



Mobilith SHC™ Series

Mobil Grease , United States

Grease

Product Description

Mobilith SHC™ Series greases are superior performance products designed for a wide variety of applications at extremes of temperature. They combine the unique features of synthetic base fluids with those of a high quality lithium complex thickener. The wax-free nature of synthetic fluids and the low coefficient of traction (compared with mineral oils), provide excellent low temperature pumpability and very low starting and running torque. These products offer the potential for energy savings and can reduce operating temperatures in the load zone of spherical roller and ball bearings. The lithium complex thickener contributes excellent adhesion, structural stability and resistance to water. The greases have a high level of chemical stability and are formulated with special additive combinations to provide excellent protection against wear, rust and corrosion, and providing operating viscosity at high and low temperatures. Mobilith SHC Series greases are available in seven grades, varying in base oil viscosity from ISO VG 100 to 1500 and in NLGI grade from 2 to 00.

Mobilith SHC Series greases have become the products of choice for many users, in many industries worldwide. Their reputation is based on their exceptional quality, reliability, versatility and the performance benefits they deliver.

Features and Benefits

The Mobil SHC brand of oils and greases are recognized and appreciated around the world for their innovation and outstanding performance. The Mobilith SHC series symbolizes ExxonMobil's continued commitment to using advanced technology to provide outstanding products. A key factor in the development of the Mobilith SHC Series were the close contacts between our scientists and application specialists with key Original Equipment Manufacturers (OEMs) to ensure that our product offerings would provide exceptional performance in the continually evolving industrial equipment designs.

Our work with equipment builders has helped confirm the results from our own laboratory tests showing the exceptional performance of the Mobilith SHC Series lubricants. These benefits include longer grease life, enhanced bearing protection and bearing life, wide temperature range of application, and the potential for improved mechanical efficiency and energy savings.

To combat high thermal exposure of the oil our product formulation scientists chose proprietary synthetic base oils for Mobilith SHC Series oils because of their exceptional thermal/oxidative resistance potential. Our scientists developed a state-of-the-art lithium complex thickener technology and used specific additives to enhance the performance of each grade of the Mobilith SHC Series product family. The Mobilith SHC Series greases offer the following features and benefits:

Features	Advantages and Potential Benefits
Outstanding high temperature and low temperature performance	Wide application temperature ranges, with excellent protection at high temperatures and low torque, easy start-up at low temperatures
Excellent protection against wear, rust and corrosion	Reduced downtime and maintenance costs because of reduced wear, rust and corrosion
Excellent thermal stability and oxidation resistance	Extended service life with longer intervals between relubrication and improved bearing life
Low traction coefficient	Potential to improve mechanical life and reduced energy consumption
Includes both high and low viscosity grades	Options for outstanding protection of slow speed, heavily loaded bearings, and options for good low temperature performance
Outstanding structural stability in the presence of water	Retains excellent grease performance in hostile aqueous environments
Low volatility	Helps resist viscosity increase at high temperatures to maximize relubrication intervals and bearing life

Applications

Application Considerations: While Mobilith SHC Series greases are compatible with most mineral oil based products, admixture may detract from their performance. Consequently it is recommended that before changing a system to one of the Mobilith SHC Series, it should be thoroughly cleaned out to achieve the maximum performance benefits. While the Mobilith SHC Series greases share many performance benefits, their applications are best described in terms of each product grade:

- Mobilith SHC 100 is an antiwear and extreme pressure grease primarily recommended for higher speed applications such as electric motors, where reduced friction, low wear and long service life are required. It is an NLGI 2 Grade / ISO VG 100 grease with a synthetic base fluid. Its operating temperature range is -40° C* to 150° C.
- Mobilith SHC 220 is a multi-purpose, NLGI 2 extreme pressure grease recommended for heavy-duty automotive and industrial applications. It uses an ISO VG 220 synthetic base fluid. Mobilith SHC 220 has a recommended operating temperature range of -40° C* to 150° C.
- Mobilith SHC 221 is a multi-purpose, extreme pressure grease recommended for heavy-duty automotive and industrial applications, particularly where centralized grease systems are utilized. It uses an ISO VG 220 synthetic base fluid. Mobilith SHC 221 has a recommended operating temperature range of -40° C to 150° C.
- Mobilith SHC 460 is an NLGI 1.5 Grade grease with ISO VG 460 synthetic base fluid and is an extreme pressure grease recommended for tough industrial and marine applications. It provides outstanding bearing protection under heavy loads at low-to-moderate speeds and in applications where water resistance is a critical factor. Mobilith SHC 460 has demonstrated outstanding performance in steel mills, paper mills and marine applications. The recommended operating temperature range is -30° C* to 150°C.
- Mobilith SHC 1500 is an NLGI 1.5 Grade / ISO VG 1500 grease with a synthetic base fluid. It is intended for use in plain and rolling element bearings operating at extremely slow speeds, under heavy loads and high temperatures. Mobilith SHC 1500 has a recommended operating temperature range of -30 °C* to 150 °C with appropriate relubrication intervals. Continuous lubrication with Mobilith SHC 1500 has been very effective in prolonging bearing life in a severe roll press application. Mobilith SHC 1500 has also provided excellent performance in rotary kiln roller bearings and in slag transfer rail car bearings.
- Mobilith SHC 007 is an NLGI 00 Grade / ISO VG 460 grease with a synthetic base fluid; it has a recommended operating temperature range of -50° C to 150 ° C with appropriate relubrication intervals. Its primary uses are in grease filled industrial gear cases subject to high temperatures, where conventional semi fluid greases will not provide acceptable lubricant life and in non-driven heavy-duty truck trailer wheel hubs.

*Low temperature claims based on ASTM D 1478 results vs. maximum limits of 10,000 / 1000 gcm @ startup and 1 hour respectively.

Specifications and Approvals

This product has the following approvals:	007	100	1500	220	221	460
AAR-M942		X			X	
Siemens Gamesa Renewable Energy offshore direct drive wind turbine main bearing	X					

This product is recommended for use in applications requiring:	007	100	1500	220	221	460
CEN EN 12081:2017		X				

This product meets or exceeds the requirements of:	007	100	1500	220	221	460
DIN 51825:2004-06 - KP HC 1-2 N -30			X			
DIN 51825:2004-06 - KP HC 1-2 N -40						X
DIN 51825:2004-06 - KP HC 2 N -30				X		
DIN 51825:2004-06 - KP HC 2 N -40		X				

This product meets or exceeds the requirements of:	007	100	1500	220	221	460
DIN 51826:2005-01 - GP HC 00 K -30	X					

Properties and Specifications

Property	007	100	1500	220	221	460
Grade	NLGI 00	NLGI 2	NLGI 1.5	NLGI 2	NLGI 1	NLGI 1.5
Thickener Type	Lithium Complex Greases					
Color, Visual	Red	Red	Red	Red	Light Tan	Red
Copper Strip Corrosion, 24 h, 100 C, Rating, ASTM D4048	1B	1B	1B	1B		1B
Corrosion Preventive Properties, Rating, ASTM D1743			Pass	Pass	Pass	Pass
Dropping Point, °C, ASTM D2265		265	265	265	265	265
Four-Ball Extreme Pressure Test, Weld Point, kgf, ASTM D2596	250	250	250	250	250	250
Four-Ball Wear Test, Scar Diameter, mm, ASTM D2266	0.5	0.5	0.5	0.5	0.5	0.5
Oil Separation, 0.25 psi, 24 h @ 25 C, mass%, ASTM D1742			<1	2		3
Penetration, 60X, 0.1 mm, ASTM D217	415	280	305	280	325	305
SKF Emcors Rust Test, 10% Synthetic Sea Water, ASTM D6138		0, 1	0, 1	0, 1		0, 1
SKF Emcors Rust Test, Acidic Water, ASTM D6138		0, 1	0, 1	0, 1		0, 1
SKF Emcors Rust Test, Distilled Water, ASTM D6138	0, 0	0, 0	0, 0	0, 0	0, 0	0, 0
Viscosity @ 100 C, Base Oil, mm ² /s, ASTM D445	55.6	16.3	149	30.3	30.3	55.6
Viscosity @ 40 C, Base Oil, mm ² /s, ASTM D445	460	100	1500	220	220	460
Viscosity Index, ASTM D2270	188	175	212	179	179	188
Water Washout, Loss @ 79 C, wt%, ASTM D1264		6	6	1.5		7

Health and Safety

Health and Safety recommendations for this product can be found on the Material Safety Data Sheet (MSDS) @ <http://www.msds.exxonmobil.com/psims/psims.aspx>

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05-2025

Exxon Mobil Corporation

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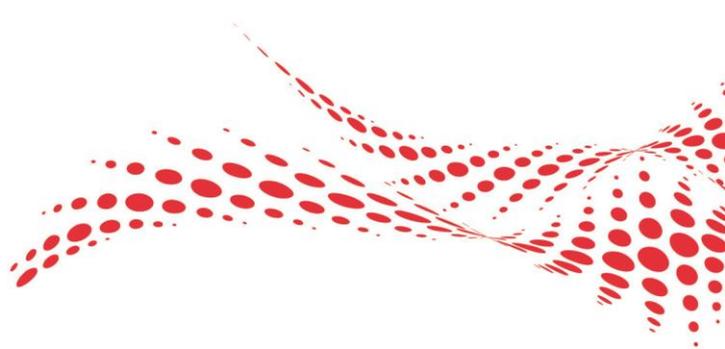
Typical Properties are typical of those obtained with normal production tolerance and do not constitute a specification. Variations that do not affect product performance are to be expected during normal manufacture and at different blending locations. The information contained herein is subject to change without notice. All products may not be available locally. For more information, contact your local ExxonMobil contact or visit www.exxonmobil.com

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TECHNICAL DATA SHEET

V.03/2021

Ref.59045350

FLUOSTAR SG 2

DESCRIPTION

FLUOSTAR SG 2 is a fluorinated grease with an inorganic thickening and with all the advantages of carbon-fluor liaisons at linear structure:

- Exceptional chemical resistance and very high viscosity index
- Very good thermal stability
- Total compatibility with all elastomers, seals and plastics

APPLICATION

FLUOSTAR SG 2 is used for the long-life lubrication of micro-mechanisms or micro-contacts submitted to extreme temperatures:

- Electronic (audio and video reproduction, printers...)
- Electrical industry (HT and BT contact lubrication, potentiometers...)
- Automotive (selection mechanisms, launchers, noises reducer...)
- Chemistry of gases and aggressive fluids
- Sanitary and industrial fittings

SPECIFICATIONS

PROPERTIES	VALUES	UNITS	STANDARDS
Colour	White		(visual)
Density	1.87	Kg / dm ³	ISO 2811
Thickener	Gel		
Base oil	PFPE		
Kinematic viscosity at 40°C	310	mm ² /s	ISO 3104
Consistency	2	rank	NLGI
Worked penetration	265/295	X0.1mm	ISO 2137
Dropping point	without	°C	ISO 6299
Vapor pressure	1x10 ⁻⁶	torr	
Evaporation rate (204°C, 22h)	0.4	%	ASTM D 2595
Resistivity at 20°C	3.5x10 ¹⁴	Ω.cm	ASTM D 257
Max rotation factor	500 000	N x dm	
Temperature range	-60 to +320	°C	



ISOFLEX TOPAS NCA 52

Synthetic long-term grease for rolling and plain bearings, linear motion guides



Benefits for your application

- **Reduced maintenance due to long-term or lifetime lubrication**
- **Reliable operation and many years of practical experience**
- **Wide application range even with high loads**
- **Low starting and running torques particularly at low temperatures ensure high efficiency and energy savings**
- **Longer component life due to good wear protection**

Description

ISOFLEX TOPAS NCA 52 is a synthetic long-term grease with good low-temperature properties. It has a good load-carrying capacity and ensures smooth running even at high speeds and accelerations.

The thickener made of special calcium soap ensures good adhesion to the component and good resistance to media.

The additives contained in ISOFLEX TOPAS NCA 52 increase wear protection.

Application

ISOFLEX TOPAS NCA 52 is used for high-speed rolling and plain bearings as well as for small gears subject to high loads. Due to the good compatibility with plastics the grease is suitable for plastic-plastic or metal-plastic material combinations. The low starting torque and the good wear protection make it an ideal grease for the long-term lubrication of linear motion guides and ball screws, e.g. in handling and automation technology. ISOFLEX TOPAS NCA 52 can also be used for many automobile applications, e.g. for the lifetime lubrication of seat

rails. It is suitable for components which have to be lubricated prior to dip painting and the drying process at peak temperatures of 180 °C as the lubricant remains at the friction point and provides reliable lubrication even after short thermal treatment.

Application notes

The lubricant is applied by means of a spatula, brush or grease gun. If automatic lubrication systems are to be used, please check pumpability beforehand.

Material safety data sheets

Material safety data sheets can be requested via our website www.klueber.com. You may also obtain them through your contact person at Klüber Lubrication.

Pack sizes	ISOFLEX TOPAS NCA 52
Can 1 kg	+
Bucket 25 kg	+

Product data	ISOFLEX TOPAS NCA 52
Article number	004179
Chemical composition, type of oil	synthetic hydrocarbon oil
Chemical composition, thickener	special calcium soap
Lower service temperature	-50 °C / -58 °F
Upper service temperature	130 °C / 266 °F
Colour space	beige
Density at 20 °C	approx. 0.89 g/cm ³



ISOFLEX TOPAS NCA 52

Synthetic long-term grease for rolling and plain bearings, linear motion guides

Product data	ISOFLEX TOPAS NCA 52
Worked penetration, DIN ISO 2137, 25 °C, lower limit value	265 x 0.1 mm
Worked penetration, DIN ISO 2137, 25 °C, upper limit value	295 x 0.1 mm
Kinematic viscosity of the base oil, DIN 51562 pt. 01/ASTM D-445/ASTM D 7042, 40 °C	approx. 31 mm ² /s
Kinematic viscosity of the base oil, DIN 51562 pt. 01/ASTM D-445/ASTM D 7042, 100 °C	approx. 5.9 mm ² /s
Shear viscosity at 25 °C, shear rate 300 s ⁻¹ , equipment: rotational viscometer, lower limit value	2 800 mPas
Shear viscosity at 25°C, shear rate 300 s ⁻¹ , equipment:rotational viscometer, upper limit value	5 200 mPas
Corrosion inhibiting properties of lubricating greases, DIN 51802, (SKF-EMCOR), test duration: 1 week, distilled water	<= 1 corrosion degree
Copper corrosion, DIN 51811, (lubricating grease), 24h/120 °C	1 - 120 corrosion degree
Flow pressure of lubricating greases, DIN 51805, test temperature: -40 °C	<= 1 400 mbar
Speed factor (n x dm)	approx. 1 000 000 mm/min
Drop point, DIN ISO 2176, IP 396	>= 220 °C
Minimum shelf life from the date of manufacture - in a dry, frost-free place and in the unopened original container, approx.	36 months

Klüber Lubrication – your global specialist

Innovative tribological solutions are our passion. Through personal contact and consultation, we help our customers to be successful worldwide, in all industries and markets. With our ambitious technical concepts and experienced, competent staff we have been fulfilling increasingly demanding requirements by manufacturing efficient high-performance lubricants for more than 80 years.

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GLEITMO 805 K

White high-performance paste for long-term lubrication under extreme conditions and for assembly

Performance Features

- temperature range: -45 / +110 °C
- withstands extreme pressures
- has a low coefficient of friction
- reduces wear to a minimum
- adheres extremely well
- protects against corrosion and is water-resistant
- prevents fretting corrosion (tribocorrosion)
- avoids stick-slip and seizing



slide shafts



chucks



ball joints

Description

GLEITMO 805 K is a high-performance paste based on a synthetic oil with a synergistic combination of highly effective white solid lubricants.

Field of application

GLEITMO 805 K is used for machine elements of all types, simultaneously subject to extreme pressures, shock loads and vibratory or oscillatory movements. For paired sliding surfaces which have a tendency to stick-slip and seizure. For low sliding speeds and high pressures, if fretting corrosion (tribocorrosion) occurs. GLEITMO 805 K is particularly suitable for lubrication of chucks and clamping elements. Other typical applications: plastic gears, gaskets on industrial shock suppressors, spindles, big armatures, sliding guides, sliding bearings, oscillating bolts of construction machinery, ball joints, slow-speed worm gears, etc. Also suitable as general assembly paste. Wherever a high adhesive power of the lubricant and best lubrication properties are required. Due to the high

content of solid lubricants only suitable for slow-speed roller bearings.

Method of application

Clean the surfaces if possible and the apply GLEITMO 805 K with a brush or a lint-free cloth. Otherwise, application as is usual for greases. If using grease guns or grease pumping devices, please note the information on pumpability in the 'Technical Data' section.

Technical Data: GLEITMO 805 K

Characteristics	Value	Unit	Test Method
Colour	beige		
Temperature range	-45 / +110	° C	LLS 134
Base oil	syn		
Thickener	Li		
Solid lubricants	white		
Base oil viscosity [40°C]	130	mm ² /s	DIN 51562-1
Corrosion protection properties			
100% rel. humidity; 30 °C; AHT	>30	cycles	DIN EN ISO 6270-2
NLGI grade	2		DIN 51818
Oxidation stability [100 h, 100 °C]	0,40	bar	DIN 51808
Water rinse out test [3 h, 40 °C]	-2,5	%	DIN 51807
Dropping point	160	° C	DIN ISO 2176
Water resistance	0-90	rating	DIN 51807-1
Flow pressure [20 °C]	appr. 250	hPa	DIN 51805
Flow pressure [-40 °C]	<850	hPa	DIN 51805
EMCOR [dist. Water]	0/0	rating	DIN 51802
Four Ball Test welding load	3600/3800	N	DIN 51350-4
TIMKEN OK-load	55	lbs	ASTM D 2509
Almen-Wieland scuffing load	>18	kN	LLS 060
DB stir test	-45	° C	

LLS = LUBRITECH Laboratory Specification
Typical for current production. Variations in these characteristics may occur.

Product Information



LUBRITECH
Special Application Lubricants

As far as we know this information reflects the current state of knowledge and our research. It cannot, however, be taken as an assurance about the properties nor as a guarantee of the suitability of the product for the individual case in point. Before using our products the purchaser must, therefore, check their suitability and be satisfied that the output will be satisfactory. Please be aware that our products must not be used for applications in nuclear primary circuits or on-board aerospace systems. Our products undergo continuous improvement. We therefore retain the right to change our product program, the products, and their manufacturing processes as well as all details of our product information sheets at any time and without prior announcement, unless otherwise provided in customer-specific agreements. With the publication of this product information sheet, all previous editions cease to be valid.

We are specialized in developing products for extreme tribological problems in cooperation with end users. FUCHS LUBRITECH provides service and individual advice. Please contact us!
E-Mail: flt.info@fuchs.com

TECHNICAL DATA SHEET

V.07/2025 | Ref.10000163

Lubrilog S F 14 V2

DESCRIPTION

Lubrilog S F 14 V2 is a PFPE solvent which has a zero ozone depletion potential.

Lubrilog S F 14 V2 has a chemical and thermal stability and is nonflammable.

APPLICATIONS

Lubrilog S F 14 V2 is suitable for the following applications:

- Cleaning electronic components
- Cleaning glass, plastics and elastomers
- Dispersion of grease and oils

LUBRILOG S F 14 V2 is particularly suitable for the elimination of fluorinated greases and oils.

TYPICAL CHARACTERISTICS

PROPERTIES	VALUES	UNITS	STANDARDS
Colour	Colorless		(visual)
Density	1.65	Kg / dm ³	ISO 12185
Kinematic viscosity at 25°C	0.45	mm ² /s	
Flash point	None	°C	ISO 2592
Boiling point	55	°C	
Surface tension (25°C)	14	dynes/cm	
Vapour pressure (20°C)	225	torr	
Water solubility	<10	ppm	
Ozone depletion potential	0		

MOTIP Silicone Spray

Technical Information



Protect and lubricate rubber parts against freezing, drying out and plastic parts from creaking and squeaking with MOTIP Silicone Spray. Silicone spray is water-repellent, pH-neutral and resistant to the weather and weak acids and bases. Silicone spray has outstanding mechanical and thermal stability. MOTIP Silicone Spray has a directed jetspray and is resistant to temperatures of - 50°C up to + 200°C.

Ord.-no: 090107, 290107, 000562

Quality & properties

- Prevents freezing and drying out of rubber parts
- Outstanding mechanical and thermal stability
- Prevents creaking and squeaking of plastic parts
- Water-repellent
- Excellent adhesion
- Resistant to weather influences
- Directed jetspray
- Resistant to weak acids and bases

Physical & chemical data

- Base: Polydimethylsiloxane
- Colourname: no colour
- Smell: Characteristic
- Surfaces: For rubber and plastic surfaces, etc.
- Minimum Working Temperature: 10 °C
- Maximum Working Temperature: 25 °C
- Flash point: n.a.
- Storage stability: 10 years
- Content:
 - 500 ML
 - 200 ML
 - 400 ml

How to use

- Before use, carefully read the directions on the packaging and act accordingly.
- The aerosol should have room temperature
- Best processing temperature 10 to 25°C.
- Before use, shake the aerosol.
- Apply silicone spray in a thin layer. Optimum lubrication is obtained after evaporation of the solvent (approximately 1 minute).

Environmentally sound

European Aerosols is committed to apply formulations without restricted or critical ingredients and to achieve best possible performance. The caps and packagings are made of recyclable material.

Disposal

Only the completely emptied cans should be put into the recycling skip or appropriate container for reclaimable refuse. Cans which are not empty should be disposed off as "special refuse".

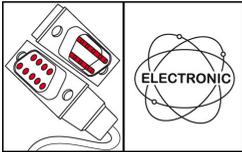
Marking/Labelling

All products made by European Aerosols comply with the actual labelling regulations according to Preparation Guideline 1999/45/EG. All aerosols correspond to TRGS 200 and TRG 300 as well as to aerosol guideline 75/324/EWG in the actually valid version.

As of August 4, 2025 – This release replaces all eventually earlier issued versions.

OKS 2621

Contact Cleaner, Spray



Description

OKS 2621 is a contact cleaner to remove soiling that can cause creepage currents.

Applications

- Removal of loose oxide and electrode-erosion residues, dust deposits or creepage currents which cause soiling in moving contact areas such as motor-vehicle ignition distributors, relay contacts, resistance or potentiometer slideways, in static contact areas such as motor-vehicle spark plugs, plug-in connections, sliding and screw connections, in or on electrical and electronic equipment or devices of all kinds

Advantages and benefits

- Highly effective due to outstanding cleaning properties
- Broad range of uses for all maintenance and customer service work in electrical sector
- Fast evaporation after striking surface

Branches

- Logistics
- Rail vehicle technology
- Iron and steel industry
- Shipbuilding and marine technology
- Plant and machine (tool) engineering
- Glass and foundry industry
- Municipal services
- Maintenance and servicing
- Paper and packaging industry
- Rubber and plastic processing
- Chemical industry

Application tips

Disconnect voltage and shunt electrostatic charge prior to application. Spray on areas to be cleaned until the desired cleanliness is reached. Components are generally considered to be compatible with plastics, but because of the big variety of materials we recommend you to check the resistance before use.

Packaging

- 400 ml Spray

Technical Data

	Standard	Conditions	Unit	Value
Main components				
base oil				aliphatic hydrocarbons



OKS 2621
Contact Cleaner, Spray

	Standard	Conditions	Unit	Value
Application related technical data				
colour				colourless
density (at 20°C)	DIN EN ISO 3838		g/cm ³	0.66

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Safety data sheet for industrial and commercial users is available for downloading under www.oks-germany.com. Our Customer and Technical service will be pleased to help should you have any further questions.

Klübersynth GEM 4 N

Synthetic high-performance gear and multipurpose oils based on KlüberComp Lube Technology



Benefits for your application

- The oils meet the requirements according to DIN 51517-3, CLP. Corresponding gears can be switched to Klübersynth GEM 4 N oils without prior consultation provided the general application notes are observed.
- KlüberComp Lube Technology involves the selection of high-quality raw materials and individual consultation and services by Klüber, ensuring high-performance lubrication of different gearbox components.
- Klübersynth GEM 4 N oils offer a high scuffing load resistance. Gears are sufficiently protected against scuffing even at high peak loads.
- The oils' high micropitting resistance acc. to FVA 54 GFT ≥ 10 offers sufficient protection to gears that are subject to high loads and would normally be susceptible to this type of damage.
- Good wear protection prevents premature rolling bearing failure.
- Much longer service life than mineral oils due to the excellent ageing and oxidation resistance of the base oil; thus maintenance intervals can be extended and in certain cases even lifetime lubrication is possible.
- Owing to the wide service temperature range a single viscosity grade can cover both low and high temperatures in many applications.
- The optimum friction behaviour of the PAO base oil reduces power losses and improves efficiency.
- The excellent viscosity-temperature behaviour supports the formation of a sufficient lubricating film even at elevated and high temperatures.
- Seals made of 72 NBR 902, 75 FKM 585 and 75 FKM 170055 are resistant to Klübersynth GEM 4 N oils. Leakage and contamination are prevented.
- Approved by Bosch Rexroth, SEW Eurodrive, Getriebbau Nord, Stöber Antriebstechnik, ZAE Antriebssysteme, David Brown, FLSmidth MAA Gears, ACCIONA ENERGY, etc.

Description

Klübersynth GEM 4 N oils are gear- and multipurpose oils based on polyalphaolefin. They have a high resistance to scuffing and micropitting as laid down in FVA 54.

The good antiwear characteristics of the Klübersynth GEM 4 N oils were also proven for rolling bearings in the standard FAG FE8 test rig for gear oils.

Klübersynth GEM 4 N oils are particularly resistant to ageing and oxidation. They have a good viscosity-temperature behaviour and excellent low- and high-temperature characteristics. They also offer good corrosion protection and are neutral towards most nonferrous metals, elastomers and interior paints that are commonly used in gear construction.

Application

The Klübersynth GEM 4 N oils were specially developed for the lubrication of spur-, bevel- and planetary gears that are subject to high loads. Such gears are frequently used in the wind, steel, mining and sugar industries. Klübersynth GEM 4 N oils are also

used for the lubrication of worm gears with steel/bronze material pairings and for the lubrication of plain and rolling bearings, all kinds of toothed couplings, chains, guideways, joints, spindles and pumps, especially in applications where the equipment is exposed to elevated temperatures or pronounced temperature fluctuations.

Application notes

Klübersynth GEM 4 N oils can be applied by means of immersion, immersion circulation or injection. The use of drip-feed oilers, brushes, oil cans or suitable automatic lubricating systems is also possible. The low-viscosity varieties can also be applied using oil mist lubrication. Klübersynth GEM 4 N oils are miscible with mineral oils. However, for the Klübersynth GEM 4 N oils to deliver their full performance, any residues of a previously used mineral oil should not exceed 5 % in quantity.

For use at permanent temperatures of 80 °C max., seals made of 72 NBR 902 may be used. For higher temperatures, seals made of 75 FKM 585 or 75 FKM 170055 should be chosen. It should

Klübersynth GEM 4 N

Synthetic high-performance gear and multipurpose oils based on KlüberComp Lube Technology

be noted that elastomers from one or several manufacturers can behave differently; therefore tests should be performed.

Viscosity selection

When determining the oil viscosity for gears, the manufacturer's instructions take priority. Only in cases where there are no gear manufacturer's instructions, the viscosity can be selected in accordance with the enclosed worksheet " Klübersynth GEM 4 N oils – selection of oil viscosity for gears".

To determine the correct oil viscosity for bearings, please observe the bearing manufacturer's instructions.

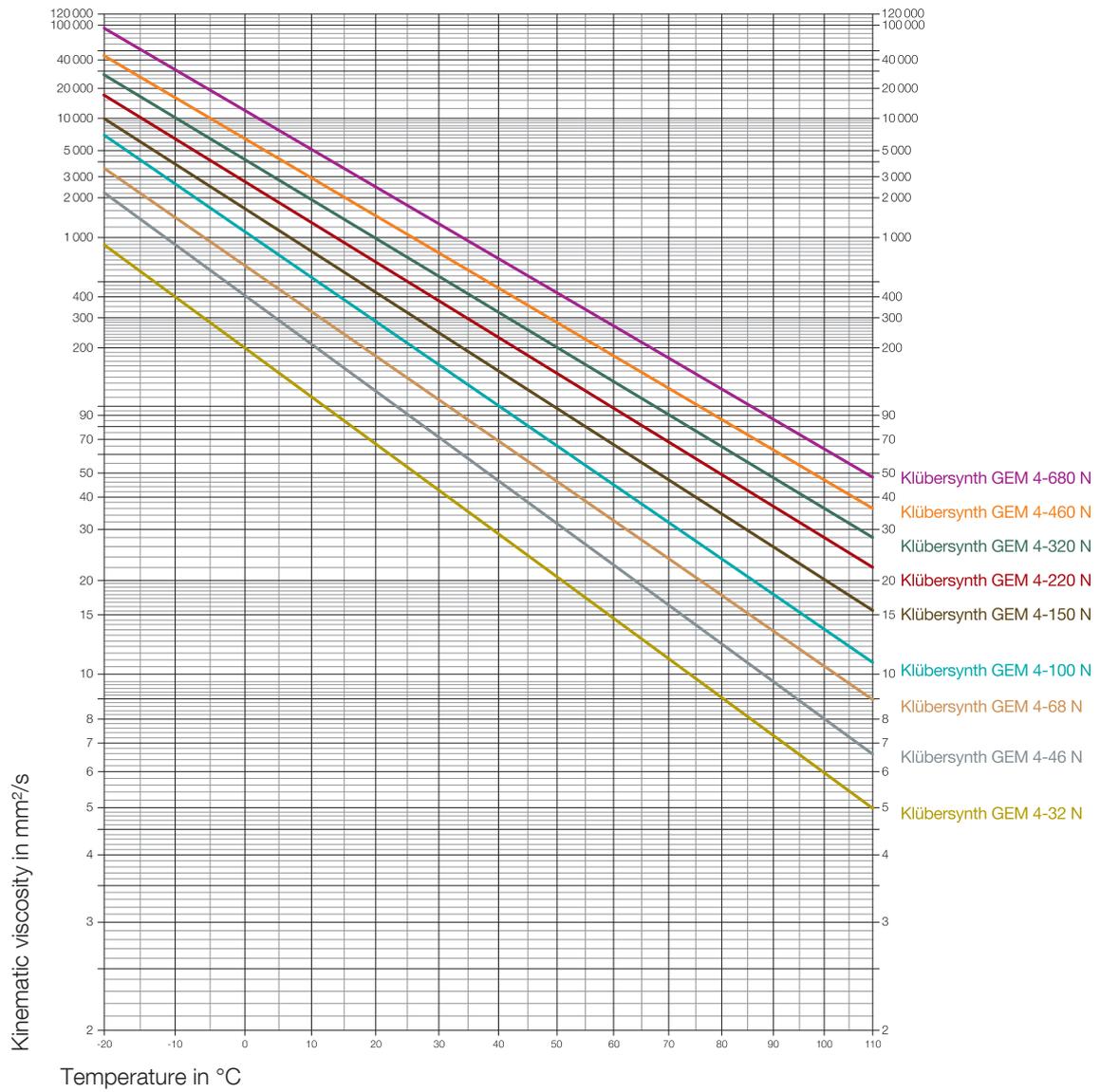
For determining the existing viscosity, please refer to the enclosed viscosity-temperature diagram indicating the differing viscosity-temperature behaviour of Klübersynth GEM 4 N oils as compared to mineral oils.

Material safety data sheets

Material safety data sheets can be downloaded or requested via our website www.klueber.com. You may also obtain them through your contact person at Klüber Lubrication.



Viscosity-temperature diagram



Klübersynth GEM 4 N

Synthetic high-performance gear and multipurpose oils based on KlüberComp Lube Technology

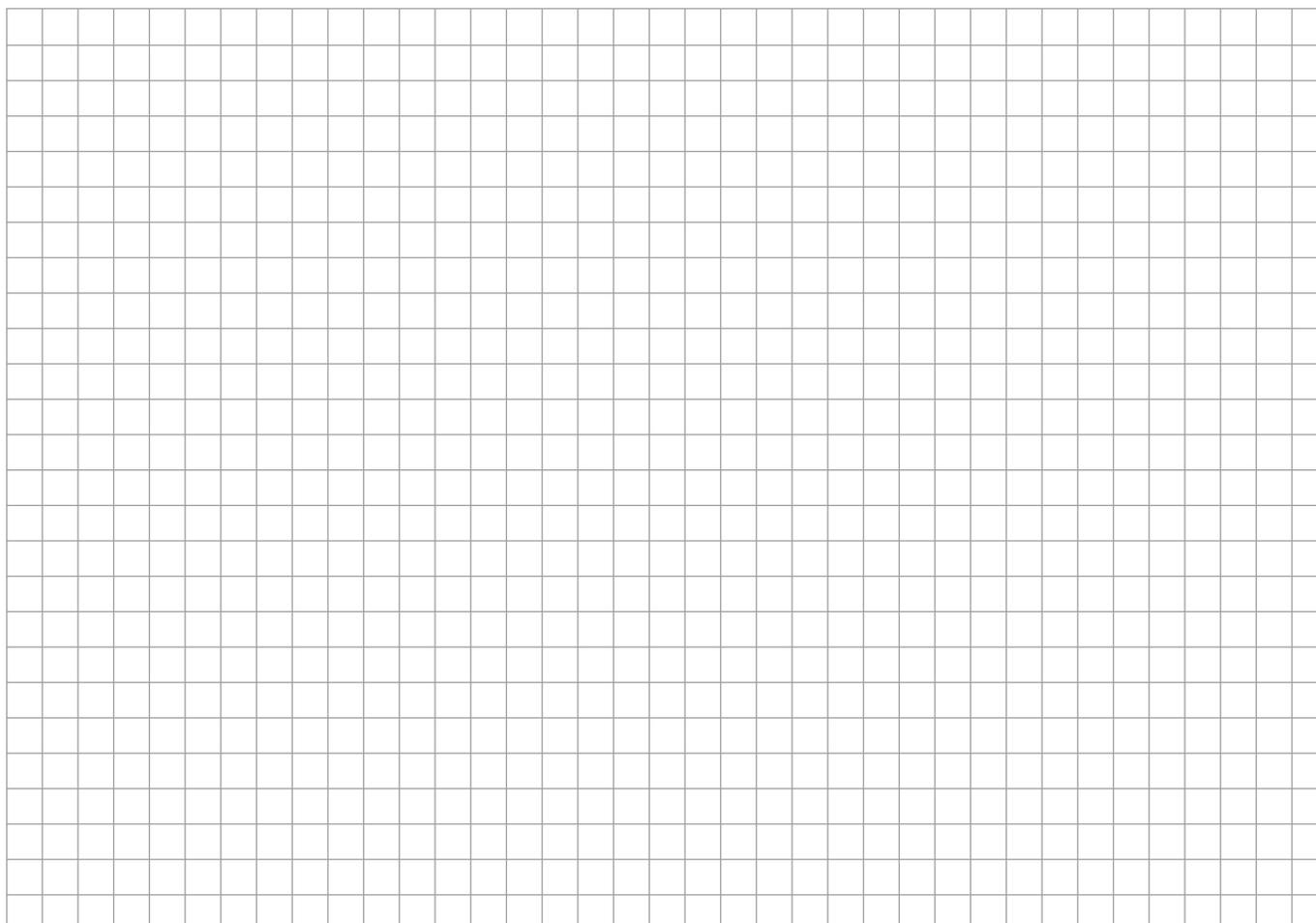
Pack sizes	Klübersynth GEM 4- 32 N	Klübersynth GEM 4- 46 N	Klübersynth GEM 4- 68 N
Canister 20 l	+	+	+
Drum 200 l	+	+	+

Product data	Klübersynth GEM 4- 32 N	Klübersynth GEM 4- 46 N	Klübersynth GEM 4- 68 N
Article number	012229	012230	012231
CLP classification acc. to DIN 51502 and DIN 51517-3	CLP HC 32	CLP HC 46	CLP HC 68
Classification acc. to ISO 12925-1	CKC 32	CKC 46	CKC 68
ISO viscosity grade, DIN ISO 3448	32	46	68
Density, based on DIN 51757) at 15 °C	840 kg/m ³	approx. 840 kg/m ³	850 kg/m ³
Kinematic viscosity, DIN 51562 pt. 01/ASTM D-445/ASTM D 7042, 40 °C	approx. 32 mm ² /s	approx. 46 mm ² /s	approx. 68 mm ² /s
Kinematic viscosity, DIN 51562 pt. 01/ASTM D-445/ASTM D 7042, 100 °C	approx. 6 mm ² /s	approx. 8 mm ² /s	approx. 11 mm ² /s
Viscosity index, DIN ISO 2909	>= 135	>= 140	>= 140
Flash point, DIN EN ISO 2592, Cleveland, open-cup apparatus	>= 200 °C	>= 200 °C	>= 200 °C
Pour point, DIN ISO 3016	<= -50 °C	<= -40 °C	<= -40 °C
Foam test, ASTM-D 892, ISO 6247, sequence I/24 °C	<= 100/10 ml	<= 100/10 ml	<= 100/10 ml
Foam test, ASTM-D 892, ISO 6247, sequence II/ 93.5 °C	<= 100/10 ml	<= 100/10 ml	<= 100/10 ml
Foam test, ASTM D 892, ISO 6247, sequence III/24°C	<= 100/10 ml	<= 100/10 ml	<= 100/10 ml
Copper corrosion, DIN EN ISO 2160, 3 h/100 °C	1 - 100 corrosion degree	1 - 100 corrosion degree	1 - 100 corrosion degree
Anticorrosive properties on steel, DIN ISO 7120, method A, steel, 24 h/60 °C	no rust	no rust	no rust
Ageing properties, ASTM D 2893, increase in viscosity	< 6 %	< 6 %	< 6 %
FZG scuffing test, DIN ISO 14635-1, A/8.3/90, scuffing load stage	>= 12	>= 12	>= 12
FZG scuffing test, based on DIN ISO 14635-1, A/16.6/90, scuffing load stage	>= 12	>= 12	>= 12
FAG FE8 rolling bearing test, DIN 51819-3, D 7,5/80-80, wear of rolling element	<= 30 mg	<= 30 mg	<= 30 mg
FAG FE8 rolling bearing test, DIN 51819-3, D 7,5/80-80, wear of cage	<= 200 mg	<= 200 mg	<= 200 mg
Lower service temperature	-50 °C / -58 °F	-40 °C / -40 °F	-40 °C / -40 °F
Upper service temperature	140 °C / 284 °F	140 °C / 284 °F	140 °C / 284 °F
Minimum shelf life from the date of manufacture - in a dry, frost-free place and in the unopened original container, approx.	24 months	24 months	24 months



Klübersynth GEM 4 N

Synthetic high-performance gear and multipurpose oils based on KlüberComp Lube Technology



Klüber Lubrication – your global specialist

Innovative tribological solutions are our passion. Through personal contact and consultation, we help our customers to be successful worldwide, in all industries and markets. With our ambitious technical concepts and experienced, competent staff we have been fulfilling increasingly demanding requirements by manufacturing efficient high-performance lubricants for more than 80 years.

**Klüber Lubrication München SE & Co. KG /
Geisenhausenerstraße 7 / 81379 München / Germany /
phone +49 89 7876-0 / fax +49 89 7876-333.**

The data in this document is based on our general experience and knowledge at the time of publication and is intended to give information of possible applications to a reader with technical experience. It constitutes neither an assurance of product properties nor does it release the user from the obligation of performing preliminary field tests with the product selected for a specific application. All data are guide values which depend on the lubricant's composition, the intended use and the application method. The technical values of lubricants change depending on the mechanical, dynamical, chemical and thermal loads, time and pressure. These changes may affect the function of a component. We recommend contacting us to discuss your specific application. If possible we will be pleased to provide a sample for testing on request. Klüber products are continually improved. Therefore, Klüber Lubrication reserves the right to change all the technical data in this document at any time without notice.

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a company of the Freudenberg Group



Turbo Evolution 10W-40

SPECIFICATIONS

Engine:	gasoline, diesel
SAE:	10W-40
API:	CI-4 / SL
ACEA:	A3/B4 / E7

APPROVALS AND CONFORMITY

MB-Approval 228.3 Volvo VDS-3 Mack EO-M Plus / EO-N RENAULT VI, RLD-2

MB 229.1 MAN M 3275 Cummins CES 20071/-72/-75/-76/-77/-78 MTU 2 IVECO

Caterpillar ECF-1-a, ECF-2 ALLISON C-4 Voith Retarder Typ A

CHARACTERISTICS

- Full Saps technology;
- Low evaporation and high stability;
- Excellent viscosity-temperature behaviour;
- Reduces formation of ageing products at high temperatures;
- Optimal protection against corrosion, oxidation, wear and foaming;
- Extremely high pressure susceptibility;
- Highest wear protection.

EFFECTS

- Meets the requirements of ecological standards EURO 3/4/5;
- All-year-round operation;
- Easy start in cold season;
- Provides lower fuel consumption;
- Excellent viscosity characteristics even during extended drain intervals;
- Prevents black sludge formation;
- Protection against reflector surface formation;
- Minimum wear at highly strained engines;
- Versatility, which reduces the number of varieties of consumed oil for mixed fleets.

DISPOSAL

- Wolver Turbo Evolution SAE 10W-40 is assigned to category 2 of used oils and thus is free for disposal.

TYPICALS

Kinematic viscosity at 100 °C, mm ² /s	14.9
Viscosity index, -	165
Pour point, °C	-34
Viscosity CCS at -20 °C, mPa·s	6400
TBN, mgKOH/g	10.5
Flash point , °C	228
Density at 15.6 °C, kg/m ³	863

DESCRIPTION

Wolver Turbo Evolution 10W-40 is a highly effective semi-synthetic engine oil of a new level of modern vehicles and stationary engines, which is a product of the evolution of API CI-4 oil (2002 publication) to higher requirements of ACEA E7 (2016 revision).

Wolver Turbo Evolution 10W-40 is produced with the use of an advanced and balanced additive package - Stable Protect, which allows to ensure optimum productivity, thermal, viscosity and antioxidant stability during a long period of exploitation.

Wolver Turbo Evolution 10W-40 is especially effective in engines of commercial vehicles, medium-loaded engines of main trucks, agricultural and quarry equipment. Complies with the current environmental standards EURO 5/4/3 and can be used in engines with EGR and / or SCR exhaust gas cleaning technologies without a particulate filter.

Application

- Commercial vehicle diesel engines
 - with turbocharging;
 - with catalyst technology;
 - with EGR technology;
 - with SCR technology.
- Passenger car diesel engines
 - with turbocharging;
 - with catalyst technology.
- Four-stroke petrol engine
 - with turbocharging;
 - with multivalve technology;
 - with catalyst technology.

Miscibility

Wolver Turbo Evolution SAE 10W-40 is fully compatible to comparable lubrications and can be mixed without any doubts. However, it is recommended to take Wolver Turbo Evolution SAE 10W-40 when refilling.

20L - Pail

4398

426036094398

60L - Barrel

4400

426036094400

208L - Barrel

4399

426036094399

PRODUCT DESCRIPTION

LOCTITE® 222 provides the following product characteristics:

Technology	Acrylic
Chemical Type	Dimethacrylate ester
Appearance (uncured)	Purple liquid
Fluorescence	Positive under UV light
Components	One component - requires no mixing
Viscosity	Low, thixotropic
Cure	Anaerobic
Secondary Cure	Activator
Application	Threadlocking
Strength	Low

LOCTITE® 222 is designed for the locking and sealing of threaded fasteners which require easy disassembly with standard hand tools. The product cures when confined in the absence of air between close fitting metal surfaces and prevents loosening and leakage from shock and vibration. Particularly suitable for applications such as adjustment of set screws, small diameter or long engagement length fasteners, where easy disassembly is required without shearing the screw. The thixotropic nature of LOCTITE® 222 reduces the migration of liquid product after application to the substrate.

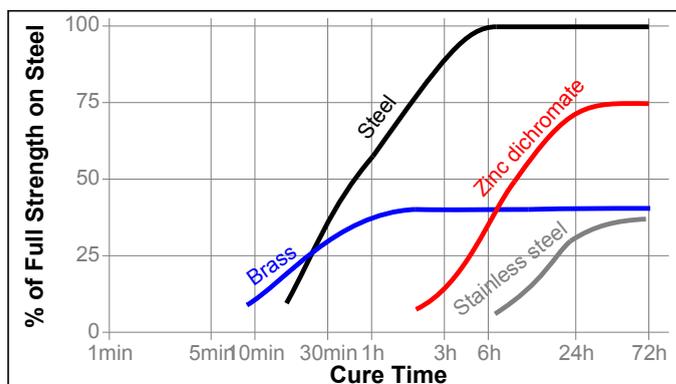
TYPICAL PROPERTIES OF UNCURED MATERIAL

Specific Gravity @ 25 °C	1.05
Flash Point - See SDS	
Viscosity, Brookfield - RVT, 25 °C, mPa·s (cP):	
Spindle 3, speed 2.5 rpm	≥3,500
Spindle 3, speed 20 rpm	900 to 1,500
Viscosity, EN 12092 - MV, 25 °C, after 180 s, mPa·s (cP):	
Shear rate 277 s ⁻¹	135

TYPICAL CURING PERFORMANCE

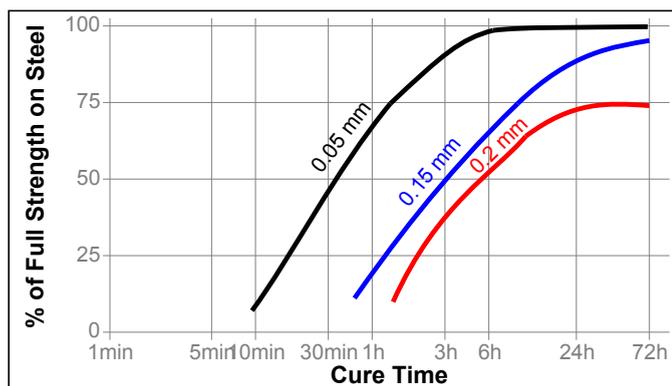
Cure Speed vs. Substrate

The rate of cure will depend on the substrate used. The graph below shows the breakaway strength developed with time on M10 steel nuts and bolts compared to different materials and tested according to ISO 10964.



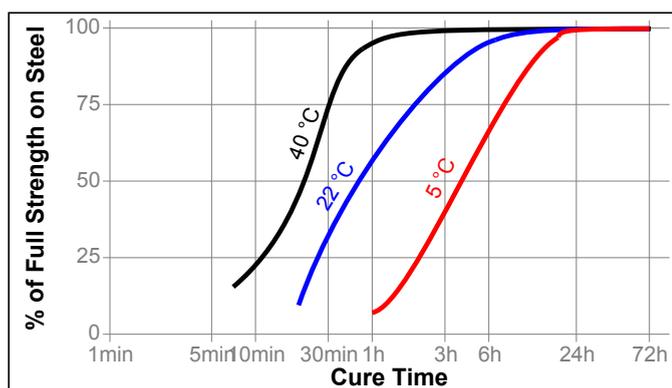
Cure Speed vs. Bond Gap

The rate of cure will depend on the bondline gap. Gaps in threaded fasteners depends on thread type, quality and size. The following graph shows shear strength developed with time on steel pins and collars at different controlled gaps and tested according to ISO 10123.



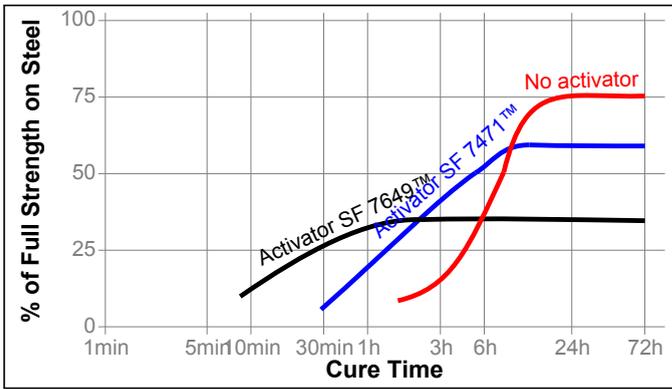
Cure Speed vs. Temperature

The rate of cure will depend on the temperature. The graph below shows the breakaway strength developed with time at different temperatures on M10 steel nuts and bolts and tested according to ISO 10964.



Cure Speed vs. Activator

Where cure speed is unacceptably long, or large gaps are present, applying activator to the surface will improve cure speed. The graph below shows the breakaway strength developed with time on M10 zinc dichromate steel nuts and bolts using Activator SF 7471™ or SF 7649™ and tested according to ISO 10964.



TYPICAL PROPERTIES OF CURED MATERIAL

Physical Properties:

Coefficient of Thermal Expansion, ISO 11359-2, K ⁻¹	80×10 ⁻⁶
Coefficient of Thermal Conductivity, ISO 8302, W/(m·K)	0.1
Specific Heat, kJ/(kg·K)	0.3

TYPICAL PERFORMANCE OF CURED MATERIAL

Adhesive Properties

After 24 hours @ 22 °C

Breakaway Torque, ISO 10964:

M10 steel nuts and bolts	N·m	6
	(lb.in)	(50)

Prevail Torque, ISO 10964:

M10 steel nuts and bolts	N·m	4
	(lb.in)	(35)

Breakloose Torque, ISO 10964, Pre-torqued to 5 N·m:

M10 steel nuts and bolts	N·m	14
	(lb.in)	(120)

Max. Prevail Torque, ISO 10964, Pre-torqued to 5 N·m:

M10 steel nuts and bolts	N·m	14
	(lb.in)	(120)

Compressive Shear Strength, ISO 10123:

Steel pins and collars	N/mm ²	≥2.5
	(psi)	(≥360)

TYPICAL ENVIRONMENTAL RESISTANCE

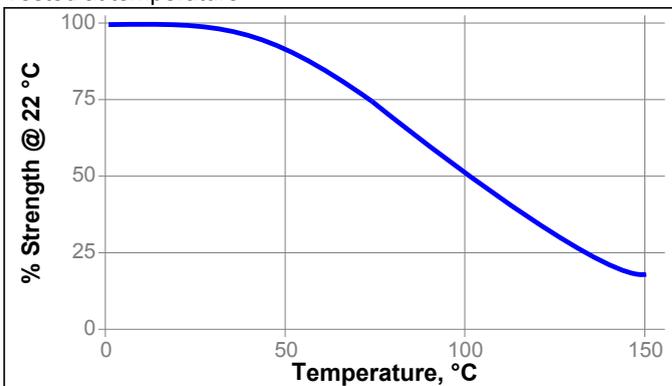
Cured for 1 week @ 22 °C

Breakloose Torque, ISO 10964, Pre-torqued to 5 N·m:

M10 zinc phosphate steel nuts and bolts

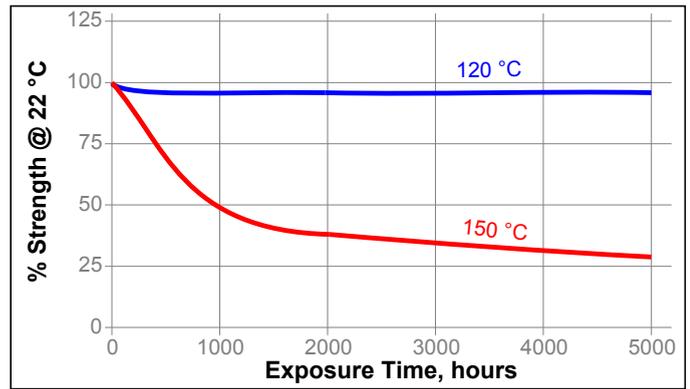
Hot Strength

Tested at temperature



Heat Aging

Aged at temperature indicated and tested @ 23 °C



Chemical/Solvent Resistance

Aged under conditions indicated and tested @ 23 °C

Environment	°C	% of initial strength			
		100 h	500 h	1000 h	5000 h
Motor oil (MIL-L-46152)	125	100	95	90	85
Leaded Petrol	22	95	95	95	95
Brake fluid	22	95	95	95	90
Water/glycol 50/50	87	80	80	80	80
Acetone	22	100	90	90	90
Ethanol	22	95	95	90	90

GENERAL INFORMATION

This product is not recommended for use in pure oxygen and/or oxygen rich systems and should not be selected as a sealant for chlorine or other strong oxidizing materials.

For safe handling information on this product, consult the Safety Data Sheet (SDS).

Where aqueous washing systems are used to clean the surfaces before bonding, it is important to check for compatibility of the washing solution with the adhesive. In some cases these aqueous washes can affect the cure and performance of the adhesive.

This product is not normally recommended for use on plastics (particularly thermoplastic materials where stress cracking of the plastic could result). Users are recommended to confirm compatibility of the product with such substrates.

Directions for use

For Assembly

1. For best results, clean all surfaces (external and internal) with a LOCTITE® cleaning solvent and allow to dry.
2. If the material is an inactive metal or the cure speed is too slow, spray all threads with Activator SF 7471™ or SF 7649™ and allow to dry.
3. Shake the product thoroughly before use.
4. To prevent the product from clogging in the nozzle, do not allow the tip to touch metal surfaces during application.
5. **For Thru Holes**, apply several drops of the product onto the bolt at the nut engagement area.
6. **For Blind Holes**, apply several drops of the product down the internal threads to the bottom of the hole.
7. Assemble and tighten as required.



8. **For Sealing Applications**, apply a 360° bead of product to the leading threads of the male fitting, leaving the first thread free. Force the material into the threads to thoroughly fill the voids. For bigger threads and voids, adjust product amount accordingly and apply a 360° bead of product on the female threads also.

For Disassembly

1. Remove with standard hand tools.
2. In rare instances where hand tools do not work because of excessive engagement length, apply localized heat to nut or bolt to approximately 250 °C. Disassemble while hot.

Clean-up

1. Cured product can be removed with a combination of soaking in a LOCTITE® solvent and mechanical abrasion such as a wire brush.

Loctite Material Specification^{LMS}

LMS dated May 18, 1999. Test reports for each batch are available for the indicated properties. LMS test reports include selected QC test parameters considered appropriate to specifications for customer use. Additionally, comprehensive controls are in place to assure product quality and consistency. Special customer specification requirements may be coordinated through Henkel Quality.

Storage

Store product in the unopened container in a dry location. Storage information may be indicated on the product container labeling.

Optimal Storage: 8 °C to 21 °C. Storage below 8 °C or greater than 28 °C can adversely affect product properties.

Material removed from containers may be contaminated during use. Do not return product to the original container. Henkel Corporation cannot assume responsibility for product which has been contaminated or stored under conditions other than those previously indicated. If additional information is required, please contact your local Henkel representative.

Conversions

$(^{\circ}\text{C} \times 1.8) + 32 = ^{\circ}\text{F}$
 $\text{kV/mm} \times 25.4 = \text{V/mil}$
 $\text{mm} / 25.4 = \text{inches}$
 $\mu\text{m} / 25.4 = \text{mil}$
 $\text{N} \times 0.225 = \text{lb}$
 $\text{N/mm} \times 5.71 = \text{lb/in}$
 $\text{N/mm}^2 \times 145 = \text{psi}$
 $\text{MPa} \times 145 = \text{psi}$
 $\text{N}\cdot\text{m} \times 8.851 = \text{lb}\cdot\text{in}$
 $\text{N}\cdot\text{m} \times 0.738 = \text{lb}\cdot\text{ft}$
 $\text{N}\cdot\text{mm} \times 0.142 = \text{oz}\cdot\text{in}$
 $\text{mPa}\cdot\text{s} = \text{cP}$

Disclaimer

The information provided in this Technical Data Sheet (TDS) including the recommendations for use and application of the product are based on our knowledge and experience of the product as at the date of this TDS. The product can have a variety of different applications as well as differing application and working conditions in your environment that are beyond our control. Henkel is, therefore, not liable for the suitability of our product for the production processes and conditions in respect of which you use them, as well as the intended applications and results. We strongly recommend that you carry out your own prior trials to confirm such suitability of our product. Any liability in respect of the information in the Technical Data Sheet or any other written or oral recommendation(s) regarding the concerned product is excluded, except if otherwise explicitly agreed and except in relation to death or personal injury caused by our negligence and any liability under any applicable mandatory product liability law.

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The information provided in this Technical Data Sheet (TDS) including the recommendations for use and application of the product are based on our knowledge and experience of the product as at the date of this TDS. Henkel is, therefore, not liable for the suitability of our product for the production processes and conditions in respect of which you use them, as well as the intended applications and results. We strongly recommend that you carry out your own prior trials to confirm such suitability of our product.

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Reference 0.5



LOCTITE[®] 406™

 (TDS for new formulation of Loctite[®] 406™) February 2012

PRODUCT DESCRIPTION

LOCTITE[®] 406™ provides the following product characteristics:

Technology	Cyanoacrylate
Chemical Type	Ethyl cyanoacrylate
Appearance (uncured)	Transparent, colorless to straw colored liquid ^{LMS}
Components	One part - requires no mixing
Viscosity	Low
Cure	Humidity
Application	Bonding
Key Substrates	Plastics and Rubbers

This Technical Data Sheet is valid for LOCTITE[®] 406™ manufactured from the dates outlined in the "Manufacturing Date Reference" section.

LOCTITE[®] 406™ is designed for bonding of plastics and elastomeric materials where very fast fixturing is required.

Commercial Item Description A-A-3097:

LOCTITE[®] 406™ has been qualified to Commercial Item Description A-A-3097. **Note:** This is a regional approval. Please contact your local Technical Service Center for more information and clarification.

TYPICAL PROPERTIES OF UNCURED MATERIAL

Specific Gravity @ 25 °C	1.1
Viscosity, Cone & Plate, mPa·s (cP):	
Temperature: 25 °C, Shear Rate: 3,000 s ⁻¹	12 to 22 ^{LMS}
Viscosity, Brookfield - LVF, 25 °C, mPa·s (cP):	
Spindle 1, speed 30 rpm	15 to 25
Flash Point - See SDS	

TYPICAL CURING PERFORMANCE

Under normal conditions, the atmospheric moisture initiates the curing process. Although full functional strength is developed in a relatively short time, curing continues for at least 24 hours before full chemical/solvent resistance is developed.

Cure Speed vs. Substrate

The rate of cure will depend on the substrate used. The table below shows the fixture time achieved on different materials at 22 °C / 50 % relative humidity. This is defined as the time to develop a shear strength of 0.1 N/mm².

Fixture Time, seconds:

Steel (degreased)	20 to 45
Aluminum (etched)	<5
Neoprene	<5
Rubber, nitrile	<5
ABS	<5
PVC	<5
Polycarbonate	10 to 20
Phenolic	<5

Cure Speed vs. Bond Gap

The rate of cure will depend on the bondline gap. Thin bond lines result in high cure speeds, increasing the bond gap will decrease the rate of cure.

Cure Speed vs. Humidity

The rate of cure will depend on the ambient relative humidity. The best results are achieved when the relative humidity in the working environment is 40% to 60% at 22°C. Lower humidity leads to slower cure. Higher humidity accelerates it, but may impair the final strength of the bond.

Cure Speed vs. Activator

Where cure speed is unacceptably long due to large gaps, applying activator to the surface will improve cure speed. However, this can reduce ultimate strength of the bond and therefore testing is recommended to confirm effect.

TYPICAL PERFORMANCE OF CURED MATERIAL

Adhesive Properties

After 24 hours @ 22 °C

Lap Shear Strength, ISO 4587:

Steel (grit blasted)	N/mm ² 15.5 (psi) (2,250)
Aluminum (etched)	N/mm ² 12 (psi) (1,740)
Zinc dichromate	N/mm ² 14 (psi) (2,030)
ABS	* N/mm ² 8.8 * (psi) (1,280)
PVC	* N/mm ² 8.7 * (psi) (1,260)
Polycarbonate	* N/mm ² 9.1 * (psi) (1,320)
Phenolic	* N/mm ² 11.3 * (psi) (1,640)
Neoprene	* N/mm ² 1 * (psi) (150)
Nitrile	* N/mm ² 1.2 * (psi) ()

Block Shear Strength, ISO 13445:

Polycarbonate	N/mm ²	13.1
	(psi)	(1,900)
ABS	* N/mm ²	23.7
	* (psi)	(3,440)
PVC	N/mm ²	1.8
	(psi)	(260)
Phenolic	* N/mm ²	13.8
	* (psi)	(2,000)

* substrate failure

Tensile Strength, ISO 6922:

Buna-N	N/mm ²	13
	(psi)	(1,890)

After 10 seconds @ 22 °C

Tensile Strength, ISO 6922:

Buna-N	N/mm ²	≥6.9 ^{LMS}
	(psi)	(≥1,000)

TYPICAL ENVIRONMENTAL RESISTANCE

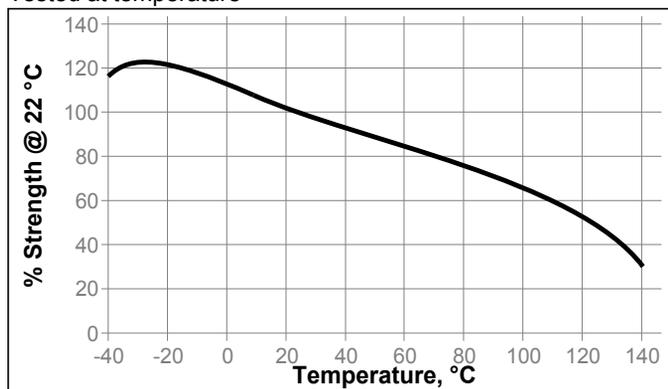
Cured for 1 week @ 22 °C

Lap Shear Strength, ISO 4587:

Mild Steel (grit blasted)

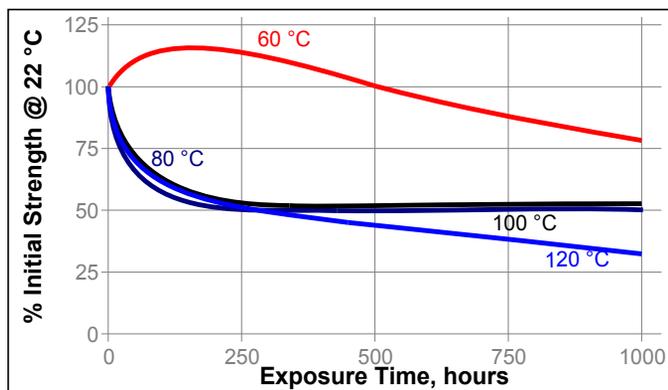
Hot Strength

Tested at temperature



Heat Aging

Aged at temperature indicated and tested @ 22 °C



Chemical/Solvent Resistance

Aged under conditions indicated and tested @ 22 °C.

Environment	°C	% of initial strength		
		100 h	500 h	1000 h
Motor oil	40	100	85	70
Gasoline	22	90	100	95
Water	22	55	70	70
Water/glycol	22	85	75	80
Ethanol	22	105	105	100
Isopropanol	22	120	110	120
98% RH	40	50	60	45

Chemical/Solvent Resistance

Aged under conditions indicated and tested @ 22 °C.

Lap Shear Strength, ISO 4587, Polycarbonate

Environment	°C	% of initial strength		
		100 h	500 h	1000 h
Air	22	100	100	105
98% RH	40	85	90	85

GENERAL INFORMATION

This product is not recommended for use in pure oxygen and/or oxygen rich systems and should not be selected as a sealant for chlorine or other strong oxidizing materials.

For safe handling information on this product, consult the Safety Data Sheet (SDS).

Directions for use:

- Bond areas should be clean and free from grease. Clean all surfaces with a Loctite® cleaning solvent and allow to dry.
- To improve bonding on low energy plastic surfaces, Loctite® Primer may be applied to the bond area. Avoid applying excess Primer. Allow the Primer to dry.
- LOCTITE® Activator may be used if necessary. Apply it to one bond surface (do not apply activator to the primed surface where Primer is also used). Allow the Activator to dry.
- Apply adhesive to one of the bond surfaces (do not apply the adhesive to the activated surface). Do not use items like tissue or a brush to spread the adhesive. Assemble the parts within a few seconds. The parts should be accurately located, as the short fixture time leaves little opportunity for adjustment.
- LOCTITE® Activator can be used to cure fillets of product outside the bond area. Spray or drop the activator on the excess product.
- Bonds should be held fixed or clamped until adhesive has fixtured.
- Product should be allowed to develop full strength before subjecting to any service loads (typically 24 to 72 hours after assembly, depending on bond gap, materials and ambient conditions).

Loctite Material Specification^{LMS}

LMS dated December 22, 2011. Test reports for each batch are available for the indicated properties. LMS test reports include selected QC test parameters considered appropriate to specifications for customer use. Additionally, comprehensive controls are in place to assure product quality and consistency. Special customer specification requirements may be coordinated through Henkel Quality.

Storage

Store product in the unopened container in a dry location. Storage information may be indicated on the product container labeling.

Optimal Storage: 2 °C to 8 °C. Storage below 2 °C or greater than 8 °C can adversely affect product properties.

Material removed from containers may be contaminated during use. Do not return product to the original container. Henkel Corporation cannot assume responsibility for product which has been contaminated or stored under conditions other than those previously indicated. If additional information is required, please contact your local Technical Service Center or Customer Service Representative.

Conversions

(°C x 1.8) + 32 = °F
 kV/mm x 25.4 = V/mil
 mm / 25.4 = inches
 µm / 25.4 = mil
 N x 0.225 = lb
 N/mm x 5.71 = lb/in
 N/mm² x 145 = psi
 MPa x 145 = psi
 N·m x 8.851 = lb·in
 N·m x 0.738 = lb·ft
 N·mm x 0.142 = oz·in
 mPa·s = cP

Manufacturing Date Reference

This Technical Data Sheet is valid for LOCTITE® 406™ manufactured from the dates below:

Made in:	First manufacturing date:
EU	November 2011
China	Pending
India	Pending
U.S.A.	February 2012
Brazil	February 2013

The manufacturing date can be determined from the batch code on the pack. For assistance please contact your local Technical Service Center or Customer Service Representative.

Note:

The information provided in this Technical Data Sheet (TDS) including the recommendations for use and application of the product are based on our knowledge and experience of the product as at the date of this TDS. The product can have a variety of different applications as well as differing application and working conditions in your environment that are beyond our control. Henkel is, therefore, not liable for the suitability of our product for the production processes and conditions in respect of which you use them, as well as the intended applications and results. We strongly recommend that you carry out your own prior trials to confirm such suitability of our product.

Any liability in respect of the information in the Technical Data Sheet or any other written or oral recommendation(s) regarding the concerned product is excluded, except if otherwise explicitly agreed and except in relation to death or personal injury caused by our negligence and any liability under any applicable mandatory product liability law.

In case products are delivered by Henkel Belgium NV, Henkel Electronic Materials NV, Henkel Nederland BV, Henkel Technologies France SAS and Henkel France SA please additionally note the following:

In case Henkel would be nevertheless held liable, on whatever legal ground, Henkel's liability will in no event exceed the amount of the concerned delivery.

In case products are delivered by Henkel Colombiana, S.A.S. the following disclaimer is applicable:

The information provided in this Technical Data Sheet (TDS) including the recommendations for use and application of the product are based on our knowledge and experience of the product as at the date of this TDS. Henkel is, therefore, not liable for the suitability of our product for the production processes and conditions in respect of which you use them, as well as the intended applications and results. We strongly recommend that you carry out your own prior trials to confirm such suitability of our product.

Any liability in respect of the information in the Technical Data Sheet or any other written or oral recommendation(s) regarding the concerned product is excluded, except if otherwise explicitly agreed and except in relation to death or personal injury caused by our negligence and any liability under any applicable mandatory product liability law.

In case products are delivered by Henkel Corporation, Resin Technology Group, Inc., or Henkel Canada Corporation, the following disclaimer is applicable:

The data contained herein are furnished for information only and are believed to be reliable. We cannot assume responsibility for the results obtained by others over whose methods we have no control. It is the user's responsibility to determine suitability for the user's purpose of any production methods mentioned herein and to adopt such precautions as may be advisable for the protection of property and of persons against any hazards that may be involved in the handling and use thereof. In light of the foregoing, **Henkel Corporation specifically disclaims all warranties expressed or implied, including warranties of merchantability or fitness for a particular purpose, arising from sale or use of Henkel Corporation's products. Henkel Corporation specifically disclaims any liability for consequential or incidental damages of any kind, including lost profits.** The discussion herein of various processes or compositions is not to be interpreted as representation that they are free from domination of patents owned by others or as a license under any Henkel Corporation patents that may cover such processes or compositions. We recommend that each prospective user test his proposed application before repetitive use, using this data as a guide. This product may be covered by one or more United States or foreign patents or patent applications.

Trademark usage

Except as otherwise noted, all trademarks in this document are trademarks of Henkel Corporation in the U.S. and elsewhere. ® denotes a trademark registered in the U.S. Patent and Trademark Office.

Reference 1.5

WEICONLOCK® AN 302-72 Locking of Threads and Stud Bolts



Locking of threads and stud bolts | high-temperature-resistant | DVGW- and drinking water approval

- higher viscosity
- high strength
- hard to disassemble

Technical Data

Colour	red
Fluorescent	no
For thread connections up to	M 56 R 2 ^m
Viscosity	6.000 - 15.000 mPa·s
Gap bridging up to max.	0,3 mm
Breakaway torque	20 - 30 Nm
Prevail torque	40 - 75 Nm
Shear strength Nmm ² (DIN 54452)	10 - 15 N/mm ²
Handling strength	20 - 40 min.
Final strength (100 % strength)	5-10 h
Temperature resistance	-60°C to +230°C
Compressive strength (free cutting steel / grub screw = 8.8)	
M_3x6	max. 1500 bar
M4x6	max. 1500 bar
M5x8	max. 1000 bar
M6x10	max. 700 bar
M8x12	max. 500 bar
M10x16	max. 300 bar

Approvals / Guidelines

Hygiene Institute	UBA KTW-BWGL
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Anaerobic Adhesives and Sealants

Surface pre-treatment

To achieve optimum results, the mounting parts should be degreased and cleaned, e.g. with WEICON Surface (roughen the surfaces, if required). WEICONLOCK can also be used on uncleaned surfaces, e.g. screws as delivered. However, the cleaner the surface, the better the results achieved.

Processing

WEICONLOCK is applied evenly straight from the Pen with the help of the dosing tip; avoid direct contact between dosing tip /metal. For sealing applications, apply WEICONLOCK to the thread in circles. Assemble parts and screw tight. Do not pour any WEICONLOCK back into the bottle that has already come into contact with metal. Even extremely small metal particles cause the adhesive to cure inside the bottle. Therefore, in serial production, the use of dosing devices is recommended.

Storage

WEICONLOCK has a shelf life of at least 24 months, when stored at room temperature in closed original container. Protect from heat sources and direct sunlight. The air contained in the Pen keeps WEICONLOCK liquid.

Instructions for use

When using WEICON products, the physical, safety-related, toxicological and ecological data and regulations in our EC safety data sheets (www.weicon.com) must be observed.

Available sizes

- 10019901 WEICONLOCK® AN 302-72 Locking of Threads and Stud Bolts, 20 ml, red
- 10017889 WEICONLOCK® AN 302-72 Locking of Threads and Stud Bolts, 50 ml, red
- 10019982 WEICONLOCK® AN 302-72 Locking of Threads and Stud Bolts, 200 ml, red

To the product detail page:



Note

The specifications and recommendations given in this technical data sheet must not be seen as guaranteed product characteristics. They are based on our laboratory tests and on practical experience. Since individual application conditions are beyond our knowledge, control and responsibility, this information is provided without any obligation. We do guarantee the continuously high quality of our products. However, own adequate laboratory and practical tests to find out if the product in question meets the requested properties are recommended. A claim cannot be derived from them. The user bears the only responsibility for non-appropriate or other than specified applications.

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CA 1010 Mastinox Chromate Free Jointing Compound

Description

CA 1010 is a non-curing, non-chromate corrosion inhibitive compound. It has a service temperature of -54°C (-65°F) to 160°C (320°F). This material acts as an effective barrier against the common causes of corrosion on aluminium alloys or between dissimilar metals. The compound remains permanently mastic after prolonged exposure to aircraft fuels, both jet fuel and aviation gas.

CA 1010 is a one-part, polyester compound. The material is thixotropic paste suitable for application by brush or spatula.

Application properties (typical)

Colour	off white
Appearance	Uniform composition, no lumps or separated material
Viscosity, (Brookfield #6 @ 20 rpm) Pa.s (poise)	84 (840)

Performance properties (typical)

Cured specific gravity	1.37
Non-volatile content, %	89
Pigment contents, %	43
Fineness of grind, Hegman	> 5
Flash point °C (°F) Closed cup (SETA)	24 (75)
Solubility in water@ 23°C (7 °F), %	2
Exposure to heat @ 40°C (104°F) 95 % R.H for 1000 hours	
- aluminum / stainless steel	easy removal, no corrosion
- graphite / aluminum	easy removal, no corrosion
Exposure to dry heat @ 120°C (250°F) For 1000 hours	easy removal, still tacky
Chemical resistance	
No swelling, loss of adhesion or film failure After 7 days at 60°C (140°F) in:	
- AMS2629 type 1	
- AMS3020	
- MIL-PRF-83282	

Corrosion test by galvanic cell method

No signs of corrosion or sealant deterioration for:

Aluminum / Titanium couple, 2 weeks

Aluminum / Stainless steel couple, 2 weeks

Note: The application and performance property values above are typical for the material, but not intended for use in specifications or for acceptance inspection criteria because of variations in testing methods, conditions and configurations.

Surface preparation

Immediately before applying sealant to primed substrates, the surfaces should be cleaned with solvents. Contaminants such as dirt, grease, and/or processing lubricants must be removed prior to sealant application. A progressive cleaning procedure should be employed using appropriate solvents and a new lint-free cloth conforming to AMS3819. (Reclaimed solvents or tissue paper should not be used).

Always pour solvent on the cloth to avoid contaminating the solvent supply. Wash one small area at a time. It is important that the surface is dried with a second clean cloth prior to the solvent evaporating to prevent the redeposition of contaminants on the substrate.

Substrate composition can vary greatly. This can affect sealant adhesion. It is recommended that adhesion characteristics to a specific substrate be determined prior to application on production parts or assemblies.

For a more thorough discussion of proper surface preparation, please consult the SAE Aerospace Information Report AIR 4069. This document is available through SAE, 400 Commonwealth Avenue, Warrendale, PA 15096-0001.

Packing options

CA 1010 is supplied in 1 part 6 oz. Semco® cartridges.

Mixing instructions

CA 1010 is supplied in a 1 part 6 oz. Semco® cartridge. Mixing is not required.

Storage life

The storage life of CA 1010 is at least 12 months when stored at temperatures below 80°F (27°C) in original, unopened containers.

CA 1010 Mastinox Chromate Free Jointing Compound

Health precautions

This product is safe to use and apply when recommended precautions are followed. Before using this product, read and understand the Safety Data Sheet (SDS), which provides information on health, physical and environmental hazards, handling precautions and first aid recommendations.

An SDS is available on request. Avoid overexposure. Obtain medical care in case of extreme overexposure.

For industrial use only. Keep away from children.

**For emergency medical information call:
1-800-228-5635.**

**Additional information can be found at:
www.ppgaerospace.com**

**For sales and ordering information call:
1-800-AEROMIX (2376649).**

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All recommendations, statements, and technical data contained herein are based on tests we believe to be reliable and correct, but accuracy and completeness of said tests are not guaranteed and are not to be construed as a warranty, either expressed or implied. User shall rely on his own information and tests to determine suitability of the product for the intended use and assumes all risks and liability resulting from his use of the product. Seller's and manufacturer's sole responsibility shall be to replace that portion of the product of this manufacturer which proves to be defective. Neither seller nor manufacturer shall be liable to the buyer or any third person for any injury, loss, or damage directly or indirectly resulting from use of, or inability to use, the product. Recommendations or statements other than those contained in a written agreement signed by an officer of the manufacturer shall not be binding upon the manufacturer or seller.

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Issue Date: 02/22
Supersedes: 01/17
Lit: 4437

Ardrox[®] 396/1 E8

WATER-DISPLACING CORROSION INHIBITOR

1 Description

Ardrox[®] 396/1 E8 is a blend of surfactants, corrosion inhibitors and oil in a petroleum-based solvent. It is designed to have excellent dewatering and penetrating properties and will leave a thin, oily film on articles to which it is applied. This film will impart good corrosion protection. Ardrox[®] 396/1 E8 is not recommended for outdoor storage protection. Other Ardrox[®] products, e.g. Ardrox[®]3140, are available for long-term protection outdoors.

Approvals

✓ CFMI	CFM56
✓ Dassault Aviation	DGQT 1.7.0.103
✓ Eurocopter	SPM, ECA-L 3071
✓ SNECMA	DMR 75-60

Ask your Chemetall representative for a complete list of approvals

2 Physical and chemical properties

Property	Typical Value	Unit	Test Method
Appearance	Yellow to amber liquid	-	-
Density	0.810 – 0.844 at 20 °C / 68 °F	g/ml	-
Flash point	Approx. 43 °C / 109 °F	-	-
Viscosity	< 7 at 40 °C / 104 °F	mm ² /s	-

These are typical values only and do not constitute a specification.

3 Typical use

The following are examples of the uses of the product:

- Dewatering and temporary corrosion protection after pickling
- Temporary protection in inter-stage fabrication and storage of parts, sub-assemblies, dies and tools
- Penetrating fluid for freeing seized components
- Restoring wet electrical equipment to working order without the necessity for drying out
- Preservation of gas turbine compressors
- Maintenance protection of on-site plant and equipment

4 Method of use

The preferred methods of application of Ardrox[®] 396/1 E8 are by spraying, brushing or swabbing. It may, however, also be applied by dipping, in which case tanks should be constructed with a sloping or conical bottom so that any water which collects may be easily run off.

Ardrox[®] 396/1 E8 is also available in an aerosol pack for ease of application. Extension tubes are supplied with the aerosols so that the product may be sprayed into crevices, recesses etc.

For optimum protection, film thickness should be > 5 µm.

Ardrox[®] 396/1 E8 may be removed with white spirit, Ardrox[®] 9PR50 or Ardrox[®] 5503.

A slight precipitation may occur during storage; it is therefore recommended to thoroughly mix Ardrox[®] 396/1 E8 before use.

5 Effects on materials

When used in the prescribed manner Ardrox[®] 396/1 E8 will have no deleterious effect on most materials of construction or good quality paint schemes. Some types of rubber, however, will swell after prolonged contact.

Mild steel is a suitable material for tank construction.

6 Shelf life

The shelf life is 3 years from date of manufacture.

7 Storage

Store under normal conditions with the containers tightly closed.

8 Labor and environmental protection

Before operating the process described it is important that this complete document, together with any relevant Safety Data sheets, be read and understood.

All local and national regulations on the transport, storage, use and waste treatment of chemicals in concentrated or diluted form and as working solutions must be obeyed.

9 General Information

Chemetall supplies a wide range of chemical products and associated equipment for cleaning, descaling, paint and carbon removal, metal working and protection and non-destructive testing. Sales Executives are available to advice on specific problems and applications.

The above details have been compiled to the best of our knowledge on the basis of tests and research work and with regard to the current state of our practical experience. This technical product information is non-binding. No liabilities or guarantees deriving from or in connection with this leaflet can be imputed to us. Statements relating to possible uses of the product do not constitute a guarantee that such uses are appropriate in a particular user's case or that such uses do not infringe the patents or proprietary rights of any third party. The reproduction of any or all of the information contained in this leaflet is expressly forbidden without Chemetall's prior written consent.

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Описание

Спрей для электропроводки – это полностью синтетический контактный спрей, совместимый с пластиком, предназначенный для электрической части и электроники в автомобиле. Не содержит минеральные, животные и растительные масла и силиконы.

Свойства

- очищает загрязнённые контакты
- хорошее выделение воды
- хорошая защита от коррозии
- подползает под отложения из оксидов и сульфидов
- вытесняет влагу
- уменьшает сопротивление контактов
- не содержит силикона

Технические данные

Цвет / внешний вид	blue
База	synthetic oil
Вязкость при 40°C	49,5 мм ² /с
Вязкость при 100°C	7 мм ² /с
Индекс вязкости	145
Температура застывания	-53 °C DIN ISO 3016
Потери на испарение (согласно спецификации Noack)	2,1 % массы DIN ISO 2909
Содержание воды	40 ppm Ω · см DIN 51 581
Число нейтрализации	0,03 мг KOH/г DIN 51 777 T 1
Коррозия меди	0-1 DIN 51 809
Удельное сопротивление	1,6 · 10 ⁹ Ω · см
Запах	characteristic
Форма	liquid

Сфера применения

Для техобслуживания и ухода (чистка и защита) за любыми электрическими деталями в автомобиле, как штекерные разъемы и клеммовые соединения, цоколи лампочек, кабельные распределители, переключатели, реле, распределитель зажигания, прерыватель, стартер, генератор, предохранители, полюса аккумулятора, антенны, смазка деталей приборов.

Применение

Перед монтажом обработайте детали спреем Electronic, после чего установите их. В случае



контактов с сильной коррозией подождите подольше для обеспечения действия, отставшие следы коррозии сотрите сукном или щеткой.

Имеющиеся упаковки

200 мл баллончик аэрозоля 8047
D-RUS-UA

Наша информация основывается на тщательных исследованиях и считается достоверной, тем не менее, она должна использоваться только для не обязывающей рекомендации.



DRAKO CAR

DE-ICER

Продуктът е предназначен за използване като средство за отстраняване на лед и сняг от повърхности на превозни средства. Използването му е разрешено само за превозни средства с метални повърхности. Използването му е забранено за пластмасови и боядисани повърхности. Прочетете внимателно инструкциите на опаковката.

Никога не използвайте продукта в близост до деца, животни или растения. Използването му е забранено за отстраняване на лед и сняг от повърхности на кожни изделия, обувки, мебели и др. Използването му е забранено за отстраняване на лед и сняг от повърхности на метални изделия, които са боядисани с боя, съдържаща алуминий.

Детска безопасност:
- Избягвайте контакт с очите.
- Избягвайте контакт с кожата.
- Избягвайте контакт с дрехите.
- Избягвайте контакт с храната.

Продуктът е предназначен за използване като средство за отстраняване на лед и сняг от повърхности на превозни средства. Използването му е разрешено само за превозни средства с метални повърхности. Използването му е забранено за пластмасови и боядисани повърхности. Прочетете внимателно инструкциите на опаковката.

750ml
50%

21 OCT 2005

