



Food-Grade Lubricants Catalogue





INDEX

| | |
|------------------------------------|----|
| Introduction..... | 4 |
| Oils for Hydraulic Systems..... | 6 |
| Oils for Gear Assemblies..... | 8 |
| Oil for Chains..... | 10 |
| Oil for Guides | 11 |
| Greases for Food Applications..... | 12 |
| Packs | 14 |
| Commercial Offices | 15 |

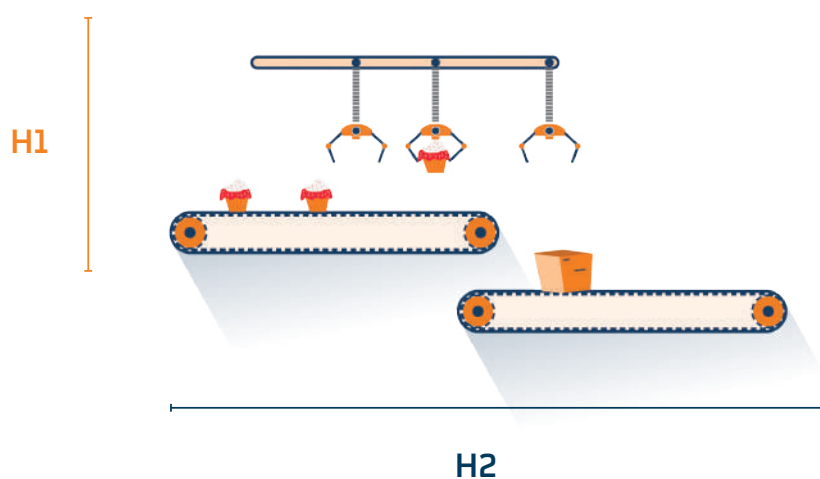
Introduction

The industries involved in the processing of foods or the raw materials that come into contact with foods pose a challenge for the companies that manufacture lubricants for these types of applications. Large-scale food processing requires **pumps, mixers, tanks, chains, conveyor belts and other equipment, all of which has the same lubrication requirements** as conventional equipment, but must also be lubricated with oils which are harmless to health in the event of a spillage.

The biggest challenge is to develop a lubricant capable of **protecting against wear, corrosion and the build-up of deposits inside equipment** in the same way as conventional oils do, according to the restrictions on the use of certain substances in the formulation, in order to obtain a lubricant which is suitable for accidental contact with food.

The lubricants used in the food industry must comply with additional requirements, protocols and certificates to those required of conventional lubricants. The best-known organisation worldwide is the **National Sanitation Foundation (NSF)**, which is responsible for evaluating and registering the chemical composition of each lubricant designed for this purpose and **grouping them according to their applications:**

- **H1:** used in environments in which foods are processed and where **there is the possibility of accidental contact with food**. These lubricants can only be formulated using the additives, lubricant base oils and thickeners listed under title 21 CFR 178.3750 of the FDA positive list, which is used by the NSF to catalogue lubricants on the basis of their chemistry. This group includes the lubricants designed by Repsol for its new accidental contact range.
- **H2:** used in equipment and machinery where there is **no possibility** of the lubricant or lubricated surface coming into **contact with food**. As there is no risk of contact with food, the H2 lubricants have fewer formulation restrictions than those categorised as H1.
- **H3:** also known as soluble or edible oils, they can be used to **clean and prevent rust**.





Category H1 Repsol Lubricants

Maximum innovation and quality for the most demanding industries

Repsol offers the food industry its range of **Category H1 Lubricants**. A range of **high-quality accidental contact lubricants** designed by Repsol to meet the most demanding lubrication needs of the food processing industry and its machinery.

They have a unique formulation which complies with special requirements, protocols and certificates, ensuring that they are **harmless to health** in the event of spillage or contact with food. All this whilst maintaining their **high lubrication quality**.

Innovation and high quality for your company

You also get the **most innovative products**. Because at Repsol we have our research center, **Repsol Technology Lab**, at the forefront of R&D+i worldwide. Here, our technicians and researchers are constantly striving to improve every product we offer to ensure maximum efficiency, as well as enhanced technical and environmental quality.

With the Repsol guarantee

The guarantee of a **large integrated global energy company** which carries out exploration, production, refining, distribution and marketing activities in **more than 90 countries**. It provides millions of people and companies all over the world with the most efficient, responsible and innovative energy solutions.

Discover the **range of Repsol Food-Grade Lubricants** in this catalogue:

- Oils for hydraulic systems
- Oils for gear assemblies
- Oil for chains
- Oil for guides
- Greases for food applications



1.

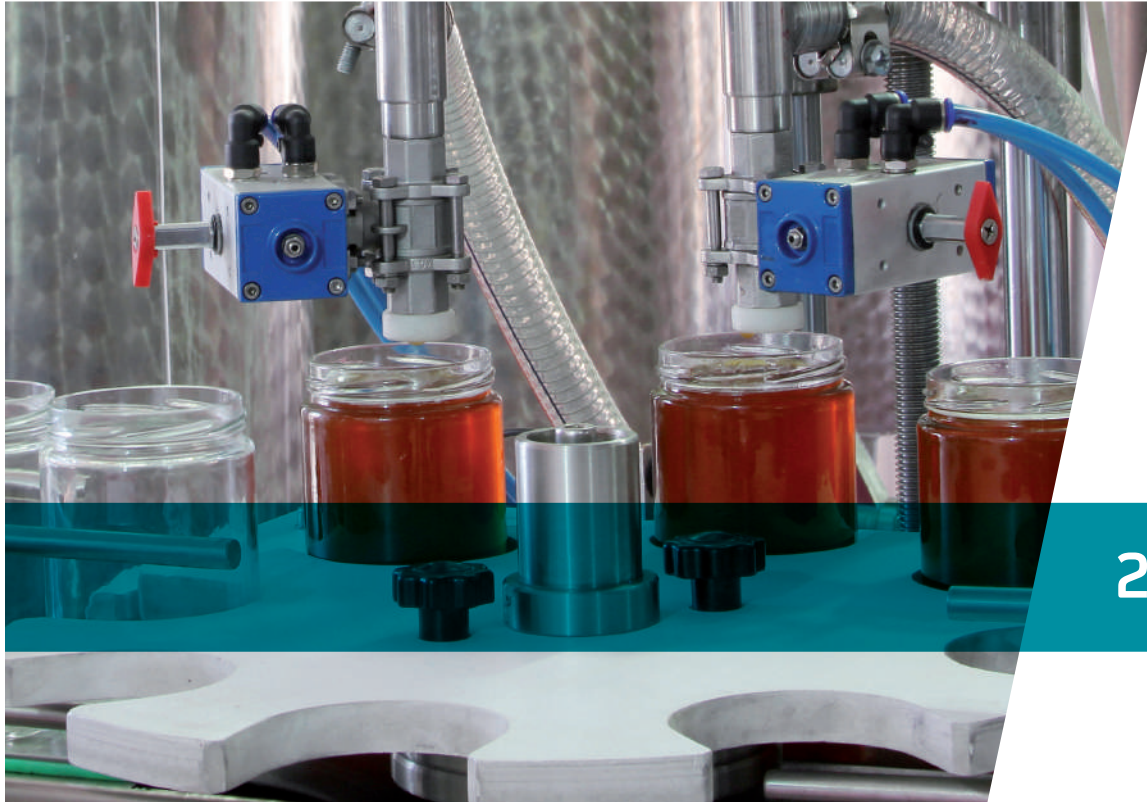
Oils for Hydraulic Systems

The **FG HYDRAULIC** range of lubricants for accidental contact with **food** is formulated with **white mineral oil**. These oils are enhanced with additives included in the FDA positive list, providing the FG HYDRAULIC lubricant with the same performance as conventional oils. The **NSF category H1 accreditation** allows this lubricant to be used in all hydraulic applications where there is the possibility of food being contaminated. Lubricant classified as HLP according to DIN 51524 part 2, AFNOR NFE 48603-HM and ISO 6743/4 HM.



FG HYDRAULIC technical characteristics:

| TESTS | UNIT | METHOD | VALUES | | | |
|----------------------------------|----------|------------|---------|---------|---------|---------|
| ISO grade | | | 32 | 46 | 68 | 100 |
| NSF registration no. | | | 154735 | 154481 | 154482 | 154736 |
| Viscosity at 40° | cSt | ASTM D445 | 32 | 46 | 68 | 100 |
| Viscosity index | cSt | ASTM D2270 | 105 | 105 | 105 | 100 |
| Flash point | °C | ASTM D92 | 170 | 180 | 200 | 215 |
| Pour point | °C | ASTM D97 | -21 | -21 | -18 | -18 |
| Copper corrosion 3 hours at 100° | | ASTM D130 | 1A | 1A | 1A | 1A |
| Aniline point | °C | ASTM D611 | 105 | 105 | 105 | 105 |
| Rust resistance A and B | | ASTM D665 | Pasa | Pasa | Pasa | Pasa |
| Density at 20° | g/cm³ | ASTM D4052 | 0.848 | 0.853 | 0.859 | 0.865 |
| Demulsification | ml/ml/ml | ASTM D1401 | 40/37/3 | 40/37/3 | 40/37/3 | 40/37/3 |



2.

Oils for Gear Assemblies

There are a number of different scenarios in gear assembly and bearing applications, basically due to the working pressures and temperatures to which the lubricants are subjected in these applications. In its endeavour to provide the ideal lubricant for every piece of equipment, Repsol has developed two types of gear assembly oils adapted to the general needs of the food industry. **FG GEAR** is a **semi-synthetic lubricant enhanced with extreme-pressure additives** included in the FDA positive list. This means that its performance in machinery is similar to our conventional oil, the only difference being that it is categorised as an H1 lubricant by the NSF.

The **FG GEAR SYNTH** has been developed for installations with extremely severe load and temperature conditions. It is formulated with fully synthetic base oils to obtain a lubricant which is able to offer excellent performance in the most extreme pressure and temperature conditions. It is suitable for the most severe working environments in which a polyalphaolefin (PAO) based synthetic lubricant is required to lubricate the most demanding additive applications according to FDA restrictions and is categorised as an H1 lubricant by the NSF.

FG GEAR technical characteristics:

| TESTS | UNIT | METHOD | VALUES | | |
|----------------------|-------|------------|---------|---------|---------|
| ISO grade | | | 150 | 220 | 320 |
| NSF registration no. | | | 154737 | 154738 | 154739 |
| Viscosity at 40° | cSt | ASTM D445 | 135/165 | 192/242 | 288/352 |
| Viscosity at 100° | cSt | ASTM D445 | 16.5 | 21.1 | 28 |
| Viscosity index | cSt | ASTM D2270 | 113 | 116 | 118 |
| Pour point | °C | ASTM D97 | -12 | -12 | -12 |
| Flash point | °C | ASTM D92 | 253 | 254 | 256 |
| Copper corrosion | | ASTM D130 | 1A | 1A | 1A |
| FZG test | Stage | DIN 51354 | >12 | >12 | >12 |
| Weld load [min] | Kg | ASTM D4172 | 160 | 160 | 160 |
| Density at 20° | g/cm³ | ASTM D4052 | 0.886 | 0.872 | 0.873 |

FG GEAR SYNTH technical characteristics:

| TESTS | UNIT | METHOD | VALUES | | | |
|--------------------------|-------|------------|---------|---------|---------|---------|
| ISO grade | | | 150 | 220 | 320 | 460 |
| NSF H1 registration code | | | 155056 | 155057 | 155058 | 155059 |
| Density at 20° | g/cm³ | ASTM D4052 | 0.841 | 0.844 | 0.844 | 0.845 |
| Viscosity at 40° | cSt | ASTM D445 | 135/165 | 198/242 | 288/352 | 414/506 |
| Viscosity at 100° | cSt | ASTM D445 | 21.4 | 28.2 | 36.9 | 47.5 |
| Viscosity index | cSt | ASTM D2270 | 160 | 160 | 160 | 160 |
| Pour point | °C | ASTM D97 | -46 | -43 | -42 | -40 |
| Flash point | °C | ASTM D92 | 240 | 240 | 240 | 250 |
| Copper corrosion | | ASTM D130 | 1A | 1A | 1A | 1A |
| FZG test | Stage | DIN 51354 | >12 | >12 | >12 | >12 |

Oil for Chains

Synthetic oil developed for its application in **oven conveyor belt chains** that move food around whilst working at high temperatures. The product is able to work at up to 240°C, maintaining outstanding lubrication capacity due to its **excellent antioxidant additives**. Its good adhesion and oiliness also means that it does not slip down from the point of application.

The oil is enhanced with **anti-wear additives and corrosion inhibitors** to withstand the demanding working conditions to which this oil will be subjected in application. It has been especially stabilised for use at high temperatures, leaving minimal evaporation residue.

3.



FG CHAIN technical characteristics:

| TESTS | UNIT | METHOD | VALUES |
|----------------------|-------|------------|--------|
| ISO grade | | | 320 |
| NSF registration no. | | | 154478 |
| Density at 20° | g/cm³ | ASTM D4052 | 0.906 |
| Viscosity at 40° | cSt | ASTM D445 | 310.2 |
| Viscosity at 100° | cSt | ASTM D445 | 26.1 |
| Viscosity index | cSt | ASTM D2270 | 120 |
| Pour point | °C | ASTM D97 | -12 |
| Flash point | °C | ASTM D92 | 246 |

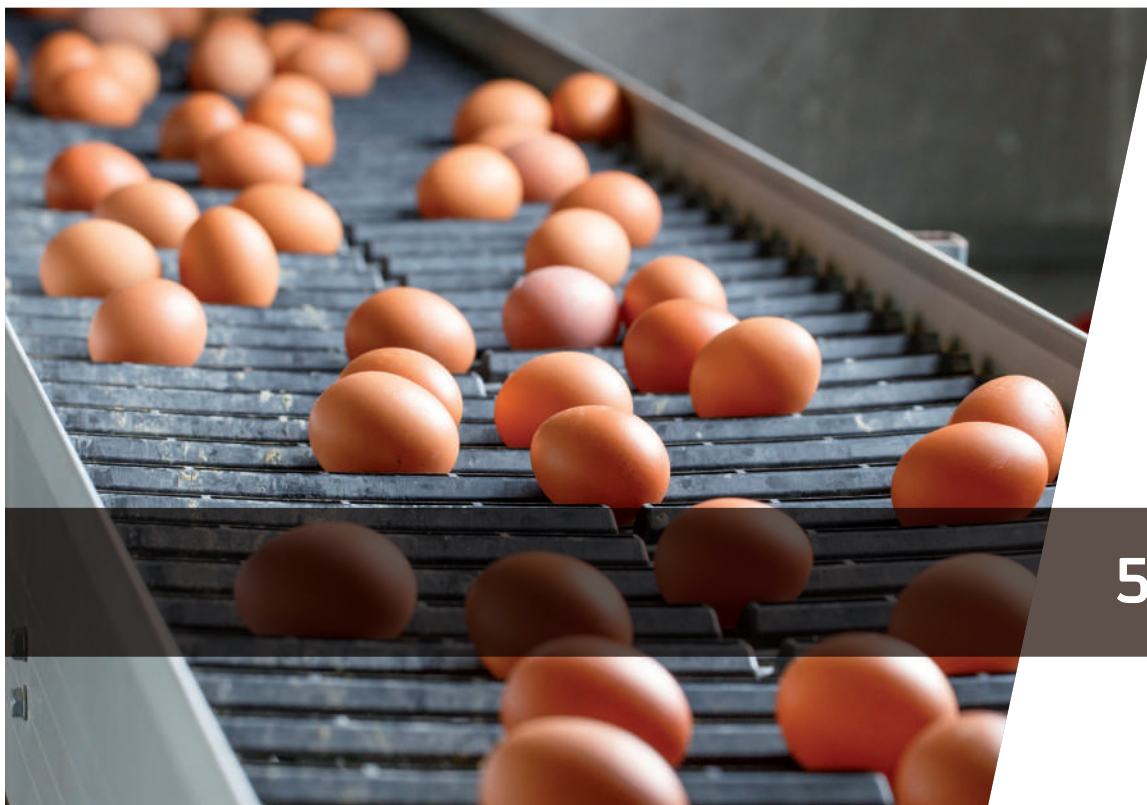
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Oil for Guides

Semi-synthetic oil enhanced with anti-stick-slip additives, it is especially designed to work in the **lubrication of horizontal and vertical guides** without slipping down. The oil is able to work in humid environments subjected to high temperatures due to its anti-wear and anti-rust additives.

FG SLIDEWAY technical characteristics:

| TESTS | UNIT | METHOD | VALUES | |
|----------------------|------|------------|--------|--------|
| ISO grade | | | 68 | 220 |
| NSF registration no. | | | 154479 | 154480 |
| Viscosity at 40° | cSt | ASTM D445 | 68 | 220 |
| Viscosity at 100° | cSt | ASTM D445 | 9.8 | 22.2 |
| Viscosity index | cSt | ASTM D2270 | 130 | 118 |
| Pour point | °C | ASTM D97 | -12 | -12 |
| Flash point | °C | ASTM D92 | 206 | 240 |
| Copper corrosion | | ASTM D130 | 1a | 1a |
| Weld load | Kg | ASTM D4172 | 160 | 160 |



5.

Greases for Food Applications

FG ALUMINIUM COMPLEX grease is suitable for accidental contact with foods and has been developed for use in the food processing industry in applications which require grease with excellent performance at **high working temperatures**.

The formulation of this grease based on **complex aluminium** soap and synthetic oil offers unbeatable performance in an extremely wide range of temperatures. It is able to work correctly from -30°C up to operating temperatures close to 180°C.

The carefully balanced additives enhanced with solid PTFE loads provide excellent anti-corrosion, antioxidant, anti-wear and extreme-pressure properties, qualities which are required to guarantee that it will work in the most demanding applications. The grease has **excellent adhesive and lubrication capacity** and is especially designed to work in bearings subjected to severe temperature conditions.

The **FG CALCIUM SULFONATE grease** is an extremely high-performance lubricant for use in applications which require a product with excellent mechanical load performance in **environments with high humidity**.

Formulated with **complex calcium sulfonate soap**, this grease has very good metal affinity, high stability in load work and high lubricant and antioxidant power due to the semi-synthetic base oil used in its formulation. The grease is able to operate across a range of temperatures from -30°C to 170°C, maintaining the lubricant properties and protecting the equipment.

Grease with excellent **sealing power** which is ideal for working in the lubrication of bearings subjected to extreme working conditions.

The product is especially designed to work in bearings subjected to high loads in environments with high humidity.

FG ALUMINIUM COMPLEX technical characteristics:

| TESTS | UNIT | METHOD | VALUES |
|---------------------------|---------|-------------|-------------------|
| Colour | | | Ivory |
| Thickener | | | Aluminium complex |
| Base oil | | | Synthetic |
| Consistency | | NLGI | 2 |
| Penetration at 60 strokes | 1/10 mm | ASTM D217 | 265/295 |
| Weld load | Kg | IP 239 | Min 400 |
| Drop point | °C | ASTM D566 | 240 |
| Flow pressure [-35°] | mbar | ASTM D51805 | Max 1000 |
| EMCOR corrosion | | ASTM D51802 | Max 0.5 |

FG CALCIUM SULFONATE technical characteristics:

| TESTS | UNIT | METHOD | VALUES |
|------------------------------|------|-------------|-------------------|
| Colour | | | Light brown |
| Thickener | | | Calcium sulfonate |
| Base oil | | | Semi-synthetic |
| Consistency | | NLGI | 1/2 |
| Penetration at 60 strokes | | ASTM D217 | 305 |
| Weld load | kg | IP 239 | 700 |
| Drop point | °C | ASTM D566 | 270 |
| Water resistance 3 hours/90° | | ASTM D51807 | 0 grade |
| EMCOR corrosion | | ASTM D51802 | 0 grade |

PACKS

| REPSOL PRODUCTS | 1000L container | 208L drum | 20L drum | Cartridge |
|-----------------------------|-----------------|-----------|----------|-----------|
| FG HYDRAULIC 32 | | ✓ | ✓ | |
| FG HYDRAULIC 46 | ✓ | ✓ | ✓ | |
| FG HYDRAULIC 68 | ✓ | ✓ | ✓ | |
| FG HYDRAULIC 100 | | ✓ | ✓ | |
| FG GEAR 150 | | ✓ | ✓ | |
| FG GEAR 220 | | ✓ | ✓ | |
| FG GEAR 320 | | ✓ | ✓ | |
| FG GEAR SYNTH 150 | | ✓ | | |
| FG GEAR SYNTH 220 | | ✓ | ✓ | |
| FG GEAR SYNTH 320 | | ✓ | ✓ | |
| FG GEAR SYNTH 460 | | ✓ | ✓ | |
| FG SLIDEWAY 68 | | ✓ | | |
| FG SLIDEWAY 220 | | ✓ | | |
| FG CHAIN 320 | | ✓ | | |
| FG CALCIUM SULFONATE GREASE | | | | ✓ |
| FG ALUMINIUM COMPLEX GREASE | | | | ✓ |

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