



# F A C S I M I L E

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Subject: Chassis, Ltd - Widdowson "6" Federal Gun No 1

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Chisos, Ltd.

Wishbone "6" Federal Com. No. 1 - Date Sampled: 01/26/05

Wildcat (Strawn) Field

Saturation pressure calculation

Equilibrium Properties at 4751.000 psia and 149.000 deg F  
 Peng-Robinson Equations of State

| component | mole percent |          |          |
|-----------|--------------|----------|----------|
|           | Feed         | Phase01  | Phase02  |
| N2        | 1.37200      | 1.33700  | 1.37200  |
| CO2       | 0.17700      | 0.17594  | 0.17700  |
| C1        | 61.29300     | 60.39577 | 61.29300 |
| C2        | 13.56500     | 13.54562 | 13.56500 |
| C3        | 6.75900      | 6.80920  | 6.75900  |
| IC4       | 0.95600      | 0.96825  | 0.95600  |
| NC4       | 2.59100      | 2.63314  | 2.59100  |
| IC5       | 0.80500      | 0.82280  | 0.80500  |
| NC5       | 1.14300      | 1.17072  | 1.14300  |
| FC6       | 1.20200      | 1.24119  | 1.20200  |
| C7+       | 10.13700     | 10.90037 | 10.13700 |

  

| component | ln (fug, atm) | K-values w.r.t phase 1 |             |
|-----------|---------------|------------------------|-------------|
|           |               | Phase01                | Phase02     |
| N2        | 2.22634E+00   | 1.00000E+00            | 1.02618E+00 |
| CO2       | -1.14852E+00  | 1.00000E+00            | 1.00605E+00 |
| C1        | 5.25256E+00   | 1.00000E+00            | 1.01486E+00 |
| C2        | 2.64247E+00   | 1.00000E+00            | 1.00143E+00 |
| C3        | 1.15669E+00   | 1.00000E+00            | 9.92627E-01 |
| IC4       | -1.33324E+00  | 1.00000E+00            | 9.87348E-01 |
| NC4       | -5.68442E-01  | 1.00000E+00            | 9.83997E-01 |
| IC5       | -2.28798E+00  | 1.00000E+00            | 9.78368E-01 |
| NC5       | -2.10853E+00  | 1.00000E+00            | 9.76323E-01 |
| FC6       | -2.66312E+00  | 1.00000E+00            | 9.68422E-01 |
| C7+       | -3.02295E+00  | 1.00000E+00            | 9.29969E-01 |

|                       | liquid   |         | vapour   |
|-----------------------|----------|---------|----------|
| Z-factor              |          | 0.8748  | 0.8720   |
| Molar vol, m3/kmol    | 0.07484  | 0.07509 | 0.07484  |
| MW, g/mol             | 39.514   | 40.80   | 39.51    |
| Ideal H, BTU/lbmol    | 7136.377 | 7263.24 | 7136.38  |
| Enthalpy, BTU/lbmol   | 2944.002 | 2917.70 | 2944.00  |
| Ideal Cp, BTU/lbmol-R |          | 17.994  | 17.500   |
| Cp, BTU/lbmol-R       |          | 25.036  | 24.481   |
| Density, lb/ft3       |          | 33.9251 | 32.9595  |
| Viscosity, cp         |          | 0.1446  | 0.1276   |
| IFT, dyne/cm          |          | 0.0000  | 0.0000   |
| Phase volume %        |          | 0.0000  | 100.0000 |
| Phase mole %          |          | 0.0000  | 100.0000 |

Enthalpy is zero for ideal gas at absolute zero

Interfacial tension, IFT, is reference to phase 1

Chisos, Ltd.  
 Wishbone "6" Federal Com. No. 1 - Date Sampled: 01/26/05  
 Wildcat (Strawn) Field  
 Critical point calculation  
 2 critical point(s) detected

Peng-Robinson Equations of State

| component             | mole percent |         |
|-----------------------|--------------|---------|
|                       | Phase01      | Phase02 |
| N2                    | 1.3720       | 1.3720  |
| CO2                   | 0.1770       | 0.1770  |
| C1                    | 61.2930      | 61.2930 |
| C2                    | 13.5650      | 13.5650 |
| C3                    | 6.7590       | 6.7590  |
| IC4                   | 0.9560       | 0.9560  |
| NC4                   | 2.5910       | 2.5910  |
| IC5                   | 0.8050       | 0.8050  |
| NC5                   | 1.1430       | 1.1430  |
| FC6                   | 1.2020       | 1.2020  |
| C7+                   | 10.1370      | 10.1370 |
| Crit. P, psia         | 4843.28      | 5031.73 |
| Crit. T, deg F        | 110.929      | 46.245  |
|                       | liquid       | liquid  |
| Z-factor              | 0.8885       | 0.9450  |
| Molar vol, m3/kmol    | 0.07013      | 0.06366 |
| MW, g/mol             | 39.51        | 39.51   |
| Ideal H, BTU/lbmol    | 6484.90      | 5445.56 |
| Enthalpy, BTU/lbmol   | 2030.55      | 569.24  |
| Ideal Cp, BTU/lbmol-R | 16.725       | 15.413  |
| Cp, BTU/lbmol-R       | 23.557       | 21.903  |
| Density, lb/ft3       | 15.1745      | 38.7522 |
| Viscosity, cp         | 0.1821       | 0.3721  |

Enthalpy is zero for ideal gas at absolute zero

Chisos, Ltd.

Wishbone "6" Federal Com. No. 1 - Date Sampled: 01/26/05

Wildcat (Strawn) Field

Cricondentherm calculation

Equilibrium Properties at 1390.193 psia and 424.642 deg F  
 Peng-Robinson Equations of State

| component | mole percent |          |          |
|-----------|--------------|----------|----------|
|           | Feed         | Phase01  | Phase02  |
| N2        | 1.37200      | 0.26188  | 1.37200  |
| CO2       | 0.17700      | 0.06126  | 0.17700  |
| C1        | 61.29300     | 17.36058 | 61.29300 |
| C2        | 13.56500     | 6.34202  | 13.56500 |
| C3        | 6.75900      | 4.58882  | 6.75900  |
| IC4       | 0.95600      | 0.85333  | 0.95600  |
| NC4       | 2.59100      | 2.55639  | 2.59100  |
| IC5       | 0.80500      | 1.04328  | 0.80500  |
| NC5       | 1.14300      | 1.57925  | 1.14300  |
| FC6       | 1.20200      | 2.25852  | 1.20200  |
| C7+       | 10.13700     | 63.09467 | 10.13700 |

| component | ln (fug, atm) | K-values w.r.t phase 1 |             |
|-----------|---------------|------------------------|-------------|
|           |               | Phase01                | Phase02     |
| N2        | 4.37838E-01   | 1.00000E+00            | 5.23903E+00 |
| CO2       | -1.79944E+00  | 1.00000E+00            | 2.88915E+00 |
| C1        | 4.10693E+00   | 1.00000E+00            | 3.53058E+00 |
| C2        | 2.41170E+00   | 1.00000E+00            | 2.13891E+00 |
| C3        | 1.56699E+00   | 1.00000E+00            | 1.47293E+00 |
| IC4       | -5.04086E-01  | 1.00000E+00            | 1.12032E+00 |
| NC4       | 4.61103E-01   | 1.00000E+00            | 1.01354E+00 |
| IC5       | -8.21578E-01  | 1.00000E+00            | 7.71607E-01 |
| NC5       | -4.95622E-01  | 1.00000E+00            | 7.23762E-01 |
| FC6       | -5.56045E-01  | 1.00000E+00            | 5.32208E-01 |
| C7+       | 1.18454E+00   | 1.00000E+00            | 1.60663E-01 |

|                       | liquid    |          | vapour   |
|-----------------------|-----------|----------|----------|
| Z-factor              |           | 0.3743   | 0.8763   |
| Molar vol, m3/kmol    | 0.37344   | 0.15953  | 0.37344  |
| MW, g/mol             | 39.514    | 122.54   | 39.51    |
| Ideal H, BTU/lbmol    | 12727.720 | 31711.45 | 12727.72 |
| Enthalpy, BTU/lbmol   | 11592.080 | 20934.38 | 11592.08 |
| Ideal Cp, BTU/lbmol-R |           | 68.214   | 23.019   |
| Cp, BTU/lbmol-R       |           | 84.536   | 25.892   |
| Density, lb/ft3       |           | 47.9541  | 6.6055   |
| Viscosity, cp         |           | 0.9659   | 0.0183   |
| IFT, dyne/cm          |           | 0.0000   | 11.3712  |
| Phase volume %        |           | 0.0000   | 100.0000 |
| Phase mole %          |           | 0.0000   | 100.0000 |

Enthalpy is zero for ideal gas at absolute zero  
 Interfacial tension, IFT, is reference to phase 1

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Wishbone "6" Federal Com. No. 1 - Date Sampled: 01/26/05

Wildcat (Strawn) Field

Cricodenbar calculation

Equilibrium Properties at 4999.037 psia and 53.735 deg F  
 Peng Robinson Equations of State

| component | mole percent |          |          |
|-----------|--------------|----------|----------|
|           | Feed         | Phase01  | Phase02  |
| N2        | 1.37200      | 1.37200  | 1.37589  |
| CO2       | 0.17700      | 0.17700  | 0.17708  |
| C1        | 61.29300     | 61.29300 | 61.39091 |
| C2        | 13.56500     | 13.56500 | 13.56724 |
| C3        | 6.75900      | 6.75900  | 6.75402  |
| IC4       | 0.95600      | 0.95600  | 0.95483  |
| NC4       | 2.59100      | 2.59100  | 2.58678  |
| IC5       | 0.80500      | 0.80500  | 0.80324  |
| NC5       | 1.14300      | 1.14300  | 1.14023  |
| IC6       | 1.20200      | 1.20200  | 1.19800  |
| C7+       | 10.13700     | 10.13700 | 10.05177 |

| component | ln (fug, atm) | K-values w.r.t phase 1 |             |
|-----------|---------------|------------------------|-------------|
|           |               | Phase01                | Phase02     |
| N2        | 2.38076E+00   | 1.00000E+00            | 1.00284E+00 |
| CO2       | -1.56128E+00  | 1.00000E+00            | 1.00045E+00 |
| C1        | 5.13408E+00   | 1.00000E+00            | 1.00160E+00 |
| C2        | 2.05756E+00   | 1.00000E+00            | 1.00017E+00 |
| C3        | 2.34164E-01   | 1.00000E+00            | 9.99264E-01 |
| IC4       | -2.47771E+00  | 1.00000E+00            | 9.98778E-01 |
| NC4       | -1.81285E+00  | 1.00000E+00            | 9.98372E-01 |
| IC5       | -3.77072E+00  | 1.00000E+00            | 9.97818E-01 |
| NC5       | -3.67801E+00  | 1.00000E+00            | 9.97573E-01 |
| IC6       | -4.48054E+00  | 1.00000E+00            | 9.96672E-01 |
| C7+       | 6.01243E+00   | 1.00000E+00            | 9.91592E-01 |

|                       |          | liquid   | liquid  |
|-----------------------|----------|----------|---------|
| Z-factor              |          | 0.9350   | 0.9341  |
| Molar vol, m3/kmol    | 0.06433  | 0.06433  | 0.06427 |
| MW, g/mol             | 39.514   | 39.51    | 39.37   |
| Ideal H, BTU/lbmol    | 5561.566 | 5561.57  | 5552.29 |
| Enthalpy, BTU/lbmol   | 731.919  | 731.92   | 739.93  |
| Ideal Cp, BTU/lbmol-R |          | 15.565   | 15.519  |
| Cp, BTU/lbmol-R       |          | 22.100   | 22.049  |
| Density, lb/ft3       |          | 38.3445  | 38.2410 |
| Viscosity, cp         |          | 0.3401   | 0.3341  |
| IFT, dyne/cm          |          | 0.0000   | 0.0000  |
| Phase volume %        |          | 100.0000 | 0.0000  |
| Phase mole %          |          | 100.0000 | 0.0000  |

Enthalpy is zero for ideal gas at absolute zero  
 Interfacial tension, IFT, is reference to phase 1

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Wishbone "6" Federal Com. No. 1

FIGURE 1  
Pressure - Temperature Diagram  
Simulated PVT Analysis

