

# Klüberoil 4 UH1 N

Synthetic gear and multi-purpose oils for the food-processing and pharmaceutical industries



## Your benefits at a glance

- Registered as NSF H1 and certified according to ISO 21469
- High scuffing protection
- Good wear protection for gears and rolling bearings
- Good shear stability for reliable lubricant film formation
- Excellent ageing and oxidation resistance
- Wide service temperature range due to good viscosity-temperature behaviour
- Low foaming tendency
- Energy savings due to optimised friction behaviour
- Good elastomer compatibility
- Approved by numerous gear OEMs

## Your requirements - our solution

Klüberoil 4 UH1 N is a synthetic high-performance gear and multipurpose oil based on polyalphaolefin satisfying the growing requirements and increasing power density of modern gears. Klüberoil 4 UH1 N is based on high-grade raw materials and advanced additives, enabling maximum performance in the lubrication of all gear components.

Klüberoil 4 UH1 N is registered as NSF H1 for use in the food-processing and pharmaceutical industries and complies with FDA 21 CFR Sec 178.3570. It was developed for incidental contact with products and packaging materials in the food-processing, cosmetics, pharmaceutical or animal feed industries. The use of Klüberoil 4 UH1 N can contribute to increase reliability of your production processes. Nevertheless it is recommended to conduct an additional risk analysis, e.g. HACCP.

Klüberoil 4 UH1 N is certified according to ISO 21469, thus supporting compliance with hygienic requirements of your production. You will find further information about ISO Standard 21469 on our website [www.klueber.com](http://www.klueber.com).

Klüberoil 4 UH1 N from ISO VG 68 to 680 clearly exceeds CLP requirements according to DIN 51517-3. Corresponding gears can be switched to Klüberoil 4 UH1 N without prior consultation provided the general application notes are observed.

Gears are sufficiently protected against scuffing even at extremely high peak loads, vibrations or oscillations, or if no running-in was performed. The good wear protection of both gears and rolling bearings ensures that the service life calculated for the lubricated components is achieved, leading to lower maintenance and repair costs.

Klüberoil 4 UH1 N offers a much longer service life than mineral and white oils due to the excellent ageing and oxidation resistance of the selected raw materials; thus service intervals can be extended and maintenance costs reduced. In certain applications, even lifetime lubrication is possible. The product's low foaming tendency and anti-corrosive properties enable problem-free gear operation. Oil leakage leading to contamination is prevented due to the good compatibility with elastomers.

The good viscosity-temperature behaviour supports the formation of a sufficient lubricant film across a wide service temperature range, even at elevated and high temperatures. Therefore, a single viscosity grade can cover both low and high temperatures in many applications.

The optimised friction behaviour enabled by the carefully selected base oils reduces power loss and improves gear efficiency.

Klüberoil 4 UH1 N is approved by SEW Eurodrive, Getriebebau Nord, Stöber Antriebstechnik, Lenze, Sumitomo, Bonfiglioli, Brevini, STM, Watt Drive, etc.

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By using Klüberoil 4 UH1 N you can benefit from a number of advantages that will help you save costs easily and efficiently. We look forward to hearing from you.

## Application

Klüberoil 4 UH1 N was developed for the lubrication of spur, bevel and worm gears subject to high loads, bearings, spindles, joints as well as lifting, drive and transport chains.

## Application notes

Klüberoil 4 UH1 N can be used for immersion, immersion circulation and injection lubrication. The use of drip-feed oilers, brushes, oil cans or suitable automatic lubricating systems is also possible. When using automatic lubricating systems, please note the manufacturer's instructions regarding the maximum permissible viscosity. The low-viscosity varieties are also used for oil mist lubrication.

Klüberoil 4 UH1 N is miscible with mineral oils and synthetic hydrocarbons. Prior to switchover, lubrication points should be cleaned, or gears or enclosed systems be flushed with the Klüberoil

4 UH1 N oil to be used. In view of the H1 requirements in the food-processing industry, any mixture with non-H1 lubricants during conversion has to be prevented.

For use at permanent temperatures of 80 °C max., seals made of NBR may be used. For higher temperatures, seals made of FKM should be chosen. It should be noted that elastomers from one or several manufacturers can behave differently; therefore tests should be performed.

For checking the contact pattern during running-in, the inspection paint Klübertop P 39-462 Spray (Art. No. 081295) can be used.

For more details on MOSH/MOAH and their assessment in H1 lubricants, please visit our website or contact your Klüber representative.

## 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       | Klüberoil 4 UH1-32 N | Klüberoil 4 UH1-46 N | Klüberoil 4 UH1-68 N | Klüberoil 4 UH1-100 N |
|------------------|----------------------|----------------------|----------------------|-----------------------|
| Canister 1 l     | +                    | +                    | +                    | +                     |
| Canister 5 l     | +                    |                      | +                    | +                     |
| Canister 20 l    | +                    | +                    | +                    | +                     |
| Drum 200 l       | +                    | +                    | +                    | +                     |
| Container 1000 l |                      |                      |                      |                       |

| Pack sizes       | Klüberoil 4 UH1-150 N | Klüberoil 4 UH1-220 N | Klüberoil 4 UH1-320 N | Klüberoil 4 UH1-460 N |
|------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| Canister 1 l     | +                     | +                     | +                     | +                     |
| Canister 5 l     | +                     | +                     | +                     | +                     |
| Canister 20 l    | +                     | +                     | +                     | +                     |
| Drum 200 l       | +                     | +                     | +                     | +                     |
| Container 1000 l |                       | +                     |                       | +                     |

| Pack sizes   | Klüberoil 4 UH1-680 N | Klüberoil 4 UH1-1500 N |
|--------------|-----------------------|------------------------|
| Canister 1 l | +                     | +                      |
| Canister 5 l | +                     | +                      |

# Klüberoil 4 UH1 N

Synthetic gear and multi-purpose oils for the food-processing and pharmaceutical industries



| Pack sizes       | Klüberoil 4 UH1-680 N | Klüberoil 4 UH1-1500 N |
|------------------|-----------------------|------------------------|
| Canister 20 l    | +                     | +                      |
| Drum 200 l       | +                     | +                      |
| Container 1000 l |                       |                        |

| Characteristics                                                                                       | Klüberoil 4 UH1-32 N          | Klüberoil 4 UH1-46 N          | Klüberoil 4 UH1-68 N          | Klüberoil 4 UH1-100 N         |
|-------------------------------------------------------------------------------------------------------|-------------------------------|-------------------------------|-------------------------------|-------------------------------|
| Article number                                                                                        | 029037                        | 029038                        | 029039                        | 029040                        |
| Service temperature, upper limit                                                                      | 120 °C                        | 120 °C                        | 120 °C                        | 120 °C                        |
| NSF H1 registration number                                                                            | 121152                        | 121175                        | 121174                        | 121173                        |
| Density, DIN 51757, 15°C                                                                              | approx. 844 kg/m³             | approx. 847 kg/m³             | approx. 851 kg/m³             | approx. 855 kg/m³             |
| Flash point, DIN EN ISO 2592, Cleveland open cup                                                      | ≥ 200 °C                      | ≥ 200 °C                      | ≥ 200 °C                      | ≥ 200 °C                      |
| Foam test, ISO 6247 / ASTM D892, 24°C, sequence I                                                     | ≤ 100/10 ml                   | ≤ 100/10 ml                   | ≤ 100/10 ml                   | ≤ 100/10 ml                   |
| Foam test, ISO 6247 / ASTM D892, 24°C, sequence III                                                   | ≤ 100/10 ml                   | ≤ 100/10 ml                   | ≤ 100/10 ml                   | ≤ 100/10 ml                   |
| Foam test, ISO 6247 / ASTM D892, 93.5°C, sequence II                                                  | ≤ 100/10 ml                   | ≤ 100/10 ml                   | ≤ 100/10 ml                   | ≤ 100/10 ml                   |
| ISO viscosity grade, DIN ISO 3448, ISO VG                                                             | 32                            | 46                            | 68                            | 100                           |
| Kinematic viscosity, DIN EN ISO 3104 / DIN 53000-1, based on standard / ASTM D445 / ASTM D7042, 100°C | approx. 6 mm²/s               | approx. 8 mm²/s               | approx. 11 mm²/s              | approx. 14 mm²/s              |
| Kinematic viscosity, DIN EN ISO 3104 / DIN 53000-1, based on standard / ASTM D445 / ASTM D7042, 40°C  | approx. 32 mm²/s              | approx. 46 mm²/s              | approx. 68 mm²/s              | approx. 100 mm²/s             |
| Viscosity index, DIN ISO 2909                                                                         | ≥ 135                         | ≥ 135                         | ≥ 140                         | ≥ 140                         |
| Copper corrosion, DIN EN ISO 2160, 24 h, 100°C                                                        | 1 - 100 - 24 corrosion degree | 1 - 100 - 24 corrosion degree | 1 - 100 - 24 corrosion degree | 1 - 100 - 24 corrosion degree |
| Steel corrosion, DIN ISO 7120 / ASTM D665, method A, 24 h, 60°C                                       | rust-free                     | rust-free                     | rust-free                     | rust-free                     |
| Pour point, DIN ISO 3016, ASTM D97, ASTM D5950, ASTM D7346                                            | ≤ -39 °C                      | ≤ -39 °C                      | ≤ -36 °C                      | ≤ -36 °C                      |
| Ageing behaviour, DIN EN ISO 4263-4 / ASTM D2893, 312 h, 95°C, increase in viscosity at 100°C         | ≤ 6 %                         | ≤ 6 %                         | ≤ 6 %                         | ≤ 6 %                         |
| FAG FE8 rolling bearing test, DIN 51819-3, D-7.5 / 80-80, wear of cage                                | ≤ 200 mg                      | ≤ 200 mg                      | ≤ 200 mg                      | ≤ 200 mg                      |
| FAG FE8 rolling bearing test, DIN 51819-3, D-7.5 / 80-80, wear of rolling elements                    | ≤ 30 mg                       | ≤ 30 mg                       | ≤ 30 mg                       | ≤ 30 mg                       |
| FZG scuffing test, DIN ISO 14635-1, A / 8.3 / 90, failure load stage                                  | ≥ 12                          | ≥ 12                          | ≥ 12                          | ≥ 12                          |

# Klüberoil 4 UH1 N

Synthetic gear and multi-purpose oils for the food-processing and pharmaceutical industries



| Characteristics                                                                                                                                          | Klüberoil 4 UH1-32 N   | Klüberoil 4 UH1-46 N   | Klüberoil 4 UH1-68 N   | Klüberoil 4 UH1-100 N  |
|----------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------|------------------------|------------------------|------------------------|
| Mineral Oils associated with, MOAH (Mineral Oil Aromatic Hydrocarbons), (Information based on recipe. The presence of impurities, cannot be ruled out.)  | No component of recipe | No component of recipe | No component of recipe | No component of recipe |
| Mineral Oils associated with, MOSH (Mineral Oil Saturated Hydrocarbons), (Information based on recipe. The presence of impurities, cannot be ruled out.) | No component of recipe | No component of recipe | No component of recipe | No component of recipe |
| Minimum shelf life from the date of manufacture - in a dry, frost-free place and in the unopened original container, approx.                             | 36 months              | 36 months              | 36 months              | 36 months              |

| Characteristics                                                                                       | Klüberoil 4 UH1-150 N         | Klüberoil 4 UH1-220 N         | Klüberoil 4 UH1-320 N         | Klüberoil 4 UH1-460 N         |
|-------------------------------------------------------------------------------------------------------|-------------------------------|-------------------------------|-------------------------------|-------------------------------|
| Article number                                                                                        | 029041                        | 029042                        | 029034                        | 029043                        |
| Service temperature, upper limit                                                                      | 120 °C                        | 120 °C                        | 120 °C                        | 120 °C                        |
| NSF H1 registration number                                                                            | 121172                        | 121171                        | 122841                        | 121170                        |
| Density, DIN 51757, 15°C                                                                              | approx. 858 kg/m³             | approx. 861 kg/m³             | approx. 862 kg/m³             | approx. 862 kg/m³             |
| Flash point, DIN EN ISO 2592, Cleveland open cup                                                      | ≥ 200 °C                      | ≥ 200 °C                      | ≥ 200 °C                      | ≥ 200 °C                      |
| Foam test, ISO 6247 / ASTM D892, 24°C, sequence I                                                     | ≤ 100/10 ml                   | ≤ 100/10 ml                   | ≤ 100/10 ml                   | ≤ 100/10 ml                   |
| Foam test, ISO 6247 / ASTM D892, 24°C, sequence III                                                   | ≤ 100/10 ml                   | ≤ 100/10 ml                   | ≤ 100/10 ml                   | ≤ 100/10 ml                   |
| Foam test, ISO 6247 / ASTM D892, 93.5°C, sequence II                                                  | ≤ 100/10 ml                   | ≤ 100/10 ml                   | ≤ 100/10 ml                   | ≤ 100/10 ml                   |
| ISO viscosity grade, DIN ISO 3448, ISO VG                                                             | 150                           | 220                           | 320                           | 460                           |
| Kinematic viscosity, DIN EN ISO 3104 / DIN 53000-1, based on standard / ASTM D445 / ASTM D7042, 100°C | approx. 19 mm²/s              | approx. 26 mm²/s              | approx. 35 mm²/s              | approx. 47 mm²/s              |
| Kinematic viscosity, DIN EN ISO 3104 / DIN 53000-1, based on standard / ASTM D445 / ASTM D7042, 40°C  | approx. 150 mm²/s             | approx. 220 mm²/s             | approx. 320 mm²/s             | approx. 460 mm²/s             |
| Viscosity index, DIN ISO 2909                                                                         | ≥ 140                         | ≥ 140                         | ≥ 150                         | ≥ 150                         |
| Copper corrosion, DIN EN ISO 2160, 24 h, 100°C                                                        | 1 - 100 - 24 corrosion degree | 1 - 100 - 24 corrosion degree | 1 - 100 - 24 corrosion degree | 1 - 100 - 24 corrosion degree |
| Steel corrosion, DIN ISO 7120 / ASTM D665, method A, 24 h, 60°C                                       | rust-free                     | rust-free                     | rust-free                     | rust-free                     |
| Pour point, DIN ISO 3016, ASTM D97, ASTM D5950, ASTM D7346                                            | ≤ -36 °C                      | ≤ -30 °C                      | ≤ -30 °C                      | ≤ -30 °C                      |

# Klüberoil 4 UH1 N

Synthetic gear and multi-purpose oils for the food-processing and pharmaceutical industries



| Characteristics                                                                                                                                          | Klüberoil 4 UH1-150 N  | Klüberoil 4 UH1-220 N  | Klüberoil 4 UH1-320 N  | Klüberoil 4 UH1-460 N  |
|----------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------|------------------------|------------------------|------------------------|
| Ageing behaviour, DIN EN ISO 4263-4 / ASTM D2893, 312 h, 95°C, increase in viscosity at 100°C                                                            | ≤ 6 %                  | ≤ 6 %                  | ≤ 6 %                  | ≤ 6 %                  |
| FAG FE8 rolling bearing test, DIN 51819-3, D-7.5 / 80-80, wear of cage                                                                                   | ≤ 200 mg               | ≤ 200 mg               | ≤ 200 mg               | ≤ 200 mg               |
| FAG FE8 rolling bearing test, DIN 51819-3, D-7.5 / 80-80, wear of rolling elements                                                                       | ≤ 30 mg                | ≤ 30 mg                | ≤ 30 mg                | ≤ 30 mg                |
| FZG scuffing test, DIN ISO 14635-1, A / 8.3 / 90, failure load stage                                                                                     | ≥ 12                   | ≥ 12                   | ≥ 12                   | ≥ 12                   |
| Mineral Oils associated with, MOAH (Mineral Oil Aromatic Hydrocarbons), (Information based on recipe. The presence of impurities, cannot be ruled out.)  | No component of recipe | No component of recipe | No component of recipe | No component of recipe |
| Mineral Oils associated with, MOSH (Mineral Oil Saturated Hydrocarbons), (Information based on recipe. The presence of impurities, cannot be ruled out.) | No component of recipe | No component of recipe | No component of recipe | No component of recipe |
| Minimum shelf life from the date of manufacture - in a dry, frost-free place and in the unopened original container, approx.                             | 36 months              | 36 months              | 36 months              | 36 months              |

| Characteristics                                                                                       | Klüberoil 4 UH1-680 N | Klüberoil 4 UH1-1500 N |
|-------------------------------------------------------------------------------------------------------|-----------------------|------------------------|
| Article number                                                                                        | 029044                | 029045                 |
| Service temperature, upper limit                                                                      | 120 °C                | 120 °C                 |
| NSF H1 registration number                                                                            | 121169                | 122842                 |
| Density, DIN 51757, 15°C                                                                              | 863 kg/m³             | approx. 866 kg/m³      |
| Flash point, DIN EN ISO 2592, Cleveland open cup                                                      | ≥ 200 °C              | ≥ 200 °C               |
| Foam test, ISO 6247 / ASTM D892, 24°C, sequence I                                                     | ≤ 100/10 ml           | -                      |
| Foam test, ISO 6247 / ASTM D892, 24°C, sequence III                                                   | ≤ 100/10 ml           | -                      |
| Foam test, ISO 6247 / ASTM D892, 93.5°C, sequence II                                                  | ≤ 100/10 ml           | -                      |
| ISO viscosity grade, DIN ISO 3448, ISO VG                                                             | 680                   | 1500                   |
| Kinematic viscosity, DIN EN ISO 3104 / DIN 53000-1, based on standard / ASTM D445 / ASTM D7042, 100°C | approx. 65 mm²/s      | approx. 125 mm²/s      |
| Kinematic viscosity, DIN EN ISO 3104 / DIN 53000-1, based on standard / ASTM D445 / ASTM D7042, 40°C  | approx. 680 mm²/s     | approx. 1500 mm²/s     |
| Viscosity index, DIN ISO 2909                                                                         | ≥ 150                 | ≥ 180                  |

# Klüberoil 4 UH1 N

Synthetic gear and multi-purpose oils for the food-processing and pharmaceutical industries



| Characteristics                                                                                                                                          | Klüberoil 4 UH1-680 N         | Klüberoil 4 UH1-1500 N        |
|----------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------|-------------------------------|
| Copper corrosion, DIN EN ISO 2160, 24 h, 100°C                                                                                                           | 1 - 100 - 24 corrosion degree | 1 - 100 - 24 corrosion degree |
| Steel corrosion, DIN ISO 7120 / ASTM D665, method A, 24 h, 60°C                                                                                          | rust-free                     | rust-free                     |
| Pour point, DIN ISO 3016, ASTM D97, ASTM D5950, ASTM D7346                                                                                               | ≤ -27 °C                      | ≤ -25 °C                      |
| Ageing behaviour, DIN EN ISO 4263-4 / ASTM D2893, 312 h, 95°C, increase in viscosity at 100°C                                                            | ≤ 6 %                         | ≤ 6 %                         |
| FAG FE8 rolling bearing test, DIN 51819-3, D-7.5 / 80-80, wear of cage                                                                                   | ≤ 200 mg                      | ≤ 200 mg                      |
| FAG FE8 rolling bearing test, DIN 51819-3, D-7.5 / 80-80, wear of rolling elements                                                                       | ≤ 30 mg                       | ≤ 30 mg                       |
| FZG scuffing test, DIN ISO 14635-1, A / 8.3 / 90, failure load stage                                                                                     | ≥ 12                          | ≥ 12                          |
| Mineral Oils associated with, MOAH (Mineral Oil Aromatic Hydrocarbons), (Information based on recipe. The presence of impurities, cannot be ruled out.)  | No component of recipe        | No component of recipe        |
| Mineral Oils associated with, MOSH (Mineral Oil Saturated Hydrocarbons), (Information based on recipe. The presence of impurities, cannot be ruled out.) | No component of recipe        | No component of recipe        |
| Minimum shelf life from the date of manufacture - in a dry, frost-free place and in the unopened original container, approx.                             | 36 months                     | 36 months                     |

## 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 95 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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