

**BONGA15X**

|  | Whole crude | Butane and Lighter IBP - 60F | Lt. Naphtha C5 - 165F | Hvy Naphtha 165 - 330F | Kerosene 330 - 480F | Diesel 480 - 650F | Vacuum Gas Oil 650 - 1000F | Vacuum Residue 1000F+ |
|--|-------------|------------------------------|-----------------------|------------------------|---------------------|-------------------|----------------------------|-----------------------|
| Cut volume, %                              | 100.0       | 0.9                          | 3.4                   | 13.5                   | 16.8                | 24.8              | 31.8                       | 8.7                   |
| API Gravity,                               | 28.6        | 124.0                        | 84.9                  | 51.5                   | 36.1                | 27.0              | 16.7                       | 13.8                  |
| Specific Gravity (60/60F),                 | 0.884       | 0.554                        | 0.654                 | 0.773                  | 0.844               | 0.893             | 0.955                      | 0.974                 |
| Carbon, wt %                               | 87.1        | 82.5                         | 84.0                  | 86.1                   | 87.1                | 87.3              | 87.8                       | 86.6                  |
| Hydrogen, wt %                             | 12.5        | 17.5                         | 16.0                  | 13.9                   | 12.9                | 12.5              | 11.6                       | 12.0                  |
| Pour point, F                              | (25.6)      |                              |                       | (156.3)                | (101.6)             | (16.5)            | 64.0                       | 110.5                 |
| Neutralization number (TAN), MG/GM         | 0.619       | 0.000                        | 0.008                 | 0.072                  | 0.192               | 0.530             | 1.109                      | 0.689                 |
| Sulfur, wt%                                | 0.254       | 0.000                        | 0.000                 | 0.009                  | 0.061               | 0.205             | 0.354                      | 0.731                 |
| Viscosity at 20C/68F, cSt                  | 11.6        | 0.4                          | 0.6                   | 0.9                    | 2.2                 | 10.1              | 2,060.2                    | 123,191,535.7         |
| Viscosity at 40C/104F, cSt                 | 6.2         | 0.4                          | 0.5                   | 0.7                    | 1.6                 | 5.4               | 292.2                      | 1,806,533.9           |
| Viscosity at 50C/122F, cSt                 | 4.8         | 0.3                          | 0.4                   | 0.6                    | 1.4                 | 4.2               | 138.3                      | 343,492.9             |
| Mercaptan sulfur, ppm                      | 1.0         | 0.0                          | 0.0                   | 0.2                    | 1.8                 | 1.5               | 0.2                        | 0.0                   |
| Nitrogen, ppm                              | 1,283.8     | -                            | -                     | 0.6                    | 13.3                | 127.4             | 1,666.3                    | 7,057.6               |
| CCR, wt%                                   | 1.4         |                              |                       |                        |                     |                   | 0.3                        | 13.6                  |
| N-Heptane Insolubles (C7 Asphaltenes), wt% | 0.0         |                              |                       |                        |                     |                   | -                          | 0.2                   |
| Nickel, ppm                                | 3.5         |                              |                       |                        |                     |                   |                            | 36.7                  |
| Vanadium, ppm                              | 0.3         |                              |                       |                        |                     |                   |                            | 3.4                   |
| Calcium, ppm                               | 0.5         |                              |                       |                        |                     |                   |                            |                       |
| Reid Vapor Pressure (RVP) Whole Crude, psi | 4.8         |                              |                       |                        |                     |                   |                            |                       |
| Hydrogen Sulfide (dissolved), ppm          | -           |                              |                       |                        |                     |                   |                            |                       |
| Salt content, ptb                          | 0.8         |                              |                       |                        |                     |                   |                            |                       |
| Paraffins, vol %                           | 17.1        | 100.0                        | 76.6                  | 25.5                   | 18.4                | 15.3              | 7.5                        | 1.2                   |
| Naphthenes, vol %                          | 42.1        | -                            | 23.4                  | 60.7                   | 46.4                | 49.9              | 35.6                       | 14.6                  |
| Aromatics (FIA), vol %                     | 40.8        | -                            | -                     | 13.8                   | 35.2                | 34.8              | 56.8                       | 84.2                  |
| Distillation type, TBP                     |             |                              |                       |                        |                     |                   |                            |                       |
| IBP, F                                     | 37.4        |                              | 61.0                  | 166.1                  | 330.9               | 480.9             | 651.2                      | 1,000.9               |
| 5 vol%, F                                  | 175.7       |                              | 69.2                  | 175.7                  | 339.4               | 488.8             | 661.7                      | 1,009.7               |
| 10 vol%, F                                 | 239.9       |                              | 74.4                  | 185.5                  | 348.7               | 497.5             | 673.6                      | 1,019.8               |
| 20 vol%, F                                 | 353.7       |                              | 84.9                  | 203.6                  | 367.0               | 514.8             | 698.5                      | 1,041.6               |
| 30 vol%, F                                 | 445.8       |                              | 103.5                 | 220.6                  | 384.4               | 531.9             | 724.6                      | 1,065.7               |
| 40 vol%, F                                 | 517.3       |                              | 122.0                 | 236.8                  | 400.6               | 548.6             | 752.3                      | 1,092.9               |
| 50 vol%, F                                 | 584.4       |                              | 131.2                 | 252.7                  | 415.7               | 565.1             | 781.8                      | 1,124.0               |
| 60 vol%, F                                 | 653.6       |                              | 139.2                 | 268.4                  | 429.7               | 581.6             | 813.9                      | 1,160.5               |
| 70 vol%, F                                 | 732.8       |                              | 146.4                 | 283.9                  | 443.0               | 598.1             | 849.7                      | 1,204.9               |
| 80 vol%, F                                 | 829.4       |                              | 153.0                 | 299.3                  | 455.7               | 615.0             | 890.7                      | 1,262.0               |
| 90 vol%, F                                 | 973.6       |                              | 159.2                 | 314.7                  | 467.9               | 632.2             | 939.3                      | 1,342.8               |
| 95 vol%, F                                 | 1,100.6     |                              | 162.1                 | 322.4                  | 474.0               | 641.0             | 967.7                      | 1,401.3               |
| EP, F                                      | 1,391.4     |                              | 164.7                 | 329.2                  | 479.4               | 649.1             | 996.5                      | 1,489.8               |
| Freeze point, F                            |             |                              |                       | (145.0)                | (90.2)              | (2.5)             |                            |                       |
| Smoke point, mm                            |             |                              |                       | 24.6                   | 18.6                | 13.3              |                            |                       |
| Naphthalenes (D1840), vol%                 |             |                              |                       |                        | 2.5                 | 9.0               |                            |                       |
| Viscosity at 100C/212F, cSt                | 1.9         | 0.3                          | 0.3                   | 0.4                    | 0.8                 | 1.7               | 12.7                       | 1,449.1               |
| Viscosity at 150C/302F, cSt                | 1.1         | 0.2                          | 0.2                   | 0.3                    | 0.5                 | 0.9               | 3.7                        | 85.9                  |
| Cetane Index 1990 (D4737),                 |             |                              |                       | 23.1                   | 31.1                | 38.5              |                            |                       |
| Cloud point, F                             |             |                              |                       | (152.4)                | (97.2)              | (11.5)            |                            |                       |
| Aniline pt, F                              |             |                              |                       |                        | 119.5               | 131.0             | 151.2                      |                       |