World Halal Research Summit
May 7/8, 2009 Kuala Lumpur

Halal Certified Food Machinery Lubricants
- Reducing Contamination Risks

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The food industry and raw materials suppliers from the pharmaceutical and chemical industries are putting more and more pressure on lubricant manufacturers to develop and recommend special lubricants for the processing of foodstuffs:

- New and more demanding Legislation
- Higher hygiene standards, such as the HACCP (Hazard Analysis and Critical Control Points)
- ... and not to forget: the basic function of Lubricants
Introduction

Machinery and equipment in the food industry do in principle not differ from those used in other industries, but the environmental influences acting upon them may be considerably more complex:

- Daily Cleaning of Machinery, sometimes with:
  - High Pressure water washing & aggressive cleaning/sanitizing fluids.
- Contamination with active substances (Fruit Juices & Sugar)
- Impact of extreme Temperatures, from Shock Freezing to Wafer Ovens (extremely low to very high in short time periods)
Introduction

Specialist knowledge and practical experience are very important to allow the best possible lubricant to be recommended and the maintenance intervals for lubrication to be specified, the latter being tailored to the particular application and the environmental conditions.

Oil change intervals depend more on contamination of the lubricant than on the reduction of its lubrication properties due to the degradation of additives, or the oxidation of the lubricant.

An exciting challenge which will have to be met with a range of high-performance lubricants and with specialist knowledge. User input is essential here.
Market Insight

Quality, hygiene and product liability are exceptionally important matters in the food, drink and pharmaceutical industries. Large sums are invested to give a brand a high profile in the consumer goods sector, but a good reputation can be quickly ruined by the negative publicity generated by a product recall and this often has drastic financial consequences.

According to most regional legislation, a food manufacturer remains liable unless he can demonstrate that he has taken every conceivable step to prevent food contamination. The Government will monitor all food manufacturers to ensure they comply with regional and international statutory regulations.
Market Insight

The local authorities are also have a joint responsibility for the safety of any food finding its way onto the market. New regulations in the body of laws known as the Food Hygiene Regulations of the Consumer Goods Act have been in force since 31 December 1995. One major aspect of these regulations, which were derived from Regulation No 852/2004 (formerly directive 93/43/EEC), is the introduction of the HACCP concept (Hazard Analysis and Critical Control Points), which is based on the US model.

The EU, in common with the US, uses the HACCP concept in order to allow critical points in the preparation, packaging and distribution process chain to be identified and controlled.
Market Insight

Market Insight

As there is no international standard for food-compatible lubricants, it is normal practice to use the **US standards** issued by:

- FDA (US Food and Drug Administration) and
- USDA (US Department of Agriculture).

The USDA ceased registration of lubricants in 1998, and this function was taken over by the private institution **NSF International** (previously known as the National Sanitation Foundation).
Market Insight

The food market is one of the most innovative markets, and continues to face very strong competition. Quality and productivity are therefore exceptionally important. Some Figures:

- yearly Growth in Europe: **5%** (2-6% from region to region)
- the **third largest industry** in the European Union
- employing some **2.7 million** people in
- over **26,000 companies**
- oil products demand: about **1.17 million metric Tons** whereof
  - about **15,000 metric tons (33 million pounds) Lubricants**.

The proportion of food grade lubricants varies between **5% and 20%** from one country to another.

**Germany** with biggest market share
- generates about 152 billions Euro (200 billions US$)
- applies about 1.33 billions Euro for Energy (1.77 billions US$).

Other important markets in Europe are **Italy, UK, France, Spain and the Netherlands**.
Market Insight

Typical Sub-Sector Split

Food production, major sectors in the UK

- BREAD & BISCUIT & CEREALS: 36%
- MEAT PROCESSING: 14%
- CONFECTIONERY: 6%
- DAIRY & FATS: 6%
- OTHER FOOD: 10%
- PULP & PAPER: 2%
- ANIMAL FARM: 3%
- ANIMAL FOOD: 6%
- FRUIT & VEG: 7%
- DRINK: 10%
- OTHER FOOD: 10%

Main sectors in food production
Food Crisis – Do you like Lubricants on your plate or in your glass?

Almost every day we are faced with crisis situations relating to foodstuffs. An apt example is the need to recall products contaminated by glass, metal particles, or toxic substances harmful to humans, which in turn damages the manufacturer’s image and brand name. A number of such crises in the food industry can be found on websites like:

www.ukrecallnotice.co.uk/
Food Crisis – Do you like Lubricants on your plate or in your glass?

Example1:

Food and animal feed contaminated by PCB (Polychlorinated Biphenyl) because during the production process PCB escaped from or was given off by defective heating elements. In 1968 some 1300 people fell ill in Fukuoka, Nagasaki and other areas of Western Japan because they had consumed rice bran oil contaminated with 2000 to 3000 parts per million (ppm) of a substance of Japanese manufacture used in a heated transport system that contained PCB.
Food Crisis – Do you like Lubricants on your plate or in your glass?

Example 2:

The **Belgian dioxin crisis** broke out in 1999, when it was discovered that this carcinogenic substance had got into the food chain as a result of the contamination of animal feed. The news that a food presented a health risk reverberated around the world, and led to import bans on food and livestock from Belgium. This crisis, which was triggered by the contamination of food with dioxin, directly cost the Belgian Government €632.1 million (25.5 billion Belgian Francs, according to a Government statement).
## Lubricant Contamination Throughout the World

<table>
<thead>
<tr>
<th>Date</th>
<th>Company Name</th>
<th>Product</th>
<th>Problem</th>
<th>Quantity</th>
<th>Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>2005</td>
<td>Empak Foods</td>
<td>Beef</td>
<td>contaminated food - hydraulic oil</td>
<td>123,000 lbs.</td>
<td>Wisconsin</td>
</tr>
<tr>
<td>2002</td>
<td>NQR</td>
<td>Soft Drink</td>
<td>contaminated food - lubricant</td>
<td>4,000 cases</td>
<td>Australia</td>
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<tr>
<td>2002</td>
<td>Arinco</td>
<td>Milk Powder</td>
<td>contaminated food - lubricant</td>
<td>1,100 tons of product</td>
<td>Denmark</td>
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<tr>
<td>2002</td>
<td>Mishima Shokuhin</td>
<td>Seasoning</td>
<td>contaminated food - lubricant</td>
<td>55 tons of product</td>
<td>Japan</td>
</tr>
<tr>
<td>2002</td>
<td>Medpoint Healthcare</td>
<td>Carispol tablets</td>
<td>contaminated food - lubricant</td>
<td>traced back to 1983</td>
<td>New Jersey</td>
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<tr>
<td>2001</td>
<td>Kraft Foods</td>
<td>Microwave macaroni</td>
<td>contaminated food - compressed air system lubricant</td>
<td>142,000 cases</td>
<td>Illinois</td>
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<tr>
<td>2000</td>
<td>Farmland Foods</td>
<td>Turkey Meat</td>
<td>contaminated food - non food grade lubricant</td>
<td>86,000 lbs.</td>
<td>Missouri</td>
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<tr>
<td>2000</td>
<td>Heinz</td>
<td>Baby Food</td>
<td>contaminated food - lubricant</td>
<td></td>
<td>U.K.</td>
</tr>
<tr>
<td>1998</td>
<td>Smithfield Packing</td>
<td>Ham</td>
<td>contaminated food - gear lubricant</td>
<td>490,000 lbs.</td>
<td>North Carolina</td>
</tr>
</tbody>
</table>
Food Crisis

EU to restrict Ukrainian sunflower oil after contamination scare

( Brussels 24 May 2008) - The European Commission blocked Friday imports of Ukrainian sunflower oil into the EU until Kiev puts a strict system of checks place, after tainted product was found in the bloc last month. "Sunflower oil originating in, or consigned from, Ukraine shall not enter the EU unless a valid certificate and results of sampling and analysis for the presence of mineral oil accompany the sunflower oil consignments," it said.

UK Food Standards Agency

The Agency wrote to organisations representing suppliers and importers of cooking oils in May 2008 to alert them to the presence in the UK of sunflower oil containing mineral oil. The oil originated in Ukraine. Since then the European Commission has imposed a temporary ban on all imports of sunflower oil from Ukraine.

Total sunflower-seed oil export from Ukraine to the EU is worth $1 billion a year. The contaminated oil was discovered in 13 European countries (Belgium, Germany, Spain, France, the Great Britain, Greece, Ireland, Italy, the Netherlands, Norway, Portugal, Romania, and Sweden) and nine other states (Albania, Azerbaijan, Ghana, Monaco, Maldives, Turkey, Taiwan, Tanzania and Vanuatu).

And these are just the cases that hit the public media
“Sliced Turkey Products Contamination With Oil”
Food manufacturer in Kansas City recalls 40,000 kg of sliced turkey, which may be contaminated with (non-food grade) lubricants.

“USDA Food Safety & Inspection Service recalls products”
Smoked ham. Various kinds of smoked ham, including sliced, diced and honey-glazed ham, produced under various brands, may be contaminated with transmission oil.

“USDA Food Safety & Inspection Service recalls products”
Sliced and packaged turkey products contaminated with non-food compatible lubricant.

“Oil in baby food”
A random inspection showed that a can of baby food was contaminated with a harmful lubricant.

Note concerning the three product recalls in the US: “only” 0.5% of the meat recalled was actually contaminated, but 250,000 kg were recalled.
Food Manufacturers and the Fear of Loss of Image or Collateral Damage

Rather sadly, in addition to increased statutory requirements it is such fears that in recent years have provided the major impetus to food manufacturers to invest a great deal of money and energy in developing safer procedures. This is not surprising when one considers what can happen when a well-known company suddenly finds itself getting negative headlines in the media.

A glance at the so-called market value of a global brand is sufficient to obtain a better understanding of this.
### Food Manufacturers and the Fear of Loss of Image or Collateral Damage

<table>
<thead>
<tr>
<th>Brand/Sector</th>
<th>Market Value in US$ billions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Soft Drinks</td>
<td>65.3</td>
</tr>
<tr>
<td>Computer Software</td>
<td>58.7</td>
</tr>
<tr>
<td>Computer Software &amp; Hardware</td>
<td>57.1</td>
</tr>
<tr>
<td>Computer Hardware</td>
<td>30.9</td>
</tr>
<tr>
<td>Entertainment</td>
<td>29.2</td>
</tr>
<tr>
<td>Car Manufacturing</td>
<td>23.6</td>
</tr>
<tr>
<td>Coffee</td>
<td>12.9</td>
</tr>
<tr>
<td>Soft Drinks</td>
<td>12.9</td>
</tr>
<tr>
<td>Beer</td>
<td>11.7</td>
</tr>
<tr>
<td>Cereals</td>
<td>9.3</td>
</tr>
<tr>
<td>Tomato Products</td>
<td>6.5</td>
</tr>
<tr>
<td>Chewing Gum</td>
<td>5.8</td>
</tr>
<tr>
<td>Baby Food</td>
<td>5.3</td>
</tr>
<tr>
<td>Dairy</td>
<td>5.0</td>
</tr>
</tbody>
</table>

Food Manufacturers and the Fear of Loss of Image or Collateral Damage

The first example we could mention here would be a car manufacturer / tyre manufacturer case. Even though this did not involve food companies, the outcome is an example for all branches of industry.

For example, it led to the following results:

- **91% reduction in profits** in the six months following the event, compared with the previous year
- Change in **market value**: from US$ 36.4 billion to US$ 20.4 billion within two years
- **Recall costs** for 50,000 vehicles: US$ 3 billion
- **Legal costs**: US$ 840 million
- 11% rise in the number of customers who will **no longer buy** such a vehicle.

These figures are very interesting, especially as the whole fiasco involved not just the car manufacturer, but a supplier as well.
Food Manufacturers and the Fear of Loss of Image or Collateral Damage

The second example sets out the facts of a case of contamination in Japan. Contaminated milk led to the following results there:

- **Loss of 53 and 72 billion** Yen respectively in the years 2000 and 2001
- **Workforce** reduced from 5500 to 4000 (27%) in the first year
- **Workforce** reduced by a further 1500 in 2003.

The third example describes the situation of a soft drink manufacturer. Contamination of soft drinks in Belgium led to:

- **Recall** costs (Belgium): US$ 103 million
- **5% drop in sales**
- **20% drop in share value**.

*In this case it is interesting to note the evidence that the main competitor was also harmed by this incident.*
Food Manufacturers and the Fear of Loss of Image or Collateral Damage

Behaviour of share prices of two competitive soft drink manufacturers
Lubrication Charts

Manufacturers often offer so called **Lubrication Charts** to their customers, sometimes in conjunction with an **LCCP-Survey** (Lubrication Critical Control Point) as a support to increase food safety. Often a **Flow Chart** showing critical areas of production is used as a starting point.
Customer Approach / Philosophy

Basically Customers fall into two categories:

- Use of H1 Lubricants in CCP’s (Critical Control Point) only

- Use of H1 lubricants in the whole plant
Customer Approach / Philosophy

By using H1 Lubricants in CCP’s only, there is a basic rule, which can be applied *):

*The alignment of CCP’s is basically in almost every case above or lateral to the food flow.*

Lubrication Points below the food flow can, as long as they are not pressurized, be lubricated with conventional lubricants.

*) *Keep in mind by choosing this approach:*

- Non H1 Lubricants can be “transferred” from non sensitive to sensitive areas by shoes.
- There is a danger of mix-up of H1 with non H1 lubricants in the lubes store.
Food Crisis – Lubricants – What can be done?

Storage and Handling

Storage: Bad Example

Storage: Good Example. Colour coded by Application. Food grade lubricants separated from ordinary lubricants.
Storage and Handling

Handling, Best Practice. All should be Labelled clearly. Sample Taking for Oil Analysis
Food Crisis – Lubricants – What can be done?

Maintenance

Potential danger due to over-lubrication...
Poor Maintenance. Excess of grease can be transferred to sensitive areas of the machine:
Open food containers pass pretty near.

Potential Leakage? Where is the Oil?
Open bottles passing directly below. Is it in the food product. To be safe food grade lubricants should be used.
Food Crisis – Lubricants – What can be done?

Maintenance

No Comment....

Potential Leakage? Poor Maintenance. Where is the Oil? Is it on the food product?
Food Crisis – Lubricants – What can be done?

Compressors and Vacuum Pumps

Oil mist concentration by each filtering system

- Compressor
- Air filter
- Micro mist filter
- Charcoal filter

Oil mist concentration in the compressed Air:
- 30 to 300 ppm
- 0.5 ppm
- 0.1 ppm
Gears

Leaking Gearbox above production line should be filled with food grade lubricants and should be monitored closely by maintenance department.

Leaking Gearbox above production line should be filled with food grade lubricants and reason for leakage should be investigated and action taken.
Requirements for Food Grade Lubricants

- General Requirements
- Industry Specifications (Performance)
- Equipment Manufacturers (OEM’s)
  - Manufacturers of Final Equipment
  - Manufacturers of Components
- Monitoring Machinery and Lubricants
Requirements for Food Grade Lubricants

In this case the requirements for lubricants are not governed exclusively by technical considerations. It must also be borne in mind that

- Machinery and facilities are developed and built on the basis of hygiene considerations. The lubricant should be regarded as an element in the design here, and it is entirely possible that the requirements placed on it may deviate from the normal industry standard (HACCP, EHEDG, EU, ISO, ASTM/ANSI and local guidelines)

- The formulation chemist is severely restricted by the limited number of permitted additives and base oils available, and as a consequence it may not always be possible to achieve maximum performance (FDA, USDA, NSF)
## Requirements for Food Grade Lubricants

### White Book™ - Nonfood Compounds Listings Directory

Note: If you want to search by Company Name and/or Product Name, just type the first few letters of the company's name and/or product's name. To select multiple categories, hold the "Ctrl" key while making your category selections.

<table>
<thead>
<tr>
<th>Company Name</th>
<th>Product Name</th>
<th>Registration Number</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Country</th>
<th>State</th>
</tr>
</thead>
<tbody>
<tr>
<td>ALL</td>
<td></td>
</tr>
<tr>
<td>Alabama</td>
<td></td>
</tr>
<tr>
<td>Alaska</td>
<td></td>
</tr>
</tbody>
</table>

### Nonfood Categories

- H1. Lubricants with incidental contact
- H2. Lubricants with no contact
- H3. Soluble oils
- HT1. Heat transfer fluids with incidental contact

[Email the webmaster](http://www.nsf.org/usda/psnclistings.asp) regarding any website questions.
Requirements for Food Grade Lubricants

- Other bodies and institutions may restrict further the use of lubricant components (*Kosher, Halal*, associations for gas and water).

- Finally more and more questions have to be handled regarding GMO’s / Allergens / BSE
Requirements for Food Grade Lubricants - Manufacturing

According to the current standard, food grade lubricants are only produced in those parts of a production facility (conduits, mixing vessels, bottling plant), which are certified according to ISO 9001 / 14001 / 21469.

A number of lubricant manufacturers have even carried out a CCP (Critical Control Points) analysis, and use food grade lubricants to lubricate their own equipment. In addition, at least one manufacturer applies a special so-called GMP (Good Manufacturing Practice) in its certified facilities, which from our point of view is the...
Requirements for Food Grade Lubricants - Manufacturing

As food-compatible lubricants **do not as a rule differ** fundamentally from standard mineral oil-based products, the same production facilities can usually be used (liquid lubricants and greases).

- However, it is quite clear that during the manufacture of food-compatible lubricants **more stringent rules** are applied in order to achieve the greatest possible **purity** and avoid cross-contamination.

- According to the **current standard**, food grade lubricants are only produced in those parts of a production facility (conduits, mixing vessels, bottling plant), which are **certified according to ISO 9001 / 14001 / 21469**.
ISO 21469 Certification – the most actual challenge for a Lubricants Manufacturer

INTERNATIONAL STANDARD

ISO 21469

Safety of machinery — Lubricants with incidental product contact — Hygiene requirements

ISO 21469 Certified

Nonfood Compounds Program Listed (Category Code) (Registration #)
ISO 21469 Certification – A New Certification Program for Food Grade Lubricants

NSF Certification Programs are accredited by the American National Standards Institute (ANSI)

As an ANSI accredited Certification body, NSF develops American National Standards and certifies products to internationally accepted standards. NSF Certification gives the confidence of knowing that our products and processes are in compliance with internationally accepted food safety standards.

It is a key component in any HACCP-based risk management program inspectors and users, registered products are listed online in the NSF White BookTM at www.nsfwhitebook.org.

Label change
NSF International

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AUTHORIZED TO BEAR THE NSF MARK.

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Date: March 12, 2008
Certificate # N06215 - 01

Nancy J. Colotta, Vice President
Nonfood Compounds
Product Certification vs Product Registration only – the Safety Benefits for the User

Certification © / Registration ® consist of:

- Formulation Review © ®
- Product Label Review © ®
- Risk Assessment ©
- Facility Audit: ©
  - Raw material verification
  - Batch sheets agree with the NSF authorized formula
  - Certified product labelling complies with the NSF Marking requirements
  - Verify QC practices / procedures resulting from the risk assessment
  - GMP / GHP practices
  - ISO 9001 Registration

- Product Testing ©
Performance of Food Grade Lubricants

By speaking with Customers in the Food Industry one often encounters:

- H1 lubricants are in general worse than standard lubricants
- Lifetime and Wear Protection is a problem
- Application is difficult and problematic
- etc. etc.

This may have been the case 20 years ago. Today, modern H1 lubricants are well designed and balanced high performance products.

As a Summary:

„Food Grade Lubricants are not “exotic components”. The Selection and Application follow the same rules as for standard lubricants”. 
# Food Grade Hydraulic Oils, Comparison

<table>
<thead>
<tr>
<th></th>
<th>Synthetic H1</th>
<th>White Oil H1</th>
<th>Standard mineral oil - non Food Grade</th>
</tr>
</thead>
<tbody>
<tr>
<td>Multigrade Characteristics</td>
<td>↑</td>
<td>⇝</td>
<td>⇝</td>
</tr>
<tr>
<td>Antiwear Characteristics</td>
<td>↑</td>
<td>⇝</td>
<td>↑</td>
</tr>
<tr>
<td>Oxidation Stability</td>
<td>↑</td>
<td>⇝</td>
<td>⇝</td>
</tr>
<tr>
<td>Filterability</td>
<td>↑</td>
<td>⇝</td>
<td>⇝</td>
</tr>
<tr>
<td>Corrosion Prevention</td>
<td>↑</td>
<td>⇝</td>
<td>↑</td>
</tr>
<tr>
<td>Foam Characteristics</td>
<td>↑</td>
<td>↑</td>
<td>↑</td>
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<tr>
<td>Seal Compatibility NBR-1</td>
<td>⇝</td>
<td>↑</td>
<td>↑</td>
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<tr>
<td>Low Temp. Characteristics</td>
<td>↑</td>
<td>⇝</td>
<td>⇝</td>
</tr>
<tr>
<td>Overall lifetime in the field</td>
<td>↑</td>
<td>⇝</td>
<td>⇝</td>
</tr>
<tr>
<td>Overall</td>
<td>↑</td>
<td>⇝/⇝</td>
<td>⇝</td>
</tr>
</tbody>
</table>

Key: ↑=Excellent, ⇝=Good, ⇝=Fair
# Food Grade Greases, Comparison

<table>
<thead>
<tr>
<th></th>
<th>Synthetic H1</th>
<th>White Oil H1</th>
<th>Standard mineral oil – non Food Grade</th>
</tr>
</thead>
<tbody>
<tr>
<td>Antiwear Characteristics</td>
<td>↑</td>
<td>↑</td>
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<tr>
<td>Oxidation Stability</td>
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<td>Mech. Stability</td>
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<td>❍</td>
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<tr>
<td>Water Resistance</td>
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<td>❍</td>
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<tr>
<td>Corrosion Prevention</td>
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<tr>
<td>Overall</td>
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<td>❍</td>
<td>❍</td>
</tr>
</tbody>
</table>

Key: ↑=Excellent, ❍=Good, ❍=Fair
Performance of Food Grade Lubricants

This point continues to be the subject of discussions, especially between users or OEM’s and lubricant manufacturers. Depending on geographic location, the prevailing opinion is that lubricants for the food industry do not come up to the performance levels of standard lubricants, that more problems of wear and tear occur and that, generally speaking the lifetime of an oil filling is reduced.

The synthetic lubricants in particular now achieve performance profiles at least as high as those of conventional synthetic lubricants, if not higher.
In general synthetic lubricants perform better

By using “Synthetics” a user usually gets:

- “Cleaner” and Safer products
- Superior performance
- Extended lubricant life
- Rationalised portfolio
- Less lubricants used
- Reduced downtime
- Minimised waste/disposal
- Extended Machinery Life

All this will result in lower overall maintenance costs and improved food safety
Storage and Handling

Beside the given examples there are quite a number of other precautions / measures, which are related to ensure clean, safe and proper lubrication:

- Re-Lubrication Intervals
- Lubrication Volumes
- Control of Oil Level (how often)
- Top Up Volumes
- Sample Taking for Oil Analysis (how often)
- Check for Leaks
- Control of Filter Equipment
- Control of Central Lubrication Systems
- Check of Reservoir Vents
- Etc.
# Switch Over Procedures

## Grease Compatibility

<table>
<thead>
<tr>
<th>Thickener, Grease to be Used</th>
<th>Lithium Soap</th>
<th>Lithium Cx Soap</th>
<th>Sodium Soap</th>
<th>Sodium Cx Soap</th>
<th>Calcium Soap</th>
<th>Calcium Cx Soap</th>
<th>Barium Soap</th>
<th>Alumin. Soap</th>
<th>Alumin. Cx Soap</th>
<th>Clay</th>
<th>Polyurea</th>
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<tbody>
<tr>
<td>Grease in Use</td>
<td></td>
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<tr>
<td>Li- Soap</td>
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<tr>
<td>Lithium Cx Soap</td>
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- **In general compatible**
- **Likely compatible but to be checked**
- **In general in-compatible**

*Shell Lubricants*
Keeping in mind the FDA / USDA Limits it is crucial to follow a proper Switch Over Process to ensure that as less conventional lubricant as possible remains in the system. It is recommended to switch over machinery during a scheduled maintenance break.

Example for Oils (General Rough Rule):

- Drain the used oil from the warm system (normally about 5-10% of old oil remain in the system, including wear particles and oxidation / hydrolysis by products)
- Clean the system as good as possible (especially hydraulic reservoirs and central lubricating systems)
- Fill the system with new lubricant. Use a cheap flushing fluid the first time (e.g. technical white oil)
- Run the system for a short period under light load only
- Repeat the whole process until the visual aspect of the new drained oil becomes identical to the new fluid.
Switch Over Procedures

Example for Greases (General Rough Rule):

Procedure 1 (best way):

- Dismantle everything completely. Clean parts as good as possible and re-mount them again. Lubricate with new Grease before or after re-mounting.

Procedure 2 (easiest way):

- „Push Through“ new grease as long as the old grease has disappeared from the bearings. Take care to not over-lubricate because this may lead to excessive heat and finally bearing failure.

Both Procedures:

- Increase the re-lubrication intervals for a certain period of time.
More
Application Examples
Application Examples

Gears

Leaking Gearbox above production line

Typical CCP. Gearbox above production line
Application Examples

Gears

Typical CCP
Gearbox and electric motor above production line

Typical CCP (Mixing Kettle)
Leaking Oil may follow the shaft directly into the mixing kettle
Application Examples
Hydraulics

"Hidden" CCP.
High-Pressure Hoses beside production line.

High pressure hydraulic hoses in vicinity of production line.
Typical CCP.
Can Seamer. Grease directly above cans. Due to the relatively high speed, grease may fling off and contaminate cans.

Can Seamer, Lubrication System.
Older models using loss lubrication may take up to 2 gallons of lubricant a day.
Can Seamers

Typical Leakage by poor maintenance (seals).
Leakage made visible by dyed lubricant.
Picture taken after 75 minutes from starting up the machine.
Application Examples
Transport- and Conveyor Systems

Bakery, Trolleys. Extension of re-lubrication intervals by using a synthetic H1 grease
Application Examples
Transport- and Conveyor Systems

CCP: Conveyor in Bakery

Conveyor in Abattoir. Typical CCP: Lubrication Points above production line
Application Examples
Citrus-Processing

Machine Inside. Lubrication of Shafts and Bearings. In this case “standard” Gear Oils may run into problems because of heavy contamination with water and juice

Typical Citrus Press
Application Examples
Animal Feed - Manufacturing

Pellet Press – Animal Feed Processing

Bearing of a Pellet Press
Application Examples
Heat Transfer Systems

Heat Transfer System (Potato-Chips) with „Micro-Leakage“.
Application Examples

Maintenance

CCP: Oil- and Grease just beside food containers.

Typical CCP (Grease). Shaft and Bearing directly above production line.
Application Examples
Compressors and Vacuum Pumps

Typical CCP. Compressed Air blown directly on the foodstuff.
Performance of Food Grade Lubricants / Conclusion

Today’s H1 lubricants are

High Performance Lubricants, based on selected technical / pharmaceutical / medicinal Mineral White Oils or Synthetic Base Fluids.

This and the fact that the manufacturer is allowed to use designated FDA chemicals only and that the products should be manufactured in dedicated parts of his plant is resulting in higher R&D and manufacturing costs, which finally leads to more expensive products.

Especially by using synthetic products the higher price is often compensated by a longer lifetime of the product and lower overall maintenance costs.
Conclusion / Summary

The general rule is:

“Lubricants (oils and greases) must not have any adverse effects on foodstuffs.”

This means that lubricants, which may accidentally come into contact with products intended for consumption as a result of leaks, which are not always technically avoidable, or unsuitable design of equipment or machinery, must satisfy the most stringent of the requirements listed above.

Regarding Application:

- The Application of Food Grade Lubricants does not differ from other Industry areas.
- There are more stringent requirements regarding Hygiene and Contamination.
- Supporting Customers by lubrication specialists regarding LCCP’s and Maintenance is crucial.

Shell Lubricants
Many Thanks for Your Attention

“Now, Please Relax and Do Not Forget

-- Food Is Good! –

as long as food grade lubricants are used for its processing....”