PLANTOGEAR 220 – 680 S

Environmentally acceptable lubricating oil and EP industrial gear oil based on synthetic saturated esters

Description

PLANTOGEAR S products are environmentally acceptable industrial gear oils based on special saturated synthetic esters which guarantee high ageing resistance and excellent wear protection - very good lubricity. The products have a good solvency (good detergent dispersant properties due to the polar ester base oils).
PLANTOGEAR S products have high scuffing protection (FZG > 12). The selected antiwear/ extreme pressure additive system guarantees the wear protection of bearings due to the excellent FE8 roller bearing wear test results (excellent wear protection of roller bearings under severe conditions, high load, low velocity).

Application

PLANTOGEAR S products can be used as universal CLP industrial gear oils. PLANTOGEAR S products can be used in spur, bevel, planetary and worm gears, especially in environmentally sensitive areas. The products can also be used in drive systems in water protection areas where ground and surface water can be polluted by oil leakages. The formulation of PLANTOGEAR S series is based on fully synthetic saturated high-performance esters based on natural renewable resources. The products can be used in applications where the use of synthetic lubricants are of advantage.

Specifications

The products of the PLANTOGEAR S series fulfill and surpass the requirements according to:

- DIN 51517-3: CLP
- ISO 6743-6 and ISO 12925-1: CKC / CKD / CKE / CKSMP (from ISO VG 320)
- AGMA 9005/E02: EP
- European EU Ecolabel

The products are listed, recommended, approved by important gear manufacturers, resp. they fulfill and surpass their requirements.

Advantages

- **Good corrosion protection**
- **Excellent wear protection for gears and bearings**
- **Excellent viscosity temperature behaviour, high viscosity index (VI)**
- **Miscible with mineral oil and polyalphaolefin gear oils**
- **Natural dissolving properties**
- **Highest shear stability**
- **Based on renewable resources**
- **Rapidly biodegradable (> 60% acc. to OECD 301 B)**
- **High resistance to ageing**
- **Good air release**
- **Low foaming**
- **Optimally suited for high and low temperature use**

EU Ecolabel : DE/027/273

EU Ecolabel
www.ecolabel.eu

FUCHS LUBRICANTS GERMANY GmbH
Friesenheimer Straße 19
68169 Mannheim

Zertifizierungen:
ISO 9001, IATF 16949, ISO 14001, ISO 45001, ISO 50001

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Instructions for use

The PLANTOGEAR S products can be used as a universal industrial gear oil in new gears as well as in used gears. New gears should be flushed and rinsed before applying PLANTOGEAR S. New gears are usually partly filled with mineral oil based corrosion protection and running-in oils after manufacture. If they are not completely flushed, the running-in oil and the corrosion protection oil remains in the gear box and may contaminate the PLANTOGEAR S products. Under unfavourable conditions this can result in increased foam values and this can affect the biodegradability of the PLANTOGEAR S products negatively.
The content of the residual mineral oil should, therefore, be reduced as recommended in the ISO 15380 guideline, table A1 (guidelines for changing fluid from mineral based oils to environmentally acceptable fluids) to a percentage of approximately lower than 2% mineral oil in PLANTOGEAR S.

If an existing gear box is changed-over from a mineral based gear oil to PLANTOGEAR S, the gear box should also be flushed and rinsed so that the residual content of the previous product can be reduced (preferably <2%).

The internal tank and gear coatings should be compatible with ester based products.

Paints which are not compatible to esters are not recommended to be used. In general two components coating systems can be used with ester based products. The use of stainless steel tanks or stainless steel filter housings is recommended.

When deep filtration filters are used, the good solvency, dissolving properties of the PLANTOGEAR S products can reduce the filter life.

Clean/check or replace the oil filters in the system immediately after changing over to PLANTOGEAR S products. After one week further changing of the oil filter is perhaps relevant. To ensure a safe operation, when using PLANTOGEAR S products in gear and circulating systems, remove any water that may have penetrated the systems before start-up or after longer periods of down-time. We recommend the use of suitable dryer systems and filtration units. Use ester-resistant compatible sealing materials and plastic materials in general. We recommend the use of viton material in dynamic stressed seals.

Observe the change-over recommendations according to ISO 15380, which can be transferred to industrial gear oil applications.

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Typical technical data:

Product name		**PLANTOGEAR**				
		220 S	**320 S**	**460 S**	**680 S**	
Properties	**Unit**					**Test method**
Type of lubricant acc. to DIN 51517-3, Labeling acc. to DIN 51502		CLP 220	CLP 320	CLP 460	CLP 680	DIN 51502
Classification acc. to ISO 12925-1		CKC 220 CKD 220 CKE 220	CKC 320 CKD 320 CKE 320	CKC 460 CKD 460 CKE 460	CKC 680 CKD 680 CKE 680	ISO 12925-1 ISO 12925-1 ISO 12925-1
Viscosity class acc. to DIN ISO 3448		ISO VG 220	ISO VG 320	ISO VG 460	ISO VG 680	DIN ISO 3448
Kinematic viscosity at 40 °C at 100 °C	 mm²/s mm²/s	 220 26.2	 320 35.1	 460 48.0	 680 66.0	 DIN EN ISO 3104 DIN EN ISO 3104
Viscosity index		152	155	163	170	DIN ISO 2909
Density at 15 °C	kg/m³	938	943	951	958	DIN 51757
Flashpoint in open cup acc. to Cleveland	°C	280	280	280	280	DIN EN ISO 2592
Pourpoint	°C	-30	-30	-30	-30	DIN ISO 3016
Neutralisation number (acidic)	mg KOH/g	0.7	0.7	0.7	0.7	DIN 51558-1
Water content (%)	%	< 0.05	< 0.05	< 0.05	< 0.05	DIN 51777-2
Foaming immediately and after 10 min. Seq. I, at 24 °C Seq. II, at 93 °C Seq. III, at 24 °C	 ml ml ml	 0/0 0/0 0/0	 0/0 0/0 0/0	 0/0 20/0 0/0	 0/0 20/0 0/0	 ISO 6247

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Typical technical data (continued):

Product name		**PLANTOGEAR**				
		220 S	**320 S**	**460 S**	**680 S**	
Properties	**Unit**					**Test method**
Demulsifying at 82 °C (ISO VG 100 and higher)	min	20	25	40	50	ISO 6614
Copper corrosion (3 h, 100 °C)	degree of corros.	1	1	1	1	DIN EN ISO 2160
Steel corrosion,						
method A: distilled water	degree of corros			0 - A (pass)		DIN ISO 7120
method B: synth. sea water	degree of corros			0 – B (pass)		DIN ISO 7120
Ageing 312 h / 95 °C						
- Increase of viscosity at 100 °C	%	3.5	3.7	4.1	4.3	DIN EN ISO 4263-4
- Increase of viscosity number	ml	0	0	0	0	DIN EN ISO 4263-4
Scuffing and scoring test FZG A/8.3/90	failure load stage			>12		DIN ISO 14635-1
FE8 wear test, D-7.5/80-80 (analog),						DIN 51819-3
- roller wear	mg			< 10		
- cage wear	mg			< 100		
Micropitting load capacity						
C/8.3/90	GF Class			GFT high, >10		FVA 54/I-IV
C/8.3/60	GF Class			GFT high, >10		FVA 54/I-IV
Effect on seal material SRE-NBR 28/SX after 7 days at 100 °C						
Change in volume	%	5.8	4.6	4,0	3,6	DIN ISO 1817
Change in hardness	%	- 5.5	- 4.0	- 3.5	- 3.1	
Change in tensile strength	%	- 2.2	- 3.3	- 2	- 1.9	
Change in elongation	%	- 12.3	- 16.5	- 15.4	- 9.5	

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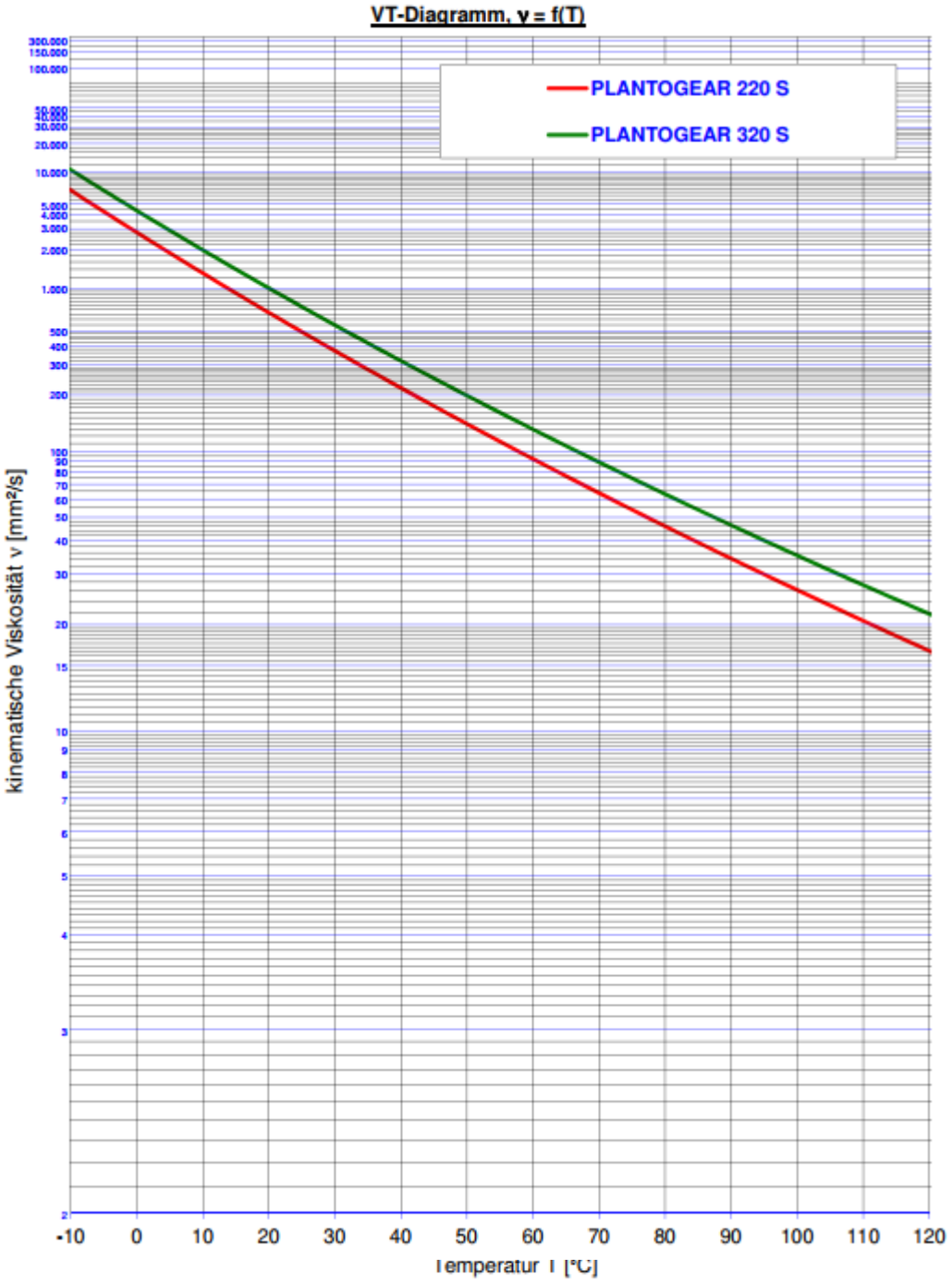

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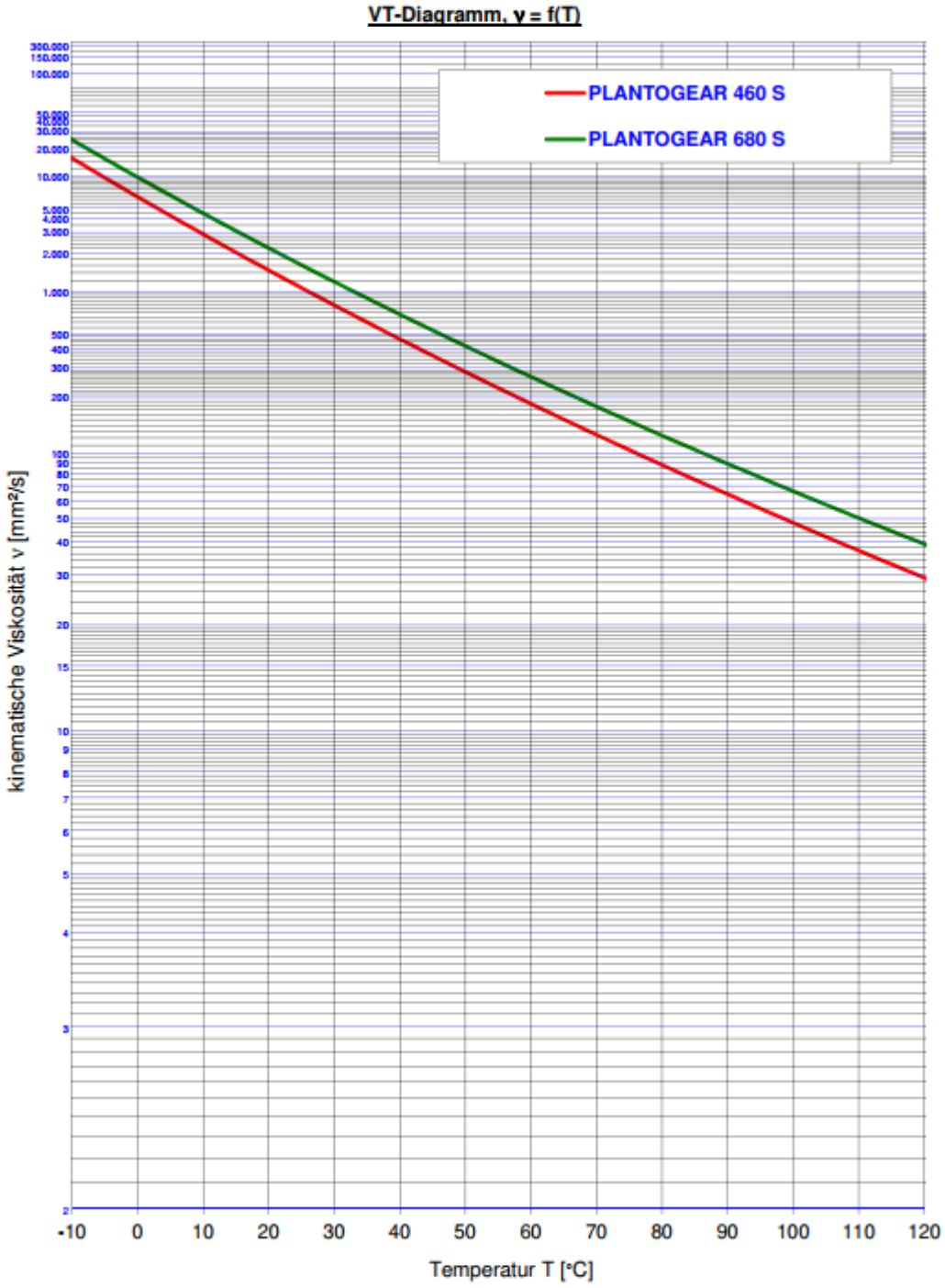

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