

# R-134a

## SPÉCIFICATIONS SELON NORME AHRI 700

| CARACTÉRISTIQUES STANDARD                | CONFORMITÉ EN LIMITE DE TOLÉRANCE |
|------------------------------------------|-----------------------------------|
| Pureté                                   | ≥ 99,5 % poids                    |
| Teneur en eau                            | ≤ 10 ppm poids                    |
| Acidité (HCl)                            | ≤ 1 ppm poids                     |
| Teneur en incondensables (phase gazeuse) | ≤ 1,5 % volume                    |
| Résidus haute ébullition                 | ≤ 0,01 % volume                   |

## PROPRIÉTÉS PHYSIQUES

|                                               |                                             |
|-----------------------------------------------|---------------------------------------------|
| Nom                                           | 1,1,1,2-tétrafluoroéthane                   |
| Formule chimique                              | CF <sub>3</sub> -CH <sub>2</sub> F          |
| Température d'ébullition à 1,013 bar          | -26,1 °C                                    |
| Température critique                          | 101 °C                                      |
| Potentiel de Réchauffement Global (GWP) [AR4] | 1430                                        |
| Classe de sécurité (ISO817, EN378, ASHRAE34)  | A1                                          |
| Potentiel d'action sur l'ozone                | 0                                           |
| Limites inférieures d'Inflammabilité [kg/m³]  | Ininflammable                               |
| Lubrifiant                                    | POE – Polyalkylèneglycol – PAG (clim. auto) |



12 L



27 L



62 L



448 L



900 L

## DIFFÉRENTES APPELLATIONS DU MARCHÉ

- FREON™ 134a
- FORANE® 134a
- KLEA® 134a

**R-134a****TABLE THERMODYNAMIQUE**

| Température<br>(°C) | Liquide            | Liquide         | Vapeur          | Liquide           | Vapeur            | Liquide            | Vapeur             |
|---------------------|--------------------|-----------------|-----------------|-------------------|-------------------|--------------------|--------------------|
|                     | Pression (bar abs) | Densité (kg/m³) | Densité (kg/m³) | Enthalpie (kJ/kg) | Enthalpie (kJ/kg) | Entropie (kJ/kg-K) | Entropie (kJ/kg-K) |
| -100                | 0,005594           | 1582,4          | 0,039694        | 75,362            | 336,85            | 0,4354             | 1,9456             |
| -99                 | 0,0062222          | 1579,7          | 0,043901        | 76,547            | 337,44            | 0,44222            | 1,9403             |
| -98                 | 0,0069109          | 1577,1          | 0,048487        | 77,731            | 338,02            | 0,449              | 1,9351             |
| -97                 | 0,007665           | 1574,5          | 0,053477        | 78,916            | 338,61            | 0,45575            | 1,93               |
| -96                 | 0,0084895          | 1571,8          | 0,058902        | 80,102            | 339,19            | 0,46246            | 1,925              |
| -95                 | 0,0093899          | 1569,1          | 0,06479         | 81,288            | 339,78            | 0,46913            | 1,9201             |
| -94                 | 0,010372           | 1566,5          | 0,071174        | 82,474            | 340,38            | 0,47578            | 1,9154             |
| -93                 | 0,011441           | 1563,8          | 0,078087        | 83,661            | 340,97            | 0,48238            | 1,9107             |
| -92                 | 0,012605           | 1561,2          | 0,085563        | 84,849            | 341,56            | 0,48896            | 1,9061             |
| -91                 | 0,013869           | 1558,5          | 0,09364         | 86,037            | 342,16            | 0,4955             | 1,9016             |
| -90                 | 0,015241           | 1555,8          | 0,10236         | 87,226            | 342,76            | 0,50201            | 1,8972             |
| -89                 | 0,016728           | 1553,2          | 0,11175         | 88,415            | 343,36            | 0,50848            | 1,8929             |
| -88                 | 0,018338           | 1550,5          | 0,12186         | 89,606            | 343,96            | 0,51493            | 1,8887             |
| -87                 | 0,020079           | 1547,8          | 0,13274         | 90,797            | 344,56            | 0,52134            | 1,8846             |
| -86                 | 0,02196            | 1545,1          | 0,14443         | 91,989            | 345,17            | 0,52773            | 1,8805             |
| -85                 | 0,02399            | 1542,5          | 0,15697         | 93,182            | 345,77            | 0,53409            | 1,8766             |
| -84                 | 0,026178           | 1539,8          | 0,17042         | 94,376            | 346,38            | 0,54041            | 1,8727             |
| -83                 | 0,028535           | 1537,1          | 0,18482         | 95,57             | 346,99            | 0,54671            | 1,8689             |
| -82                 | 0,03107            | 1534,4          | 0,20023         | 96,766            | 347,6             | 0,55298            | 1,8652             |
| -81                 | 0,033794           | 1531,7          | 0,2167          | 97,963            | 348,21            | 0,55923            | 1,8616             |
| -80                 | 0,036719           | 1529            | 0,23429         | 99,161            | 348,83            | 0,56544            | 1,858              |
| -79                 | 0,039856           | 1526,3          | 0,25306         | 100,36            | 349,44            | 0,57163            | 1,8546             |
| -78                 | 0,043217           | 1523,6          | 0,27307         | 101,56            | 350,06            | 0,5778             | 1,8512             |
| -77                 | 0,046816           | 1520,9          | 0,29438         | 102,76            | 350,67            | 0,58393            | 1,8478             |
| -76                 | 0,050665           | 1518,2          | 0,31705         | 103,96            | 351,29            | 0,59004            | 1,8446             |
| -75                 | 0,054777           | 1515,5          | 0,34116         | 105,17            | 351,91            | 0,59613            | 1,8414             |
| -74                 | 0,059168           | 1512,8          | 0,36677         | 106,37            | 352,53            | 0,60219            | 1,8382             |
| -73                 | 0,063851           | 1510,1          | 0,39395         | 107,58            | 353,15            | 0,60823            | 1,8352             |
| -72                 | 0,068843           | 1507,3          | 0,42278         | 108,78            | 353,77            | 0,61424            | 1,8322             |
| -71                 | 0,074158           | 1504,6          | 0,45333         | 109,99            | 354,4             | 0,62023            | 1,8293             |
| -70                 | 0,079814           | 1501,9          | 0,48568         | 111,2             | 355,02            | 0,62619            | 1,8264             |
| -69                 | 0,085826           | 1499,1          | 0,51991         | 112,41            | 355,65            | 0,63214            | 1,8236             |
| -68                 | 0,092213           | 1496,4          | 0,5561          | 113,62            | 356,27            | 0,63806            | 1,8209             |
| -67                 | 0,098992           | 1493,7          | 0,59433         | 114,83            | 356,9             | 0,64395            | 1,8182             |
| -66                 | 0,10618            | 1490,9          | 0,6347          | 116,05            | 357,53            | 0,64983            | 1,8155             |
| -65                 | 0,1138             | 1488,2          | 0,67728         | 117,26            | 358,16            | 0,65568            | 1,813              |
| -64                 | 0,12187            | 1485,4          | 0,72218         | 118,48            | 358,79            | 0,66151            | 1,8105             |
| -63                 | 0,13041            | 1482,6          | 0,76947         | 119,7             | 359,42            | 0,66732            | 1,808              |

**R-134a****TABLE THERMODYNAMIQUE**

| Température<br>(°C) | Liquide            | Liquide         | Vapeur          | Liquide           | Vapeur            | Liquide            | Vapeur             |
|---------------------|--------------------|-----------------|-----------------|-------------------|-------------------|--------------------|--------------------|
|                     | Pression (bar abs) | Densité (kg/m³) | Densité (kg/m³) | Enthalpie (kJ/kg) | Enthalpie (kJ/kg) | Entropie (kJ/kg-K) | Entropie (kJ/kg-K) |
| -62                 | 0,13944            | 1479,9          | 0,81927         | 120,92            | 360,05            | 0,67311            | 1,8056             |
| -61                 | 0,14899            | 1477,1          | 0,87167         | 122,14            | 360,68            | 0,67887            | 1,8033             |
| -60                 | 0,15906            | 1474,3          | 0,92676         | 123,36            | 361,31            | 0,68462            | 1,801              |
| -59                 | 0,1697             | 1471,6          | 0,98465         | 124,59            | 361,94            | 0,69035            | 1,7987             |
| -58                 | 0,18091            | 1468,8          | 1,0454          | 125,81            | 362,58            | 0,69605            | 1,7965             |
| -57                 | 0,19273            | 1466            | 1,1092          | 127,04            | 363,21            | 0,70174            | 1,7944             |
| -56                 | 0,20518            | 1463,2          | 1,1762          | 128,27            | 363,84            | 0,70741            | 1,7922             |
| -55                 | 0,21828            | 1460,4          | 1,2463          | 129,5             | 364,48            | 0,71305            | 1,7902             |
| -54                 | 0,23206            | 1457,6          | 1,3198          | 130,73            | 365,11            | 0,71868            | 1,7882             |
| -53                 | 0,24655            | 1454,8          | 1,3968          | 131,96            | 365,75            | 0,72429            | 1,7862             |
| -52                 | 0,26176            | 1452            | 1,4773          | 133,2             | 366,38            | 0,72988            | 1,7843             |
| -51                 | 0,27774            | 1449,1          | 1,5616          | 134,44            | 367,02            | 0,73546            | 1,7824             |
| -50                 | 0,29451            | 1446,3          | 1,6496          | 135,67            | 367,65            | 0,74101            | 1,7806             |
| -49                 | 0,31209            | 1443,5          | 1,7416          | 136,91            | 368,29            | 0,74655            | 1,7788             |
| -48                 | 0,33051            | 1440,6          | 1,8377          | 138,15            | 368,92            | 0,75207            | 1,777              |
| -47                 | 0,34982            | 1437,8          | 1,938           | 139,4             | 369,56            | 0,75757            | 1,7753             |
| -46                 | 0,37003            | 1434,9          | 2,0427          | 140,64            | 370,19            | 0,76305            | 1,7736             |
| -45                 | 0,39117            | 1432,1          | 2,1518          | 141,89            | 370,83            | 0,76852            | 1,772              |
| -44                 | 0,41329            | 1429,2          | 2,2655          | 143,14            | 371,46            | 0,77397            | 1,7704             |
| -43                 | 0,4364             | 1426,4          | 2,384           | 144,39            | 372,1             | 0,77941            | 1,7688             |
| -42                 | 0,46055            | 1423,5          | 2,5074          | 145,64            | 372,73            | 0,78482            | 1,7673             |
| -41                 | 0,48577            | 1420,6          | 2,6359          | 146,89            | 373,37            | 0,79023            | 1,7658             |
| -40                 | 0,51209            | 1417,7          | 2,7695          | 148,14            | 374               | 0,79561            | 1,7643             |
| -39                 | 0,53955            | 1414,8          | 2,9085          | 149,4             | 374,64            | 0,80098            | 1,7629             |
| -38                 | 0,56817            | 1411,9          | 3,0529          | 150,66            | 375,27            | 0,80633            | 1,7615             |
| -37                 | 0,59801            | 1409            | 3,2031          | 151,92            | 375,9             | 0,81167            | 1,7602             |
| -36                 | 0,62908            | 1406,1          | 3,359           | 153,18            | 376,54            | 0,817              | 1,7588             |
| -35                 | 0,66144            | 1403,1          | 3,5209          | 154,44            | 377,17            | 0,8223             | 1,7575             |
| -34                 | 0,69512            | 1400,2          | 3,689           | 155,71            | 377,8             | 0,8276             | 1,7563             |
| -33                 | 0,73015            | 1397,3          | 3,8633          | 156,98            | 378,43            | 0,83288            | 1,755              |
| -32                 | 0,76658            | 1394,3          | 4,0441          | 158,25            | 379,06            | 0,83814            | 1,7538             |
| -31                 | 0,80444            | 1391,4          | 4,2316          | 159,52            | 379,69            | 0,84339            | 1,7526             |
| -30                 | 0,84378            | 1388,4          | 4,4259          | 160,79            | 380,32            | 0,84863            | 1,7515             |
| -29                 | 0,88463            | 1385,4          | 4,6271          | 162,07            | 380,95            | 0,85385            | 1,7503             |
| -28                 | 0,92703            | 1382,4          | 4,8356          | 163,34            | 381,57            | 0,85906            | 1,7492             |
| -27                 | 0,97104            | 1379,5          | 5,0514          | 164,62            | 382,2             | 0,86425            | 1,7482             |
| -26                 | 1,0167             | 1376,5          | 5,2748          | 165,9             | 382,82            | 0,86943            | 1,7471             |
| -25                 | 1,064              | 1373,4          | 5,5059          | 167,19            | 383,45            | 0,8746             | 1,7461             |

**R-134a****TABLE THERMODYNAMIQUE**

| Température<br>(°C) | Liquide            | Liquide         | Vapeur          | Liquide           | Vapeur            | Liquide            | Vapeur             |
|---------------------|--------------------|-----------------|-----------------|-------------------|-------------------|--------------------|--------------------|
|                     | Pression (bar abs) | Densité (kg/m³) | Densité (kg/m³) | Enthalpie (kJ/kg) | Enthalpie (kJ/kg) | Entropie (kJ/kg-K) | Entropie (kJ/kg-K) |
| -24                 | 1,113              | 1370,4          | 5,745           | 168,47            | 384,07            | 0,87975            | 1,7451             |
| -23                 | 1,1639             | 1367,4          | 5,9922          | 169,76            | 384,69            | 0,8849             | 1,7441             |
| -22                 | 1,2165             | 1364,4          | 6,2477          | 171,05            | 385,32            | 0,89002            | 1,7432             |
| -21                 | 1,271              | 1361,3          | 6,5117          | 172,34            | 385,94            | 0,89514            | 1,7422             |
| -20                 | 1,3273             | 1358,3          | 6,7845          | 173,64            | 386,55            | 0,90025            | 1,7413             |
| -19                 | 1,3857             | 1355,2          | 7,0662          | 174,93            | 387,17            | 0,90534            | 1,7404             |
| -18                 | 1,446              | 1352,1          | 7,3571          | 176,23            | 387,79            | 0,91042            | 1,7396             |
| -17                 | 1,5084             | 1349            | 7,6574          | 177,53            | 388,4             | 0,91549            | 1,7387             |
| -16                 | 1,5728             | 1345,9          | 7,9673          | 178,83            | 389,02            | 0,92054            | 1,7379             |
| -15                 | 1,6394             | 1342,8          | 8,287           | 180,14            | 389,63            | 0,92559            | 1,7371             |
| -14                 | 1,7082             | 1339,7          | 8,6168          | 181,44            | 390,24            | 0,93062            | 1,7363             |
| -13                 | 1,7792             | 1336,6          | 8,9568          | 182,75            | 390,85            | 0,93564            | 1,7355             |
| -12                 | 1,8524             | 1333,4          | 9,3074          | 184,07            | 391,46            | 0,94066            | 1,7348             |
| -11                 | 1,928              | 1330,3          | 9,6688          | 185,38            | 392,06            | 0,94566            | 1,7341             |
| -10                 | 2,006              | 1327,1          | 10,041          | 186,7             | 392,66            | 0,95065            | 1,7334             |
| -9                  | 2,0864             | 1323,9          | 10,425          | 188,02            | 393,27            | 0,95563            | 1,7327             |
| -8                  | 2,1693             | 1320,8          | 10,82           | 189,34            | 393,87            | 0,9606             | 1,732              |
| -7                  | 2,2548             | 1317,6          | 11,227          | 190,66            | 394,47            | 0,96556            | 1,7313             |
| -6                  | 2,3428             | 1314,3          | 11,646          | 191,99            | 395,06            | 0,97051            | 1,7307             |
| -5                  | 2,4334             | 1311,1          | 12,077          | 193,32            | 395,66            | 0,97544            | 1,73               |
| -4                  | 2,5268             | 1307,9          | 12,521          | 194,65            | 396,25            | 0,98037            | 1,7294             |
| -3                  | 2,6228             | 1304,6          | 12,978          | 195,98            | 396,84            | 0,98529            | 1,7288             |
| -2                  | 2,7217             | 1301,4          | 13,448          | 197,32            | 397,43            | 0,99021            | 1,7282             |
| -1                  | 2,8234             | 1298,1          | 13,931          | 198,66            | 398,02            | 0,99511            | 1,7276             |
| 0                   | 2,928              | 1294,8          | 14,428          | 200               | 398,6             | 1                  | 1,7271             |
| 1                   | 3,0356             | 1291,5          | 14,939          | 201,34            | 399,19            | 1,0049             | 1,7265             |
| 2                   | 3,1462             | 1288,1          | 15,465          | 202,69            | 399,77            | 1,0098             | 1,726              |
| 3                   | 3,2598             | 1284,8          | 16,005          | 204,04            | 400,34            | 1,0146             | 1,7255             |
| 4                   | 3,3766             | 1281,4          | 16,56           | 205,4             | 400,92            | 1,0195             | 1,725              |
| 5                   | 3,4966             | 1278,1          | 17,131          | 206,75            | 401,49            | 1,0243             | 1,7245             |
| 6                   | 3,6198             | 1274,7          | 17,717          | 208,11            | 402,06            | 1,0292             | 1,724              |
| 7                   | 3,7463             | 1271,3          | 18,319          | 209,47            | 402,63            | 1,034              | 1,7235             |
| 8                   | 3,8761             | 1267,9          | 18,938          | 210,84            | 403,2             | 1,0388             | 1,723              |
| 9                   | 4,0094             | 1264,4          | 19,573          | 212,21            | 403,76            | 1,0437             | 1,7226             |
| 10                  | 4,1461             | 1261            | 20,226          | 213,58            | 404,32            | 1,0485             | 1,7221             |
| 11                  | 4,2863             | 1257,5          | 20,896          | 214,95            | 404,88            | 1,0533             | 1,7217             |
| 12                  | 4,4301             | 1254            | 21,584          | 216,33            | 405,43            | 1,0581             | 1,7212             |
| 13                  | 4,5776             | 1250,5          | 22,29           | 217,71            | 405,98            | 1,0629             | 1,7208             |

**R-134a****TABLE THERMODYNAMIQUE**

| Température<br>(°C) | Liquide            | Liquide         | Vapeur          | Liquide           | Vapeur            | Liquide            | Vapeur             |
|---------------------|--------------------|-----------------|-----------------|-------------------|-------------------|--------------------|--------------------|
|                     | Pression (bar abs) | Densité (kg/m³) | Densité (kg/m³) | Enthalpie (kJ/kg) | Enthalpie (kJ/kg) | Entropie (kJ/kg-K) | Entropie (kJ/kg-K) |
| 14                  | 4,7288             | 1246,9          | 23,015          | 219,09            | 406,53            | 1,0677             | 1,7204             |
| 15                  | 4,8837             | 1243,4          | 23,758          | 220,48            | 407,07            | 1,0724             | 1,72               |
| 16                  | 5,0425             | 1239,8          | 24,522          | 221,87            | 407,61            | 1,0772             | 1,7196             |
| 17                  | 5,2052             | 1236,2          | 25,305          | 223,26            | 408,15            | 1,082              | 1,7192             |
| 18                  | 5,3718             | 1232,6          | 26,109          | 224,66            | 408,69            | 1,0867             | 1,7188             |
| 19                  | 5,5424             | 1229            | 26,934          | 226,06            | 409,22            | 1,0915             | 1,7184             |
| 20                  | 5,7171             | 1225,3          | 27,78           | 227,47            | 409,75            | 1,0962             | 1,718              |
| 21                  | 5,8959             | 1221,7          | 28,648          | 228,88            | 410,27            | 1,101              | 1,7177             |
| 22                  | 6,0789             | 1218            | 29,539          | 230,29            | 410,79            | 1,1057             | 1,7173             |
| 23                  | 6,2662             | 1214,2          | 30,452          | 231,7             | 411,31            | 1,1105             | 1,7169             |
| 24                  | 6,4578             | 1210,5          | 31,389          | 233,12            | 411,82            | 1,1152             | 1,7166             |
| 25                  | 6,6538             | 1206,7          | 32,35           | 234,55            | 412,33            | 1,1199             | 1,7162             |
| 26                  | 6,8543             | 1202,9          | 33,335          | 235,97            | 412,84            | 1,1246             | 1,7159             |
| 27                  | 7,0592             | 1199,1          | 34,346          | 237,4             | 413,34            | 1,1294             | 1,7155             |
| 28                  | 7,2688             | 1195,2          | 35,382          | 238,84            | 413,84            | 1,1341             | 1,7152             |
| 29                  | 7,483              | 1191,4          | 36,445          | 240,28            | 414,33            | 1,1388             | 1,7148             |
| 30                  | 7,702              | 1187,5          | 37,535          | 241,72            | 414,82            | 1,1435             | 1,7145             |
| 31                  | 7,9257             | 1183,5          | 38,653          | 243,17            | 415,3             | 1,1482             | 1,7142             |
| 32                  | 8,1543             | 1179,6          | 39,799          | 244,62            | 415,78            | 1,1529             | 1,7138             |
| 33                  | 8,3878             | 1175,6          | 40,974          | 246,08            | 416,26            | 1,1576             | 1,7135             |
| 34                  | 8,6263             | 1171,6          | 42,18           | 247,54            | 416,72            | 1,1623             | 1,7131             |
| 35                  | 8,8698             | 1167,5          | 43,416          | 249,01            | 417,19            | 1,167              | 1,7128             |
| 36                  | 9,1185             | 1163,4          | 44,683          | 250,48            | 417,65            | 1,1717             | 1,7124             |
| 37                  | 9,3724             | 1159,3          | 45,983          | 251,95            | 418,1             | 1,1764             | 1,7121             |
| 38                  | 9,6315             | 1155,1          | 47,316          | 253,43            | 418,55            | 1,1811             | 1,7118             |
| 39                  | 9,896              | 1151            | 48,683          | 254,92            | 418,99            | 1,1858             | 1,7114             |
| 40                  | 10,166             | 1146,7          | 50,085          | 256,41            | 419,43            | 1,1905             | 1,7111             |
| 41                  | 10,441             | 1142,5          | 51,523          | 257,91            | 419,86            | 1,1952             | 1,7107             |
| 42                  | 10,722             | 1138,2          | 52,998          | 259,41            | 420,28            | 1,1999             | 1,7103             |
| 43                  | 11,009             | 1133,8          | 54,512          | 260,91            | 420,7             | 1,2046             | 1,71               |
| 44                  | 11,301             | 1129,5          | 56,064          | 262,43            | 421,11            | 1,2092             | 1,7096             |
| 45                  | 11,599             | 1125,1          | 57,657          | 263,94            | 421,52            | 1,2139             | 1,7092             |
| 46                  | 11,903             | 1120,6          | 59,292          | 265,47            | 421,92            | 1,2186             | 1,7089             |
| 47                  | 12,213             | 1116,1          | 60,969          | 267               | 422,31            | 1,2233             | 1,7085             |
| 48                  | 12,529             | 1111,5          | 62,69           | 268,53            | 422,69            | 1,228              | 1,7081             |
| 49                  | 12,851             | 1106,9          | 64,458          | 270,07            | 423,07            | 1,2327             | 1,7077             |
| 50                  | 13,179             | 1102,3          | 66,272          | 271,62            | 423,44            | 1,2375             | 1,7072             |
| 51                  | 13,513             | 1097,6          | 68,134          | 273,18            | 423,8             | 1,2422             | 1,7068             |

**R-134a****TABLE THERMODYNAMIQUE**

| Température<br>(°C) | Liquide            | Liquide         | Vapeur          | Liquide           | Vapeur            | Liquide            | Vapeur             |
|---------------------|--------------------|-----------------|-----------------|-------------------|-------------------|--------------------|--------------------|
|                     | Pression (bar abs) | Densité (kg/m³) | Densité (kg/m³) | Enthalpie (kJ/kg) | Enthalpie (kJ/kg) | Entropie (kJ/kg-K) | Entropie (kJ/kg-K) |
| 52                  | 13,854             | 1092,9          | 70,047          | 274,74            | 424,15            | 1,2469             | 1,7064             |
| 53                  | 14,201             | 1088,1          | 72,012          | 276,31            | 424,49            | 1,2516             | 1,7059             |
| 54                  | 14,555             | 1083,2          | 74,03           | 277,89            | 424,83            | 1,2563             | 1,7055             |
| 55                  | 14,915             | 1078,3          | 76,104          | 279,47            | 425,15            | 1,2611             | 1,705              |
| 56                  | 15,282             | 1073,4          | 78,235          | 281,06            | 425,47            | 1,2658             | 1,7045             |
| 57                  | 15,656             | 1068,3          | 80,426          | 282,66            | 425,77            | 1,2705             | 1,704              |
| 58                  | 16,036             | 1063,2          | 82,679          | 284,27            | 426,07            | 1,2753             | 1,7035             |
| 59                  | 16,423             | 1058,1          | 84,996          | 285,88            | 426,36            | 1,2801             | 1,703              |
| 60                  | 16,818             | 1052,9          | 87,379          | 287,5             | 426,63            | 1,2848             | 1,7024             |
| 61                  | 17,219             | 1047,6          | 89,832          | 289,14            | 426,89            | 1,2896             | 1,7019             |
| 62                  | 17,628             | 1042,2          | 92,358          | 290,78            | 427,14            | 1,2944             | 1,7013             |
| 63                  | 18,044             | 1036,8          | 94,958          | 292,43            | 427,38            | 1,2992             | 1,7006             |
| 64                  | 18,467             | 1031,2          | 97,637          | 294,09            | 427,61            | 1,304              | 1,7                |
| 65                  | 18,898             | 1025,6          | 100,4           | 295,76            | 427,82            | 1,3088             | 1,6993             |
| 66                  | 19,337             | 1020            | 103,24          | 297,44            | 428,02            | 1,3137             | 1,6987             |
| 67                  | 19,783             | 1014,2          | 106,18          | 299,14            | 428,2             | 1,3185             | 1,6979             |
| 68                  | 20,237             | 1008,3          | 109,21          | 300,84            | 428,36            | 1,3234             | 1,6972             |
| 69                  | 20,698             | 1002,3          | 112,34          | 302,55            | 428,52            | 1,3283             | 1,6964             |
| 70                  | 21,168             | 996,25          | 115,57          | 304,28            | 428,65            | 1,3332             | 1,6956             |
| 71                  | 21,646             | 990,06          | 118,91          | 306,02            | 428,77            | 1,3381             | 1,6948             |
| 72                  | 22,132             | 983,76          | 122,37          | 307,78            | 428,86            | 1,343              | 1,6939             |
| 73                  | 22,627             | 977,33          | 125,95          | 309,55            | 428,94            | 1,348              | 1,6929             |
| 74                  | 23,13              | 970,78          | 129,65          | 311,33            | 429               | 1,353              | 1,692              |
| 75                  | 23,641             | 964,09          | 133,49          | 313,13            | 429,03            | 1,358              | 1,6909             |
| 76                  | 24,161             | 957,25          | 137,48          | 314,94            | 429,04            | 1,3631             | 1,6899             |
| 77                  | 24,69              | 950,26          | 141,62          | 316,78            | 429,03            | 1,3682             | 1,6887             |
| 78                  | 25,228             | 943,1           | 145,93          | 318,63            | 428,98            | 1,3733             | 1,6876             |
| 79                  | 25,776             | 935,77          | 150,41          | 320,5             | 428,91            | 1,3784             | 1,6863             |
| 80                  | 26,332             | 928,24          | 155,08          | 322,39            | 428,81            | 1,3836             | 1,685              |
| 81                  | 26,898             | 920,51          | 159,95          | 324,3             | 428,68            | 1,3889             | 1,6836             |
| 82                  | 27,473             | 912,56          | 165,05          | 326,24            | 428,51            | 1,3942             | 1,6821             |
| 83                  | 28,058             | 904,37          | 170,38          | 328,21            | 428,3             | 1,3995             | 1,6806             |
| 84                  | 28,653             | 895,91          | 175,97          | 330,2             | 428,05            | 1,4049             | 1,6789             |
| 85                  | 29,258             | 887,16          | 181,85          | 332,22            | 427,76            | 1,4104             | 1,6771             |
| 86                  | 29,874             | 878,1           | 188,05          | 334,28            | 427,42            | 1,4159             | 1,6752             |
| 87                  | 30,499             | 868,68          | 194,59          | 336,38            | 427,02            | 1,4215             | 1,6732             |
| 88                  | 31,136             | 858,86          | 201,52          | 338,51            | 426,55            | 1,4273             | 1,671              |
| 89                  | 31,783             | 848,6           | 208,89          | 340,69            | 426,02            | 1,4331             | 1,6687             |

**R-134a****TABLE THERMODYNAMIQUE**

| Température<br>(°C) | Liquide            | Liquide         | Vapeur          | Liquide           | Vapeur            | Liquide            | Vapeur             |
|---------------------|--------------------|-----------------|-----------------|-------------------|-------------------|--------------------|--------------------|
|                     | Pression (bar abs) | Densité (kg/m³) | Densité (kg/m³) | Enthalpie (kJ/kg) | Enthalpie (kJ/kg) | Entropie (kJ/kg-K) | Entropie (kJ/kg-K) |
| 90                  | 32,442             | 837,83          | 216,76          | 342,93            | 425,42            | 1,439              | 1,6662             |
| 91                  | 33,112             | 826,47          | 225,2           | 345,22            | 424,72            | 1,4451             | 1,6634             |
| 92                  | 33,793             | 814,43          | 234,31          | 347,59            | 423,92            | 1,4514             | 1,6604             |
| 93                  | 34,487             | 801,58          | 244,22          | 350,03            | 422,99            | 1,4578             | 1,6571             |
| 94                  | 35,193             | 787,75          | 255,08          | 352,58            | 421,92            | 1,4645             | 1,6534             |
| 95                  | 35,912             | 772,7           | 267,14          | 355,25            | 420,67            | 1,4715             | 1,6492             |
| 96                  | 36,645             | 756,09          | 280,73          | 358,07            | 419,18            | 1,4789             | 1,6445             |
| 97                  | 37,391             | 737,34          | 296,41          | 361,12            | 417,39            | 1,4869             | 1,6389             |
| 98                  | 38,152             | 715,51          | 315,13          | 364,47            | 415,14            | 1,4957             | 1,6322             |
| 99                  | 38,929             | 688,6           | 338,85          | 368,34            | 412,16            | 1,5058             | 1,6235             |
| 100                 | 39,724             | 651,18          | 373,01          | 373,3             | 407,68            | 1,5188             | 1,6109             |