

**Appendix B. Commercial Specifications for Propane and Butane**

|                |            |
|----------------|------------|
| <b>Propane</b> | <b>1.0</b> |
|----------------|------------|

|               |                |         |
|---------------|----------------|---------|
| Product name: | <b>Propane</b> | Propane |
| Destination:  | <b>Export</b>  |         |

|                            |                   |     |                 |                    |    |
|----------------------------|-------------------|-----|-----------------|--------------------|----|
| Product code (PSS nr.):    |                   |     | <b>M16228</b>   | Test method:       |    |
| Period                     |                   |     | <b>all year</b> |                    |    |
| Vapour pressure at 40°C    | kPa (ga)          | max | 1470            | ISO 8973           |    |
| Density @ 15°C             | kg/m <sup>3</sup> |     | Report          | ISO 8973           |    |
| Total evaporation residue  | mg/kg             | max | 20              | ISO 13757          | 1) |
| Total sulphur              | mg/kg             | max | 50              | D 6667             | 7) |
| Corrosion, copper strip    |                   | max | 1               | ISO 6251           | 2) |
| Odour                      |                   |     |                 |                    | 3) |
| Water                      |                   |     | Pass            | D2713              | 4) |
| Alkalinity                 |                   |     | Negative        | DIN 51614 modified | 6) |
| Composition:               |                   |     |                 | ISO 7941           |    |
| C <sub>3</sub>             | % liq. V          | min | 95              |                    |    |
| C <sub>5</sub> and heavier | % liq. V          | max | 0.5             |                    |    |
| 1.3 Butadiene              | % liq. V          | max | 0.1             |                    | 5) |
| Unsaturates                | % liq. V          | max | 5               |                    |    |
| Additives:                 |                   |     |                 |                    |    |
| Ethyl mercaptan            | mg/kg             | min | 15              |                    | 3) |

**Notes:**

- 1) Modified method.
- 2) Use of corrosion inhibitor is not allowed.
- 3) The dosing is done at the road car loading facilities only. (Deliveries to ship are not dosed).
- 4) Tested periodically once a week. If Propane not pass "Standard test method for dryness of propane (Valve freeze method)", ASTM D2713, but Free water @ 15°C [DIN 51614] is negative. Propane can be accepted, if recipient is notified.
- 5) Legal limit
- 6) In case of positive result the product can still be released by notifying Shell LPG and Supply. Laboratory has to issue a note to movements planner before the product is released. Movements planner will follow up and notify customers within normal working hours.
- 7) Tested periodically once every half year