

## Propylene (Chemical)

| #  | Property                               | Units   | Test Method                            | Value          |
|----|--|---------|--|----------------|
| 1  | Purity                                 | Mol%    | G.C                                    | 92 min         |
| 2  | Paraffin                               | Mol%    | G.C                                    | 8 max          |
| 3  | Ethylene                               | Mol.ppm | G.C                                    | 10 max         |
| 4  | Acetylene                              | Mol.ppm | G.C                                    | 1 max          |
| 5  | Methyl Acetylene+ Propadiene           | Mol.ppm | G.C                                    | 10 max         |
| 6  | Butadiene                              | Mol.ppm | G.C                                    | 5 max          |
| 7  | Butanes & Butenes                      | Mol.ppm | G.C                                    | 20 max         |
| 8  | Total Sulphur                          | Wt.ppm  | Microcoulometry (Based on ASTM D-3246) | 2 max          |
| 9  | Water Content                          | Vol.ppm | Shaw dew point                         | 2.5 max        |
| 10 | Nitrogen                               | Mol.ppm | G.C                                    | Nil            |
| 11 | Hydrogen                               | Mol.ppm | G.C                                    | 10 max         |
| 12 | Carbon Monoxide                        | Mol.ppm | G.C                                    | 5 max          |
| 13 | Carbon Monoxide                        | Mol.ppm | G.C                                    | 10 max         |
| 14 | Oxygene                                | Mol.ppm | G.C                                    | 5 max          |
| 15 | Oxygenated Organic Compound (Methanol) | Mol.ppm | G.C                                    | 5 max          |
| 16 | SP.Gr. @. (60/60 °F)                   | --      | ASTM D-2598                            | To be reported |

## Propylene (polymer Grade)

| #  | Property           | Units   | Test Method | Value    |
|----|--------------------|---------|-------------|----------|
| 1  | Purity             | vol%    | G.C         | 99.7 min |
| 2  | Propane & Heavier  | vol%    | G.C         | Balance  |
| 3  | Ethane             | Vol.ppm | G.C         | 30 max   |
| 4  | Ethylene           | Vol.ppm | G.C         | 2 max    |
| 5  | Acetylene          | Vol.ppm | G.C         | 1 max    |
| 6  | Methylacetylene    | Vol.ppm | G.C         | 1 max    |
| 7  | Propadiene         | Vol.ppm | G.C         | 2 max    |
| 8  | Total C4's         | Vol.ppm | G.C         | 1 max    |
| 9  | Hydrogen           | Vol.ppm | G.C         | 5 max    |
| 10 | Methane            | Vol.ppm | G.C         | 10 max   |
| 11 | Carbon Monoxide    | Vol.ppm | G.C         | 0.3 max  |
| 12 | Carbon Dioxide     | Vol.ppm | G.C         | 2 max    |
| 13 | Oxygen             | Vol.ppm | G.C         | 2 max    |
| 14 | Water Content      | Vol.ppm | G.C         | 5 max    |
| 15 | Total Sulphur      | Vol.ppm | G.C         | 2 max    |
| 16 | Methanol & Ketones | Vol.ppm | G.C         | 5 max    |

## Raffinate C4

| #  | Property                    | Units  | Test Method        | Value          |
|----|-----------------------------|--------|--------------------|----------------|
| 1  | Iso & Normal Butane         | Mol%   | G.C                | 28 max         |
| 2  | 1-Butene                    | Mol%   | G.C                | 25 max         |
| 3  | Iso-Butene                  | Mol%   | G.C                | 45 min         |
| 4  | Trans & Cis butane-2        | Mol%   | G.C                | 22 max         |
| 5  | 1,2 & 1,3 Butadiene         | Mol%   | G.C                | 1 max          |
| 6  | Methyl Acetylene            | Mol%   | G.C                | 0.5 max        |
| 7  | Vinyl Acetylene             | Mol%   | G.C                | 0.2 max        |
| 8  | Ethyl Acetylene             | Mol%   | G.C                | 0.2 max        |
| 9  | Sp.Gr@(15.6 °C)             | —      | ASTM D-2598        | To be reported |
| 10 | Total Sulphur               | Wt.ppm | Microcoulometry    | 1 max          |
| 11 | Copper Corrosion            | -      | ASTM D-1838        | No.1a          |
| 12 | C <sub>3</sub> & Lighter HC | Mol%   | G.C                | 0.05 max       |
| 13 | C <sub>5</sub> & Heavier HC | Mol%   | G.C                | 0.1 max        |
| 14 | R.V.P @ (100°F)             | Psia   | ASTM D-1267        | 70 max         |
| 15 | Evaporated Temp, 95%        | °C     | ASTM D-1837        | -2.5 max       |
| 16 | Residue on Evaporation      | Vol%   | ASTM D-2158        | 0.05 max       |
| 17 | Water Content               | Wt.ppm | Evaporation Method | 700 max        |

## Ethylene

| #  | Property                    | Units         | Test Method                                      | Value     |
|----|-----------------------------|---------------|--|-----------|
| 1  | Ethylene                    | Vol%          | Lindeinstr.553                                   | 99.95 min |
| 2  | Hydrogen                    | Vol.ppm       | ASTM D-1946                                      | 5 max     |
| 3  | Methane+Ethane              | Vol.ppm       | Lindeinstr.553                                   | 500 max   |
| 4  | Acetylene                   | Vol.ppm       | Lindeinstr.553                                   | 1 max     |
| 5  | Propylene+Higher            | Vol.ppm       | Lindeinstr.553                                   | 10 max    |
| 6  | Carbon Monoxide             | Vol.ppm       | ISO 6381   | 0.2 max   |
| 7  | Carbon Di Oxide             | Vol.ppm       | ISO 6381   | 1 max     |
| 8  | Oxygen                      | Vol.ppm       | Oxygen Analyzer (Teledine)                       | 1 max     |
| 9  | Water                       | Vol.ppm       | H <sub>2</sub> O analyser (show dew point meter) | 1 max     |
| 10 | Sulphur as H <sub>2</sub> S | Vol.ppm       | ASTM E-840                                       | 1 max     |
| 11 | Methanol                    | Vol.ppm       | Lindeinstr.535                                   | 1 max     |
| 12 | Oxygenated Organics         | Vol.ppm       | Lindeinstr.535                                   | 1 max     |
| 13 | Carbonyl Sulphide           |               | ASTM D-6228                                      | 0.1 max   |
| #  | Propert                     | Vol.ppm Units |  |           |

## C6 Non Aromatic

| #  | Property          | Units | Test Method | Value    |
|----|-------------------|-------|-------------|----------|
| 1  | Doctor Test       | –     | ASTM D-4952 | Negative |
| 2  | SP.Gr.@(60/60 °F) | –     | ASTM D-1298 | 0.7-0.8  |
| 3  | I.B.P             | °C    | ASTM D-86   | 60 min   |
| 4  | F.B.P             | °C    | ASTM D-86   | 100 max  |
| 5  | Benzene           | Wt%   | UOP-744     | 5 max    |
| 6  | C4                | Wt%   | UOP-744     | 2 max    |
| 7  | C5                | Wt%   | UOP-744     | 18 max   |
| 8  | C6                | Wt%   | UOP-744     | 70 max   |
| 9  | C7                | Wt%   | UOP-744     | 10 max   |
| 10 | Toluene           | Wt%   | UOP-744     | *        |
| 11 | C8+               | Wt%   | UOP-744     | *        |

## Heavy End

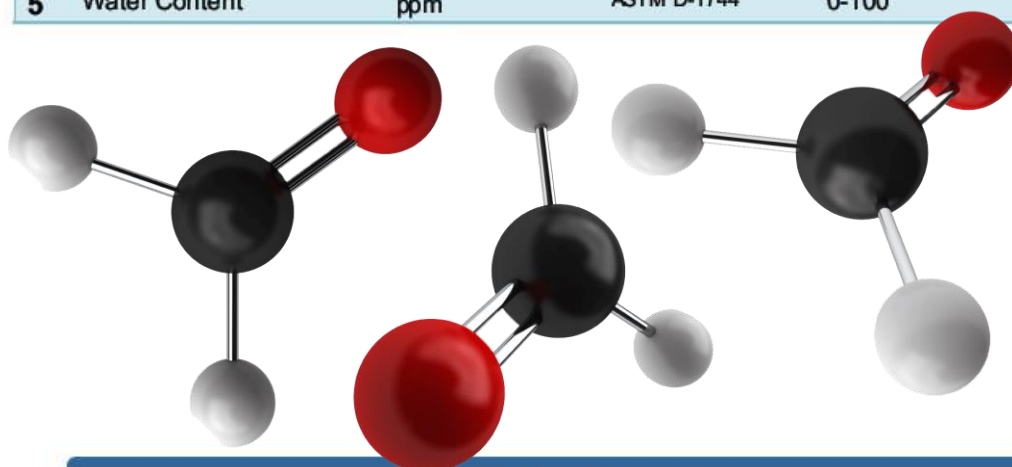
| # | Property  | Units                  | Test Method | Value   |
|---|---|------------------------|-------------|---|
| 1 | Distillation Range IBP<br>10% 30% 50% 90% FBP             | Centigrade             | ASTM D-86   | 165-176 177-183<br>186-194 194-203<br>252-271 297-322 |
| 2 | Total Sulphur   | Ppm                    | ASTM D-3120 | 1800 max  |
| 3 | Water content   | Ppm                    | ASTM D-1744 | 160 max   |
| 4 | Color   | –                      | ASTM D-1500 | 1.0 max   |
| 5 | Flash Point   | Centigrade             | ASTM D-93   | 55 min  |
| 6 | Po Na Paraffinic Olefins<br>Naphthenic Aromatic<br>Others | Wt% Wt% Wt%<br>Wt% Wt% | ASTM D-5134 | 0.05-1.17 0<br>0.26-2.34<br>4.73-19.86 80-90          |
| 7 | Specific-Gravity  | –                      | ASTM D-1298 | 0.78-0.81   |

## Light End

| # | Property   | Units                      | Test Method | Value                                  |
|---|--|----------------------------|-------------|--|
| 1 | Po Na Paraffinic Olefinic<br>Naphthenic Aromatic<br>Others | Wt% Wt% Wt%<br>Wt% Wt% Wt% | ASTM D-5134 | 86-97 0-1.67<br>0.47-5.5 0-5<br>0-0.02 |
| 2 | Total Sulphur  | Ppm                        | ASTM D-3120 | 850-1260                               |
| 3 | Water content  | Ppm                        | ASTM D-1744 | 160                                    |

## Raffinate

| # | Property            | Units  | Test Method | Value     |
|---|---------------------|--------|-------------|-----------|
| 1 | Total Non-Aromatics | Wt%    |             | 90.0 min  |
| 2 | Aromatics           | Wt%    |             | 10.0 max  |
| 3 | Density             | Gr/cm3 | ASTM D-4052 | 0.63-0.72 |
| 4 | Total Sulpur        | Ppm    | ASTM D-4045 | 1.0 max   |
| 5 | Water Content       | ppm    | ASTM D-1744 | 0-100     |



## Butadiene

| ITEM | COMPONENT        | TEST METHOD | UNIT | RESULT   |
|------|------------------|-------------|------|----------|
| 1    | 1,3 BD           | ASTM D-2593 | WT%  | Min 99.4 |
| 2    | Total Acetylenes | ASTM D-2593 | PPM  | Max 60   |
| 3    | Total Butenes    | ASTM D-2593 | WT%  | Max 0.5  |
| 4    | 1,2 BD           | ASTM D-2593 | PPM  | Max 200  |
| 5    | Propadiene       | ASTM D-2593 | PPM  | Max 50   |
| 6    | C5s              | ASTM D-2593 | PPM  | Max 20   |
| 7    | BD Dimer         | ASTM D-2426 | WT%  | Max 0.1  |
| 8    | NMP              | GC          | PPM  | Max 10   |
| 9    | TBC              | ASTM D-1157 | PPM  | 50-200   |
| 10   | Peroxides        | ASTM D-5799 | PPM  | Max 10   |
| 11   | Carbonyl         | ASTM D-4423 | PPM  | Max 30   |
| 12   | Water            | ASTM D-1744 | PPM  | Max 100  |
| 13   | Total Sulfer     | ASTM D-3246 | PPM  | Max 10   |

### DPG

| PROPERTY                  | UNIT   | METHOD | RESULT    |
|---------------------------|--------|--------|-----------|
| <i>Density at 15.6 °C</i> | GR/CM3 | D-4052 | 0.78-0.82 |
| <i>R.V.P.</i>             | PSIA   | D-323  | 7-12      |
| <i>Colour Saybolt</i>     | -      | D-156  | 10-20     |
| <i>Total Sulphur</i>      | PPM    | D-3120 | 300 MAX   |
| <i>Lead Content</i>       | PPB    | A.A.   | 10 MAX    |
| <i>I.B.P</i>              | °C     | D-86   | 34MIN     |
| <i>F.B.P</i>              | °C     | D-86   | 210 MAX   |
| <i>Paraffin</i>           | WT%    | G.C.   | TBR       |
| <i>Olefins</i>            | WT%    | G.C.   | TBR       |
| <i>Naphthenes</i>         | WT%    | G.C.   | TBR       |
| <i>Aromatics</i>          | WT%    | G.C.   | MIN 50    |
| <i>DOCTOR TEST</i>        | -----  | -----  | NEGATIVE  |
| <i>COPPER CORROSION</i>   | -----  | D 130  | NO 1A     |

### Pentane Plus ( C5+ )

| PROPERTY                     | UNIT   | METHOD          | RESULT    |
|------------------------------|--------|-----------------|-----------|
| <i>Density at 15.6 °C</i>    | GR/CM3 | D-4052          | 0.735 MAX |
| <i>R.V.P.</i>                | PSIA   | D-323           | 13 MAX    |
| <i>Colour Saybolt</i>        | -      | D-156           | 18 MIN    |
| <i>Total Sulphur</i>         | PPM    | D-3120          | 100 MAX   |
| <i>Lead Content</i>          | PPB    | A.A.            | 50 MAX    |
| <i>I.B.P.</i>                | °C     | D-86            | 30 MIN    |
| <i>F.B.P.</i>                | °C     | D-86            | 165 MAX   |
| <i>Paraffins</i>             | WT%    | G.C.            | 80 MIN    |
| <i>Olefins</i>               | WT%    | G.C.            | 1 MAX     |
| <i>Naphthenes +Aromatics</i> | WT%    | G.C.            | BALANCE   |
| <i>Total Chloride</i>        | PPM    | Microcoulometry | 10 MAX    |
| <i>H2 S</i>                  | PPM    | D-2440          | 2 MAX     |