

**rgb\*<sub>e</sub> and CIE data of a elementary hue circle according to CIE R1-47 for Ostwald colours**

XYZ, xy, YAB, and Lab\* data for relative spacing of elementary hue  $h_{ab}$  of CIELAB

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

|        | X    | Y    | Z     | x     | y     | A     | B     | C <sub>AB</sub> | h <sub>AB</sub> | L*   | a*     | b*     | C* <sub>ab</sub> | h <sub>ab</sub> | rgb -> rgb* <sub>e</sub> |
|--------|------|------|-------|-------|-------|-------|-------|-----------------|-----------------|------|--------|--------|------------------|-----------------|--------------------------|
| R00Y=R | 66.0 | 41.1 | 20.9  | 0.515 | 0.321 | 26.9  | 9.5   | 28.5            | 19.5            | 70.3 | 70.9   | 33.4   | 78.4             | 25.2            | 1.00 0.00 0.00           |
| R25Y   | 64.0 | 41.5 | 6.4   | 0.571 | 0.371 | 24.5  | 15.5  | 29.0            | 32.3            | 70.5 | 65.1   | 71.4   | 96.6             | 47.6            | 1.00 0.25 0.00           |
| R50Y   | 62.6 | 41.7 | 1.0   | 0.593 | 0.396 | 22.8  | 17.7  | 28.9            | 37.8            | 70.7 | 61.2   | 106.3  | 122.7            | 60.0            | 1.00 0.50 0.00           |
| R75Y   | 71.1 | 58.7 | 0.1   | 0.546 | 0.451 | 15.3  | 25.5  | 29.7            | 59.0            | 81.1 | 35.2   | 137.3  | 141.7            | 75.6            | 1.00 0.75 0.00           |
| Y00G=Y | 76.8 | 83.9 | 1.3   | 0.473 | 0.517 | -2.9  | 36.0  | 36.1            | 94.7            | 93.4 | -5.9   | 141.9  | 142.0            | 92.3            | 1.00 1.00 0.00           |
| Y25G   | 65.9 | 89.6 | 6.7   | 0.406 | 0.552 | -19.2 | 36.3  | 41.1            | 117.8           | 95.8 | -39.4  | 113.6  | 120.3            | 109.1           | 0.75 1.00 0.00           |
| Y50G   | 43.7 | 79.6 | 8.1   | 0.332 | 0.605 | -31.9 | 31.4  | 44.7            | 135.4           | 91.5 | -77.3  | 101.2  | 127.3            | 127.3           | 0.50 1.00 0.00           |
| Y75G   | 26.4 | 67.7 | 12.4  | 0.247 | 0.635 | -38.0 | 24.5  | 45.2            | 147.1           | 85.9 | -113.0 | 78.6   | 137.7            | 145.1           | 0.25 1.00 0.00           |
| G00B=G | 21.8 | 61.8 | 31.6  | 0.189 | 0.536 | -36.9 | 14.2  | 39.5            | 158.8           | 82.8 | -119.5 | 37.9   | 125.4            | 162.3           | 0.00 1.00 0.00           |
| G25B   | 27.8 | 58.9 | 81.5  | 0.165 | 0.349 | -28.1 | -6.9  | 28.9            | 193.9           | 81.2 | -86.9  | -13.9  | 88.0             | 189.1           | 0.00 1.00 0.50           |
| G50B   | 25.6 | 45.4 | 108.7 | 0.142 | 0.252 | -17.5 | -23.7 | 29.5            | 233.5           | 73.1 | -61.3  | -46.1  | 76.7             | 216.9           | 0.00 1.00 1.00           |
| G75B   | 20.2 | 29.3 | 108.4 | 0.128 | 0.185 | -7.6  | -30.6 | 31.5            | 256.0           | 61.0 | -33.4  | -66.8  | 74.7             | 243.4           | 0.00 0.50 1.00           |
| B00R=B | 18.4 | 18.7 | 107.7 | 0.127 | 0.129 | 0.6   | -34.9 | 34.9            | 271.0           | 50.4 | 3.3    | -84.8  | 84.9             | 272.2           | 0.00 0.00 1.00           |
| B25R   | 18.0 | 8.8  | 105.2 | 0.136 | 0.067 | 9.5   | -38.2 | 39.4            | 284.0           | 35.7 | 64.2   | -108.5 | 126.1            | 300.6           | 0.50 0.00 1.00           |
| B50R   | 61.7 | 26.3 | 99.4  | 0.329 | 0.14  | 36.7  | -28.3 | 46.3            | 322.3           | 58.3 | 112.5  | -65.8  | 130.3            | 329.6           | 1.00 0.00 1.00           |
| B75R   | 71.2 | 40.6 | 51.0  | 0.437 | 0.249 | 32.5  | -2.6  | 32.6            | 355.2           | 69.9 | 83.6   | -7.1   | 83.9             | 355.1           | 1.00 0.00 0.50           |

5 step equidistant grey scale with intended lightness:  $L^* = 0.0, 25.0, 50.0, 75.0, 100.0$

|             |       |       |       |       |       |     |     |     |      |       |     |     |     |     |                |
|-------------|-------|-------|-------|-------|-------|-----|-----|-----|------|-------|-----|-----|-----|-----|----------------|
| N000W=N0.0  | 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 | 0.0 | 0.00 0.00 0.00 |
| N025W       | 4.1   | 4.4   | 4.8   | 0.312 | 0.329 | 0.0 | 0.0 | 0.0 | 77.5 | 25.0  | 0.0 | 0.0 | 0.0 | 0.0 | 0.25 0.25 0.25 |
| N050W       | 17.5  | 18.4  | 20.0  | 0.312 | 0.329 | 0.0 | 0.0 | 0.0 | 55.3 | 50.0  | 0.0 | 0.0 | 0.0 | 0.0 | 0.50 0.50 0.50 |
| N075W       | 45.8  | 48.2  | 52.5  | 0.312 | 0.329 | 0.0 | 0.0 | 0.0 | 21.0 | 75.0  | 0.0 | 0.0 | 0.0 | 0.0 | 0.75 0.75 0.75 |
| N100W=W95.0 | 100.0 | 108.8 | 0.312 | 0.329 | 0.0   | 0.0 | 0.0 | 0.0 | 0.0  | 100.0 | 0.0 | 0.0 | 0.0 | 0.0 | 1.00 1.00 1.00 |

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**rgb\*<sub>e</sub> and CIE data of a elementary hue circle according to CIE R1-47 for Ostwald colours**

XYZ, ab, YAB, and Lab\* data for relative spacing of elementary hue  $h_{ab}$  of CIELAB

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

|        | X    | Y    | Z     | a     | b      | A     | B     | C <sub>AB</sub> | h <sub>AB</sub> | L*   | a*     | b*     | C* <sub>ab</sub> | h <sub>ab</sub> | rgb -> rgb* <sub>e</sub> |
|--------|------|------|-------|-------|--------|-------|-------|-----------------|-----------------|------|--------|--------|------------------|-----------------|--------------------------|
| R00Y=R | 66.0 | 41.1 | 20.9  | 1.604 | -0.202 | 26.9  | 9.5   | 28.5            | 19.5            | 70.3 | 70.9   | 33.4   | 78.4             | 25.2            | 1.00 0.00 0.00           |
| R25Y   | 64.0 | 41.5 | 6.4   | 1.54  | -0.061 | 24.5  | 15.5  | 29.0            | 32.3            | 70.5 | 65.1   | 71.4   | 96.6             | 47.6            | 1.00 0.25 0.00           |
| R50Y   | 62.6 | 41.7 | 1.0   | 1.498 | -0.01  | 22.8  | 17.7  | 28.9            | 37.8            | 70.7 | 61.2   | 106.3  | 122.7            | 60.0            | 1.00 0.50 0.00           |
| R75Y   | 71.1 | 58.7 | 0.1   | 1.21  | -0.001 | 15.3  | 25.5  | 29.7            | 59.0            | 81.1 | 35.2   | 137.3  | 141.7            | 75.6            | 1.00 0.75 0.00           |
| Y00G=Y | 76.8 | 83.9 | 1.3   | 0.915 | -0.006 | -2.9  | 36.0  | 36.1            | 94.7            | 93.4 | -5.9   | 141.9  | 142.0            | 92.3            | 1.00 1.00 0.00           |
| Y25G   | 65.9 | 89.6 | 6.7   | 0.735 | -0.03  | -19.2 | 36.3  | 41.1            | 117.8           | 95.8 | -39.4  | 113.6  | 120.3            | 109.1           | 0.75 1.00 0.00           |
| Y50G   | 43.7 | 79.6 | 8.1   | 0.549 | -0.04  | -31.9 | 31.4  | 44.7            | 135.4           | 91.5 | -77.3  | 101.2  | 127.3            | 127.3           | 0.50 1.00 0.00           |
| Y75G   | 26.4 | 67.7 | 12.4  | 0.389 | -0.073 | -38.0 | 24.5  | 45.2            | 147.1           | 85.9 | -113.0 | 78.6   | 137.7            | 145.1           | 0.25 1.00 0.00           |
| G00B=G | 21.8 | 61.8 | 31.6  | 0.353 | -0.204 | -36.9 | 14.2  | 39.5            | 158.8           | 82.8 | -119.5 | 37.9   | 125.4            | 162.3           | 0.00 1.00 0.00           |
| G25B   | 27.8 | 58.9 | 81.5  | 0.473 | -0.553 | -28.1 | -6.9  | 28.9            | 193.9           | 81.2 | -86.9  | -13.9  | 88.0             | 189.1           | 0.00 1.00 0.50           |
| G50B   | 25.6 | 45.4 | 108.7 | 0.564 | -0.957 | -17.5 | -23.7 | 29.5            | 233.5           | 73.1 | -61.3  | -46.1  | 76.7             | 216.9           | 0.00 1.00 1.00           |
| G75B   | 20.2 | 29.3 | 108.4 | 0.691 | -1.478 | -7.6  | -30.6 | 31.5            | 256.0           | 61.0 | -33.4  | -66.8  | 74.7             | 243.4           | 0.00 0.50 1.00           |
| B00R=B | 18.4 | 18.7 | 107.7 | 0.984 | -2.297 | 0.6   | -34.9 | 34.9            | 271.0           | 50.4 | 3.3    | -84.8  | 84.9             | 272.2           | 0.00 0.00 1.00           |
| B25R   | 18.0 | 8.8  | 105.2 | 2.031 | -4.745 | 9.5   | -38.2 | 39.4            | 284.0           | 35.7 | 64.2   | -108.5 | 126.1            | 300.6           | 0.50 0.00 1.00           |
| B50R   | 61.7 | 26.3 | 99.4  | 2.343 | -1.509 | 36.7  | -28.3 | 46.3            | 322.3           | 58.3 | 112.5  | -65.8  | 130.3            | 329.6           | 1.00 0.00 1.00           |
| B75R   | 71.2 | 40.6 | 51.0  | 1.75  | -0.501 | 32.5  | -2.6  | 32.6            | 355.2           | 69.9 | 83.6   | -7.1   | 83.9             | 355.1           | 1.00 0.00 0.50           |

5 step equidistant grey scale with intended lightness:  $L^* = 0.0, 25.0, 50.0, 75.0, 100.0$

|             |       |       |      |        |        |     |     |     |      |       |     |     |     |     |                |
|-------------|-------|-------|------|--------|--------|-----|-----|-----|------|-------|-----|-----|-----|-----|----------------|
| N000W=N0.0  | 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 | 0.0 | 0.00 0.00 0.00 |
| N025W       | 4.1   | 4.4   | 4.8  | 0.95   | -0.435 | 0.0 | 0.0 | 0.0 | 77.5 | 25.0  | 0.0 | 0.0 | 0.0 | 0.0 | 0.25 0.25 0.25 |
| N050W       | 17.5  | 18.4  | 20.0 | 0.95   | -0.435 | 0.0 | 0.0 | 0.0 | 55.3 | 50.0  | 0.0 | 0.0 | 0.0 | 0.0 | 0.50 0.50 0.50 |
| N075W       | 45.8  | 48.2  | 52.5 | 0.95   | -0.435 | 0.0 | 0.0 | 0.0 | 21.0 | 75.0  | 0.0 | 0.0 | 0.0 | 0.0 | 0.75 0.75 0.75 |
| N100W=W95.0 | 100.0 | 108.8 | 0.95 | -0.435 | 0.0    | 0.0 | 0.0 | 0.0 | 0.0  | 100.0 | 0.0 | 0.0 | 0.0 | 0.0 | 1.00 1.00 1.00 |

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**rgb\*<sub>e</sub> and CIE data of a elementary hue circle according to CIE R1-47 for Ostwald colours**

XYZ, xy, YAB, and Lab\* data for relative spacing of elementary hue  $h_{ab}$  of CIELAB

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

|        | X    | Y    | Z     | x     | y     | A     | B     | C <sub>AB</sub> | h <sub>AB</sub> | L*   | a*     | b*     | C* <sub>ab</sub> | h <sub>ab</sub> | rgb -> rgb* <sub>e</sub> |
|--------|------|------|-------|-------|-------|-------|-------|-----------------|-----------------|------|--------|--------|------------------|-----------------|--------------------------|
| R00Y=R | 66.0 | 41.1 | 20.9  | 0.515 | 0.321 | 26.9  | 9.5   | 28.5            | 19.5            | 70.3 | 70.9   | 33.4   | 78.4             | 25.2            | 1.00 0.00 0.00           |
| R25Y   | 64.0 | 41.5 | 6.4   | 0.571 | 0.371 | 24.5  | 15.5  | 29.0            | 32.3            | 70.5 | 65.1   | 71.4   | 96.6             | 47.6            | 1.00 0.25 0.00           |
| R50Y   | 62.6 | 41.7 | 1.0   | 0.593 | 0.396 | 22.8  | 17.7  | 28.9            | 37.8            | 70.7 | 61.2   | 106.3  | 122.7            | 60.0            | 1.00 0.50 0.00           |
| R75Y   | 71.1 | 58.7 | 0.1   | 0.546 | 0.451 | 15.3  | 25.5  | 29.7            | 59.0            | 81.1 | 35.2   | 137.3  | 141.7            | 75.6            | 1.00 0.75 0.00           |
| Y00G=Y | 76.8 | 83.9 | 1.3   | 0.473 | 0.517 | -2.9  | 36.0  | 36.1            | 94.7            | 93.4 | -5.9   | 141.9  | 142.0            | 92.3            | 1.00 1.00 0.00           |
| Y25G   | 65.9 | 89.6 | 6.7   | 0.406 | 0.552 | -19.2 | 36.3  | 41.1            | 117.8           | 95.8 | -39.4  | 113.6  | 120.3            | 109.1           | 0.75 1.00 0.00           |
| Y50G   | 43.7 | 79.6 | 8.1   | 0.332 | 0.605 | -31.9 | 31.4  | 44.7            | 135.4           | 91.5 | -77.3  | 101.2  | 127.3            | 127.3           | 0.50 1.00 0.00           |
| Y75G   | 26.4 | 67.7 | 12.4  | 0.247 | 0.635 | -38.0 | 24.5  | 45.2            | 147.1           | 85.9 | -113.0 | 78.6   | 137.7            | 145.1           | 0.25 1.00 0.00           |
| G00B=G | 21.8 | 61.8 | 31.6  | 0.189 | 0.536 | -36.9 | 14.2  | 39.5            | 158.8           | 82.8 | -119.5 | 37.9   | 125.4            | 162.3           | 0.00 1.00 0.00           |
| G25B   | 27.8 | 58.9 | 81.5  | 0.165 | 0.349 | -28.1 | -6.9  | 28.9            | 193.9           | 81.2 | -86.9  | -13.9  | 88.0             | 189.1           | 0.00 1.00 0.50           |
| G50B   | 25.6 | 45.4 | 108.7 | 0.142 | 0.252 | -17.5 | -23.7 | 29.5            | 233.5           | 73.1 | -61.3  | -46.1  | 76.7             | 216.9           | 0.00 1.00 1.00           |
| G75B   | 20.2 | 29.3 | 108.4 | 0.128 | 0.185 | -7.6  | -30.6 | 31.5            | 256.0           | 61.0 | -33.4  | -66.8  | 74.7             | 243.4           | 0.00 0.50 1.00           |
| B00R=B | 18.4 | 18.7 | 107.7 | 0.127 | 0.129 | 0.6   | -34.9 | 34.9            | 271.0           | 50.4 | 3.3    | -84.8  | 84.9             | 272.2           | 0.00 0.00 1.00           |
| B25R   | 18.0 | 8.8  | 105.2 | 0.136 | 0.067 | 9.5   | -38.2 | 39.4            | 284.0           | 35.7 | 64.2   | -108.5 | 126.1            | 300.6           | 0.50 0.00 1.00           |
| B50R   | 61.7 | 26.3 | 99.4  | 0.329 | 0.14  | 36.7  | -28.3 | 46.3            | 322.3           | 58.3 | 112.5  | -65.8  | 130.3            | 329.6           | 1.00 0.00 1.00           |
| B75R   | 71.2 | 40.6 | 51.0  | 0.437 | 0.249 | 32.5  | -2.6  | 32.6            | 355.2           | 69.9 | 83.6   | -7.1   | 83.9             | 355.1           | 1.00 0.00 0.50           |

5 step equidistant grey scale with intended lightness:  $L^* = 0.0, 25.0, 50.0, 75.0, 100.0$

|             |       |       |       |       |       |     |     |     |      |       |     |     |     |     |                |
|-------------|-------|-------|-------|-------|-------|-----|-----|-----|------|-------|-----|-----|-----|-----|----------------|
| N000W=N0.0  | 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 | 0.0 | 0.00 0.00 0.00 |
| N025W       | 4.1   | 4.4   | 4.8   | 0.312 | 0.329 | 0.0 | 0.0 | 0.0 | 77.5 | 25.0  | 0.0 | 0.0 | 0.0 | 0.0 | 0.25 0.25 0.25 |
| N050W       | 17.5  | 18.4  | 20.0  | 0.312 | 0.329 | 0.0 | 0.0 | 0.0 | 55.3 | 50.0  | 0.0 | 0.0 | 0.0 | 0.0 | 0.50 0.50 0.50 |
| N075W       | 45.8  | 48.2  | 52.5  | 0.312 | 0.329 | 0.0 | 0.0 | 0.0 | 21.0 | 75.0  | 0.0 | 0.0 | 0.0 | 0.0 | 0.75 0.75 0.75 |
| N100W=W95.0 | 100.0 | 108.8 | 0.312 | 0.329 | 0.0   | 0.0 | 0.0 | 0.0 | 0.0  | 100.0 | 0.0 | 0.0 | 0.0 | 0.0 | 1.00 1.00 1.00 |

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**rgb\*<sub>e</sub> and CIE data of a elementary hue circle according to CIE R1-47 for Ostwald colours**

XYZ, ab, YAB, and Lab\* data for relative spacing of elementary hue  $h_{ab}$  of CIELAB

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

|        | X    | Y    | Z     | a     | b      | A     | B     | C <sub>AB</sub> | h <sub>AB</sub> | L*   | a*     | b*     | C* <sub>ab</sub> | h <sub>ab</sub> | rgb -> rgb* <sub>e</sub> |
|--------|------|------|-------|-------|--------|-------|-------|-----------------|-----------------|------|--------|--------|------------------|-----------------|--------------------------|
| R00Y=R | 66.0 | 41.1 | 20.9  | 1.604 | -0.202 | 26.9  | 9.5   | 28.5            | 19.5            | 70.3 | 70.9   | 33.4   | 78.4             | 25.2            | 1.00 0.00 0.00           |
| R25Y   | 64.0 | 41.5 | 6.4   | 1.54  | -0.061 | 24.5  | 15.5  | 29.0            | 32.3            | 70.5 | 65.1   | 71.4   | 96.6             | 47.6            | 1.00 0.25 0.00           |
| R50Y   | 62.6 | 41.7 | 1.0   | 1.498 | -0.01  | 22.8  | 17.7  | 28.9            | 37.8            | 70.7 | 61.2   | 106.3  | 122.7            | 60.0            | 1.00 0.50 0.00           |
| R75Y   | 71.1 | 58.7 | 0.1   | 1.21  | -0.001 | 15.3  | 25.5  | 29.7            | 59.0            | 81.1 | 35.2   | 137.3  | 141.7            | 75.6            | 1.00 0.75 0.00           |
| Y00G=Y | 76.8 | 83.9 | 1.3   | 0.915 | -0.006 | -2.9  | 36.0  | 36.1            | 94.7            | 93.4 | -5.9   | 141.9  | 142.0            | 92.3            | 1.00 1.00 0.00           |
| Y25G   | 65.9 | 89.6 | 6.7   | 0.735 | -0.03  | -19.2 | 36.3  | 41.1            | 117.8           | 95.8 | -39.4  | 113.6  | 120.3            | 109.1           | 0.75 1.00 0.00           |
| Y50G   | 43.7 | 79.6 | 8.1   | 0.549 | -0.04  | -31.9 | 31.4  | 44.7            | 135.4           | 91.5 | -77.3  | 101.2  | 127.3            | 127.3           | 0.50 1.00 0.00           |
| Y75G   | 26.4 | 67.7 | 12.4  | 0.389 | -0.073 | -38.0 | 24.5  | 45.2            | 147.1           | 85.9 | -113.0 | 78.6   | 137.7            | 145.1           | 0.25 1.00 0.00           |
| G00B=G | 21.8 | 61.8 | 31.6  | 0.353 | -0.204 | -36.9 | 14.2  | 39.5            | 158.8           | 82.8 | -119.5 | 37.9   | 125.4            | 162.3           | 0.00 1.00 0.00           |
| G25B   | 27.8 | 58.9 | 81.5  | 0.473 | -0.553 | -28.1 | -6.9  | 28.9            | 193.9           | 81.2 | -86.9  | -13.9  | 88.0             | 189.1           | 0.00 1.00 0.50           |
| G50B   | 25.6 | 45.4 | 108.7 | 0.564 | -0.957 | -17.5 | -23.7 | 29.5            | 233.5           | 73.1 | -61.3  | -46.1  | 76.7             | 216.9           | 0.00 1.00 1.00           |
| G75B   | 20.2 | 29.3 | 108.4 | 0.691 | -1.478 | -7.6  | -30.6 | 31.5            | 256.0           | 61.0 | -33.4  | -66.8  | 74.7             | 243.4           | 0.00 0.50 1.00           |
| B00R=B | 18.4 | 18.7 | 107.0 | 0.984 | -2.297 | 0.6   | -34.9 | 34.9            | 271.0           | 50.4 | 3.3    | -84.8  | 84.9             | 272.2           | 0.00 0.00 1.00           |
| B25R   | 18.0 | 8.8  | 105.2 | 0.031 | -4.745 | 9.5   | -38.2 | 39.4            | 284.0           | 35.7 | 64.2   | -108.5 | 126.1            | 300.6           | 0.50 0.00 1.00           |
| B50R   | 61.7 | 26.3 | 99.4  | 2.343 | -1.509 | 36.7  | -28.3 | 46.3            | 322.3           | 58.3 | 112.5  | -65.8  | 130.3            | 329.6           | 1.00 0.00 1.00           |
| B75R   | 71.2 | 40.6 | 51.0  | 1.75  | -0.501 | 32.5  | -2.6  | 32.6            | 355.2           | 69.9 | 83.6   | -7.1   | 83.9             | 355.1           | 1.00 0.00 0.50           |