



## Tribol™GR SW 460-1

High Performance Grease for Wind Turbines

### Description

Castrol Tribol™ GR SW 460-1 is a lithium complex based grease containing a synthetic base fluid working in combination with Castrol's unique **MicroFlux Trans – Plastic Deformation (MFT-PD)** additive technology. The waxfree nature of the synthetic base oil and the low coefficient of friction provide excellent low temperature pumpability as well as very low starting and running torque. It can also offer the potential for energy savings and can reduce operating temperatures in the load zone of rolling and sliding element bearings. The lithium complex thickener gives excellent adhesion, structural stability, sealing effects and water resistance. Primarily intended for a wide variety of applications at extremes of temperature, the grease also has a high level of chemical stability and provides excellent protection against wear, rust and corrosion.

The MFT -PD additive technology provides unsurpassed wear protection and an extremely low coefficient of friction even under extremes of pressure, vibration, shock loads, at high or low speeds. Under severe load, components of the MFT-PD additive combination are activated, initiating an improvement of surface friction characteristics through plastic deformation. Unlike the case with conventional lubricants, the layer formed by MFT-PD provides excellent lubricity and adhesion. The load carrying area is improved and a hydrodynamic lubrication film is easier to maintain. This unique physio-chemical reaction achieves a non-sacrificial micro-smoothing of the friction surfaces.

### Application

Tribol GR SW 460-1 is recommended for tough industrial applications especially as encountered in Wind Turbine Main Bearings, Pitch and Yaw Bearings It gives outstanding bearing protection under high loads at low to moderate speeds and in applications where water resistance is critical.

A very important feature is to help to reduce wear from static vibration known as false brinelling and from sliding motion due to axial thrust. These are the most prominent failure modes in Wind Turbine main bearings.

Tribol GR SW 460-1 is certified against NLGI High Performance Multiuse grease specification with enhanced Corrosion Resistance, High Load Carrying Capacity and Low Temperature Performance (HPM + CR + HL + LT)

### Advantages

- Reduced downtime and maintenance costs because of reduced wear, rust and corrosion.
- Reduced bearing failures on account of better wear control from axial thrust.
- Reduced pitting risk due to low coefficient of friction
- Reduced wear from static vibration (false brinelling)
- Outstanding high and low temperature performance.
- Extended service life with longer intervals between re-lubrication.
- Reduced energy consumption due to low friction coefficient.

# Typical Characteristics

Name	Method	Units	Tribol GR SW 460-1
Color	Visual	-	Yellow
Appearance	Visual	-	Homogeneous
Thickner Type	-	-	Lithium Complex
Base Oil Type	-	-	Synthetic
Consistency	ISO 2137/ ASTM D217	NLGI Grade	1
Base Oil Viscosity @ 40 °C/104 °F	ISO 3104/ ASTM D445	mm <sup>2</sup> /s	460
Base Oil Viscosity @ 100 °C/212 °F	ISO 3104/ ASTM D445	mm <sup>2</sup> /s	53
Worked Penetration, 60 strokes @ 25°C/77°F	ASTM D217	0.1 mm	310-340
Worked Penetration (100,000 strokes @ 25°C / 77°F) - change from 60 strokes	ASTM D217	0.1 mm	< 30
Dropping Point	ISO 2176/ASTM D2265	°C/°F	>250/>482
Roll Stability (50 h, 80 °C), units change	ASTM D1831	0.1 mm	+40
Four Ball Wear test - Wear Scar Diameter (40 kgf/75 °C, 60 minutes)	ASTM D2266	mm	0.4
Four Ball Weld Load test - Weld Point	ASTM D2596	kgf	500
Rust Test - EMCOR (1% NaCl solution)	ISO 11007 modified	Rating	≤0/1
Flow Pressure -40 °C	DIN 51805	hPa	500
Oil Separation (168h @40°C)	DIN 51817	% wt	max 8
Oil Separation (24 h, RT)	ASTM D1742	% wt loss	≤ 3
Water Wash-out (1 hr/79°C)	ASTM D1264	% wt loss	5
Copper Corrosion (24 h, 120 °C)	ASTM D 4048	Rating	1b
Low Temperature Starting Torque @ -40 °C	ASTM D1478	Nm	0.3
Low Temperature Running Torque @ -40 °C	ASTM D1478	Nm	0.07
Fretting wear resistance (SRV) (100 N/50 °C/0.3 mm/ 50 Hz/4 h, ball scar diameter)	ASTM D7594	mm	0.33
FFq Test (B/1500/6000-140)	DIN 51821	-	Pass, F50>200 h
FF8 Test (C/75/50-RT-500 h)	DIN 51819	MW50 mg	10

Tribol™ GR SW 460-1  
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This subject to usual manufacturing tolerances. Data provided is based on standard tests under laboratory conditions and is given as a guide only. Users are advised to ensure that they refer to the latest version of this data sheet. It is the responsibility of the user to evaluate and use products safely, to assess suitability for the intended application and to comply with all applicable laws and regulations. Material Safety Data Sheets are available for all our products and should be consulted for appropriate information regarding storage, safe handling, and disposal of the product. No responsibility is taken by either BP plc or its subsidiaries for any damage or injury resulting from abnormal use of the material, from any failure to adhere to recommendations, or from hazards inherent in the nature of the material. All products, services and information supplied are provided under our standard conditions of sale. You should consult our local representative if you require any further information.

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