B, and C. Illuminant A is a gas-filled lamp operated at a colour temperature of 2848°K. Illuminants B and C are the same lamp used in combination with certain specified liquid filters to yield approximately colour temperatures of 4800°K and 6500°K respectively, corresponding to the yellower and bluer phases of daylight.
Sim: (ICI standard illuminants for colorimetry — IES, OSA)

*STANDARD OBSERVER apa
An hypothetical observer with a visual response mechanism possessing the colorimetric properties defined by the 1931 ICI tables of the distribution coefficients $\bar{x}$, $\bar{y}$, $\bar{z}$, and the trichromatic coefficients, x, y, z, of the equal energy spectrum.
The $\bar{y}$ coefficients of the equal energy spectrum are the relative luminosity values defining the standard observer for photometry.

STEFAN-BOLTZMANN LAW IES
The Stefan-Boltzmann law is the statement that the emitted radiant flux density (or radiancy) of a blackbody is proportional to the fourth power of its absolute temperature; that is,

$$W = 6 T^4$$

Note: Experimental values of the constant 6 , called the Stefan-Boltzmann constant, average about 5.70×10^{-12} watts cm^{-2} deg K^{-4}, but recent determinations have generally given results somewhat larger.
Sim: OSA

——— — OSA
Radiant emittance of any surface is proportional to the fourth power of its absolute temperature.
Sim: IES

1/ STERADIANCY, N IES
Alternate symbol, $\mathcal{B}$
Steradiancy of an element of a source in any direction is the radiant flux per unit solid angle per unit of projected area of the element of source as observed from that direction. It is equivalent to the radiant intensity per unit of projected area of the source.
$N = d^2P/d\omega(dA \cos\theta) = dJ/(dA \cos\theta)$
Note: In the defining equation θ is the angle between the normal to the element of source and the direction of observation.

Sim: (radiance - OSA)

1/ STILB, sb IES
The stilb is a unit of luminance equal to one candle per square centimeter.
Note: The name stilb has been adopted by the International Commission on Illumination and is commonly used in European publications.

The apostilb, asb, is a unit of luminance defined by the German Illuminating Engineering Society (DLTG) as $1/(\pi \times 10^4)$ stilb. It is therefore equal to the luminance of a perfecting diffusing surface emitting or reflecting one lumen per square meter.
Sim: OSA

—— OSA
Luminance of a source having an intensity of one candle per square centimeter of projected area.
Sim: IES

*STIMULUS FIELD APA
The extended totality of visual stimuli which act upon the unmoving eye at a given moment.

STREAKS aatcc
A term used in textile printing to describe a continued smear noticeable on textile print goods which may be caused by a particle of foreign matter under the doctor blade which raises it at one point and allows color to pass through.

STREAKS, STREAKY AATCC, TCCA
Dark or light marks running lengthwise (warpwise of a fabric.

STRENGTH AATCC, TCCA
The strength of a dyeing is the amount of dye introduced in the dye bath to dye a given amount of material, usually expressed as a percentage of the weight of the material.
See: Strong.
Diff: CGPS

——— CGPS (146)
Comparisons:- Stronger, weaker
(Dyeing industry) That colour quality, an increase in which is associated with an increase in the quantity of dye-stuff present, all other conditions (viewing, etc.) remaining the same.
Diff: AATCC, TCCA

STRONG AATCC, TCCA
A comparative term used to indicate that one dyeing has the appearance of having been dyed with more dye than the other. Opposite of weak. One dye is said to be stronger or to have greater strength than another if a given weight of it will dye more material to the given color than the same weight of the other dye.
Sim: CGPS
Diff: USP-NF

—— CGPS
1. (150) (Dyeing industry) Adjective applied to a colour produced by the application of a relatively large amount of dye-stuff. Alternatively, to a dye possessing strong colouring power. Also called Deep, Full. Opposite of weak.
2. (182) (Printing industry) "Tinctorial strength": the degree to which a colour has to be "extended" (i.e. diluted) with white to match a given 'tint'. Usually used as a comparative term only, i.e. of two inks of similar hue one may be of greater tinctorial strength than the other. Opposite of Weak.
Sim: AATCC, TCCA
Diff: USP-NF

—— USP-NF
Characterized by high chroma or saturation; the opposite of weak.
Sim: (strong color - APA)
Diff: AATCC, CGPS, TCCA

STRONG COLOR APA
A color of high saturation.
Sim: (strong - USP-NF)

STRONGER CGPS (162)
(Paint and pigment industries) A difference apparently due to the presence of more colour than in the original sample. Also called Richer, Fuller, Purer. (Similar terms are used to describe the tinting properties of pigments.) Opposite of Weaker.

SUBTRACTIVE MIXTURE CGPS (5)
The mixture of absorbing media or the superposition of filters so that the composition of the light stimulus passing through the combination is determined by the simultaneous or successive absorption of parts of the spectrum by each medium present.

SUBTRACTIVE PRIMARIES CGPS (7)
Certain tyes or pigments characterized by strong absorption in one part of the spectrum, which by subtractive mixture (see Note) in varying proportions can be made to match a large range of colours. Generally three in number, a minus red, a minus green, and a minus blue, i.e., a cyan, a magenta, and a yellow.
Note: Pigment mixture is not entirely subtractive; it involves both additive and subtractive mixture.
Sim: SMPE

1/ For I.E.S. revision, see p. viii.

——— ——— SMPE
The three printing colors used in a three-color subtractive process; usually named magenta (minus green), blue-green or cyan (minus red), and yellow (minus blue).
Sim: CGPS

SUBTRACTIVE PROCESS CGPS (186)
(Colour photography) A process of reproducing the colours of objects in a picture by means of the subtractive colour mixture of two or more subtractive primaries, the amounts of which at any point are controlled by colour separation images. Also called Subtractive Synthesis.
Sim: SMPE

——— ——— SMPE
A process of reproducing objects in natural colors using a restricted number of primary component colors in which the composite image is produced by passing a single beam of white light successively through two or more layers of colored images, each of which absorbs one region of the spectrum which is passed by the other layers.
Sim: CGPS

*SURFACE COLOR APA
Color seen as belonging to a surface, compact in texture, resistant to the gaze and well-localized, viz., a color in the surface mode of appearance.
Examples: Color of a wall, book-cover, a table-top, etc.
Sim: USP-NF, (surface colour – CGPS), (surface-color perception – OSA)

——— ——— USP-NF
A color which appears as definitely occupying the surface of a perceived object.
Contrast with film color.
Sim: APA, (surface colour – CGPS), (surface-color perception – OSA)

——— COLOUR CGPS (3)
The colour of an illuminated surface.
Sim: (surface color – APA, USP-NF), (surface-color perception – OSA)

SURFACE-COLOR PERCEPTION OSA
Color perceived as belonging to a surface.
Note: The surface mode of visual appearance has the attributes of transparency and glossiness in addition to the attributes of color perception.
Sim: (surface color – APA, USP-NF), (surface colour – CGPS)

SURFACE-UNIFORMITY GLOSS ASTM
Surface-uniformity gloss is revealed by the degree of freedom of relatively high-gloss surfaces from visible local variations.

SUSTAINED AAPL
A scheme of color, which is at once free and energetic, or solid tones which enhance the effect of the modelling, are said to be sustained.

SYMMETRICAL LIGHT DISTRIBUTION IES
A symmetrical light distribution is one in which the curves of vertical distribution are substantially the same for all planes.

*SYNESTHESIA APA
A persisting condition of the individual in which stimulation of one sensory receptor results in experience characteristic of another sensory mode. These experiences may involve any combination of sensory receptors. Colored hearing (synopsia) is common but the reverse tonal vision, is rare.

T

TANNING DEVELOPERS SMPE
Solutions which cause hardening, or which render insoluble, the gelatin of an emulsion in proportion to the amount of latent image converted into silver.

TEMPERATE HUES AAPL
Green and red-purple, the hues that are between the warm and cool halves of the hue circuit and are relatively neither hot nor cold.

1/ TEMPERATURE RADIATOR IES
A temperature radiator is one whose radiant flux density (irradiance) is determined by its temperature and the material and character of its surface, and is independent of its previous history.

TENDER AAPL
Light, delicate. Bright, fresh colors are called tender.

TERTIARY COLORS AAPL
Colors are called tertiary when they are produced by the mixture of a primary and secondary color, one of the colors being in excess of the others. They are olive, citrine, and russet.
Sim: (tertiary colours – cgps)

——— COLOURS cgps (215)
(Artist painters) Term occasionally used to denote three classes of colours known as russet, citrine, and olive, made by mixing the secondaries, orange, green, and purple in pairs. (Nearly obsolete)
Sim: (tertiary colors – AAPL)

TEST LAMP IES
A test lamp, in a photometer, is a lamp to be tested.

TETARTANOPIA apa, osa
Form of dichromatism in which blue and yellow stimuli are confused.
The existence of this form is disputed.
Cf. blue-yellow blindness and tritanopia.

TEXTURE AAPL
A term applied to the arrangement of neighboring tones, or different shades of the same color in alternation or juxtaposition. The secret of the vibration of the greens in Constable's landscapes results from the fact that he gets his effect by a texture of greens of different intensity. In another sense texture denotes the quality of the surface of draperies, etc. Thus we say that an artist is skilled in rendering textures, when he clearly marks in his pictures the varying qualities of the surfaces which he represents.

1/ See I.E.S. revision, p. viii.

THERMAL RADIATION OSA
Radiation by solids heated to incandescence.

THERMOCOUPLE OSA
Junction of two dissimilar metals used to measure temperature.
Note: When blackened to absorb radiant energy, a thermocouple may be used to measure irradiance.

THIN AATCC, TCCA
Weak, hungry.

THIN OR STINGY COLOR AAPL
A technical effect due to dry and insufficient paint which yields an impoverished and uninteresting canvas.

* THREE-COLOR MIXTURE IES
It is usually possible to match a color with a mixture of suitable amounts of light of three suitable selected chromaticities.
Note: The colors used for the mixture are commonly termed primaries, and are usually very pure red, green, and bluish violet. In certain cases the amounts of one or two of the primaries required to match the sample are zero. In other cases a match cannot be obtained in the basic manner described, but a mixture of the sample with one of the primaries can be matched with a mixture of the other two primaries. In rare cases a match cannot be obtained in either of these ways, but then one of the primaries can be matched by a mixture of the sample with the other two primaries.

THREE-COLOR PROCESS SMPE
Any process, either additive or subtractive, for producing photographs by the use of three primary colors.

THREE-COMPONENT THEORY APA, osa
See Trireceptor Theory.

THRESHOLD APA, osa
A statistically determined point or region of the stimulus scale, at which occurs a transition in a series of sensory judgments regarding perceptibility or difference of stimuli.
Also called Limen.

THROUGH-LOOK PERSPECTIVE AATCC
Same as overhand.

THROWSTER COLORS aatcc
For identification purposes, the silk throwster tints his different lots of raw silk with coloring matter which can be readily and completely removed when the woven goods are given the soap boil-off.

TIMBER AATCC
Same as shade.

TINCTORIAL POWER AATCC, TCCA, osa
The effectiveness of a given weight of dye in dyeing a given weight of material.
Sim: (tinting power — AAPL)

TINGE CGPS (173, 180)
Paint and pigment industries, Printing industry) A trace of added colour.
Sim: cgps

—— cgps (141)
Same as Tint (140b)
Sim: CGPS

TINT AAPL
n. 1. A tint of a color is a color of the same hue at a higher than normal value; as, a tint to blue.
v. 1. To tint is to tone lightly in color.
2. To mix a chromatic pigment with a white pigment; as, to tint white with yellow.
Diff(1): APA, ASTM, CGPS, cgps
Diff(v1, v2): All definitions of the term, tint.

—— APA
Any color lighter i.e., of higher lightness, than median gray.
May imply weak saturation as well as relatively high lightness.
Diff: AAPL, ASTM, CGPS, cgps

—— ASTM
A color produced by the mixture of white pigment or paint in predominating amount with a colored pigment or paint, not white. The tint of a color is, therefore, much lighter and much less saturated than the color itself.
Sim: CGPS, cgps
Diff: AAPL, APA

—— CGPS
1. (181) (Printing industry) A colour "extended" (i.e. diluted) appreciably with white.
2. (172) (Paint and pigment industries) A mixture of a large proportion of white pigment with a small proportion of coloured pigment.
3. (157) (Dyeing industry) The very weak colour resulting from the application of a small amount of a bright dyestuff to material originally white or near white.
Sim: ASTM, cgps
Diff: AAPL, APA

—— cgps
1. (140a) (Ordinary speech) A weakly coloured near-white (and therefore a pale colour).
2. (140b) (Ordinary speech) The weak appearance of a colour of different hue superimposed on another colour (including white or grey).
3. (222) (Artist painters) The desaturated colour obtained on mixing a pure vivid undiluted colour (pigment) with white.
Sim: ASTM, CGPS
Diff: AAPL, APA

—— FPVPC
(v) To alter the color of a paint to more nearly approach a standard.
Note: Same as Shade — FPVPC

TINT TONE FPVPC
The hue of mixtures of a black pigment with white.
See Undertone.

TINTED AAPL
Covered with a tint, uniformly covered with a light shade.

TINTING SMPE
Coloring film by dyeing the gelatin of the emulsion.

TINTING POWER AAPL
Tinting power is the effectiveness with which a chromatic pigment or dye can surround and modify particles of another pigment or material; as, Prussian blue has a strong tinting power.
Sim: (tinctorial power — AATCC, TCCA, osa)

TIPPY WOOL aatcc
A tippy dyeing effect is the uneven appearance noticeable after certain dyes have been applied to loose uncarded wool. It may be caused by a difference in the affinity of dye for different portions of the wool fiber. Tippy wool made into a material may cause the material to look skittery.

TONALITY AAPL
Tonality is the total, additive color effect or balance of whatever is in the picture including hue, value, and chroma. The term is also, or may be, used in a more restricted sense as hue-tonality, value-tonality, and chroma-tonality.

TONE AAPL
n. 1. In drawing and painting, tone means the general effect of color (dark, light, hue, intensity, and psychological impression); as, the tone of the picture was light and joyous.
2. Used also to designate an area of color, as a dark tone.
v. 1. To tone a drawing is to apply values. To tone is distinguished from to shade, for the former means to apply values in general, whether as light and shade or as a schematic arrangement, while to shade implies the application of tone to simulate light and shade.
2. Also used in the sense of imparting a general color to something; as, to tone a canvas with gray; to tone a picture as by glazing in such a way as to affect all the colors by that used as a glaze; to tone several pigments by intermixing various amounts of a selected pigment, as to tone several blues with purple.
Diff: AATCC, CGPS, TCCA, astm, cgps

—— AATCC, TCCA
Hue or spectral character of a color, sometimes "color".
Diff: AAPL, CGPS, TCCA, astm, cgps

—— astm
A general term used occasionally as a synonym for color, but preferably referring to a variation of a color other than in hue.
Diff: AAPL, AATCC, CGPS, cgps (1,2,3), TCCA

—— CGPS
1. (179a) (Printing industry) "Toner": a colour (usually an oil-soluble dye) added to an ink to modify its colour. Usually used in connection with the blue dyes added to black inks in order to neutralize the brownish colour of carbon black.
2. (179b) (Printing industry) Similar to 'shade' (176), e.g., a "blue-toned trichromatic red".
Sim: cgps (1)
Diff: AAPL, AATCC, astm, TCCA, cgps(2,3)

—— cgps
1. (142) (Ordinary speech) A term somewhat loosely used, by analogy with musical tone, to indicate a variation in colour or in the general effect of colour or light and shade in a scene, picture or colour scheme.
2. (201) (Decorating trade) The degree of lightness or darkness of a colour. Also called Lightness.
3. (Artist painters) This term is employed in as many different ways as the word 'value'. For some it means the ruling colour pervading any arrangement or composition — namely, general suffusion of a particular hue. The artist means that the chromaticity of all colours in the composition varies over a restricted range. Thus, for example, tone may arise from a whole composition with a golden varnish. This tones the whole. The term is equally used to describe any member of a scale made by mixing a pigment of vivid hue with black or white or grey in quantities which provide steps of equal interval. Perhaps most usually the term refers to a certain colour area in a painting; as "this tone is related to that tone". The word 'tone' here means a colour. The average level of lightness of the whole picture is sometimes referred to as being 'light in tone' or 'dark in tone'. Similarly an individual tone may be 'light' or 'dark'.
Sim(1): CGPS
Diff(1): AAPL, AATCC, astm, TCCA, cgps (2,3)
Diff(2,3): All definitions listed for the term, tone.

TONED DOWN AAPL
Colors are said to have toned down when with age they have become lower in tone and more sombre than they were when freshly laid on.

TONING SMPE
Coloring a film by chemical action on the silver image.

TOTAL COLOR BLINDNESS osa
Same as Monochromatism.

TOTAL EMISSIVITY, ε_t IES
The total emissivity of an element of surface of a temperature radiator is the ratio of its radiant flux density (radiancy) to that of a blackbody at the same temperature.
Sim: OSA

____ _____ OSA
Ratio of the radiant emittance of an incomplete radiator to that of a complete radiator at the same temperature.
Sim: IES

TOTAL FLUX IES
The total flux of a source is the flux from that source in all directions.

TOTAL LUMINOUS REFLECTANCE ASTM
The total luminous reflectance of a specimen is the ratio of the light reflected by it to that incident upon it.
Note: The total luminous reflectance of a specimen may vary with either direction or spectral character of the incident light flux; therefore both must be included in reporting the result of a measurement. The directions in which light is reflected do not affect total reflectance; however, the visual appearance may differ greatly. Thus a silver mirror and a white paint could both easily have the same total reflectance of 0.92 (92%) for 45° incident light. Total reflectance refers to the sum of the light reflected in an image-forming state plus that reflected in a non-image forming state (total) specular (diffuse); it has sometimes been called simply "reflectance", but "total" is here added to distinguish it from reflectance used in a general sense without reference to a specific measurement scale. Total luminous reflectance can be measured directly only with apparatus whose spectral sensitivity is adjusted to the luminosity function.
Sim: (luminous reflectance — OSA)

TRANQUIL AAPL
A work, which is executed in a quiet, harmonious tonality, may be termed tranquil. To produce a tranquil effect all striking notes in a picture must be softened and its brilliant lights must be extinguished.

TRANSFER PROCESS SMPE
A process in which an image, usually dyed or pigmented, is transferred from one support to another.

*TRANSFORMATION APA
The subjective process or mechanism which presumably underlies and accounts for the phenomenon of color constancy.

* TRANSFORMATION OF COLOR-MIXTURE DATA IES
Color-mixture data for one set of primaries can be used to compute the color-mixture data for any other set of primaries, for the same observer. Such computations are known as transformations of color-mixture data.
Note: Such transformations which are linear, homogeneous, and independent combinations of the original data yield valid color-mixture data for some definable primaries even though it may be physically impossible to produce the new primaries.
Sim: OSA

_____ — _____ _____ OSA
Change of the color-mixture data for a sample from one set of primaries to another.
Note: Color-mixture data for one set of primaries can be used to predict the color-mixture data for another set of primaries for the same observer. The prediction is obtained by a transformation of the color-mixture data. Mathematically, the transformation is linear and homogeneous. Conversely, any such transformation of color-mixture data yields valid color-mixture data for some definable primaries, even though such primaries are physically impossible.
Sim: IES

TRANSMISSION FACTOR CGPS (36)
The ratio of the luminous flux transmitted through a body to the total incident flux. Also called Transmittance.

1/ _____ _____ IES
The transmission factor of a body is the ratio of the light transmitted by the body to the incident light.

$$\tau = F_t/F_i$$

Sim: CGPS, (transmittance — OSA)

TRANSMISSIVITY CGPS (41)
The internal transmission factor of unit thickness of the transmitting material.
Sim: OSA

_____ OSA
Internal transmittance for a unit thickness of a non-light diffusing substance.
Note: Transmissivity characterizes a material that does not scatter radiant energy.
Sim: CGPS

TRANSMITTANCE IES
The transmittance of a body is the ratio of the light reaching the second surface of the body to the light which enters the surface where it is incident.
Note: This definition of Transmittance as distinguished from Transmission Factor, is adopted tentatively. The distinctive use of the two terms is not generally accepted. This note applies also to Absorptance and Absorption Factor.
Sim: (internal transmission factor — CGPS), (internal transmittance — OSA)
Diff: OSA

_____ OSA
Ratio of transmitted to incident flux.
Sim: (transmission factor — CGPS, IES)
Diff: IES

_____ - PARALLEL and TOTAL TAPPI
For each type, parallel, completely diffuse or diffuse illumination, the light will leave the sheet either by reflection or transmission. The transmitted light may leave the sheet in directions parallel to that of the incident direction or any other possible direction. The light which leaves the sheet parallel in direction to the incident light is parallel transmitted light.

1/ For I.E.S. revision, see p. ix.

The remaining portion of the transmitted beam is diffusely transmitted light. The ratio of the energy of the parallel transmitted light to the energy of the parallel light incident on the sheet is called the parallel transmittance of the sheet when expressed on a percentage basis. Similarly, the ratio of the total energy of the transmitted light to the energy of either the parallel or diffuse incident energy is taken as the total transmittance of the sheet.

TRANSMITTANCY CGPS (44)
The ratio of the transmission factor of a liquid or solid solution to that of the solvent in equal thickness. Also called Transmittance.
Sim: OSA

———— OSA
Ratio of the transmittance of a cell containing the solution to that of a substantially identical cell containing the solvent.
Sim: CGPS

TRANSPARENCY osa
Attribute of volume and surface modes of visual appearance ranging from opaque to clear.

TRANSPARENCY RATIO TAPPI
The transparency ratio is the ratio of the parallel transmittance to the total transmittance of the sample. Now the transparency ratio is –

$$T_r = \frac{i_p/i_o}{i_t/i_o} = i_p/i_t$$

TRANSPARENT GLASS IES
Transparent glass is glass having no apparent diffusing properties. Varieties of such glass are sometimes referred to as flint, crystal, clear.

*TRANSPARENT SURFACE COLOR APA
A color seen as in a two-dimensional mode and possessing among other properties, the property of transparency which permits other objects to be seen beyond or behind it.
Example: color of clear glass pane perceived as a transparent plane.

TRIAD AAPL
A triad is a schematic selection of three hues in which each hue differs in the same degree of hue contrast from each of the other two; as, a yellow, a blue-green, and a red-purple that are equally different in hue form a triad.

TRIADIC AAPL
1. Triadic means schematically arranged through selection of a triad, or triads; as, he selected a triadic color scheme.
2. Composed of three colors equally contrasting in hue.

TRICHROMAT CGPS (79)
One who possesses trichromatic vision.
Sim: OSA, apa

———— OSA, apa
Observer having trichromatic vision.
Sim: CGPS

TRICHROMATIC COEFFICIENTS CGPS (69)
Three quantities, $u/(u + v + w)$, $v/(u + v + w)$, and $w/(u + v + w)$. Denoted by x, y, z in the C.I.E. system.
Sim: (trichromatic coordinates – IES, OSA)

———— ———— osa
Same as Chromaticity Coordinates.
Sim: CGPS, (trichromatic coordinates – IES)

TRICHROMATIC COLORIMETER OSA
Colorimeter providing for equivalent stimuli by addition of three colors.

TRICHROMATIC COORDINATES CGPS (63)
The three coordinates of a colour in any three-dimensional trichromatic system of colour specification. Also called Tristimulus Values, Tristimulus coefficients.
Diff: IES, OSA

1/* ———— ———— IES
The ratio of any one of the color-mixture data for a sample to the sum of the three color-mixture data is a trichromatic coefficient. Any pair of these three coefficients may be used as coordinates of a point in a plane representing the chromaticity of the sample. These two coefficients are the trichromatic coordinates of the sample.
Sim: IES, (trichromatic coefficients – CGPS)
Diff: CGPS

———— ———— OSA
Same as Chromaticity Coordinates.
Sim: IES, (trichromatic coefficients – CGPS)
Diff: CGPS

TRICHROMATIC INKS CGPS (175)
(Printing industry) The three inks used in making a three-colour print. They normally correspond in colour with the physicist's subtractive primaries, cyan, magenta, and yellow, but are usually called blue, red, and yellow. Also called Three-Colour Inks.

TRICHROMATIC SYSTEM CGPS (62)
Any system of colour specification based on the possibility of matching all colours by the additive mixture (positive or negative) of three suitably chosen standard stimuli.

TRICHROMATIC THEORY APA
A color theory based upon the facts of trichromatic mixture, namely that all hues may be derived from the mixture of two or more of the three primaries.

TRICHROMATIC VISION OSA, apa
Same as Trichromatism.

TRICHROMATISM apa
Form of vision yielding colors which require in general three independently adjustable primaries (such as red, green,

1/ For I.E.S. revision, see p. vii.

and blue) for their duplication by stimulus mixture.
Trichromatism may be either anomalous trichromatism or normal color vision.
Sim: OSA, (normal trichromatic vision — CGPS)

——— OSA
Type of vision in which the colors seen require in general three independently adjustable primaries (such as red, green and blue) for their duplication by mixture.
Note: Trichromatism may be either anomalous trichromatism or normal vision.
Sim: apa, (normal trichromatic vision — CGPS)

TRICOLOR FILTER SMPE
1. A composite filter containing areas of three primary colors.
2. A single filter of one of three primaries.

TRICOLOR RATIO SMPE
A series of filter factors which indicate the relative sensitivities of an emulsion to blue, green, and red light under certain specified conditions.

TRIPACK PROCESS SMPE
A process of exposing three films (or plates) simultaneously, in which the films are arranged as a pack so that the outer films (or interposed filters) transmit certain portions of the light to expose the following layers.

TRIRECEPTOR THEORY APA, osa
A type of theory, such as that of Young and Helmholtz, which assumes that color vision depends upon the operation of three kinds of retinal receptors; each of these with its nerve connections comprising a fundamental response process and mediating a fixed fundamental hue quality, all gradations of color being dependent upon the proportions of activity of the three.

1/ TRISTIMULUS VALUES OSA
Same as Color-Mixture Data.
Note: In the ICI system the symbols are X, Y, Z.

TRITANOMALOUS VISION CGPS (88)
A form of anomalous trichromatism intermediate between normal trichromatism and tritanopia, but about which detailed information is lacking. Also called Partial Tritanopia.
Sim: (tritanomaly — OSA, apa)

TRITANOMALY apa, OSA
Rare type of trichromatism in which an abnormally large proportion of blue stimulus is required in a blue-green mixture to match a given cyan.
Sim: (tritanomalous vision — CGPS)

TRITANOPE OSA, apa
Observer having Tritanopic Vision.

TRITANOPIA apa, OSA
Form of dichromatism in which reddish blue and greenish yellow stimuli are confused. Tritanopia is a common result of retinal disease, but in rare cases may be inherited. Sometimes called blue blindness.
Diff: CGPS

——— CGPS (84)
A form of dichromatism about which detailed information is lacking, but in which the relative spectral visual sensitivity in the blue is believed to be much less than the normal and in which colours can be matched by a mixture of red and green stimuli. Also called Blue blindness, hence Tritanope.
Diff: OSA, apa

TRITANOPIC VISION osa
Same as Tritanopia.

*TROLAND APA
A unit of visual stimulation defined as that illuminance of the retina which results when a surface luminance of 1 candle per square meter is incident through an apparent pupil of 1 square millimeter area.
The name of this unit has been changed from photon to troland to avoid the confusion caused by the subsequent physical use of photon as a name for the quantum of electromagnetic radiation.
Sim: OSA

——— OSA
Retinal illuminance produced by luminance of one candle per square meter when the apparent area of the entrance pupil of the eye is one square millimeter.
Note: Trolands may be converted to lumens per square meter (lux) by multiplying the number of trolands by 0.00400 and by the transmittance of the ocular media.
Sim: APA, (photon — APA)

TRUCULENT AAPL
Brutal and lively at the same time. Thus bright fresh colors, which do not lack harmony, are termed truculent.

TRUE TEMPERATURE OSA
Temperature of a radiator on the Kelvin thermodynamic scale read by a suitable thermometer in thermal equilibrium with a radiator.

TURBID MEDIA OSA
Same as Heterogeneous Media.

TWO-COLOR PROCESS SMPE
Any process, either additive or subtractive, for producing color photographs using only two colors.

TWO-SIDES AATCC, TCCA
The two sides of the fabric are different in color.
Sim: TAPPI

——— TAPPI
The two sides of the fabric, paper, etc., are different in color.
Sim: AATCC, TCCA

TYNDALL EFFECT OSA
Scattering of radiant energy selectively in accord with Rayleigh's law of scattering.

1/ Also defined by I.C.I., 1948, see p. vi; and I.E.S., see p. vii.

ULTRA-VIOLET apa
Radiant energy of wave-lengths shorter than extreme violet and lying beyond the ordinarily visible spectrum.
Usually assigned to vibrations below 400 or 390 millimicrons.

UNCOLOURED CGPS (156)
(Dyeing industry) Material is uncoloured if it is in the natural or bleached state and has not been dyed, printed or pigmented. Grey. Opposite of Coloured.

UNDERTONE AATCC, FPVPC, TCCA, osa
The color a pigment exhibits when mixed with a vehicle, such as gum solution, oil, or varnish, and spread thinly on white paper or when diluted with a considerable amount of white pigment.
Sim: astm, CGPS

———— astm
The color of a thin film of printing ink on white paper, viewed by transmitted light.
Sim: AATCC, CGPS, FPVPC, TCCA, osa

———— CGPS
1. (184) (Printing industry) The changed hue of a coloured pigment which may result when it is used in very thin layers or greatly extended with white, e.g. Indian yellow is a deep orange-yellow with greenish undertone.
2. (171) (Paint and pigment industries) The colour by reflected light of a pigment mixed with an excess of white pigment, or the transmitted colour of a thin film of pigmented oil or other medium.
Sim: AATCC, FPVPC, TCCA, astm, osa

UNIAXIAL CRYSTAL OSA
Polarizing crystal having a single direction in which the extraordinary ray is propagated with the same velocity as the ordinary ray.
Note: Crystals of the tetragonal and hexagonal systems (such as quartz and calcite) are uniaxial.

UNIDIRECTIONAL ILLUMINATION IES, osa
Unidirectional illumination on a surface is that produced by a single light source of relatively small dimensions. It is characterized by the fact that a small opaque object placed near the illuminated surface casts a sharp shadow.

UNIFORM-CHROMATICITY-SCALE DIAGRAM OSA
Chromaticity diagram found by a transformation of the ICI standard color-mixture data such that the distance between the points on the diagram representing two chromaticities is approximately proportional to the perceptibility of the difference between them.

UNIFORM DIFFUSER CGPS (49)
A surface having a total reflection factor independent of the angle of illumination, and luminance independent of the angle of view.

UNITARY HUE osa
One of the four hues (red, yellow, green, blue) of color sensations that do not partake of the nature of any one of the other three; unitary red is the hue of any sensation that is neither yellowish, greenish, nor bluish; unitary yellow is neither greenish, bluish, nor reddish; and so on.
Sim: (color, unique — USP-NF), (primary hues — APA)

UNITARY STIMULI CGPS (64)
The three standard stimuli of a trichromatic system of colour specification. They might but do not generally correspond to the matching stimuli of a colorimeter. Also called Reference Stimuli, Primaries.
Sim: (primary colors — OSA)

1/ UNITS OF LUMINANCE IES
The practice recognized internationally is to express luminance in candles per unit area of surface. The luminance of any surface, in a specified direction, can also be expressed in terms of lumens per unit area from a perfectly diffusing surface of equal luminance.

UNITS OF WAVELENGTH IES
Spectral radiant-energy measurements necessitate some statement as to the unit of wavelength used, since four different units are in use, as shown.

Micron	μ	1 μ = 10^{-3} mm
Millimicron	mμ	1 mμ = 10^{-6} mm
Angstrom	A	1 A = 10^{-7} mm
X-unit	XU	1 XU = 10^{-10} mm

Note: It was formerly thought satisfactory to express wavelength in microns, but if this unit is used, the wavelengths of the entire visible and ultraviolet spectrum are expressed by fractions. To avoid the use of fractions, many authors express wavelengths in millimicrons. Using this unit, the wavelengths of the visible spectrum are expressed by three figures before the decimal point. For most work in radiation measurements, wavelengths expressed by three figures seem to be accurate enough, but some workers express wavelengths in angstrom units in all cases; hence it seems impossible to get unity of action even among workers in radiation measurements. The spectroscopist uses angstrom units for all of his work except in the x-ray region, where the unit XU (XU =0.001 A) is often used.

UNRELATED COLOUR CGPS (109)
(Ostwald system) One colour seen alone in an otherwise dark visual field.

UPPER REGISTER AAPL
Upper register is a term used to designate colors in the lighter range of values as distinguished from the darker range; as, in color the painting was chiefly in the upper register.

UPWARD FLUX IES
The upward flux is the flux from the source above the horizontal plane passing through its center.

1/ For I.E.S. revision, see p. viii.

VALENCE, CHROMATIC APA
See Chromatic Valence.

VALUABLE DISCORD AAPL
If a pleasing result is obtained by the restrained use of discordant color, we may say that a valuable discord has been achieved.

VALUE AAPL
Value is a general conception, far more important to the artist than hue or chroma alone. Value includes not merely gray scale (bright – dull, light – dark, tints - shades) but also lighting, atmosphere and aerial perspective. The test of good value in a picture is whether or not the several component colors hold their proper position or planes in the picture space. Value and Tone are often used interchangeably.
Diff: APA, CGPS, OSA, USP-NF, cgps

—— APA
The dimension in the Munsell System of color which corresponds most closely to lightness.
Sim: CGPS, OSA, USP-NF, (Munsell value – OSA)
Diff: AAPL, cgps

—— CGPS (107)
(Munsell System) The estimated lightness of any colour on a scale of 10 equal sensation intervals extending from ideal black (value = 0) to ideal white (value = 10). The values of black and white in the Munsell Atlas are 1 and 9 respectively.

—— or VALUES cgps (210)
(Artist painters) This term is applied by different artists to describe different effects. The majority use the word to mean the adjustment of the individual colour areas of a painting as closely as possible to the lightness, independently of the hues, of the corresponding areas of the illuminated objects which are the subject of the painting. Thus, provided that the range of lightness in the original subject is not too great the artist holds it to be possible to match the lightnesses of all areas of his painted image exactly to those of the original. Alternatively, the word denotes the strength of colour sensation, and particularly of the psychological effect arising therefrom, associated with the perception of an area of colour considered always in relation to other coloured areas in a given combination. Thus, Cezanne is generally conceded to be a great master of colour values, but in a sense utterly different from that referred to in the first interpretation of the term given above. Other artists use the word to refer to the power of a given colour used in association with other colours to suggest three dimensional projection or recession of selected areas in the whole composition, and occasionally as indicating the psychological significance or insignificance of a selected area or aspect of the subject matter. Thus an important form or plane may be coloured in more vivid or pure colours than a plane of less importance. The judgment of relative significance may be based upon personal predeliction and a criterion of aesthetic logic peculiar to one artist only. Artists also speak of tactile colour values as denoting the power of colour to suggest solid form projected in three dimensional space.
Diff: AAPL, APA, CGPS, OSA, USP-NF

—— OSA, USP-NF
Same as Lightness.
See: Munsell Value.
Sim: APA, CGPS, USP-NF
Diff: AAPL, cgps

VALUE KEY AAPL
A particular relationship of values in a painting, lithograph, etching, etc., which is specified according to the dominant value and to the darkest and lightest values in the composition.

VALUE LEVEL AAPL
A horizontal cross section through the color solid on which all colors are of the same value.

VALUE SCALE AAPL
A series of visually equidistant neutral grays lying between black and white.

VARIATION FACTOR IES
Variation factor of an illumination installation is the ratio of either the maximum or minimum illumination on a given plane to the average illumination on that plane.

VARIATION RANGE IES
Variation range of illumination on a given plane is the ratio of the maximum illumination to the minimum illumination on that range.

VECTOR COLORIMETER OSA
Instrument developed by Guild in which the unknown color is matched separately by two different pairs of spectrum colors.
Note: No heterochromatic photometry is involved; see "Monochromatic-plus-white" Colorimeter.

VIBRATING AAPL
A term applied in pictures to a strongly marked, nervous living effect of colour, obtained by skillful contrasts.

*VIEWING CONDITIONS APA
Various conditions under which a visual observation is made including the size of the stimulus, characteristics of the surround, nature of the illuminant, area of the retina, etc.

*VIOLET APA
The hue attribute of visual sensations typically evoked by stimulation of the normal human eye with short-wave radiation around 433 mμ and shorter.

VISIBILITY APA
The capacity of radiant energy, within a certain range of wave-lengths, to excite a visual receptor process and thereby evoke the phenomenon of brightness.

VISIBILITY, IMAGE TAPPI
The ratio of the contrast between the white and black of the background for the transparent sheet in contact with the background to the contrast for the background alone.
The image visibility then becomes -

$$\text{Image Visibility} = \frac{S_w - S_b}{S'_w - S'_b} = \text{I.V.}$$

The prime notation refers to the brightness sensation of background alone.

VISIBLE APA
Capable of being seen, or represented in consciousness by the operation of the organs of vision.

VISION APA 1/
The sense whose receptive organ is the eye, whose normal stimulus is luminous energy, and whose response is color.

VISION, CENTRAL APA
Same as Vision, Foveal.

VISION, FOVEAL APA, osa
Visual sensation or perceptions due to stimulation of the fovea centralis, or center of the retina.
Contrast with peripheral vision.

VISION, INDIRECT APA, osa
Same as Vision, Peripheral.

VISION, PERIPHERAL APA, osa
Visual sensations or perceptions due to stimulation of the outlying portions of the retina.
Contrast with foveal vision.

VISION, PERSISTENCE OF APA, osa
The tendency of visual excitation to outlast the stimulus, or more generally the tendency of changes in visual sensory response to lag behind changes in the stimulus.

VISION, THEORY OF osa
A systematic attempt to account for the various phenomena of visual perception in relation to the known structure and functions of the visual organs.
Included by extension are the study of photoreceptors, the action of nerve-endings and of related nervous structures in general, responses to light in lower organisms, the higher psychological implications of light, color, form, and their spatial and temporal relations, etc. The anatomical and physiological basis may be, to a considerable extent, hypothetical, as is the case with the current theories of color vision. The leading theories are known as (1) Young-Helmholtz (three component); (2) Hering (antagonistic process); (3) Ladd-Franklin (genetic); (4) Von Kreis (duplicity); (5) Edridge-Green.

1/ osa — Same as APA, except that response is "color sensation."

VISUAL ACUITY APA
The capacity of the visual organ to resolve small space-intervals in the discrimination of form.
The threshold separation of two points or small spots is an inverse measure of acuity but many types of test objects are possible.

VISUAL ADAPTATION APA
Adjustive change in visual sensitivity due to continued visual stimulation or lack of stimulation. Three recognized types are: (1) scotopic or dark adaptation, (2) photopic or light adaptation, and (3) chromatic or color adaptation.

VISUAL ANGLE APA, osa
The angle subtended by any object of vision at the nodal point of the eye.
The magnitude of this angle determines the size of the corresponding retinal image, independently of the size or of the distance of the object alone.
The nodal point is about 7 mm. behind the corneal surface and about 17 mm. in front of the retina.

*VISUAL FIELD APA, osa
The visually perceived three-dimensional space-manifold which is developed from early localizing experiences of the individual and depends for its phenomenal presence at any given time, upon extended areal stimulation of the retina.
The visual field forms a subjective frame of reference for perceived objects, distances, movements, etc.
Also called subjective visual field, phenomenal field.

*VISUAL INDUCTION APA
The effect of stimulation from one part of the visual field upon the perceptual response referred to another part.
Cf. Brightness contrast, Chromatic contrast.

VISUAL PROCESS APA, osa
Any change or operation which occurs in vision, or (in certain contexts) the operation of vision in general.

VISUAL RESPONSE PROCESS OSA
Chain of events starting with the effect that occurs as a result of the absorption of the radiant energy of which the retinal image is composed, continuing inward along the afferent nerve fibers to the central nervous system and thence outward along the efferent nerve fibers terminating with the epithelial (that is either muscular or glandular) reaction and its effect on the organism or its environment.

VISUAL SENSITIVITY CGPS (23)
The ratio of luminous flux to radiant energy flux. Also called Luminosity, Luminosity factor, Luminous efficiency, Visual efficiency, Visibility, Visibility factor.
Sim: (luminosity factor — IES)

VISUAL SENSITIVITY FACTOR CGPS (25)
The spectral visual sensitivity for a given wavelength relative to the maximum.
Sim: (relative luminosity factor – IES)

VISUAL SPACE APA, osa
This term, like visual field, refers to the extended world as perceived by means of the eyes; but is commonly used in a more generic and abstract way in discussions of the perception of distance and length, of depth or distance away from the retina, and of form or figure in two and three dimensions.

VISUAL STIMULUS PROCESS OSA
Chain of events leading up to the formation of and including the image on the retina.

VIVID AATCC, TCCA
Bright (opposite of dull).
Sim: USP-NF, (rich – cgps)
Diff: cgps

—— cgps (134)
(Ordinary speech) Very bright. Also called Brilliant.
Diff: AATCC, TCCA, USP-NF

—— USP-NF
Very strong.
Sim: AATCC, TCCA, (rich – cgps)
Diff: cgps

VOLUME COLOR APA
Color seen as organized, transparent and filling a tri-dimensional space, viz., color in the volume or bulky mode of appearance.
Examples: block of clear ice, jar of jelly, room full of smoke.
Sim: (volume-color perception – OSA)

VOLUME-COLOR PERCEPTION OSA
Color perceived as belonging to a definite tridimentional space or volume.
Note: The volume mode of visual appearance has the attribute of transparency (excluding complete opaqueness) in addition to the attributes of color perception.
Sim: (volume color – APA)

W

WARM cgps (136)
(Ordinary speech) Of red to orange colour, or colours containing a marked predominance of red or orange.

WARM COLOR AAPL
Any color which produces in the observer a psychological reaction or impression of apparent heat is called a warm color, usually a color in which there are perceptible elements of redness; for example, the warmth of the red jacket against the cool colors of the shadows on the snow gave a telling note of contrast.
Sim: cgps

—— COLOUR cgps (223)
(Artist painters) The pure colours red, orange, yellow, or colours which exhibit a marked predominance of these. Thus, both purple and brown are warm.
Sim: AAPL

WARM GREY cgps (225)
(Artist painters) A grey exhibiting slight predominance of red, orange, yellow or purple.

WASH-BACK SMPE
A step in an imbitition type color process in which, after the matrix is dyed up, some of the dye is washed out before transfer.

WAVE-LENGTH apa
The distance, at any instant, between two adjacent crests (or identical phases) of a series of waves which are advancing through a uniform medium.
The wave-length varies inversely with the vibration rate, or number of waves passing any given point per unit period of time.

—— OSA, USP-NF
Distance transversed by the spectrally homogenseous radiant energy during a single period.
Sim: apa

WAVE-LENGTH HUE, or DOMINANT WAVE-LENGTH USP-NF
The wave-length of the homogeneous light which, when mixed in the correct proportions with a specified white light for the ICI standard observer gives a color match with the light considered.
To produce a color match with purple, the homogeneous light must be subtracted from the specified white light.
Sim: (dominant wave-length – CGPS, IES, OSA, apa)

WEAK AATCC, TCCA
The opposite of strong; appearance of one sample having been dyed with less dye than another.
Sim: CGPS
Diff: USP-NF (weak color – APA)

—— CGPS
1. (151) (Dyeing industry) Adjective applied to a colour produced by the application of a relatively small amount of dyestuff. Alternatively, to a dye possessing weak colouring power. Opposite of strong.
2. (183) (Printing industry) "Tinctorial strength": the degree to which a colour has to be "extended" (i.e., diluted) with white to match a given 'tint'. Usually used as a comparative term only, i.e. of two inks of similar hue one may be of greater tinctorial strength than the other. Opposite of strong.
Sim: AATCC, TCCA
Diff: USP-NF, (weak color – APA)

—— USP-NF
Characterized by low chroma or saturation; the opposite of strong.
Sim: (weak color – APA)
Diff: AATCC, CGPS, TCCA

WEAK COLOR APA
A color of low saturation.
Sim: (weak – USP-NF)
Diff: (weak – AATCC, CGPS, TCCA)

WEAKER CGPS (163)
(Paint and pigment industries) A difference apparently due to the presence of less colour than in the original sample. Opposite of Stronger.

WEBER'S LAW APA
The difference limen or the just noticeable increment of a stimulus, is proportional to the stimulus intensity.
In vision, the law is approximately verified over a wide range of luminances, but fails markedly at low luminances.
Sim: OSA

—— — OSA
The difference threshold is an approximately constant fraction of the stimulus quantity over a wide range.
Note: The extension of Weber's law made by Fechner is known as the Weber-Fechner law. It states that as the stimulus is increased arithmetically the sensation increases logarithmically. The validity of the Fechner extension is under serious doubt.
Sim: APA

WEDGE SMPE
An optical device composed of absorbing material in which the transmission varies progressively from point to point. Such a device may cause a variation in either hue or intensity, or both.

WEDGE SPECTROGRAM SMPE
A spectrogram produced by photographing a spectrum through a neutral wedge (sometimes an optical wedge), placed over the slit of the spectrograph. Such a spectrogram shows graphically the effective photographic sensitivity versus wavelength for the photographic material and light source used.

WHITE AAPL
The ideal white is obtained when a normally illuminated surface reflects all the light falling upon it.
Sim: APA, CGPS, TCCA, cgps, osa
Diff: AATCC

—— AATCC
Any one of a range of colors having an appearance similar to that of a perfectly diffusing surface.
Diff: AAPL, APA, CGPS, TCCA, USP-NF, cgps, osa

*—— APA, osa
An achromatic color of maximum lightness which represents one limit of the series of grays, and which is the complement or antagonist of black, the other extreme of the gray series.
White is typically evoked by any mixture of wave-lengths from a high-reflectance matt surface, which approximates average daylight or the equivalent color temperature; but white depends also upon surrounding contrast.
Sim: AAPL, TCCA, USP-NF, cgps
Diff: AATCC, CGPS

—— CGPS (55)
An achromatic sensation of relatively high luminosity.
Diff: AAPL, AATCC, APA, TCCA, USP-NF, cgps, osa

—— cgps (127)
(Ordinary speech) Not coloured and very light.
Sim: AAPL, APA, TCCA, USP-NF, osa
Diff: AATCC, CGPS

—— TCCA
A high-reflecting sample lacking all color.
Diff: AAPL, AATCC, APA, CGPS, USP-NF, cgps, osa

—— USP-NF
1. The hue attribute of visual sensations evoked by stimulation of the retina by a mixture of radiant energies of different wavelengths (usually of high intensities), approximating in physiological action that which is characteristic of daylight. (It constitutes the upper limit of the gray or achromatic series of colors. The complement of black.
2. One of the psychologically unique colors.
Sim: AAPL, APA, cgps, osa
Diff: AATCC, CGPS, TCCA

WHITE BODY CGPS (74)
Adjective applied to a secondary source which is non-absorbing at all visible wavelengths.

WHITE CONTENT CGPS (113)
(Ostwald System) W in the equation, W + B + C = 1, which Ostwald considered interprets the appearance of all related colours.
Sim: OSA

—— ——— OSA
Smaller of the two spectral reflectances in the ideal Ostwald surface color matching the sample.
Sim: CGPS

WHITE LIGHT SMPE
Radiant energy which has a wavelength-intensity distribution such that it evokes a neutral (hueless) sensation in the average normal eye.
Sim: (achromatic light — OSA), (achromatic stimulus — APA)

WHITE OBJECT SMPE
An object which reflects all wavelengths of the visible spectrum equally, an object which if illuminated by white light will appear without hue to the average normal eye.

*WHITENESS APA
Degree of approach to that extreme or limit of the series of grays which is known as white.
Sim: TAPPI, TCCA, osa

——— TAPPI, osa
The proposed definition of whiteness is -

$$\text{Whiteness} = (R - KS^2)^{1/2}$$

where

R = reflectivity

S = distance on the uniform-chromaticity scale diagram, between the point representing the standard white, and the point representing the sample, and

K = a constant which is found, from MacAdam's results on the whiteness grading of laundered white goods, to be 6700 when S^2 is measured as

$$\left(\frac{\Delta r}{}^2 + \frac{}{\Delta g}^2 + \frac{}{\Delta b}^2\right)$$

Δr, Δg, Δb being the corresponding differences in the trilinear coordinates.

Sim: APA, TCCA

——— TCCA
Suggesting white, as, for example, a very pale shade or tint of a color.

Sim: APA, TAPPI, osa

WHITER CGPS (158)
(Paint and pigment industries) A difference apparently due to the presence of more white than in the original sample. Opposite of Deeper.

WIDE-ANGLE DIFFUSION IES
Wide-angle diffusion is that in which light is scattered over a wide angle so that the diffusing medium appears of approximately the same brightness when observed from any angle.

Note: The particular degree of diffusion exhibited by a sample can be represented by plotting on a polar diagram the values of brightness obtained by measurements at different angles.

WIEN DISPLACEMENT LAW IES
The Wien displacement law is an expression representing, in a functional form, the spectral radiant intensity of a blackbody as a function of the wavelength (or frequency) and the temperature.

$$J_\lambda / A' = N_\lambda = c_1 \lambda^{-5} f(\lambda T)$$

The two principal corollaries of this law are:

$$\lambda_m T = \text{constant}$$

$$J_m / (A' T^5) = \text{constant}$$

which show how the maximum spectral radiant intensity J_m, and the wavelength λ_m at which it occurs, are related to the absolute temperature T.

Note: A' is the projected area of the radiating aperture. The numerical values of the two constants are now somewhat uncertain. The present International Temperature Scale makes $\lambda_m T$ equal 0.2884 cm deg K, (or 2884 micron deg K), but 0.2892 is more nearly correct. $J_m/A'T^5 = 4.13 \times 10^{-12}$ watt cm^{-3} steradian $^{-1}$ deg K^{-5}.

Diff: (Wien's displacement law — OSA)

WIEN RADIATION LAW IES
The Wien radiation law is an expression representing approximately the spectral radiant intensity of a blackbody as a function of its wavelength (or frequency) and temperature. It is commonly expressed by the formula:

$$J_\lambda / A' = N_\lambda = c_{1N} \lambda^{-5} e^{\frac{-c_2}{\lambda T}}$$

This law is accurate to 1 percent or better for values of T less than 3000 micron degrees Kelvin.

Sim: (Wien's law — OSA)

WIEN'S DISPLACEMENT LAW OSA
The wave-length for which the spectral emittance of a blackbody is a maximum is inversely proportional to its absolute temperature.

Diff: (Wien displacement law — IES)

WIEN'S LAW OSA
Spectral emittance of a blackbody is inversely proportional to the fifth power of the wave-length, and to the expression, $\exp(-C_2/T)$, where T is absolute temperature.

Note: Wien's law holds only for small values of T.

Sim: (Wien radiation law — IES)

WINDOW GLASS IES
Window glass is transparent, relatively thin, flat glass having glossy, fire-finished, apparently plane and smooth surfaces, but having a characteristic waviness of surface which is visible when viewed at an acute angle or in reflected light.

WOLLASTON PRISM OSA
Polarizing prism consisting of two calcite wedges cemented together so that the ordinary and extraordinary rays are equally deviated from the direction of incidence, one to one side and one to the other.

WORKING STANDARD IES
A working standard is any standardized luminous source for daily use in photometry.

Y

*YELLOW APA, osa
1. The hue attribute of visual sensations typically evoked by stimulation of the normal human eye with radiation of wave-length approximately 582 millimicrons.
2. Any color manifesting a hue predominantly similar to that of the typical yellow. (The complement of blue.)

Sim: USP-NF

——— USP-NF
1. The hue attribute of visual sensations typically evoked by stimulation of the normal retina with radiation of wave-length approximately 578 millimicrons.
2. Any color manifesting a hue predominantly similar to that of the typical yellow. (The complement of blue.)
3. One of the psychologically unique colors.

Sim: APA, osa

YELLOWING FPVPC
The color change of white or light-colored paints produced by oxidation of the vehicle in the absence of light. It occurs when such paints are stored in the dark, or when they are heated.

YELLOW-SIGHTED APA, osa
Characterizing a heightened color sensitivity for yellow, or a tendency to see all objects tinged with yellow.
The phenomenon occurs (1) in individuals who possess a peculiar pigmentation of certain tissues of the eye, (2) in normal individuals following blue-adaptation, or (3) following the use of certain drugs.

YELLOW SPOT APA
Same as Macula.

YOUNG-HELMHOLTZ THEORY APA
A theory which seeks to explain the phenomena of color vision on the assumption of three independent component mechanisms (or processes) in the retina or its attached nervous apparatus, these mechanisms, when separately aroused (chiefly by radiant energy of corresponding regions in the spectrum) giving rise to the colors, red, green, and blue, respectively, all other colors including yellow, purple, and white or gray, being due to various combinations of the three component activities.

Z

ZONAL CANDLEPOWER IES, osa
The (mean) zonal candlepower of a lamp is the average candlepower of the lamp over a given zone. It is equal to the luminous flux in that zone divided by the solid angle of the zone.

THE AMERICAN ARTISTS PROFESSIONAL LEAGUE

The terms and definitions for this society were first compiled by the Subcommittee from the following sources:

1. Culver, Byron. A Dictionary of Important Terms. Rochester, N. Y. : School of Applied Art, Rochester Athenaeum and Mechanics Institute, 1935.

2. Adeline. Art Dictionary. London: D. Appleton and Co., 1910, pp. 422.

3. Judson, J. A. V. A Handbook of Colour, including the Ostwald theory and its practical application. Leicester: The Dryad Press, 1935.

4. Graves, Maitland. The Art of Color and Design. New York: McGraw-Hill Book Co., 1941, pp. 292.

5. A list of Ostwald terms and definitions submitted by Walter C. Granville, Member of the ASTM delegation.

6. Suggestions and advice from the following artists: Milton Bond of Rochester Institute of Technology, Arthur Pope of Harvard University, and James Watts of Eastman Kodak Company.

7. Letter from J. S. Williams, former Chairman of the AAPL delegation, to S. M. Newhall.

After a preliminary editing the list was sent to Alon Bement, Chairman of the AAPL delegation, who approved the list.

absorb
achromatic
advancing colors
aerial perspective
analogous colors
analogous harmony
balance
black
blended colors
body-color
chalky
chiaroscuro (chiarooscuro)
chroma
chromatic
clarity of color
coat
color
color attributes
color balance
color chart
color interval
color notation
color scale
color standard
color symbolism
color tree, sphere, or solid
coloring
colorless
complement
complementary
complementary color
contrast of colors
cool color
dark clear series
depth of color
direct light
discord
distemper
dominant
dominant harmony
effect
elements
equal-greyed color circle
equal-shade circle
equal-tint circle
faded
flat
flat lighting
form
full color
general color
gilding
gouche
gray
greyed color
half-tone
harmonic color
harmonious hues
harmony
heighten
high key
high light
hue
hue circuit
hue key
hue, value, chroma
intensity
intermediate key
irradiation
isochromes
isotint series
isotone series
isovalent colors
juicy or fat color
light (adj)
light (n)
light clear series
light colors
lights
livid color
local color
local tone
low key
lower register
luminosity
luminous
major
major hues
matt
middle-tint
minor
monochromatic
monochrome
natural luminosity
neutral
neutral tone
neutralize
opalescent
opaque
pearly color
perception
pigment neutralizers
polychromy
primary colors
principal hues
prismatic colors
pure color
pure-color circle
purity
reflected light
reflection
relative colors
reticence
retreating colors
rutilant
satiny
saturation
scumbling
secondary colors
secondary light
semi-transparent
shade
shaded
shadow
shadow series
shot color
simplified single-hued triangle
single-hued harmony
single-hued triangle
sober
sombre
split complements
sustained
temperate hues
tender
tertiary colors
texture
thin or stingy color
tint
tinted
tinting power
tonality
tone
toned down
tranquil
triad
triadic
truculent
upper register
valuable discord
value
value key
value level
value scale
vibrating
warm color
white

AMERICAN ASSOCIATION OF TEXTILE CHEMISTS AND COLORISTS

The compilation of this list was under the direction of E. I. Stearns, Chairman of the AATCC delegation and member of Subcommittee 6. The list was formulated by the Committee on Color of the AATCC by reviewing and correcting the 1939 Comparative List of Color Terms and adding new words and definitions. The final copy was checked and approved by the delegation chairman, who added the 12 secondary (indented) terms.

Unindented: Terms approved by the AATCC Committee on Color (indicated in the unified list by the upper-case initials, AATCC).

Indented: Additional terms having to do with color but on which the committee did not act (indicated in the unified list by the lower-case initials, aatcc).

back grey
barre, barry
black liquor
bleach
bleed
bloom (bloomy)
blotchy
bluing
blurry
bright
brightness
bronzy
cast
chatters
clean, clear
cloudy
crock
dark
dichroism
dichromatism
dingy
downhand
dull (dullness)
duochroism
duotonic
dusty, dust-tone
even
fast
fiery
fire
flat
fugitive
grey
halo effect
heterochromic
hue
hungry
jet
level
light (adj.)
luster
marking-off
masstone
mealy
monotonic
mottled
neutralize
nicks
off-shade
overhand
overlook perspective
picking-off
resist
shade
shade, full
shade, heavy
shade, light
shade, medium
shade, mode
shade, pastel
shaded
skitteriness
snaps
solid color
somber
specky
spotty
streaks
streaks, streaky
strength
strong
thin
through-look perspective
throwster colors
timber
tinctorial power
tippy wool
tone
two-sided
undertone
vivid
weak
white

AMERICAN CERAMIC SOCIETY

The terms for this member society are taken from a paper, Color Terms in the Ceramic Industry, by Richard S. Hunter, Chairman of the American Ceramic Society delegation to the ISCC. Section V of this paper, "The ceramist's color terms", is printed below and the three dimensions of color as the ceramist uses the concept comprise the word list itself. Mr. Hunter approved this use of his paper.

THE CERAMIST'S COLOR TERMS

The ceramist's dimensions of color are those he encounters in dealing with ceramic materials. The ceramist deals with white materials, colored materials and frequently black materials which he uses separately or mixes in varying proportions to produce his colored ware. Different ingredients, different mixtures, and different production methods produce ware of different colors. The ceramist's thinking about color develops from his experience with these sources of color variation.

What are the terms ceramists used to describe these colored materials and the differences between them? In a survey made in 1940 by the ISCC Delegation of the American Ceramic Society, about twelve widely used terms were singled out for study. It was found that the definitions prepared for each of these terms used others of the same group of terms. Thus the survey of 1940 furnished a series of interrelated definitions that do not of themselves provide satisfactory meanings for the ceramist's dimensions of color.

In preparing definitions for the color terms widely used by the ceramist, the writer has related them to the terms of color science and shown how the ceramist's dimensions of color fit into color space. We know from measurements of colored ceramic materials (and of other materials which behave in the same manner) how the colors of these materials vary in the color solid. The directions of color change of these materials are found to fit into the color solid. Instead of the color scientists' dimensions of hue, lightness and saturation, the dimensions

familiar to the ceramist are hue, depth and cleanness.

Hue is the same in both sets of dimensions. Because of the limited variety of ceramic coloring materials the ceramist is not able to reproduce all the hues that the color scientist describes, but the ceramist nevertheless has no difficulty in appreciating the dimension of hue.

The other two dimensions of the color scientist, lightness and particularly saturation are harder for the ceramist to understand. They are not dimensions commonly met in dealing with ceramic materials. The ceramist usually colors his ware by mixing a white and a colored ingredient, or colorant. As more colorant is added to the mixture with white, the resulting ware becomes simultaneously darker and more saturated in color. The dimension of divergence from white is called "depth of color". The depth dimension is roughly a diagonal in the color scientist's space.

Unfortunately, the dimension of depth is not a straight line in color space. For any mixture of given white and colorant, one starts at pastel and goes to darker and more saturated colors as he increases the proportion of colorant till he reaches some mixture giving maximum saturation. With proportions of colorant greater than those for maximum saturation the resulting ware is darker, but less saturated in color than that prepared with mixtures of lesser depth. A good cobalt, for instance, will give a bright blue color when mixed with proper proportion of white, but this same cobalt gives a much darker, but unsaturated color when no white is used.

The factors responsible for the shape and location in the color solid of the curve representing change of depth with changing proportions of white and colorant are many and complex. They depend on the nature of the white as well as that of the colorant. They depend on grinding conditions, firing conditions and many other factors. Use of the term depth is by no means limited to describing changes of color produced by changing proportions of ingredients in mixtures of colorants and whites. It is used to compare nearly identical colorants, in which case the terms strength and tinting strength may be synonyms for depth, and to describe other changes and differences in color of like appearance.

The ceramist's third dimension of color, cleanness, has a direction roughly at right angles in the color solid to the dimension of depth. To add dirt or gray to a color mixture will generally make it both darker and less saturated. Conversely a colored object that is both lighter and more saturated than another appears the cleaner of the two.

This dimension of cleanness is of immense practical interest to the ceramist. Cleanness is what customers pay for. Ware with dirty color must be avoided whether the dirty appearance arises from inferior ingredients or improper handling of good ingredients. As with depth, the dimension of cleanness usually takes a diagonal direction in color space and this direction may vary from one situation to another.

It was indicated above that the ceramists use a number of different words in talking about the dimensions of color. Depth of color has its opposite, paleness or pastel, and cleanness has its opposite in dirtiness. For each of these terms there are moreover other terms used in nearly, if not exactly, the same sense. From results of the survey and from conversations with ceramists, the writer believes the following to be the proper arrangement of terms for the foregoing dimensions of color and their synonyms:

Hue, (color, tone)

Depth, (intensity, strength)
Pastel, (paleness, tint)

Cleanness, (brilliance, purity, brightness)
Dirtiness, (muddiness, dullness)

The first term in each of the above lines is not necessarily the most popular term. It is instead the term which most clearly identifies the corresponding dimension. Meanings that differ from those above are quite frequently applied to the terms which follow in parentheses. In particular the meanings for intensity, strength, brilliance, and brightness seem to be poorly established or frequently confused by ceramic technologists.

Better definitions are obviously needed. The following definitions for these dimensions are suggested:
(1) Hue is defined as that attribute of a colored object by which it is identified as red, green, blue, purple, or the like.
(2) Depth is defined as departure of a colored object from white and is frequently associated with either concentration or efficiency of a coloring agent.
(3) Cleanness is defined as freedom of a colored object from grayness.

AMERICAN PHARMACEUTICAL ASSOCIATION, NATIONAL FORMULARY
See U. S. Pharmacopoeial Convention.

AMERICAN PSYCHOLOGICAL ASSOCIATION

The APA list consists of revisions of relevant definitions from Warren's Dictionary of Psychology and the 1939 Comparative List of Color Terms together with various new terms and definitions which have become necessary. A number of adaptations of OSA definitions were included; adaptation was necessary to secure conformation with the psychological concept of color. The APA list was arranged by Sidney M. Newhall, Chairman of the APA delegation, with the assistance of Harry Helson, member of the APA delegation, and Robert W. Burnham member of the American Psychological Association. All other members of the APA delegation also were requested to send in any terms and definitions which in their judgment should be considered for inclusion in the list.

Unindented: Terms considered to be primarily psychological in either origin or usage and to be accepted by psychologists (indicated in the unified list by the upper-case initials, APA).

Indented: Words not primarily psychological in origin or meaning but used and understood by psychologists (indicated in the unified list by the lower-case initials, apa).

accommodation
achromatic
achromatic color
*achromatic stimulus
achromatopsia
*adaptation
adaptometer
after-image
after-image, negative
after-image, positive
*albedo
*albedo perception
amaurosis
amblyopia
angle of incidence
angle of reflection
angle of refraction
angles of displacement
anomaloscope
anomalous trichromatism
attributes of color
attributes of sensation
Aubert-Förster law
Aubert-Förster phenomenon
Bezold-Brücke phenomenon
binocular color mixture
binocular flicker
binocular fusion
binocular rivalry
binocular vision
*black
blackbody radiation
blending
blind spot
*blue
blue arc phenomenon
blue-sighted
blue-yellow blindness
bright
*brightness
brightness contrast
brightness threshold, absolute
†brilliance
bulky color
campimeter
candle
candle, new
candlepower
Charpentier's bands
chroma
chromatic aberration
chromatic adaptation
chromatic color
chromatic contrast
chromatic flicker
*chromatic valence
*chromaticity
*chromaticity diagram
*chromaticness
chromatopsia
chromesthesia
*color
color attributes
color blindness
*color circle
color constancy
*color conversion
*color deficiency
color mixture
color-mixture data
color sensation
color shades
color solid
*color stimulus
†color surface
color temperature
color tints
color triangle
color vision
color vision, theory of
color weakness
color zones
*colorants
colored hearing
colored shadow phenomenon
*colorimeter
*colorimetric primaries
*compensation
complementary color
*complementary wave-length
cone, retinal
constancy
constancy hypothesis
contrast
contrast flicker
†cortical gray
critical flicker frequency
*cyan
Daltonism
dark
dark adaptation, darkness adaptation
dark-adapted eye
day-blindness
*depth contrast
deuteranomalous trichromat
deuteranomaly
deuteranope
deuteranopia
dichromat
dichromatism
difference limen
diffusion circle
dimensions of color
dimming effect
dominant wavelength
duplicity theory
Emmert's law
episcotister
erythrogenic radiations
erythropsia
extraspectrum hue
†fatigue, retinal
*fatigue, visual
Fechner's law
Fechner's paradox
figure
film color
flicker, flicker phenomenon
flicker photometry
flight of colors
footcandle

footlambert
fovea
*fundamental colors
*fundamental response curves
*fundamental response processes
glitter
glossiness
*gray
*green
ground
halo
Hering after-image
Hering gray
Hering theory of vision
heterochromatic photometry
Holmgren test
Horner's law
horopter
hue
identical points
idioretinal light
*illuminance
illuminant color
illumination color
*illumination flicker
illumination, law of
image, optical
image, retinal
induced color
inducing color
*insistence
*invariable hues
irradiation
just noticeable difference
Ladd-Franklin theory of color vision
lambert
light (adj.)
light (n.)
light-adapted eye
light sensation
light waves
lightness
limen
*located color
lumen
luminance
*luminosity
*luminosity coefficients
*luminosity curve
*luminous
luminous flux
luminous intensity
luster
lux (meter candle)
macula, macula lutea
*magenta
marginal contrast
Maxwell disks
median gray
memory color
*mesopic vision
*metallic color
*metameric colors
*metamerism, metameric
*micro-structure
mirrored color
mode of appearance
mode of appearance, attribute of
monochromatic vision
monochromatism
monochromator
*Munsell book notation
*Munsell color notation
*Munsell colors
*Munsell renotation
nodal point
normal (optics)
object color
Ostwald colors
paracentral vision
perception
perimeter
*perimetry
periphery of retina
phenomenal regression
phosphene
photochromatic interval
photometer
photometric measure
photometry, visual
†photon
*photopic adaptation
photopic vision
photoreceptive (or photo-receptor) process
photoreceptor
primary colors
*primary hues
primary position
*pronouncedness
protanomalous trichromat
protanomaly
protanope
protanopia
pseudo-isochromatic charts
psychic blindness
psychological primaries
pure color
purity
Purkinje after-image
Purkinje phenomenon
purples
radiant energy
Rayleigh equation
recurrent image
recurrent vision
*red
red-green blindness
red-sighted
reduced color
reduced eye
reflected color
retina
*retinal field
*retinal illuminance
retinal oscillations
retinal rivalry
retinal zones
retinitis pigmentosa
Ridgway colors
rod, retinal
rod vision
saturation
saturation scale
scotopic adaptation
scotopic vision
sensation
shade
sight
snow-blindness
*sparkle
spectrometer
spectrophotometer
spectroscope
spectrum
spectrum colors
spectrum line
*standard observer
*stimulus field
strong color
*surface color
*synesthesia
tetartanopia
three-component theory
threshold
tint
*transformation
*transparent surface color
trichromat
trichromatic theory
trichromatic vision
trichromatism
trireceptor theory
tritanomaly
tritanope
tritanopia
*troland
ultra-violet
valence, chromatic
value
*viewing conditions
*violet
visibility
visible
vision
vision, central
vision, foveal
vision, indirect
vision, peripheral
vision, persistence of
visual acuity
visual adaptation
visual angle
*visual field
*visual induction
visual process
visual space
volume color
wave-length
weak color
Weber's law
*white
*whiteness
*yellow
yellow-sighted
yellow spot
Young-Helmholtz theory

AMERICAN SOCIETY FOR TESTING MATERIALS

The ASTM list was arranged by M. Rea Paul, Chairman of the ASTM delegation, with the assistance of Walter C. Granville, member of the ASTM delegation and Secretary of ASTM Committee D-1, Subcommittee X. Mr. Granville suggested a secondary list of terms and definitions which are given here as secondary (indented) terms.

Unindented: Terms from the published list of ASTM standard definitions, (indicated in the unified list by upper-case initials, ASTM).

Indented: Terms of the suggested definitions mentioned above (indicated in the unified list by the lower-case initials, astm).

absence-of-bloom gloss
  bleach
bleeding
  bronzy
color
contrast gloss
distinctness-of-image gloss
  dull
  ghosting
hue
lightness
luminous directional reflectance
  masstone
  matte or mat
opacity
pigment
  print tone
  rub-out
saturation
  separation
shade
  shade
sheen
specular gloss
surface-uniformity gloss
tint
  tone
total luminous reflectance
  undertone

COLOUR GROUP OF THE PHYSICAL SOCIETY (LONDON)

The terms in this list were obtained from the final draft (May 1947) of the Report on Colour Terminology by a Committee of the Colour Group of the Physical Society. This report was sent to us through the courtesy of Mr. R. G. Horner, Secretary of the Subcommittee on Colour Terminology, in response to our request through Dr. W. D. Wright.

This report is a compilation of color terms used by various branches of industry and science which deal with color. The definitions are presented with considerable discussion of the various correlations between the usage by the different industries. Our policy in editing the report was to omit these discussions and present only the definitions. In some instances, however, the discussion so clarified the definitions that we included it with the definition. The discussions were also of assistance in listing synonyms. All the definitions we have used from this report are labelled (in the definition only) as to the industry concerned.

In classifying these terms with respect to primary and secondary status, we have followed the usage on the British list, which proves to be similar to ours. Thus, below, we have not indented (upper-case) to designate "terms preferred by the Subcommittee" (p. 4). Indentation (lower-case) is used to designate terms "not considered essential" or "deprecated" (p. 4). Words given preferred position in the British list are used in this individual list, while alternative words are listed as synonyms in the unified list. The report states, "No recommendations have been attempted in Section V, Ordinary Speech, and Section VII, Terms used by Contemporary Artists." These two groups of terms we have entered in the present list as secondary (indented) terms.

The British list is now published with a number given to each definition. These numbers have been added to each CGPS reference, and corrections made to agree with the published report. Copies of the British report (1948) may be obtained from The Physical Society, 1 Lowther Gardens, Prince Consort Road, London, S. W. 7 (7s. net).

absorption factor
absorptivity
achromatic colour (or sensation)
additive mixture
additive primaries
additive process
alychne
anomalous trichromatic vision
basic stimulus
black
  black
black body
black content
bright
  bright
brightness
  brightness
brilliant

candle
cardinal stimuli
chalky
  †chiaroscuro
  chord
chroma
chromatic colour or sensation
chromaticity
  clean
cleaner
clear
colour
  colour
colour balance
colour separation
colour temperature
colour threshold
colorimetry purity
coloured
  coloured
colourless
complementary colours
  complementary colours
  cool
  cool colour
  cool grey
  dark
darker
decolorized
  deep
deeper
defective colour vision
  degraded colour
degraded colours
density
desaturated colours
deuteranomalous vision
deuteranopia
dichroism
dichromatic vision
diffuse reflection
diffuse transmission
direct (regular, specular)
    reflection
direct (regular) transmission
dirtier
discoloured
  discord
distribution cosfficients
  dominant hue
dominant wavelength
dull
  dull
dullness
equal energy source
excitation purity
extinction coefficient
full colour
full colour content
full radiator
grey
  grey
grey body
  harmony
high
hue
  hue
ideal full colours
illumination
instrumental stimuli
internal absorption factor
internal density
internal transmission factor
  iridescent
isochromes
isotints
isotones
isovalent colours
  key
light (n.)
  light (adj.)
  light (n.)
  light and shade
lighter
lightness
  local colour
low
lumen
luminance
luminance factor
luminosity
  luminosity
luminous emittance
luminous flux
luminous intensity
mass-tone
minus colours
mixed reflection
mixed transmission
monochromatic vision
neutral
neutral body or neutral
    grey body
normal trichromatic vision
off-white
opacity
  pale
  pastel
perfect diffuser
photopic vision
preferential reflection
preferential transmission
primary colours
  primary colours
primary light source
protanomalous vision
protanopia
psychological isochromes
  pure
Purkinje effect
quality
reflection factor
reflectivity
related colours
  rich
saturation
  scale
scotopic vision
  secondary colours
secondary light source
shade
  shade
shadow series
  shot
solarized
sombre
spectral visual sensitivity
standard illuminant
strength
strong
stronger
subtractive mixture
subtractive primaries
subtractive process
surface colour
  tertiary colours
tinge
  tinge
tint
  tint
tone
  tone
transmission factor
transmissivity
transmittancy
trichromat
trichromatic coefficients
trichromatic coordinates
trichromatic inks
trichromatic system
tritanonalous vision
tritanopia
uncoloured
undertone
uniform diffuser
unitary stimuli
unrelated colour
value
  values
visual sensitivity
visual sensitivity factor
  vivid
  warm
  warm colour
  warm grey
weak
weaker
white
  white
white body
white content
whiter

FEDERATION OF PAINT AND VARNISH PRODUCTION CLUBS

Mr. Francis Scofield, Chairman of the FPVPC delegation to the ISCC, compiled this list by reviewing the 1939 word list and adding a number of new terms. All FPVPC words have been listed as primary terms and appear in the unified list accompanied by the upper-case initials, FPVPC.

bloom (bloomy)
blue
blushing
bronzy
cast
chroma
clean, clear
color
color chip
color standard
colorimeter
dark
dingy
dull
egg shell
fading
fast
flat
gloss
gray
green
hiding power
luster
masstone
orange peel
rubout
semigloss
shade
sheen
tint
tint tone
undertone
yellowing

ILLUMINATING ENGINEERING SOCIETY

The compilation of the IES list was under the direction of Norman Macbeth, Chairman of the IES delegation to the ISCC. Most of the terms were taken directly from Illuminating Engineering Nomenclature and Photometric Standards, ASA Z7.1-1942. There was in addition a list of proposed terms prepared by the IES Committee on Nomenclature. All IES words submitted have been listed as primary terms and appear in the unified list accompanied by the upper-case initials, IES. Proposed new terms are marked with an asterisk (*). Those on which changes have been made or suggested in a report by the committee on nomenclature under the chairmanship of A. F. Parker and presented to the I.E.S. Council, December 1948, are followed by the code number given for the term in Illuminating Engineering Nomenclature and Photometric Standards (ASA Z7.1-1942). Suggested revisions for the added color terms are included in the text, and are indicated by terms in parentheses in the list below. See Addenda, pages vi to x, for list of definitions for these suggested changes and information concerning them, including a detailed list of revisions.

absorptance (30.131, luminous absorptance)
absorption factor (30.130, internal luminous transmittance)
*achromatic locus
alabaster glass
antique glass
apparent candlepower
asymmetrical light distribution
blackbody
*blackbody locus
brightness (05.065, luminance)
brightness ratio (05.090, luminance ratio)
candle (05.025)
candlepower
cased glass
characteristic curve
*chromaticities of ICI standard illuminants (luminators)
*chromaticities of other important illuminants (luminators)
*chromaticity
*chromaticity diagram
coefficient of utilization
*color
*color-mixture data
*color-mixture data for the spectrum
*color temperature (25.030)
*colorants
*colorimetric purity
*colors of objects
comparison lamp
comparison of sources (40.090)
*complementary wavelength
complete diffusion
configurated glass
curve of horizontal distribution
curve of light distribution
curve of vertical distribution
decorated glass
diffuse reflection (30.080, regular or specular reflection
diffuse reflection factor (30.095, diffuse reflection)
diffuse transmission (30.105, luminous transmittance)
diffuse transmission factor (30.120, diffuse transmission)
diffused illumination
diffusing surfaces and media
*dominant wavelength
downward flux
efficiency of a source of light
electric discharge lamp
electric filament lamp
enameled glass
equal-area web
*excitation purity
fluorescent lamp
footcandle (05.040)
footlambert (05.085)
globe
graybody
headlamp or headlight
hemispherical candlepower
hemispherical ratio
homogeneous glass
*ICI chromaticity diagram
*ICI standard color-mixture data for the spectrum
*ICI standard illuminants (luminators) for colorimetry
*ICI standard trichromatic coordinates
illumination (05.035, illuminance)
*indirect colorimetry
irradiancy (10.045, delete)
isocandle diagram
isocandle line
isolux diagram (40.081)
isolux line (40.080)
lambert (05.080)
lamp (25.005)
life tests
light (n.)
lumen
lumen-hour
luminaire
*luminosity coefficients
luminosity factor
luminosity efficiency (05.105)
luminous flux
luminous intensity
lux (05.045)
mat-surface glass
mean horizontal candlepower (25.040)
multidirectional illumination
narrow-angle diffusion
opal glass
opalescent glass
outline lighting
partial or incomplete diffusion
perfect diffusion
performance curve
phot (05.050)
photometric tests (40.095)
Planck radiation law
polished plate glass
power input
primary luminous standard
prismatic glass
projector
*purity
*purple boundary
quantity of light (05.055)
radiant energy

radiant energy density (10.020)
radiant flux (10.015)
radiant flux density (10.025)
radiant intensity (10.030)
redirecting surfaces and media
reflection factor, or reflectance (30.100, diffuse luminous reflectance)
reflector
refractor
regular or specular reflection (30.080, luminous reflectance)
regular reflection factor (30.090, regular luminous reflectance)
regular transmission (30.110)
regular transmission factor (30.115, regular luminous transmittance)
relative luminosity factor
scattering surfaces and media
secondary standard
*selected ordinate method of colorimetric calculation
shade
solid of light distribution
specific consumption
spectral emissivity
spectral radiant energy
spectral radiant intensity
*spectrum locus
spherical candlepower
spherical reduction factor
Stefan-Boltzmann law
steradiancy (10.040, radiance)
stilb (05.075)
symmetrical light distribution
temperature radiator (10.050)
test lamp
*three-color mixture
total emissivity
total flux
*transformation of color-mixture data
transmission factor (30.125, diffuse luminous transmittance)
transmittance
transparent glass
*trichromatic coordinates (20.026, chromaticity coordinate)
unidirectional illumination
units of brightness (05.070, luminance)
units of wavelength
upward flux
variation factor
variation range
wide-angle diffusion
Wien displacement law
Wien radiation law
window glass
working standard
zonal candlepower

OPTICAL SOCIETY OF AMERICA

Deane B. Judd, Chairman of the OSA delegation to the ISCC, compiled the list of this member body. He checked through the 1939 list, making corrections as needed. He also added a great number of new terms and definitions. Dr. Judd writes in the preface of his report, "Special acknowledgment is due to Dr. D. L. MacAdam whose list of terms and definitions prepared for the considerations of the IES Committee on Nomenclature and Standards has been drawn upon freely." Dr. Judd approved the final copy.

Unindented: Primarily OSA terms and definitions, (indicated in the unified list by the upper-case initials, OSA).

Indented: Words not primarily OSA words, but which seem to be in accord with OSA usage, (indicated in the unified list by the lower-case initials, osa).

absorptance
absorptivity
achromatic color
achromatic light
achromatic point
achromatic region
achromatic stimulus
  achromatopsia
aeolotropic material
  after-image
anisotropic material
  anomalous trichromatism
aperture-color perception
  apparent candlepower
  apparent luminous reflectance
  Arny solutions
  artificial daylight
  attributes of sensation
  barrier-layer cell
Beer's law
biaxial crystal
  binocular flicker
  binocular fusion
  binocular vision
  black
  black content
blackbody
blackbody locus
blackbody temperature
  bleach
  blind spot
  blue
  blue arc phenomenon
  blue-sighted
bolometer
Bouguer's law
Brewster's law
brightness
brightness purity
brightness temperature
†brilliance
  bulky-color perception
Callier coefficient
  candle
candle, new
chroma
chromatic color
  chromatic flicker
chromaticity
chromaticity coordinates
chromaticity diagram
chromaticness
chromaticness scales
  CIE
color
color blindness
color comparator
color deficiency
  color mixture
color-mixture data
color-mixture data for the spectrum
color perception
  color pyramid
  color sensation
  color solid
color temperature
color triangle
  color vision, theory of
  color weakness
  color zones
colorants
colorimeter
colorimetric purity
  comparison lamp
complementary color
complementary wave-length
complete radiator
conjunctive wave-length
  constancy
continuous spectral distribution
contrast-ratio

photometer, integrating (lumenmeter)
photometer, physical
photometric measure
photometry, visual
photopic vision
photoreceptive process
photoreceptor
photovoltaic detector
Planckian locus
Planckian radiator
Planck's law
plane of polarization
plane of vibration
polarizing angle
positive crystal
primary colors
primary luminous standard
prolate crystal
protanomalous trichromat
protanomalous vision
protanomaly
protanope
protanopia
protanopic vision
pseudo-color temperature
pseudo-isochromatic charts
psychic blindness
psychical response
psychophysical measurements
purity
Purkinje after-image
Purkinje phenomenon
purple boundary
quantity of light
quarter-wave plate
radiance
radiant density
radiant emittance
radiant energy
radiant flux
radiant intensity
radiant power
radiant reflectance
radiant transmittance
radiation
radiation temperature
radiator
Rayleigh equation
Rayleigh's law of scattering
reciprocal color temperature
recurrent vision
red-green blindness
red-sighted
reflectance
reflectivity
regular density
regular transmittance
retinal illuminances
retinal image
retinal oscillations
retinal rivalry
retinal zones
Rochon prism
rotatory dispersion
sample point
saturation
saturation scale
scotopic adaptation
scotopic vision
secondary standard
selected ordinate method of colorimetric calculation
selective absorber
selective radiator
selective scattering
semichrome
sensation
shade, light
shade, pastel
shadow series
sight
Snell's law
snow-blindness
spectral centroid
spectral color
spectral composition
spectral distribution
spectral emissivity
spectral reflectance
spectral transmittance
spectrograph
spectrometer
spectrophotometer
spectroscope
spectrum color
spectrum locus
specular reflectance
spherical candlepower
spotty
Stefan-Boltzmann law
stilb
surface-color perception
tetartanopia
thermal radiation
thermocouple
three-component theory
threshold
tinctorial power
total color blindness
total emissivity
transformation of color-mixture data
transmissivity
transmittance
transmittancy
transparency
trichromat
trichromatic coefficients
trichromatic colorimeter
trichromatic coordinates
trichromatic vision
trichromatism
trireceptor theory
tristimulus values
tritanomaly
tritanope
tritanopia
tritanopic vision
troland
true temperature
turbid media
Tyndal effect
undertone
uniaxial crystal
unidirectional illumination
uniform-chromaticity-scale diagram
unitary hue
value
vector colorimeter
vision
vision, foveal
vision, indirect
vision, peripheral
vision, persistence of
vision, theory of
visual angle
visual field
visual process
visual response process
visual space
visual stimulus process
volume-color perception
wave-length
Weber's law
white
white content
whiteness
Wien's displacement law
Wien's law
Wollaston prism
yellow
yellow-sighted
zonal candlepower

SOCIETY OF MOTION PICTURE ENGINEERS

Ralph M. Evans, Chairman of the SMPE delegation to the ISCC, supplied and approved this list.

absorption band of a color filter
additive process
additive synthesis
artificial light
beam-splitter
bipack
bleach
bleach-out process
bleeding of color
carbon printing
carbon transfer process
chemical toning
chromatic aberration
chromoscope
color balance
color developer
color negative
color photography
color positive
color process
color screen
color sensitivity, photographic
color separation
color specification
color transparency
contamination
continuous spectrum
contrast, color
daylight
density
developed color images
dichroic
dichroic filter
dye density
dye impurities
dye mordanting
dye toning
dye up
elements of a screen-plate or lenticular color film
embossing
filter
filter cut
filter factor (filter ratio)
filter overlap
fringe
gelatin filter
gray key image
hypersensitization
imbibition
imbibition matrix
interference colors
isopaque curve
lake
lenticulation
leuco-base
light restraining dye
line-screen process
mask
matte
Maxwell experiment
minus color
mirror, semi-transparent
mosaic screen plate
motion fringe
neutral color
neutral wedge
optical wedge
orthochromatic
orthochromatic emulsion
orthochromatic photography
pan
panchromatic
parallax
pigment
positive
primary colors
print
prismatic spectrum
quality of radiation
ratio diaphragm cap
ratiometer
register
relief process
resist
reversal process
sensitizers
soft gelatin process
spectral composition of radiation
spectral sensitivity
spectral transmission of a filter
spectrogram
spectrophotometer
spectroscope
spectrum
subtractive primaries
subtractive process
tanning developers
three-color process
tinting
toning
transfer process
tricolor filter
tricolor ratio
tripack process
two-color process
wash-back
wedge
wedge spectrogram
white light
white object

TECHNICAL ASSOCIATION OF THE PULP AND PAPER INDUSTRY

A. H. Croup, Chairman of the TAPPI Optical Properties Committee and of the TAPPI delegation to the ISCC, compiled this list. He added the term "gloss" to the list, although the definition of the term is now being revised by the TAPPI Optical Properties Committee. Richard S. Hunter supplied the definition for "gloss" which is listed as a lower-case TAPPI word. Mr. Croup checked and approved the final copy.

bleach
brightness
color fastness
color of pulp and paper
fade, fading
fast
fugitive
gloss
opacity
reflectivity, spectral
transmittance - parallel and total
transparency ratio
two-sided
visibility, image
whiteness

TCCA
USP

THE TEXTILE COLOR CARD ASSOCIATION OF THE UNITED STATES, INC.

The compilation of this list was under the supervision of Mrs. Margaret Hayden Rorke, Chairman of the TCCA delegation to the ISCC. For the greater part of the TCCA list, the terms and definitions are identical with those of the American Association of Textile Chemists and Colorists. Corrections and additions have been made where necessary to make definitions agree with TCCA usage.

barre, barry
bleach
bleed
bloom (bloomy)
blotchy
blurry
bright
brightness
bronzy
cast
clean, clear
cloudy
crock
dark
dingy
downhand
dull, dullness
dusty, dust-tone
even
fast
flat
fugitive
grey
hungry
jet
light (adj.)
luster
mealy
mottled
off-shade
overhand
resist
shade
shade, full
shade, heavy
shade, light
shade, medium
shade, mode
shade, pastel
shaded
solid color
specky
spotty
streaks, streaky
strength
strong
thin
tinctorial power
tone
two-sided
undertone
vivid
weak
white
whiteness

U. S. PHARMACOPOEIAL CONVENTION and AMERICAN PHARMACEUTICAL ASSOCIATION, NATIONAL FORMULARY

This list was compiled by Kenneth L. Kelly, Chairman of the American Pharmaceutical Association—National Formulary and the U. S. Pharmacopoeial Convention delegations to the ISCC. Mr. Kelly revised the 1939 list and added a number of new terms and definitions to bring the list up to date.

achromatic
achromatic color
Army solutions
black
blue
brilliant
brown
chroma
chromatic color
chromaticity
color, colour
color attributes
color, classes of
color, cycle
color mixture
color solid
color, unique
colorimeter
complementary color
dark
darkness
deep
diffused illumination
dusky
faint
gray
green
hue
ISCC-NBS color designation
light (adj.)
lightness
medium
medium gray
moderate
Munsell book notation
Munsell chroma
Munsell color system
Munsell hue
Munsell notation
Munsell renotation
Munsell value
olive
orange
pale
pink
purple
red
saturation
strong
surface color
value
vivid
wave-length
wave-length hue, or dominant wave-length
weak
white
yellow

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E. Q. Adams	A. E. Parker
Josephine Grove Brennan	E. I. Stearns
Harry Helson	

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R. S. Hunter	A. E. Parker	

Problem 14, A Study of Transparent Standards Using Single-Number Specification: Robert H. Osborn, Chairman

Blanche R. Bellamy	N. J. Kreidl	Procter Thomson
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