



SAPPHIRE® Endure



ISO 21469 Certified

High Performance Perfluoropolyether, Extreme Pressure (EP) Lubricating Grease

Applications

ROCOL SAPPHIRE® Endure is an NLGI No.2 perfluoropolyether (PFPE) based lubricant which lengthens relubrication periods dramatically due to its ability to resist degradation in hostile conditions.

SAPPHIRE Endure is designed for use on anti-friction and plain bearings, small gears, slides, pins, valves, plungers, threaded fasteners etc. particularly where a non-toxic, NSF H1 lubricant is required.

SAPPHIRE Endure has extreme resistance against aggressive chemicals and strong oxidising agents making it a natural choice for all types of industries including food, pharmaceutical and other clean industries.

Features and Benefits

- SAPPHIRE Endure has a wide temperature range from -25°C to +280°C.
- SAPPHIRE Endure has outstanding EP performance with a weld load of 620kg.
- SAPPHIRE Endure is a chemically inert, non-toxic lubricant with extremely high oxidation and thermal resistance.
- The product has an exceptionally long service life providing excellent cost effectiveness from extended lubrication intervals, reduced downtime and reduced labour costs.
- SAPPHIRE Endure is an effective anti-seize lubricant for chemically aggressive service and resists corrosion in extreme environments.
- SAPPHIRE Endure should have no detrimental effect on rubbers, plastics or metals.

Usage and Storage Guidance

- SAPPHIRE Endure can be applied manually or by other methods suitable for an NLGI 2 lubricant.
- SAPPHIRE Endure is compatible with other perfluoropolyether greases. For best results, remove previous lubricant prior to application.
- If previous lubricant was not PFPE-based, ensure that the components are fully cleaned with a suitable solvent, for example ROCOL Industrial Cleaner Rapid Drying Spray.
- For rolling element bearings, fill should be lower than for a hydrocarbon-based grease
- As an anti-seize and assembly lubricant, apply as a thin film to threads and bearing surfaces
- Storage must be between +1°C and +40°C.
- Shelf life is 5 years from date of manufacture.

Approvals and Certifications

- SAPPHIRE Endure does not contain: mineral hydrocarbons, animal derived materials, nut oils or genetically modified ingredients.
- FDA Group 21 CFR 178.3570
- NSF H1 registered - 123718
- ISO 21469 certified
- WRAS - 240855032

Pack Sizes

Part Code	Pack Size
12330	100 g
12331	700 g
12334	1 kg
12336	5 kg
12337	18 kg
12338	50 kg

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Registered Company No: 00559693
Registered Office: Saxon House, 2-4 Victoria Street, Windsor, England, SL4 1EN





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Parameter	Test Method	Value
Appearance	Visual	Smooth white lubricant
NLGI Number	IP50 - ASTM D217	2
Base Type	N/A	Perfluoropolyether
Base Fluid Viscosity at 20°C	IP71 - ASTM D445	1525 cSt
Base Fluid Viscosity at 40°C	IP71 - ASTM D445	420 cSt
Base Fluid Viscosity at 100°C	IP71 - ASTM D445	40 cSt
Thickener	N/A	PTFE
Temperature Range	N/A	-25°C to +280°C
4-Ball Weld Load	IP239 - ASTM D2596	620 kg
4-Ball Wear Load Index	IP239 - ASTM D2596	106 kg
Oil Separation (30 hours & 204°C)	IP121	13%
Specific Gravity	N/A	1.9
Solvent Resistance	N/A	Most solvents
Chemical Resistance	N/A	Most acids
Soluble in:	N/A	Fluorinated solvents

Safety Datasheets

These are available at <https://www.rocol.com/datasheets>. For further assistance, please contact us via the ROCOL website or using the details below.

Note

The information in this Technical Datasheet is informed by our experience and feedback from industry. There are many variables outside our control or knowledge which affect the use and performance of our products, for which reason it is given without responsibility. Values quoted are typical and do not constitute a specification.

If you'd like to discuss the suitability of any ROCOL solution for your system, please get in touch.

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Torque Setting for Threaded Fasteners

When a thread compound is applied to a fastener that will be torque tightened, the torque setting will require adjustment to achieve the correct tension in the fastener. Correct torque settings can be calculated using the methods below.

The following parameters were derived from the tension-torsion relationship measured on M12 x 50mm setscrews with 1.75mm thread pitch, full nut and Form A washers. Fasteners were degreased and a thin layer of thread compound applied to threads, nut face and washers. Data are for fasteners at 75% rated yield stress:

Fastener Material	Coefficient of Friction (μ)	K-Factor
8.8 Steel Plain Finish	0.135	0.18
A2-70 Stainless Steel	0.157	0.20
A4-80 Stainless Steel (70% Yield Stress)	0.191	0.24

$$T = F \times \left[(0.159 \times P) + (0.577 \times d \times \mu) + (D_f \times \frac{\mu}{2}) \right]$$

T = Torque Applied (Nm)
F = Tension Generated in Fastener (N)
P = Thread Pitch (m)
d = Pitch Diameter (m)
D_f = Nut Friction Diameter (m)
 μ = Coefficient of Friction

$$T = K \times F \times D$$

T = Torque Applied (Nm)
F = Tension Generated in Fastener (N)
D = Nut Nominal Bolt Diameter (m)
K = K-Factor

Many parameters affect the tension-torsion relationship of fasteners, including: Bolt geometry, surface finish, lubricant application method, joint material, torque application method, variation in fastener manufacture etc. Therefore, these parameters above are for guidance only, especially if a different material is used or if geometry is significantly different to M12. Any calculated values are a predictive tool and the final tension should be verified, especially in critical applications. These values do not constitute a specification.

For further guidance, please speak to your usual ROCOL contact or technical.lubricants@rocol.com.

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