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# Pilot Reference Pack

RVR and visibility, the ICAO standard atmosphere, crosswind components, speed, temperature, fuel volume and mass in one PDF

For: Student and private pilots, flight instructors, dispatchers and aviation students

**allunitconversions.com/charts/packs**
By Miguel Coelho · Edition 2.0
9 November 2026

Seven sheets for the flight bag or the ground-school classroom: the 14 CFR 91.175(h) RVR to visibility table with metric RVR, the ICAO standard atmosphere with density altitude, crosswind and headwind components, speed in knots, mph, km/h and m/s, temperature, US and imperial gallons to litres, and kilograms to pounds. For study and planning only: always use the approved flight manual and current published procedures.

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Conversion values in this pack are generated by the AllUnitConversions conversion library and automatically checked against exact definitions (NIST SP 811, BIPM SI Brochure, 1959 International Yard and Pound Agreement) before the PDF is produced. Reference data taken from standards and regulations is cited to its source on each sheet. Free to print, copy and share with attribution (CC BY 4.0).

Printing tip: print double-sided and staple at the top left, or print single sheets from each chart's own page.

# RVR and Visibility Conversion Chart

Runway visual range in feet and metres, the 14 CFR 91.175 RVR-to-visibility table, and statute miles to metres

For: Pilots, flight students, dispatchers and flight instructors

**allunitconversions.com/rvr-visibility-chart**
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| KEY RELATIONSHIP | FORMULA | REVERSE | WORKED EXAMPLE |
|---|---|---|---|
| 1 ft = 0.3048 m; 1 statute mile = 5,280 ft = 1,609.344 m (exact) | metres = feet × 0.3048; statute miles = feet ÷ 5,280 | feet = metres ÷ 0.3048 | RVR 2,400 ft = 731.5 m; the 91.175(h) table equates it to 1/2 SM visibility |

Metres to the nearest metre, miles to 2 decimals. The regulatory table is not a unit conversion: use it only as 91.175(h) allows.

## RVR to ground visibility, 14 CFR 91.175(h)(2)

Use when RVR is not reported for the runway of intended operation. The distance columns show how the regulatory values compare with a straight conversion.

| RVR (feet) | Visibility (statute miles) | RVR in metres | RVR as a distance (SM) |
|---|---|---|---|
| 1,600 | 1/4 | 488 | 0.30 |
| 2,400 | 1/2 | 732 | 0.45 |
| 3,200 | 5/8 | 975 | 0.61 |
| 4,000 | 3/4 | 1,219 | 0.76 |
| 4,500 | 7/8 | 1,372 | 0.85 |
| 5,000 | 1 | 1,524 | 0.95 |
| 6,000 | 1 1/4 | 1,829 | 1.14 |

## RVR in feet to metres and statute miles

| RVR (ft) | Metres | Statute miles | Nautical miles |
|---|---|---|---|
| 300 | 91 | 0.06 | 0.05 |
| 400 | 122 | 0.08 | 0.07 |
| 500 | 152 | 0.09 | 0.08 |
| 600 | 183 | 0.11 | 0.10 |
| 700 | 213 | 0.13 | 0.12 |
| 800 | 244 | 0.15 | 0.13 |
| 1,000 | 305 | 0.19 | 0.16 |
| 1,200 | 366 | 0.23 | 0.20 |
| 1,400 | 427 | 0.27 | 0.23 |
| 1,600 | 488 | 0.30 | 0.26 |
| 1,800 | 549 | 0.34 | 0.30 |
| 2,000 | 610 | 0.38 | 0.33 |

| RVR (ft) | Metres | Statute miles | Nautical miles |
|---|---|---|---|
| 2,200 | 671 | 0.42 | 0.36 |
| 2,400 | 732 | 0.45 | 0.39 |
| 2,600 | 792 | 0.49 | 0.43 |
| 2,800 | 853 | 0.53 | 0.46 |
| 3,000 | 914 | 0.57 | 0.49 |
| 3,500 | 1,067 | 0.66 | 0.58 |
| 4,000 | 1,219 | 0.76 | 0.66 |
| 4,500 | 1,372 | 0.85 | 0.74 |
| 5,000 | 1,524 | 0.95 | 0.82 |
| 5,500 | 1,676 | 1.04 | 0.91 |
| 6,000 | 1,829 | 1.14 | 0.99 |
| 6,500 | 1,981 | 1.23 | 1.07 |

## RVR or visibility in metres to feet and statute miles

| Metres | Feet | Statute miles | Nautical miles |
|---|---|---|---|
| 50 | 164 | 0.03 | 0.03 |
| 75 | 246 | 0.05 | 0.04 |
| 100 | 328 | 0.06 | 0.05 |
| 125 | 410 | 0.08 | 0.07 |
| 150 | 492 | 0.09 | 0.08 |
| 175 | 574 | 0.11 | 0.09 |
| 200 | 656 | 0.12 | 0.11 |
| 225 | 738 | 0.14 | 0.12 |
| 250 | 820 | 0.16 | 0.13 |

| Metres | Feet | Statute miles | Nautical miles |
|---|---|---|---|
| 700 | 2,297 | 0.43 | 0.38 |
| 750 | 2,461 | 0.47 | 0.40 |
| 800 | 2,625 | 0.50 | 0.43 |
| 900 | 2,953 | 0.56 | 0.49 |
| 1,000 | 3,281 | 0.62 | 0.54 |
| 1,100 | 3,609 | 0.68 | 0.59 |
| 1,200 | 3,937 | 0.75 | 0.65 |
| 1,300 | 4,265 | 0.81 | 0.70 |
| 1,400 | 4,593 | 0.87 | 0.76 |

| Metres | Feet | Statute miles | Nautical miles |
|---|---|---|---|
| **275** | 902 | 0.17 | 0.15 |
| **300** | 984 | 0.19 | 0.16 |
| **325** | 1,066 | 0.20 | 0.18 |
| **350** | 1,148 | 0.22 | 0.19 |
| **375** | 1,230 | 0.23 | 0.20 |
| **400** | 1,312 | 0.25 | 0.22 |
| **450** | 1,476 | 0.28 | 0.24 |
| **500** | 1,640 | 0.31 | 0.27 |
| **550** | 1,804 | 0.34 | 0.30 |
| **600** | 1,969 | 0.37 | 0.32 |
| **650** | 2,133 | 0.40 | 0.35 |

| Metres | Feet | Statute miles | Nautical miles |
|---|---|---|---|
| **1,500** | 4,921 | 0.93 | 0.81 |
| **1,600** | 5,249 | 0.99 | 0.86 |
| **1,700** | 5,577 | 1.06 | 0.92 |
| **1,800** | 5,906 | 1.12 | 0.97 |
| **1,900** | 6,234 | 1.18 | 1.03 |
| **2,000** | 6,562 | 1.24 | 1.08 |
| **3,000** | 9,843 | 1.86 | 1.62 |
| **5,000** | 16,404 | 3.11 | 2.70 |
| **8,000** | 26,247 | 4.97 | 4.32 |
| **9,999** | 32,805 | 6.21 | 5.40 |

## Visibility in statute miles to metres and kilometres

| Statute miles | Metres | Kilometres | Feet |
|---|---|---|---|
| **1/16** | 101 | 0.10 | 330 |
| **1/8** | 201 | 0.20 | 660 |
| **3/16** | 302 | 0.30 | 990 |
| **1/4** | 402 | 0.40 | 1,320 |
| **5/16** | 503 | 0.50 | 1,650 |
| **3/8** | 604 | 0.60 | 1,980 |
| **1/2** | 805 | 0.80 | 2,640 |
| **5/8** | 1,006 | 1.01 | 3,300 |
| **3/4** | 1,207 | 1.21 | 3,960 |
| **7/8** | 1,408 | 1.41 | 4,620 |
| **1** | 1,609 | 1.61 | 5,280 |

| Statute miles | Metres | Kilometres | Feet |
|---|---|---|---|
| **1 1/4** | 2,012 | 2.01 | 6,600 |
| **1 1/2** | 2,414 | 2.41 | 7,920 |
| **1 3/4** | 2,816 | 2.82 | 9,240 |
| **2** | 3,219 | 3.22 | 10,560 |
| **2 1/2** | 4,023 | 4.02 | 13,200 |
| **3** | 4,828 | 4.83 | 15,840 |
| **4** | 6,437 | 6.44 | 21,120 |
| **5** | 8,047 | 8.05 | 26,400 |
| **6** | 9,656 | 9.66 | 31,680 |
| **7** | 11,265 | 11.27 | 36,960 |
| **10** | 16,093 | 16.09 | 52,800 |

## RVR and visibility: what to know

| Point | Detail |
|---|---|
| **RVR** | Runway visual range: how far a pilot on the runway centreline can see the runway lights or markings, measured by instruments. |
| **Ground visibility** | Prevailing visibility reported by an observer or automated system (statute miles in the US, metres elsewhere). |
| **91.175(h)** | Applies only when RVR is not reported for the runway of intended operation, and not to Category II or III minimums. |
| **Not a conversion** | RVR 1,600 ft is 0.30 SM as a distance, but the rule equates it to 1/4 SM: use the table, not arithmetic. |

## Sources and method

- **14 CFR 91.175(h), Comparable values of RVR and ground visibility** — Converts an RVR minimum to ground visibility when RVR is not reported (not for Category II or III minimums) (www.ecfr.gov/current/title-14/chapter-I/subchapter-F/part-91/subpart-B/subject-group-ECFR1d8a5dbf4a51ac3/section-91.175)
- **International Yard and Pound Agreement (1959)** — 1 ft = 0.3048 m exactly; 1 statute mile = 5,280 ft; 1 nautical mile = 1,852 m (exact by definition)

The RVR-to-visibility equivalences are quoted from 14 CFR 91.175(h)(2); every other value is an exact distance conversion. Interactive version, corrections and more charts: **allunitconversions.com/rvr-visibility-chart**

# Standard Atmosphere Table

ICAO standard atmosphere (ISA) temperature, pressure, density and speed of sound by altitude, with density altitude

For: Pilots, flight students, aerospace engineers, meteorology and physics students

**allunitconversions.com/standard-atmosphere-chart**
By Miguel Coelho · Edition 2.0
9 November 2026

| KEY RELATIONSHIP | FORMULA | REVERSE | WORKED EXAMPLE |
|---|---|---|---|
| Sea level 15 °C, 1013.25 hPa (29.92 inHg), 1.225 kg/m³; −6.5 °C per km up to 11 km, then −56.5 °C | T = 288.15 − 0.0065 × h; p = 1013.25 × (T ÷ 288.15)^5.2559 | h = (288.15 − T) ÷ 0.0065 (troposphere) | At 10,000 ft: −4.8 °C, 696.8 hPa, density 0.7385 of sea level |

Geopotential altitude, as used for pressure altitude. About −2 °C per 1,000 ft and roughly 1 hPa per 30 ft near sea level.

## Standard atmosphere by altitude in feet

| Altitude (ft) | Metres | Temp. (°C) | Temp. (°F) | Pressure (hPa) | Pressure (inHg) | Density ratio σ | Speed of sound (kt) |
|---|---|---|---|---|---|---|---|
| −1,000 | −305 | 17.0 | 62.6 | 1,050.41 | 31.02 | 1.0296 | 663.7 |
| 0 | 0 | 15.0 | 59.0 | 1,013.25 | 29.92 | 1.0000 | 661.5 |
| 1,000 | 305 | 13.0 | 55.4 | 977.17 | 28.86 | 0.9711 | 659.2 |
| 2,000 | 610 | 11.0 | 51.9 | 942.13 | 27.82 | 0.9428 | 656.9 |
| 3,000 | 914 | 9.1 | 48.3 | 908.12 | 26.82 | 0.9151 | 654.6 |
| 4,000 | 1,219 | 7.1 | 44.7 | 875.11 | 25.84 | 0.8881 | 652.3 |
| 5,000 | 1,524 | 5.1 | 41.2 | 843.07 | 24.90 | 0.8617 | 650.0 |
| 6,000 | 1,829 | 3.1 | 37.6 | 812.00 | 23.98 | 0.8359 | 647.7 |
| 7,000 | 2,134 | 1.1 | 34.0 | 781.85 | 23.09 | 0.8106 | 645.4 |
| 8,000 | 2,438 | −0.8 | 30.5 | 752.62 | 22.22 | 0.7860 | 643.0 |
| 9,000 | 2,743 | −2.8 | 26.9 | 724.28 | 21.39 | 0.7620 | 640.7 |
| 10,000 | 3,048 | −4.8 | 23.3 | 696.82 | 20.58 | 0.7385 | 638.3 |
| 11,000 | 3,353 | −6.8 | 19.8 | 670.20 | 19.79 | 0.7156 | 636.0 |
| 12,000 | 3,658 | −8.8 | 16.2 | 644.41 | 19.03 | 0.6932 | 633.6 |
| 13,000 | 3,962 | −10.8 | 12.6 | 619.43 | 18.29 | 0.6713 | 631.2 |
| 14,000 | 4,267 | −12.7 | 9.1 | 595.24 | 17.58 | 0.6500 | 628.8 |
| 15,000 | 4,572 | −14.7 | 5.5 | 571.82 | 16.89 | 0.6292 | 626.4 |
| 16,000 | 4,877 | −16.7 | 1.9 | 549.15 | 16.22 | 0.6090 | 624.0 |
| 17,000 | 5,182 | −18.7 | −1.6 | 527.22 | 15.57 | 0.5892 | 621.6 |
| 18,000 | 5,486 | −20.7 | −5.2 | 506.00 | 14.94 | 0.5699 | 619.2 |
| 19,000 | 5,791 | −22.6 | −8.8 | 485.48 | 14.34 | 0.5511 | 616.8 |
| 20,000 | 6,096 | −24.6 | −12.3 | 465.63 | 13.75 | 0.5328 | 614.3 |
| 21,000 | 6,401 | −26.6 | −15.9 | 446.45 | 13.18 | 0.5150 | 611.9 |
| 22,000 | 6,706 | −28.6 | −19.5 | 427.91 | 12.64 | 0.4976 | 609.4 |
| 23,000 | 7,010 | −30.6 | −23.0 | 410.01 | 12.11 | 0.4807 | 606.9 |
| 24,000 | 7,315 | −32.5 | −26.6 | 392.71 | 11.60 | 0.4642 | 604.4 |
| 25,000 | 7,620 | −34.5 | −30.2 | 376.01 | 11.10 | 0.4481 | 601.9 |
| 26,000 | 7,925 | −36.5 | −33.7 | 359.89 | 10.63 | 0.4325 | 599.4 |
| 27,000 | 8,230 | −38.5 | −37.3 | 344.33 | 10.17 | 0.4173 | 596.9 |
| 28,000 | 8,534 | −40.5 | −40.9 | 329.32 | 9.72 | 0.4025 | 594.4 |
| 29,000 | 8,839 | −42.5 | −44.4 | 314.85 | 9.30 | 0.3881 | 591.9 |
| 30,000 | 9,144 | −44.4 | −48.0 | 300.90 | 8.89 | 0.3741 | 589.3 |
| 31,000 | 9,449 | −46.4 | −51.6 | 287.45 | 8.49 | 0.3605 | 586.8 |
| 32,000 | 9,754 | −48.4 | −55.1 | 274.49 | 8.11 | 0.3473 | 584.2 |

| Altitude (ft) | Metres | Temp. (°C) | Temp. (°F) | Pressure (hPa) | Pressure (inHg) | Density ratio σ | Speed of sound (kt) |
|---|---|---|---|---|---|---|---|
| **33,000** | 10,058 | −50.4 | −58.7 | 262.01 | 7.74 | 0.3345 | 581.6 |
| **34,000** | 10,363 | −52.4 | −62.2 | 249.99 | 7.38 | 0.3220 | 579.0 |
| **35,000** | 10,668 | −54.3 | −65.8 | 238.42 | 7.04 | 0.3099 | 576.4 |
| **36,000** | 10,973 | −56.3 | −69.4 | 227.29 | 6.71 | 0.2981 | 573.8 |
| **37,000** | 11,278 | −56.5 | −69.7 | 216.63 | 6.40 | 0.2844 | 573.6 |
| **38,000** | 11,582 | −56.5 | −69.7 | 206.46 | 6.10 | 0.2710 | 573.6 |
| **39,000** | 11,887 | −56.5 | −69.7 | 196.77 | 5.81 | 0.2583 | 573.6 |
| **40,000** | 12,192 | −56.5 | −69.7 | 187.54 | 5.54 | 0.2462 | 573.6 |
| **41,000** | 12,497 | −56.5 | −69.7 | 178.74 | 5.28 | 0.2346 | 573.6 |
| **42,000** | 12,802 | −56.5 | −69.7 | 170.35 | 5.03 | 0.2236 | 573.6 |
| **43,000** | 13,106 | −56.5 | −69.7 | 162.36 | 4.79 | 0.2131 | 573.6 |
| **44,000** | 13,411 | −56.5 | −69.7 | 154.74 | 4.57 | 0.2031 | 573.6 |
| **45,000** | 13,716 | −56.5 | −69.7 | 147.48 | 4.35 | 0.1936 | 573.6 |
| **50,000** | 15,240 | −56.5 | −69.7 | 115.97 | 3.42 | 0.1522 | 573.6 |
| **55,000** | 16,764 | −56.5 | −69.7 | 91.20 | 2.69 | 0.1197 | 573.6 |
| **60,000** | 18,288 | −56.5 | −69.7 | 71.72 | 2.12 | 0.0941 | 573.6 |
| **65,000** | 19,812 | −56.5 | −69.7 | 56.40 | 1.67 | 0.0740 | 573.6 |

## Standard atmosphere by altitude in metres

| Altitude (m) | Feet | Temp. (°C) | Pressure (hPa) | Density (kg/m³) | Density ratio σ | Speed of sound (m/s) |
|---|---|---|---|---|---|---|
| **0** | 0 | 15.00 | 1,013.3 | 1.225 | 1.0000 | 340.3 |
| **500** | 1,640 | 11.75 | 954.61 | 1.167 | 0.9529 | 338.4 |
| **1,000** | 3,281 | 8.50 | 898.75 | 1.112 | 0.9075 | 336.4 |
| **1,500** | 4,921 | 5.25 | 845.56 | 1.058 | 0.8637 | 334.5 |
| **2,000** | 6,562 | 2.00 | 794.95 | 1.006 | 0.8216 | 332.5 |
| **2,500** | 8,202 | −1.25 | 746.83 | 0.9569 | 0.7811 | 330.6 |
| **3,000** | 9,843 | −4.50 | 701.09 | 0.9091 | 0.7421 | 328.6 |
| **3,500** | 11,483 | −7.75 | 657.64 | 0.8632 | 0.7047 | 326.6 |
| **4,000** | 13,123 | −11.00 | 616.40 | 0.8191 | 0.6687 | 324.6 |
| **4,500** | 14,764 | −14.25 | 577.28 | 0.7768 | 0.6341 | 322.6 |
| **5,000** | 16,404 | −17.50 | 540.20 | 0.7361 | 0.6009 | 320.5 |
| **5,500** | 18,045 | −20.75 | 505.07 | 0.6971 | 0.5691 | 318.5 |
| **6,000** | 19,685 | −24.00 | 471.81 | 0.6597 | 0.5385 | 316.4 |
| **6,500** | 21,325 | −27.25 | 440.35 | 0.6238 | 0.5093 | 314.4 |
| **7,000** | 22,966 | −30.50 | 410.61 | 0.5895 | 0.4812 | 312.3 |
| **7,500** | 24,606 | −33.75 | 382.51 | 0.5566 | 0.4544 | 310.2 |
| **8,000** | 26,247 | −37.00 | 356.00 | 0.5252 | 0.4287 | 308.1 |
| **8,500** | 27,887 | −40.25 | 330.99 | 0.4951 | 0.4042 | 305.9 |
| **9,000** | 29,528 | −43.50 | 307.42 | 0.4663 | 0.3807 | 303.8 |
| **9,500** | 31,168 | −46.75 | 285.24 | 0.4389 | 0.3583 | 301.6 |
| **10,000** | 32,808 | −50.00 | 264.36 | 0.4127 | 0.3369 | 299.5 |
| **10,500** | 34,449 | −53.25 | 244.74 | 0.3877 | 0.3165 | 297.3 |
| **11,000** | 36,089 | −56.50 | 226.32 | 0.3639 | 0.2971 | 295.1 |
| **11,500** | 37,730 | −56.50 | 209.16 | 0.3363 | 0.2746 | 295.1 |
| **12,000** | 39,370 | −56.50 | 193.30 | 0.3108 | 0.2537 | 295.1 |
| **12,500** | 41,010 | −56.50 | 178.65 | 0.2873 | 0.2345 | 295.1 |
| **13,000** | 42,651 | −56.50 | 165.10 | 0.2655 | 0.2167 | 295.1 |
| **13,500** | 44,291 | −56.50 | 152.59 | 0.2454 | 0.2003 | 295.1 |
| **14,000** | 45,932 | −56.50 | 141.02 | 0.2268 | 0.1851 | 295.1 |

| Altitude (m) | Feet | Temp. (°C) | Pressure (hPa) | Density (kg/m³) | Density ratio σ | Speed of sound (m/s) |
|---|---|---|---|---|---|---|
| **14,500** | 47,572 | −56.50 | 130.33 | 0.2096 | 0.1711 | 295.1 |
| **15,000** | 49,213 | −56.50 | 120.45 | 0.1937 | 0.1581 | 295.1 |
| **15,500** | 50,853 | −56.50 | 111.31 | 0.1790 | 0.1461 | 295.1 |
| **16,000** | 52,493 | −56.50 | 102.87 | 0.1654 | 0.1350 | 295.1 |
| **16,500** | 54,134 | −56.50 | 95.075 | 0.1529 | 0.1248 | 295.1 |
| **17,000** | 55,774 | −56.50 | 87.867 | 0.1413 | 0.1153 | 295.1 |
| **17,500** | 57,415 | −56.50 | 81.205 | 0.1306 | 0.1066 | 295.1 |
| **18,000** | 59,055 | −56.50 | 75.048 | 0.1207 | 0.0985 | 295.1 |
| **18,500** | 60,696 | −56.50 | 69.358 | 0.1115 | 0.0910 | 295.1 |
| **19,000** | 62,336 | −56.50 | 64.100 | 0.1031 | 0.0841 | 295.1 |
| **19,500** | 63,976 | −56.50 | 59.240 | 0.09526 | 0.0778 | 295.1 |
| **20,000** | 65,617 | −56.50 | 54.749 | 0.08803 | 0.0719 | 295.1 |

## Density altitude (feet) from pressure altitude and temperature

Rows: pressure altitude (set 29.92 inHg / 1013 hPa and read the altimeter). Columns: outside air temperature. Calculated exactly from ISA density.

| Pressure alt. (ft) | −10 °C | 0 °C | 10 °C | 20 °C | 30 °C | 40 °C |
|---|---|---|---|---|---|---|
| **0** | −3,130 | −1,840 | −600 | 590 | 1,720 | 2,820 |
| **1,000** | −1,870 | −590 | 640 | 1,820 | 2,940 | 4,030 |
| **2,000** | −620 | 660 | 1,880 | 3,040 | 4,160 | 5,230 |
| **3,000** | 640 | 1,900 | 3,110 | 4,270 | 5,380 | 6,440 |
| **4,000** | 1,900 | 3,150 | 4,340 | 5,490 | 6,590 | 7,640 |
| **5,000** | 3,150 | 4,390 | 5,580 | 6,710 | 7,800 | 8,850 |
| **6,000** | 4,400 | 5,630 | 6,800 | 7,930 | 9,010 | 10,050 |
| **7,000** | 5,650 | 6,870 | 8,030 | 9,150 | 10,220 | 11,240 |
| **8,000** | 6,890 | 8,100 | 9,260 | 10,360 | 11,420 | 12,440 |
| **9,000** | 8,140 | 9,330 | 10,480 | 11,570 | 12,630 | 13,630 |
| **10,000** | 9,380 | 10,560 | 11,700 | 12,790 | 13,830 | 14,830 |
| **11,000** | 10,620 | 11,790 | 12,920 | 13,990 | 15,030 | 16,020 |
| **12,000** | 11,850 | 13,020 | 14,130 | 15,200 | 16,220 | 17,200 |

## ISA constants and formulas

| Quantity | Value or formula |
|---|---|
| **Sea-level temperature** | 288.15 K (15 °C, 59 °F) |
| **Sea-level pressure** | 101,325 Pa = 1013.25 hPa = 29.921 inHg = 14.696 psi |
| **Sea-level density** | 1.225 kg/m³ (0.002377 slug/ft³) |
| **Lapse rate** | 6.5 K per km (1.98 °C per 1,000 ft) up to 11 km (36,089 ft) |
| **Tropopause to 20 km** | Constant 216.65 K (−56.5 °C); p = 22,632 Pa × e^(−(h − 11,000) ÷ 6,341.6 m) |
| **Speed of sound** | a = √(1.4 × 287.053 × T); 340.29 m/s = 661.5 kt at sea level |
| **ISA deviation** | ISA temperature at altitude: 15 − 1.98 × (altitude ÷ 1,000 ft) °C |

## Sources and method

- **ICAO Doc 7488, Manual of the ICAO Standard Atmosphere (3rd edition, 1993)** — Identical to ISO 2533:1975 up to 32 km; defining constants used for every value
- **FAA Pilot's Handbook of Aeronautical Knowledge (FAA-H-8083-25)** — Density altitude, crosswind and headwind components (www.faa.gov/regulations_policies/handbooks_manuals/aviation/phak)

Every value is calculated from the ICAO Doc 7488 defining constants ($T_0$ 288.15 K, $p_0$ 101,325 Pa, R 287.052 87 J/(kg·K), $g_0$ 9.806 65 m/s²); density altitude inverts the ISA density exactly. Interactive version, corrections and more charts: **allunitconversions.com/standard-atmosphere-chart**

# Crosswind Component Chart

Crosswind and headwind components for wind angles from 0° to 90° and wind speeds up to 50 knots

For: Pilots, flight students and flight instructors

allunitconversions.com/crosswind-component-chart
By Miguel Coelho · Edition 2.0
9 November 2026

| KEY RELATIONSHIP | FORMULA | REVERSE | WORKED EXAMPLE |
|---|---|---|---|
| Wind angle = difference between wind direction and runway heading | Crosswind = wind speed × sin(angle); headwind = wind speed × cos(angle) | Angle = arcsin(crosswind ÷ wind speed) | Runway 27, wind 300° at 20 kt: 30° off, crosswind 10 kt, headwind 17.3 kt |

Components to 1 decimal place of a knot. Use the gust value as well as the steady wind when checking a crosswind limit.

## Component factors by wind angle

| Angle | Crosswind factor (sin) | Headwind factor (cos) | Clock rule |
|---|---|---|---|
| 0° | 0.000 | 1.000 | 0 |
| 5° | 0.087 | 0.996 | |
| 10° | 0.174 | 0.985 | |
| 15° | 0.259 | 0.966 | 1/4 |
| 20° | 0.342 | 0.940 | |
| 25° | 0.423 | 0.906 | |
| 30° | 0.500 | 0.866 | 1/2 |
| 35° | 0.574 | 0.819 | |
| 40° | 0.643 | 0.766 | |
| 45° | 0.707 | 0.707 | 3/4 |

| Angle | Crosswind factor (sin) | Headwind factor (cos) | Clock rule |
|---|---|---|---|
| 50° | 0.766 | 0.643 | |
| 55° | 0.819 | 0.574 | |
| 60° | 0.866 | 0.500 | all |
| 65° | 0.906 | 0.423 | |
| 70° | 0.940 | 0.342 | |
| 75° | 0.966 | 0.259 | |
| 80° | 0.985 | 0.174 | |
| 85° | 0.996 | 0.087 | |
| 90° | 1.000 | 0.000 | |

## Crosswind component (knots)

Rows: wind speed (kt). Columns: angle between wind and runway.

| Wind (kt) | 10° | 20° | 30° | 40° | 45° | 50° | 60° | 70° | 80° | 90° |
|---|---|---|---|---|---|---|---|---|---|---|
| 5 | 0.9 | 1.7 | 2.5 | 3.2 | 3.5 | 3.8 | 4.3 | 4.7 | 4.9 | 5.0 |
| 10 | 1.7 | 3.4 | 5.0 | 6.4 | 7.1 | 7.7 | 8.7 | 9.4 | 9.8 | 10.0 |
| 15 | 2.6 | 5.1 | 7.5 | 9.6 | 10.6 | 11.5 | 13.0 | 14.1 | 14.8 | 15.0 |
| 20 | 3.5 | 6.8 | 10.0 | 12.9 | 14.1 | 15.3 | 17.3 | 18.8 | 19.7 | 20.0 |
| 25 | 4.3 | 8.6 | 12.5 | 16.1 | 17.7 | 19.2 | 21.7 | 23.5 | 24.6 | 25.0 |
| 30 | 5.2 | 10.3 | 15.0 | 19.3 | 21.2 | 23.0 | 26.0 | 28.2 | 29.5 | 30.0 |
| 35 | 6.1 | 12.0 | 17.5 | 22.5 | 24.7 | 26.8 | 30.3 | 32.9 | 34.5 | 35.0 |
| 40 | 6.9 | 13.7 | 20.0 | 25.7 | 28.3 | 30.6 | 34.6 | 37.6 | 39.4 | 40.0 |
| 45 | 7.8 | 15.4 | 22.5 | 28.9 | 31.8 | 34.5 | 39.0 | 42.3 | 44.3 | 45.0 |
| 50 | 8.7 | 17.1 | 25.0 | 32.1 | 35.4 | 38.3 | 43.3 | 47.0 | 49.2 | 50.0 |

## Headwind component (knots)

Beyond 90° the wind is behind the aircraft: the same values become a tailwind.

| Wind (kt) | 10° | 20° | 30° | 40° | 45° | 50° | 60° | 70° | 80° | 90° |
|---|---|---|---|---|---|---|---|---|---|---|
| 5 | 4.9 | 4.7 | 4.3 | 3.8 | 3.5 | 3.2 | 2.5 | 1.7 | 0.9 | 0.0 |
| 10 | 9.8 | 9.4 | 8.7 | 7.7 | 7.1 | 6.4 | 5.0 | 3.4 | 1.7 | 0.0 |
| 15 | 14.8 | 14.1 | 13.0 | 11.5 | 10.6 | 9.6 | 7.5 | 5.1 | 2.6 | 0.0 |
| 20 | 19.7 | 18.8 | 17.3 | 15.3 | 14.1 | 12.9 | 10.0 | 6.8 | 3.5 | 0.0 |
| 25 | 24.6 | 23.5 | 21.7 | 19.2 | 17.7 | 16.1 | 12.5 | 8.6 | 4.3 | 0.0 |
| 30 | 29.5 | 28.2 | 26.0 | 23.0 | 21.2 | 19.3 | 15.0 | 10.3 | 5.2 | 0.0 |
| 35 | 34.5 | 32.9 | 30.3 | 26.8 | 24.7 | 22.5 | 17.5 | 12.0 | 6.1 | 0.0 |

| Wind (kt) | 10° | 20° | 30° | 40° | 45° | 50° | 60° | 70° | 80° | 90° |
|---|---|---|---|---|---|---|---|---|---|---|
| **40** | 39.4 | 37.6 | 34.6 | 30.6 | 28.3 | 25.7 | 20.0 | 13.7 | 6.9 | 0.0 |
| **45** | 44.3 | 42.3 | 39.0 | 34.5 | 31.8 | 28.9 | 22.5 | 15.4 | 7.8 | 0.0 |
| **50** | 49.2 | 47.0 | 43.3 | 38.3 | 35.4 | 32.1 | 25.0 | 17.1 | 8.7 | 0.0 |

## Using the chart

| Point | Detail |
|---|---|
| **Runway heading** | Runway number × 10 is the approximate magnetic heading: runway 27 ≈ 270°. |
| **Wind source** | METAR and TAF winds are relative to true north; ATIS and tower winds are magnetic. Use magnetic wind with runway headings. |
| **Clock rule** | 15° ≈ 1/4, 30° ≈ 1/2, 45° ≈ 3/4 and 60° or more ≈ all of the wind speed as crosswind. |
| **Limits** | Compare with the maximum demonstrated crosswind in the aircraft flight manual, and your own limits; include gusts. |

## Sources and method

- **FAA Pilot's Handbook of Aeronautical Knowledge (FAA-H-8083-25)** — Density altitude, crosswind and headwind components (www.faa.gov/regulations_policies/handbooks_manuals/aviation/phak)

Every component is calculated with sin and cos of the wind angle; the clock rule is shown for comparison. Interactive version, corrections and more charts: **allunitconversions.com/crosswind-component-chart**

# Speed Conversion Chart

km/h, mph, m/s, knots and ft/s, with the Beaufort wind scale

For: Drivers, pilots, sailors, cyclists and weather watchers

**allunitconversions.com/speed-conversion-chart**
By Miguel Coelho · Edition 2.0
9 November 2026

| EXACT DEFINITION | FORMULA | REVERSE | WORKED EXAMPLE |
|---|---|---|---|
| 1 mph = 1.609 344 km/h; 1 kn = 1.852 km/h; 1 m/s = 3.6 km/h (all exact) | mph = km/h ÷ 1.609 344; km/h = m/s × 3.6 | km/h = mph × 1.609 344; kn = km/h ÷ 1.852 | 100 km/h = 62.14 mph = 27.78 m/s = 54.0 kn |

Matrix values use 6 significant figures; tables to 1–2 decimal places.

## Factor matrix — 1 unit in every other unit

| 1 unit = | m/s | km/h | mph | kn | ft/s |
|---|---|---|---|---|---|
| **1 m/s** | 1 | 3.6 | 2.23694 | 1.94384 | 3.28084 |
| **1 km/h** | 0.277778 | 1 | 0.621371 | 0.539957 | 0.911344 |
| **1 mph** | 0.44704 | 1.60934 | 1 | 0.868976 | 1.46667 |
| **1 kn** | 0.514444 | 1.852 | 1.15078 | 1 | 1.68781 |
| **1 ft/s** | 0.3048 | 1.09728 | 0.681818 | 0.592484 | 1 |

## km/h to mph, m/s and knots

| Kilometres per hour (km/h) | Miles per hour (mph) | Metres per second (m/s) | Knots (kn) |
|---|---|---|---|
| **10** | 6.2 | 2.78 | 5.4 |
| **20** | 12.4 | 5.56 | 10.8 |
| **30** | 18.6 | 8.33 | 16.2 |
| **40** | 24.9 | 11.11 | 21.6 |
| **50** | 31.1 | 13.89 | 27.0 |
| **60** | 37.3 | 16.67 | 32.4 |
| **70** | 43.5 | 19.44 | 37.8 |
| **80** | 49.7 | 22.22 | 43.2 |
| **90** | 55.9 | 25.00 | 48.6 |
| **100** | 62.1 | 27.78 | 54.0 |

| Kilometres per hour (km/h) | Miles per hour (mph) | Metres per second (m/s) | Knots (kn) |
|---|---|---|---|
| **110** | 68.4 | 30.56 | 59.4 |
| **120** | 74.6 | 33.33 | 64.8 |
| **130** | 80.8 | 36.11 | 70.2 |
| **140** | 87.0 | 38.89 | 75.6 |
| **150** | 93.2 | 41.67 | 81.0 |
| **160** | 99.4 | 44.44 | 86.4 |
| **170** | 105.6 | 47.22 | 91.8 |
| **180** | 111.8 | 50.00 | 97.2 |
| **190** | 118.1 | 52.78 | 102.6 |
| **200** | 124.3 | 55.56 | 108.0 |

## mph to km/h

| Miles per hour (mph) | Kilometres per hour (km/h) |
|---|---|
| **5** | 8.0 |
| **10** | 16.1 |
| **15** | 24.1 |
| **20** | 32.2 |
| **25** | 40.2 |
| **30** | 48.3 |
| **35** | 56.3 |
| **40** | 64.4 |
| **45** | 72.4 |
| **50** | 80.5 |

| Miles per hour (mph) | Kilometres per hour (km/h) |
|---|---|
| **55** | 88.5 |
| **60** | 96.6 |
| **65** | 104.6 |
| **70** | 112.7 |
| **75** | 120.7 |
| **80** | 128.7 |
| **85** | 136.8 |
| **90** | 144.8 |
| **95** | 152.9 |
| **100** | 160.9 |

| Miles per hour (mph) | Kilometres per hour (km/h) |
|---|---|
| **105** | 169.0 |
| **110** | 177.0 |
| **115** | 185.1 |
| **120** | 193.1 |
| **125** | 201.2 |
| **130** | 209.2 |
| **135** | 217.3 |
| **140** | 225.3 |
| **145** | 233.4 |
| **150** | 241.4 |

## Beaufort wind scale

| Force | Description | Knots | km/h |
|---|---|---|---|
| **0** | Calm | < 1 | < 1 |
| **1** | Light air | 1–3 | 1–5 |
| **2** | Light breeze | 4–6 | 6–11 |
| **3** | Gentle breeze | 7–10 | 12–19 |
| **4** | Moderate breeze | 11–16 | 20–28 |
| **5** | Fresh breeze | 17–21 | 29–38 |
| **6** | Strong breeze | 22–27 | 39–49 |
| **7** | Near gale | 28–33 | 50–61 |
| **8** | Gale | 34–40 | 62–74 |
| **9** | Strong gale | 41–47 | 75–88 |
| **10** | Storm | 48–55 | 89–102 |
| **11** | Violent storm | 56–63 | 103–117 |
| **12** | Hurricane force | ≥ 64 | ≥ 118 |

## Sources and method

- **International Yard and Pound Agreement (1959)** — 1 in = 25.4 mm, 1 ft = 0.3048 m, 1 lb = 0.453 592 37 kg exactly
- **NIST Special Publication 811** — Guide for the Use of the International System of Units (www.nist.gov/pml/special-publication-811)
- **World Meteorological Organization** — Beaufort wind force scale (knots); Met Office km/h equivalents

Conversion values on this sheet are generated by the AllUnitConversions conversion library and automatically checked against the exact definitions above before the PDF is produced; reference tables are taken from the sources listed. Interactive version, corrections and more charts: **allunitconversions.com/speed-conversion-chart**

# Temperature Conversion Chart

Celsius, Fahrenheit and Kelvin side by side

For: Students, scientists, engineers and cooks

**allunitconversions.com/temperature-conversion-chart**
By Miguel Coelho · Edition 2.0
9 November 2026

| EXACT DEFINITION | FORMULA | REVERSE | WORKED EXAMPLE |
|---|---|---|---|
| K = °C + 273.15 and °F = °C × 9/5 + 32 (exact) | °F = (°C × 1.8) + 32; K = °C + 273.15 | °C = (°F − 32) ÷ 1.8; °C = K − 273.15 | 25 °C = 77 °F = 298.15 K |

Values are rounded to 2 decimal places.

## −50 °C to 300 °C in 5-degree steps

| Celsius (°C) | Fahrenheit (°F) | Kelvin (K) | Celsius (°C) | Fahrenheit (°F) | Kelvin (K) |
|---|---|---|---|---|---|
| **−50** | −58.0 | 223.15 | **130** | 266.0 | 403.15 |
| **−45** | −49.0 | 228.15 | **135** | 275.0 | 408.15 |
| **−40** | −40.0 | 233.15 | **140** | 284.0 | 413.15 |
| **−35** | −31.0 | 238.15 | **145** | 293.0 | 418.15 |
| **−30** | −22.0 | 243.15 | **150** | 302.0 | 423.15 |
| **−25** | −13.0 | 248.15 | **155** | 311.0 | 428.15 |
| **−20** | −4.0 | 253.15 | **160** | 320.0 | 433.15 |
| **−15** | 5.0 | 258.15 | **165** | 329.0 | 438.15 |
| **−10** | 14.0 | 263.15 | **170** | 338.0 | 443.15 |
| **−5** | 23.0 | 268.15 | **175** | 347.0 | 448.15 |
| **0** | 32.0 | 273.15 | **180** | 356.0 | 453.15 |
| **5** | 41.0 | 278.15 | **185** | 365.0 | 458.15 |
| **10** | 50.0 | 283.15 | **190** | 374.0 | 463.15 |
| **15** | 59.0 | 288.15 | **195** | 383.0 | 468.15 |
| **20** | 68.0 | 293.15 | **200** | 392.0 | 473.15 |
| **25** | 77.0 | 298.15 | **205** | 401.0 | 478.15 |
| **30** | 86.0 | 303.15 | **210** | 410.0 | 483.15 |
| **35** | 95.0 | 308.15 | **215** | 419.0 | 488.15 |
| **40** | 104.0 | 313.15 | **220** | 428.0 | 493.15 |
| **45** | 113.0 | 318.15 | **225** | 437.0 | 498.15 |
| **50** | 122.0 | 323.15 | **230** | 446.0 | 503.15 |
| **55** | 131.0 | 328.15 | **235** | 455.0 | 508.15 |
| **60** | 140.0 | 333.15 | **240** | 464.0 | 513.15 |
| **65** | 149.0 | 338.15 | **245** | 473.0 | 518.15 |
| **70** | 158.0 | 343.15 | **250** | 482.0 | 523.15 |
| **75** | 167.0 | 348.15 | **255** | 491.0 | 528.15 |
| **80** | 176.0 | 353.15 | **260** | 500.0 | 533.15 |
| **85** | 185.0 | 358.15 | **265** | 509.0 | 538.15 |
| **90** | 194.0 | 363.15 | **270** | 518.0 | 543.15 |
| **95** | 203.0 | 368.15 | **275** | 527.0 | 548.15 |
| **100** | 212.0 | 373.15 | **280** | 536.0 | 553.15 |
| **105** | 221.0 | 378.15 | **285** | 545.0 | 558.15 |
| **110** | 230.0 | 383.15 | **290** | 554.0 | 563.15 |

| Celsius (°C) | Fahrenheit (°F) | Kelvin (K) |
|---|---|---|
| **115** | 239.0 | 388.15 |
| **120** | 248.0 | 393.15 |
| **125** | 257.0 | 398.15 |

| Celsius (°C) | Fahrenheit (°F) | Kelvin (K) |
|---|---|---|
| **295** | 563.0 | 568.15 |
| **300** | 572.0 | 573.15 |

## Reference points

| Reference | Celsius (°C) | Fahrenheit (°F) | Kelvin (K) |
|---|---|---|---|
| Absolute zero | −273.15 | −459.67 | 0 |
| Celsius equals Fahrenheit | −40 | −40 | 233.15 |
| Water freezes | 0 | 32 | 273.15 |
| Room temperature | 20 | 68 | 293.15 |
| Body temperature | 37 | 98.6 | 310.15 |
| Water boils (sea level) | 100 | 212 | 373.15 |

## Sources and method

- **BIPM SI Brochure, 9th edition** — Definitions of the SI units, including the kelvin (www.bipm.org/en/publications/si-brochure)
- **NIST Special Publication 811** — Guide for the Use of the International System of Units (www.nist.gov/pml/special-publication-811)

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# Gallons to Litres Conversion Chart

US and UK (imperial) gallons to litres

For: Drivers, boaters, brewers, gardeners and aquarium keepers

allunitconversions.com/gal-to-l-conversion-chart
By Miguel Coelho · Edition 2.0
9 November 2026

| EXACT DEFINITION | FORMULA | REVERSE | WORKED EXAMPLE |
|---|---|---|---|
| 1 US gal = 3.785 411 784 L; 1 UK gal = 4.546 09 L (both exact) | L = US gal × 3.785 412 | US gal = L ÷ 3.785 412 | 15 US gal × 3.785412 = 56.78 L |

Litres are rounded to 2 decimal places.

## US gallons to litres

| US gallons (US gal) | Litres (L) | US gallons (US gal) | Litres (L) | US gallons (US gal) | Litres (L) | US gallons (US gal) | Litres (L) |
|---|---|---|---|---|---|---|---|
| **1** | 3.79 | **26** | 98.42 | **51** | 193.06 | **76** | 287.69 |
| **2** | 7.57 | **27** | 102.21 | **52** | 196.84 | **77** | 291.48 |
| **3** | 11.36 | **28** | 105.99 | **53** | 200.63 | **78** | 295.26 |
| **4** | 15.14 | **29** | 109.78 | **54** | 204.41 | **79** | 299.05 |
| **5** | 18.93 | **30** | 113.56 | **55** | 208.20 | **80** | 302.83 |
| **6** | 22.71 | **31** | 117.35 | **56** | 211.98 | **81** | 306.62 |
| **7** | 26.50 | **32** | 121.13 | **57** | 215.77 | **82** | 310.40 |
| **8** | 30.28 | **33** | 124.92 | **58** | 219.55 | **83** | 314.19 |
| **9** | 34.07 | **34** | 128.70 | **59** | 223.34 | **84** | 317.97 |
| **10** | 37.85 | **35** | 132.49 | **60** | 227.12 | **85** | 321.76 |
| **11** | 41.64 | **36** | 136.27 | **61** | 230.91 | **86** | 325.55 |
| **12** | 45.42 | **37** | 140.06 | **62** | 234.70 | **87** | 329.33 |
| **13** | 49.21 | **38** | 143.85 | **63** | 238.48 | **88** | 333.12 |
| **14** | 53.00 | **39** | 147.63 | **64** | 242.27 | **89** | 336.90 |
| **15** | 56.78 | **40** | 151.42 | **65** | 246.05 | **90** | 340.69 |
| **16** | 60.57 | **41** | 155.20 | **66** | 249.84 | **91** | 344.47 |
| **17** | 64.35 | **42** | 158.99 | **67** | 253.62 | **92** | 348.26 |
| **18** | 68.14 | **43** | 162.77 | **68** | 257.41 | **93** | 352.04 |
| **19** | 71.92 | **44** | 166.56 | **69** | 261.19 | **94** | 355.83 |
| **20** | 75.71 | **45** | 170.34 | **70** | 264.98 | **95** | 359.61 |
| **21** | 79.49 | **46** | 174.13 | **71** | 268.76 | **96** | 363.40 |
| **22** | 83.28 | **47** | 177.91 | **72** | 272.55 | **97** | 367.18 |
| **23** | 87.06 | **48** | 181.70 | **73** | 276.34 | **98** | 370.97 |
| **24** | 90.85 | **49** | 185.49 | **74** | 280.12 | **99** | 374.76 |
| **25** | 94.64 | **50** | 189.27 | **75** | 283.91 | **100** | 378.54 |

## UK (imperial) gallons to litres

| UK gallons (UK gal) | Litres (L) | UK gallons (UK gal) | Litres (L) | UK gallons (UK gal) | Litres (L) |
|---|---|---|---|---|---|
| **1** | 4.55 | **18** | 81.83 | **35** | 159.11 |
| **2** | 9.09 | **19** | 86.38 | **36** | 163.66 |
| **3** | 13.64 | **20** | 90.92 | **37** | 168.21 |
| **4** | 18.18 | **21** | 95.47 | **38** | 172.75 |
| **5** | 22.73 | **22** | 100.01 | **39** | 177.30 |

| UK gallons (UK gal) | Litres (L) |
|---|---|
| **6** | 27.28 |
| **7** | 31.82 |
| **8** | 36.37 |
| **9** | 40.91 |
| **10** | 45.46 |
| **11** | 50.01 |
| **12** | 54.55 |
| **13** | 59.10 |
| **14** | 63.65 |
| **15** | 68.19 |
| **16** | 72.74 |
| **17** | 77.28 |

| UK gallons (UK gal) | Litres (L) |
|---|---|
| **23** | 104.56 |
| **24** | 109.11 |
| **25** | 113.65 |
| **26** | 118.20 |
| **27** | 122.74 |
| **28** | 127.29 |
| **29** | 131.84 |
| **30** | 136.38 |
| **31** | 140.93 |
| **32** | 145.47 |
| **33** | 150.02 |
| **34** | 154.57 |

| UK gallons (UK gal) | Litres (L) |
|---|---|
| **40** | 181.84 |
| **41** | 186.39 |
| **42** | 190.94 |
| **43** | 195.48 |
| **44** | 200.03 |
| **45** | 204.57 |
| **46** | 209.12 |
| **47** | 213.67 |
| **48** | 218.21 |
| **49** | 222.76 |
| **50** | 227.30 |

## US and UK liquid measures

| From | To | Multiply by |
|---|---|---|
| **US gallons (US gal)** | Litres (L) | 3.785412 |
| **UK gallons (UK gal)** | Litres (L) | 4.54609 |
| **US quarts (US qt)** | Litres (L) | 0.9463529 |
| **UK quarts (UK qt)** | Litres (L) | 1.136522 |
| **US pints (US pt)** | Litres (L) | 0.4731765 |
| **UK pints (UK pt)** | Litres (L) | 0.5682612 |
| **UK gallons (UK gal)** | US gallons (US gal) | 1.20095 |

## Sources and method

- **NIST Special Publication 811** — Guide for the Use of the International System of Units (www.nist.gov/pml/special-publication-811)

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# Kilograms to Pounds Conversion Chart

Body weight, luggage and kitchen weights in pounds and ounces

For: Fitness, travel, shipping and cooking

allunitconversions.com/kg-to-lb-conversion-chart
By Miguel Coelho · Edition 2.0
9 November 2026

| EXACT DEFINITION | FORMULA | REVERSE | WORKED EXAMPLE |
|---|---|---|---|
| 1 lb = 0.453 592 37 kg exactly, so 1 kg = 2.204 62 lb | lb = kg ÷ 0.453 592 37 | kg = lb × 0.453 592 37 | 23 kg ÷ 0.45359237 = 50.71 lb (a typical checked-bag limit) |

Pounds are rounded to 2 decimal places; ounces to 0.1 oz.

## 1 to 100 kg

| Kilograms (kg) | Pounds (lb) | Kilograms (kg) | Pounds (lb) | Kilograms (kg) | Pounds (lb) | Kilograms (kg) | Pounds (lb) |
|---|---|---|---|---|---|---|---|
| **1** | 2.20 | **26** | 57.32 | **51** | 112.44 | **76** | 167.55 |
| **2** | 4.41 | **27** | 59.52 | **52** | 114.64 | **77** | 169.76 |
| **3** | 6.61 | **28** | 61.73 | **53** | 116.84 | **78** | 171.96 |
| **4** | 8.82 | **29** | 63.93 | **54** | 119.05 | **79** | 174.17 |
| **5** | 11.02 | **30** | 66.14 | **55** | 121.25 | **80** | 176.37 |
| **6** | 13.23 | **31** | 68.34 | **56** | 123.46 | **81** | 178.57 |
| **7** | 15.43 | **32** | 70.55 | **57** | 125.66 | **82** | 180.78 |
| **8** | 17.64 | **33** | 72.75 | **58** | 127.87 | **83** | 182.98 |
| **9** | 19.84 | **34** | 74.96 | **59** | 130.07 | **84** | 185.19 |
| **10** | 22.05 | **35** | 77.16 | **60** | 132.28 | **85** | 187.39 |
| **11** | 24.25 | **36** | 79.37 | **61** | 134.48 | **86** | 189.60 |
| **12** | 26.46 | **37** | 81.57 | **62** | 136.69 | **87** | 191.80 |
| **13** | 28.66 | **38** | 83.78 | **63** | 138.89 | **88** | 194.01 |
| **14** | 30.86 | **39** | 85.98 | **64** | 141.10 | **89** | 196.21 |
| **15** | 33.07 | **40** | 88.18 | **65** | 143.30 | **90** | 198.42 |
| **16** | 35.27 | **41** | 90.39 | **66** | 145.51 | **91** | 200.62 |
| **17** | 37.48 | **42** | 92.59 | **67** | 147.71 | **92** | 202.83 |
| **18** | 39.68 | **43** | 94.80 | **68** | 149.91 | **93** | 205.03 |
| **19** | 41.89 | **44** | 97.00 | **69** | 152.12 | **94** | 207.23 |
| **20** | 44.09 | **45** | 99.21 | **70** | 154.32 | **95** | 209.44 |
| **21** | 46.30 | **46** | 101.41 | **71** | 156.53 | **96** | 211.64 |
| **22** | 48.50 | **47** | 103.62 | **72** | 158.73 | **97** | 213.85 |
| **23** | 50.71 | **48** | 105.82 | **73** | 160.94 | **98** | 216.05 |
| **24** | 52.91 | **49** | 108.03 | **74** | 163.14 | **99** | 218.26 |
| **25** | 55.12 | **50** | 110.23 | **75** | 165.35 | **100** | 220.46 |

## 105 to 300 kg

| Kilograms (kg) | Pounds (lb) | Kilograms (kg) | Pounds (lb) | Kilograms (kg) | Pounds (lb) | Kilograms (kg) | Pounds (lb) |
|---|---|---|---|---|---|---|---|
| **105** | 231.5 | **155** | 341.7 | **205** | 451.9 | **255** | 562.2 |
| **110** | 242.5 | **160** | 352.7 | **210** | 463.0 | **260** | 573.2 |
| **115** | 253.5 | **165** | 363.8 | **215** | 474.0 | **265** | 584.2 |
| **120** | 264.6 | **170** | 374.8 | **220** | 485.0 | **270** | 595.2 |
| **125** | 275.6 | **175** | 385.8 | **225** | 496.0 | **275** | 606.3 |

| Kilograms (kg) | Pounds (lb) | Kilograms (kg) | Pounds (lb) | Kilograms (kg) | Pounds (lb) | Kilograms (kg) | Pounds (lb) |
|---|---|---|---|---|---|---|---|
| **130** | 286.6 | **180** | 396.8 | **230** | 507.1 | **280** | 617.3 |
| **135** | 297.6 | **185** | 407.9 | **235** | 518.1 | **285** | 628.3 |
| **140** | 308.6 | **190** | 418.9 | **240** | 529.1 | **290** | 639.3 |
| **145** | 319.7 | **195** | 429.9 | **245** | 540.1 | **295** | 650.4 |
| **150** | 330.7 | **200** | 440.9 | **250** | 551.2 | **300** | 661.4 |

## Kitchen and parcels: 0.1 to 2 kg in pounds and ounces

| Kilograms (kg) | Pounds (lb) | lb + oz | Kilograms (kg) | Pounds (lb) | lb + oz |
|---|---|---|---|---|---|
| **0.1** | 0.220 | 3.5 oz | **1.1** | 2.425 | 2 lb 6.8 oz |
| **0.2** | 0.441 | 7.1 oz | **1.2** | 2.646 | 2 lb 10.3 oz |
| **0.3** | 0.661 | 10.6 oz | **1.3** | 2.866 | 2 lb 13.9 oz |
| **0.4** | 0.882 | 14.1 oz | **1.4** | 3.086 | 3 lb 1.4 oz |
| **0.5** | 1.102 | 1 lb 1.6 oz | **1.5** | 3.307 | 3 lb 4.9 oz |
| **0.6** | 1.323 | 1 lb 5.2 oz | **1.6** | 3.527 | 3 lb 8.4 oz |
| **0.7** | 1.543 | 1 lb 8.7 oz | **1.7** | 3.748 | 3 lb 12.0 oz |
| **0.8** | 1.764 | 1 lb 12.2 oz | **1.8** | 3.968 | 3 lb 15.5 oz |
| **0.9** | 1.984 | 1 lb 15.7 oz | **1.9** | 4.189 | 4 lb 3.0 oz |
| **1.0** | 2.205 | 2 lb 3.3 oz | **2.0** | 4.409 | 4 lb 6.5 oz |

## Sources and method

- **International Yard and Pound Agreement (1959)** — 1 in = 25.4 mm, 1 ft = 0.3048 m, 1 lb = 0.453 592 37 kg exactly
- **NIST Special Publication 811** — Guide for the Use of the International System of Units (www.nist.gov/pml/special-publication-811)

Conversion values on this sheet are generated by the AllUnitConversions conversion library and automatically checked against the exact definitions above before the PDF is produced; reference tables are taken from the sources listed. Interactive version, corrections and more charts: **allunitconversions.com/kg-to-lb-conversion-chart**