

INDEX OF REFRACTION OF AIR

This is a table of the index of refraction n of dry air at 15°C and a pressure of 101.325 kPa and containing 0.03% by volume of carbon dioxide ("sta air"). The index of refraction is defined by $n = \lambda_{vac} / \lambda_{air}$, where λ is the wavelength of the radiation. The index is calculated from the express:

$$(n - 1) \times 10^8 = 8342.13 + 2406030(130 - \sigma^2)^{-1} + 15997(38.9 - \sigma^2)^{-1}$$

where $\sigma = 1 / \lambda_{vac}$ and λ_{vac} has units of μm . The equation is valid for λ_{vac} from 200 nm to 2 μm .

The table also gives the correction $(n - 1)\lambda_{air}$ which must be added to the wavelength in air to obtain λ_{vac} .

If the air is at a temperature t in °C and a pressure p in pascals, a value of $(n - 1)$ from this table should be multiplied by

$$\frac{p[1 + p(61.3 - t) \times 10^{-10}]}{96095.4(1 + 0.003661t)}$$

REFERENCE

Edlen, B., *Metrologia*, 2, 71, 1966.

| λ_{vac} | $(n - 1) \times 10^8$ | $\lambda_{vac} - \lambda_{air}$ | λ_{vac} | $(n - 1) \times 10^8$ | $\lambda_{vac} - \lambda_{air}$ | λ_{vac} | $(n - 1) \times 10^8$ | $\lambda_{vac} - \lambda_{air}$ |
|-----------------|-----------------------|---------------------------------|-----------------|-----------------------|---------------------------------|--------------------|-----------------------|---------------------------------|
| 200 nm | 32408 | 0.0648 nm | 540 | 27803 | 0.1501 | 880 | 27461 | 0.2416 |
| 210 | 31746 | 0.0666 | 550 | 27782 | 0.1528 | 890 | 27457 | 0.2443 |
| 220 | 31224 | 0.0687 | 560 | 27763 | 0.1554 | 900 | 27452 | 0.2470 |
| 230 | 30799 | 0.0708 | 570 | 27745 | 0.1581 | 910 | 27448 | 0.2497 |
| 240 | 30445 | 0.0730 | 580 | 27728 | 0.1608 | 920 | 27444 | 0.2524 |
| 250 | 30146 | 0.0753 | 590 | 27712 | 0.1635 | 930 | 27440 | 0.2551 |
| 260 | 29890 | 0.0777 | 600 | 27697 | 0.1661 | 940 | 27436 | 0.2578 |
| 270 | 29669 | 0.0801 | 610 | 27682 | 0.1688 | 950 | 27432 | 0.2605 |
| 280 | 29475 | 0.0825 | 620 | 27669 | 0.1715 | 960 | 27429 | 0.2632 |
| 290 | 29306 | 0.0850 | 630 | 27656 | 0.1742 | 970 | 27425 | 0.2660 |
| 300 | 29155 | 0.0874 | 640 | 27643 | 0.1769 | 980 | 27422 | 0.2687 |
| 310 | 29022 | 0.0899 | 650 | 27631 | 0.1796 | 990 nm | 27419 | 0.2714 |
| 320 | 28902 | 0.0925 | 660 | 27620 | 0.1822 | | | |
| 330 | 28795 | 0.0950 | 670 | 27609 | 0.1849 | 1.00 μm | 27416 | 0.00027 |
| 340 | 28698 | 0.0975 | 680 | 27599 | 0.1876 | 1.05 | 27401 | 0.00028 |
| 350 | 28611 | 0.1001 | 690 | 27589 | 0.1903 | 1.10 | 27389 | 0.00030 |
| 360 | 28531 | 0.1027 | 700 | 27579 | 0.1930 | 1.15 | 27378 | 0.00031 |
| 370 | 28458 | 0.1053 | 710 | 27570 | 0.1957 | 1.20 | 27368 | 0.00032 |
| 380 | 28392 | 0.1079 | 720 | 27562 | 0.1984 | 1.25 | 27360 | 0.00034 |
| 390 | 28331 | 0.1105 | 730 | 27553 | 0.2011 | 1.30 | 27352 | 0.00035 |
| 400 | 28275 | 0.1131 | 740 | 27545 | 0.2038 | 1.35 | 27346 | 0.00036 |
| 410 | 28223 | 0.1157 | 750 | 27538 | 0.2065 | 1.40 | 27340 | 0.00038 |
| 420 | 28175 | 0.1183 | 760 | 27530 | 0.2092 | 1.45 | 27334 | 0.00039 |
| 430 | 28131 | 0.1209 | 770 | 27523 | 0.2119 | 1.50 | 27330 | 0.00041 |
| 440 | 28090 | 0.1236 | 780 | 27516 | 0.2146 | 1.55 | 27325 | 0.00042 |
| 450 | 28052 | 0.1262 | 790 | 27510 | 0.2173 | 1.60 | 27321 | 0.00043 |
| 460 | 28016 | 0.1288 | 800 | 27504 | 0.2200 | 1.65 | 27318 | 0.00045 |
| 470 | 27983 | 0.1315 | 810 | 27498 | 0.2227 | 1.70 | 27314 | 0.00046 |
| 480 | 27952 | 0.1341 | 820 | 27492 | 0.2254 | 1.75 | 27311 | 0.00047 |
| 490 | 27923 | 0.1368 | 830 | 27486 | 0.2281 | 1.80 | 27309 | 0.00049 |
| 500 | 27896 | 0.1394 | 840 | 27481 | 0.2308 | 1.85 | 27306 | 0.00050 |
| 510 | 27870 | 0.1421 | 850 | 27476 | 0.2335 | 1.90 | 27304 | 0.00051 |
| 520 | 27846 | 0.1448 | 860 | 27471 | 0.2362 | 1.95 | 27302 | 0.00053 |
| 530 | 27824 | 0.1474 | 870 | 27466 | 0.2389 | 2.00 μm | 27300 | 0.00054 |