

Chemours Refrigerants

R-22 Replacements

Pressure-Temperature Guide

Key: **Green** (in of Hg) = Vacuum
 Black (psig) = Saturated Vapor (calculate Superheat)
Bold (psig) = Saturated Liquid (calculate Subcooling)

| °F | Freon™ 22 (R-22) | Opteon™ XP40 (R-449A) | Freon™ M029 (R-422D) | Freon™ 407A (R-407A) | Freon™ M099 (R-438A) | Freon™ 407C (R-407C) | Freon™ 410A (R-410A) |
|-----|------------------------|-----------------------------|----------------------------|----------------------------|----------------------------|----------------------------|----------------------------|
| | -50 | 6.1 | 7.4 | 9.2 | 9.0 | 11.4 | 11.0 |
| -48 | 4.8 | 6.1 | 7.9 | 7.7 | 10.3 | 9.8 | 5.9 |
| -46 | 3.4 | 4.7 | 6.6 | 6.4 | 9.1 | 8.6 | 7.1 |
| -44 | 1.9 | 3.2 | 5.3 | 5.0 | 7.8 | 7.3 | 8.2 |
| -42 | 0.4 | 1.7 | 3.8 | 3.5 | 6.5 | 6.0 | 9.4 |
| -40 | 0.6 | 0.1 | 2.3 | 2.0 | 5.2 | 4.6 | 10.7 |
| -38 | 1.4 | 0.8 | 0.8 | 0.4 | 3.8 | 3.2 | 12.0 |
| -36 | 2.2 | 1.6 | 0.4 | 0.6 | 2.3 | 1.6 | 13.3 |
| -34 | 3.1 | 2.5 | 1.2 | 1.5 | 0.8 | 0.1 | 14.7 |
| -32 | 4.0 | 3.4 | 2.1 | 2.3 | 0.4 | 0.8 | 16.2 |
| -30 | 4.9 | 4.4 | 3.0 | 3.3 | 1.2 | 1.6 | 17.7 |
| -28 | 5.9 | 5.4 | 3.9 | 4.2 | 2.1 | 2.5 | 19.3 |
| -26 | 6.9 | 6.4 | 4.9 | 5.2 | 3.0 | 3.5 | 20.9 |
| -24 | 8.0 | 7.5 | 5.9 | 6.3 | 3.9 | 4.4 | 22.6 |
| -22 | 9.1 | 8.6 | 7.0 | 7.4 | 4.9 | 5.4 | 24.4 |
| -20 | 10.2 | 9.8 | 8.1 | 8.5 | 5.9 | 6.5 | 26.2 |
| -18 | 11.4 | 11.0 | 9.2 | 9.7 | 7.0 | 7.6 | 28.1 |
| -16 | 12.6 | 12.3 | 10.4 | 10.9 | 8.1 | 8.7 | 30.0 |
| -14 | 13.9 | 13.6 | 11.7 | 12.2 | 9.2 | 9.9 | 32.0 |
| -12 | 15.2 | 14.9 | 12.9 | 13.5 | 10.4 | 11.1 | 34.1 |
| -10 | 16.5 | 16.3 | 14.3 | 14.9 | 11.6 | 12.3 | 36.3 |
| -8 | 17.9 | 17.8 | 15.6 | 16.3 | 12.9 | 13.7 | 38.5 |
| -6 | 19.4 | 19.3 | 17.1 | 17.8 | 14.2 | 15.0 | 40.8 |
| -4 | 20.9 | 20.8 | 18.5 | 19.3 | 15.6 | 16.4 | 43.2 |
| -2 | 22.4 | 22.5 | 20.1 | 20.9 | 17.0 | 17.9 | 45.7 |
| 0 | 24.0 | 24.1 | 21.7 | 22.5 | 18.5 | 19.4 | 48.2 |
| 2 | 25.7 | 25.9 | 23.3 | 24.2 | 20.0 | 21.0 | 50.8 |
| 4 | 27.4 | 27.7 | 25.0 | 26.0 | 21.6 | 22.6 | 53.5 |
| 6 | 29.2 | 29.5 | 26.7 | 27.8 | 23.2 | 24.3 | 56.3 |
| 8 | 31.0 | 31.4 | 28.5 | 29.7 | 24.9 | 26.1 | 59.2 |
| 10 | 32.8 | 33.4 | 30.4 | 31.6 | 26.6 | 27.9 | 62.2 |
| 12 | 34.8 | 35.4 | 32.3 | 33.6 | 28.4 | 29.8 | 65.2 |
| 14 | 36.8 | 37.6 | 34.3 | 35.7 | 30.3 | 31.7 | 68.4 |
| 16 | 38.8 | 39.7 | 36.4 | 37.8 | 32.2 | 33.7 | 71.6 |
| 18 | 40.9 | 42.0 | 38.5 | 40.0 | 34.2 | 35.7 | 74.9 |
| 20 | 43.1 | 44.3 | 40.7 | 42.3 | 36.2 | 37.9 | 78.4 |
| 22 | 45.3 | 46.7 | 42.9 | 44.7 | 38.3 | 40.1 | 81.9 |
| 24 | 47.6 | 49.1 | 45.2 | 47.1 | 40.5 | 42.3 | 85.5 |
| 26 | 50.0 | 51.7 | 47.6 | 49.6 | 42.8 | 44.7 | 89.2 |
| 28 | 52.4 | 54.3 | 50.1 | 52.2 | 45.1 | 47.1 | 93.1 |
| 30 | 55.0 | 56.9 | 52.6 | 54.8 | 47.5 | 49.6 | 97.0 |
| 32 | 57.5 | 59.7 | 55.2 | 57.6 | 49.9 | 52.1 | 101.1 |
| 34 | 60.2 | 62.6 | 57.9 | 60.4 | 52.5 | 54.8 | 105.2 |
| 36 | 62.9 | 65.5 | 60.6 | 63.3 | 55.1 | 57.5 | 109.5 |
| 38 | 65.7 | 68.5 | 63.5 | 66.3 | 57.7 | 60.3 | 113.9 |
| 40 | 68.6 | 71.6 | 66.4 | 69.4 | 60.5 | 63.2 | 118.4 |
| 42 | 71.5 | 74.8 | 69.4 | 72.5 | 63.3 | 66.1 | 123.0 |
| 44 | 74.5 | 78.0 | 72.5 | 75.8 | 66.3 | 69.2 | 127.7 |
| 46 | 77.6 | 81.4 | 75.6 | 79.1 | 69.3 | 72.3 | 132.6 |
| 48 | 80.8 | 84.8 | 78.9 | 82.6 | 72.3 | 75.5 | 137.5 |
| 50 | 84.1 | 88.4 | 82.2 | 86.1 | 75.5 | 78.8 | 142.6 |
| 52 | 87.4 | 110.8 | 96.1 | 108.2 | 94.6 | 101.7 | 148.4 |
| 54 | 90.8 | 115.0 | 99.8 | 112.3 | 98.3 | 105.6 | 153.8 |
| 56 | 94.4 | 119.2 | 103.6 | 116.5 | 102.1 | 109.6 | 159.3 |
| 58 | 98.0 | 123.5 | 107.4 | 120.8 | 105.9 | 113.7 | 164.9 |
| 60 | 101.6 | 128.0 | 111.4 | 125.2 | 109.8 | 117.9 | 170.7 |
| 62 | 105.4 | 132.5 | 115.4 | 129.7 | 113.9 | 122.3 | 176.6 |
| 64 | 109.3 | 137.2 | 119.6 | 134.3 | 118.0 | 126.7 | 182.7 |
| 66 | 113.2 | 142.0 | 123.8 | 139.0 | 122.2 | 131.2 | 188.9 |
| 68 | 117.3 | 146.8 | 128.1 | 143.9 | 126.6 | 135.8 | 195.3 |
| 70 | 121.4 | 151.8 | 132.6 | 148.8 | 131.0 | 140.5 | 201.8 |
| 72 | 125.7 | 156.9 | 137.1 | 153.9 | 135.5 | 145.4 | 208.4 |
| 74 | 130.0 | 162.2 | 141.7 | 159.1 | 140.2 | 150.3 | 215.2 |
| 76 | 134.5 | 167.5 | 146.5 | 164.4 | 144.9 | 155.4 | 222.2 |
| 78 | 139.0 | 172.9 | 151.3 | 169.8 | 149.8 | 160.5 | 229.3 |
| 80 | 143.6 | 178.5 | 156.3 | 175.3 | 154.7 | 165.8 | 236.5 |
| 82 | 148.4 | 184.2 | 161.4 | 181.0 | 159.8 | 171.2 | 244.0 |
| 84 | 153.2 | 190.0 | 166.5 | 186.7 | 165.0 | 176.8 | 251.6 |
| 86 | 158.2 | 195.9 | 171.8 | 192.6 | 170.3 | 182.4 | 259.3 |
| 88 | 163.2 | 202.0 | 177.2 | 198.7 | 175.7 | 188.2 | 267.3 |
| 90 | 168.4 | 208.2 | 182.8 | 204.8 | 181.2 | 194.1 | 275.4 |
| 92 | 173.7 | 214.5 | 188.4 | 211.1 | 186.8 | 200.1 | 283.6 |
| 94 | 179.1 | 221.0 | 194.2 | 217.6 | 192.6 | 206.3 | 292.1 |
| 96 | 184.6 | 227.6 | 200.0 | 224.1 | 198.5 | 212.5 | 300.7 |
| 98 | 190.2 | 234.3 | 206.0 | 230.8 | 204.5 | 219.0 | 309.5 |
| 100 | 195.9 | 241.1 | 212.2 | 237.6 | 210.6 | 225.5 | 318.5 |
| 102 | 201.8 | 248.1 | 218.4 | 244.6 | 216.8 | 232.2 | 327.7 |
| 104 | 207.7 | 255.3 | 224.8 | 251.7 | 223.2 | 239.0 | 337.1 |
| 106 | 213.8 | 262.5 | 231.3 | 259.0 | 229.7 | 245.9 | 346.7 |
| 108 | 220.0 | 270.0 | 237.9 | 266.4 | 236.4 | 253.0 | 356.5 |
| 110 | 226.4 | 277.5 | 244.7 | 273.9 | 243.1 | 260.3 | 366.4 |
| 112 | 232.8 | 285.2 | 251.6 | 281.6 | 250.1 | 267.6 | 376.6 |
| 114 | 239.4 | 293.1 | 258.7 | 289.5 | 257.1 | 275.1 | 387.0 |
| 116 | 246.1 | 301.1 | 265.9 | 297.5 | 264.3 | 282.8 | 397.6 |
| 118 | 253.0 | 309.3 | 273.2 | 305.6 | 271.6 | 290.6 | 408.4 |
| 120 | 260.0 | 317.6 | 280.7 | 314.0 | 279.1 | 298.6 | 419.4 |
| 122 | 267.1 | 326.0 | 288.3 | 322.4 | 286.7 | 306.7 | 430.7 |
| 124 | 274.3 | 334.7 | 296.0 | 331.1 | 294.4 | 315.0 | 442.1 |
| 126 | 281.7 | 343.5 | 303.9 | 339.9 | 302.3 | 323.4 | 453.8 |
| 128 | 289.2 | 352.4 | 312.0 | 348.8 | 310.3 | 332.0 | 465.8 |
| 130 | 296.9 | 361.5 | 320.2 | 357.9 | 318.5 | 340.7 | 477.9 |
| 132 | 304.7 | 370.8 | 328.6 | 367.2 | 326.9 | 349.6 | 490.3 |
| 134 | 312.6 | 380.2 | 337.1 | 376.7 | 335.4 | 358.7 | 503.0 |
| 136 | 320.7 | 389.9 | 345.8 | 386.3 | 344.1 | 368.0 | 515.9 |
| 138 | 329.0 | 399.7 | 354.7 | 396.2 | 352.9 | 377.4 | 529.1 |
| 140 | 337.4 | 409.6 | 363.7 | 406.2 | 361.9 | 386.9 | 542.5 |
| 142 | 345.9 | 419.7 | 372.9 | 416.3 | 371.0 | 396.7 | 556.2 |
| 144 | 354.6 | 430.1 | 382.3 | 426.7 | 380.3 | 406.6 | 570.2 |
| 146 | 363.5 | 440.6 | 391.8 | 437.2 | 389.8 | 416.7 | 584.5 |
| 148 | 372.5 | 451.2 | 401.5 | 448.0 | 399.4 | 427.0 | 599.0 |
| 150 | 381.7 | 462.1 | 411.4 | 458.9 | 409.2 | 437.5 | 613.9 |

Approximate Pressure Control Settings—Refrigeration

| Application | Temp Range °F | Evap ΔT °F | Freon™ 22 | | Opteon™ XP40 | | Freon™ 407A | | Freon™ 404A | |
|-------------------------|---------------|------------|-----------|----|--------------|----|-------------|----|-------------|----|
| | | | Out | In | Out | In | Out | In | Out | In |
| Beverage Cooler | 35 to 38 | 15 | 41 | 66 | 47 | 75 | 45 | 73 | 53 | 83 |
| Floral Cooler | | | | | | | | | | |
| Produce Cooler | 32 to 35 | 15 | 38 | 62 | 43 | 70 | 42 | 68 | 49 | 78 |
| Smoked Meat Cooler | | | | | | | | | | |
| Meat Reach Through | | | | | | | | | | |
| Service Deli | | | | | | | | | | |
| Seafood | 26 to 29 | 15 | 32 | 54 | 37 | 64 | 35 | 59 | 42 | 68 |
| Multi-Deck Fresh Meat | | | | | | | | | | |
| Frozen Glass Door | | | | | | | | | | |
| Frozen Glass Walk-In | | | | | | | | | | |
| Frozen Ice Cream | -30 to -20 | 10 | 0 | 10 | 1 | 13 | 0 | 11 | 4 | 16 |
| Frozen Food - Open Type | | | | | | | | | | |

Chemours Refrigerants

R-12 and R-502 Replacements

Pressure-Temperature Guide

Key: **Green** (in of Hg) = Vacuum
 Black (psig) = Saturated Vapor (calculate Superheat)
Bold (psig) = Saturated Liquid (calculate Subcooling)

| °F | Freon™ 134a (R-134a) | Opteon™ XP10 (R-513A) | Freon™ M049 Plus (R-437A) | Freon™ 507 (R-507A) | Freon™ 404A (R-404A) | Opteon™ XP40 (R-449A) | Freon™ M079 (R-422A) | Freon™ HP80 (R-402A) |
|-----|----------------------------|-----------------------------|------------------------------------|---------------------------|----------------------------|-----------------------------|----------------------------|----------------------------|
| | -50 | 18.7 | 16.6 | 17.0 | 0.9 | 0.1 | 7.4 | 2.2 |
| -48 | 18.0 | 15.8 | 16.2 | 1.7 | 0.7 | 6.1 | 0.6 | 1.9 |
| -46 | 17.3 | 14.9 | 15.3 | 2.6 | 1.6 | 4.7 | 0.5 | 2.8 |
| -44 | 16.5 | 14.0 | 14.4 | 3.5 | 2.4 | 3.2 | 1.4 | 3.7 |
| -42 | 15.7 | 13.1 | 13.5 | 4.4 | 3.4 | 1.7 | 2.2 | 4.7 |
| -40 | 14.8 | 12.1 | 12.5 | 5.4 | 4.3 | 0.1 | 3.1 | 5.7 |
| -38 | 13.9 | 11.1 | 11.5 | 6.4 | 5.3 | 0.8 | 4.1 | 6.8 |
| -36 | 13.0 | 10.0 | 10.4 | 7.5 | 6.3 | 1.6 | 5.1 | 7.8 |
| -34 | 12.0 | 8.9 | 9.3 | 8.6 | 7.4 | 2.5 | 6.1 | 9.0 |
| -32 | 10.9 | 7.8 | 8.1 | 9.8 | 8.5 | 3.4 | 7.2 | 10.1 |
| -30 | 9.8 | 6.6 | 6.9 | 11.0 | 9.6 | 4.4 | 8.3 | 11.4 |
| -28 | 8.7 | 5.3 | 5.6 | 12.2 | 10.8 | 5.4 | 9.5 | 12.6 |
| -26 | 7.5 | 4.0 | 4.3 | 13.5 | 12.0 | 6.4 | 10.7 | 13.9 |
| -24 | 6.3 | 2.6 | 2.9 | 14.8 | 13.3 | 7.5 | 11.9 | 15.3 |
| -22 | 5.0 | 1.2 | 1.4 | 16.2 | 14.6 | 8.6 | 13.2 | 16.7 |
| -20 | 3.7 | 0.1 | 0.0 | 17.6 | 16.0 | 9.8 | 14.6 | 18.2 |
| -18 | 2.3 | 0.9 | 0.8 | 19.1 | 17.4 | 11.0 | 16.0 | 19.7 |
| -16 | 0.8 | 1.7 | 1.6 | 20.6 | 18.9 | 12.3 | 17.4 | 21.2 |
| -14 | 0.4 | 2.5 | 2.5 | 22.2 | 20.4 | 13.6 | 18.9 | 22.9 |
| -12 | 1.1 | 3.4 | 3.4 | 23.8 | 22.0 | 14.9 | 20.5 | 24.5 |
| -10 | 1.9 | 4.3 | 4.3 | 25.5 | 23.6 | 16.3 | 22.1 | 26.3 |
| -8 | 2.8 | 5.2 | 5.2 | 27.2 | 25.3 | 17.8 | 23.7 | 28.0 |
| -6 | 3.6 | 6.1 | 6.2 | 29.0 | 27.0 | 19.3 | 25.4 | 29.9 |
| -4 | 4.6 | 7.1 | 7.2 | 30.9 | 28.8 | 20.8 | 27.2 | 31.8 |
| -2 | 5.5 | 8.1 | 8.3 | 32.8 | 30.7 | 22.5 | 29.1 | 33.8 |
| 0 | 6.5 | 9.2 | 9.4 | 34.8 | 32.6 | 24.1 | 30.9 | 35.8 |
| 2 | 7.5 | 10.3 | 10.5 | 36.8 | 34.6 | 25.9 | 32.9 | 37.9 |
| 4 | 8.5 | 11.4 | 11.7 | 38.9 | 36.6 | 27.7 | 34.9 | 40.1 |
| 6 | 9.6 | 12.6 | 12.9 | 41.1 | 38.7 | 29.5 | 37.0 | 42.3 |
| 8 | 10.8 | 13.8 | 14.2 | 43.4 | 40.9 | 31.4 | 39.1 | 44.6 |
| 10 | 11.9 | 15.1 | 15.5 | 45.7 | 43.1 | 33.4 | | |