

# Klüberalfa YV 93-302

Sliding agent for valves, fittings and installations carrying oxygen under high partial pressure



## Benefits for your application

- **Reliable operation of installations and components using gaseous oxygen due to**
  - high oxygen pressure surge resistance (see product data)
  - good compatibility with most materials used in this branch of industry
  - wide service temperature range
- **Versatile sliding agent**
  - for the industrial handling of oxygen, air, carbon dioxide, inert and other gases as well as their condensation products
  - NSF H1-registered for use in the food and beverage industries
- **Also suitable for installations and components carrying liquid oxygen**
- **Each production batch checked for reactivity with oxygen**

## Description

Klüberalfa YV 93-302 is a white high-pressure sliding agent based on perfluorinated polyether with solid lubricants having good wetting ability.

It offers good oxygen pressure surge resistance and good resistance to a very wide range of chemicals. To ensure continuous adherence to this high quality standard, Klüberalfa YV 93-302 is manufactured in small batches subject to strict hygiene requirements. Each batch is tested based on M 034-1 List of nonmetallic materials (213-075).

Klüberalfa YV 93-302 is registered as NSF H1 and complies with FDA 21 CFR § 178.3570 for uses in the food-processing industry.

## Application

Klüberalfa YV 93-302 is used as a lubricant for valves, fittings and installations carrying gaseous and/or liquid oxygen or in chemical installations and equipment requiring high resistance to various gases. (Conclusion by analogy based on chemical composition. We recommend users conduct their own component tests under conditions as occur in practice). The product's high pressure-absorption capacity and consistent friction values over a wide temperature range ensure constant actuation forces. Test results show the product's usability for an O<sub>2</sub> content > 21 % by vol. under operating conditions specified in the product data section of this product information leaflet.

Possible applications are:

- Oxygen valves
- Peripheral aggregates of chemical installations
- Hose couplings, e.g. oxygen pipe connections, sliding and plain bearings, bolts, slideways, etc.
- Steel and heavy industry

- Assembly aid for most rubber-elastic materials and plastics
- For industrial handling, maintenance and care of oxygen components

## Behaviour towards metal, elastomers and plastics

Klüberalfa YV 93-302 is normally neutral towards metallic materials, plastics and elastomers within the given temperature range. Nevertheless, we recommend checking the compatibility of the lubricant with the materials in contact prior to its introduction.

## Application notes

All surfaces to be wetted must be thoroughly cleaned prior to product application.

The application point must be clean and bright (i.e., free from oil, grease, dirt particles or perspiration). For optimum lubrication effect, we recommend cleaning the surfaces with white spirit and then Klüberalfa XZ 3-1, ensuring residue-free surfaces when dried. For installations carrying oxygen, the application procedure must also be "oxygen clean" in order to attain a "ready for oxygen service" condition.

For use at low temperatures, e.g. where components are in direct contact with liquid oxygen, experimental testing and approval by the component manufacturer is required since the design and power ratings, for example in actuator gears, may play a decisive role in this context. For optimised service life, please contact our service engineers.

\* Notes on the lower service temperature limit (see product data):

The service temperature is defined on the basis of physical and mechanical-dynamic product characteristics. At very low temperatures, and at pressures causing oxygen to become

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liquid, the product remains stable within the conditions specified for tests for liquid oxygen. If, however, the product is intended to be used below the lower service temperature limit, it has to be checked if reliable operation of the component is ensured under these conditions. In cases of doubt, application-specific tests would have to be performed.

\*\* Notes on the upper service temperature limit (see product data):

The service temperature is defined on the basis of physical and mechanical-dynamic product characteristics. When working in an atmosphere with added oxygen and/or under high oxygen partial pressure, the upper service temperature limit may be reduced due to a reaction with oxygen. To assess whether use in a particular application is safe, please refer to the product data section of this product information leaflet. In cases of doubt, application-specific tests would have to be performed.

Safety advice:

The resistance to oxygen was determined with the unused, contamination-free product. If the product is decomposed during use due to physical (temperature, electric discharge,

pressure surges) or chemical influence or contaminated by foreign substances (e.g. easily oxidisable organic or inorganic materials, particularly iron metals, magnesium, aluminium, titanium or their alloys, e.g. rubbed-off particles, contamination from the environment), decomposition products or foreign substances can be generated which clearly reduce oxygen resistance. Furthermore, operating conditions have a major impact on the lubricant's behaviour in the application. Therefore, it can be necessary or prescribed to conduct own safety-relevant examinations on the equipment or lubricated component.

## Material safety data sheets

Material safety data sheets can be requested via our website [www.klueber.com](http://www.klueber.com). You may also obtain them through your contact person at Klüber Lubrication.

Pack sizes	Klüberalfa YV 93-302
Can 50 g	+
Tube 100 g	+
Can 1 kg	+

Product data	Klüberalfa YV 93-302
Article number	013062
NSF-H1 registration	129 521
Chemical composition, type of oil	PFPE
Chemical composition	solid lubricant
Lower service temperature *	-60 °C
Upper service temperature **	200 °C
Colour space	white
Texture	homogeneous
Density at 20 °C	approx. 2.00 g/cm <sup>3</sup>
NLGI grade, DIN 51818	2
Shear viscosity at 25 °C, shear rate 300 s <sup>-1</sup> , equipment: rotational viscometer, lower limit value	5 000 mPas
Shear viscosity at 25 °C, shear rate 300 s <sup>-1</sup> , equipment: rotational viscometer, upper limit value	10 000 mPas
Copper corrosion, DIN 51811, (lubricating grease), 24h/100 °C	1 - 100 corrosion degree
Flow pressure of lubricating greases, DIN 51805-2, test temperature: -60 °C	<= 1 400 mbar
Four-ball tester, welding load, DIN 51350 pt. 04	>= 4 000 N

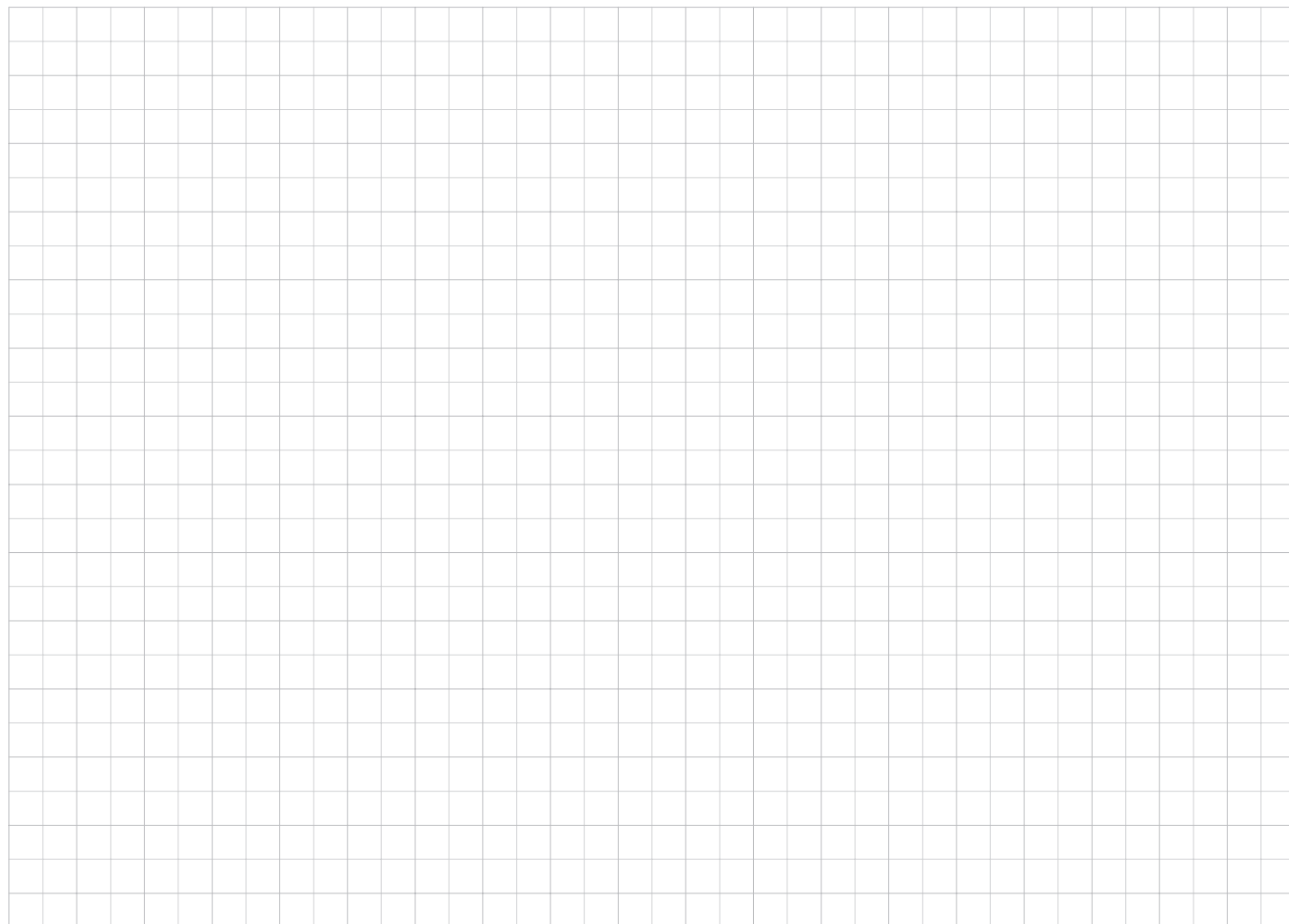


Product data	Klüberalfa YV 93-302
Upper oxygen pressure limit up to a maximum operating temperature of 60 °C, reactivity when exposed to oxygen pressure surges, adiabatic procedure	360 bar
Upper oxygen pressure limit up to a maximum operating temperature of 200 °C, reactivity when exposed to oxygen pressure surges, adiabatic procedure	100 bar
Minimum shelf life from the date of manufacture - in a dry, frost-free place and in the unopened original container, approx.	60 months



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### Klüber Lubrication – your global specialist

Innovative tribological solutions are our passion. Through personal contact and consultation, we help our customers to be successful worldwide, in all industries and markets. With our ambitious technical concepts and experienced, competent staff we have been fulfilling increasingly demanding requirements by manufacturing efficient high-performance lubricants for more than 80 years.

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The data in this document is based on our general experience and knowledge at the time of publication 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 field tests with the product selected for a specific application. All data are guide values which depend on the lubricant's composition, the intended use and the application method. The technical values of lubricants change depending on the mechanical, dynamical, chemical and thermal loads, time and pressure. These changes may affect the function of a component. We recommend contacting us to discuss your specific application. If possible we will be pleased to provide a sample for testing on request. Klüber products are continually improved. Therefore, Klüber Lubrication reserves the right to change all the technical data in this document at any time without notice.

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