



R-410A Technical Guidelines



| Physical Properties of Refrigerants | R-410A |
|--|--------|
| Environmental Classification | HFC |
| Molecular Weight | 72.6 |
| Boiling Point (1 atm, °F) | -61 |
| Critical Pressure (psia) | 691.8 |
| Critical Temperature (°F) | 158.3 |
| Critical Density, (lb./ft ³) | 34.5 |
| Liquid Density (70 °F, lb./ft ³) | 67.74 |
| Vapor Density (bp, lb./ft ³) | 0.261 |
| Heat of Vaporization (bp, BTU/lb.) | 116.8 |
| Specific Heat Liquid (70 °F, BTU/lb. °F) | 0.3948 |
| Specific Heat Vapor (1 atm, 70 °F, BTU/lb. °F) | 0.1953 |
| Ozone Depletion Potential (CFC 11 = 1.0) | 0 |
| Global Warming Potential (CO ₂ = 1.0) | 2088 |
| ASHRAE Standard 34 Safety Rating | A1 |
| Temperature Glide (°F) (see section 2) | 0.2 |

Available in the following size
R-410A
25lb. Cylinder only

Pressure-Temp Chart

| Temp (°F) | R-410A psig |
|-----------|-------------|
| -40 | 11.6 |
| -35 | 14.9 |
| -30 | 18.5 |
| -25 | 22.5 |
| -20 | 26.9 |
| -15 | 31.7 |
| -10 | 36.8 |
| -5 | 42.5 |
| 0 | 48.6 |
| 5 | 55.2 |
| 10 | 62.3 |
| 15 | 70.0 |
| 20 | 78.3 |
| 25 | 87.3 |
| 30 | 96.8 |
| 35 | 107 |
| 40 | 118 |
| 45 | 130 |
| 50 | 142 |
| 55 | 155 |
| 60 | 170 |
| 65 | 185 |
| 70 | 201 |
| 75 | 217 |
| 80 | 235 |
| 85 | 254 |
| 90 | 274 |
| 95 | 295 |
| 100 | 317 |
| 105 | 340 |
| 110 | 365 |
| 115 | 391 |
| 120 | 418 |
| 125 | 446 |
| 130 | 476 |
| 135 | 507 |
| 140 | 539 |
| 145 | 573 |
| 150 | 608 |

R-410A (R-32/125)
(50 / 50 wt%)

Replaces: R-22

Applications: Air conditioning equipment and heat pumps. Only for newly manufactured equipment, not for retrofitting R-22 systems

Performance: Pressures are 60% higher than R-22, therefore should be used only in new equipment

Lubricant

Recommendation: Compatible with polyolester lubricant

Retrofitting: For new equipment only



R-410A Technical Guidelines



THERMODYNAMIC PROPERTIES OF R-410A

| <u>Temp</u> [°F] | <u>Pressure</u> Liquid [psia] | <u>Pressure</u> Vapor [psia] | <u>Density</u> Liquid [lb/ft ³] | <u>Density</u> Vapor [lb/ft ³] | <u>Enthalpy</u> Liquid [Btu/lb] | <u>Enthalpy</u> Vapor [Btu/lb] | <u>Entropy</u> Liquid [Btu/R-lb] | <u>Entropy</u> Vapor [Btu/R-lb] |
|---------------------|-------------------------------------|------------------------------------|---|--|---------------------------------------|--------------------------------------|--|---------------------------------------|
| -40 | 25.6 | 25.5 | 82.02 | 0.4384 | 0.000 | 112.5 | 0.00000 | 0.2682 |
| -35 | 28.9 | 28.9 | 81.45 | 0.4929 | 1.648 | 113.1 | 0.00389 | 0.2664 |
| -30 | 32.6 | 32.6 | 80.88 | 0.5526 | 3.303 | 113.7 | 0.00774 | 0.2647 |
| -25 | 36.7 | 36.6 | 80.30 | 0.6179 | 4.967 | 114.3 | 0.01157 | 0.2631 |
| -20 | 41.1 | 41.0 | 79.71 | 0.6892 | 6.640 | 114.8 | 0.01537 | 0.2615 |
| -15 | 46.0 | 45.8 | 79.12 | 0.7669 | 8.321 | 115.4 | 0.01915 | 0.2599 |
| -10 | 51.2 | 51.1 | 78.51 | 0.8514 | 10.01 | 115.9 | 0.02290 | 0.2584 |
| -5 | 56.9 | 56.8 | 77.91 | 0.9431 | 11.71 | 116.4 | 0.02663 | 0.2570 |
| 0 | 63.1 | 63.0 | 77.29 | 1.043 | 13.42 | 116.9 | 0.03035 | 0.2555 |
| 5 | 69.8 | 69.7 | 76.66 | 1.151 | 15.15 | 117.4 | 0.03404 | 0.2541 |
| 10 | 77.1 | 76.9 | 76.03 | 1.267 | 16.88 | 117.9 | 0.03771 | 0.2528 |
| 15 | 84.9 | 84.6 | 75.38 | 1.394 | 18.63 | 118.3 | 0.04137 | 0.2514 |
| 20 | 93.2 | 93.0 | 74.73 | 1.530 | 20.39 | 118.8 | 0.04502 | 0.2501 |
| 25 | 102.2 | 101.9 | 74.06 | 1.677 | 22.16 | 119.2 | 0.04865 | 0.2488 |
| 30 | 111.9 | 111.5 | 73.38 | 1.836 | 23.95 | 119.6 | 0.05227 | 0.2476 |
| 35 | 122.2 | 121.8 | 72.69 | 2.007 | 25.75 | 119.9 | 0.05588 | 0.2463 |
| 40 | 133.2 | 132.8 | 71.99 | 2.192 | 27.58 | 120.3 | 0.05949 | 0.2451 |
| 45 | 144.9 | 144.5 | 71.27 | 2.391 | 29.41 | 120.6 | 0.06309 | 0.2438 |
| 50 | 157.4 | 156.9 | 70.53 | 2.606 | 31.27 | 120.9 | 0.06668 | 0.2426 |
| 55 | 170.7 | 170.2 | 69.78 | 2.838 | 33.14 | 121.2 | 0.07028 | 0.2413 |
| 60 | 184.8 | 184.3 | 69.01 | 3.088 | 35.04 | 121.4 | 0.07387 | 0.2401 |
| 65 | 199.8 | 199.2 | 68.22 | 3.357 | 36.96 | 121.6 | 0.07747 | 0.2388 |
| 70 | 215.7 | 215.1 | 67.41 | 3.648 | 38.90 | 121.8 | 0.08107 | 0.2376 |
| 75 | 232.5 | 231.8 | 66.58 | 3.963 | 40.87 | 121.9 | 0.08469 | 0.2363 |
| 80 | 250.3 | 249.6 | 65.71 | 4.304 | 42.87 | 122.0 | 0.08832 | 0.2350 |
| 85 | 269.1 | 268.3 | 64.82 | 4.674 | 44.90 | 122.0 | 0.09196 | 0.2336 |
| 90 | 289.0 | 288.2 | 63.90 | 5.075 | 46.96 | 122.0 | 0.09562 | 0.2322 |
| 95 | 310.0 | 309.1 | 62.95 | 5.513 | 49.06 | 122.0 | 0.09932 | 0.2308 |
| 100 | 332.0 | 331.1 | 61.95 | 5.990 | 51.21 | 121.8 | 0.1030 | 0.2293 |
| 105 | 355.3 | 354.3 | 60.90 | 6.513 | 53.39 | 121.6 | 0.1068 | 0.2277 |
| 110 | 379.8 | 378.8 | 59.81 | 7.089 | 55.63 | 121.4 | 0.1106 | 0.2261 |
| 115 | 405.6 | 404.5 | 58.65 | 7.725 | 57.93 | 121.0 | 0.1145 | 0.2243 |
| 120 | 432.7 | 431.6 | 57.42 | 8.434 | 60.30 | 120.5 | 0.1185 | 0.2224 |
| 125 | 461.2 | 460.1 | 56.11 | 9.230 | 62.76 | 119.9 | 0.1225 | 0.2203 |
| 130 | 491.2 | 490.1 | 54.68 | 10.13 | 65.31 | 119.2 | 0.1267 | 0.2180 |
| 135 | 522.7 | 521.6 | 53.12 | 11.17 | 67.99 | 118.2 | 0.1310 | 0.2155 |
| 140 | 555.9 | 554.8 | 51.38 | 12.40 | 70.84 | 117.0 | 0.1356 | 0.2125 |