Product Information

Specialty Lubricants

MOLYKOTE® 106 Anti-friction Coating

FEATURES

- Low coefficient of friction
- High load carrying capacity
- Protection from corrosion
- Good adhesion
- Can be painted over

COMPOSITION

- Solid lubricants
- Organic binder
- Solvent

Heat-curing dry lubricant

APPLICATIONS

- For smooth coating of metal/metal combinations.
- Maintenance-free, permanent lubrication of highly stressed friction combinations with low speeds or oscillating operation.
- Used where design construction prevents the use of oil or grease or where the risk of soiling is undesirable.
- This product is used successfully for the dry lubrication of locks, hinges, joints, magnetic armatures and for the anti-seizure coating of engine and gear components.

TYPICAL PROPERTIES

Specification writers: These values are not intended for use in preparing specifications. Please contact your local Dow Corning sales representative prior to writing specifications on this product.

Standard*	Test	Unit	Result
	Color		Dark grey
	Physical properties		
DIN 53211/3	Viscosity at 20°C (DIN3 cup)	s	42
DIN 53217/2	Density at 20°C	g/ml	1.16
CTM 0242 I	Non-volatile content	%	41
	Temperature		
	Curing time	minutes/°C	60/150
	Curing time	minutes/°C	30/180
	Service temperature range	°C	-70 to +250
	Load-carrying capacity, wear protection, service life		
ASTM-D2625	Falex load-carrying capacity[1]	N	p=13600* s=11300*
ASTM-D2714	LFW-1, rotating[1]		p=187*
	F=2860N, n=72 minutes[a1], v=7.9m/minutes		
	no. of revolutions x1000 to μ=0.1		
ASTM-D2714	LFW-1, oscillating[1]		p=409*
	F=900N, frequency=89.5osc./minutes		
	no. of oscillations to μ=0.08		
	Corrosion protection		
ISO/R 1456	Salt spray test	h	2

1. * Surface:p = phosphatized, s = sand-blasted.

* CTM: Corporate Test Method, copies of CTMs are available on request.
ASTM: American Society for Testing and Materials.
DIN: Deutsche Industrie Norm

HOW TO USE

Surface preparation

First clean and degrease the surface which will be coated with MOLYKOTE 106 Anti-Friction Coating. Phosphatization or sandblasting (180 grid) increases the adhesion and service life.

How to apply

Stir the Anti-friction Coating thoroughly before applying by spraying, dipping, centrifuging or brushing. Recommended dry film thickness: 5 to 20µm.

Curing

60 minutes at 150°C,
30 minutes at 180°C
(Object temperature).

Solubility

Thinning can be carried out using MOLYKOTE® L 13 Thinner.

HANDLING PRECAUTIONS

PRODUCT SAFETY INFORMATION REQUIRED FOR SAFE USE IS NOT INCLUDED. BEFORE HANDLING, READ PRODUCT AND SAFETY DATA SHEETS AND CONTAINER LABELS FOR SAFE USE, PHYSICAL AND HEALTH HAZARD INFORMATION. THE SAFETY DATA SHEET IS AVAILABLE FROM YOUR LOCAL DOW CORNING SALES REPRESENTATIVE.

USABLE LIFE AND STORAGE

When stored at or below 20°C in the original unopened containers, MOLYKOTE 106 Anti-Friction Coating has a usable life of 36 months from the date of production.

PACKAGING

This product is available in different standard container sizes. Detailed container size information should be obtained from your nearest Dow Corning sales office or Dow Corning distributor.

LIMITATIONS

This product is neither tested nor represented as suitable for medical or pharmaceutical uses.

HEALTH AND ENVIRONMENTAL INFORMATION

To support customers in their product safety needs, Dow Corning has an extensive Product Stewardship organization and a team of Health, Environment and Regulatory Affairs specialists available in each area.

For further information, please consult your local Dow Corning representative.

WARRANTY INFORMATION - PLEASE READ CAREFULLY

The information contained herein is offered in good faith and is believed to be accurate. However, because conditions and methods of use of our products are beyond our control, this information should not be used in substitution for customer's tests to ensure that Dow Corning's products are safe, effective, and fully satisfactory for the intended end use. Dow Corning's sole warranty is that the product will meet the Dow Corning sales specifications in effect at the time of shipment. Your exclusive remedy for breach of such warranty is limited to refund of purchase price or replacement of any product shown to be other than as warranted. Dow Corning specifically disclaims any other express or implied warranty of fitness for a particular purpose or merchantability. Unless Dow Corning provides you with a specific, duly signed endorsement of fitness for use, Dow Corning disclaims liability for any incidental or consequential damages. Suggestions of use shall not be taken as inducements to infringe any patent.

DOW CORNING

DOW CORNING CORPORATION
Material Safety Data Sheet

Version: 1.10
Revision Date: 2007/02/11

MOLYKOTE(R) 106 ANTI-FRICTION COATING

1. IDENTIFICATION OF THE SUBSTANCE AND OF THE COMPANY

Dow Corning Corporation
South Saginaw Road
Midland, Michigan 48686

24 Hour Emergency Telephone: (989) 496-5900
Customer Service: (989) 496-6000
Product Disposal Information: (989) 496-6315
CHEMTREC: (800) 424-9300

MSDS No.: 01005138 Revision Date: 2007/02/11

Generic Description: Inorganic and organic compounds dispersion
Physical Form: Viscous Liquid
Color: Gray
Odor: Solvent odor.

NFPA Profile: Health 2 Flammability 3 Instability/Reactivity 0

Note: NFPA = National Fire Protection Association

2. HAZARDS IDENTIFICATION

POTENTIAL HEALTH EFFECTS

Acute Effects

Eye: Direct contact may cause severe irritation. Vapor may cause eye irritation.

Skin: Corrosive. Burns skin upon prolonged contact.

Inhalation: Vapor may irritate nose and throat. Overexposure by inhalation may cause drowsiness, dizziness, confusion or loss of coordination.

Oral: May cause vomiting. Aspiration of liquid while vomiting may injure lungs seriously.

Prolonged/Repeated Exposure Effects

Skin: Prolonged exposure (greater than one hour) may burn seriously.

Inhalation**:** Overexposure by inhalation may injure the following organ(s): Nervous system. Kidneys. Blood. Liver. Lungs.

Oral: Repeated ingestion or swallowing large amounts may injure internally.

Signs and Symptoms of Overexposure

No known applicable information.

Medical Conditions Aggravated by Exposure

No known applicable information.

The above listed potential effects of overexposure are based on actual data, results of studies performed upon similar compositions, component data and/or expert review of the product. Please refer to Section 11 for the detailed toxicology information.

3. COMPOSITION/INFORMATION ON INGREDIENTS

CAS Number	Wt %	Component Name
1330-20-7	15.0 - 40.0	Xylene
71-36-3	15.0 - 40.0	n-Butyl alcohol
108-65-6	15.0 - 40.0	Methoxypropanol acetate
1317-33-5	15.0 - 40.0	Molybdenum disulfide
25068-38-6	10.0 - 30.0	Bisphenol A-epichlorohydrin copolymer
7782-42-5	5.0 - 10.0	Graphite
None	3.0 - 7.0	Urea-Formaldehyde Resin Butyl Ether
100-41-4	1.0 - 5.0	Ethylbenzene
67-56-1	<1.0	Methyl alcohol

The above components are hazardous as defined in 29 CFR 1910.1200.

4. FIRST AID MEASURES

Eye:	Immediately flush with water for 15 minutes. Get medical attention.
Skin:	Remove from skin and immediately flush with water for 15 minutes. Get medical attention.
Inhalation:	Remove to fresh air. Get medical attention if ill effects persist.
Oral:	Get immediate medical attention. Only induce vomiting at the instructions of a physician. Never give anything by mouth to an unconscious person.
Notes to Physician:	Treat according to person's condition and specifics of exposure.

5. FIRE FIGHTING MEASURES

Flash Point:	> 74.3 °F / > 23.5 °C (Pensky-Martens Closed Cup)
Autoignition Temperature:	Not determined.

Flammability Limits in Air:	Not determined.
Extinguishing Media:	On large fires use dry chemical, foam or water spray. On small fires use carbon dioxide (CO2), dry chemical or water spray. Water can be used to cool fire exposed containers.
Fire Fighting Measures:	Self-contained breathing apparatus and protective clothing should be worn in fighting large fires involving chemicals. Determine the need to evacuate or isolate the area according to your local emergency plan. Use water spray to keep fire exposed containers cool.
Unusual Fire Hazards:	Vapors are heavier than air and may travel to a source of ignition and flash back. Static electricity will accumulate and may ignite vapors. Prevent a possible fire hazard by bonding and grounding or inert gas purge.

6. ACCIDENTAL RELEASE MEASURES

Containment/Clean up:	Remove possible ignition sources. Determine whether to evacuate or isolate the area according to your local emergency plan. Observe all personal protection equipment recommendations described in Sections 5 and 8. For large spills, provide diking or other appropriate containment to keep material from spreading. If diked material can be pumped, store recovered material in appropriate container. Clean up remaining materials from spill with suitable absorbant. Clean area as appropriate since spilled materials, even in small quantities, may present a slip hazard. Final cleaning may require use of steam, solvents or detergents. Dispose of saturated absorbant or cleaning materials appropriately, since spontaneous heating may occur. Local, state and federal laws and regulations may apply to releases and disposal of this material, as well as those materials and items employed in the cleanup of releases. You will need to determine which federal, state and local laws and regulations are applicable. Sections 13 and 15 of this MSDS provide information regarding certain federal and state requirements.

Note: See section 8 for Personal Protective Equipment for Spills. Call (989) 496-5900, if additional information is required.

7. HANDLING AND STORAGE

Use with adequate ventilation. Traces of benzene (carcinogen) may form if heated in air above 300 F (149 C). Provide ventilation to control vapor exposure within inhalation guidelines when handling at elevated temperatures. Review the OSHA benzene regulation for detailed information on safe handling requirements. Avoid eye exposure. Avoid skin contact. Avoid breathing vapor, mist, dust, or fumes. Keep container closed. Do not take internally.

Static electricity will accumulate and may ignite vapors. Prevent a possible fire hazard by bonding and grounding or inert gas purge. Keep container closed and away from heat, sparks, and flame.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

Component Exposure Limits

CAS Number	Component Name	Exposure Limits
1330-20-7	Xylene	Observe xylene limits. OSHA PEL (final rule) and ACGIH TLV: TWA 100 ppm, STEL 150 ppm.
71-36-3	n-Butyl alcohol	OSHA PEL (final rule): TWA 100 ppm, 300 mg/m3. ACGIH TLV: TWA 20 ppm.
108-65-6	Methoxypropanol acetate	AIHA WEEL: TWA 100 ppm.
7782-42-5	Graphite	OSHA PEL (final rule): TWA 15 mg/m3 total dust, 5 mg/m3 respirable fraction. ACGIH TLV: TWA 2 mg/m3 respirable fraction.
100-41-4	Ethylbenzene	OSHA PEL (final rule): TWA 100 ppm, 435 mg/m3. ACGIH TLV: TWA 100 ppm, STEL 125 ppm.

Engineering Controls

Local Ventilation: Recommended.
General Ventilation: Recommended.

Personal Protective Equipment for Routine Handling

Eyes: Use chemical worker's goggles.

Skin: Wash at mealtime and end of shift. Skin contact must be avoided by using impervious protective clothing (gloves, aprons, boots, etc.). Use chemical protective gloves as a minimum and wash skin promptly upon any skin contact.

Suitable Gloves: Avoid skin contact by implementing good industrial hygiene practices and procedures. Select and use gloves and/or protective clothing to further minimize the potential for skin contact. Consult with your glove and/or personnel protective equipment manufacturer for selection of appropriate compatible materials.

Inhalation: Use respiratory protection unless adequate local exhaust ventilation is provided or exposure assessment demonstrates that exposures are within recommended exposure guidelines. IH personnel can assist in judging the adequacy of existing engineering controls.

Suitable Respirator: General and local exhaust ventilation is recommended to maintain vapor exposures below recommended limits. Where concentrations are above recommended limits or are unknown, appropriate respiratory protection should be worn. Follow OSHA respirator regulations (29 CFR 1910.134) and use NIOSH/MSHA approved respirators.

Personal Protective Equipment for Spills

Eyes: Use full face respirator.

Skin:	Wash at mealtime and end of shift. Skin contact must be avoided by using impervious protective clothing (gloves, aprons, boots, etc.). Use chemical protective gloves as a minimum and wash skin promptly upon any skin contact.
Inhalation/Suitable Respirator:	Respiratory protection recommended. Follow OSHA Respirator Regulations (29 CFR 1910.134) and use NIOSH/MHSA approved respirators. Protection provided by air purifying respirators against exposure to any hazardous chemical is limited. Use a positive pressure air supplied respirator if there is any potential for uncontrolled release, exposure levels are unknown, or any other circumstance where air purifying respirators may not provide adequate protection.
Precautionary Measures:	Avoid eye exposure. Avoid skin contact. Avoid breathing vapor, mist, dust, or fumes. Keep container closed. Do not take internally. Use reasonable care.
Comments:	Traces of benzene (carcinogen) may form if heated in air above 300 F (149 C). Provide ventilation to control vapor exposure within inhalation guidelines when handling at elevated temperatures. Review the OSHA benzene regulation for detailed information on safe handling requirements. When heated to temperatures above 150 degrees C in the presence of air, product can form formaldehyde vapors. Formaldehyde is a potential cancer hazard, a known skin and respiratory sensitizer, and an irritant to the eyes, nose, throat, skin, and digestive system. Safe handling conditions may be maintained by keeping vapor concentrations within the OSHA Permissible Exposure Limit for formaldehyde.

Note: These precautions are for room temperature handling. Use at elevated temperature or aerosol/spray applications may require added precautions.

9. PHYSICAL AND CHEMICAL PROPERTIES

Physical Form:	Viscous Liquid
Color:	Gray
Odor:	Solvent odor.
Specific Gravity @ 25°C:	1.165
Viscosity:	42 s
Freezing/Melting Point:	Not determined.
Boiling Point:	64.6 °C
Vapor Pressure @ 25°C:	Not determined.
Vapor Density:	Not determined.
Solubility in Water:	Not determined.
pH:	Not determined.
Volatile Content:	62 %
Flash Point:	> 74.3 °F / > 23.5 °C (Pensky-Martens Closed Cup)
Autoignition Temperature:	Not determined.
Flammability Limits in Air:	Not determined.

Note: The above information is not intended for use in preparing product specifications. Contact Dow Corning before writing specifications.

MOLYKOTE(R) 106 ANTI-FRICTION COATING

10. STABILITY AND REACTIVITY

Chemical Stability: Stable.

Hazardous Polymerization: Hazardous polymerization will not occur.

Conditions to Avoid: None.

Materials to Avoid: Oxidizing material can cause a reaction.

Hazardous Decomposition Products

Thermal breakdown of this product during fire or very high heat conditions may evolve the following decomposition products: Carbon oxides and traces of incompletely burned carbon compounds. Formaldehyde. Nitrogen oxides. Chlorine compounds. Sulfur oxides. Metal oxides.

11. TOXICOLOGICAL INFORMATION

Acute Toxicology Data for Product

	Species	Test Results	Type of Test
Skin Irritation:	Rabbit	Corrosive	
Oral LD50:	Rat	> 2,000 mg/kg	
Dermal LD50:	Rabbit	> 2,000 mg/kg	
Sensitization:	Guinea Pig	Negative	Buehler
Mutagenicity:	In Vitro	Negative	Ames

Special Hazard Information on Components

Carcinogens

CAS Number	Wt %	Component Name	
100-41-4	1.0 - 5.0	Ethylbenzene	IARC Group 2B - Possibly Carcinogenic to Humans.

Teratogens

CAS Number	Wt %	Component Name	
100-41-4	1.0 - 5.0	Ethylbenzene	Evidence of teratogenicity (birth defects)

in laboratory animals.

Mutagens

CAS Number	Wt %	Component Name	
100-41-4	1.0 - 5.0	Ethylbenzene	Genetically active in IN VIVO assay(s).

12. ECOLOGICAL INFORMATION

Environmental Fate and Distribution

Complete information is not yet available.

Environmental Effects

Complete information is not yet available.

Fate and Effects in Waste Water Treatment Plants

Complete information is not yet available.

Ecotoxicity Classification Criteria

Hazard Parameters (LC50 or EC50)	High	Medium	Low
Acute Aquatic Toxicity (mg/L)	<=1	>1 and <=100	>100
Acute Terrestrial Toxicity	<=100	>100 and <= 2000	>2000

This table is adapted from "Environmental Toxicology and Risk Assessment", ASTM STP 1179, p.34, 1993.

This table can be used to classify the ecotoxicity of this product when ecotoxicity data is listed above. Please read the other information presented in the section concerning the overall ecological safety of this material.

13. DISPOSAL CONSIDERATIONS

RCRA Hazard Class (40 CFR 261)

When a decision is made to discard this material, as received, is it classified as a hazardous waste? Yes

Characteristic Waste:
Ignitable: D001
TCLP: D018

State or local laws may impose additional regulatory requirements regarding disposal.Call (989) 496-6315, if additional information is required.

14. TRANSPORT INFORMATION

DOT Road Shipment Information (49 CFR 172.101)

Proper Shipping Name:	Flammable liquids, corrosive, n.o.s.
Hazard Technical Name:	1-Butanol / Bisphenol A-epichlorohydrin copolymer
Hazard Class:	3: 8
UN/NA Number:	UN 2924
Packing Group:	III
Hazard Label(s):	Flammable Liquid Corrosive

Ocean Shipment (IMDG)

Proper Shipping Name:	FLAMMABLE LIQUID, CORROSIVE, N.O.S.
Hazard Technical Name:	1-Butanol / Bisphenol A-epichlorohydrin copolymer
Hazard Class:	3: 8
UN/NA Number:	UN 2924
Packing Group:	III
Hazard Label(s):	flammable liquid corrosive

Air Shipment (IATA)

Proper Shipping Name:	Flammable liquid, corrosive, n.o.s.
Hazard Technical Name:	1-Butanol / Bisphenol A-epichlorohydrin copolymer
Hazard Class:	3: 8
UN/NA Number:	UN 2924
Packing Group:	III
Hazard Class:	Flammable Liquid Corrosive

Call Dow Corning Transportation, (989) 496-8577, if additional information is required.

15. REGULATORY INFORMATION

Contents of this MSDS comply with the OSHA Hazard Communication Standard 29 CFR 1910.1200.

TSCA Status: All chemical substances in this material are included on or exempted from listing on the TSCA Inventory of Chemical Substances.

EPA SARA Title III Chemical Listings

Section 302 Extremely Hazardous Substances (40 CFR 355):
None.

Section 304 CERCLA Hazardous Substances (40 CFR 302):

CAS Number	Wt %	Component Name
1330-20-7	20.0	Xylene
71-36-3	20.0	n-Butyl alcohol
100-41-4	2.0	Ethylbenzene

Section 311/312 Hazard Class (40 CFR 370):

Acute: Yes
Chronic: Yes
Fire: Yes
Pressure: No
Reactive: No

Section 313 Toxic Chemicals (40 CFR 372):

CAS Number	Wt %	Component Name
1330-20-7	20.0	Xylene
71-36-3	20.0	n-Butyl alcohol
100-41-4	2.0	Ethylbenzene

Note: Chemicals are listed under the 313 Toxic Chemicals section only if they meet or exceed a reporting threshold.

Supplemental State Compliance Information

California

Warning: This product contains the following chemical(s) listed by the State of California under the Safe Drinking Water and Toxic Enforcement Act of 1986 (Proposition 65) as being known to cause cancer, birth defects or other reproductive harm.

CAS Number	Wt %	Component Name	
100-41-4	1.0 - 5.0	Ethylbenzene	Carcinogenic.

50-00-0	<0.1	Formaldehyde	Carcinogenic.

Massachusetts

CAS Number	Wt %	Component Name
1330-20-7	15.0 - 40.0	Xylene
71-36-3	15.0 - 40.0	n-Butyl alcohol
1317-33-5	15.0 - 40.0	Molybdenum disulfide
7782-42-5	5.0 - 10.0	Graphite
100-41-4	1.0 - 5.0	Ethylbenzene
50-00-0	<0.1	Formaldehyde

New Jersey

CAS Number	Wt %	Component Name
1330-20-7	15.0 - 40.0	Xylene
71-36-3	15.0 - 40.0	n-Butyl alcohol
108-65-6	15.0 - 40.0	Methoxypropanol acetate
1317-33-5	15.0 - 40.0	Molybdenum disulfide
25068-38-6	10.0 - 30.0	Bisphenol A-epichlorohydrin copolymer
7782-42-5	5.0 - 10.0	Graphite
100-41-4	1.0 - 5.0	Ethylbenzene

Pennsylvania

CAS Number	Wt %	Component Name
1330-20-7	15.0 - 40.0	Xylene
71-36-3	15.0 - 40.0	n-Butyl alcohol

108-65-6	15.0 - 40.0	Methoxypropanol acetate
1317-33-5	15.0 - 40.0	Molybdenum disulfide
25068-38-6	10.0 - 30.0	Bisphenol A-epichlorohydrin copolymer
7782-42-5	5.0 - 10.0	Graphite
None	3.0 - 7.0	Urea-Formaldehyde Resin Butyl Ether
100-41-4	1.0 - 5.0	Ethylbenzene
50-00-0	<0.1	Formaldehyde

16. OTHER INFORMATION

Prepared by: Dow Corning Corporation

These data are offered in good faith as typical values and not as product specifications. No warranty, either expressed or implied, is hereby made. The recommended industrial hygiene and safe handling procedures are believed to be generally applicable. However, each user should review these recommendations in the specific context of the intended use and determine whether they are appropriate.

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