Product Data

Performance™ Bio HE ESU Range

Biodegradable ester based hydraulic oil

Description

The Castrol Performance™ Bio HE ESU hydraulic oil range (previously called Carelube™ HES) are based on carefully selected synthetic esters, which are highly biodegradable and recommended for use in situations where leakage or spillage may present a risk of harm to the environment.

Application

Performance Bio HE ESU Range is used as a hydraulic oil for applications in environmentally sensitive areas such as; near or on waterways, and in the agriculture, forestry, mining and construction industries. The range may also be used for machine tool hydraulic systems where ester based soluble cutting fluids are being utilised and minimisation of impact of contamination is required. Performance Bio HE ESU Range is miscible with conventional mineral oil-based hydraulic fluids and products based on natural esters but, in order to maximise the performance benefits of these products - both physically and environmentally, either through draining or flushing to minimise residues of other lubricants is recommended. This range is fully compatible with the elastomer materials commonly used for static and dynamic seals, such as nitrile, silicone and fluorinated (e.g. Viton) polymers.
Performance Bio HE ESU Range is classified as follows: ISO 6743/4 - Hydraulic Oils Type HEES
Performance Bio HE ESU Range grades meet the requirements (for appropriate viscosity grade) of: ISO DIS 15380 VDMA 24568 Komatsu G3/G4

Advantages

- Inherently biodegradable so ideally suited for minimising the impact to the environment should leakage occur (note: local legislation/regulations regarding the clean up of oil leakage/spills should always be followed).
- Environmentally friendly with low aquatic toxicity – rated WGK 1.
- Very high viscosity index gives reliable operation and consistent response across wide temperature ranges.
- Maximum component protection at cold start-up and at elevated temperatures.
- Excellent anti-wear performance and lubricity maximises component life and ensures system reliability.
- Seal, diaphragm and hose material compatibility similar to that of mineral oil, allowing easy changeover without component modification.

Typical Characteristics

Name	Method	Units	HE 15 ESU	HE 32 ESU	HE 46 ESU
ISO Viscosity Grade	-	-	15	32	46
Density @ 20°C / 68°F	ISO 12185 / ASTM D4052	kg/m³	890	910	920
Kinematic Viscosity @ 40°C / 104°F	ISO 3104 / ASTM D445	mm²/s	15	32	46
Kinematic Viscosity @ 100°C / 212°F	ISO 3104 / ASTM D445	mm²/s	4.13	6.92	9.12
Viscosity Index	ISO 2909 / ASTM D2270	-	183	185	185
Flash Point - open cup method	ISO 2592 / ASTM D92	°C/°F	186/367	222/432	270/518
Pour Point	ISO 3016 / ASTM D97	°C/°F	-48/-54	-27/-17	-27/-17
Foam Sequence I - tendency / stability	ISO 6247 / ASTM D892	ml/ml	30/0	30/0	30/0
Water Separation @ 54°C / 129°F (40/ 37/3)	ISO 6614 / ASTM D1401	min	20	20	20
Copper corrosion (3 hrs@100°C/212°F)	ISO 2160 / ASTM D130	Rating	1a	1a	1a
Rust test - distilled water (24 hrs)	ISO 7120 / ASTM D665A	Rating	Pass	Pass	Pass
Rust test - synthetic seawater (24 hrs)	ISO 7120 / ASTM D665B	Rating	Pass	Pass	Pass
Air Release @ 50°C / 122°F	ISO 9120 / ASTM D3427	min	1	6	5
Four Ball Wear test - Wear Scar Diameter (30 kgf / 75°C / 1460 rpm / 1 hr)	ASTM D4172	mm	0.41	0.38	0.32
FZG Gear Scuffing test - A/8.3/90	ISO 14635-1	Failure Load Stage	-	-	12
Eaton-Vickers 35VQ/25 Vane Pump test (3000 psi, 2400 rpm, 100 hrs, 95°C / 203°F)	Vickers M-2952-S	wt loss (ring & vane) mg	-	-	<50

Subject to usual manufacturing tolerances.

Additional Information

The Performance Bio HE ESU Range is miscible and compatible with nearly all mineral oil and ester type hydraulic fluids. To convert a system using these types of oils, simply drain and recharge with correct Performance Bio HE ESU viscosity grade. Biodegradability CEC-L-33-A-93 > 95 % Biodegradability OECD 301B > 69 %

This product was previously called Carelube HES. The name was changed in 2015.

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