**Castrol Braycote® Micronic 600 EF**
Grease, Rocket Propellant Cooler
Low Temperature

**Description**
Castrol Braycote Micronic 600 EF is a smooth, buttery, translucent off-white colored, NLGI #2 grease. This product uses Castrol Brayco 815Z as the base fluid and a tetrafluoroethylene telomer as the gelling agent. This grease is nonflammable, chemically inert, and thermally stable and does not use any chlorofluorocarbons (CFCs) during product manufacture. It has exceptionally low volatility and has little tendency to form deposits. It has excellent lubricating properties, good sheer stability, and low acute toxicity. Castrol Fluoroclean™ X100 or Castrol Fluoroclean™ HE can be used to remove this lubricant. Refer to the data sheets for information regarding these products.

**Application**
Braycote Micronic 600 EF is designed to operate in the presence of fuels, oxidizers, and in applications of deep space vacuum. It is used in gears, ball and roller bearings, electrical contacts, and "O" rings. This grease is highly recommended for applications where temperature extremes and/or low vacuums are routine, such as cryogenic coolers, FLIR, laser optical systems, or hostile chemical environments. Perfluorinated greases, such as this product, exhibit excellent shelf life due to their intrinsic inertness.

**Characteristics**

<table>
<thead>
<tr>
<th>TEST METHOD</th>
<th>DESCRIPTION</th>
<th>RESULT</th>
</tr>
</thead>
<tbody>
<tr>
<td>D 1403</td>
<td>Penetration @ 25°C (77°F), mm’</td>
<td>284</td>
</tr>
<tr>
<td></td>
<td>Unworked</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Worked, 60 strokes</td>
<td>286</td>
</tr>
<tr>
<td>FTM 321</td>
<td>Oil Separation, 30 hrs, 204°C (400°F), % wt</td>
<td>12.14</td>
</tr>
<tr>
<td></td>
<td>Evaporation Loss, % wt</td>
<td>0.18</td>
</tr>
<tr>
<td>FTM 5309</td>
<td>Copper Strip Corrosion</td>
<td>1b</td>
</tr>
<tr>
<td></td>
<td>24 hrs, 100°C (212°F)</td>
<td></td>
</tr>
<tr>
<td>D 2265</td>
<td>Dropping Point, °F (°C)</td>
<td>214 (417)</td>
</tr>
</tbody>
</table>
Four-Ball Wear-Test, AWSD, mm
1200 rpm, 40 kgf, 1 hr, 75°C (167°F)  
1200 rpm, 40 kgf, 1 hr, 204°C (400°F)  

Four-Ball Extreme-Pressure Weld, kgf 700+

Vacuum Stability Test
24 hrs, 125°C (257°F), 10⁻⁴, torr 0.20
Total Weight Loss (TWL), % wt 0.03
Volatile Condensable Material (VCM), % wt

Low-Temperature Torque, g.cm
-62°C (-80°F)  
Starting 585
Running, 1 hr 228
-73°C (-100°F)  
Starting 1430
Running, 1 hr 637

LOX Impact Sensitivity
100 mm, 20 drops Pass

Particulate Contamination Level
25-74 Microns 286
75 or larger None

Outgassing test total mass loss, 48 hours
150°C, ~10⁻⁶ torr, % wt. 0.04

Extrapolated Vapor Pressure, torr
Derived from ASTM vapor pressure versus temperature plot.
Refer to the attached plot. Samples preconditioned at 150°C

for 48 hours.
@ 60°C (140°F) 7 x 10⁻¹²
@ 100°C (212°F) 6 x 10⁻⁴
@ 150°C (302°F) 4 x 10⁻⁴

Pounds per gallon @ 16°C (60°F) 15.70
Grams per milliliter @ 16°C (60°F) 1.88

Base Oil Characteristics

Specific Gravity @ 16/16°C (60/60°F) 1.8531
Pounds per Gallon @ 16°C (60°F) 15.430

Kinematic Viscosity, cSt
99°C (210°F) 45
38°C (100°F) 148
-54°C (-65°F) 10,855

Viscosity Index 350

Pour Point, °C (°F) -72 (-100)

Vapor Pressure, torr
20°C (68°F) 4 x 10⁻¹³
100°C (212°F) 2 x 10⁻⁶
200°C (392°F) 2 x 10⁻⁶

Health, safety and environmental information are provided for this product in the Materials Safety Data Sheet. This gives details of potential hazards, precautions and First Aid measures, together with environmental effects and disposal of used products. Castrol will not accept liability if the product is used other than in the manner or with the precautions or for the purpose(s) specified. Before using the product other than directed, please contact Castrol for consultation.

Additional Information

Temperature Range

-80°C to 204°C (-112°F to 400°F)
Limitations
Braycote Micronic 600 EF is compatible with most commonly utilized materials, plastics and elastomers. It may be adversely affected by Lewis Acid Catalysts such as aluminum chloride at elevated temperatures. Newly exposed rubbing surfaces of aluminum, magnesium or titanium alloys may react with this product under certain conditions. Such systems should be thoroughly evaluated. Surfaces must be well cleaned of organic rust inhibitors prior to grease application to insure proper lubrication. This product is not recommended for use in applications under high vacuum with loads exceeding 100,000 psi for extended periods of time.

Packaging
Braycote Micronic 600 EF is packaged in 2 oz (AVDP) disposable polypropylene syringes and 1 pound jars.

Castrol Braycote Micronic 600EF
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