

rgb\* and CIE data of a elementary hue circle according to CIE R1-47:2009 for sRGB display  $L_r=0\%$

16 step elementary hue circle with intended elementary hues:  $h_{ab,a} = 25.4, 92.3, 162.2, 271.7$

| Code   | X    | Y    | Z    | x     | y     | L*   | a*    | b*    | L*a  | a*a   | b*a   | C* <sub>ab,a</sub> | h <sub>ab,a</sub> | rgb -> rgb*    |
|--------|------|------|------|-------|-------|------|-------|-------|------|-------|-------|--------------------|-------------------|----------------|
| r00j=R | 37.4 | 19.1 | 6.5  | 0.592 | 0.303 | 50.9 | 71.9  | 37.1  | 50.9 | 71.9  | 37.1  | 86.4               | 25.4              | 1.00 0.00 0.00 |
| r25j   | 37.2 | 20.3 | 1.9  | 0.625 | 0.341 | 52.2 | 71.9  | 65.2  | 52.2 | 71.9  | 65.2  | 97.1               | 42.1              | 1.00 0.25 0.00 |
| r50j   | 42.9 | 31.7 | 3.8  | 0.546 | 0.403 | 63.1 | 42.7  | 70.7  | 63.1 | 42.7  | 70.7  | 82.6               | 58.8              | 1.00 0.50 0.00 |
| r75j   | 49.5 | 44.7 | 6.0  | 0.493 | 0.446 | 72.7 | 19.7  | 76.7  | 72.7 | 19.7  | 76.7  | 79.2               | 75.5              | 1.00 0.75 0.00 |
| j00g=G | 58.8 | 63.3 | 9.1  | 0.447 | 0.482 | 83.6 | -3.4  | 84.2  | 83.6 | -3.4  | 84.2  | 84.3               | 92.3              | 1.00 1.00 0.00 |
| j25g   | 59.9 | 78.1 | 11.9 | 0.399 | 0.521 | 90.8 | -31.8 | 88.5  | 90.8 | -31.8 | 88.5  | 94.0               | 109.7             | 0.75 1.00 0.00 |
| j50g   | 40.6 | 67.9 | 10.9 | 0.339 | 0.568 | 85.9 | -63.0 | 82.7  | 85.9 | -63.0 | 82.7  | 104.0              | 127.2             | 0.50 1.00 0.00 |
| j75g   | 33.9 | 64.2 | 22.6 | 0.281 | 0.531 | 84.1 | -76.6 | 54.1  | 84.1 | -76.6 | 54.1  | 93.8               | 144.7             | 0.25 1.00 0.00 |
| g00b=B | 39.0 | 66.3 | 49.5 | 0.252 | 0.428 | 85.1 | -64.2 | 20.5  | 85.1 | -64.2 | 20.5  | 67.4               | 162.2             | 0.00 1.00 0.00 |
| g25b   | 46.9 | 70.3 | 88.0 | 0.228 | 0.342 | 87.1 | -49.5 | -8.4  | 87.1 | -49.5 | -8.4  | 50.2               | 189.6             | 0.00 1.00 0.50 |
| g50b   | 40.4 | 55.1 | 92.7 | 0.214 | 0.292 | 79.1 | -33.9 | -25.6 | 79.1 | -33.9 | -25.6 | 42.5               | 217.0             | 0.00 1.00 1.00 |
| g75b   | 33.2 | 40.9 | 89.9 | 0.202 | 0.249 | 70.1 | -18.8 | -39.1 | 70.1 | -18.8 | -39.1 | 43.4               | 244.2             | 0.00 0.50 1.00 |
| b00r=B | 26.5 | 27.4 | 87.7 | 0.187 | 0.193 | 59.3 | 1.7   | -56.0 | 59.3 | 1.7   | -56.0 | 56.1               | 271.7             | 0.00 0.00 1.00 |
| b25r   | 17.9 | 10.2 | 84.8 | 0.158 | 0.09  | 38.3 | 52.5  | -90.3 | 38.3 | 52.5  | -90.3 | 104.4              | 300.1             | 0.50 0.00 1.00 |
| b50r   | 52.5 | 25.2 | 84.6 | 0.323 | 0.155 | 57.3 | 94.2  | -57.4 | 57.3 | 94.2  | -57.4 | 110.4              | 328.6             | 1.00 0.00 1.00 |
| b75r   | 40.9 | 20.5 | 24.9 | 0.473 | 0.238 | 52.5 | 82.3  | -4.2  | 52.5 | 82.3  | -4.2  | 82.4               | 357.0             | 1.00 0.00 0.50 |

5 step equidistant grey scale with intended lightness:  $L^* = 0.0, 23.8, 47.7, 71.5, 95.4$

| Code    | X    | Y    | Z    | x     | y     | L*   | a*  | b*  | L*a  | a*a | b*a | C* <sub>ab,a</sub> | h <sub>ab,a</sub> | rgb -> rgb*    |
|---------|------|------|------|-------|-------|------|-----|-----|------|-----|-----|--------------------|-------------------|----------------|
| n000w=N | 0.0  | 0.0  | 0.0  | 0.0   | 0.0   | 0.0  | 0.0 | 0.0 | 0.0  | 0.0 | 0.0 | 0.0                | 0.0               | 0.00 0.00 0.00 |
| n025w   | 3.8  | 4.0  | 4.4  | 0.312 | 0.329 | 23.8 | 0.0 | 0.0 | 23.8 | 0.0 | 0.0 | 0.0                | 325.3             | 0.25 0.25 0.25 |
| n050w   | 15.7 | 16.6 | 18.0 | 0.312 | 0.329 | 47.7 | 0.0 | 0.0 | 47.7 | 0.0 | 0.0 | 0.0                | 325.1             | 0.50 0.50 0.50 |
| n075w   | 40.7 | 42.8 | 46.6 | 0.312 | 0.329 | 71.4 | 0.0 | 0.0 | 71.4 | 0.0 | 0.0 | 0.0                | 325.1             | 0.75 0.75 0.75 |
| n100w=W | 84.1 | 88.5 | 96.4 | 0.312 | 0.329 | 95.4 | 0.0 | 0.0 | 95.4 | 0.0 | 0.0 | 0.0                | 0.0               | 1.00 1.00 1.00 |

KE150-3N, Page 4/11, LAB\*la0, adapted=not adapted

rgb\* and CIE data of a elementary hue circle according to CIE R1-47:2009 for sRGB display  $L_r=0.6\%$

16 step elementary hue circle with intended elementary hues:  $h_{ab,a} = 25.4, 92.3, 162.2, 271.7$

| Code   | X    | Y    | Z    | x     | y     | L*   | a*    | b*    | L*a  | a*a   | b*a   | C* <sub>ab,a</sub> | h <sub>ab,a</sub> | rgb -> rgb*    |
|--------|------|------|------|-------|-------|------|-------|-------|------|-------|-------|--------------------|-------------------|----------------|
| r00j=R | 37.7 | 19.6 | 6.9  | 0.586 | 0.305 | 51.4 | 76.6  | 36.5  | 51.4 | 76.6  | 36.5  | 84.9               | 25.4              | 1.00 0.00 0.00 |
| r25j   | 38.1 | 21.8 | 2.7  | 0.607 | 0.347 | 53.8 | 67.7  | 61.3  | 53.8 | 67.7  | 61.3  | 93.1               | 42.1              | 1.00 0.25 0.00 |
| r50j   | 43.5 | 32.6 | 4.6  | 0.538 | 0.404 | 63.8 | 41.1  | 68.0  | 63.8 | 41.1  | 68.0  | 79.5               | 58.8              | 1.00 0.50 0.00 |
| r75j   | 49.8 | 45.3 | 6.7  | 0.489 | 0.444 | 73.1 | 19.1  | 74.6  | 73.1 | 19.1  | 74.6  | 77.0               | 75.5              | 1.00 0.75 0.00 |
| j00g=G | 58.9 | 63.4 | 9.7  | 0.446 | 0.48  | 83.6 | -3.2  | 82.4  | 83.6 | -3.2  | 82.4  | 82.4               | 92.2              | 1.00 1.00 0.00 |
| j25g   | 60.3 | 78.4 | 12.5 | 0.398 | 0.518 | 90.9 | -31.3 | 87.1  | 90.9 | -31.3 | 87.1  | 92.5               | 109.7             | 0.75 1.00 0.00 |
| j50g   | 41.1 | 68.2 | 11.5 | 0.34  | 0.563 | 86.1 | -61.8 | 81.2  | 86.1 | -61.8 | 81.2  | 102.1              | 127.2             | 0.50 1.00 0.00 |
| j75g   | 34.3 | 64.4 | 23.0 | 0.281 | 0.529 | 84.1 | -75.8 | 53.5  | 84.1 | -75.8 | 53.5  | 92.9               | 144.7             | 0.25 1.00 0.00 |
| g00b=B | 39.4 | 66.4 | 49.8 | 0.252 | 0.426 | 85.2 | -63.5 | 20.3  | 85.2 | -63.5 | 20.3  | 66.7               | 162.2             | 0.00 1.00 0.00 |
| g25b   | 47.1 | 70.5 | 87.9 | 0.229 | 0.342 | 87.2 | -49.1 | -8.2  | 87.2 | -49.1 | -8.2  | 49.8               | 189.5             | 0.00 1.00 0.50 |
| g50b   | 40.7 | 55.3 | 92.7 | 0.215 | 0.293 | 79.2 | -33.5 | -25.3 | 79.2 | -33.5 | -25.3 | 42.1               | 217.0             | 0.00 1.00 1.00 |
| g75b   | 33.6 | 41.2 | 89.9 | 0.203 | 0.25  | 70.3 | -18.6 | -38.8 | 70.3 | -18.6 | -38.8 | 43.0               | 244.3             | 0.00 0.50 1.00 |
| b00r=B | 26.9 | 27.8 | 87.7 | 0.188 | 0.195 | 59.7 | 1.7   | -55.4 | 59.7 | 1.7   | -55.4 | 55.4               | 271.7             | 0.00 0.00 1.00 |
| b25r   | 18.2 | 10.6 | 84.8 | 0.16  | 0.093 | 38.9 | 52.0  | -89.4 | 38.9 | 52.0  | -89.4 | 103.4              | 300.1             | 0.50 0.00 1.00 |
| b50r   | 52.7 | 25.7 | 84.6 | 0.323 | 0.157 | 57.7 | 92.9  | -56.7 | 57.7 | 92.9  | -56.7 | 108.8              | 328.6             | 1.00 0.00 1.00 |
| b75r   | 41.2 | 21.0 | 25.4 | 0.469 | 0.24  | 53.0 | 80.9  | -4.1  | 53.0 | 80.9  | -4.1  | 81.0               | 357.0             | 1.00 0.00 0.50 |

5 step equidistant grey scale with intended lightness:  $L^* = 5.6, 28.1, 50.5, 72.9, 95.4$

| Code    | X    | Y    | Z    | x     | y     | L*   | a*  | b*  | L*a  | a*a | b*a | C* <sub>ab,a</sub> | h <sub>ab,a</sub> | rgb -> rgb*    |
|---------|------|------|------|-------|-------|------|-----|-----|------|-----|-----|--------------------|-------------------|----------------|
| n000w=N | 0.5  | 0.6  | 0.6  | 0.312 | 0.329 | 5.6  | 0.0 | 0.0 | 5.6  | 0.0 | 0.0 | 0.0                | 0.0               | 0.00 0.00 0.00 |
| n025w   | 5.2  | 5.5  | 6.0  | 0.312 | 0.329 | 28.1 | 0.0 | 0.0 | 28.1 | 0.0 | 0.0 | 0.0                | 325.1             | 0.25 0.25 0.25 |
| n050w   | 17.9 | 18.8 | 20.5 | 0.312 | 0.329 | 50.5 | 0.0 | 0.0 | 50.5 | 0.0 | 0.0 | 0.0                | 324.8             | 0.50 0.50 0.50 |
| n075w   | 42.9 | 45.1 | 49.2 | 0.312 | 0.329 | 73.0 | 0.0 | 0.0 | 73.0 | 0.0 | 0.0 | 0.0                | 323.7             | 0.75 0.75 0.75 |
| n100w=W | 84.1 | 88.5 | 96.4 | 0.312 | 0.329 | 95.4 | 0.0 | 0.0 | 95.4 | 0.0 | 0.0 | 0.0                | 0.0               | 1.00 1.00 1.00 |

KE150-7N, Page 5/11, LAB\*la1, adapted=not adapted

TUB-test chart KE15; CIE data of sRGB display  $L_r=0$  to 2,5%

16 steps of elementary hue circle and 5 grey steps

rgb\* and CIE data of a elementary hue circle according to CIE R1-47:2009 for sRGB display  $L_r=1,2\%$

16 step elementary hue circle with intended elementary hues:  $h_{ab,a} = 25.4, 92.3, 162.2, 271.7$

| Code   | X    | Y    | Z    | x     | y     | L*   | a*    | b*    | L*a  | a*a   | b*a   | C* <sub>ab,a</sub> | h <sub>ab,a</sub> | rgb -> rgb*    |
|--------|------|------|------|-------|-------|------|-------|-------|------|-------|-------|--------------------|-------------------|----------------|
| r00j=R | 38.0 | 20.1 | 7.3  | 0.58  | 0.307 | 52.0 | 75.2  | 35.9  | 52.0 | 75.2  | 35.9  | 83.4               | 25.4              | 1.00 0.00 0.00 |
| r25j   | 38.8 | 23.0 | 3.5  | 0.593 | 0.351 | 55.0 | 64.5  | 58.4  | 55.0 | 64.5  | 58.4  | 87.0               | 42.1              | 1.00 0.25 0.00 |
| r50j   | 44.0 | 33.5 | 5.3  | 0.531 | 0.404 | 64.5 | 39.6  | 65.7  | 64.5 | 39.6  | 65.7  | 76.7               | 58.8              | 1.00 0.50 0.00 |
| r75j   | 50.2 | 45.9 | 7.4  | 0.485 | 0.443 | 73.4 | 18.5  | 72.6  | 73.4 | 18.5  | 72.6  | 75.0               | 75.6              | 1.00 0.75 0.00 |
| j00g=G | 59.1 | 63.6 | 10.3 | 0.444 | 0.478 | 83.7 | -3.2  | 80.7  | 83.7 | -3.2  | 80.7  | 80.7               | 92.3              | 1.00 1.00 0.00 |
| j25g   | 60.7 | 78.6 | 13.1 | 0.398 | 0.515 | 91.0 | -30.8 | 85.6  | 91.0 | -30.8 | 85.6  | 91.0               | 109.8             | 0.75 1.00 0.00 |
| j50g   | 41.7 | 68.5 | 12.2 | 0.34  | 0.559 | 86.2 | -60.7 | 79.8  | 86.2 | -60.7 | 79.8  | 100.3              | 127.2             | 0.50 1.00 0.00 |
| j75g   | 34.6 | 64.6 | 23.4 | 0.282 | 0.526 | 84.2 | -75.0 | 53.0  | 84.2 | -75.0 | 53.0  | 91.9               | 144.7             | 0.25 1.00 0.00 |
| g00b=B | 39.7 | 66.6 | 50.2 | 0.253 | 0.425 | 85.3 | -62.8 | 20.1  | 85.3 | -62.8 | 20.1  | 66.0               | 162.2             | 0.00 1.00 0.00 |
| g25b   | 47.4 | 70.6 | 88.0 | 0.23  | 0.342 | 87.3 | -48.6 | -8.2  | 87.3 | -48.6 | -8.2  | 49.3               | 189.5             | 0.00 1.00 0.50 |
| g50b   | 41.1 | 55.7 | 92.8 | 0.216 | 0.293 | 79.4 | -33.3 | -25.0 | 79.4 | -33.3 | -25.0 | 41.7               | 216.9             | 0.00 1.00 1.00 |
| g75b   | 33.9 | 41.5 | 90.0 | 0.205 | 0.251 | 70.5 | -18.3 | -38.4 | 70.5 | -18.3 | -38.4 | 42.6               | 244.4             | 0.00 0.50 1.00 |
| b00r=B | 27.3 | 28.3 | 87.8 | 0.19  | 0.197 | 60.1 | 1.6   | -54.8 | 60.1 | 1.6   | -54.8 | 54.8               | 271.7             | 0.00 0.00 1.00 |
| b25r   | 18.6 | 10.9 | 84.9 | 0.162 | 0.095 | 39.4 | 51.4  | -88.4 | 39.4 | 51.4  | -88.4 | 102.3              | 300.1             | 0.50 0.00 1.00 |
| b50r   | 52.9 | 26.1 | 84.5 | 0.323 | 0.159 | 58.1 | 91.6  | -55.9 | 58.1 | 91.6  | -55.9 | 107.3              | 328.6             | 1.00 0.00 1.00 |
| b75r   | 41.5 | 21.5 | 25.9 | 0.466 | 0.242 | 53.5 | 79.6  | -4.0  | 53.5 | 79.6  | -4.0  | 79.7               | 357.0             | 1.00 0.00 0.50 |

5 step equidistant grey scale with intended lightness:  $L^* = 10.9, 32.0, 53.2, 74.3, 95.4$

| Code    | X    | Y    | Z    | x     | y     | L*   | a*  | b*  | L*a  | a*a | b*a | C* <sub>ab,a</sub> | h <sub>ab,a</sub> | rgb -> rgb*    |
|---------|------|------|------|-------|-------|------|-----|-----|------|-----|-----|--------------------|-------------------|----------------|
| n000w=N | 1.1  | 1.2  | 1.3  | 0.312 | 0.329 | 10.9 | 0.0 | 0.0 | 10.9 | 0.0 | 0.0 | 0.0                | 0.0               | 0.00 0.00 0.00 |
| n025w   | 6.7  | 7.1  | 7.7  | 0.312 | 0.329 | 32.1 | 0.0 | 0.0 | 32.1 | 0.0 | 0.0 | 0.0                | 325.6             | 0.25 0.25 0.25 |
| n050w   | 20.1 | 21.1 | 23.0 | 0.312 | 0.329 | 53.1 | 0.0 | 0.0 | 53.1 | 0.0 | 0.0 | 0.0                | 325.5             | 0.50 0.50 0.50 |
| n075w   | 44.8 | 47.1 | 51.3 | 0.312 | 0.329 | 74.2 | 0.0 | 0.0 | 74.2 | 0.0 | 0.0 | 0.0                | 323.5             | 0.75 0.75 0.75 |
| n100w=W | 84.1 | 88.5 | 96.4 | 0.312 | 0.329 | 95.4 | 0.0 | 0.0 | 95.4 | 0.0 | 0.0 | 0.0                | 0.0               | 1.00 1.00 1.00 |

KE151-3N, Page 6/11, LAB\*la2, adapted=not adapted

rgb\* and CIE data of a elementary hue circle according to CIE R1-47:2009 for sRGB display  $L_r=2,5\%$

16 step elementary hue circle with intended elementary hues:  $h_{ab,a} = 25.4, 92.3, 162.2, 271.7$

| Code   | X    | Y    | Z    | x     | y     | L*   | a*    | b*    | L <sub>a</sub> * | a <sub>a</sub> * | b <sub>a</sub> * | C <sub>ab</sub> * | h <sub>ab,a</sub> | rgb -> rgb*    |
|--------|------|------|------|-------|-------|------|-------|-------|------------------|------------------|------------------|-------------------|-------------------|----------------|
| r00j=R | 38.6 | 21.1 | 8.2  | 0.568 | 0.31  | 53.0 | 72.6  | 34.5  | 53.0             | 72.6             | 34.5             | 80.4              | 25.4              | 1.00 0.00 0.00 |
| r25j   | 40.0 | 25.0 | 5.1  | 0.57  | 0.357 | 57.1 | 59.5  | 53.9  | 57.1             | 59.5             | 53.9             | 80.3              | 42.1              | 1.00 0.25 0.00 |
| r50j   | 44.9 | 34.9 | 6.7  | 0.518 | 0.403 | 65.7 | 37.3  | 61.7  | 65.7             | 37.3             | 61.7             | 72.1              | 58.8              | 1.00 0.50 0.00 |
| r75j   | 50.9 | 46.8 | 8.7  | 0.477 | 0.439 | 74.0 | 17.7  | 69.0  | 74.0             | 17.7             | 69.0             | 71.2              | 75.6              | 1.00 0.75 0.00 |
| j00g=G | 59.4 | 63.8 | 11.5 | 0.44  | 0.473 | 83.8 | -3.0  | 77.4  | 83.8             | -3.0             | 77.4             | 77.5              | 92.2              | 1.00 1.00 0.00 |
| j25g   | 61.4 | 79.0 | 14.3 | 0.396 | 0.51  | 91.2 | -29.9 | 83.0  | 91.2             | -29.9            | 83.0             | 88.2              | 109.8             | 0.75 1.00 0.00 |
| j50g   | 42.7 | 69.0 | 13.4 | 0.341 | 0.551 | 86.5 | -58.7 | 77.1  | 86.5             | -58.7            | 77.1             | 96.9              | 127.2             | 0.50 1.00 0.00 |
| j75g   | 35.3 | 64.9 | 24.2 | 0.283 | 0.521 | 84.4 | -73.5 | 51.9  | 84.4             | -73.5            | 51.9             | 90.0              | 144.7             | 0.25 1.00 0.00 |
| g00b=B | 40.3 | 66.9 | 50.8 | 0.255 | 0.423 | 85.4 | -61.5 | 19.7  | 85.4             | -61.5            | 19.7             | 64.6              | 162.1             | 0.00 1.00 0.00 |
| g25b   | 47.9 | 70.8 | 88.1 | 0.231 | 0.342 | 87.4 | -47.7 | -8.0  | 87.4             | -47.7            | -8.0             | 48.4              | 189.5             | 0.00 1.00 0.50 |
| g50b   | 41.7 | 56.2 | 92.8 | 0.218 | 0.294 | 79.7 | -32.6 | -24.6 | 79.7             | -32.6            | -24.6            | 40.8              | 217.0             | 0.00 1.00 1.00 |
| g75b   | 34.7 | 42.3 | 90.1 | 0.207 | 0.253 | 71.1 | -18.0 | -37.5 | 71.1             | -18.0            | -37.5            | 41.6              | 244.3             | 0.00 0.50 1.00 |
| b00r=B | 28.1 | 29.2 | 87.9 | 0.193 | 0.2   | 60.9 | 1.6   | -53.5 | 60.9             | 1.6              | -53.5            | 53.6              | 271.7             | 0.00 0.00 1.00 |
| b25r   | 19.3 | 11.5 | 85.0 | 0.166 | 0.1   | 40.5 | 50.3  | -86.6 | 40.5             | 50.3             | -86.6            | 100.2             | 300.1             | 0.50 0.00 1.00 |
| b50r   | 53.3 | 27.0 | 84.4 | 0.323 | 0.164 | 59.0 | 89.1  | -54.4 | 59.0             | 89.1             | -54.4            | 104.4             | 328.6             | 1.00 0.00 1.00 |
| b75r   | 42.1 | 22.5 | 27.0 | 0.459 | 0.245 | 54.5 | 77.1  | -4.0  | 54.5             | 77.1             | -4.0             | 77.2              | 357.0             | 1.00 0.00 0.50 |