



Optigear EP Range

High Performance Gear Range

Description

Castrol Optigear™ EP is formulated with Castrol's Microflux Trans Plastic Deformation (MFT-PD) additives and increased load carrying additives.

MFT-PD helps improve performance when operating temperature and loads reach a certain level of activation energy, by enabling the micro-smoothing of surface roughness without increasing wear. The smoothed surface delivers optimum wear protection and an extremely low coefficient of friction, especially in applications which experience extreme pressure, shock loads, vibrations or low speeds.

The increased load carrying additives are included in order to meet the FZG Gear Scuffing test (Included in API GL-5 designation).

Optigear EP exceeds the minimum requirements according to DIN 51517, part 3, CLP gear oils and also meets the FZG "Sprungtest" included in the GL5 specification.

Application

In Optigear EP the combination of MFT-PD low friction, gear oil-CLP and GL5 - FZG "Sprungtest" performance means this product range is particularly suited for applications where boundary and mixed film lubrication conditions occur. These are conditions are most likely found in gear boxes and bearings which have stop/start motion such as in Robots or Textile machines.

The combination of high performance in the GL5 - FZG "Sprungtest", FE8 bearing test, elastomer compatibility, low friction makes this range is unique in Industrial gears.

Advantages

- Very high load carrying capacity.
- Reduction of the coefficient of friction and temperature.
- Extended operating periods even under high loads and speed.
- Improvement of the surface quality and smoothing of existing surface damage.
- Reduced running-in period or even eliminated.
- Extended service life of gears.
- Reduced energy, maintenance and disposal costs.

Typical Characteristics

Name	Method	Units	EP 32	EP 46	EP 68	EP 100	EP 150	EP 220	EP 320	EP 460
Appearance	Visual	-	clear, yellow/ brown	clear, yellow/ brown	clear, yellow/ brown	clear, yellow/ brown	clear, yellow/ brown	clear, yellow/ brown	clear, yellow/ brown	clear, yellow/ brown
Density @ 15°C / 59°F	ISO 12185 / ASTM D4052	kg/m ³	873	880	885	892	896	900	905	908
Kinematic Viscosity @ 40°C / 104°F	ISO 3104 / ASTM D 445	mm ² /s	32	46	68	102	148	210	326	450
Kinematic Viscosity @ 100°C / 212°F	ISO 3104 / ASTM D 445	mm ² /s	5.3	6.8	8.9	11.4	14.5	18.3	24.4	30
Viscosity Index	ISO 2909 / ASTM D2270	-	100	103	102	97	95	95	95	94
Copper corrosion (3 hrs@100°C/212°F)	ISO 2160 / ASTM D130	Rating	1	1	1	1	1	1	1	1
Pour Point	ISO 3016 / ASTM D97	°C/°F	-33/-27	-30/-22	-27/-17	-24/-11	-24/-11	-15/5	-9/16	-9/16
Flash Point - open cup method	ISO 2592 / ASTM D92	°C/°F	210/ 410	220/ 428	240/ 464	240/ 464	240/ 464	250/ 482	240/ 464	240/ 464
Rust test - distilled water (24 hrs)	ISO 7120 / ASTM D665A	-	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass
Foam Sequence I - tendency / stability	ISO 6247 / ASTM D892	ml/ml	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0
Foam Sequence II - tendency / stability	ISO 6247 / ASTM D892	ml/ml	50/0	50/0	50/0	50/0	50/0	50/0	50/0	50/0
Water Separation @ 54°C / 129°F (40/37/3)	ISO 6614 / ASTM D1401	minutes	10	10	10	-	-	-	-	-
Water Separation @ 82°C / 180°F (40/37/3)	ISO 6614 / ASTM D1401	minutes	-	-	-	20	20	20	20	20
Aging behaviour (95°C/203°F) Viscosity Change (100°C/212°F) Precipitation	ISO 4263-4 / ASTM D2893	% ml	<3 none	<3 none	<3 none	<3 none	<3 none	<3 none	<3 none	<3 none
Elastomer compatibility SRE-NBR 28, 168 hours at 100°C/212°F.	ISO 1817	Δ% Vol ΔShore D	-3 to 0 9.5	-3 to 0 8.0	-3 to 0 6.0	-3 to 0 6.0	-3 to 0 7.0	-3 to 0 5.0	-3 to 0 4.0	-3 to 0 3.0
FZG Gear Scuffing test - A/8.3/90	ISO 14635-1	Failure Load Stage	> 12	> 12	> 12	> 14	> 14	> 14	> 14	> 14
FZG Gear Scuffing test - A/16.6/90	ISO 14635-1	Failure Load Stage	> 12	> 12	> 12	> 14	> 14	> 14	> 14	> 14
FZG Micropitting test @ 90°C/194°F	FVA 54-7	Failure Load Stage/ Micropitting Rating	-	-	-	-	-	> 10 / High	-	-

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FZG Gear Scuffing test - S-A10/16,6R/90 (API GL-5 Sprungtest)	FVA 243	Failure Load Stage	-	-	-	> 9	> 9	> 9	> 9	> 9
FE-8 Bearing Wear test (F.562831.01-7.5/80-80)	DIN 51819-3	Roller wear (Mw50)	-	-	-	25	-	10	-	-
Four Ball Test Weld Load Wear Scar (300N/1h) Wear Scar (1000N/1min)	DIN 51350-4 DIN 51350-5 DIN 51350-5	N mm mm	2400 0.48 0.6	2600 0.45 0.5	2800 0.38 0.5	3000 0.39 0.45	3200 0.39 0.7	3400 0.42 0.95	3200 0.42 0.8	3200 0.43 0.75
SRV Test - 5AE Coefficient of Friction Wear scar diameter	DIN 51834-2	- mm	0.112 0.54	- -	0.103 0.53	0.105 0.55	- -	0.103 0.55	- -	0.107 0.55
Brugger Wear Test	DIN 51347	N/mm ²	65	65	65	65	65	65	65	65

Subject to usual manufacturing tolerances.

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