RENOLIN CLP

Heavy duty - EP - industrial gear oils of highest performance, outstanding extreme pressure characteristics and load carrying capacity

Description

The RENOLIN CLP products are industrial gear oils of the latest generation, having outstanding extreme pressure characteristics (EP/AW properties) and an extremely high load carrying capacity. They are industrial gear oils with excellent demulsifying properties which can be used in all types of enclosed gear drives with circulation or splash lubrication systems. The RENOLIN CLP products offer extraordinary wear protection. They surpass the requirements in the standard FZG A/8.3/90 scuffing test as well as the more severe FZG test A/16.6/140 (double velocity - 16.6 m/s - and increased starting oil sump temperature - 140 °C). The RENOLIN CLP products offer an extremely high micropitting protection (load stage “high” in the load stage test as well as the endurance test). They offer excellent wear protection for roller bearings. The wear rates in the FAG FE8 test are extremely low under these extreme test conditions (7.5 rpm, 80 °C, 80 h, 80 kN).
Latest additive technology guarantees excellent wear protection and excellent corrosion protection (steel and copper-containing materials) The RENOLIN CLP products have good elastomer compatibility, stressed static and dynamic elastomers are lubricated and protected from wear. The lifetime of the components is increased. RENOLIN CLP oils can improve equipment reliability and increase productivity.

Advantages / Benefits

- **Excellent corrosion protection**
- **Low foaming, excellent air release**
- **Excellent demulsifying properties (water and water-containing fluids are separated fast)**
- **High oxidation resistance**
- **Extremely high load-carrying capacity, extreme pressure-, anti-wear performance**
- **Excellent bearing wear protection (under mixed friction conditions) – FE8**
- **Excellent protection from scuffing, excellent wear protection – FZG**
- **Excellent micropitting resistance in the load stage and endurance test**
- **High Brugger wear protection**
- **Excellent elastomer compatibility (static and dynamic)**
- **Good compatibility with paint materials**
- **Flender approved according to Revision 16.1**

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Zertifizierungen:
ISO 9001, IATF 16949, ISO 14001,
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Application

The RENOLIN CLP oils are recommended for industrial spur-, helical- and bevel enclosed gears with circulation or splash lubrication, operating at oil temperatures up to 100 °C and peaks above (up to 120 °C). The RENOLIN CLP oils can be used for all applications where lubricants of the CLP type according to DIN 51517-3 are recommended by the gear manufacturer. These products meet and in many cases exceed the new requirements of well-known gearbox and bearing manufacturers. The RENOLIN CLP oils are particularly suited for gear sets working under heavy load or shock load. They also can be used in non-gear applications including highly loaded, low-speed plain and rolling contact bearings. These mineral oil-based products are designed to provide high quality, latest additive technology of industrial gear oil formulation. They meet the latest industrial standards of well-known OEMs.

Specifications

The RENOLIN CLP oils meet and in many cases exceed the requirements:

- DIN 51517-3: CLP
- ISO 6743-6 and ISO 12925-1: CKC / CKD / CKSMP
- AGMA 9005/E02: EP
- AIST 224
- David Brown S1 53.101

The products of the RENOLIN CLP series are approved for example by:

- Flender GmbH, Bocholt, Germany, Flender BA 7300, table A
- Müller Weingarten AG, Germany, DT 55 005, 10/2003
- Flender GmbH, Revision 16.1

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Typical technical data:

Product name		**RENOLIN CLP**				
Properties	**Unit**	**68**	**100**	**150**	**220**	**Test method**
ISO VG	-	68	100	150	220	DIN 51519
Kinematic Viscosity at 40 °C at 100 °C	 mm²/s mm²/s	 68 8.7	 100 11.3	 150 14.5	 220 18.9	DIN EN ISO 3104
Viscosity Index	-	99	99	96	96	DIN ISO 2909
Density at 15 °C	kg/m³	883	885	889	892	DIN 51757
Colour	ASTM	1.5	1.5	2.0	3.0	DIN ISO 2049
Flashpoint	°C	> 230	> 230	> 230	> 240	DIN ISO 2592
Pourpoint	°C	-24	-24	-24	-21	DIN ISO 3016
Neutralization number	mgKOH/g	0.6	0.6	0.6	0.6	DIN 51558-1
Demulsibility at 54 °C	min.	10	-	-	-	DIN ISO 6614
Demulsibility at 82 °C	min.	-	10	15	15	DIN ISO 6614
Copper corrosion 3 h, 100 °C (100 A3)	 degree of corrosion	 1	 1	 1	 1	DIN EN ISO 2160
Corrosion protection – steel procedure A: dist. water procedure B: sea water	 degree of corrosion	 0 0	 0 0	 0 0	 0 0	DIN ISO 7120
Foaming Seq. I Seq. II Seq. III	 ml ml ml	 0/0 0/0 0/0	 0/0 0/0 0/0	 0/0 0/0 0/0	 0/0 0/0 0/0	ASTM D 892

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Typical technical data:

Product name		**RENOLIN CLP**				
Properties	**Unit**	**68**	**100**	**150**	**220**	**Test method**
FZG A/8.3/90 gear test rig Start temperature: 90 °C	failure load stage	> 14	> 14	> 14	> 14	DIN ISO 14635-1
FZG A/16.6/140 gear test rig Start temperature: 140 °C	failure load stage	> 12	> 12	> 12	> 12	DIN ISO 14635-1
FZG-GFT* test GT-C/8.3/90 Load stage test	GF Class	GFT high	GFT high	GFT high	GFT high	FVA-Information Sheet No. 54/I-IV
FZG-GFT* test GT-C/8.3/90 Endurance test	GF Class	GFT high	GFT high	GFT high	GFT high	FVA-Information Sheet No. 54/I-IV
FE8 wear test, D7.5/80-80 Roller wear	mg	< 5	< 5	< 5	< 5	DIN 51819-3
Testing in mixed friction area according to Brugger	N/mm²	≥ 55	≥ 55	≥ 55	≥ 55	DIN 51347-2
Timken OK load	lbs	85	95	95	95	ASTM D 2782
4-Ball EP test	N			≥ 2400		DIN 51350-2
Weld load	kg			≥ 250		ASTM D 2783-88
Elastomer compatibility - dynamic and static: • 72 NBR 902 (1000 h, 80 °C – dynamic) • 75 FKM 585 (1000 h, 90 °C – dynamic) • 75 FKM 17055 (1000 h, 90 °C – dynamic) • SRE-NBR 28/SX according to DIN ISO 13226 (100 °C, 7 d – static)				 pass pass pass pass		Fuchs Inhouse Test according to DIN ISO 1817 and according to Flender DIN ISO 1817

* GFT = Micropitting test (grey discoloration test)

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Typical technical data:

Product name		**RENOLIN CLP**			
Properties	**Unit**	**320**	**460**	**680**	**Test method**
ISO VG	-	320	460	680	DIN 51519
Kinematic Viscosity at 40 °C at 100 °C	 mm²/s mm²/s	 320 24.0	 460 30.4	 680 40.0	DIN EN ISO 3104
Viscosity Index	-	95	95	97	DIN ISO 2909
Density at 15 °C	kg/m³	897	901	902	DIN 51757
Colour	ASTM	4.0	4.0	4.0	DIN ISO 2049
Flashpoint	°C	> 240	> 240	> 240	DIN ISO 2592
Pourpoint	°C	-12	-12	-12	DIN ISO 3016
Neutralization number	mgKOH/g	0.6	0.6	0.6	DIN 51558-1
Demulsibility at 54 °C	min.	-	-	-	DIN ISO 6614
Demulsibility at 82 °C	min.	20	25	30	DIN ISO 6614
Copper corrosion 3 h, 100 °C (100 A3)	degree of corrosion	 1	 1	 1	DIN EN ISO 2160
Corrosion protection – steel procedure A: dist. water procedure B: sea water	 degree of corrosion	 0 0	 0 0	 0 0	DIN ISO 7120
Foaming Seq. I Seq. II Seq. III	 ml ml ml	 0/0 0/0 0/0	 0/0 0/0 0/0	 0/0 0/0 0/0	ASTM D 892

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Typical technical data:

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Properties	**Unit**	**320**	**460**	**680**	**Test method**
FZG A/8.3/90 gear test rig Start temperature: 90 °C	failure load stage	> 14	> 14	> 14	DIN ISO 14635-1
FZG A/16.6/140 gear test rig Start temperature: 140 °C	failure load stage	> 12	> 12	> 12	DIN ISO 14635-1
FZG-GFT* test GT-C/8.3/90 Load stage test	GF Class	GFT high	GFT high	GFT high	FVA-Information Sheet No. 54/I-IV
FZG-GFT* test GT-C/8.3/90 Endurance test	GF Class	GFT high	GFT high	GFT high	FVA-Information Sheet No. 54/I-IV
FE8 wear test, D7.5/80-80, Roller wear	mg	< 5	< 5	< 5	DIN 51819-3
Testing in mixed friction area according to Brugger	N/mm²	≥ 55	≥ 55	≥ 55	DIN 51347-2
Timken OK load	lbs	95	95	95	ASTM D 2782
4-Ball EP test	N		≥ 2400		DIN 51350-2
Weld load	kg		≥ 250		ASTM D 2783-88
Elastomer compatibility - dynamic and static: • 72 NBR 902 (1000 h, 80 °C – dynamic) • 75 FKM 585 (1000 h, 90 °C – dynamic) • 75 FKM 17055 (1000 h, 90 °C – dynamic) • SRE-NBR 28/SX according to DIN ISO 13226 (100 °C, 7 d – static)			 pass pass pass pass		Fuchs Inhouse Test according to DIN ISO 1817 and according to Flender DIN ISO 1817

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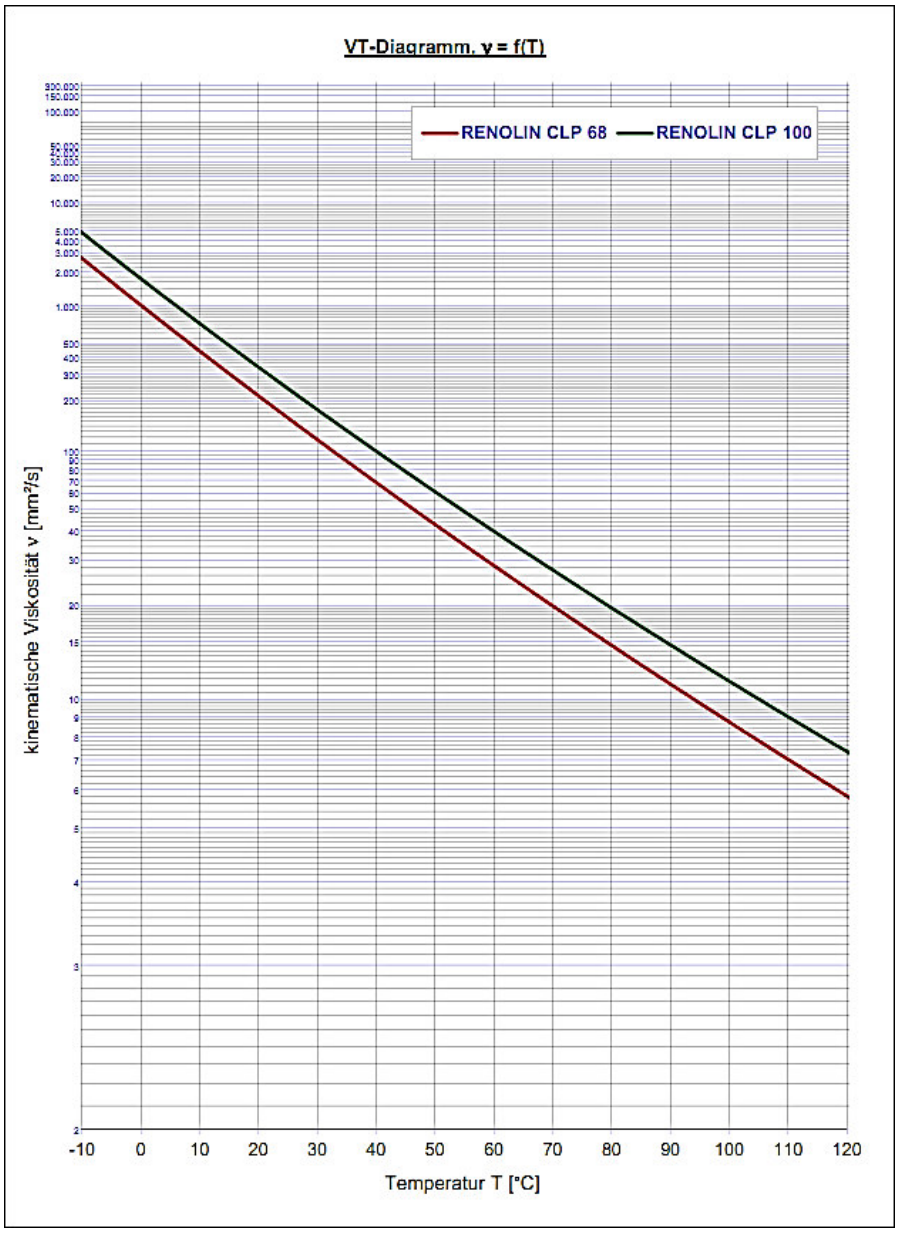

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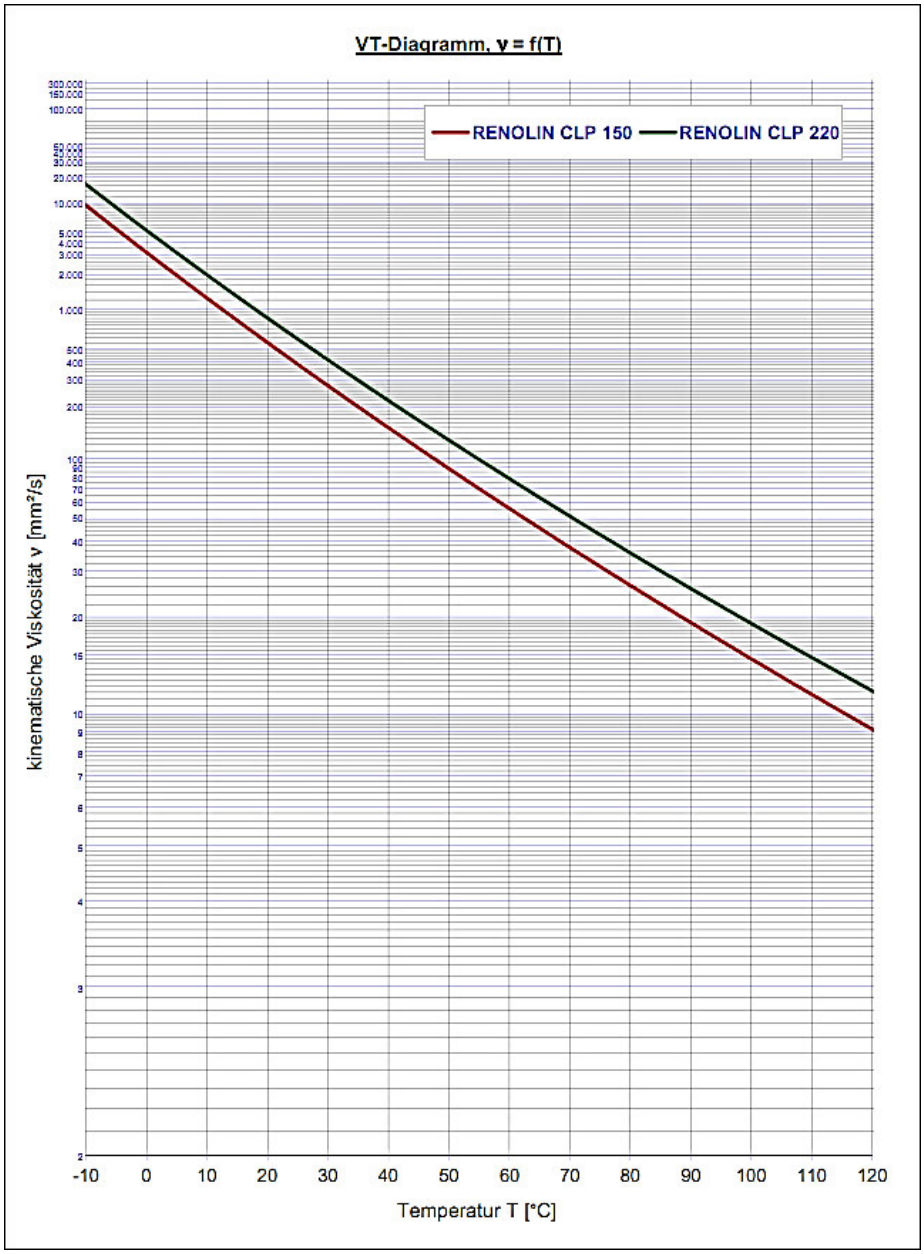

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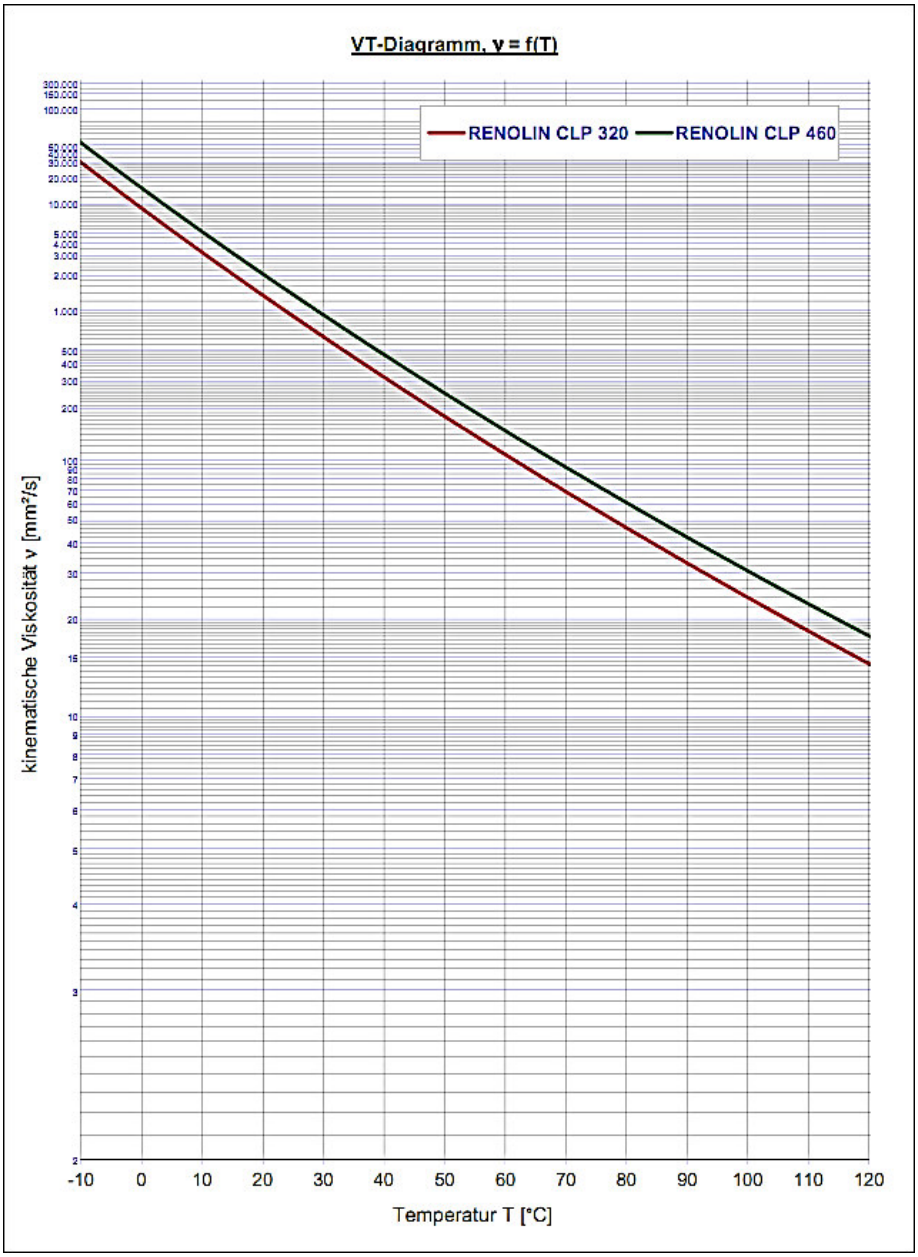

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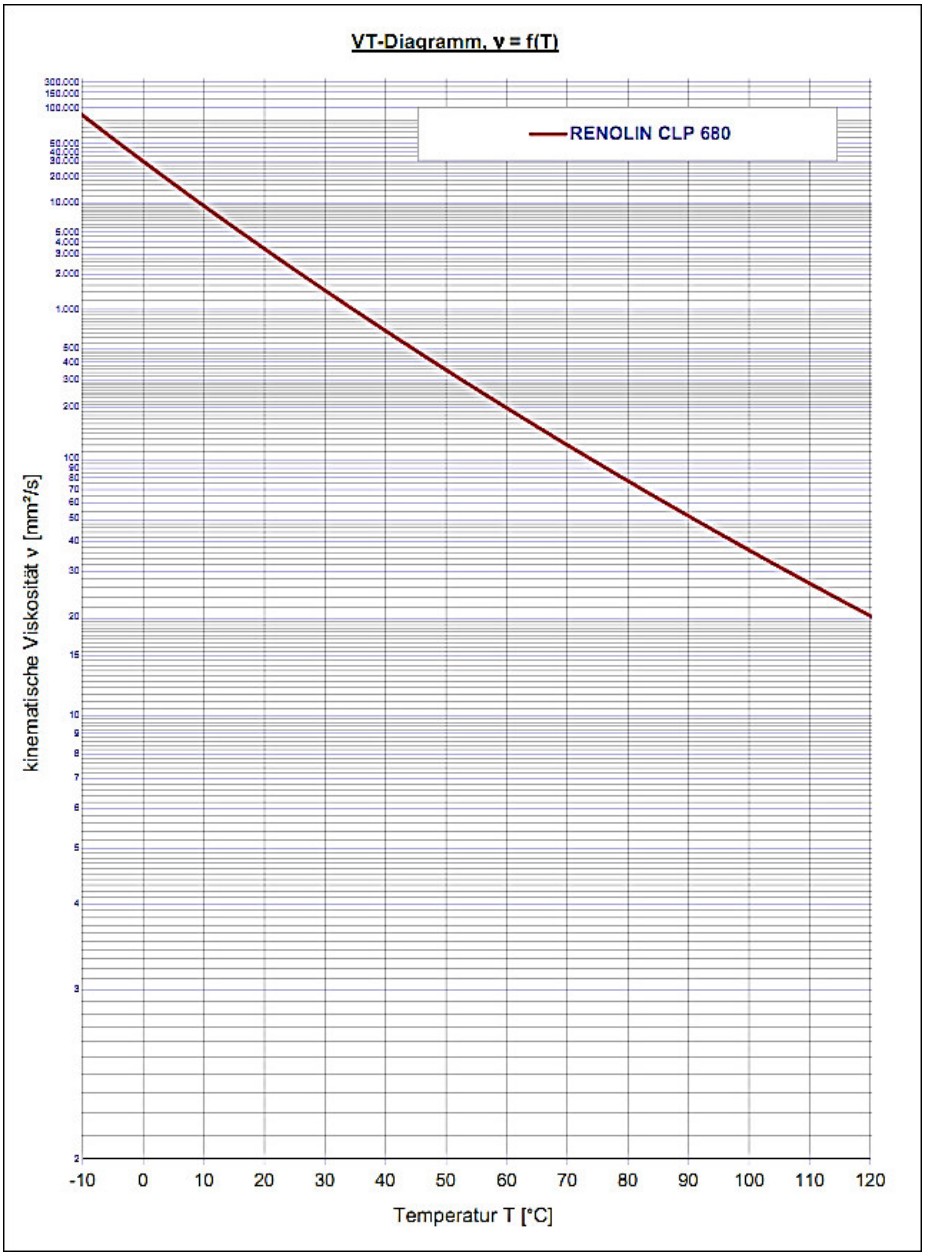

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