

NyeCorr[®]



Dulub Co. Ltd. www.dulub.com.tw

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Better Grease. Better Price. Better Value.
Discover the NyeCorr[®] Advantage



NyeCorr[®] 140

Nye Lubricants, Inc. and the Corrugating Industry

NyeCorr[®] 140, a high-temperature PFPE/PTFE grease for single-facer bearings, was introduced to the corrugating industry in 1997. Since that time, over 200 corrugating plants worldwide have experienced the cost savings and extended bearing life that NyeCorr 140 offers. NyeCorr 140 is completely compatible with DuPont Krytox[®] 226 and 227 and can be installed into bearings currently packed with Krytox with no problems whatsoever.

About Nye

Nye Lubricants, Inc. is a privately held, employee-owned company with 160 employees and 23 International Channel Partners on six continents. We formulate, manufacture, market and sell high-quality synthetic lubricants, thermal coupling compounds, and index-matching optical gels. Our product development process is consultative, focusing on the customers' performance specifications and cost and warranty requirements. Nye services a broad range of industries, with a concentration of your business in the automotive, computer printer, disc drive, mobile appliance, aerospace, defense and HB-LED OEM markets. We also manufacture industrial maintenance lubricants for incidental food contact, high temperature and other extreme environments. All Nye products are carefully engineered materials, formulated for a specific application and typically developed in consultation with a customer's engineering department. That's the essence of the SmartGrease[™] brand. Synthetic lubricants, thermal compounds, and optical gels from Nye "know" how you want your product to perform.

Operations

Nye is headquartered in Fairhaven, Massachusetts. Local facilities include R&D and production labs, clean room operations, packaging and production lines, and administrative offices. Technical sales and support offices are located in 23 countries. Annual grease production capacity is 5.5 million pounds. Our products are available in a wide variety of packages, including blister packs, pouches and syringes, jars, tubes, cartridges, pails, drums, and totes. All packaging is done on site. We assemble lubricant kits, which customers often use for field maintenance. We also private label any Nye product under customer brand names.

Nye[®] Corporate Overview



Welcome to Nye

Nye Lubricants, Inc., is a privately held, employee-owned company with 150 employees and 28 International Channel Partners on six continents. We formulate, manufacture, market and sell high-quality synthetic lubricants, thermal coupling compounds, and index-matching optical gels. Our product development process is focused on the customers' performance specifications and cost and warranty requirements. Nye services a broad range of industries, with a concentration of our business in the automotive, computer printer, disc drive, appliance, aerospace, defense and HB-LED markets. We also manufacture industrial maintenance lubricants for incidental food contact, high temperature and other extreme environments. All Nye products are carefully engineered materials, formulated for a specific application and typically developed in consultation with a customer's engineering department. That's the essence of the SmartGrease™ brand. Synthetic lubricants, thermal compounds, and optical gels from Nye "know" how you want your product to perform.

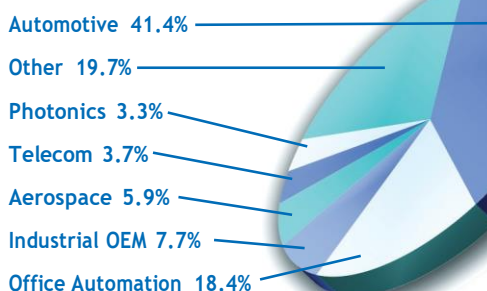
Heritage Founded in 1844, Nye's history is one of continual adaptation to market needs. From the Industrial Revolution to the Information Age, Nye has enabled and improved breakthrough products and critical new technologies. Among Nye's many customers, we serve the Top 25 global automotive parts suppliers, the world's largest aerospace and defense contractors, name-brand appliance and power tool companies, manufacturers of 60 percent of the world's computer printers, and three of the Top Five HB-LED manufacturers. Nye's lubricants, thermal compounds, and optical gels add value to thousands of products around the globe.

Mission Nye seeks long-term partnerships with innovative companies that benefit from high-quality synthetic lubricants, thermal compounds and optical gels. These partnerships enrich our employees, expand our product line, and create value for our customers.

Values Nye is committed to mutual respect; products and services that meet the highest quality standards; a workplace that is safe for employees and the environment; the continuous pursuit of technical excellence; creativity and innovation as paths to excellence; personal initiative and empowerment to achieve company goals. Nye supports these values in our communities by regularly contributing to arts, ecological, historical and charitable organizations.

Brands The Nye family of brands includes the following trademarks and registered service marks: Nye,[®] NyeBar,[®] NyeCorr,[®] NyeFilm,[®] Nye Fluorocarbon Gel,[™] NyeTact,[®] NyeTorr,[®] Nye Ultrafiltered,[®] NyoGel,[®] NyOil,[®] NyoSil,[™] Rheolube,[™] Rheoplex,[™] Rheosil,[™] Rheotemp,[™] SmartGel,[®] SmartGrease,[™] The SmartGrease Company,[®] and UniFlor.[™]

MAJOR MARKETS SERVED



Technology Nye's products are based on a full range of synthetic chemistries, including polyalphaolefins, esters, glycols, polyphenylethers, silicones, alkylated naphthalenes, and all four types of perfluoropolyethers (PFPE). Through an agreement with Shell Global Solutions, Nye is also the exclusive global reseller of Pennzane® multiplyalkylated cyclopentane fluids.

Research and Development Tribologists, chemists, mechanical, electrical, chemical and optical engineers all bring their expertise to Nye's product development efforts. We partner with raw material suppliers to test new fluids, additives, thickeners and formulation methods. We work closely with customers and routinely enter into Non-Disclosure and Joint Development Agreements. We also seek out relationships with universities, research consortiums, and engineering departments at some of the world's most innovative companies to continually improve our technical knowledge and services.

Partial List of R&D Equipment:

- Falex 4-Ball Wear Stand
- Fourier Transform Infrared Spectroscopy (FTIR)
- Gel Permeation Chromatograph
- Inductively-Coupled Plasma Chromatograph (ICP)
- Instron Force Tester
- Penetrometers
- Rheometers
- Scanning Electron Microscope
- SRV-IV Tribological Test System
- Vapor Pressure Test Stand
- Viscometer
- Water Washout Tester

Operations Nye is headquartered in Fairhaven, Massachusetts. Local facilities include R&D and production labs, clean room operations, packaging and production lines, and administrative offices. Our technical sales and support offices serve 38 countries worldwide. Annual grease production capacity is 5.5 million pounds. Our products are available in a wide variety of packages, including blister packs, pouches and syringes, jars, tubes, cartridges, pails, drums, and totes. We assemble lubricant kits, which customers often use for field maintenance. We also private label any Nye product under customer brand names.

Other Services:

- Lubricant Failure Analysis
- Lubricant Profiling
- Pre-Qualification Lubricant Testing
- Technical Support
- Specialty Lubricant Formulation
- Lubricant Sampling
- Ultrafiltration
- Deaeration
- Lubricant Education
- Lubricant Dispensing Support

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Synthetic Lubricants

The SmartGrease Company

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ISO 9001:2000
ISO 14001:2004
ISO/TS 16949:2002

THE NYECORR[®] DIFFERENCE

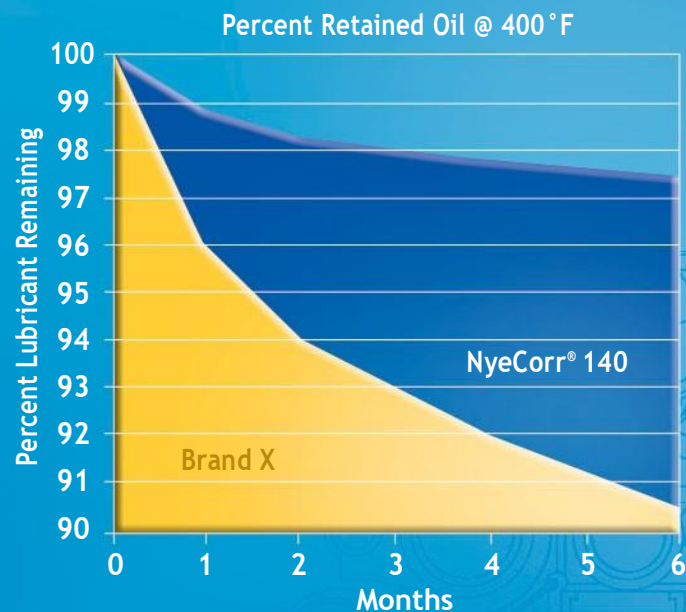
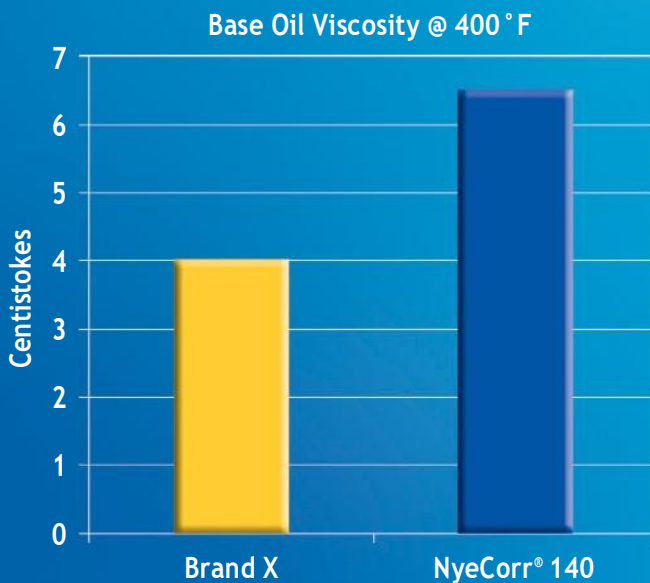


Higher Oil Viscosity

- = thicker film of oil
- = less bearing/race contact
- = less vibration and wear

Lower Evaporation = longer life

- Same Chemistry = no waiting for roll change
- Better Corrosion Package = less rust
- Cost Less = save \$\$



The **POWER** of a **NUMBER**



You have to wonder why more than **200** plants

have switched to *NyeCorr*[®] 140, the

perfluoropolyether (PFPE) grease for corrugator

roll bearings. Maybe it's because NyeCorr 140 uses ISO

460 base oil, not ISO **220** like competitive greases, to ensure

bearings last the life of the roll. Maybe it's because NyeCorr 140 has **2** times

the amount of high-temp anti-corrosion additives for longer operating life and faster, cleaner roll changes. The numbers don't lie. Isn't it time you consider the switch?

Call Corrugating Industry Manager Dewayne Massie at **1.865.671.4501**

Put the power of NyeCorr[®] 140 to work for you.



The SmartGrease Company

SmartGrease.com/NyeCorr

Nye, The SmartGrease Company, and NyeCorr are registered trademarks and SmartGrease is a trademark of Nye Lubricants, Inc.

STRENGTH

in **NUMBERS**



NyeCorr® is the only family of synthetic greases designed specifically for the corrugating industry.

NyeCorr® 140 – Fortified PFPE/PTFE grease for single facer heated roll bearings — designed to last the life of the rolls.

NyeCorr® 346 – Synthetic ester grease for large preheater bearings. Switch safely from PFPE grease to reduce maintenance costs.

NyeSolv™ HG – Solvent for hydrocarbon lubricants. Removes protective oil on new bearings; purges petroleum before converting to PFPE grease.

NyeCorr® GP – Fortified, rust-inhibited, synthetic hydrocarbon grease for anilox roll bearings and 'General Purpose' plant maintenance.

Nye Fluorosolvent 504 – Nonflammable solvent for cleaning fluorinated oils. Use before repacking fresh grease.

For more information, call
Dewayne Massie at 1.865.671.4501
or send an e-mail to
dmassie@nyelubricants.com

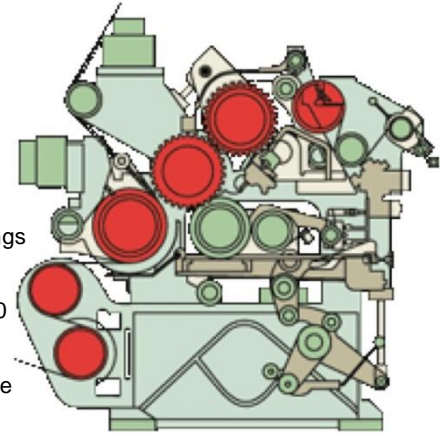


SmartGrease.com/NyeCorr

NyeCorr[®] 140

NyeCorr[®] 140 Commonly Asked Questions

NyeCorr 140 grease is a perfluoropolyether (PFPE) oil-based lubricant that is completely compatible with other PFPE's currently used in the heated roll bearings of single facers and large 36" preheaters. NyeCorr 140 PFPE has a base oil viscosity equivalent to an ISO 460 base oil while other PFPE's use only ISO 220 base oil stock. NyeCorr's higher viscosity base oil provides more load carrying capability and is able to better withstand the operating temperatures of the single facer application.



Whether you are using an existing PFPE grease or converting from a conventional hydrocarbon oil system, Nye Lubricants can help make the transition easier.

Below are a few commonly asked questions about converting to NyeCorr:

Q. *Our plant is currently using a more expensive brand of PFPE grease. Can we switch to NyeCorr now?*

A. Yes. NyeCorr is a PFPE base oil grease which has the same chemistry as the other, more expensive, PFPE greases. It is completely compatible with and can be pumped directly over the other PFPE brand. There is no need to remove the brand "X" PFPE grease, simply start using NyeCorr and save money.

Q. *When is the best time to change our single facer oil system over to NyeCorr grease?*

A. The best time to convert from hydrocarbon oil or grease to NyeCorr is during the roll change.

Q. *What changes need to be made when converting a single facer or pre-heater from an oil system to NyeCorr?*

A. C-4 or greater internal bearing clearance is required since bearings tend to run slightly hotter with PFPE type greases.

New bearings should be thoroughly cleaned to remove any rust inhibitors or oils that may have been applied by the bearing manufacturer. Nye Lubricants can provide you with an effective hydrocarbon solvent for the job, NyeSolv HG.

Pack the new bearings and cavities with NyeCorr before re-installing them into the housing or on the roll shafts. Finally, after complete assembly and the equipment has reached normal operating temperature fill the bearings completely with NyeCorr.

Use a pin type or button head grease fitting on all NyeCorr greased bearings and use a dedicated grease gun with the proper mating fitting. This will prevent the chance of a petroleum or other hydrocarbon grease from being accidentally mixed with NyeCorr.

NyeCorr[®] 140

Q. Will seals be needed when converting to NyeCorr grease?

A. When the housing to shaft tolerances are close, NyeCorr will help to provide a seal but it will not be as long lasting as a standard lip seal. Lip seals on each side of the bearing are recommended for most applications. The addition of multiple lip seals will reduce the need to re-lubricate as often as cases where no seals are used.

Q. What is the lubrication interval when using NyeCorr?

A. Re-lubrication will vary from 1 to 4 months depending on the type of the equipment and seals used. Older single facers without seals should be re-lubricated every month. Generally, the amount of NyeCorr used in re-lubrication is about half that of the initial fill amount and should be added while the bearings are rotating to insure even distribution of lubrication.

Q. Which units or bearings can be converted to NyeCorr grease?

A. Almost any single facer manufactured can be converted to NyeCorr grease with exception to some extremely old equipment. Upper and lower corrugating roll bearings, pressure roll, preheater and preconditioner roll bearings are being lubricated with NyeCorr.

Q. What are some of the advantages of converting to NyeCorr?

A. NyeCorr grease will improve safety and housekeeping by eliminating the slipping hazards around machinery usually associated with oil systems. Product quality can be improved because oil will no longer be getting on your corrugated board. EPA fines are avoided with the removal of oil running down the single facer side frames into sewer drains. NyeCorr greases were specially formulated for more resistance to high temperature, improved corrosion and wear prevention properties. This will protect your single facer bearings and reduce downtime over other more expensive PFPE base oil greases.

Q. What solvent can be used to remove PFPE's from housings and other re-usable single facer parts?

A. Nye Fluorosolvent 504 is a completely fluorinated, fast-evaporating "ozone-safe" solvent intended as a cleaning solvent for NyeCorr PFPE greases.



The SmartGrease Company

NYECORR 140

A PTFE thickened, heavy viscosity, completely fluorinated grease intended for severe service bearings and mechanical devices where good film strength is needed at high temperatures and/or fuel or chemical resistance is required.

Lubricant Properties		Typical Value	Test Method	
Recommended Service Range (°C)		-20 to 250		
Thickener		PTFE		
Base Oil	Type	Perfluoropolyether		
(Uniflor 8620)	Kinematic Viscosity	100°C	47 cSt	ASTM D-445
		40°C	510 cSt	ASTM D-445
	Viscosity Index		135	ASTM D-2270
	Flash Point		None, Non-Flammable	ASTM D-92
	Pour Point	°C	-20	ASTM D-97
Typical Properties of the Grease		Typical Value	Test Method	
Color, Appearance		White		
Penetration (1/10 mm)	Unworked		254	ASTM D-217
	Worked	60 X	272	ASTM D-217
	NLGI Grade		2	ASTM D-217
Density		25°C	1.94 g/cm ³	ASTM D-70
Oil Separation	24 hour(s)	100°C	4.1 %	FTM 791, Method 321.2
Evaporation	24 hour(s)	150°C	0 %	NYE CTM
Water Washout	60 minute(s)	80°C	1.1 %	ASTM D-1264
Copper Corrosion	24 hour(s)	150°C	2A, No Corrosion	ASTM D-4048
4 Ball Wear	60 minute(s), 1200RPM, 40 kg load	75°C	0.66 mm	ASTM D-2266
Oxidative Stability	168 hour(s)	100°C	3.4 kPa	ASTM D-942
Bearing Rust Test		52°C	Pass	ASTM D-1743
SKF EMCOR Bearing Corrosion	168 hour(s)		0-1 (none to trace)	ASTM D-6138

The typical properties shown on this product data sheet should not be used as a basis for preparing specifications. Refer to our product Material Safety Data Sheet for detailed safety information. (0806)

MATERIAL SAFETY DATA SHEET

1. Product and Company Identification

Material name NYECORR 140
Revision date 27-Jun-2008
Product use Lubricating Grease
Manufacturer information Nye Lubricants, Inc.
 12 Howland Road
 Fairhaven, MA 02179 US
 508-996-6721
 www.nyelubricants.com
Emergency CHEMTREC 1-800-424-9300

2. Hazards Identification

Emergency overview Thermal decomposition will generate hydrogen fluoride, which is corrosive and can cause burns on contact with skin and other tissue. Inhalation of fumes generated during thermal decomposition may cause polymer fume fever. Contact with eyes may cause irritation. Prolonged and/or repeated skin contact may result in mild irritation or redness.
OSHA regulatory status This product is considered not hazardous under 29 CFR 1910.1200 (Hazard Communication).
Potential health effects
Routes of exposure Eye contact. Skin contact.
Eyes Contact with eyes may cause irritation.
Skin Prolonged and/or repeated skin contact may result in mild irritation or redness.
Inhalation Health injuries are not known or expected under normal use.
Ingestion Health injuries are not known or expected under normal use.
Target organs Eyes. Skin.

3. Composition / Information on Ingredients

Components	CAS #	Percent
SODIUM NITRITE	7632-00-0	2.5 - 10
Non-hazardous and other components below reportable levels		> 90

4. First Aid Measures

Eye contact Immediately flush eyes with plenty of water for at least 15 minutes. Get immediate medical attention.
Skin contact Wash off with soap and water. Get medical attention if symptoms occur. Wash clothing separately before reuse.
Inhalation If symptoms develop, remove affected person from source of exposure into fresh air. Get immediate medical attention.
Ingestion If ingestion of a large amount does occur, seek medical attention. Do not induce vomiting without medical advice. If vomiting occurs naturally, have victim lean forward to reduce risk of aspiration. Never give anything by mouth to a victim who is unconscious or is having convulsions.

5. Fire Fighting Measures

Suitable extinguishing media Product does not burn. Use methods for the surrounding fire.
Unsuitable extinguishing media Do not use a solid water stream as it may scatter and spread fire.
Hazardous combustion products Oxides of nitrogen. Hydrogen fluoride. Carbonyl fluoride.

Protective equipment and precautions for firefighters

Wear full protective clothing, including helmet, self-contained positive pressure or pressure demand breathing apparatus, protective clothing and face mask. Use water spray to cool unopened containers. Move containers from fire area if you can do it without risk.

6. Accidental Release Measures

Personal precautions

Observe precautions from other sections. Keep unnecessary personnel away. Do not touch damaged containers or spilled material unless wearing appropriate protective clothing. Keep people away from and upwind of spill/leak.

Environmental precautions

Prevent entry into waterways, sewers, basements or confined areas.

Methods for containment

Stop the flow of material, if this is without risk. Dike the spilled material, where this is possible.

Methods for cleaning up

Soak up with inert absorbent material. Clean contaminated surface thoroughly. Clean up spills immediately, observing precautions in Protective Equipment section. Sweep up and shovel into suitable containers for disposal.

7. Handling and Storage

Handling

Do not handle or store near an open flame, heat or other sources of ignition. Do NOT pressurize, cut, heat, or weld containers. Empty product containers may contain product residue. Avoid contact with eyes. Avoid prolonged or repeated skin contact with this material. Wash thoroughly after handling. Avoid breathing gas/vapors/mist/fumes. Do not take internally. Do not taste or swallow.

Storage

Keep away from heat and sources of ignition. Store in cool place. Store in a closed container away from incompatible materials.

8. Exposure Controls / Personal Protection

Exposure limits

ACGIH

None available

OSHA

None available

Engineering controls

Use process enclosures, local exhaust ventilation, or other engineering controls to control airborne levels below recommended exposure limits.

Eye / face protection

Wear safety glasses; chemical goggles (if splashing is possible).

Skin protection

Wear nitrile, neoprene, PVC or viton gloves. Wear suitable protective clothing.

Respiratory protection

No personal respiratory protective equipment normally required. An air purifying respirator with an organic vapor cartridge may be used under certain circumstances where airborne concentrations are expected to exceed exposure limits, or if irritation or symptoms are experienced. Respiratory protection must be provided in accordance with 29 CFR 1910.134.

General hygiene considerations

When using, do not eat, drink or smoke. Wash hands thoroughly after handling. Launder contaminated clothing before reuse. Keep away from food and drink.

9. Physical & Chemical Properties

Color

White

Odor

Slight

Odor threshold

Not available

Form

Semi-solid

pH

Not available

Melting point

Not available

Freezing point

Not available

Boiling point

Not available

Flash point

None

Evaporation rate

Not available

Flammability

Not applicable

Flammability limits in air, upper, % by volume

Not Applicable

Flammability limits in air, lower, % by volume	Not Applicable
Vapor pressure	Not available
Vapor density (air=1)	Not available
Density	1.94 g/cm ³
Solubility (water)	Not available
Partition coefficient (n-octanol/water)	Not available
Auto-ignition temperature	Not Applicable
Decomposition temperature	Not available

10. Chemical Stability & Reactivity Information

Chemical stability	Stable.
Conditions to avoid	Heat, flames and sparks.
Incompatible materials	Strong acids, alkalies, oxidizing and reducing agents. Ammonium compounds. Alkaline metals. Alkaline earth metals. Powdered metals. Halogenated compounds.
Hazardous decomposition products	Oxides of nitrogen. Hydrogen fluoride. Carbonyl fluoride.

11. Toxicological Information

Acute toxicity	Acute LD50: > 5000 mg/kg, Rat, Oral
Acute effects	Inhalation of decomposition products may cause polymer fume fever, a temporary flu-like illness accompanied by fever, chills, and sometimes cough. Refer to Hazards Identification Section for additional information.
Carcinogenicity	This product does not contain any carcinogens or potential carcinogens as listed by OSHA, IARC and NTP.

12. Ecological Information

Ecotoxicity	This material is not expected to be harmful to aquatic life.
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13. Disposal Considerations

Disposal instructions	Dispose in accordance with all applicable regulations. Under RCRA, it is the responsibility of the user of the product to determine, at the time of disposal, whether the product meets RCRA criteria for hazardous waste.
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14. Transport Information

Department of Transportation (DOT) Requirements

Not regulated as dangerous goods.

IMDG

Not regulated as dangerous goods.

IATA

Not regulated as dangerous goods.

15. Regulatory Information

US federal regulations

U.S. - CERCLA/SARA - Hazardous Substances and their Reportable Quantities

SODIUM NITRITE 7632-00-0 100 lb final RQ; 45.4 kg final RQ

U.S. - CERCLA/SARA - Section 313 - Emission Reporting

SODIUM NITRITE 7632-00-0 1.0 % de minimis concentration

CERCLA (Superfund) reportable quantity

SODIUM NITRITE: 100.0000

Superfund Amendments and Reauthorization Act of 1986 (SARA)

Hazard categories	Immediate Hazard - No
	Delayed Hazard - No
	Fire Hazard - No
	Pressure Hazard - No
	Reactivity Hazard - No

Section 302 extremely hazardous substance No

Section 311 hazardous chemical No

Inventory status

Country(s) or region	Inventory name	On inventory (yes/no)*
Australia	Australian Inventory of Chemical Substances (AICS)	Yes
Canada	Domestic Substances List (DSL)	Yes
Canada	Non-Domestic Substances List (NDSL)	No
China	Inventory of Existing Chemical Substances in China (IECSC)	Yes
Europe	European Inventory of New and Existing Chemicals (EINECS)	Yes
Europe	European List of Notified Chemical Substances (ELINCS)	No
Japan	Inventory of Existing and New Chemical Substances (ENCS)	Yes
Korea	Existing Chemicals List (ECL)	Yes
Philippines	Philippine Inventory of Chemicals and Chemical Substances (PICCS)	Yes
United States	Toxic Substances Control Act (TSCA) Inventory	Yes

A "Yes" indicates that all components of this product comply with the inventory requirements administered by the governing country(s)

State regulations This product does not contain a chemical known to the State of California to cause cancer, birth defects or other reproductive harm.

U.S. - Massachusetts - Right To Know List

SODIUM NITRITE 7632-00-0 Present

U.S. - New Jersey - Right to Know Hazardous Substance List

SODIUM NITRITE 7632-00-0 sn 2258

U.S. - Pennsylvania - RTK (Right to Know) List

SODIUM NITRITE 7632-00-0 Environmental hazard

16. Other Information

HMIS® ratings Health: 1
Flammability: 0
Physical hazard: 0

NFPA ratings Health: 3
Flammability: 0
Instability: 0

Prepared by William M. Medeiros
Regulatory Affairs Manager

Disclaimer The information provided in this Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication . The information given is designed only as a guidance for safe handling, use, processing, storage, transportation, disposal and release. Nye Lubricants, Inc. makes no warranty with respect thereto and disclaims all liability with respect thereon.

MSDS sections updated This document has undergone significant changes and should be reviewed in its entirety.



The SmartGrease Company

EP Fortified

A clay thickened, heavy viscosity, ester grease intended as a high performance maintenance lubricant for bearings and mechanical devices where good film strength is required at high temperatures.

Lubricant Properties		Typical Value	Test Method
Recommended Service Range (°C)		-29 to 204	
Thickener		Clay	
Base Oil		Polyolester	
	Type		
	Kinematic Viscosity	100°C	44 cSt
		40°C	452 cSt
	Viscosity Index		151
	Flash Point	°C	279
	Pour Point	°C	-35
Typical Properties of the Grease		Typical Value	Test Method
Color, Appearance		Tan	
Penetration (1/10 mm)	Unworked		255
	Worked	60 X	280
		100000 X	317
	NLGI Grade		2
Density		25°C	0.9 g/cm ³
Oil Separation	168 hour(s)	200°C	2.3 %
Evaporation	24 hour(s)	100°C	1.4 %
		200°C	3.2 %
	168 hour(s)	200°C	10.5 %
Water Washout	60 minute(s)	80°C	2 %
4 Ball Wear	60 minute(s), 1200RPM, 40 kg load	75°C	0.5 mm
Oxidative Stability	168 hour(s)	100°C	20.4 kPa

The typical properties shown on this product data sheet should not be used as a basis for preparing specifications. Refer to our product Material Safety Data Sheet for detailed safety information. (0805)

MATERIAL SAFETY DATA SHEET

1. Product and Company Identification

Material name	NYECORR 346
Revision date	29-May-2008
Product use	Lubricating Grease
Manufacturer information	Nye Lubricants, Inc. 12 Howland Road Fairhaven, MA 02179 US 508-996-6721 www.nyelubricants.com
Emergency	CHEMTREC 1-800-424-9300

2. Hazards Identification

Emergency overview	May be ignited by heat, sparks or flames. Contact with eyes may cause irritation. Prolonged and/or repeated skin contact may result in mild irritation or redness.
OSHA regulatory status	This product is considered not hazardous under 29 CFR 1910.1200 (Hazard Communication).
Potential health effects	
Routes of exposure	Eye contact. Skin contact.
Eyes	Contact with eyes may cause irritation.
Skin	Prolonged and/or repeated skin contact may result in mild irritation or redness.
Inhalation	Health injuries are not known or expected under normal use.
Ingestion	Health injuries are not known or expected under normal use.
Target organs	Eyes. Skin.

3. Composition / Information on Ingredients

The manufacturer lists no ingredients as hazardous according to OSHA 29 CFR 1910.1200.

4. First Aid Measures

Eye contact	Immediately flush eyes with plenty of water for at least 15 minutes. Get immediate medical attention.
Skin contact	Wash off with soap and water. Get medical attention if symptoms occur. Wash clothing separately before reuse.
Inhalation	If symptoms develop, remove affected person from source of exposure into fresh air. Get immediate medical attention.
Ingestion	If ingestion of a large amount does occur, seek medical attention. Do not induce vomiting without medical advice. If vomiting occurs naturally, have victim lean forward to reduce risk of aspiration. Never give anything by mouth to a victim who is unconscious or is having convulsions.

5. Fire Fighting Measures

Suitable extinguishing media	Carbon dioxide (CO2). Dry chemical. Foam.
Unsuitable extinguishing media	Do not use a solid water stream as it may scatter and spread fire.
Hazardous combustion products	Carbon monoxide, carbon dioxide and/or low molecular weight hydrocarbons.
Protective equipment and precautions for firefighters	Wear full protective clothing, including helmet, self-contained positive pressure or pressure demand breathing apparatus, protective clothing and face mask. Use water spray to cool unopened containers. Move containers from fire area if you can do it without risk.

6. Accidental Release Measures

Personal precautions	Observe precautions from other sections. Keep unnecessary personnel away. Do not touch damaged containers or spilled material unless wearing appropriate protective clothing. Keep people away from and upwind of spill/leak.
Environmental precautions	Prevent entry into waterways, sewers, basements or confined areas.
Methods for containment	Stop the flow of material, if this is without risk. Dike the spilled material, where this is possible.
Methods for cleaning up	Soak up with inert absorbent material. Clean contaminated surface thoroughly. Clean up spills immediately, observing precautions in Protective Equipment section. Sweep up and shovel into suitable containers for disposal.

7. Handling and Storage

Handling	Do not handle or store near an open flame, heat or other sources of ignition. Do NOT pressurize, cut, heat, or weld containers. Empty product containers may contain product residue. Avoid contact with eyes. Avoid prolonged or repeated skin contact with this material. Wash thoroughly after handling. Avoid breathing gas/vapors/mist/fumes. Do not take internally. Do not taste or swallow.
Storage	Keep away from heat and sources of ignition. Store in cool place. Store in a closed container away from incompatible materials.

8. Exposure Controls / Personal Protection

Exposure limits	
ACGIH	None available
OSHA	None available
Engineering controls	Use process enclosures, local exhaust ventilation, or other engineering controls to control airborne levels below recommended exposure limits.
Eye / face protection	Wear safety glasses; chemical goggles (if splashing is possible).
Skin protection	Wear nitrile, neoprene, PVC or viton gloves. Wear suitable protective clothing.
Respiratory protection	No personal respiratory protective equipment normally required. An air purifying respirator with an organic vapor cartridge may be used under certain circumstances where airborne concentrations are expected to exceed exposure limits, or if irritation or symptoms are experienced. Respiratory protection must be provided in accordance with 29 CFR 1910.134.
General hygiene considerations	When using, do not eat, drink or smoke. Wash hands thoroughly after handling. Launder contaminated clothing before reuse. Keep away from food and drink.

9. Physical & Chemical Properties

Color	Tan
Odor	Slight
Odor threshold	Not available
Form	Semi-solid
pH	Not available
Melting point	Not available
Freezing point	Not available
Boiling point	Not available
Flash point	> 400 °F (> 204.4 °C) ASTM D-92
Evaporation rate	Not available
Flammability	Not applicable
Flammability limits in air, upper, % by volume	Not applicable
Flammability limits in air, lower, % by volume	Not applicable
Vapor pressure	Not available
Vapor density (air=1)	Not available

Density	0.9 g/cm ³
Solubility (water)	Not available
Partition coefficient (n-octanol/water)	Not available
Auto-ignition temperature	Not available
Decomposition temperature	Not available

10. Chemical Stability & Reactivity Information

Chemical stability	Stable.
Conditions to avoid	Heat, flames and sparks.
Incompatible materials	Strong acids, alkalis and oxidizing agents. Amines. Alcohols.
Hazardous decomposition products	Carbon monoxide, carbon dioxide and/or low molecular weight hydrocarbons. Benzene. Phenol.

11. Toxicological Information

Acute effects	Refer to Hazards Identification Section.
Carcinogenicity	This product does not contain any carcinogens or potential carcinogens as listed by OSHA, IARC and NTP.

12. Ecological Information

Ecotoxicity	This material is not expected to be harmful to aquatic life.
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13. Disposal Considerations

Disposal instructions	Dispose in accordance with all applicable regulations. Under RCRA, it is the responsibility of the user of the product to determine, at the time of disposal, whether the product meets RCRA criteria for hazardous waste.
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14. Transport Information

Department of Transportation (DOT) Requirements

Not regulated as dangerous goods.

IMDG

Not regulated as dangerous goods.

IATA

Not regulated as dangerous goods.

15. Regulatory Information

CERCLA (Superfund) reportable quantity

None

Superfund Amendments and Reauthorization Act of 1986 (SARA)

Hazard categories	Immediate Hazard - No Delayed Hazard - No Fire Hazard - No Pressure Hazard - No Reactivity Hazard - No
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Section 302 extremely hazardous substance	No
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Section 311 hazardous chemical	No
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Inventory status

Country(s) or region	Inventory name	On inventory (yes/no)*
Australia	Australian Inventory of Chemical Substances (AICS)	No
Canada	Domestic Substances List (DSL)	No
Canada	Non-Domestic Substances List (NDSL)	Yes
China	Inventory of Existing Chemical Substances in China (IECSC)	No
Europe	European Inventory of New and Existing Chemicals (EINECS)	Yes
Europe	European List of Notified Chemical Substances (ELINCS)	No
Japan	Inventory of Existing and New Chemical Substances (ENCS)	No
Korea	Existing Chemicals List (ECL)	No
Philippines	Philippine Inventory of Chemicals and Chemical Substances (PICCS)	No
United States	Toxic Substances Control Act (TSCA) Inventory	Yes

A "Yes" indicates that all components of this product comply with the inventory requirements administered by the governing country(s)

State regulations This product does not contain a chemical known to the State of California to cause cancer, birth defects or other reproductive harm.

16. Other Information

HMIS® ratings Health: 0
Flammability: 1
Physical hazard: 0

NFPA ratings Health: 0
Flammability: 1
Instability: 0

Prepared by William M. Medeiros
Regulatory Affairs Manager

Disclaimer The information provided in this Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information given is designed only as a guidance for safe handling, use, processing, storage, transportation, disposal and release. Nye Lubricants, Inc. makes no warranty with respect thereto and disclaims all liability with respect thereon.

MSDS sections updated This document has undergone significant changes and should be reviewed in its entirety.



NYECORR GP

EP Fortified, Rust Inhibited

A lithium soap thickened, medium viscosity, synthetic hydrocarbon grease intended for bearings and mechanical devices.

The SmartGrease Company

Lubricant Properties		Typical Value	Test Method
Recommended Service Range (°C)		-30 to 150	
Thickener		Lithium Soap	
Base Oil	Type	Polyalphaolefin	
	Kinematic Viscosity	100°C	26 cSt
		40°C	224 cSt
	Viscosity Index		148
	Flash Point	°C	280
	Pour Point	°C	-35
Typical Properties of the Grease		Typical Value	Test Method
Color, Appearance		Tan	
Penetration	Unworked		267
(1/10 mm)	Worked	60 X	285
	Unworked		2
Density		25°C	0.86 g/cm ³
Dropping Point		°C	> 260
Oil Separation	24 hour(s)	100°C	2 %
			FTM 791, Method 321.2
Evaporation	24 hour(s)	100°C	0.3 %
		150°C	1.3 %
			NYE CTM
4 Ball Wear	60 minute(s), 1200RPM, 40 kg load	75°C	0.67 mm
			ASTM D-2266
Bearing Rust Test			Pass
			ASTM D-1743
Apparent Viscosity		°C	

The typical properties shown on this product data sheet should not be used as a basis for preparing specifications. Refer to our product Material Safety Data Sheet for detailed safety information. (0806)

MATERIAL SAFETY DATA SHEET

1. Product and Company Identification

Material name NYECORR GP
Revision date 04-Jun-2008
Product use Lubricating Grease
Manufacturer information Nye Lubricants, Inc.
 12 Howland Road
 Fairhaven, MA 02179 US
 508-996-6721
 www.nyelubricants.com
Emergency CHEMTREC 1-800-424-9300

2. Hazards Identification

Emergency overview May be ignited by heat, sparks or flames. Contact with eyes may cause irritation. Prolonged and/or repeated skin contact may result in mild irritation or redness.
OSHA regulatory status This product is considered not hazardous under 29 CFR 1910.1200 (Hazard Communication).
Potential health effects
Routes of exposure Eye contact. Skin contact.
Eyes Contact with eyes may cause irritation.
Skin Prolonged and/or repeated skin contact may result in mild irritation or redness.
Inhalation Health injuries are not known or expected under normal use.
Ingestion Health injuries are not known or expected under normal use.
Target organs Eyes. Skin.

3. Composition / Information on Ingredients

Components	CAS #	Percent
ANTIMONY DIALKYLDITHIOCARBAMATE	15890-25-2	1 - 2.5
Non-hazardous and other components below reportable levels		> 90

4. First Aid Measures

Eye contact Immediately flush eyes with plenty of water for at least 15 minutes. Get immediate medical attention.
Skin contact Wash off with soap and water. Get medical attention if symptoms occur. Wash clothing separately before reuse.
Inhalation If symptoms develop, remove affected person from source of exposure into fresh air. Get immediate medical attention.
Ingestion If ingestion of a large amount does occur, seek medical attention. Do not induce vomiting without medical advice. If vomiting occurs naturally, have victim lean forward to reduce risk of aspiration. Never give anything by mouth to a victim who is unconscious or is having convulsions.

5. Fire Fighting Measures

Suitable extinguishing media Carbon dioxide (CO2). Dry chemical. Foam.
Unsuitable extinguishing media Do not use a solid water stream as it may scatter and spread fire.
Hazardous combustion products Carbon monoxide, carbon dioxide and/or low molecular weight hydrocarbons. Oxides of sulfur. Oxides of nitrogen.

Protective equipment and precautions for firefighters

Wear full protective clothing, including helmet, self-contained positive pressure or pressure demand breathing apparatus, protective clothing and face mask. Use water spray to cool unopened containers. Move containers from fire area if you can do it without risk.

6. Accidental Release Measures

Personal precautions

Observe precautions from other sections. Keep unnecessary personnel away. Do not touch damaged containers or spilled material unless wearing appropriate protective clothing. Keep people away from and upwind of spill/leak.

Environmental precautions

Prevent entry into waterways, sewers, basements or confined areas.

Methods for containment

Stop the flow of material, if this is without risk. Dike the spilled material, where this is possible.

Methods for cleaning up

Soak up with inert absorbent material. Clean contaminated surface thoroughly. Clean up spills immediately, observing precautions in Protective Equipment section. Sweep up and shovel into suitable containers for disposal.

7. Handling and Storage

Handling

Do not handle or store near an open flame, heat or other sources of ignition. Do NOT pressurize, cut, heat, or weld containers. Empty product containers may contain product residue. Avoid contact with eyes. Avoid prolonged or repeated skin contact with this material. Wash thoroughly after handling. Avoid breathing gas/vapors/mist/fumes. Do not take internally. Do not taste or swallow.

Storage

Keep away from heat and sources of ignition. Store in cool place. Store in a closed container away from incompatible materials.

8. Exposure Controls / Personal Protection

Exposure limits

ACGIH

None available

OSHA

None available

Engineering controls

Use process enclosures, local exhaust ventilation, or other engineering controls to control airborne levels below recommended exposure limits.

Eye / face protection

Wear safety glasses; chemical goggles (if splashing is possible).

Skin protection

Wear nitrile, neoprene, PVC or viton gloves. Wear suitable protective clothing.

Respiratory protection

No personal respiratory protective equipment normally required. An air purifying respirator with an organic vapor cartridge may be used under certain circumstances where airborne concentrations are expected to exceed exposure limits, or if irritation or symptoms are experienced. Respiratory protection must be provided in accordance with 29 CFR 1910.134.

General hygiene considerations

When using, do not eat, drink or smoke. Wash hands thoroughly after handling. Launder contaminated clothing before reuse. Keep away from food and drink.

9. Physical & Chemical Properties

Color

Tan

Odor

Slight

Odor threshold

Not available

Form

Semi-solid

pH

Not available

Melting point

Not available

Freezing point

Not available

Boiling point

Not available

Flash point

> 400 °F (> 204.4 °C) ASTM D-92

Evaporation rate

Not available

Flammability

Not applicable

Flammability limits in air, upper, % by volume

Not applicable

Flammability limits in air, lower, % by volume	Not applicable
Vapor pressure	Not available
Vapor density (air=1)	Not available
Density	0.86 g/cm ³
Solubility (water)	Not available
Partition coefficient (n-octanol/water)	Not available
Auto-ignition temperature	Not available
Decomposition temperature	Not available

10. Chemical Stability & Reactivity Information

Chemical stability	Stable.
Conditions to avoid	Heat, flames and sparks.
Incompatible materials	Strong acids, alkalis and oxidizing agents.
Hazardous decomposition products	Carbon monoxide, carbon dioxide and/or low molecular weight hydrocarbons.

11. Toxicological Information

Acute effects	Refer to Hazards Identification Section.
Carcinogenicity	This product does not contain any carcinogens or potential carcinogens as listed by OSHA, IARC and NTP.

12. Ecological Information

Environmental effects	Components of this product have been identified as having potential environmental concerns.
Ecotoxicity	This material is not expected to be harmful to aquatic life.

13. Disposal Considerations

Disposal instructions	Dispose in accordance with all applicable regulations. Under RCRA, it is the responsibility of the user of the product to determine, at the time of disposal, whether the product meets RCRA criteria for hazardous waste.
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14. Transport Information

Department of Transportation (DOT) Requirements

Not regulated as dangerous goods.

IMDG

Not regulated as dangerous goods.

IATA

Not regulated as dangerous goods.

15. Regulatory Information

US federal regulations

U.S. - CERCLA/SARA - Hazardous Substances and their Reportable Quantities

ANTIMONY 15890-25-2 5000 lb final RQ; 2270 kg final RQ
 DIALKYLDITHIOCARBAMATE

U.S. - CERCLA/SARA - Section 313 - Emission Reporting

ANTIMONY 15890-25-2 1.0 % de minimis concentration
 DIALKYLDITHIOCARBAMATE

CERCLA (Superfund) reportable quantity

ANTIMONY DIALKYLDITHIOCARBAMATE: 5000.0000

Superfund Amendments and Reauthorization Act of 1986 (SARA)

Hazard categories	Immediate Hazard - No Delayed Hazard - No Fire Hazard - No Pressure Hazard - No Reactivity Hazard - No
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Section 302 extremely hazardous substance No

Section 311 hazardous chemical No

Inventory status

Country(s) or region	Inventory name	On inventory (yes/no)*
Australia	Australian Inventory of Chemical Substances (AICS)	No
Canada	Domestic Substances List (DSL)	No
Canada	Non-Domestic Substances List (NDSL)	Yes
China	Inventory of Existing Chemical Substances in China (IECSC)	No
Europe	European Inventory of New and Existing Chemicals (EINECS)	Yes
Europe	European List of Notified Chemical Substances (ELINCS)	No
Japan	Inventory of Existing and New Chemical Substances (ENCS)	No
Korea	Existing Chemicals List (ECL)	No
Philippines	Philippine Inventory of Chemicals and Chemical Substances (PICCS)	No
United States	Toxic Substances Control Act (TSCA) Inventory	Yes

A "Yes" indicates that all components of this product comply with the inventory requirements administered by the governing country(s)

State regulations This product does not contain a chemical known to the State of California to cause cancer, birth defects or other reproductive harm.

16. Other Information

HMIS® ratings Health: 0
Flammability: 1
Physical hazard: 0

NFPA ratings Health: 0
Flammability: 1
Instability: 0

Prepared by William M. Medeiros
Regulatory Affairs Manager

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MSDS sections updated This document has undergone significant changes and should be reviewed in its entirety.

Requested by: NYE LUBRICANTS, INC.

Part: Grease - Rolling bearing grease

Grease NyeCorr[®] 140

Behaviour at high temperatures and corrosion resistance

Determination of evaporation loss, aggressivity against roller bearing steel and determination of the corrosion inhibiting properties

Sample: NyeCorr140 from Fa. NYE LUBRICANTS, INC.
Batch. No. Lot DR 030620

Property / characteristic	Data from supplier
Thickener	PTFE
Consistency class	NLGI 2
Base oil type	Perfluoropolyether
Base oil viscosity	510 mm ² /s at 40 °C
Operating temperature range	-20.....+ 250 °C

Tests:

- # Infrared analyses
- # Evaporation loss
- # Behaviour against roller bearing steel
- # Behaviour after ageing
- # Corrosion test under presence of water

Description of the test method performed see Enclosure 1

Results: see Enclosures 2 to 4

Conclusion:

The tested grease NyeCorr 140 from Nye Lubricants shows a very good thermal and chemical stability. The evaporation losses in the temperature range from +140 up to +200 °C can be defined as low. At those tested temperatures no remarkable change of grease behavior like appearance, colour and consistency occurred.

There is no chemical aggressivity against roller bearing steel.

In the presence of water the corrosion inhibiting properties of the grease against bearing steel are excellent.

written:

R. Kühl STW4

Distribution: Customer Nye Lubricants, STW, STW4

Tests performed:

Infrared analyses acc. to DIN 51 820

Evaporation loss

A thin layer of the grease (thickness roughly 2 mm) is distributed on a metal plate; the initial weight of the grease layer on the plate is recorded. The samples are exposed in ovens to temperatures of 140°, 160°, 180° und 200° C. Weekly the samples are cooled down to determine the weight and calculating the evaporation loss. The tests are continued until a heating time of six weeks.

Aggressivity of the grease and ist volatile components against bearing steel

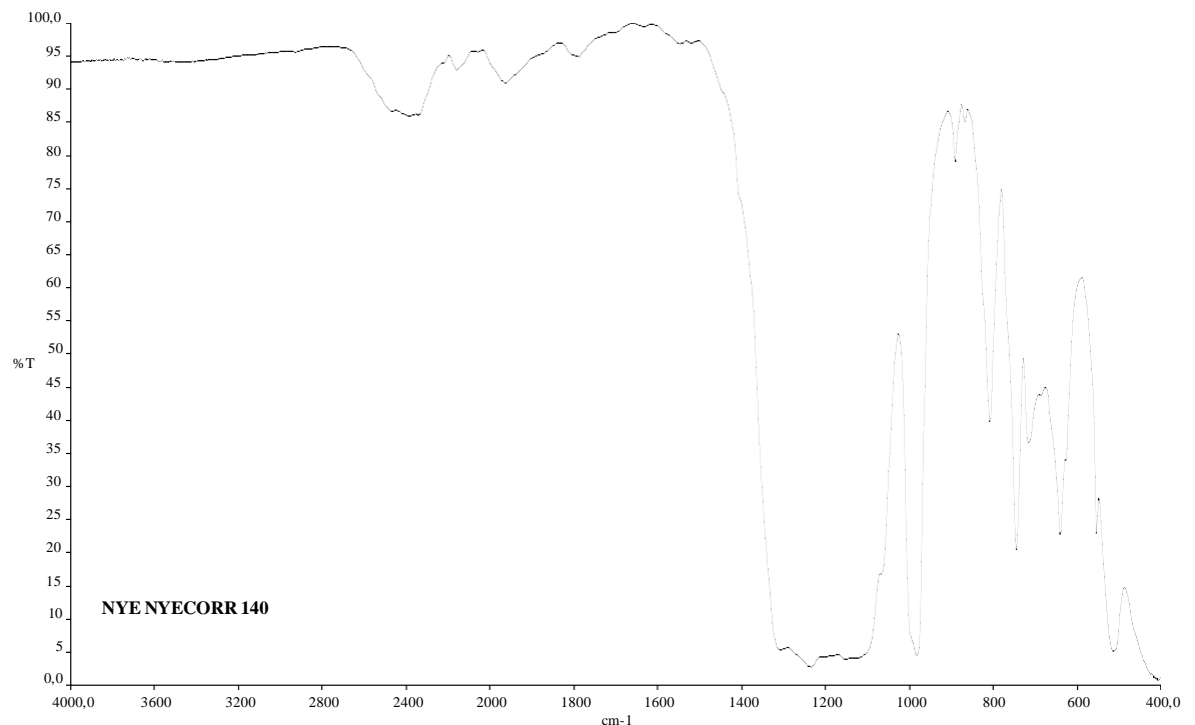
Two cylindrical rollers (e.g. RC 17 x 17) are pressed into a grease layer in such a way that only halve of the roller is dipped into the grease. The upper halve of the roller is exposed to the ambient air. After 48 hours contact time at 180 °C and remaining time of 24 hours at room temperature the rollers are cleaned and inspected for their chemical attack on the surface.

Corrosion inhibiting properties

The corrosion inhibiting properties of the grease in the presence of water is tested using the SKF Emcor y orrosionsverhindernden Eigenschaften des Fettes bei Gegenwart von Wasser werden mit dem SKF Emcor Verfahren nach DIN 51 802 bzw. ISO 11 007 ermittelt.

Results:

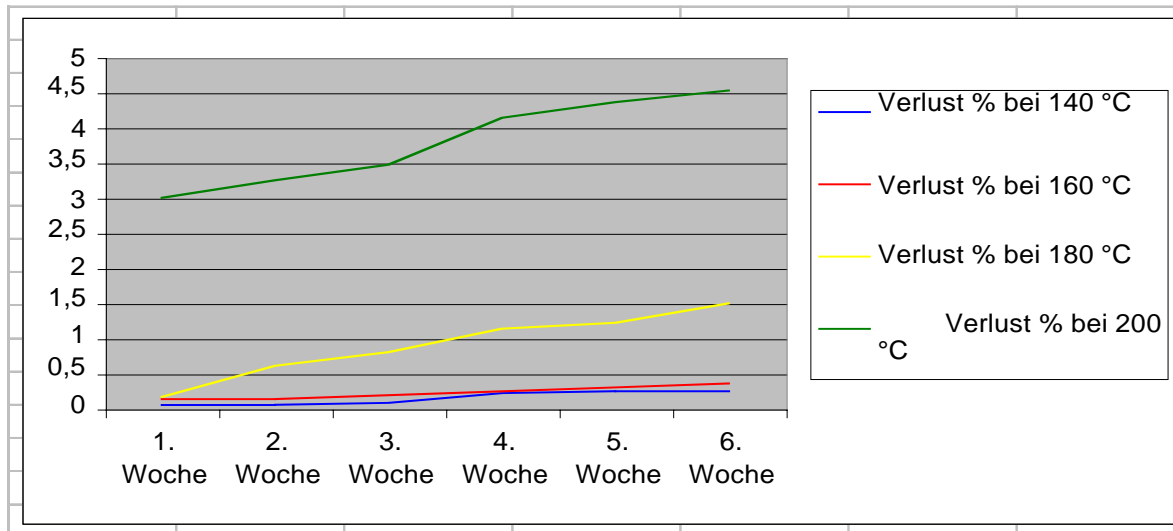
1. Infrared-Spectra of grease NyeCorr 140



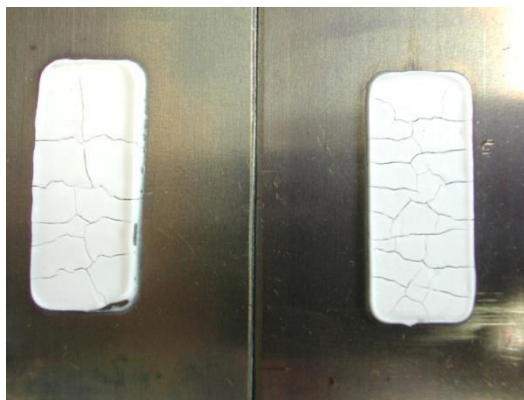
2. Evaporation loss

	1. week	2. week	3. week	4. week	5. week	6. week
Loss % at 140 °C	0,05	0,06	0,07	0,23	0,24	0,24
Loss % at 160 °C	0,14	0,15	0,2	0,25	0,3	0,37
Loss % at 180 °C	0,18	0,62	0,8	1,15	1,23	1,49
Loss % at 200 °C	2,99	3,24	3,47	4,13	4,37	4,54

Diagramm: Evaporation loss after 6 weeks at different test temperatures



Appearance of grease layer after 6 weeks storage time at 180° and 200 °C



3. Aggressivity of grease against bearing steel

	Appearance, Condition of grease and tested roller 100 Cr 6 after storage at 180° and 200 °C			
	Grease NyeCorr 140)		Roller 100 Cr6 **)	
	Appearance	Consistency	Grease contact ***)	Air contact ***)
180 °C	white, mat	NLGI 2	1	1
200 °C	white, mat, slightly oil bleeding	NLGI 2	1	1

*) origin colour white
origin consistency NLGI 2

Reference roller at 180°C
without grease: rating 1

***) rating 0: no attack, no change
rating 1: some temper colour
rating 2: heavy temper colour
rating 3: corrosion
rating 4: heavy corrosion

4. Corrosion inhibiting properties in SKF Emcor Test

Test solution: Distilled water

Corrosions degree: **0 und 1**

race ways bright, metallic shiny traces on ball contact line

End of report

Grease Color	Cotamination	Recommendation	Grease Consistency
White	None	Grease in good condition.	
Gray	0.0 - 0.1% iron	Grease is in good condition. Normal wear in bearing.	
Tan	0.1 - 0.4% iron	Add grease until cavity is full. Bearing OK.	
Brown	0.4 - 0.8% iron	Flush bearing with grease. Check bearing play for excess wear.	
Dark Brown	0.8% and higher	Check bearing for play and noise. If OK flush with grease. If bearing is NOT OK, schedule bearing change.	
Black		Replace bearing.	



Synthetic Lubricants

The SmartGrease Company[®]

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ISO 9001:2000
ISO 14001:2004
ISO/TS 16949:2002