Subject Index

A ASTM Standards on color and Appearance Measurement, 2 Adaptation effects, 102 Autocorrelation analysis, 76 Air contamination, evaluation of, 1 ANLAB color difference formula, 37 Aperture, 5; illustration, 6 B Appearance Brightness, 97 evaluation of. 1 heterochromatic, 92-102; illustraof food colors, 62-68 tion, 100 measurement principles, 2, 50 relationship between luminance modes, 5-13 and perceived, 3, 92-102; ilaperture, 5; illustration, 6 lustration, 100 illuminant, 6; illustration, 6 visual judgment of, 14 object, 6-7; illustration, 6; Brightness efficiency function, 94-95 table, 8 Brightness judgments, 92, 93, 97, and perception, 1-2, 14-32 101 of retroreflectors, 49-61 use of technology in minimizing disorientation effect, 69-77 C Application-oriented goniophotometry, measuring ap-Cartesian coordinate system, 52 Chroma, weighting of, 36-37 pearance of retroreflectors by, 49-61 Chromaticity coordinates, 54 Application parameter, 52, 53, 55, in CIE system of colorimetry, 33 69, 70-73 CIE Applied Color Systems (ACS), 80 on color difference evaluation, 33-ASTM standards 39 D 1729: 1 on hetrochromatic brightness, 92-D 523: 3, 26 D 2244: 3 CIE chromaticity diagram, 33 D 3134: 3 CIELAB formula, 34-35, 36, 38 E 167: 51 CIELUV formula, 34-35, 37, 38, 63-E 179: 51 E 808: 51, 54; illustration, 54 Coefficient of retroflection, illlustra-E 809: illustration, 57 tion, 57

tion, 86, 88, 89, 90; table, 84, 85 Contrast, 73 Contrast gloss, 15
Deflection factors, 5-13 Depth perception, and minimization of disorientation effect, 69-77 Diffuse color measurements, 13 Diffuse reflection, 7 D/0°/geometry versus 0°/45° for,
9-10; table, 8 Directionality, 15 Disorientation effect, use of appearance technology in minimizing, 69-77 Disperse dyes, use of, in dying poly-
ester fabrics, 40-48; table, 41, 42, 44, 45, 46, 47 Distinctness-of-image gloss, 15 $D_{\text{SEX}}/0^{\circ}$ geometry, 10, 13 $D_{\text{SIN}}/0^{\circ}$ geometry, 10, 13
Duro-Test, Inc., 83 Dye(s) accuracy of extraction, 40-41 analysis of polyester fabrics, 40- 48; table, 41, 42, 44, 45, 46,
47 and color quality control, 4 E
Entrance angle, 51 Escalator treads appearance of, 70-73; illustration, 71, 72 evolution of design of, 70 use of appearance technology in minimizing disorientation effect on, 4, 69-77

F

Fabric dyeing (See Dyes)
Filters, appearance of, and air contamination, 1
Fish, measurement of color on, 64
Fluorescents, 2
Foods, measurement of color on, 4, 62-68
Fruits, measurement of color on, 65-66

G

German Deutsche Industrie Norm (DIN) color system, 79 Gloss, 3 (See also Specular reflection) evaluation of, 1, 2, 5-13 experimental verification of color relationships, 10, 12; illustration, 11, 12 psychometric scaling of, 3, 14-32; illustration, 18, 20, 21, 22, 23, 24, 28, 29; table, 19, 25, 27 types of, 14-15 visual scale of, 31 Glossimetry, 26-27, 30-31 Goniophotometry application-oriented, 51-52 traditional, 51 Goodness criterion, 75-77 Grains, measurement of color on, 64 - 65

H

Helmholtz reciprocal relation, 9
Heterochromatic brightness, 92102; illustration, 100
Highlighting, 70
Hue indices, weighting of, 36-37

I

Illuminant, 6; illustration, 6 (See also Luminance)
INDSCAL, use of, in analysis of gloss data, 17-18, 20, 21, 22, 26; il-

data, 17-18, 20, 21, 22, 26; illustration, 21, 23, 24; table, 19, 25

Induction effects, 102

Industrial applications, of visual color technology, 78-91; illustration, 86, 88, 89, 90; table, 84, 85

Internal reflection, 7
International Commission on Illumination (See CIE)

J-K

JPC79, 37 KYST, use of, in analysis of gloss data, 17, 18, 20-21, 22; illustration, 18, 22, 23; table, 19, 25

L

Lightness, weighting of, 36-37
Local coordinate system, 52, 53-54
Luminance
pattern of, in excalator tread, 71;
illustration, 72
relationship between perceived
brightness and, 3, 92-102; illustration, 100
sign, 55, 60; illustration, 59
Luminance autocorrelation, 76
Luminance conversion function, 99

M

Luster, 15

Macroscopic surface properties, 15 Maxwell spinning disk, 4, 80-81 Meats, measurement of color on, 63-64

Metamerism, 83

Metamers, 70

Methods for Instrumental Evaluation of Color Differences of Opague Materials (D 2244), 3

MINISSA-1 (M), use of, in analysis of gloss data, 17, 21-22

Multidimensional scaling (MDS), 17

(See also INDSCAL; KYST; MINISSA-1(M); PINDIS)

Munsell color book, 79

N

National Institute of Industrial Technology (INTI), measurement of color on foods at, 62-68

Nondestructive tests, use of, in dye analysis, 40-41

Nonenzimatic browning, 63, 66

0

Object mode, 6; illustration, 6; table, 8 submodes of, 6 Observation angle, 51 Orange peel, 15

P

Packaging, selecting colors for, 4
Perception, and appearance, 1-2,
14-32
Periodicity, 71
Photodetectors, 94
Photoelectric instruments, use of, in
appearance evaluation, 1
PINDIS, use of, in analysis of gloss
data, 17; illustration, 22, 24,
28-29; table, 19, 25

Polyester fabrics, colorimetric determination of dye content on, 40-48; table, 41, 42, 44, 45, 46, 47

Psychometrics, 14-32

Psychometric scaling, of gloss, 3, 14-32

R

Recommended Practice for Selecting and Defining Color Gloss Tolerance of Opaque Materials for Evaluating Appearance (D 3134), 3

Reflected light, 7

Reflection (See also Diffuse reflection; Specular reflection)

geometric conditions for the measurement of color, 7, 9

Reflection haze, 15

Replicate option, 17-18

Retroreflectance. See Retroreflectors

Retroreflection (See Retroreflectors)
Retroreflectors

measuring appearance of, by application-oriented goniophotometry, 3-4, 49-61

visual appearance of, 55-60

coefficient of retroreflection, illustration, 57

headlamp angle, illustration; 58 headlamp luminous intensity, illustration, 59

measuring angle, illustration, 55, 56, 57

sign luminance, illustration, 59 Retroreflector measurement geometry, 54

Rotation angle, 51

S

Safety, use of appearance technology in minimizing disorientation effect on excalator treads, 4, 69 - 77Sensory Evaluation of Appearance of Materials, 2 Sheen, 14 Sign luminance, 55, 60; figure, 56-59 Soxlet extractions, of dyes, 40-41 Spatial frequency, 71-73 Spectrophotometry, 80 and color analysis, 80 and dye analysis, 40-48 Spectral reflection, 50 Spectral responsivity, 50 Spectrophotometer geometry illustration 3, 11 Specular gloss, 14 Specular reflection, 3, 7, 10, 14; table. 8 Standard observation of color, 80 STP 297, 5 Swedish "Natural Color" system, 79

T

Textiles, role of color as marketing factor, 4
Texture, 15
Tristimulus values, in CIE system of colorimetry, 33

U

Uniform diffusion, 9

V

Vegetables, measurement of color on, 66 Visual Color System (VCS), 82, illustration, 88, 89, 90 design elements, 83-88 lighting system, 83; table, 84 object, 83-87; illustration, 86; table, 85 operation and logic, 87-88 performance, 88-90 practical use of, 90-91 Visual color technology, industrial applications of, 78-91; illustration, 86, 88, 89, 90; table, 84, 85 Visual depth illusion, 70, 73-75 Visual gloss scales, 1, 3 Volume-color mode, 7

W-Y

Wallpaper illusion, 73, 74 Yerba Mate, measurement of color on, 66