

## COA-SPECIFICATION

### MMB

(3-Methoxy-3-Methyl-1-Butanol)

#### Applications at a glance

|   |                             |
|---|-----------------------------|
| → Air Freshener   | → Dry Soap                  |
| Electrical, Fan, Car type, Reed diffuser, Gel, Aerosol...     |                             |
| → Household Cleaner   | → Hand Cleaner              |
| Kitchen, Air fan, Toilet, Bathroom, Floor, Multi purpose...   | → Insecticide and Pesticide |
| → Industrial Cleaner  | → Ink and Coating           |
| for Electronic, PCB, Optical, Metal parts, Precision parts... |                             |

#### The main reasons why using MMB

|  |  |
|--|--|
| Low toxicity                                       | Geringe Toxizität                          |
| Amphipathic  | Amphipatisch                               |
| Good solubilizer                                   | Gutes Lösevermögen                         |
| Mild odor  | Geruchsarm                                 |
| To control evaporation speed                       | Konstantes Verdampfungsverhalten           |
| Stable versus autoxidation                         | Stabil gegenüber Autoxidation              |
| High Flash point                                   | Hoher Flammpunkt                           |
| Biodegradable                                      | Biologisch abbaubar                        |
| Faible toxicité                                    | Baja toxicidad                             |
| Amphiphile   | Anfipatico                                 |
| Bonne propriété de solubilisation                  | Buena solubilidad                          |
| Faible odeur                                       | Bajo olor                                  |
| Permet un bon contrôle de la vitesse d'évaporation | Para controlar la velocidad de evaporación |
| Stable à l'auto-oxydation                          | Estable frente a la oxidacion              |
| Point éclair élevé                                 | Alto Punto de inflamación                  |
| Bonne biodégradabilité                             | Biodegradable                              |

#### Specification of MMB

##### Appearance

Clear and Colorless Liquid

##### Color (APHA)

10 max

##### Specific Gravity (20 °C / 20 °C)

0.925 - 0.930

##### Distillation (760 mmHg)

IBP (°C) 168 min

DP (°C) 178 max

##### Acidity as acetic acid (Wt %)

0.01 max

##### Water (%)

0.2 max

## Properties of MMB

### Physical Properties

|  |  |             |
|--|--|-------------|
| Formula                                  | $C_6H_{10}O_2 = 118$                                     |             |
| Specific Gravity (@ 20 °C / 20 °C)       | 0.927  |             |
| Specific Heat                            | 2.30 J/g   | 0.549 cal/g |
| Viscosity (@ 20 °C)                      | 7.35 mPa·s   | 7.35 cps    |
| Boiling Point (@ 760mmHg, 101 kPa)       | 174 °C   | 345 °F      |
| Heat of Vaporization (@ b.p.)            | 384 J/g  | 91.8 cal/g  |
| Freezing Point                           | < -50 °C   |             |
| Flash Point (Tag's CC)                   | 68 °C  | 154 °F      |
| Log Pow (@ 25 °C)                        | 0.18   |             |
| Solubility in Water                      | INFINITE   |             |
| Solubility Parameter                     | 9.88 (cal/cm <sup>3</sup> ) <sup>1/2</sup>               |             |
| Hansen Solubility Parameter              |  |             |
| Dispersion                               | 15.1 (MPa) <sup>1/2</sup>                                |             |
| Polar                                    | 4.7 (MPa) <sup>1/2</sup>                                 |             |
| Hydrogen Bonding                         | 12.6 (MPa) <sup>1/2</sup>                                |             |
| Total                                    | 20.2 (MPa) <sup>1/2</sup>                                |             |
| Specific Electric Conductivity (@ 20 °C) | 8.6 x 10 <sup>-10</sup> Ω <sup>-1</sup> cm <sup>-1</sup> |             |
| Vapor Density (air= 1)                   | 4.1  |             |
| Refractive Index (@ 20 °C)               | 1.4275   |             |
| Expansion Coefficient                    | 0.00079/deg  |             |
| Surface Tension (@ 20 °C)                | 29.9 mN/m  | 29.9 dyn/cm |
| Vapor Pressure (@ 20 °C)                 | 0.07 kPa   | 0.5 mmHg    |
| Evaporation Rate (n-BuAc= 100)           | 7  |             |
| Explosion Range                          | 1.2 – 13.1 vol %   |             |
| Ignition Point                           | 395 °C   | 743 °F      |
| Dilution Ratio                           |  |             |
| a) Toluene (NC, 1/2 sec)                 | 4.7  |             |
| b) Toluene (Epoxy resin)                 | 4.5  |             |
| c) Xylene (NC, 1/2 sec)                  | 4.3  |             |

### Effect on Plastics

| Plastics                    | Volume % vs Initial * |
|-----------------------------|-----------------------|
| Rigid PVC                   | 8                     |
| Soft PVC                    | 9                     |
| Polyethylene (Low Density)  | 0                     |
| Polyethylene (High Density) | 0                     |
| Polypropylene               | 0                     |
| Polystyrene                 | 19                    |
| Polycarbonate               | 0                     |
| Polyacetal                  | 0                     |
| PET                         | 0                     |
| PBT                         | 0                     |
| Polyphenylene Sulfide       | 0                     |
| 6-Nylon                     | 0                     |
| 6,6-Nylon                   | 0                     |
| Teflon®                     | 0                     |
| Epoxy Glass                 | 0                     |
| Acrylic Resin               | Partially Dissolved   |
| Phenol Resin                | 0                     |
| ABS                         | 63                    |

### Effect on Elastomers

| Elastomers                | Volume % vs Initial * |
|---------------------------|-----------------------|
| Fluoro Rubber Viton®      | 82                    |
| Chloroprene Rubber        | 64                    |
| Butyl Rubber              | 0                     |
| Nitrile Rubber            | 115                   |
| Silicone Rubber           | 6                     |
| Ethylene Propylene Rubber | 7                     |
| Natural Rubber            | 17                    |
| Urethane Rubber           | 129                   |
| SBR                       | 26                    |

\* Volume increase % of test specimen (50x20x2 mm) after soaked in MMB at 50 °C for 7 days.