# R-422A and R-422C

| Physical Properties of Refrigerants | R-422A | R-422C |
|---|---|---|
| Environmental Classification | HFC | HFC |
| Molecular Weight | 113.6 | 113.5 |
| Boiling Point (1 atm, ˚F) | -51.7 | -50.7 |
| Critical Pressure (psia) | 543.7 | 547.7 |
| Critical Temperature (˚F) | 161.2 | 163.5 |
| Critical Density, (lb./ft^ 3) | 33.63 | 33.7 |
| Liquid Density (70 ˚F, lb./ft ^ 3) | 72.03 | 72.5 |
| Vapor Density (bp, lb./ft ^ 3) | 0.394 | 0.391 |
| Heat of Vaporization (bp, BTU/lb.) | 76.8 | 77.0 |
| Specific Heat Liquid (70 ˚F, BTU/lb. ˚F) | 0.3385 | 0.3373 |
| Specific Heat Vapor (1 atm, 70 ˚F, BTU/lb. ˚F) | 0.1976 | 0.1973 |
| Ozone Depletion Potential (CFC 11 = 1.0) | 0 | 0 |
| Global Warming Potential ($CO_2$ = 1.0) | 3145 | 3085 |
| ASHRAE Standard 34 Safety Rating | A1 | A1 |
| Temperature Glide (˚F) (see section 2) | 5 | 5 |

Available in the following sizes

R-422C
24 LB. CYLINDER
100 LB. CYLINDER

## R-422A

(R-125 /134a /600a)
(85.1 / 11.5 / 3.4 wt%)

## R-422C

(R-125 /134a /600a)
(82 / 15 / 3 wt%)

Replaces: R-502 / R-22

Applications: Medium and low temperature commercial and industrial direct expansion refrigeration

Performance:
- Slightly lower discharge temperature
- TXV may appear undersized when retrofitting a R-22 application
- Up to 10% lower capacity

Lubricant Recommendation: Compatible with mineral and alkylbenzene oil and if oil return becomes a concern, addition of polyolester lubricant in 5% increments could help resolve the issue

Retrofitting:


| | | |
|---|---|---|
| from R-22 | page | 96 |
| from R-502 | page | 100 |
| from R-402A and R-402B | page | 100 |
| from R-408A | page | 100 |


### Pressure-Temp Chart

| R-422A Liquid (psig) | R-422A Vapor (psig) | Temp (˚F) | R-422C Liquid (psig) | R-422C Vapor (psig) |
|---|---|---|---|---|
| 5.2 | 3.2 | **-40** | 4.7 | 2.2 |
| 7.8 | 5.6 | **-35** | 7.2 | 4.5 |
| 10.7 | 8.3 | **-30** | 10.1 | 7.1 |
| 13.9 | 11.3 | **-25** | 13.1 | 10.0 |
| 17.3 | 14.6 | **-20** | 16.5 | 13.2 |
| 21.1 | 18.2 | **-15** | 20.2 | 16.6 |
| 25.2 | 22.1 | **-10** | 24.2 | 20.4 |
| 29.6 | 26.3 | **-5** | 28.6 | 24.5 |
| 34.4 | 30.9 | **0** | 33.3 | 29.0 |
| 39.6 | 35.6 | **5** | 38.4 | 33.8 |
| 45.2 | 41.4 | **10** | 43.9 | 39.1 |
| 51.3 | 47.2 | **15** | 49.8 | 44.7 |
| 57.8 | 53.5 | **20** | 56.1 | 50.8 |
| 64.7 | 60.2 | **25** | 63.0 | 57.4 |
| 72.2 | 67.5 | **30** | 70.3 | 64.4 |
| 80.1 | 75.2 | **35** | 78.1 | 72.0 |
| 88.6 | 83.5 | **40** | 86.4 | 80.1 |
| 97.6 | 92.3 | **45** | 95.3 | 88.7 |
| 107 | 102 | **50** | 105 | 97.9 |
| 117 | 112 | **55** | 115 | 108 |
| 128 | 122 | **60** | 125 | 118 |
| 140 | 134 | **65** | 137 | 129 |
| 152 | 146 | **70** | 149 | 141 |
| 165 | 158 | **75** | 161 | 153 |
| 179 | 172 | **80** | 175 | 167 |
| 193 | 186 | **85** | 189 | 181 |
| 208 | 201 | **90** | 204 | 195 |
| 224 | 217 | **95** | 219 | 211 |
| 241 | 234 | **100** | 236 | 227 |
| 258 | 251 | **105** | 253 | 244 |
| 277 | 270 | **110** | 272 | 263 |
| 296 | 289 | **115** | 291 | 282 |
| 317 | 310 | **120** | 311 | 302 |
| 338 | 331 | **125** | 332 | 323 |
| 361 | 354 | **130** | 354 | 345 |
| 385 | 378 | **135** | 377 | 369 |
| 410 | 403 | **140** | 402 | 394 |

# THERMODYNAMIC PROPERTIES OF R-422C

| Temp [˚F] | Pressure Liquid [psia] | Pressure Vapor [psia] | Density Liquid [lb/ft^3] | Density Vapor [lb/ft^3] | Enthalpy Liquid [Btu/lb] | Enthalpy Vapor [Btu/lb] | Entropy Liquid [Btu/R-lb] | Entropy Vapor [Btu/R-lb] |
|---|---|---|---|---|---|---|---|---|
| -60 | 11.4 | 9.6 | 90.27 | 0.26 | -5.616 | 71.83 | -0.01367 | 0.1819 |
| -55 | 13.1 | 11.1 | 89.70 | 0.30 | -4.222 | 72.55 | -0.01021 | 0.1812 |
| -50 | 15.0 | 12.8 | 89.12 | 0.34 | -2.822 | 73.27 | -0.00678 | 0.1805 |
| -45 | 17.1 | 14.8 | 88.54 | 0.39 | -1.414 | 73.98 | -0.00338 | 0.1800 |
| -40 | 19.4 | 16.9 | 87.95 | 0.45 | 0.000 | 74.70 | 0.00000 | 0.1794 |
| -35 | 21.9 | 19.2 | 87.36 | 0.50 | 1.422 | 75.41 | 0.00335 | 0.1789 |
| -30 | 24.7 | 21.8 | 86.76 | 0.57 | 2.851 | 76.11 | 0.00669 | 0.1785 |
| -25 | 27.8 | 24.7 | 86.16 | 0.64 | 4.287 | 76.82 | 0.01000 | 0.1781 |
| -20 | 31.2 | 27.9 | 85.54 | 0.72 | 5.732 | 77.51 | 0.01328 | 0.1777 |
| -15 | 34.9 | 31.3 | 84.92 | 0.80 | 7.185 | 78.21 | 0.01655 | 0.1773 |
| -10 | 38.9 | 35.1 | 84.30 | 0.89 | 8.647 | 78.90 | 0.01980 | 0.1770 |
| -5 | 43.3 | 39.2 | 83.66 | 0.99 | 10.12 | 79.58 | 0.02303 | 0.1768 |
| 0 | 48.0 | 43.7 | 83.02 | 1.10 | 11.60 | 80.25 | 0.02625 | 0.1765 |
| 5 | 53.1 | 48.5 | 82.36 | 1.22 | 13.09 | 80.92 | 0.02945 | 0.1763 |
| 10 | 58.6 | 53.8 | 81.70 | 1.35 | 14.59 | 81.59 | 0.03263 | 0.1761 |
| 15 | 64.5 | 59.4 | 81.03 | 1.49 | 16.10 | 82.24 | 0.03580 | 0.1759 |
| 20 | 70.8 | 65.5 | 80.34 | 1.64 | 17.62 | 82.88 | 0.03896 | 0.1757 |
| 25 | 77.6 | 72.1 | 79.64 | 1.80 | 19.15 | 83.52 | 0.04210 | 0.1756 |
| 30 | 84.9 | 79.1 | 78.93 | 1.98 | 20.70 | 84.14 | 0.04524 | 0.1754 |
| 35 | 92.8 | 86.7 | 78.21 | 2.16 | 22.25 | 84.76 | 0.04837 | 0.1753 |
| 40 | 101 | 94.8 | 77.47 | 2.37 | 23.82 | 85.36 | 0.05148 | 0.1752 |
| 45 | 110 | 103 | 76.72 | 2.59 | 25.41 | 85.94 | 0.05460 | 0.1751 |
| 50 | 119 | 113 | 75.95 | 2.82 | 27.01 | 86.52 | 0.05770 | 0.1750 |
| 55 | 129 | 122 | 75.16 | 3.08 | 28.62 | 87.07 | 0.06081 | 0.1748 |
| 60 | 140 | 133 | 74.35 | 3.35 | 30.25 | 87.61 | 0.06391 | 0.1747 |
| 65 | 151 | 144 | 73.52 | 3.65 | 31.90 | 88.13 | 0.06701 | 01.746 |
| 70 | 163 | 156 | 72.66 | 3.97 | 33.56 | 88.62 | 0.07011 | 0.1745 |
| 75 | 176 | 168 | 71.78 | 4.31 | 35.25 | 89.10 | 0.07322 | 0.1743 |
| 80 | 189 | 181 | 70.87 | 4.69 | 36.96 | 89.54 | 0.07633 | 0.1741 |
| 85 | 204 | 195 | 69.93 | 5.09 | 38.69 | 89.96 | 0.07945 | 0.1739 |
| 90 | 218 | 210 | 68.96 | 5.53 | 40.44 | 90.35 | 0.08258 | 0.1737 |
| 95 | 234 | 225 | 67.95 | 6.01 | 42.22 | 90.70 | 0.08573 | 0.1734 |
| 100 | 251 | 242 | 66.89 | 6.53 | 44.03 | 91.02 | 0.08890 | 0.1731 |
| 105 | 268 | 259 | 65.78 | 7.09 | 45.88 | 91.29 | 0.09210 | 0.1728 |
| 110 | 286 | 277 | 64.62 | 7.72 | 47.76 | 91.52 | 0.09532 | 0.1724 |
| 115 | 305 | 296 | 63.39 | 8.41 | 49.68 | 91.69 | 0.09859 | 0.1719 |
| 120 | 326 | 317 | 62.09 | 9.17 | 51.65 | 91.79 | 0.1019 | 0.1713 |
| 125 | 347 | 338 | 60.69 | 10.02 | 53.68 | 91.82 | 0.1053 | 0.1707 |
| 130 | 369 | 360 | 59.17 | 10.99 | 55.78 | 91.75 | 0.1087 | 0.1699 |
| 135 | 392 | 384 | 57.52 | 12.09 | 57.97 | 91.55 | 0.1123 | 0.1689 |
| 140 | 416 | 408 | 55.67 | 13.38 | 60.27 | 91.20 | 0.1160 | 0.1677 |
| 145 | 442 | 434 | 53.54 | 14.94 | 62.72 | 90.63 | 0.1199 | 0.1662 |
| 150 | 469 | 462 | 51.00 | 16.90 | 65.41 | 89.72 | 0.1242 | 0.1642 |