



Product Data

## Optigear Synthetic PD...ES Range

High Performance Synthetic Gear Oil

### Description

Castrol Optigear® Synthetic PD...ES Range is based on synthetic hydrocarbons (PAO) with Castrol's advanced gear oil system which gives special plastic deformation (PD) and surface improvement performance. The additive package, when activated by high specific loads and corresponding temperatures, helps to equalize surface roughness without creating abrasion leading to the surface improvement (plastic deformation).

Optigear Synthetic PD...ES is a CLP-HC gear oil (according to DIN 51502) and exceeds the minimum requirements according to DIN 51517, part 3, CLP gear oils and is formulated with detergent type additives.

Optigear Synthetic PD 150 ES to PD 460 ES gear oils are approved by Flender (Flender gear units - Listing T 7300, Rev. 16, formerly Siemens Mechanical Drives).

### Application

Optigear Synthetic PD...ES may be used in spur gear, bevel gears or planetary gear units and in heavy loaded gear units. It is also suitable for the lubrication of oil-lubricated rolling bearings. It is especially designed to reduce friction losses and can reduce energy consumption compared to more conventional lubricants. The lower friction observed with Optigear Synthetic PD...ES means less stress in the contact point subsurface area, which means lower risk for pittings and micropittings.

Being synthetic based it will also withstand higher temperatures and provide extended life. Depending on the specific application, Optigear Synthetic PD...ES may be used in an operating temperature range from -40°C to +100°C, and upto +120°C for short periods. (Note the lower operating temperature is dependent on the pour point).

The beneficial effects of the special PD additives contained in Optigear Synthetic PD...ES will be reduced if mixed with other lubricants. If mixing with other oils cannot be avoided, contact our local technical support team for advice on compatibility (as a guide at least <5% of other oils is preferred). Optigear Synthetic PD...ES is compatible with most commonly used elastomer seal materials.

### Advantages

- High load carrying capacity
- Very low friction coefficient and frictional torque
- Superior micropitting protection
- Surface smoothing effect
- Excellent bearing lubrication suitability
- Good filtration properties
- Long life lubricant

## Typical Characteristics

Name	Method	Units	PD 220 ES
Appearance	Visual	-	Clear & Bright
ISO Viscosity Grade	-	-	220
Density @ 15°C / 59°F	ISO 12185 / ASTM D4052	kg/m³	853
Kinematic Viscosity @ 40°C / 104°F	ISO 3104 / ASTM D445	mm²/s	230
Kinematic Viscosity @ 100°C / 212°F	ISO 3104 / ASTM D445	mm²/s	30.2
Viscosity Index	ISO 2909 / ASTM D2270	-	172
Flash Point - open cup method	ISO 2592 / ASTM D92	°C °F	>250 >482
Copper corrosion (3 h @ 100°C/212°F)	ISO 2160 / ASTM D130	Rating	1
Rust test - synthetic seawater (24 h)	ISO 7120 / ASTM D665B	Rating	Pass
Foam, Sequences I/II/III tendency / stability	ISO 6247 / ASTM D892	ml/ml	0/0
Pour Point	ISO 3016 / ASTM D97	°C °F	-48 -54
Oxidation Stability (312 hrs @ 121°C)	ISO 4263-4 / ASTM D2893	Viscosity increase @ 100°C (%)	1.0
Elastomer Compatibility - with NBR 28, 168 hours @ 100°C	ISO 1817	-	Pass
FZG Gear Scuffing test A/8.3/90	ISO 14635-1	Failure Load Stage	>14
FZG Micropitting test @ 90°C/194°F	FVA 54-7	Failure Load Stage Micropitting Rating	>10* high*
FE8 Bearing Wear test (F.562831.01-7.5/80-80)	DIN 51819-3	Roller wear (Mw50), mg	<5*

Subject to usual manufacturing tolerances. \*Read across from lower viscosity.

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27 Aug 2020

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