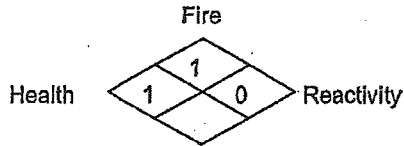


MATERIAL SAFETY DATA SHEET

PAGE 1

DATE PREPARED: 2008/2/27

PRODUCT NAME : HARMONIC GREASE 4B No.2



NFPA HAZARD RATING

- 4 -- Extreme
- 3 -- Height
- 2 -- Moderate
- 1 -- Slight
- 0 -- Insignificant

1 CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

PRODUCT NAME : HARMONIC GREASE 4B No.2

COMPANY NAME : HARMONIC DRIVE SYSTEMS INC.  
1856-1, HOTAKAMAKI, AZUMINO-SHI, NAGANO, 399-8305, JAPAN

EMERGENCY TELEPHONE NUMBER : +081-(0)263-83-6803

2 COMPOSITION / INFORMATION ON INGREDIENTS

CHEMICAL FAMILY : Lubricating Grease.

FORMULA : not applicable

COMPONENTS :

NAME	CONTENTS (%)
Base oil (Synthetic hydrocarbon oil)	65 - 75
Thickener (Urea derivatives)	<10
EP agent (Containing molybdenum and zinc compounds)	5 - 15
Additives (Containing refined mineral oil)	5 - 15

HAZARDOUS INGREDIENTS

NAME	CAS No.	CONTENTS (%)
Molybdenum compound	72030-25-2	1 - 3
Zinc compound	registered	1 - 3

See Section 8 for exposure limits (if applicable)

3 HAZARDOUS IDENTIFICATION

CLASS NAME OF HAZARDOUS CHEMICALS FOR SDS IN JAPAN Not applicable

- PHYSICAL AND CHEMICAL HAZARDS : Combustible
- ADVERSE HUMAN HEALTH EFFECTS : Prolonged and repeated contact may cause skin irritation.
- ENVIRONMENTAL EFFECTS : No data available.

# MATERIAL SAFETY DATA SHEET

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PRODUCT NAME : HARMONIC GREASE 4B No.2

## 4 FIRST AID MEASURES

**EYES** : Immediately flush with water for at least 15 minutes. Get medical attention.

**SKIN** : Remove excess with cloth or paper and wash area thoroughly with soap and water.

**INGESTION** : Consult a physician. Do not induce vomiting.

**INHALATION** : Keep the victim warm and quiet. Remove the victim from the contamination immediately to fresh air.

**NOTE TO PHYSICIANS** : Supportive care. Treatment based on judgment of the physician in response to reactions of the patient.

## 5 FIRE FIGHTING MEASURES

### FLAMMABLE PROPERTIES :

- FLASH POINT : 191 °C                      METHOD : Seta Flash Method
- FLAMMABLE LIMITS : LFL: N/A              UFL: N/A
- AUTOIGNITION TEMPERATURE : no data available
- HAZARDOUS DECOMPOSITION PRODUCTS : Thermal decomposition and combustion may produce carbon monoxide and/or carbon dioxide.

\* N/A : Not applicable.

**EXTINGUISH MEDIA** : Dry chemical, Water fog, CO<sub>2</sub>, Foam, Sand/Earth

**FIRE FIGHTING INSTRUCTIONS** : Dense smoke. Fire fighter wear an approved self-contained breathing apparatus. Do not use water except fog.

## 6 ACCIDENTAL RELEASE MEASURES

**PROCEDURE FOR CLEAN-UP** : Transfer bulk of mixture into another container. Absorb residue with an inert material such as earth, sand and vermiculite.  
Sweep up and dispose solid waste in accordance with local, state and federal regulations.

**WASTE DISPOSAL** : Dispose of in accordance with all applicable federal, state and local regulations.

## 7 HANDLING AND STORAGE

**HANDLING** : Contact with eye may cause irritation. Use protective glasses or other devices to avoid contact with eyes. Contact with skin may cause irritation. Use protective gloves to avoid skin contact.

Do not swallow. (Eating product cause diarrhea and vomiting.)

Wear gloves to avoid injury on hands at opening the container.

Keep out reach of children.

**STORAGE** : Keep container closed until ready for use. Storage away from fire source or sunlight and in cool dry area.

# MATERIAL SAFETY DATA SHEET

PAGE 3

PRODUCT NAME : HARMONIC GREASE 4B No.2

## 8 EXPOSURE CONTROLS/PERSONAL PROTECTION

### CONTROL PARAMETERS :

Oil mist, mineral : ACGIH TLV (1999): TWA 5mg/m<sup>3</sup>  
Molybdenum compound: ACGIH TLV (1999): TWA as Mo 10mg/m<sup>3</sup>

ENGINEERING MEASURES : none

### PERSONAL PROTECTIVE EQUIPMENT :

- RESPIRATORY PROTECTION : Wear a gas mask (for organic gas), if necessary.
- EYE PROTECTION : Chemical safety goggles and if handled hot, full face shield.
- HAND AND BODY PROTECTION : Protective gloves, rubber or plastic oil resistant.
- OTHER PROTECTIVE EQUIPMENT : none

## 9 PHYSICAL AND CHEMICAL PROPERTIES

- |                                         |              |                          |              |
|-----------------------------------------|--------------|--------------------------|--------------|
| • APPEARANCE :                          | Yellow paste | • ODOR :                 | Slight odor. |
| • VAPOR PRESSURE                        | N/A          | • VAPOR DENSITY(AIR=1) : | N/A          |
| • SPECIFIC GRAVITY(H <sub>2</sub> O=1): | 0.88         | • EVAPORATION RATE       | Slower       |
| • SOLUBILITY IN WATER                   | Negligible   | (n-Butyl Acetate=1)      |              |
| • SOLUBILITY IN ---- :                  | N/A          | • FREEZING POINT :       | N/A          |
| • PH :                                  | N/A          | • VISCOSITY :            | N/A          |
| • BOILING POINT :                       | N/A          |                          |              |
| • MELTING POINT(Dropping Point) :       | 247 °C       |                          |              |
- \* N/A : Not applicable.

## 10 STABILITY AND REACTIVITY

- STABILITY :(CONDITION TO AVOID) Product is stable under normal condition. Avoid over heating.
- INCOMPATIBILITY : ( SPECIFIC MATERIALS TO AVOID) Strong oxidizers such as hydrogen peroxide, bromine, and chromic acid.
- HAZARDOUS DECOMPOSITION PRODUCTS :Oxide of nitrogen, molybdenum, zinc, sulfur, phosphorus.
- HAZARDOUS POLYMERIZATION : none
- REACTIVITY WITH WATER : none

## 11 TOXICOLOGICAL INFORMATION

- CORROSIVE AND IRRITANT PROPERTIES : No data available
- ALLERGENIC AND SENSITIZING EFFECTS : No data available
- ACUTE TOXICITY : Refined mineral oil LD50 Acute oral 5<g/kg(rat)
- SUB-CHRONIC TOXICITY : No data available
- CHRONIC TOXICITY : Prolonged and repeated skin contact may cause irritation.
- CARCINOGENIC EFFECT : Not listed IARC,NTP,ACGIH.
- MUTAGENIC EFFECTS : No data available
- EFFECTS ON THE REPRODUCTIVE SYSTEM : No data available
- TERATOGENIC EFFECTS : No data available

MATERIAL SAFETY DATA SHEET

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PRODUCT NAME : HARMONIC GREASE 4B No.2

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1 2 ECOLOGICAL INFORMATION

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- BIODEGRABILITY : No data available
- BIOACCUMULATION : No data available
- FISH TOXICITY : No data available

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1 3 DISPOSAL CONSIDERATION

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WASTE DISPOSAL METHOD : Incinerate in accordance with applicable regulation.

ATTENTION : Do not use pressure to empty this container. When empty, container may have vapor or product residue. Do not cut, puncture or weld on near the drum.

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1 4 TRANSPORT INFORMATION

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DOT : Not applicable  
UN No. : Not applicable  
FIRE SERVICE LAW (JAPAN) : Not applicable

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1 5 REGULATORY INFORMATION

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Regulatory information with regard to this product in your country or your region should be examined by your own responsibility.

US TSCA (Toxic Substances Control Act):

All components of this product are listed on the TSCA inventory of Chemical Substances.

US OSHA (Occupational Safety and Health Act):

This product is hazardous according to the OSHA Hazard Communication Standard, 29 CFR 1910.1200, since this product contains OSHA Hazardous Substances; Molybdenum compound.

US CERCLA (Comprehensive Environmental Release, Compensation & Liability Act):

Zinc compounds no RQ is assigned to this generic or broad class.

US SARA (Superfund Amendment & Reauthorization Act) Title III:

This product contains no Extremely Hazardous Substances.

SARA Hazard Categories (311/312): None

SARA Toxic Release Inventory (TRI) (313): Zinc compounds

MATERIAL SAFETY DATA SHEET

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PRODUCT NAME : HARMONIC GREASE 4B No.2

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1.6 OTHER INFORMATION

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INFORMATION CONTACT : HARMONIC DRIVE SYSTEMS INC.

MSsuishinshitu

1856-1, Hotakamaki, Azumino-shi, Nagano, 399-8305, Japan

Tel 0263-83-6803

REFERENCE : CMA Interim Guideline for the Preparation of MSDS.

Chapter 7 : MSDS Examples.

ACGIH Threshold Limit Values for Chemical Substances in the Work Environment.  
(1998-1999)

ORIGINAL DATE : 2001/1/29

REVISION DATE : 2008/2/27

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This MSDS is an addition and complementary document beside the technical data sheet.  
The information is based upon our knowledge about the product at the date of edition.  
Since we cannot anticipate or control the different conditions under which these information  
or our product may be used, we make no guarantee that recommendations will be adequate for all  
individuals and situations.