

# **AN INTRODUCTION TO BEST-PRACTICE LUBRICATION PROCEDURES IN THE FOOD INDUSTRY**

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## **1.0 INTRODUCTION**

As a food manufacturer, you will almost certainly be operating equipment that will require some form of lubrication to maintain it in reliable working order. This document gives guidance on best practice for the selection, storage, application and waste disposal of any lubricants that are used at your site.

Information is provided to enable engineers and technical staff to select, store and apply lubricants correctly, thus reducing the potential for food safety issues and non-conformities during a site audit.

## **2.0 REQUIREMENT OF THE BRC GLOBAL STANDARD FOR FOOD SAFETY**

Issue 7 of the BRC Global Standard for Food Safety, clause 4.7.6, states that:

*Materials used for equipment and plant maintenance and that pose a risk by direct or indirect contact with raw materials, intermediate and finished products, such as lubricating oil, shall be food grade and of known allergen status.*

This short guide will help you put procedures in place to ensure that your lubricating activities are carried out correctly and in a controlled manner, using only food-grade lubricants. Controlled application will help prevent potential risks such as physical or chemical contamination of the product which may render the production batch unsafe for consumption.

An example of a lubricant audit sheet is provided in Appendix 1.

## **3.0 WHAT IS A 'FOOD-GRADE' LUBRICANT?**

A food-grade lubricant is a lubricant that is used in food-processing areas where there is a possibility of incidental or direct food contact.

Food-grade lubricants perform similar functions to conventional mineral-oil-based lubricants. In many cases they use fully synthetic base oils that give improved performance and a longer service life.

Food-grade lubricants are formulated in such a way that if small quantities of technically unavoidable residues enter the processed product, they have no adverse effect and are deemed innocuous in terms of health, taste and odour. However, it should be noted that food-grade lubricants are not intended for human consumption or for contact with skin or mucous membranes.

There are few recognised independent assessment schemes for lubricants. One method is to establish whether the lubricant is formulated using ingredients that are listed in, for example, the FDA (United States Food & Drug Administration) Chemicals Register (Code of Federal Regulations Title 21). Ingredients listed in this register are deemed suitable for use in the manufacture of food-grade lubricants, and these finished lubricants are then usually classified by the NSF International as follows:

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- **NSF H1** Acceptable as a lubricant for 'incidental contact applications in and around food processing areas'
- **NSF HTI** Acceptable for use as 'a heat transfer fluid where there is a possibility of incidental food contact'
- **NSF 3H** Acceptable for use as 'a release agent on grills, ovens, loaf pans, boning benches, chopping boards and other hard surfaces in contact with meat & poultry products to prevent food from adhering during processing'.

In all cases where food-grade lubricants are used, 'the amount used should be the minimum to accomplish the desired technical effect'. The status of any lubricant recognised as a food-grade lubricant within this assessment scheme may be checked using the search engine at:

<http://info.nsf.org/USDA/psnclistings.asp>

Here you will find the actual certificate relating to the lubricant and this will detail the method of application and any after-application cleaning procedures that may be required.

The latest standard to which food-grade lubricants and their associated manufacturing sites may be assessed is ISO 21469:2006. This is a certification process that adds another level of safety and security to food-grade lubricants as it takes into account not only the formulation of the lubricant itself but also the manufacturing process (GMP), the traceability of ingredients, and the strict hygiene standards throughout all stages of the process. Each ISO 21469 certificated product has been independently assessed to ensure that it is fit for purpose as a food-grade lubricant.

To check if a lubricant product or lubricant manufacturer is certificated to ISO 21469, go to:

[http://info.nsf.org/Certified/iso\\_21469/listings.asp](http://info.nsf.org/Certified/iso_21469/listings.asp)

Sites should also check any specific legislation in the country or region in which they operate.

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## **4.0 SELECTING A SUITABLE FOOD-GRADE LUBRICANT**

Where lubricants are to be used inside food-processing areas and there is a possibility that the lubricant might accidentally come into contact with the processed material then it will be necessary to select a suitable food-grade lubricant.

Reference should be made to the equipment manufacturer's maintenance manual where details will usually be found of recommended lubricants including information on oil viscosity, grease NLGI consistency, recommended application frequencies and lubricant change intervals.

If a food-grade lubricant is not listed in the equipment maintenance manual then information on alternative materials could be obtained from a recognised food-grade lubricant manufacturer who should also be able to help you with issues such as a lubricant survey and advice on compatibility and switch-over procedures. Some sites have found it beneficial to have an initial lubrication survey completed by a professional lubricant engineer to provide guidance as to which equipment requires lubrication and the types of lubricants required.

Remember that to comply with clause 4.7.6 in Issue 7 of the BRC Global Standard for Food Safety, which states that lubricants used must be 'food grade' and of 'known allergen status', a site should make sure that the lubricant supplier can provide the appropriate documentation to confirm this.

Where any lubricant is manufactured from allergenic materials or is at risk of contamination with allergenic materials (for example, it is manufactured from food ingredients or manufactured at a site which handles allergenic materials) then relevant information regarding any allergen content or allergen contamination risks should also be made available.

It should also be remembered that food manufacturing areas with their constant wash-downs, 24-hour operation and often changing temperatures, will provide a demanding environment in which the lubricants must operate, so careful selection and monitoring of the lubricant condition will help extend their life and that of the equipment's uptime.

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## **5.0 STORAGE OF FOOD-GRADE LUBRICANTS**

To eliminate risks of incorrect lubricant selection or cross-contamination, food-grade lubricants should always be stored completely separately from non-food-grade lubricants or waste oil products. The storage areas should be clearly identified and, if oils are used, ideally a bunded purpose-built storage unit should be provided.

Good practice is essential to ensure that the lids of lubricant containers are always replaced immediately after use and that the storage area is kept clean and tidy.

Wherever possible, all lubricants should remain stored in their original containers and if, for example, oil is transferred to another container for dispensing purposes, then that container must be clearly labelled with the name of the oil inside it (see clause 4.9.1.1 of the BRC Global Standard for Food Safety).

Auditors may wish to see confirmation of the food grade and allergen status for the lubricants in use in open product areas (see section 4 above).

## **6.0 APPLICATION OF FOOD-GRADE LUBRICANTS**

There are many ways in which machinery may be lubricated including automatic and semi-automatic lubrication systems, automatic single-point lubricators, aerosol spraying and greasing or oiling by hand. Each method has certain merits and generally speaking the machine manual or your lubrication survey will advise on the best method.

Care must be taken when applying lubricants to ensure that any excess is immediately removed from the application area (e.g. grease nipple or oil filler) so that excess lubricant is prevented from contaminating the product.

Colour-coding and labelling is a good idea for lubrication points (especially where there is a high risk of contact with food) as this will help to eliminate the possibility of an incorrect lubricant being applied. As with most types of lubrication, for food-grade lubricants a little applied often is generally better than a large amount applied infrequently.

Always remove all portable lubrication equipment and lubricant containers from areas where lubrication has taken place and leave the area in a clean and tidy condition (see clause 4.7.4 in the BRC Global Standard for Food Safety).

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## **7.0 WASTE DISPOSAL OF LUBRICANTS (FOOD-GRADE AND NON-FOOD-GRADE)**

All lubricants and their empty containers will, at some stage, require disposal. All plants should have a dedicated waste disposal area, including a clearly marked 'waste oil only' area that is completely separate from the unused lubricant storage area.

All waste and empty containers (including aerosols) should be removed in accordance with national and local legislation, which may stipulate the use of a fully licensed waste removal contractor. Your lubricant supplier should be able to put you in touch with such an operator if your current waste contractor is not suitably authorised for this type of material.

## **8.0 BEST PRACTICE: SUMMARY**

All production plants should adopt best-practice methods to add extra levels of safety, security and traceability to their processes. The following list details some of the key elements of best-practice lubrication. The numbered clauses refer to those in the BRC Global Standard for Food Safety.

- Use recognised food-suitable products (e.g. NSF-registered lubricants or lubricants made by ISO 21469 certificated manufacturers).
- Where sites are producing products certified to other standards (e.g. halal or kosher), the lubricants must also meet these standards.
- Use colour-coded grease cartridges and aerosols in conjunction with matching colour-coded and labelled lubrication points, and ensure that all materials are correctly and clearly labelled.
- Operate a planned and documented lubrication schedule.
- Ensure lubricant storage areas and dispensing equipment are kept clean and correctly labelled, and form part of the internal audit or factory inspection (see clause 3.4).
- Use condition-monitoring to check on the state of oils such as those used in hydraulic systems and gearboxes.
- Store food-grade lubricants in their original containers away from other lubricants and waste oil.
- Install bunded storage facilities for food-grade lubricants and keep the lubricant documentation nearby.
- Apply proper shelf-life control by using stock rotation of lubricants to ensure outdated lubricants are not used.
- Ensure all appropriate documentation is readily available (either electronically or as hard copy).
- Use lubrication plans that incorporate the recommendations of the equipment manufacturer.
- Ensure relevant staff are fully trained in the correct use and disposal of lubricants (see clause 4.9.1.1).
- Use dedicated and labelled containers for the transfer of oil to machinery (see clause 4.9.1.1).
- Ensure waste disposal contractors are suitable and authorised (e.g. fully licensed) for removal of lubricants and/or oil.
- Remember that good housekeeping is a key element in any successful lubrication plan.

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## APPENDIX 1 EXAMPLE OF A LUBRICANT AUDIT CHECKLIST FOR A FOOD MANUFACTURING SITE

This checklist may be used by on-site personnel to ensure that the correct lubricants are in use. This is especially important where food-grade lubricants are required.

### FOOD SITE AUDIT CHECKLIST - LUBRICANTS

Date \_\_\_\_\_

Area	Checklist/audit point	Complies? (Y/N)	Auditor
Lubricant storage	Are bulk storage tanks covered and bunded?		
	Are lubricants of a suitable grade (e.g. registered food grade)?		
	Is the intended use of the lubricant clearly documented?		
	Are lubricants approved for use (e.g. food-suitable, kosher- or halal-certificated if required)?		
	Is the storage area suitably clean?		
	Are non-food-grade lubricants stored separately?		
	Is waste oil stored in a separate area?		
	Are aerosols stored in in a fireproof cabinet?		
	Are there any safety hazards in the area (e.g. oil on the floor)?		
	Are oil containers clearly labelled for the oil inside them?		
	Are the containers clean and with a sealed lid?		
Lubricant dispensing (oils)	Are oil containers stored in a specific area clearly signed?		
Lubricant dispensing (greases)	Are all grease kegs fitted with lids or dispensing equipment?		
	Are all grease kegs in good condition?		
	Are grease cartridges in good condition and with seals intact?		
	Are all grease cartridges clearly labelled?		
Workshop	Is there a lubrication schedule?		
	Is the lubrication schedule up to date?		

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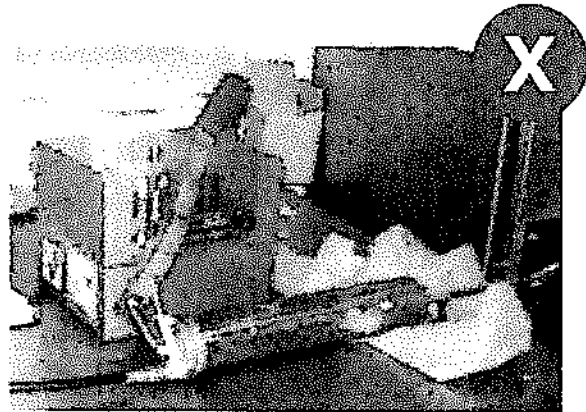
<b>Area</b>	<b>Checklist/audit point</b>	<b>Complies? (Y/N)</b>	<b>Auditor</b>
	Is the lubrication schedule readily available?		
	Who lubricates the site equipment? Maintenance personnel? Process operators?		
<b>Condition-monitoring</b>	Is lubricant condition-monitoring carried out?		
	Have there been any recent machine failures related to incorrect or inadequate lubrication?		
<b>Training</b>	Have maintenance personnel received basic lubrication training?		
	Are maintenance personnel aware of the need to use food-grade lubricants in the process area?		
<b>Health and safety</b>	Are material safety data sheets for all lubricants readily available?		
<b>Waste disposal</b>	Is there a recognised and clearly signed waste disposal area for lubricants?		
	Is waste oil put in tanks?		
	Is waste oil put in barrels?		
	Is the area bunded?		
	Are all waste oil containers clearly labelled 'waste oil only'?		
<b>In the process area</b>	Are machines identified by an asset number tag or similar system?		
	If the machine uses oil for lubrication, is the name of the required oil clearly marked on a label adjacent to the oil fill point?		
	If the machine uses grease for lubrication, is the name of the required grease clearly marked on a label adjacent to the grease nipple (or fill cap if an automatic greaser is in use)?		
	Are application frequencies for oil and grease marked near the point of application?		
	If not, does the lubrication plan give details of required application frequencies?		



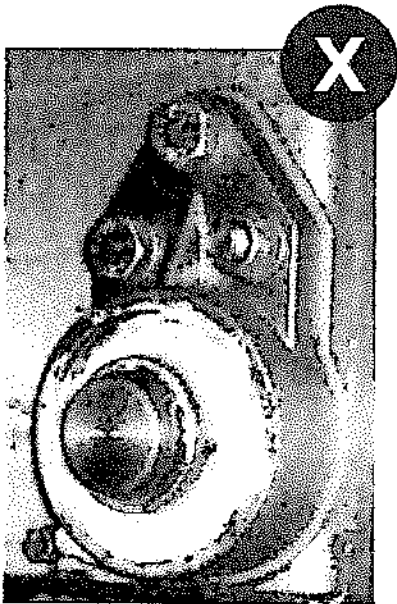
## APPENDIX 2 EXAMPLES OF GOOD AND BAD PRACTICE



Unlabelled oil containers - these could easily lead to the wrong oil being used



An unmarked grease gun means that it is not known whether food-grade or non-food-grade grease is in use. This could potentially lead to product contamination



An over-greased bearing is a potential contamination risk. Excess grease should be wiped away to prevent any contaminants adhering to the surface.



Compliant storage with built-in bund and oil-transfer containers clearly labelled in a clean, designated area



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