Product Data

# Braycote Micronic 1613

Perfluoroether, Sub-Micronic Grease

## Description

Castrol Braycote™ Micronic 1613 is a smooth, off-white colored NLGI 2 grease. It uses Castrol Brayco 815Z as the base fluid and is thickened with a special tetrafluoroethylene gelling agent with an average particle size of <0.8 microns. This grease is nonflammable and is chemically inert. It offers excellent lubricity, thermal stability, low volatility, good shear stability and low acute toxicity. Castrol Fluoroclean™ X100 and Castrol Fluoroclean™ HE can be used to remove this lubricant. Refer to the data sheets for information regarding these products.

## Application

Castrol Braycote Micronic 1613 is designed to lubricate gyros, gears, ball and roller bearings, in the presence of fuels, oxidizers and deep space vacuums and for use as an assembly lubricant for O-rings and elastomers. This product is recommended for use in applications where temperature extremes and high vacuums are routine. Perfluorinated greases, in general, exhibit excellent shelf lives due to their intrinsic inertness.

Temperature Range: -72ºC to 204ºC (-100ºF to 400ºF)

## Conditions of Use

**Limitations**

Castrol Braycote® Micronic 1613 is compatible with all commonly utilized metals, plastics and elastomers. Castrol Braycote® Micronic 1613 may be adversely affected by Lewis Acids, such as aluminum chloride, at elevated temperatures. Newly exposed rubbing surfaces of aluminum, titanium or magnesium under certain conditions may react with Castrol Braycote® Micronic 1613. 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.

## Typical Characteristics

| Name | Method | Units | Braycote Micronic 1613 |
|---|---|---|---|
| Unworked Penetration | ISO 2137 / IP 50 | 0.1 mm | 281 |
| Worked Penetration (60 strokes @ 25°C / 77°F) | ISO 2137 / ASTM D217 | 0.1 mm | 282 |
| Oil Separation (30 hrs @ 204°C / 400°F) | ASTM D6184 / FTM 321.2 | % wt | 8.2 |
| Four Ball Wear test - Wear Scar Diameter (40 kgf / 75°C / 1200 rpm / 1 hr) | ISO 51350 / ASTM D2266 | mm | 1.1 |
| Four Ball Weld Load test - Weld Point | ISO 11008 / ASTM D2596 | kgf | 800 |
| Low temperature Torque - starting torque | ASTM D1478 | N/m | 0.289 |
| Low temperature Torque - torque after 60 mins | ASTM D1478 | N/m | 0.181 |
| Low temperature Torque - torque after 10 mins | ASTM D1478 | N/m | 0.036 |
| Evaporation Loss (22hrs @ 204°C / 400°F) | ASTM D2595 | % wt | 0.18 |
| Density of finished grease @ 16°C / 60.8°F | In-house test | lb/ml | 1.93 |
| Density of finished grease @ 16°C / 60.8°F | In-house test | lb/gallon | 16.09 |
| Outgassing Performance - Total Mass Loss under vacuum (48 hrs @ 150°C / 302°F) | ASTM E597-07 | % wt | 0.3 |
| Outgassing Performance - Vapour Pressure @ 60°C / 140°F | ASTM E1559 | Torr | $7x10^{-12}$ |
| Outgassing Performance - Vapour Pressure @ 100°C / 212°F | ASTM E1559 | Torr | $2.5x10^{-10}$ |
| Outgassing Performance - Vapour Pressure @ 150°C / 302°F | ASTM E1559 | Torr | $7x10^{-9}$ |
| Vacuum Stability | ASTM E595 / NASA SP-R-0022A | Total WeightLoss (% wt) / Volatiles (%wt) | 0.2/0.03 |
| Specific Gravity @ 15°C / 59°F | ASTM D287 | - | 1.8531 |
| Base Oil Viscosity @ 99°C / 210°F | ISO 3104 / ASTM D445 | $mm^2/s$ | 45 |
| Base Oil Viscosity @ 38°C / 100°F | ISO 3104 / ASTM D445 | $mm^2/s$ | 148 |
| Base Oil Viscosity @ -54°C / -65°F | ISO 3104 / ASTM D445 | $mm^2/s$ | 10,855 |
| Viscosity Index | ISO 2909 / ASTM D2270 | - | 350 |
| Pour Point | ISO 3016 / ASTM D97 | °C/°F | -72 / -100 |
| Knudsen Vapour Pressure | - | Pa | 0.0000000000532 |
| Knudsen Vapour Pressure | - | Pa | 0.000000266 |
| Knudsen Vapour Pressure | - | Pa | 0.000266 |
| Base Oil Density @ 15°C / 59°F | ASTM D4052 /DIN 51757D | $kg/m^3$ | 1848.9 |


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