

FOR ETHANE-NITROGEN MIXTURES

Composition: 29.96% C<sub>2</sub>H<sub>6</sub> — 70.04% N<sub>2</sub>

Composition: 50.26% C<sub>2</sub>H<sub>6</sub> — 49.74% N<sub>2</sub>

| Temperature   |        | Pressure |          | Density             | Compressibility Factor |
|---------------|--------|----------|----------|---------------------|------------------------|
| °K            | °F     | Psia     | atm      | gm moles<br>1000 cc | z = P/RTp              |
| 1st Isometric |        |          |          |                     |                        |
| 305.38        | 90.00  | 4243.4   | 288.452  | 12.6655             | 0.90882                |
| 294.27        | 70.00  | 3826.9   | 260.404  | 12.6774             | 0.85063                |
| 283.17        | 50.08  | 3406.2   | 231.777  | 12.6908             | 0.78596                |
| 266.54        | 20.09  | 2785.4   | 189.535  | 12.7127             | 0.68164                |
| 249.83        | -10.00 | 2176.2   | 148.081  | 12.7373             | 0.56708                |
| 238.72        | -30.00 | 1808.8   | 124.081* | —                   | —                      |
| 227.60        | -50.00 | 1686.0   | 114.725* | —                   | —                      |
| 216.49        | -70.00 | 1573.7   | 107.084* | —                   | —                      |
| 2nd Isometric |        |          |          |                     |                        |
| 305.38        | 90.00  | 3254.0   | 221.421  | 10.9429             | 0.80745                |
| 294.27        | 70.00  | 2939.5   | 200.204  | 10.9547             | 0.75682                |
| 283.17        | 50.08  | 2623.2   | 178.498  | 10.9674             | 0.70041                |
| 266.54        | 20.09  | 2158.1   | 146.849  | 10.9875             | 0.61105                |
| 255.35        | 0.00   | 1855.8   | 126.279  | 11.0020             | 0.54776                |
| 249.83        | -10.00 | 1716.5   | 116.800* | —                   | —                      |
| 238.72        | -30.00 | 1591.0   | 108.261* | —                   | —                      |
| 227.60        | -50.00 | 1471.9   | 100.157* | —                   | —                      |
| 3rd Isometric |        |          |          |                     |                        |
| 305.38        | 90.00  | 2546.7   | 173.292  | 9.1780              | 0.75346                |
| 294.27        | 70.00  | 2314.1   | 157.465  | 9.1884              | 0.70969                |
| 283.17        | 50.08  | 2079.9   | 141.528  | 9.1995              | 0.66206                |
| 266.54        | 20.09  | 1754.7   | 118.039  | 9.2171              | 0.58551                |
| 260.94        | 10.00  | 1621.2   | 110.316  | 9.2232              | 0.55858                |
| 255.38        | 0.00   | 1534.6   | 104.423* | —                   | —                      |
| 249.83        | -10.00 | 1477.3   | 100.524* | —                   | —                      |
| 238.72        | -30.00 | 1364.0   | 92.814*  | —                   | —                      |
| 4th Isometric |        |          |          |                     |                        |
| 305.38        | 90.00  | 2012.9   | 136.969  | 7.4084              | 0.73778                |
| 294.27        | 70.00  | 1844.3   | 125.497  | 7.4174              | 0.70065                |
| 283.17        | 50.08  | 1673.6   | 113.881  | 7.4268              | 0.65989                |
| 266.54        | 20.09  | 1418.1   | 96.496   | 7.4412              | 0.59289                |
| 260.94        | 10.00  | 1349.3   | 91.814*  | —                   | —                      |
| 249.83        | -10.00 | 1237.3   | 84.193*  | —                   | —                      |
| 238.72        | -30.00 | 1132.5   | 77.062*  | —                   | —                      |
| 5th Isometric |        |          |          |                     |                        |
| 305.38        | 90.00  | 1571.3   | 106.920  | 5.6627              | 0.75347                |
| 294.27        | 70.00  | 1454.1   | 98.945   | 5.6697              | 0.72270                |
| 283.17        | 50.08  | 1335.5   | 90.875   | 5.6767              | 0.68892                |
| 266.54        | 20.09  | 1155.8   | 78.647   | 5.6874              | 0.63223                |
| 260.94        | 10.00  | 1098.6   | 74.755*  | —                   | —                      |
| 249.83        | -10.00 | 994.5    | 67.671*  | —                   | —                      |
| 238.72        | -30.00 | 902.8    | 61.432*  | —                   | —                      |
| 6th Isometric |        |          |          |                     |                        |
| 305.38        | 90.00  | 1143.0   | 77.776   | 3.8892              | 0.79802                |
| 294.27        | 70.00  | 1071.6   | 72.918   | 3.8937              | 0.77552                |
| 283.17        | 50.08  | 999.1    | 67.984   | 3.8982              | 0.75052                |
| 266.54        | 20.09  | 891.2    | 60.424   | 3.9048              | 0.70748                |
| 260.94        | 10.00  | 838.6    | 57.063*  | —                   | —                      |
| 249.83        | -10.00 | 746.4    | 50.789*  | —                   | —                      |
| 238.72        | -30.00 | 667.4    | 45.414*  | —                   | —                      |
| 7th Isometric |        |          |          |                     |                        |
| 305.38        | 90.00  | 691.0    | 47.020   | 2.1530              | 0.87150                |
| 294.27        | 70.00  | 655.4    | 44.597   | 2.1553              | 0.85688                |
| 283.17        | 50.08  | 620.0    | 42.188   | 2.1574              | 0.84155                |
| 266.54        | 20.09  | 566.4    | 38.541   | 2.1607              | 0.81552                |
| 255.35        | 0.00   | 529.6    | 36.037   | 2.1629              | 0.79514                |

\* Two-phase region

| Temperature   |         | Pressure |          | Density             | Compressibility Factor |
|---------------|---------|----------|----------|---------------------|------------------------|
| °K            | °F      | Psia     | atm      | gm moles<br>1000 cc | z = P/RTp              |
| 1st Isometric |         |          |          |                     |                        |
| 305.38        | 90.00   | 4168.7   | 283.662  | 11.3394             | 0.99804                |
| 294.27        | 70.00   | 3863.4   | 262.888  | 11.3503             | 0.95915                |
| 283.17        | 50.08   | 3553.6   | 241.807  | 11.3611             | 0.91595                |
| 266.54        | 20.09   | 3092.0   | 210.397  | 11.3803             | 0.84526                |
| 249.83        | -10.00  | 2626.8   | 178.743  | 11.3996             | 0.76483                |
| 238.72        | -30.00  | 2320.0   | 157.866  | 11.4127             | 0.70612                |
| 227.60        | -50.00  | 2018.5   | 137.350  | 11.4258             | 0.64363                |
| 222.05        | -60.00  | 1872.0   | 127.382* | —                   | —                      |
| 216.49        | -70.00  | 1799.6   | 122.455* | —                   | —                      |
| 210.94        | -80.00  | 1726.0   | 117.447* | —                   | —                      |
| 197.05        | -105.00 | 1538.6   | 104.695* | —                   | —                      |
| 2nd Isometric |         |          |          |                     |                        |
| 305.38        | 90.00   | 3295.5   | 224.245  | 9.5980              | 0.93224                |
| 294.27        | 70.00   | 3063.6   | 208.465  | 9.6072              | 0.89858                |
| 283.17        | 50.08   | 2829.1   | 192.508  | 9.6175              | 0.86141                |
| 266.54        | 20.09   | 2479.1   | 168.692  | 9.6335              | 0.80060                |
| 249.83        | -10.00  | 2125.8   | 144.652  | 9.6496              | 0.73121                |
| 238.72        | -30.00  | 1891.3   | 128.695  | 9.6605              | 0.68005                |
| 233.16        | -40.00  | 1774.6   | 120.754* | —                   | —                      |
| 227.60        | -50.00  | 1692.6   | 115.174* | —                   | —                      |
| 216.49        | -70.00  | 1565.5   | 106.526* | —                   | —                      |
| 199.83        | -100.00 | 1367.5   | 93.0525* | —                   | —                      |
| 3rd Isometric |         |          |          |                     |                        |
| 305.38        | 90.00   | 2593.8   | 176.497  | 7.8530              | 0.89686                |
| 294.27        | 70.00   | 2422.6   | 164.848  | 7.8611              | 0.86841                |
| 283.17        | 50.08   | 2249.4   | 153.062  | 7.8696              | 0.83702                |
| 266.54        | 20.09   | 1989.3   | 135.363  | 7.8822              | 0.78516                |
| 249.83        | -10.00  | 1726.3   | 117.467  | 7.8957              | 0.72569                |
| 244.27        | -20.00  | 1638.6   | 111.500  | 7.9004              | 0.70391                |
| 238.72        | -30.00  | 1550.3   | 105.491  | 7.9048              | 0.68125                |
| 227.60        | -50.00  | 1429.9   | 97.299*  | —                   | —                      |
| 216.49        | -70.00  | 1316.5   | 89.582*  | —                   | —                      |
| 4th Isometric |         |          |          |                     |                        |
| 305.38        | 90.00   | 1991.1   | 135.486  | 6.1149              | 0.88415                |
| 294.27        | 70.00   | 1870.6   | 127.286  | 6.1216              | 0.86107                |
| 283.17        | 50.08   | 1748.4   | 118.971  | 6.1281              | 0.83548                |
| 266.54        | 20.09   | 1564.8   | 106.478  | 6.1381              | 0.79311                |
| 249.83        | -10.00  | 1377.0   | 93.699   | 6.1483              | 0.74337                |
| 244.27        | -20.00  | 1313.8   | 89.398   | 6.1535              | 0.72477                |
| 238.72        | -30.00  | 1258.1   | 85.608   | 6.1585              | 0.70961                |
| 5th Isometric |         |          |          |                     |                        |
| 305.38        | 90.00   | 1440.6   | 98.027   | 4.3807              | 0.89295                |
| 294.27        | 70.00   | 1362.5   | 92.712   | 4.3853              | 0.87551                |
| 283.17        | 50.08   | 1283.3   | 87.323   | 4.3900              | 0.85602                |
| 266.54        | 20.09   | 1164.2   | 79.219   | 4.3969              | 0.82374                |
| 249.83        | -10.00  | 1042.7   | 70.951   | 4.4038              | 0.78588                |
| 6th Isometric |         |          |          |                     |                        |
| 305.38        | 90.00   | 893.6    | 60.806   | 2.6315              | 0.92207                |
| 294.27        | 70.00   | 851.5    | 57.941   | 2.6340              | 0.91095                |
| 283.17        | 50.08   | 808.9    | 55.042   | 2.6365              | 0.89844                |
| 266.54        | 20.09   | 745.0    | 50.694   | 2.6404              | 0.87779                |
| 249.83        | -10.00  | 679.9    | 46.264   | 2.6442              | 0.85344                |
| 7th Isometric |         |          |          |                     |                        |
| 305.38        | 90.00   | 512.0    | 34.839   | 1.4614              | 0.95131                |
| 294.27        | 70.00   | 490.3    | 33.363   | 1.4628              | 0.94451                |
| 283.17        | 50.08   | 468.5    | 31.879   | 1.4641              | 0.93704                |
| 266.54        | 20.09   | 435.9    | 29.661   | 1.4661              | 0.92497                |
| 249.83        | -10.00  | 402.8    | 27.409   | 1.4685              | 0.91042                |
| 238.72        | -30.00  | 380.7    | 25.905   | 1.4695              | 0.89989                |
| 227.60        | -50.00  | 358.5    | 24.394   | 1.4708              | 0.88802                |
| 216.49        | -70.00  | 321.2    | 21.856   | 1.4725              | 0.83551                |

\* Two-phase region



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