

SYNTHESO® D oils

Synthetic high-temperature lubricating oils



Description:

SYNTHESO D oils are synthetic high-temperature oils on a polyglycol basis. They are very resistant to ageing and oxidation and have a very good viscosity-temperature relation.

Application:

SYNTHESO D oils are used for the lubrication of friction points subject to high temperatures. They are also used as pressure fluids in high-temperature applications, and as heat carrier fluids. Owing to the base oil's high pressure absorption capacity and good wear protection, SYNTHESO D oils are particularly suitable for hydraulic or heat transfer applications where lubricity has to be ensured at high temperatures.

Application notes:

SYNTHESO D oils are suitable for immersion and circulation lubrication systems. If they are used as heat carrier fluids it is important not to exceed a specific load of approx. 1.5 W/cm^2 in case of free convection and approx. 2 W/cm^2 in case of forced convection. The maximum surface temperature of the heat exchanger (film load limit) should not exceed approx. $220 \text{ }^\circ\text{C}$. The maximum permanent service temperature of SYNTHESO D oils is approx. $180 \text{ }^\circ\text{C}$.

Service temperature range*:

SYNTHESO D 32:
approx. -40 to $180 \text{ }^\circ\text{C}$

SYNTHESO D 68 und D 100:
approx. -35 to $180 \text{ }^\circ\text{C}$

SYNTHESO D 220 bis D 680:
approx. -25 to $180 \text{ }^\circ\text{C}$

SYNTHESO D 1000:
approx. -20 to $180 \text{ }^\circ\text{C}$

SYNTHESO D 1500:
approx. 0 to $180 \text{ }^\circ\text{C}$

SYNTHESO D oils are **not miscible** with mineral oils and synthetic hydrocarbons. We recommend cleaning the lubrication points prior to conversion, and rinsing gears or closed lubrication systems with the SYNTHESO D oil that will be used for lubrication.

SYNTHESO D oils are neutral towards ferrous materials and almost all nonferrous metals. There may be increased wear when the contact surfaces of design elements made of aluminium or aluminium alloys are exposed to dynamic loads (sliding speed and high loads). If necessary, wear tests should be carried out. Depending on the temperature and exposure time, synthetic lubricants on a polyglycol base may have an impact on the functional capacity of rubber-elastic sealing materials. Seals made of NBR materials (acrylonitrile-butadiene-rubber) can be used at permanent temperatures up to $100 \text{ }^\circ\text{C}$. At higher temperatures we recommend using FPM (fluoropolymers)

SYNTHESO D oils

- Good resistance to ageing and oxidation
- High service temperature limit
- Excellent viscosity-temperature relation

or VMQ (silicone rubber) seals. It has to be taken into account that different elastomer qualities produced by one manufacturer or different manufacturers may show a different behaviour. Paints may be attacked by synthetic lubricants.

When applying SYNTHESO D oils we recommend the use of two-component paints (reactive paints). Oil gauge glasses should preferably be made of natural glass or polyamide materials.

We recommend testing the suitability of design materials in contact with the selected lubricants, especially for series application.

Minimum shelf life:

The minimum shelf life is approx. 36 months if the product is stored in the original closed container in a dry place.

Pack sizes:

20 kg bucket
180 kg drum

* Service temperatures are guide values which depend on the lubricant's composition, the intended use and the application method. Lubricants change their consistency, apparent dynamic viscosity or viscosity depending on the mechano-dynamical loads, time, pressure and temperature. These changes in product characteristics may affect the function of a component.

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Product data:

SYNTHESO	D 32	D 68	D 100	D 220	D 460	D 680	D 1000	D 1500
ISO VG DIN 51 519	32	–	100	220	460	680	1000	1500
Density, DIN 51 757, at 20 °C, g/ml, approx.	0.98	1.04	1.04	1.04	1.05	1.05	1.05	1.08
Kinematic viscosity, DIN 51 562 at 40 °C, mm ² /s, approx. at 100 °C, mm ² /s, approx. at 150 °C, mm ² /s, approx.	32 6.5 3.7	80 15.5 7.5	100 19.5 9.5	220 38 18.4	460 75 35	680 110 43	1000 170 71	1500 230 90
Viscosity index, DIN ISO 2909, approx.	> 140	> 180	> 200	> 200	> 230	> 250	> 270	> 270
Flash point, DIN ISO 2592, °C	> 220	> 220	> 250	> 250	> 250	> 250	> 250	> 250
Pour point, DIN ISO 3016, °C, approx.	< – 40	< – 40	< – 40	< – 30	< – 30	< – 25	< – 20	0
Thermal conductivity (W/K x m), approx.	0.16	0.175	0.175	0.175	0.175	0.175	0.178	0.178

The coefficient of thermal expansion (Kubisch), 20 – 80 °C, is approx. $78 \times 10^{-5} \text{ (K}^{-1}\text{)}$ for all viscosities.

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Safety Data Sheet

<p>1.1 Product name: SYNTHESO a) D 32, b) D 68, c) D 100, d) D 220, e) D 460, f) D 680, g) D 1000, h) D 1500</p> <p>Code-No.: a) 012 052, b) 012 078, c) 012 066, d) 012 051, e) 012 065, f) 012 067, g) 012 090, h) 012 109</p> <p style="text-align: right;">16.11.2000</p>	<p>9. Physical and chemical properties</p> <p>Form liquid</p> <p>Colour a), b), c), d), e), f), g) yellow; h) yellow-red</p> <p>Odour characteristic</p> <p>Pour point, DIN ISO 3016, °C a), b), c) < -40; d), e) < -30; f) < -25; g) < -20; h) ~ 0</p> <p>Flash point, DIN ISO 2592, °C a) b) > 220; c), d), e), f), g), h) > 250</p> <p>Ignition temperature not applicable</p> <p>Lower explosion limit not applicable</p> <p>Upper explosion limit not applicable</p> <p>Vapour pressure-first not applicable</p> <p>Density, g/cm³, 20 °C, DIN ISO 51 757, approx. a) 0,98; b), c), d) 1,04 e), f), g) 1,05; h) 1,08</p> <p>Water solubility partly soluble</p> <p>pH value not applicable</p> <p>Kinematic viscosity, mm²/s, 40 °C, DIN 51 562, approx. a) 34, b) 83, c) 100, d) 220, e) 460, f) 680, g) 1000, h) 1500</p> <p>Further information none</p>
<p>1.2 Klüber Lubrication München KG Geisenhausenerstraße 7 D-81379 München Tel. ++49 - 89 78 76 - 0 telephone exchange Fax: ++49 - 89 78 76 - 333</p> <p style="text-align: right;">Emergency telephone no.: ++49 - 89 7876 - 0</p>	
<p>2. Composition / information on ingredients Chemical characterization (preparation): Polyalkylene glycol oil</p>	
<p>3. Hazards identification No particular hazards known</p>	
<p>4. First aid measures After inhalation: Not applicable After contact with skin: Wash off with soap and plenty of water After contact with eyes: Rinse with plenty of water After ingestion: Do not induce vomiting. Obtain medical attention Advice to doctor: Treat symptomatically. If swallowed or in the event of vomiting, risk of product entering the lungs</p>	<p>10. Stability and reactivity Conditions to avoid: Do not heat above flash point Materials to avoid: Strong oxidizing agents Hazardous decomposition products: None under normal use Additional information: None</p>
<p>5. Fire-fighting measures Suitable extinguishing media: Water spray, foam, dry powder, carbon dioxide (CO₂) Unsuitable extinguishing media: High volume water jet Special hazards: In case of fire the following can be released: Carbon monoxide, hydrocarbons Special protective equipment for firefighters: Standard procedure for chemical fires Additional information: Water mist may be used to cool closed containers. In the event of fire and/or explosion do not breathe fumes</p>	<p>11. Toxicological information The toxicological data has been taken from products of similar composition Acute toxicity: LD₅₀/oral/rat = > 2 g/kg (literature data) Chronic toxicity: None Human experience: Prolonged skin contact may cause skin irritation and/or dermatitis</p>
<p>6. Accidental release measures Personal precautions: Risk of slipping due to leakage/spillage of product Environmental precautions: Do not flush into surface water or sanitary sewer system Methods for cleaning up / taking up: Soak up with inert absorbent material (e.g. sand, silica gel, acid binder, universal binder, sawdust). Dispose of absorbed material in accordance with the regulations Additional information: None</p>	<p>12. Ecological information Information on elimination (persistence and degradability): The product has not been tested Behaviour in environmental compartments: Ecological injuries are not known or expected under normal use Ecotoxic effects: The product has not been tested Additional information: Should not be released into the environment</p>
<p>7. Handling and storage Advice on safe handling: Avoid formation of aerosol Advice on protection against fire and explosion: No special precautions required Requirements on storage rooms and vessels: No special storage conditions required Incompatible materials: Incompatible with oxidizing agents. Do not store together with food Further information on storage conditions: Store at room temperature in the original container</p>	<p>13. Advice on Disposal Disposal: Dispose of in accordance with your local, state and federal regulations as used oil for incineration Dispose of contaminated packaging and recommended cleaning: Offer rinsed packaging material to local recycling facilities</p>
<p>8. Exposure controls / personal protection Additional advice on system design: Not applicable Ingredients and specific control parameters: None Respiratory protection: No special protective equipment required Hand protection: No special protective equipment required Eye protection: No special protective equipment required Body protection: No special protective equipment required Other protection measures: No special protective equipment required General protection and hygiene measures: Avoid prolonged and/or repeated contact with skin. Clean skin thoroughly after work; apply skin cream. Remove soiled or soaked clothing immediately. Do not inhale aerosol</p>	<p>14. Transport information GGVS / GGVE: not applicable ADN / ADN: not applicable IMDG-Code: not applicable ICAO / IATA-DGR: not applicable Further information: Not classified as dangerous in the meaning of transport regulations</p>
	<p>15. Regulatory information Labelling according to EU-guidelines: The product does not require a hazard warning label in accordance with EC-directives/German regulations on dangerous substances National regulations</p>
	<p>16. Other information Issue-department of Safety Data Sheet: Chemical Documentation, Tel.: ++49 - 89 7876 - 564</p>

The data in this product information is based on our general experience and knowledge at the time of printing and is intended to give information of possible applications to a reader with technical experience. It constitutes neither an assurance of product properties nor does it release the user from the obligation of performing preliminary tests with the selected product. We recommend contacting our Technical Consulting Staff to discuss your specific application. If required and possible we will be pleased to provide a sample for testing. Klüber products are continually improved. Therefore, Klüber Lubrication reserves the right to change all the technical data in this product information at any time without notice.



Klüber Lubrication München KG, a member of the Freudenberg group