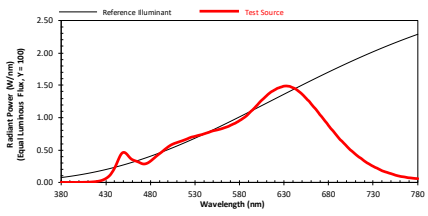
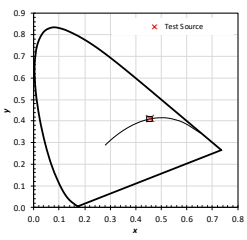
This sheet displays several graphical results related to the ANSI/IES TM-30-18 calculations initiated on the *Calculator* sheet. For detailed numerical results, see the *Results Numerical* sheet. For printable reports, see the *Simple Report*, *Intermediate Report*, or *Full Report* sheets.

Test Source and Reference Illuminant



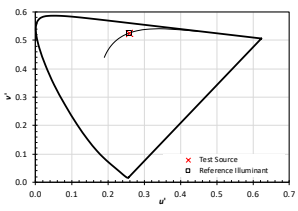
Spectral Power Distribution Comparison

Each SPD has been normalized so that the luminance factor (Y) is 100, as is done in IES TM-30 calculations.



Chromaticity Comparison (CIE 1931)

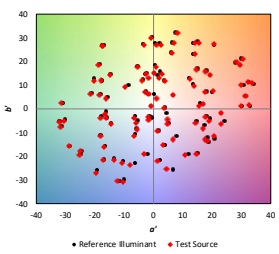
The CIE 1931 Standard 2° Colorimetric Observer is used for calculations.



Chromaticity Comparison (CIE 1976)

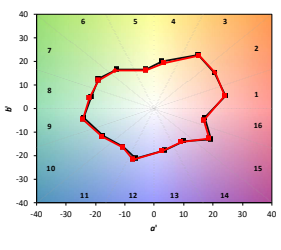
The CIE 1931 Standard 2° Colorimetric Observer is used for calculations.

TM-30 Calculation Visualizations



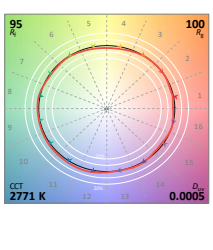
Shift in Hue-Chroma Plane

The (a', b') coordinates of CAM02-UCS are calculated for each of the 99 CES under the test and reference conditions. R_f is based on the average color difference of the 99 CES in CAM02-UCS (also including the J' dimension). [Background is for visual orientation only]



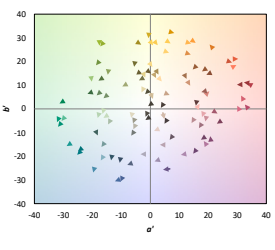
Hue-Angle Bin Average Coordinates

The average (a', b') coordinates of CAM02-UCS are calculated for the CES within each of 16 hue-angle bins. R_g is based on the area of the polygons for the test and reference conditions. The three types of "Local" values are based on the difference in coordinates for each hue-angle bin. [Background is for visual orientation only]



Color Vector Graphic

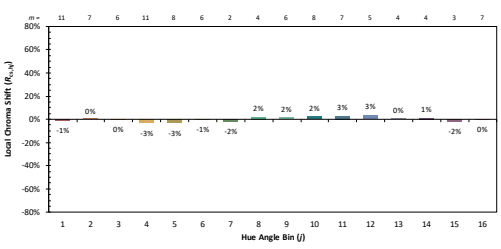
The Color Vector Graphic (CVG) shows a normalized version of the average change in (a', b') coordinates of CAM02-UCS for the CES within each hue-angle bin. Alternative versions of the CVG are available in the *CVG* sheet. Elements of this graphic can be turned on or off using the menu on the Main sheet (requires recalculation). [Background is for visual orientation only]



Vector Shifts

Each of the 99 pairs of test and reference coordinates can be plotted as a vector. This chart does not show the J' dimension, which is also included in color fidelity calculations. *[Coloring* is for visual orientation only]

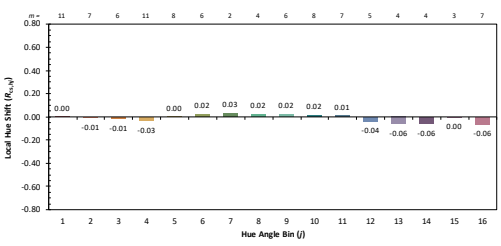
Color Rendition by Hue-Angle Bin



Local Chroma Shift

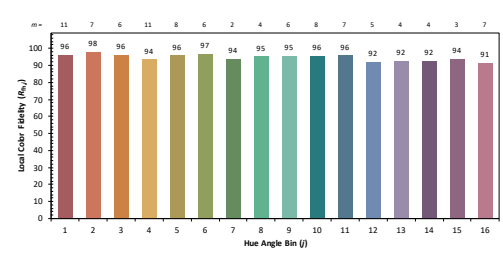
Local Chroma Shift is determined from the average radial change for the color evaluation samples within each hue-angle bin. Chroma shift is a funciton of absolute chroma, so Local Chroma Shift values are represented as a percentage. The number of samples per bin (m), which can vary based on the CCT used for the calculation, is shown at the top. [The colors of the bars are for visual orientation only.]

Bin (j)	Hue Angle
1	0.0°-22.5°
2	22.5° - 45.0°
3	45.0° - 67.5°
4	67.5° - 90.0°
5	90.0°-112.5°
6	112.5°-135.0°
7	135.0°-157.5°
8	157.5°-180.0°
9	180.0°-202.5°
10	202.5°-225.0°
11	225.0°-247.5°
12	247.5°-270.0°
13	270.0°-292.5°
14	292.5°-315.0°
15	315.0°-337.5°
16	337.5°-360.0°



Local Hue Shift

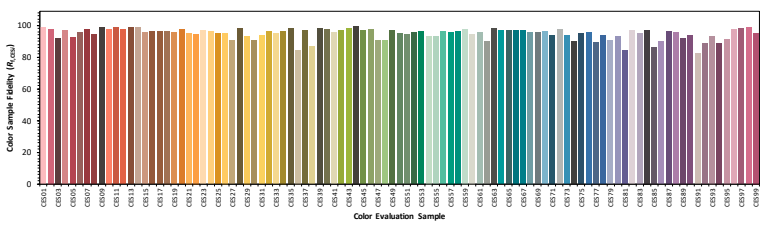
Local hue shift is deteremined from the average change perpendicular to the hue-angle bin for the color evaluation samples within each hue-angle bin. The number of samples per bin (m), which can vary based on the CCT used for the calculation, is shown at the top. [The colors of the bars are for visual orientation only.]



Local Color Fidelity

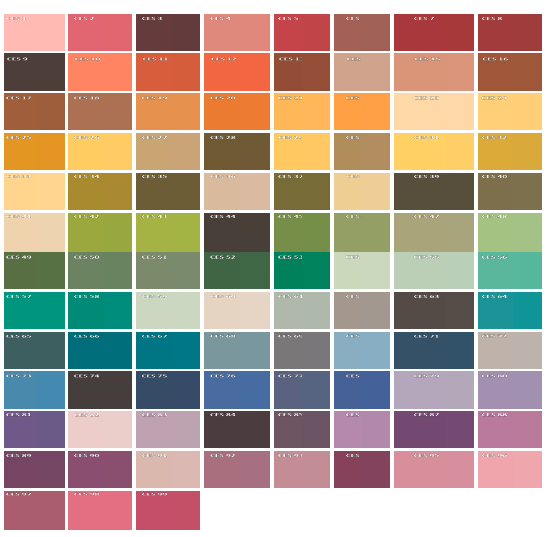
Local Color Fidelity is the average difference in CAM02-UCS for the color evaluation samples in each hue-angle bin. The number of samples per bin, which can vary based on the CCT used for the calculation, is shown at the top. [The colors of the bars are for visual orientation only.]

Color Rendition by Color Evaluation Sample (CES)



Sample Color Fidelity

Color fidelity can be calculated for each color evaluation sample. [The colors of the bars are for visual orientation only.]

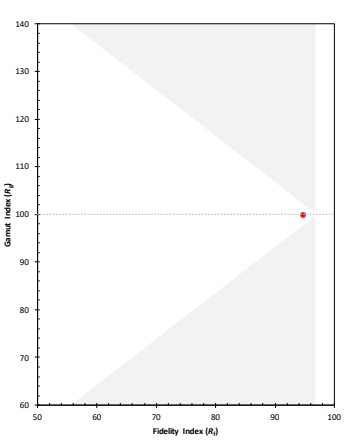


Visualiztion (Approximate)

WARNING: The colors in this graphic will not update unless the option is selected prior to calculation (*see Main* sheet). The colors shown are approximate and depend on proper monitor calibration. Some colors may be outside of the gamut of the monitor, and will not be displayed accurately. For each sample, the color on the left represents the reference source, and the color on the right represents the test source.

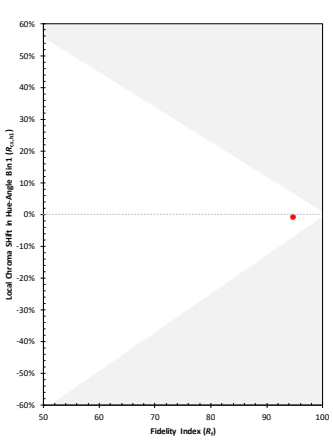
Ref | Test

Measure Comparisons



Gamut Index vs. Fidelity Index

The range in possible R_g values increases as R_f decreases. The gray shaded area indicates the approximate region of combinations that are not possible for nominally white light sources.

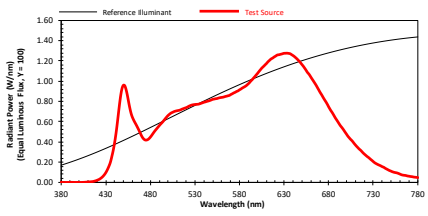


Local Chroma Shift in Hue-Angle Bin 1 vs. Fidelity Index

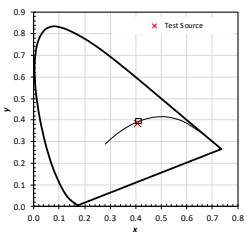
The range in possible $R_{CH,1}$ values increases as R_f decreases. The gray shaded area indicates the approximate region of combinations that are not possible for nominally white light sources.

This sheet displays several graphical results related to the ANSI/IES TM-30-18 calculations initiated on the *Calculator* sheet. For detailed numerical results, see the *Results Numerical* sheet. For printable reports, see the *Simple Report*, *Intermediate Report*, or *Full Report* sheets.

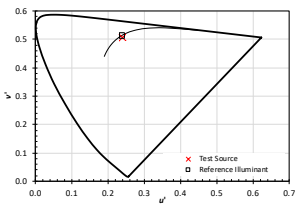
Test Source and Reference Illuminant



Spectral Power Distribution Comparison
Each SPD has been normalized so that the luminance factor (Y) is 100, as is done in IES TM-30 calculations.

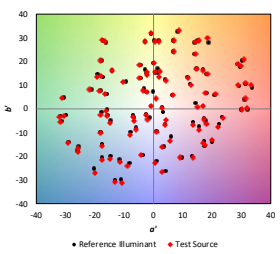


Chromaticity Comparison (CIE 1931)
The CIE 1931 Standard 2° Colorimetric Observer is used for calculations.

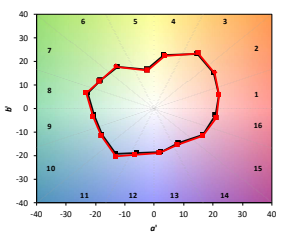


Chromaticity Comparison (CIE 1976)
The CIE 1931 Standard 2° Colorimetric Observer is used for calculations.

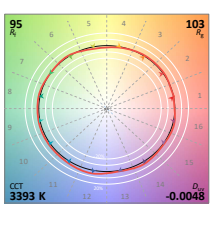
TM-30 Calculation Visualizations



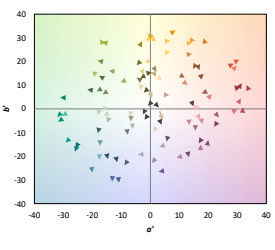
Shift in Hue-Chroma Plane
The (a', b') coordinates of CAM02-UCS are calculated for each of the 99 CES under the test and reference conditions. R_f is based on the average color difference of the 99 CES in CAM02-UCS (also including the J' dimension). [Background is for visual orientation only]



Hue-Angle Bin Average Coordinates
The average (a', b') coordinates of CAM02-UCS are calculated for the CES within each of 16 hue-angle bins. R_g is based on the area of the polygons for the test and reference conditions. The three types of "Local" values are based on the difference in coordinates for each hue-angle bin. [Background is for visual orientation only]

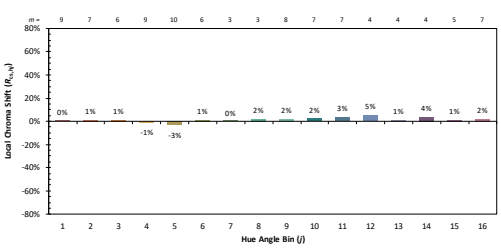


Color Vector Graphic
The Color Vector Graphic (CVG) shows a normalized version of the average change in (a', b') coordinates of CAM02-UCS for the CES within each hue-angle bin. Alternative versions of the CVG are available in the *CVG* sheet. Elements of this graphic can be turned on or off using the menu on the Main sheet (requires recalculation). [Background is for visual orientation only]

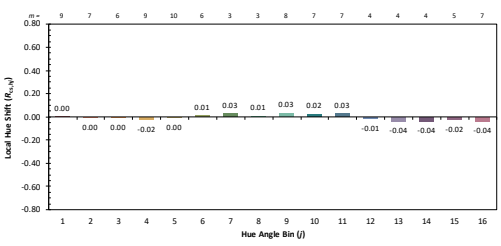


Vector Shifts
Each of the 99 pairs of test and reference coordinates can be plotted as a vector. This chart does not show the J' dimension, which is also included in color fidelity calculations. *[Coloring* is for visual orientation only]

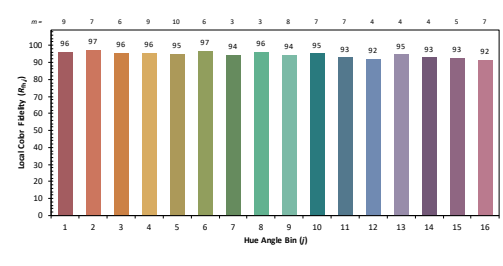
Color Rendition by Hue-Angle Bin



Local Chroma Shift
Local Chroma Shift is determined from the average radial change for the color evaluation samples within each hue-angle bin. Chroma shift is a funciton of absolute chroma, so Local Chroma Shift values are represented as a percentage. The number of samples per bin (m), which can vary based on the CCT used for the calculation, is shown at the top. [The colors of the bars are for visual orientation only.]



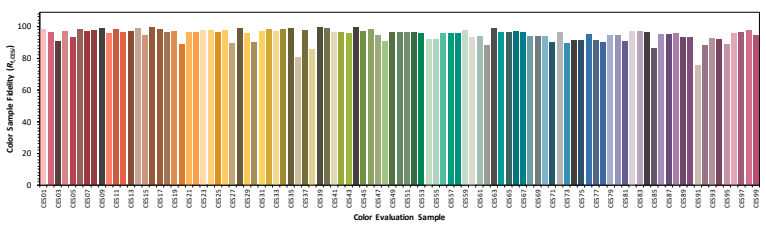
Local Hue Shift
Local hue shift is deteremined from the average change perpendicular to the hue-angle bin for the color evaluation samples within each hue-angle bin. The number of samples per bin (m), which can vary based on the CCT used for the calculation, is shown at the top. [The colors of the bars are for visual orientation only.]



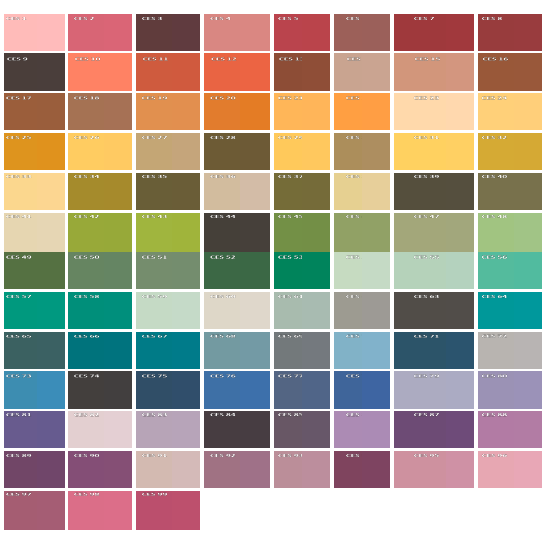
Local Color Fidelity
Local Color Fidelity is the average difference in CAM02-UCS for the color evaluation samples in each hue-angle bin. The number of samples per bin, which can vary based on the CCT used for the calculation, is shown at the top. [The colors of the bars are for visual orientation only.]

Bin (j)	Hue Angle
1	0.0°-22.5°
2	22.5° - 45.0°
3	45.0° - 67.5°
4	67.5° - 90.0°
5	90.0°-112.5°
6	112.5°-135.0°
7	135.0°-157.5°
8	157.5°-180.0°
9	180.0°-202.5°
10	202.5°-225.0°
11	225.0°-247.5°
12	247.5°-270.0°
13	270.0°-292.5°
14	292.5°-315.0°
15	315.0°-337.5°
16	337.5°-360.0°

Color Rendition by Color Evaluation Sample (CES)



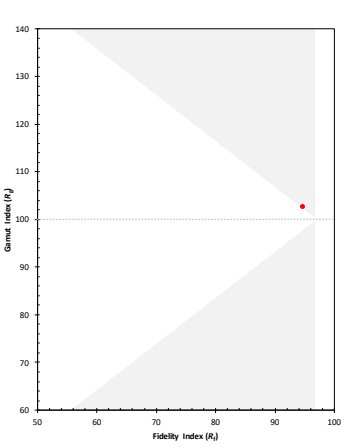
Sample Color Fidelity
Color fidelity can be calculated for each color evaluation sample. [The colors of the bars are for visual orientation only.]



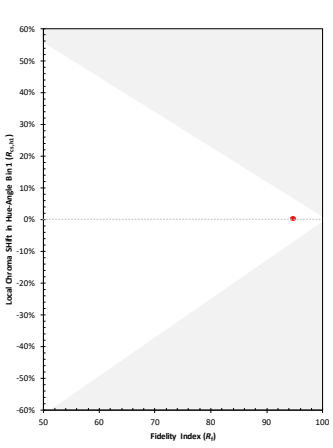
Visualiztion (Approximate)
WARNING: The colors in this graphic will not update unless the option is selected prior to calculation (*see Main sheet*). The colors shown are approximate and depend on proper monitor calibration. Some colors may be outside of the gamut of the monitor, and will not be displayed accurately. For each sample, the color on the left represents the reference source, and the color on the right represents the test source.

Ref | Test

Measure Comparisons



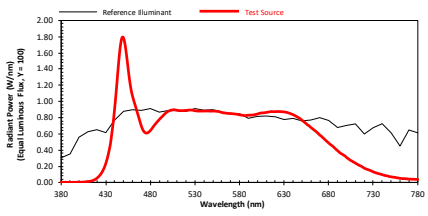
Gamut Index vs. Fidelity Index
The range in possible R_g values increases as R_f decreases. The gray shaded area indicates the approximate region of combinations that are not possible for nominally white light sources.



Local Chroma Shift in Hue-Angle Bin 1 vs. Fidelity Index
The range in possible $R_{CS,h1}$ values increases as R_f decreases. The gray shaded area indicates the approximate region of combinations that are not possible for nominally white light sources.

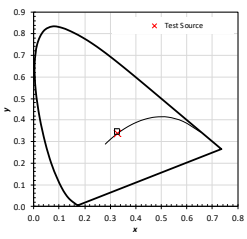
This sheet displays several graphical results related to the ANSI/IES TM-30-18 calculations initiated on the *Calculator* sheet. For detailed numerical results, see the *Results Numerical* sheet. For printable reports, see the *Simple Report*, *Intermediate Report*, or *Full Report* sheets.

Test Source and Reference Illuminant



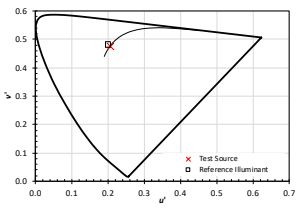
Spectral Power Distribution Comparison

Each SPD has been normalized so that the luminance factor (Y) is 100, as is done in IES TM-30 calculations.



Chromaticity Comparison (CIE 1931)

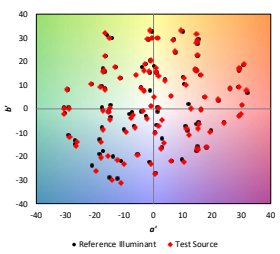
The CIE 1931 Standard 2° Colorimetric Observer is used for calculations.



Chromaticity Comparison (CIE 1976)

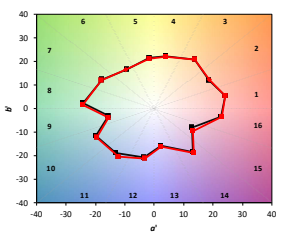
The CIE 1931 Standard 2° Colorimetric Observer is used for calculations.

TM-30 Calculation Visualizations



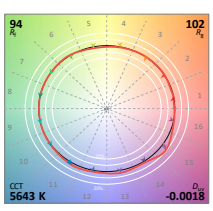
Shift in Hue-Chroma Plane

The (a', b') coordinates of CAM02-UCS are calculated for each of the 99 CES under the test and reference conditions. R_f is based on the average color difference of the 99 CES in CAM02-UCS (also including the J' dimension). [Background is for visual orientation only]



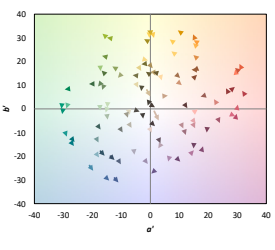
Hue-Angle Bin Average Coordinates

The average (a', b') coordinates of CAM02-UCS are calculated for the CES within each of 16 hue-angle bins. R_g is based on the area of the polygons for the test and reference conditions. The three types of "Local" values are based on the difference in coordinates for each hue-angle bin. [Background is for visual orientation only]



Color Vector Graphic

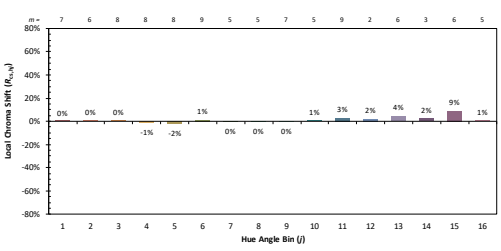
The Color Vector Graphic (CVG) shows a normalized version of the average change in (a', b') coordinates of CAM02-UCS for the CES within each hue-angle bin. Alternative versions of the CVG are available in the *CVG* sheet. Elements of this graphic can be turned on or off using the menu on the Main sheet (requires recalculation). [Background is for visual orientation only]



Vector Shifts

Each of the 99 pairs of test and reference coordinates can be plotted as a vector. This chart does not show the J' dimension, which is also included in color fidelity calculations. *[Coloring* is for visual orientation only]

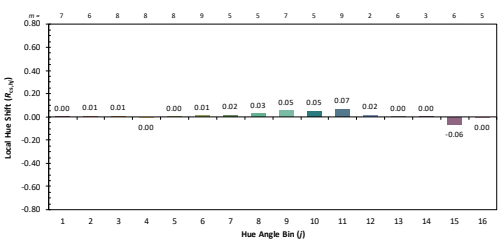
Color Rendition by Hue-Angle Bin



Local Chroma Shift

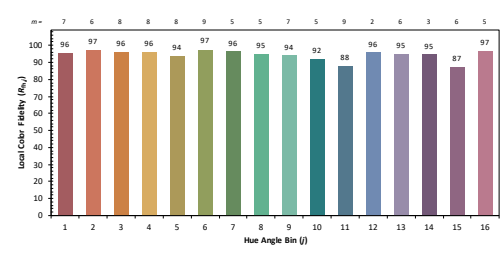
Local Chroma Shift is determined from the average radial change for the color evaluation samples within each hue-angle bin. Chroma shift is a funciton of absolute chroma, so Local Chroma Shift values are represented as a percentage. The number of samples per bin (m), which can vary based on the CCT used for the calculation, is shown at the top. [The colors of the bars are for visual orientation only.]

Bin (j)	Hue Angle
1	0.0°-22.5°
2	22.5° - 45.0°
3	45.0° - 67.5°
4	67.5° - 90.0°
5	90.0°-112.5°
6	112.5°-135.0°
7	135.0°-157.5°
8	157.5°-180.0°
9	180.0°-202.5°
10	202.5°-225.0°
11	225.0°-247.5°
12	247.5°-270.0°
13	270.0°-292.5°
14	292.5°-315.0°
15	315.0°-337.5°
16	337.5°-360.0°



Local Hue Shift

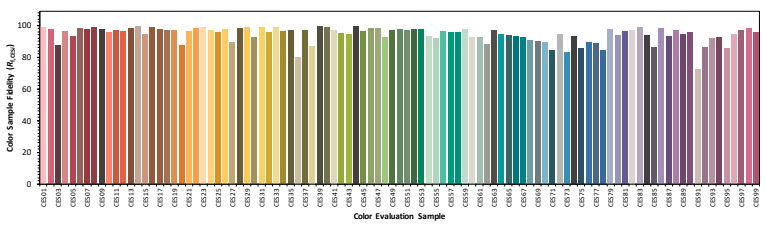
Local hue shift is deteremined from the average change perpendicular to the hue-angle bin for the color evaluation samples within each hue-angle bin. The number of samples per bin (m), which can vary based on the CCT used for the calculation, is shown at the top. [The colors of the bars are for visual orientation only.]



Local Color Fidelity

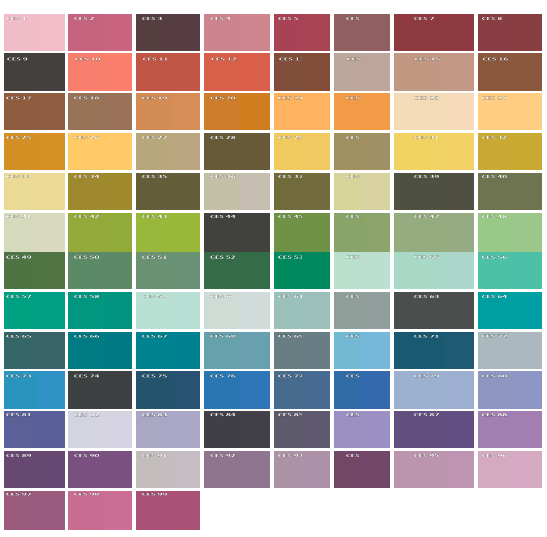
Local Color Fidelity is the average difference in CAM02-UCS for the color evaluation samples in each hue-angle bin. The number of samples per bin, which can vary based on the CCT used for the calculation, is shown at the top. [The colors of the bars are for visual orientation only.]

Color Rendition by Color Evaluation Sample (CES)



Sample Color Fidelity

Color fidelity can be calculated for each color evaluation sample. [The colors of the bars are for visual orientation only.]

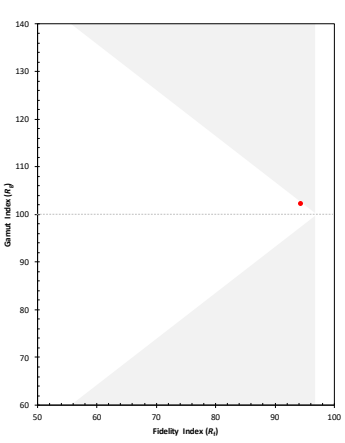


Visualiztion (Approximate)

WARNING: The colors in this graphic will not update unless the option is selected prior to calculation (*see Main sheet*). The colors shown are approximate and depend on proper monitor calibration. Some colors may be outside of the gamut of the monitor, and will not be displayed accurately. For each sample, the color on the left represents the reference source, and the color on the right represents the test source.

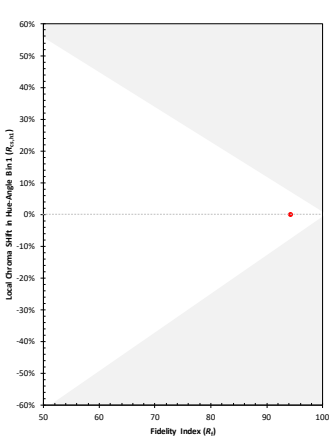
Ref | Test

Measure Comparisons



Gamut Index vs. Fidelity Index

The range in possible R_g values increases as R_f decreases. The gray shaded area indicates the approximate region of combinations that are not possible for nominally white light sources.

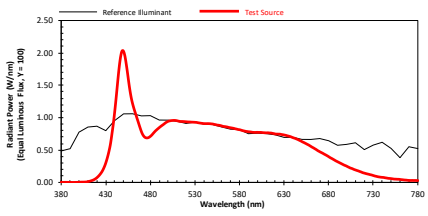


Local Chroma Shift in Hue-Angle Bin 1 vs. Fidelity Index

The range in possible $R_{CH,1}$ values increases as R_f decreases. The gray shaded area indicates the approximate region of combinations that are not possible for nominally white light sources.

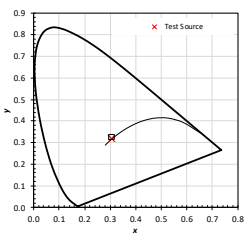
This sheet displays several graphical results related to the ANSI/IES TM-30-18 calculations initiated on the *Calculator* sheet. For detailed numerical results, see the *Results Numerical* sheet. For printable reports, see the *Simple Report*, *Intermediate Report*, or *Full Report* sheets.

Test Source and Reference Illuminant



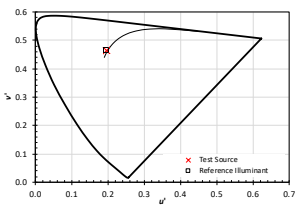
Spectral Power Distribution Comparison

Each SPD has been normalized so that the luminance factor (Y) is 100, as is done in IES TM-30 calculations.



Chromaticity Comparison (CIE 1931)

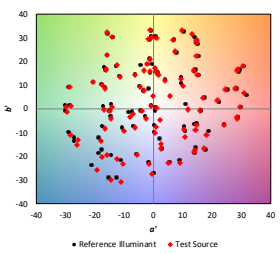
The CIE 1931 Standard 2° Colorimetric Observer is used for calculations.



Chromaticity Comparison (CIE 1976)

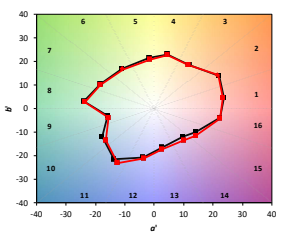
The CIE 1931 Standard 2° Colorimetric Observer is used for calculations.

TM-30 Calculation Visualizations



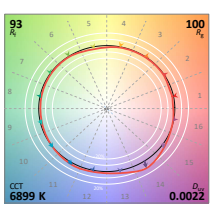
Shift in Hue-Chroma Plane

The (a', b') coordinates of CAM02-UCS are calculated for each of the 99 CES under the test and reference conditions. R_f is based on the average color difference of the 99 CES in CAM02-UCS (also including the J' dimension). [Background is for visual orientation only]



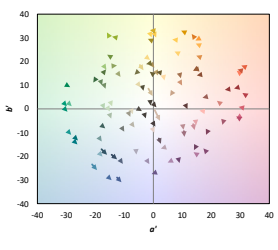
Hue-Angle Bin Average Coordinates

The average (a', b') coordinates of CAM02-UCS are calculated for the CES within each of 16 hue-angle bins. R_g is based on the area of the polygons for the test and reference conditions. The three types of "Local" values are based on the difference in coordinates for each hue-angle bin. [Background is for visual orientation only]



Color Vector Graphic

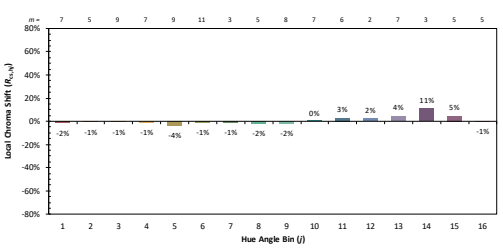
The Color Vector Graphic (CVG) shows a normalized version of the average change in (a', b') coordinates of CAM02-UCS for the CES within each hue-angle bin. Alternative versions of the CVG are available in the *CVG* sheet. Elements of this graphic can be turned on or off using the menu on the Main sheet (requires recalculation). [Background is for visual orientation only]



Vector Shifts

Each of the 99 pairs of test and reference coordinates can be plotted as a vector. This chart does not show the J' dimension, which is also included in color fidelity calculations. *[Coloring* is for visual orientation only]

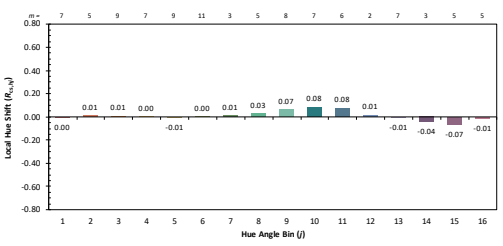
Color Rendition by Hue-Angle Bin



Local Chroma Shift

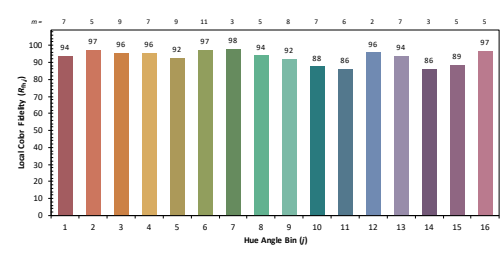
Local Chroma Shift is determined from the average radial change for the color evaluation samples within each hue-angle bin. Chroma shift is a funciton of absolute chroma, so Local Chroma Shift values are represented as a percentage. The number of samples per bin (m), which can vary based on the CCT used for the calculation, is shown at the top. [The colors of the bars are for visual orientation only.]

Bin (j)	Hue Angle
1	0.0°-22.5°
2	22.5° - 45.0°
3	45.0° - 67.5°
4	67.5° - 90.0°
5	90.0°-112.5°
6	112.5°-135.0°
7	135.0°-157.5°
8	157.5°-180.0°
9	180.0°-202.5°
10	202.5°-225.0°
11	225.0°-247.5°
12	247.5°-270.0°
13	270.0°-292.5°
14	292.5°-315.0°
15	315.0°-337.5°
16	337.5°-360.0°



Local Hue Shift

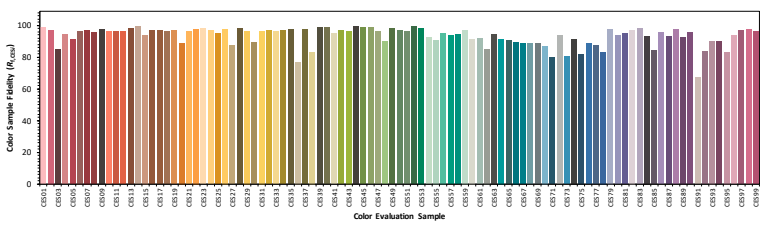
Local hue shift is deteremined from the average change perpendicular to the hue-angle bin for the color evaluation samples within each hue-angle bin. The number of samples per bin (m), which can vary based on the CCT used for the calculation, is shown at the top. [The colors of the bars are for visual orientation only.]



Local Color Fidelity

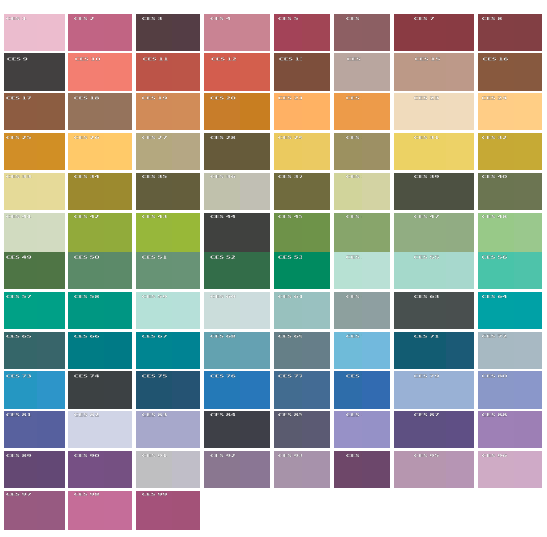
Local Color Fidelity is the average difference in CAM02-UCS for the color evaluation samples in each hue-angle bin. The number of samples per bin, which can vary based on the CCT used for the calculation, is shown at the top. [The colors of the bars are for visual orientation only.]

Color Rendition by Color Evaluation Sample (CES)



Sample Color Fidelity

Color fidelity can be calculated for each color evaluation sample. [The colors of the bars are for visual orientation only.]

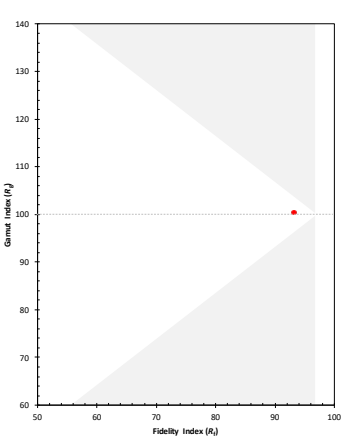


Visualiztion (Approximate)

WARNING: The colors in this graphic will not update unless the option is selected prior to calculation (*see Main sheet*). The colors shown are approximate and depend on proper monitor calibration. Some colors may be outside of the gamut of the monitor, and will not be displayed accurately. For each sample, the color on the left represents the reference source, and the color on the right represents the test source.

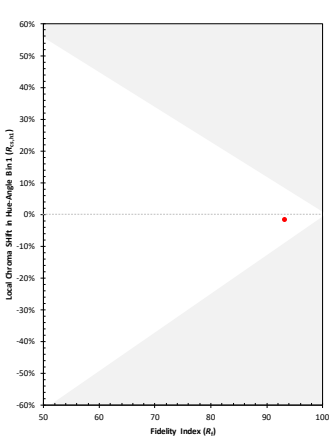
Ref | Test

Measure Comparisons



Gamut Index vs. Fidelity Index

The range in possible R_g values increases as R_f decreases. The gray shaded area indicates the approximate region of combinations that are not possible for nominally white light sources.



Local Chroma Shift in Hue-Angle Bin 1 vs. Fidelity Index

The range in possible $R_{CH,h1}$ values increases as R_f decreases. The gray shaded area indicates the approximate region of combinations that are not possible for nominally white light sources.