**Colorimetric data for system lines TLS70 −> ORS18, TLS00, NRS18, SRS18**

For input ***LCH*a0*** (TLS70 ) and output ***olv*3m*** for 4 systems ( ***m*** = 0 to 4)
Six CIELAB hue angles of device ORS18: (37.7 96.4 150.9 236.0 305.0 353.7);
Six CIELAB hue angles of device TLS00: (40.0 102.8 136.0 196.4 306.3 328.2);
Six CIELAB hue angles of device NRS18: (25.5 92.3 162.2 217.0 271.7 328.6);
Six CIELAB hue angles of device SRS18: (30.0 90.0 150.0 210.0 270.0 330.0);

| no. | Colour | ->TLS70 LCH*a0 | | | −>TLS70 n*, c*, H*ai0 | | | ORS18 olv*31 | | | TLS00 olv*32 | | | NRS18 olv*33 | | | SRS18 olv*34 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 01 | O=o00y | 78.2 | 14.1 | 22 | 0.3 | 0.5 | 22 | 0.7 | 0.2 | 0.38 | 0.7 | 0.2 | 0.33 | 0.7 | 0.2 | 0.23 | 0.7 | 0.2 | 0.27 |
| 02 | o10y | 79.0 | 12.6 | 30 | 0.3 | 0.5 | 30 | 0.7 | 0.2 | 0.29 | 0.7 | 0.2 | 0.27 | 0.7 | 0.23 | 0.2 | 0.7 | 0.2 | 0.2 |
| 03 | o20y | 80.0 | 11.5 | 39 | 0.3 | 0.5 | 39 | 0.7 | 0.21 | 0.2 | 0.7 | 0.2 | 0.21 | 0.7 | 0.3 | 0.2 | 0.7 | 0.27 | 0.2 |
| 04 | o30y | 80.9 | 10.9 | 48 | 0.3 | 0.5 | 48 | 0.7 | 0.29 | 0.2 | 0.7 | 0.26 | 0.2 | 0.7 | 0.37 | 0.2 | 0.7 | 0.35 | 0.2 |
| 05 | o40y | 81.7 | 10.5 | 56 | 0.3 | 0.5 | 56 | 0.7 | 0.36 | 0.2 | 0.7 | 0.33 | 0.2 | 0.7 | 0.43 | 0.2 | 0.7 | 0.42 | 0.2 |
| 06 | o50y | 82.6 | 10.4 | 65 | 0.3 | 0.5 | 65 | 0.7 | 0.43 | 0.2 | 0.7 | 0.4 | 0.2 | 0.7 | 0.5 | 0.2 | 0.7 | 0.49 | 0.2 |
| 07 | o60y | 83.4 | 10.5 | 73 | 0.3 | 0.5 | 73 | 0.7 | 0.5 | 0.2 | 0.7 | 0.46 | 0.2 | 0.7 | 0.56 | 0.2 | 0.7 | 0.56 | 0.2 |
| 08 | o070y | 84.4 | 10.9 | 82 | 0.3 | 0.5 | 82 | 0.7 | 0.58 | 0.2 | 0.7 | 0.53 | 0.2 | 0.7 | 0.62 | 0.2 | 0.7 | 0.63 | 0.2 |
| 09 | o80y | 85.2 | 11.5 | 90 | 0.3 | 0.5 | 90 | 0.7 | 0.65 | 0.2 | 0.7 | 0.6 | 0.2 | 0.7 | 0.68 | 0.2 | 0.7 | 0.7 | 0.2 |
| 10 | o90y | 86.1 | 12.6 | 99 | 0.3 | 0.5 | 99 | 0.68 | 0.7 | 0.2 | 0.7 | 0.67 | 0.2 | 0.65 | 0.7 | 0.2 | 0.62 | 0.7 | 0.2 |
| 11 | Y=y00l | 86.9 | 14.1 | 107 | 0.3 | 0.5 | 107 | 0.6 | 0.7 | 0.2 | 0.64 | 0.7 | 0.2 | 0.59 | 0.7 | 0.2 | 0.56 | 0.7 | 0.2 |

**Goal:** Transfer coordinates ***LCH*a0*** (system m=0) to ***rgbm = olv*3m*** (system m=1 to 4)

The given data ***LCH*a0*** include the device hue ***H*a0***
Integer (i) device hue: ***H*ai0 = round ( H*a0 )*** (1)

Fetch device data ***LCH*a,Mm*** from table with 361 entries for ***H*ai0*** from 0 to 360 degrees
Lightness, chroma, hue: ***LCH*a,M0 = LCH*a,M0 [ H*ai0 ]*** (2)

Calculate ***lcnw**** data from ***LC*a0*** and ***LC*a,M0***:
Relative lightness: ***l* = [ L*0 − L*N0 ] / [ L*W0 − L*N0 ]*** (3)
Relative chroma: ***c* = C*a0 / C*a,M0*** (4)
Relative Blackness: ***n* = 1 − l* + c* [ L*M0 − L*N0 ] / [ L*W0 − L*N0 ]*** (5)

Fetch device data ***olv*3,Mm*** from table with 361 entries for ***H*ai0*** from 0 to 360 degrees
"red, green, blue" ***rgbMm*** data: ***olv*3,Mm = olv*3,Mm [ H*ai0 ]*** (6)

For any input or output device (m=0 to 4) it is valid for constant ***n*, c*, l*, H*a***:
"red, green, blue" ***rgbm*** data: ***olv*3m = 1 − n* − c* + c* olv*3,Mm*** (7)

**Result:** device dependent relative CIELAB data of 4 systems m=1 to 4:
"red, green, blue" ***rgbm*** data: ***rgbm = olv*3m*** (8)

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**Colorimetric data for system lines TLS70 −> ORS18, TLS00, NRS18, SRS18**

For input ***olv*30*** (TLS70 ) and output ***olv*3m*** for 4 systems ( ***m*** = 0 to 4)
Six CIELAB hue angles of device ORS18: (37.7 96.4 150.9 236.0 305.0 353.7);
Six CIELAB hue angles of device TLS00: (40.0 102.8 136.0 196.4 306.3 328.2);
Six CIELAB hue angles of device NRS18: (25.5 92.3 162.2 217.0 271.7 328.6);
Six CIELAB hue angles of device SRS18: (30.0 90.0 150.0 210.0 270.0 330.0);

| no. | Colour | ->TLS70 olv*30 | | | −>TLS70 n*, c*, H*si0 | | | ORS18 olv*31 | | | TLS00 olv*32 | | | NRS18 olv*33 | | | SRS18 olv*34 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 01 | O=o00y | 0.7 | 0.2 | 0.2 | 0.3 | 0.5 | 30 | 0.7 | 0.2 | 0.38 | 0.7 | 0.2 | 0.33 | 0.7 | 0.2 | 0.23 | 0.7 | 0.2 | 0.27 |
| 02 | o10y | 0.7 | 0.25 | 0.2 | 0.3 | 0.5 | 35 | 0.7 | 0.2 | 0.29 | 0.7 | 0.2 | 0.27 | 0.7 | 0.23 | 0.2 | 0.7 | 0.2 | 0.2 |
| 03 | o20y | 0.7 | 0.3 | 0.2 | 0.3 | 0.5 | 41 | 0.7 | 0.21 | 0.2 | 0.7 | 0.2 | 0.21 | 0.7 | 0.3 | 0.2 | 0.7 | 0.27 | 0.2 |
| 04 | o30y | 0.7 | 0.35 | 0.2 | 0.3 | 0.5 | 47 | 0.7 | 0.29 | 0.2 | 0.7 | 0.26 | 0.2 | 0.7 | 0.37 | 0.2 | 0.7 | 0.35 | 0.2 |
| 05 | o40y | 0.7 | 0.4 | 0.2 | 0.3 | 0.5 | 53 | 0.7 | 0.36 | 0.2 | 0.7 | 0.33 | 0.2 | 0.7 | 0.43 | 0.2 | 0.7 | 0.42 | 0.2 |
| 06 | o50y | 0.7 | 0.45 | 0.2 | 0.3 | 0.5 | 60 | 0.7 | 0.43 | 0.2 | 0.7 | 0.4 | 0.2 | 0.7 | 0.5 | 0.2 | 0.7 | 0.49 | 0.2 |
| 07 | o60y | 0.7 | 0.5 | 0.2 | 0.3 | 0.5 | 66 | 0.7 | 0.5 | 0.2 | 0.7 | 0.46 | 0.2 | 0.7 | 0.56 | 0.2 | 0.7 | 0.56 | 0.2 |
| 08 | o070y | 0.7 | 0.55 | 0.2 | 0.3 | 0.5 | 73 | 0.7 | 0.58 | 0.2 | 0.7 | 0.53 | 0.2 | 0.7 | 0.62 | 0.2 | 0.7 | 0.63 | 0.2 |
| 09 | o80y | 0.7 | 0.6 | 0.2 | 0.3 | 0.5 | 79 | 0.7 | 0.65 | 0.2 | 0.7 | 0.6 | 0.2 | 0.7 | 0.68 | 0.2 | 0.7 | 0.7 | 0.2 |
| 10 | o90y | 0.7 | 0.65 | 0.2 | 0.3 | 0.5 | 85 | 0.68 | 0.7 | 0.2 | 0.7 | 0.67 | 0.2 | 0.65 | 0.7 | 0.2 | 0.62 | 0.7 | 0.2 |
| 11 | Y=y00l | 0.7 | 0.7 | 0.2 | 0.3 | 0.5 | 90 | 0.6 | 0.7 | 0.2 | 0.64 | 0.7 | 0.2 | 0.59 | 0.7 | 0.2 | 0.56 | 0.7 | 0.2 |

**Goal:** Transfer coordinates ***olv*30*** (system m=0) to ***olv*3m*** (system m=1 to 4)
The following equations for relative blackness and chroma are valid for any device:
***n* = 1 − max ( o*30, l*30, v*30 )*** (1)
***c* = max ( o*30, l*30, v*30 ) − min ( o*30, l*30, v*30 )*** (2)

For the calculation of the missing relative device hue asume
as a starting point that the three values ***olv*30*** belong to the standard (s) device SRS18:
relative red-green chroma: ***a*r0 = o*30 cos(30) + l*30 cos(150)*** (3)
relative yellow-blue chroma: ***b*r0 = o*30 sin(30) + l*30 sin(150) − v*30 sin(270)*** (4)
Standard integer hue: ***H*si0 = round [ atan ( b*r0 / a*r0 ) ]*** (5)
Fetch device integer hue: ***H*ai0 = H*si_ai [ H*si0 ]*** (6)

Fetch device data ***olv*3,Mm*** from table with 361 entries for ***H*ai0*** from 0 to 360 degrees
"red, green, blue" ***rgbm*** data: ***olv*3,Mm = olv*3,Mm [ H*ai0 ]*** (7)

For any input or output device (m=0 to 4) it is valid for constant ***n*, c*, l*, H*a***:
"red, green, blue" ***rgbm*** data: ***olv*3m = 1 − n* − c* + c* olv*3,Mm*** (8)

**Result:** device dependent relative CIELAB data of 4 systems m=1 to 4:
"red, green, blue" ***rgbm*** data: ***rgbm = olv*3m*** (9)

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