

| 48 step circle with equal rgb* hue steps; numbers no. of 1080 colours                                                                                                                                                                                                  |                 |       |      |       |       |                 |       |       |       |       |                 |       |       |       |       |                 |                |                |                 |                 |                 |                   |                   |                   |                   |       |       |       |       |       |       |       |       |       |       |       |       |       |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------|-------|------|-------|-------|-----------------|-------|-------|-------|-------|-----------------|-------|-------|-------|-------|-----------------|----------------|----------------|-----------------|-----------------|-----------------|-------------------|-------------------|-------------------|-------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| no.                                                                                                                                                                                                                                                                    | h <sub>ab</sub> | L*    | a*a  | b*a   | no.   | h <sub>ab</sub> | L*    | a*a   | b*a   | no.   | h <sub>ab</sub> | L*    | a*a   | b*a   | no.   | h <sub>ab</sub> | L*             | a*a            | b*a             | no.             | h <sub>ab</sub> | L*                | a*a               | b*a               |                   |       |       |       |       |       |       |       |       |       |       |       |       |       |
| 648                                                                                                                                                                                                                                                                    | 31.7            | 45.9  | 61.9 | 38.3  | 720   | 99.4            | 91.6  | -13.9 | 83.6  | 72    | 150.6           | 56.8  | -63.3 | 35.5  | 80    | 229.1           | 51.7           | -33.7          | -39.1           | 8               | 299.1           | 30.8              | 24.1              | -43.3             |                   |       |       |       |       |       |       |       |       |       |       |       |       |       |
| 657                                                                                                                                                                                                                                                                    | 43.5            | 52.3  | 56.3 | 53.4  | 639   | 100.6           | 93.4  | -17.4 | 92.9  | 73    | 158.6           | 56.2  | -61.9 | 24.2  | 71    | 232.6           | 50.9           | -31.9          | -41.8           | 89              | 307.6           | 30.6              | 31.4              | -40.7             |                   |       |       |       |       |       |       |       |       |       |       |       |       |       |
| 666                                                                                                                                                                                                                                                                    | 55.6            | 59.8  | 41.3 | 60.4  | 558   | 105.0           | 88.3  | -23.0 | 85.7  | 74    | 166.6           | 56.4  | -57.7 | 13.7  | 62    | 238.2           | 50.8           | -28.2          | -45.7           | 170             | 317.4           | 30.5              | 39.7              | -36.5             |                   |       |       |       |       |       |       |       |       |       |       |       |       |       |
| 675                                                                                                                                                                                                                                                                    | 65.4            | 65.7  | 30.0 | 65.9  | 477   | 113.5           | 80.2  | -31.4 | 72.1  | 75    | 175.3           | 56.7  | -54.2 | 4.3   | 53    | 246.5           | 48.0           | -21.0          | -48.6           | 251             | 324.9           | 32.0              | 45.9              | -32.2             |                   |       |       |       |       |       |       |       |       |       |       |       |       |       |
| 684                                                                                                                                                                                                                                                                    | 74.7            | 71.5  | 19.3 | 71.0  | 396   | 121.8           | 73.5  | -38.8 | 62.6  | 76    | 184.3           | 57.4  | -49.3 | -3.7  | 44    | 254.0           | 43.9           | -13.9          | -48.6           | 332             | 329.4           | 34.4              | 49.9              | -29.4             |                   |       |       |       |       |       |       |       |       |       |       |       |       |       |
| 693                                                                                                                                                                                                                                                                    | 80.9            | 75.7  | 11.9 | 75.0  | 315   | 128.5           | 68.9  | -44.4 | 55.8  | 77    | 195.7           | 57.2  | -44.8 | -12.6 | 35    | 263.8           | 38.9           | -5.2           | -48.8           | 413             | 334.7           | 37.2              | 54.6              | -25.7             |                   |       |       |       |       |       |       |       |       |       |       |       |       |       |
| 702                                                                                                                                                                                                                                                                    | 89.4            | 82.4  | 0.7  | 77.8  | 234   | 137.9           | 63.8  | -52.3 | 47.1  | 78    | 204.2           | 56.6  | -41.9 | -18.8 | 26    | 275.0           | 33.8           | 4.3            | -48.9           | 494             | 340.0           | 39.1              | 60.1              | -21.8             |                   |       |       |       |       |       |       |       |       |       |       |       |       |       |
| 711                                                                                                                                                                                                                                                                    | 94.5            | 86.6  | -5.7 | 72.4  | 153   | 145.1           | 60.0  | -58.1 | 40.4  | 79    | 214.7           | 55.0  | -38.8 | -26.9 | 17    | 288.1           | 33.4           | 14.9           | -45.6           | 575             | 344.4           | 41.5              | 64.9              | -18.0             |                   |       |       |       |       |       |       |       |       |       |       |       |       |       |
| RJGB <sub>ton</sub> : 25.4, 92.3, 162.2, 271.7    RJGB <sub>all</sub> : 25.4    42.1    58.8    75.6    92.3    109.7    127.2    144.7    162.2    189.6    216.9    244.3    271.7    300.1    328.6    357.0    LAB*Nio: 15.0, 0.3, 1.3    LAB*Wio: 97.3, -0.9, 2.0 |                 |       |      |       |       |                 |       |       |       |       |                 |       |       |       |       |                 |                |                |                 |                 |                 |                   |                   |                   |                   |       |       |       |       |       |       |       |       |       |       |       |       |       |
| 25.4                                                                                                                                                                                                                                                                   | 42.1            | 58.8  | 75.6 | 92.3  | 109.7 | 127.2           | 144.7 | 162.2 | 189.6 | 216.9 | 244.3           | 271.7 | 300.1 | 328.6 | 357.0 |                 |                |                |                 |                 |                 |                   |                   |                   |                   |       |       |       |       |       |       |       |       |       |       |       |       |       |
| 46                                                                                                                                                                                                                                                                     | 0               | 2     | 4    | 6     | 10    | 12              | 14    | 17    | 20    | 23    | 26              | 29    | 32    | 35    | 41    |                 |                |                |                 |                 |                 |                   |                   |                   |                   |       |       |       |       |       |       |       |       |       |       |       |       |       |
| 16.6                                                                                                                                                                                                                                                                   | 22.5            | 28.1  | 31.7 | 43.5  | 55.6  | 65.4            | 74.7  | 80.9  | 89.4  | 100.6 | 105.0           | 113.5 | 121.8 | 128.5 | 137.9 | 150.6           | 158.6          | 175.3          | 184.3           | 195.7           | 204.2           | 216.9             | 229.1             | 232.6             | 246.5             | 254.0 | 263.8 | 275.0 | 288.1 | 299.1 | 307.6 | 317.4 | 324.9 | 334.7 | 340.0 | 344.4 | 349.4 | 357.2 |
| 28.1                                                                                                                                                                                                                                                                   | 31.7            | 43.5  | 55.6 | 65.4  | 74.7  | 80.9            | 89.4  | 94.5  | 99.4  | 100.6 | 105.0           | 113.5 | 121.8 | 128.5 | 137.9 | 150.6           | 158.6          | 175.3          | 184.3           | 195.7           | 204.2           | 216.9             | 229.1             | 232.6             | 246.5             | 254.0 | 263.8 | 275.0 | 288.1 | 299.1 | 307.6 | 317.4 | 324.9 | 334.7 | 340.0 | 344.4 | 349.4 | 357.0 |
| 0.527                                                                                                                                                                                                                                                                  | 0.887           | 0.329 | 0.13 | 0.559 | 0.558 | 0.814           | 0.938 | 0.451 | 0.461 | 0.153 | 0.732           | 0.705 | 0.124 | 0.819 | 0.766 |                 |                |                |                 |                 |                 |                   |                   |                   |                   |       |       |       |       |       |       |       |       |       |       |       |       |       |
| 651                                                                                                                                                                                                                                                                    | 650             | 649   | 648  | 657   | 666   | 675             | 684   | 693   | 702   | 639   | 558             | 477   | 396   | 315   | 234   | 72              | 73             | 75             | 76              | 78              | 79              | 71                | 62                | 44                | 35                | 17    | 8     | 170   | 251   | 656   | 655   |       |       |       |       |       |       |       |
| 649                                                                                                                                                                                                                                                                    | 648             | 657   | 666  | 675   | 684   | 693             | 702   | 711   | 720   | 477   | 396             | 315   | 234   | 153   | 72    | 74              | 75             | 77             | 78              | 80              | 71              | 53                | 44                | 26                | 17                | 89    | 170   | 332   | 413   | 654   | 653   |       |       |       |       |       |       |       |
| 507                                                                                                                                                                                                                                                                    | 506             | 505   | 504  | 531   | 558   | 585             | 612   | 639   | 666   | 477   | 234             | 711   | 468   | 225   | 702   | 216             | 217            | 219            | 220             | 222             | 223             | 197               | 170               | 116               | 89                | 35    | 8     | 494   | 17    | 512   | 511   |       |       |       |       |       |       |       |
| 505                                                                                                                                                                                                                                                                    | 504             | 531   | 558  | 585   | 612   | 639             | 666   | 693   | 720   | 711   | 468             | 225   | 702   | 459   | 216   | 218             | 219            | 221            | 222             | 224             | 197             | 143               | 116               | 62                | 35                | 251   | 494   | 260   | 503   | 510   | 509   |       |       |       |       |       |       |       |
| 16 step elementary hue circle with equal CIELAB hue steps                                                                                                                                                                                                              |                 |       |      |       |       |                 |       |       |       |       |                 |       |       |       |       |                 |                |                |                 |                 |                 |                   |                   |                   |                   |       |       |       |       |       |       |       |       |       |       |       |       |       |
|                                                                                                                                                                                                                                                                        |                 |       |      |       |       |                 |       |       |       |       |                 |       |       |       |       | X <sub>t</sub>  | Y <sub>t</sub> | Z <sub>t</sub> | L* <sub>t</sub> | a* <sub>t</sub> | b* <sub>t</sub> | L* <sub>t,a</sub> | a* <sub>t,a</sub> | b* <sub>t,a</sub> | h <sub>ab,t</sub> | rgb*  |       |       |       |       |       |       |       |       |       |       |       |       |
| r00j                                                                                                                                                                                                                                                                   | 640             | 569   | 520  | 491   | 469   | 472             | 485   | 484   | 484   | 527   | 621             | 690   | 678   | 590   | 451   | 352             | 336            | 355            |                 |                 |                 |                   |                   |                   |                   | 26.2  | 14.6  | 5.6   | 45.2  | 61.7  | 31.1  | 45.2  | 61.9  | 29.5  | 25.4  | 1.00  | 0.00  | 0.00  |
|                                                                                                                                                                                                                                                                        | 338             | 335   | 597  | 1770  | 3755  | 5509            | 6585  | 7133  | 7395  | 7518  | 7574            | 7586  | 7591  | 7592  | 7602  | 7614            | 7610           | 7615           |                 |                 |                 |                   |                   |                   |                   | 32.1  | 19.7  | 3.3   | 51.5  | 57.0  | 53.6  | 51.5  | 57.3  | 52.0  | 42.2  | 1.00  | 0.25  | 0.00  |
| r25j                                                                                                                                                                                                                                                                   | 335             | 250   | 216  | 190   | 181   | 173             | 179   | 188   | 222   | 314   | 551             | 865   | 1035  | 1002  | 836   | 695             | 671            | 702            |                 |                 |                 |                   |                   |                   |                   |       |       |       |       |       |       |       |       |       |       |       |       |       |
|                                                                                                                                                                                                                                                                        | 675             | 661   | 1033 | 2496  | 4748  | 6680            | 7865  | 8474  | 8766  | 8903  | 8966            | 8974  | 8976  | 8982  | 8994  | 8986            | 8987           |                |                 |                 |                 |                   |                   |                   |                   |       |       |       |       |       |       |       |       |       |       |       |       |       |
| r50j                                                                                                                                                                                                                                                                   | 350             | 276   | 232  | 206   | 185   | 183             | 190   | 205   | 246   | 378   | 777             | 1440  | 1974  | 2146  | 2034  | 1882            | 1861           | 1905           |                 |                 |                 |                   |                   |                   |                   | 39.3  | 30.2  | 4.6   | 61.8  | 37.1  | 64.0  | 61.8  | 37.5  | 62.3  | 58.9  | 1.00  | 0.50  | 0.00  |
|                                                                                                                                                                                                                                                                        | 1864            | 1846  | 2301 | 3837  | 5878  | 7445            | 8332  | 8763  | 8969  | 9065  | 9110            | 9112  | 9112  | 9104  | 9108  | 9120            | 9111           | 9113           |                 |                 |                 |                   |                   |                   |                   |       |       |       |       |       |       |       |       |       |       |       |       |       |
| r75j                                                                                                                                                                                                                                                                   | 409             | 330   | 272  | 240   | 222   | 219             | 224   | 245   | 300   | 485   | 1067            | 2120  | 3108  | 3606  | 3662  | 3566            | 3565           | 3614           |                 |                 |                 |                   |                   |                   |                   | 47.7  | 43.7  | 6.5   | 72.0  | 17.7  | 73.5  | 72.0  | 18.3  | 71.6  | 75.6  | 1.00  | 0.75  | 0.00  |
|                                                                                                                                                                                                                                                                        | 3572            | 3559  | 3987 | 5322  | 6926  | 8048            | 8643  | 8915  | 9050  | 9119  | 9152            | 9146  | 9139  | 9129  | 9134  | 9147            | 9134           | 9135           |                 |                 |                 |                   |                   |                   |                   |       |       |       |       |       |       |       |       |       |       |       |       |       |
| j00g                                                                                                                                                                                                                                                                   | 866             | 736   | 629  | 568   | 537   | 527             | 544   | 591   | 709   | 1052  | 1980            | 3542  | 5067  | 5988  | 6324  | 6372            | 6409           | 6452           |                 |                 |                 |                   |                   |                   |                   | 60.8  | 65.7  | 12.8  | 84.8  | -3.7  | 75.9  | 84.8  | -2.9  | 73.9  | 92.3  | 0.75  | 1.00  | 0.00  |
|                                                                                                                                                                                                                                                                        | 6421            | 6428  | 6684 | 7434  | 8219  | 8699            | 8937  | 9042  | 9101  | 9141  | 9159            | 9150  | 9141  | 9129  | 9132  | 9143            | 9132           | 9132           |                 |                 |                 |                   |                   |                   |                   |       |       |       |       |       |       |       |       |       |       |       |       |       |
| j25g                                                                                                                                                                                                                                                                   | 416             | 358   | 301  | 276   | 259   | 263             | 278   | 318   | 418   | 738   | 1728            | 3602  | 5648  | 7018  | 7532  | 7471            | 7205           | 6868           |                 |                 |                 |                   |                   |                   |                   | 48.7  | 63.0  | 10.5  | 83.4  | -28.7 | 79.5  | 83.4  | -27.9 | 77.5  | 109.8 | 0.50  | 1.00  | 0.00  |
|                                                                                                                                                                                                                                                                        | 6528            | 6311  | 6162 | 6075  | 5992  | 5934            | 5913  | 5900  | 5902  | 5935  | 5990            | 6018  | 6002  | 5964  | 5904  | 5853            | 5831           | 5878           |                 |                 |                 |                   |                   |                   |                   |       |       |       |       |       |       |       |       |       |       |       |       |       |
| j50g                                                                                                                                                                                                                                                                   | 291             | 270   | 251  | 243   | 233   | 237             | 258   | 302   | 398   | 699   | 1613            | 3340  | 5125  | 6092  | 6139  | 5653            | 5025           | 4379           |                 |                 |                 |                   |                   |                   |                   | 26.2  | 40.4  | 9.5   | 69.7  | -44.0 | 58.9  | 69.7  | -43.4 | 57.0  | 127.2 | 0.25  | 1.00  | 0.00  |
|                                                                                                                                                                                                                                                                        | 3800            | 3426  | 3202 | 3069  | 2953  | 2864            | 2820  | 2793  | 2788  | 2818  | 2892            | 2943  | 2928  | 2876  | 2792  | 2707            | 2689           | 2752           |                 |                 |                 |                   |                   |                   |                   |       |       |       |       |       |       |       |       |       |       |       |       |       |
| j75g                                                                                                                                                                                                                                                                   | 248             | 232   | 249  | 242   | 238   | 244             | 272   | 323   | 438   | 765   | 1694            | 3336  | 4871  | 5498  | 5248  | 4546            | 3758           | 2992           |                 |                 |                 |                   |                   |                   |                   | 15.0  | 28.4  | 9.5   | 60.2  | -58.1 | 42.6  | 60.2  | -57.7 | 40.8  | 144.7 | 0.00  | 1.00  | 0.00  |
|                                                                                                                                                                                                                                                                        | 2341            | 1930  | 1702 | 1571  | 1459  | 1372            | 1330  | 1306  | 1296  | 1325  | 1395            | 1447  | 1434  | 1388  | 1312  | 1237            | 1224           | 1287           |                 |                 |                 |                   |                   |                   |                   |       |       |       |       |       |       |       |       |       |       |       |       |       |
| g00b                                                                                                                                                                                                                                                                   | 286             | 341   | 442  | 522   | 546   | 597             | 704   | 847   | 1049  | 1505  | 2518            | 3984  | 5083  | 5291  | 4808  | 3999            | 3159           | 2380           |                 |                 |                 |                   |                   |                   |                   | 12.0  | 24.1  | 15.1  | 56.2  | -60.5 | 21.0  | 56.2  | -60.1 | 19.3  | 162.2 | 0.00  | 1.00  | 0.00  |
|                                                                                                                                                                                                                                                                        | 1749            | 1372  | 1170 | 1059  | 966   | 896             | 861   | 841   | 833   | 855   | 909             | 951   | 940   | 902   | 842   | 787             | 782            | 828            |                 |                 |                 |                   |                   |                   |                   |       |       |       |       |       |       |       |       |       |       |       |       |       |
| g25b                                                                                                                                                                                                                                                                   | 575             | 825   | 1211 | 1560  | 1710  | 1923            | 2254  | 2580  | 2867  | 3352  | 4204            | 5184  | 5687  | 5513  | 4871  | 4004            | 3140           | 2349           |                 |                 |                 |                   |                   |                   |                   | 14.7  | 25.3  | 31.8  | 57.4  | -47.5 | -6.2  | 57.4  | -47.1 | -7.9  | 189.5 | 0.00  | 1.00  | 0.50  |
|                                                                                                                                                                                                                                                                        | 1716            | 1342  | 1148 | 1039  | 952   | 886             | 853   | 834   | 825   | 844   | 894             | 931   | 91    |       |       |                 |                |                |                 |                 |                 |                   |                   |                   |                   |       |       |       |       |       |       |       |       |       |       |       |       |       |