

Product Specification

Bio-Ethanol

Revision Date : 1 September 2010
Designated product : Bio-Ethanol

| <u>Characteristics</u> | <u>Method</u> | <u>Values</u> <u>Min</u> | <u>Values</u> <u>Max</u> | <u>Unit</u> |
|----------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------|-----------------------------|-----------------------------|--------------------|
| Appearance | Visual | Clear & Bright | Clear&Bright | |
| Colour | Visual | Clear | Clear | |
| Odour | | | Typical | |
| Density @ 20°C | ASTM D 4052 | Min 0,800 | Max 0,810 | g/ml |
| Flash point | ASTM D93 | 12 | 14 | °C |
| Ingredients: | | | | |
| Ethanol (Bio-alcohol) before denaturation | | >= 95 | | % Volume @ 20°C |
| Ethanol (Bio-alcohol) after denaturation | | >=94,5 | | % Volume @ 20°C |
| Water content (% wt) | ASTM D1364 | | < = 7,0 | % wt |
| Gross Calorific Value (GVC) | ASTM D 240 | > 27.0 | | MJ/kg |
| Nett Calorific Value (NVC) | ASTM D 240 | > 24.0 | | MJ/kg |
| Water Miscibility -50 % vol parts product -33 % vol parts product -25 % vol parts product | ASTM D 1722 | | Passes Passes Passes | |
| pH-value -50 % vol.parts product | ASTM D E 70 | Min. 7,0 | | |
| Denaturation: | | | | |
| German Methyllethylketone : Methyllethylketone (% m/m): 95 -96 Methylisopropylketone (% m/m): 2.5– 3 5-methyl-3-heptanone (% m/m): 1.5 -2 | GC (SGS SPI 221-3) | > = 1 | | % wt |
| Denatonium benzoate | Calculated by SGS | > = 1 | | gr/hlap |

Data provided in this specification are issued in good faith to the best of our knowledge, but no warranty, expressed or implied, is given.