

# Multan Cutting Fluids

| Core Range Watermiscible Cutting Fluids                 | Applications  | Machinable Metals  | Machining Operations   | Operating Concentration %          | Top-up Concentration %           | pH-Value 5% Emulsion | Corrosion Protection DIN 51360-2 (Note 0) | Mineraloil Content in % | Boron Concentration % | EP-Additives | Refractometer Factor | Emulsion Appearance    |
|---|---|--|--|------------------------------------|----------------------------------|----------------------|---|-------------------------|-----------------------|--------------|----------------------|------------------------|
| Multan 97-10 D / 97-10                                  | For machining all aluminium alloys, can also be used in universal applications for machining steel and cast iron. Should not be used in water above 5% deg. German hardness. Multan 97-10 is recommended for use with DI or soft water (below 5 deg. German Hardness)   | All aluminium alloys, Non-ferrous metals, high alloy steel, constructional and HS-Steel, cast iron                             | Reaming, tapping, thread-milling, milling, turning, drilling, forming, circular and plain grinding | 5 - 8                              | 0.5 - 1.5                        | 9,2                  | 4,0%                                      |                         | 0,0%                  | -            | 1,10                 | milky                  |
| Multan 71-10  | For machining and grinding of cast iron, steel and machining but also suitable for lighter aluminium alloy machining operations.  | High alloy steel, constructional and HS-Steel, cast iron, and aluminium alloys   | drilling, turning, sawing, milling, threading, grinding, tube welding                              | 5 - 8                              | 1 - 3                            | 9,3                  | 3,5%                                      |                         | < 5%                  | -            | 1,37                 | semi-transparent       |
| Multan 77-70  | For high performance machining operations especially for high alloy steel (i.e. stainless steel)  | Especially high alloy steel (e.g. stainless steel)   | Broaching, deep-hole drilling, tapping, thread-milling, turning, metal deformation                 | 5 - 8                              | 2 - 4                            | 9,2                  | 5,0%                                      |                         | > 5%                  | S, P         | 1,03                 | opaque yellowish brown |
| Multan 21-60  | For general machining of aluminium alloys, non-ferrous metals, steel and cast iron. Also for applications and customers requiring a boron-free / amine-free coolant   | Aluminium alloys, non-ferrous metals, high alloy steel, construct. and HS-steel, cast iron                                     | Reaming, tapping, thread-milling, turning, drilling, milling, forming circular and plain grinding  | 5 - 10                             | 3 - 5                            | 9,2                  | 5,0%                                      |                         | 0,0%                  | -            | 0,96                 | milky                  |
| Multan 46-81  | A fully synthetic product specially developed for general grinding of cast iron and steel for applications not requiring an EP-Additive. Triethanolamine content below 30%.   | Cast iron, high alloy steel, constructional and HS-Steel, non-ferrous metal, aluminium   | Diskus, roll-grinding, flat, centerless  | 3 - 5                              | 1 - 2                            | 9,3                  | 3,0%                                      | 0,0%                    | > 5%                  | -            | 1,40                 | colourless solution    |
| <b>Special Products Watermiscible</b>                   |   |  |  |                                    |                                  |                      |   |                         |                       |              |                      |                        |
| <b>1. Fully Synthetic Products without EP Additives</b> |   |  |  |                                    |                                  |                      |   |                         |                       |              |                      |                        |
| Multan 49-2 DF  | For Tungsten Carbide grinding   | tungsten carbide, steel, cast iron, yellow metals  | surface and tool grinding  | 3 - 5                              | 2 - 3                            | 9,2                  | 2,5%                                      | 0,0%                    |                       |              | 1,20                 | clear yellow solution  |
| Multan 45-11  | Grinding, Caterpillar Approval. Leaves absolutely no sticky deposits in Caterpillar test  | steel and cast iron  | grinding systems, particularly those which are foam sensitive or tend to produce sticky deposits   | 3 - 5                              | 2 - 3                            | 9,3                  | 3,0%                                      | 0,0%                    |                       |              | 1,70                 | clear green solution   |
| <b>2. Special Products</b>                              |   |  |  |                                    |                                  |                      |   |                         |                       |              |                      |                        |
| <b>Tube Welding</b>                                     |   |  |  |                                    |                                  |                      |   |                         |                       |              |                      |                        |
| Multan 61-5   | Fully synthetic product with EP properties. Tube Welding (s. extra presentation - Tube Welding) Multan 71-10 + Multan 70-40 can also be used for certain tube-welding operations  |  |  |                                    |                                  |                      |   |                         |                       |              |                      |                        |
| <b>Aluminium Wheel Manufacturing</b>                    |   |  |  |                                    |                                  |                      |   |                         |                       |              |                      |                        |
| Multan 97-10D / 97-10                                   | see Core Range  |  |  |                                    |                                  |                      |   |                         |                       |              |                      |                        |
| <b>Steel Wheel Manufacturing</b>                        |   |  |  |                                    |                                  |                      |   |                         |                       |              |                      |                        |
| Multan MKW  | Fully synthetic product with EP properties. Steel wheel manufacturing (from steel coils)  | steel, cast iron and aluminium   | forming and cutting, especially of steel and aluminium coil in the car and truck wheel production  | 3 - 10                             | 2 - 7                            | 9,3                  | 3,0%                                      | 0,0%                    |                       |              | 1,05                 | opaque yellowish brown |
| Multan 81-4B  | Mineraloil-free product Ester-based. High performance steel wheel (from steel coil) and aluminium wheel (from aluminium coil)   | steel, cast iron and aluminium   | forming and cutting, especially of steel and aluminium coil in the car and truck wheel production  | 3 - 10                             | 2 - 8                            | 9,3                  | 3,0%                                      | 0,0%                    |                       |              | 1,10                 | opaque yellowish brown |
| Multan 69-3   | Steel wheel manufacturing   | steel  | car and truck wheel production   | 3 - 10                             | 2 - 8                            | 9,2                  | 3,0%                                      |                         |                       |              | 1,05                 | white opaque emulsion  |
| Multan 81-3   | Truck Steel wheel manufacturing   | steel  | truck wheel production   | 3 - 10                             | 2 - 8                            | 9,3                  |   |                         |                       |              |                      |                        |
| <b>Special Applications</b>                             |   |  |  |                                    |                                  |                      |   |                         |                       |              |                      |                        |
| Multan 61-2 DF  | Fully synthetic product with EP properties. For production of balls for ball-bearings   | steel and cast iron  | drilling, turning, sawing, threading, milling, grinding  | 3 - 5                              | 2 - 4                            | 9,3                  | 3,0%                                      | 0,0%                    |                       |              | 1,60                 | clear solution         |
| Multan 61-3 DF  | Fully synthetic product with EP properties. For heavy machining of aluminium alloys   | steel, cast iron and aluminium   | drilling, turning, sawing, threading, milling, grinding  | 3 - 5                              | 2 - 4                            | 9,2                  | 3,5%                                      | 0,0%                    | > 5%                  |              | 1,70                 | semi-transparent       |
| Multan 70-3   | General machining of steel and cast iron. Biocide-free. No labelling requirements   | High alloy steel, constructional and HS-Steel, cast iron, and lighter aluminium alloys   | drilling, turning, sawing, milling, threading, grinding, tube welding                              | 3 - 8                              | 2 - 7                            | 9,2                  | 3,0%                                      |                         | > 5%                  | -            | 1,10                 | white opaque           |
| Multan 70-40  | General machining of steel and cast iron. Contains biocide.   | High alloy steel, constructional and HS-Steel, cast iron, and lighter aluminium alloys   | drilling, turning, sawing, milling, threading, grinding, tube welding                              | 3 - 8                              | 2 - 7                            | 9,3                  | 3,0%                                      |                         | > 5%                  | -            | 1,10                 | semi-transparent       |
| Multan 80-1   | For centerless-grinding especially in soft water  | steel and cast iron  | grinding, turning, drilling, sawing. Foam-free in de-ionised water                                 | 3 - 6                              | 2 - 4                            | 9,2                  | 3,0%                                      |                         |                       | -            | 1,25                 | semi-transparent       |
| Multan 86-70  | For machining very sensitiv yellow metals (copper and brass and their alloys)   | copper brass and their alloys  | general machining  | 3 - 5                              | 2 - 4                            | 9,2                  | 3,0%                                      |                         |                       |              |                      |                        |
| <b>Non-watermiscible Natural Ester Based Products</b>   |   |  |  |                                    |                                  |                      |   |                         |                       |              |                      |                        |
|   | <b>Product Description</b>  | <b>Applications</b>  | <b>Specific Gravity/20 deg.C (DIN 51757)</b>   | <b>Visc./40 deg. c (DIN 53015)</b> | <b>Flashpoint (DIN ISO 2592)</b> |                      |   |                         |                       |              |                      |                        |
| Multan 201  | Medium viscosity mineral-free multipurpose cutting oil and forming lubricant based on natural vegetable oils. Contains no chlorine or phosphorous additives. Recommended as EP-Additive at a concentration of 1-3% in a watersoluble cutting fluid emulsion (HD - High Demand System) to increase lubricity and cutting performance | Recommended for a wide range of metals and machining operations  | 0,89 +/- 0,1 g/cm <sub>3</sub>   | 18 +/- 2 mm <sub>2</sub> / sec     | 230 deg. C                       |                      |   |                         |                       |              |                      |                        |
| Multan 210  | Low viscosity Cutting and Grinding Oil based on natural vegetable oils. Mineraloil-free. Free of chlorine, sulphur and phosphorous additives  | Recommended for a wide range of metals for grinding, honing and fine machining operations, including tungsten carbide grinding | 0,87 +/- 0,1 g/cm <sub>3</sub>   | 12 +/- 2 mm <sub>2</sub> / sec     | > 200 deg. C                     |                      |   |                         |                       |              |                      |                        |
| Multan 225-1  | Medium Viscosity Cutting Oil based on natural vegetable oils. Mineraloil-free. Contains chlorine-free EP-Additives  | Recommended for a wide range of metals and machining operations  | 0,91 +/- 0,1 g/cm <sub>3</sub>   | 14 +/- 2 mm <sub>2</sub> / sec     | 210 deg. C                       |                      |   |                         |                       |              |                      |                        |
| Multan 233-1  | High Viscosity Cutting and Forming Oil based on natural vegetable oils. Mineraloil-free. Contains chlorine-free sulphurised EP-Additives  | Multipurpose. Recommended for a wide range of metals and machining operations  | 0,93 +/- 0,1 g/cm <sub>3</sub>   | 165 +/- 20 mm <sub>2</sub> / sec   | > 230 deg. C                     |                      |   |                         |                       |              |                      |                        |
| <b>Service Additives</b>                                |   |  |  |                                    |                                  |                      |   |                         |                       |              |                      |                        |
|   | <b>Product Description and Applications</b>   |  |  |                                    |                                  |                      |   |                         |                       |              |                      |                        |
| Multan S  | System cleaner for cleaning and desinfecting used coolant systems before emptying and refilling. Recommended concentration ca. 1%. Only suitable for emulsion systems. <b>Not suitable</b> for systems to be filled with synthetic coolants of the Multan 4- or 6- Series   |  |  |                                    |                                  |                      |   |                         |                       |              |                      |                        |
| Multan D  | Biocide based on Cathone for desinfecting watermiscible coolant systems   |  |  |                                    |                                  |                      |   |                         |                       |              |                      |                        |
| Multan D2   | Biocide based on Formaldehyde release additives   |  |  |                                    |                                  |                      |   |                         |                       |              |                      |                        |
| Multan K  | Hydroxide solution used for increasing the pH-Value of Multan 97-10 D / Multan 97-10  |  |  |                                    |                                  |                      |   |                         |                       |              |                      |                        |
| Multan A5   | Corrosion inhibitor for Yellow metals (based on Benzotriazole)  |  |  |                                    |                                  |                      |   |                         |                       |              |                      |                        |
| Multan A9   | Monoethanolamine based to increase the pH-value of an emulsion  |  |  |                                    |                                  |                      |   |                         |                       |              |                      |                        |
| Multan AS   | Antifoaming agent (contains no silicone oil)  |  |  |                                    |                                  |                      |   |                         |                       |              |                      |                        |
| Multan F  | Fungicide based on Iodine Carbamate   |  |  |                                    |                                  |                      |   |                         |                       |              |                      |                        |



## MULTAN® Cutting Fluids



## MULTAN® Product Summary

The information presented herein correspond to our interpretation of certain test results and field experience to date. This information is not to be taken as warranty or representation for which we assume legal responsibility. It is offered solely for your consideration, investigation and verification.

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