MRF-140BC Magneto-Rheological Fluid

Description
LORD MRF-140BC fluid is a hydrocarbon-based magneto-rheological (MR) fluid formulated for general use in controllable, energy-dissipating applications such as brakes, clutches and rotary knobs.

MRF-140BC fluid is a suspension of micron-sized, magnetizable particles in a carrier fluid. When exposed to a magnetic field, the rheology of MRF-140BC fluid reversibly and instantaneously changes from a free-flowing liquid to a semi-solid with controllable yield strength. Altering the strength of the applied magnetic field precisely and proportionally controls the consistency or yield strength of the fluid.

MRF-140BC fluid can be used in valve mode (fluid flowing through an orifice) or in shear mode (fluid shearing between two surfaces), but is typically better suited for shear mode. In the absence of a magnetic field, MRF-140BC fluid flows freely. Upon application of a magnetic field, the fluid’s particles align with the direction of the field in chain-like fashion, thereby restricting the fluid’s movement within the gap in proportion to the strength of the magnetic field.

Features and Benefits

Fast Response Time – responds instantly and reversibly to changes in a magnetic field.

Dynamic Yield Strength – provides high yield strength in the presence of a magnetic field and very low yield strength in the absence of a magnetic field; allows for a wide range of controllability.

Temperature Resistant – performs consistently throughout a broad temperature range.

Non-Abrasive – formulated to not abrade the devices in which the MR fluid is used.

Application

Mixing – Under common flow conditions, no separation is observed between particles and the carrier fluid. However, a degree of separation may eventually occur under static conditions. If needed, use a paint shaker to redisperse the particles into a homogeneous state prior to use.

Storage
Keep container tightly closed when not in use.

Typical Properties*

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Appearance</td>
<td>Dark Gray Liquid</td>
</tr>
<tr>
<td>Viscosity, Pa-s @ 40°C (104°F)</td>
<td>0.1140 ± 0.040</td>
</tr>
<tr>
<td>Density</td>
<td>3.75 - 3.95</td>
</tr>
<tr>
<td></td>
<td>(31.30 - 32.96)</td>
</tr>
<tr>
<td>Solids Content by Weight, %</td>
<td>86</td>
</tr>
<tr>
<td>Flash Point, °C (°F)</td>
<td>&gt;150 (&gt;302)</td>
</tr>
<tr>
<td>Operating Temperature, °C (°F)</td>
<td>-40 to +130 (-40 to +266)</td>
</tr>
</tbody>
</table>

*Data is typical and not to be used for specification purposes.
Cautionary Information

Before using this or any LORD product, refer to the Safety Data Sheet (SDS) and label for safe use and handling instructions.

*For industrial/commercial use only.* Must be applied by trained personnel only. Not to be used in household applications. Not for consumer use.

Shear Stress as a function of Shear Rate with no Magnetic Field applied at 40°C (104°F)

Yield Stress vs. Magnetic Field Strength

Values stated in this technical data sheet represent typical values as not all tests are run on each lot of material produced. For formalized product specifications for specific product end uses, contact the Customer Support Center.

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