AXEL Food Grade

Tailored Grease Technology for Your Most Demanding Applications

AXEL

AXEL CHRISTIERNSSON

FOOD GRADE: A HIGH PRIORITY FOR ALL

As consumers have become more aware of the quality of food, managing risk in the food supply chain has become a high priority for all food and beverage companies today.

Eager to prevent contamination by lubricants used in food processing industries, AXEL Christiernsson participated in the first setup of a guide on choosing and using food-grade lubricants under the responsibility of CNRS (Centre National De La Recherche Scientifique) in France.

Since then, AXEL Christiernsson has constantly invested in Research & Development to find lubricants with an increasingly high performance that meet food standards. Our ISO 21469 registered facilities dedicated to the manufacture of these lubricants make use of the most advanced equipment processes and technologies in the industry.

AXEL Christiernsson is convinced that the use of lubricants in food processing industries is on the rise and presents this guide to assist those who are involved in these interesting developments.

FOOD GRADE LUBRICANTS

Definitions

Food Grade H1

A food grade H1 lubricant is a lubricant which meets food standards and does not generate harm in case of incidental contact with foodstuffs.

Food Grade 3H

A food grade 3H lubricant is a release agent that can be used on grills, loaf pans, cutters, boning benches, chopping boards, or other hard surfaces in direct contact with meat and poultry food products to prevent food from adhering during processing.

Similar Constraints

Food grade lubricants are subject to the same constraints as those encountered in industrial applications (i.e. bearings, gears, chains). Hence, their features are similar:

- Performance at high and low temperatures
- Resistance to washing (water or steam)
- Resistance to pressure and loads
- Adhesion to surfaces
- Protection against wear, friction, corrosion, and oxidation

Besides having the same functions as conventional lubricants, food grade lubricants also have particular properties inherent to food processing industries:

- Non-toxic properties
- No physiological effects (harmless)
- Odourless and insipid
- Neutral behaviour when in contact with equipment

The regulations applicable to lubrication in the food processing industry are different from one country to another and are constantly evolving.

Registration

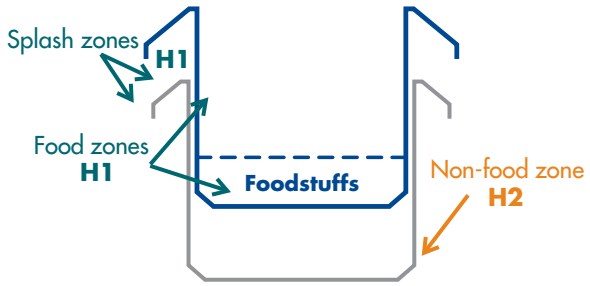
The NSF (National Sanitation Foundation) delivers new registration certificates H1, H2, etc. under the name NSF H1, NSF H2 etc. The products registered with NSF are listed in the NSF White Book*, an easy-to-use online list of registered products for quick reference as to whether a product is acceptable for use in a processing facility.

The NSF Agreements are recognised by food processing industries worldwide.

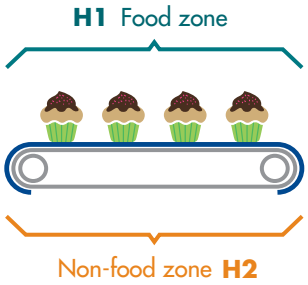
Companies may secure H1 registration with INS Services (UK), as well as registering a product, or even a company, under the ISO 21469 standard.

NSF Regulations

H1: General -- Incidental contact
Authorised for fortuitous contact (indirect or incidental) with foodstuffs



H2: General -- No contact
Not authorised for contact with foodstuffs



Where there is a risk of contamination indirect or incidental contact, only H1 type lubricants may be used ("lubricants for food contact").

In the non-food zones, where no risk of contact is possible, H2 lubricants may be used. H2 type conventional lubricants are not admitted in the food zones and splash zones.

Where there is a risk of leakage, flow or splashes, it is referred to as indirect or fortuitous contact because it is an incidental or unexpected contact between the lubricant and the foodstuffs.

When foodstuffs are in permanent contact with the lubricant, it is referred to as direct contact.

* www.NSFwhitebook.org

ISO 21469

"Safety of machinery – Lubricants with incidental product contact – Hygiene requirements".

ISO 21469 is the global standard for lubricant manufactures who produce lubricants used in specialized industries such as food and pharmaceutical sectors.

This standard determines hygienic requirements for the formulation, manufacturing, distribution and storage of lubricants that may have incidental contact with products during processing and therefore require compliance with a stringent evaluation process of the lubricant and production facilities. To obtain ISO 21469 certification, manufacturers must submit to thorough testing of lubricant formulation, toxicology and product use as well as unannounced annual plant audits.

Halal

HQC Halal Certification has been achieved by adhering to the highest international, accepted standards regarding Halal production.

Kosher

Kosher certification guarantees that the source of the ingredients and the status of the production equipment meet strict Kosher requirements.

RISK REDUCTION ASSOCIATED WITH LUBRICANT USE

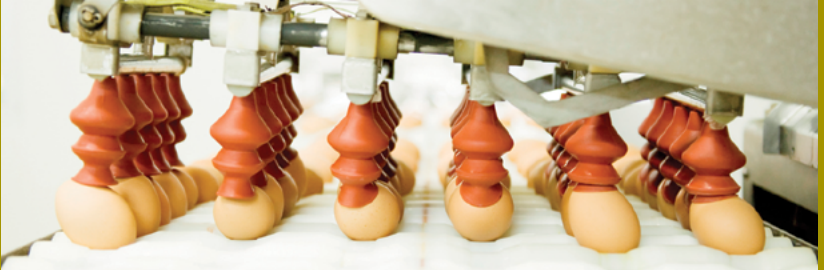
ISO 9001 and ISO 21469 standards emphasise the importance of considering and reducing the risks associated with lubricant contaminations.

Mechanical and procedural failures

- ✗ Leakage from bearings
- ✗ Drips and splashes from open lubrication points (i.e. chains, open bearings)
- ✗ Leakage from oil circulation systems, especially those where the oil is circulated under pressure and a small leak can result in a fine spray of oil onto the food
- ✗ Spillage of oil during machine maintenance
- ✗ Use of fortuitous or incidental contact lubricants for direct contact (mould-release) application

Preventive actions

- ✓ Avoid placing bearings or other equipment requiring lubricants in positions where food contamination can occur
- ✓ Wipe off all excess lubricant and remove the soiled oily and greasy rags immediately
- ✓ Make permanent repairs as soon as possible
- ✓ Sanitise and dry tools before use
- ✓ When repair work is completed, thoroughly clean the equipment and surrounding area before restarting production
- ✓ Set up an adequate preventive maintenance programme covering all items of equipment
- ✓ To guarantee the appropriate use of the right materials, draw up procedures describing the preventive measures to be taken



Deterioration of lubricants during operation

- ✗ Contamination with non-food grade lubricants
- ✗ Contamination with water, which will reduce the working life of machine parts
- ✗ Contamination with drinks or food, which may lead to the growth of bacteria and fungus
- ✗ Contamination by physical and chemical substances, which may cause oxidation and/or other chemical reactions, decreasing the proper function of the lubricants

Preventive actions

- ✓ Identify and analyse all lubrication points
- ✓ Use only food grade cleaning solvents and drinking water, and take care when using high-pressure cleaning
- ✓ Set up a control plan to analyse the lubricants during their use with respect to the proper function of the lubricants and/or their level of contamination

Lubrication and maintenance practices

- ✗ Improper filling, mostly overfilling of oil reservoirs, and overpacking of bearings with grease
- ✗ Filling up of marked lubrication points with improper lubricants (i.e. non-food grade lubricants or food grade lubricants used in the past)
- ✗ Required procedures and/or work instructions are not being followed properly
- ✗ Lack of, or insufficient, training of maintenance personnel

Preventive actions

- ✓ Store the food grade lubricants in a suitable location, off the floor and in sealed packs or containers
- ✓ Select and use the correct lubricant for each machine lubrication point, following the instructions of the equipment manufacturer and the lubricant supplier
- ✓ Use dedicated tools, sanitised and dried right after use, and sanitarily stored
- ✓ Organise a training programme for all maintenance personnel

FOOD GRADE LUBRICANTS: COMPOSITION

General Greases

Food grade lubricating greases must meet food standards and should not generate harm in case of contact with foodstuffs. Therefore, the compositions for food grade lubricant formulations should be selected and compiled in accordance with stringent specifications.

The authorised substance list for food grade lubricants is annually established and regulated by the U.S. Food and Drug Administration (FDA) through Title 21 of the Code of Federal Regulations.

As far as food grade lubricants are concerned, these substances are mainly listed in the 178.3570 paragraph of the 21 CFR and in GRAS List.

Base Oils

Authorised NSF H1

- White oils
- Polyalphaolefins
- Esters
- Polyglycols
- Silicones

Additives

Authorised NSF H1

- Mainly listed in the 178.3570 paragraph of the 21 CFR

Thickeners

Authorised NSF H1

Metallic soaps

- Calcium

Complex soaps

- Aluminium
- Calcium
- Calcium Sulfonate

Non-soap thickeners

- Silica
- Clay
- Polyurea
- PTFE

FINDING THE RIGHT FOOD GRADE LUBRICANT

Companies in the food industry have the responsibility to supply safe food to the consumer. In recent years, there has been more news about safety issues due to contamination by traditional lubricants not authorized for contact with foodstuffs. These scandals result in product recalls and generate customer mistrust, both of which can be very costly for food companies.

As a consequence, there has been a clear upswing in demand for lubricants that are suitable for use in the food industry. At the same time, there have been considerable changes in the approval procedures to verify compliance.

Modern food grade lubricants provide the same lubricating function as conventional lubricants but without posing any known health risk to the consumer. Therefore, there are stringent requirements on the contents of food grade lubricants and on the manufacturing processes used to produce them.

HACCP (Hazard Analysis Critical Control Points) is an important process managing system that identifies where potential contamination can occur and strictly controls these areas, ensuring the safest product possible is being produced. There are several useful processes or tools for identifying, analyzing and managing risks, such as ISO 22000 (Food Safety Management Systems), Safe Quality Food (SQF), British Retail Consortium (BRC), International Food Standard (IFS), etc.

With AXEL Christiernsson's high-performance food grade lubricants, provide suitable lubrication solutions for your HACCP processes. These exceptional products reduce maintenance costs and increase production efficiency in beverage, bakery, dairy and other food industries.

A single lubricant cannot handle all the lubrication needs at a food facility. AXEL provides customised food grade lubricating solutions and a comprehensive product line to protect a wide range of equipment and moving parts including hydraulics, gears, compressors, vacuum pumps, chains and bearings.

In addition to providing the precise food grade lubricant, AXEL'S ISO 21469 Certification offers product and quality assurance throughout the entire manufacturing process.

FOOD GRADE LUBRICANTS H1 (SAMPLE RANGE)

HYDRAULICS

Food Fluid
White mineral oil based – Viscosity Index approximately 140
Colourless – High Viscosity Index – Anti-Wear – Anti-Rust – Anti-Oxidant
Grades: ISO 15, 22, 32, 46, 68, 100

Food Fluid HM
White mineral oil based – Viscosity Index approximately 100
Colourless – Anti-Wear – Anti-Rust – Anti-Oxidant
Grades: ISO 32, 46, 68

Food Ice
Synthetic lubricant
Colourless – Anti-Wear – Anti-Rust – Anti-Oxidant
Grades: ISO 32, 46, 68, 100, 150

Main uses: Hydraulic circuits, jacks.

GEARS

Food Gear
Semi-synthetic lubricant
Colourless – Resistant to Loads – Excellent Shear Stability
Grades: ISO 68, 100, 150, 220, 320, 460, 680

Food Gear S
Synthetic lubricant
Colourless – Resistant to Loads – Excellent Shear Stability
Grades: ISO 100, 150, 220, 320, 460, 680

Main uses: Perfect for use in gears and loaded reductors.
ISO grade recommended by manufacturer must be respected.

COMPRESSORS

Food Compressor
Synthetic lubricant
Long Oil Life – High Temperature Resistance
Grades: ISO 46, 68, 100

Main uses: Air and screw compressors, hydraulic circuits, jacks.

Nonfood Compounds Program Listed H1 Registration No.

VACUUM PUMPS

Vacuum Pump 100

Synthetic lubricant
Grade: ISO 100

Main uses: Vacuum pumps.

HIGH TEMPERATURE CHAINS

Food Chaine HT

Synthetic lubricant – Temperature range: -40°C to +170°C
Grades: ISO 150, 220, 320

Food Chaine HTE

Synthetic lubricant – Temperature range: -40°C to +250°C
Grades: ISO 220 and 320

Food Chaine TSX

Synthetic lubricant – Temperature range: -40°C to +260°C
Grade: ISO 320

Main uses: Conveyor chains, lubrication for bread production, bakeries, ovens with high-temperature conditions. Can be applied by dripping, spraying, etc.

LOW TEMPERATURE CHAINS

Food Ice

Synthetic lubricant – Temperature range: -50°C to +150°C
Grades: ISO 32, 46, 68, 100, 150

Main uses: Chains with low-temperature conditions, refrigeration lubrication. Can be applied by dripping.

FOOD GRADE GREASES H1 (SAMPLE RANGE)

MULTIPURPOSE ALUMINIUM SOAP

Alutac FM

Aluminium thickened - multipurpose grease
Very high performance in the presence of water and steam.

White mineral oil based: NLGI 00 – 0 – 1 – 2 – 2,5
Main uses: Loaded bearings (conveyors, belts). Various applications in the presence of water.
Synthetic oil based: NLGI 000 – 00 – 0 – 1 – 1,5 – 2
Main uses: Loaded bearings for conveyors, sleeve bearings at high temperatures, crimpers, fan bearings.

Alutac TFFM

Aluminium thickened – PTFE reinforced
Reinforced to improve rubbing coefficient. Very high performance in the presence of water and steam.

White mineral base oil: NLGI 000 – 00 – 0 – 1 – 2
Main uses: Loaded bearings (conveyors, belts).
Various applications in the presence of water. Centralised greasing (NLGI 00).
Synthetic base oil: NLGI 1,5
Main uses: Loaded bearings for conveyors, sleeve bearings at high temperatures, crimpers, fan bearings.

Alutac EPFM

Aluminium thickened
High EP Properties. Very high performance in the presence of water and steam.

NLGI 1
Main uses: Loaded bearings for conveyors, sleeve bearings at high temperatures. Bearings, chains, and various applications (i.e. press machines, applications with high speed and load).

CALCIUM COMPLEX

Thermocal FM

Very adhesive (anti-ejection) at high rotation speeds
Very high resistance to pressures, loads and shocks

White mineral base oil: NLGI 1
Main uses: Pellet press machines.
Semi-synthtic base oil: NLGI 1,5
Main uses: Pellet press machines.
Synthetic base oil: NLGI 1 – 2
Main uses: Pellet press machines, steriliser machines.

INORGANIC

CALCIUM SULPHONATE COMPLEX

NSF®
Nonfood Compounds
Program Listed H1
Registration No.

Acillene FMFR

Silica gel – white mineral base oil
Colourless – insipid. Excellent performance in the presence of water and steam.

NLGI 00
Main uses: Centralised greasing, general greasing.
NLGI 2
Main uses: General greasing and espacilly for grape-harvest lubrications.

Acillene TFFM

Silica gel – PTFE reinforced
Reinforced to improve rubbing coefficient. Very good protection against oxidation. Insoluble in water and steam.

NLGI 2
Main uses: Canning factories: pistons, dispensers, bottling.
Gates and valves needing a grease to eliminate shocks.

Acillene 873 FM

Silica gel – silicone base oil
Appropriate for static lubrication at high temperatures and in demanding conditions.

NLGI 3
Main uses: Sanitary appliances, gates, pressure reducers, doughnut rings, conveyor belts, cable drafts, water pumps requiring silicone grease.

Calsullence FM

Excellent load carry capacity and mechanical stability. Good corrosion protection and excellent water resistance.

White mineral base oil: NLGI 2
Main uses: Pellet presses and compactors used to process pet food and animal feed

AXEL CHRISTIERNSSON
Your Global Partner

With over 125 years of experience, AXEL Christiernsson has expanded dramatically to become one of the leading global producers and suppliers of lubricating greases, with state-of-the-art manufacturing facilities in Sweden, France, the Netherlands and the USA.

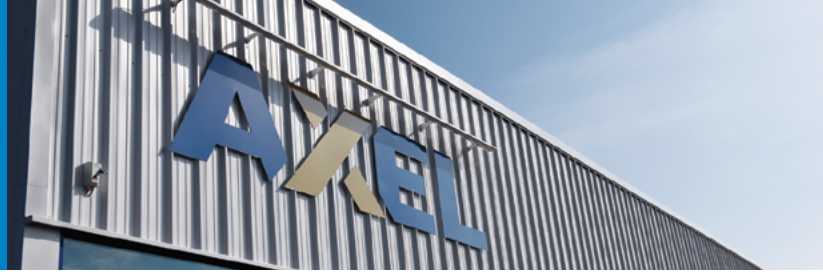
AXEL Christiernsson partners with many of the leading lubricant companies around the world who choose us because of our unique Customised Label™ concept.

CUSTOMISED LABEL™
Premium Products

AXEL Christiernsson's Customised Label™ concept ensures that every product leaving our plants is customised to your needs and labelled in your name. At AXEL Christiernsson we do not have our own brand and do not compete with our customers.

All AXEL Christiernsson products are produced under the strictest quality standards including ISO 9001, 14001, 21469 and TS 16949.

AXEL Customised Label™
Your brand, your markets
our knowledge



AXEL FOOD GRADE

As a subsidiary of AXEL Christiernsson, AXEL France is a leading "Customised Label™" food grade lubricant manufacturer.

AXEL France provides integrated H1 or 3H registered products. The entire range of food grade lubricant and grease is also Kosher and Halal Certified.

Alongside necessary food grade products' registrations and certifications, our dedicated food grade facility is certified ISO 21469 which ensures the quality of each and every step in the food grade lubricant manufacturing process.

AXEL PREMIUM SERVICES

In addition to supplying our customers with high-quality food grade lubricants, we work alongside our customers to provide premium services and valuable marketing support.

AXEL Christiernsson provides its customers with the ability to tailor Service Level Agreements (SLAs) according to their specific needs.

- Ease of Supply – Partnering for Production
- Product Development
- Logistical Management
- Technical Support and Services
- Marketing and Sales Support

Ease of Supply™
The products and services we provide become an integral part of your value chain

ISO 9001
ISO 14001
ISO 21469

Axel Christiernsson is Certified ISO 21469
Safety of Machinery
Lubricants with Incidental Product Contact
Hygiene Requirements

AXEL CHRISTIERNSSON GLOBAL FACILITIES

AXEL CHRISTIERNSSON AB

STRANDVÄGEN 10, BOX 2100
449 41 NOL
SWEDEN

PHONE: +46 303 33 25 00
EMAIL: INFO@AXELCH.COM

AXEL AMERICAS LLC

1440 ERIE ST.
NORTH KANSAS CITY, MO. 64116
USA

PHONE: +1 816 471 4590
EMAIL: INFO@AXELCH.COM

AXEL CHRISTIERNSSON
INTERNATIONAL AB

STRANDVÄGEN, BOX 2100
449 41 NOL
SWEDEN

PHONE: +46 303 33 25 00
EMAIL: INFO@AXELCH.COM

AXEL CHRISTIERNSSON B.V.

1 FEBRUARIWEG 13
4794 SM HEIJNINGEN
NETHERLANDS

PHONE: +31 167 522 980
EMAIL: INFO@AXELCH.COM

AXEL AMERICAS LLC

150 RUSSEL CRUTCHER ROAD,
ROSEDALE, MS. 38769
USA

PHONE: +1 662 759 6808
EMAIL: INFO@AXELCH.COM

AXEL FRANCE SAS

30 RUE DE PIED DE FOND
ZI ST LIGUAIRE - CS 98821
79028 NIORT CEDEX
FRANCE

PHONE: +33 5 49 77 13 71
EMAIL: INFO.FRANCE@AXELCH.COM

AXEL CHRISTIERNSSON

WWW.AXELCH.COM
INFO@AXELCH.COM

A COMPANY IN THE FAIRFORD GROUP