SAFETY DATA SHEET

This SDS complies with REACH 1907/2006 and 2001/58/EC, GHS, OSHA 29CFR 1910.1200

Section 1: Chemical Product and Company Identification

CHEMICAL SUPPLIER COMPANY NAME
Shin-Etsu MicroSi, Inc.
10028 South 51st Street
Phoenix, AZ 85044
Safety Data Sheet Competent Person:

EMERGENCY TELEPHONE
Chemtrec 24 hrs, USA: (800) 424-9300
Information: (480) 893-8898
Fax: (480) 893-8637
Customer Service csteam@microsi.com

MANUFACTURER'S NAME: Shin-Etsu Chemical Co., Ltd.
ADDRESS: 6-1, 2-Chome, Ohtemachi, Chiyodaku, Tokyo, 100-0004, Japan
TELEPHONE NUMBER: 81-3-3246-5345 Tokyo, Japan
81-255-45-5811 Niigata, Japan

DATE PREPARED: **November 20, 2008** **REVISION DATE: May 14, 2012**

PRODUCT NAMES: **X-23-7921-5**
CHEMICAL NAME: Organopolysiloxane mixture
CHEMICAL FAMILY: Silicone Grease
FORMULA: Preparation/Mixture
PRODUCT USE: Thermal Interface Material.

Section 2: Hazards Identification

Regulation (EC) No 1272/2008

GHS Hazard Class No Applicable Hazard Class
Signal word:
Hazard Statement:
Precautionary Statements:

Directive 1999/45/EC

IRRITANT

R-Phrase: R36 Irritating to Eyes
S-Phrase: S25 Avoid contact with Eyes

<10 % of mixture consists of ingredients of unknown acute toxicity.

HAZARD CLASSIFICATION Not Classified As Hazardous Based On IMO and DOT.
FIRE AND EXPLOSION Not considered flammable or combustible, but this product will burn if involved in a fire. Product emits toxic fumes when burned.

POTENTIAL HEALTH EFFECTS
INGESTION: No Information
INHALATION: No Information
SKIN CONTACT: May Cause Slight Irritation
EYE CONTACT: Eye Irritation May Result
OTHER: None
CHRONIC EFFECTS OF OVEREXPOSURE: None
APPEARANCE: Gray grease with a slight odor

NFPA Rating:

Component	Health (Blue)	Flammability (Red)	Reactivity (Yellow)	Special (White)
X-23-7921-5	2	1	0	--

Section 3: Composition, Information on Ingredients LVE

PRODUCT COMPOSITION	APPRX %	ACGIH TLV	OSHA PEL	NIOSH REL	CAS NO.	EINECS/ ELINCS	DANGER SYMBOL	RISK PHRASE	DSL CANADA
Aluminum	>70	10mg/m3 metal dust	15mg/m3 Total dust	10 mg/m3 Total dust	7429-90-5	231-072-3	F	15, 17	Y
Zinc Oxide*	<25	2 mg/m3	15 mg/m3	5 mg/m3	1314-13-2	215-222-5	N	50/53	Y
Siloxanes and Silicones TS 1	<10	-----	-----	-----	-----	Y/N	-----	-----	N
Siloxanes and Silicones TS 2	<5	-----	-----	-----	-----	Y/N	-----	-----	Y

Trade Secret (TS) Some items on this MSDS may be designated as trade secrets. Bonafide requests for disclosure of trade secret information to medical personnel must be made in accordance with the provisions contained in 29 CFR 1910.1200 I 1-13. The full text for all R-Phrases is shown in Section 16.

*Lead is a natural occurring impurity in Zinc Oxide and is not physically added during the manufacture of Zinc oxide. The percentage of Lead in this product is <0.001.

Section 4: First Aid Measures

INHALATION: Remove to fresh air. If not breathing, provide CPR (cardio pulmonary resuscitation). Get immediate medical attention.

SKIN CONTACT: Immediately flush skin with plenty of soap and water for at least 15 minutes. Remove contaminated clothing.

EYE CONTACT: Immediately flush eyes with plenty of water for at least 15 minutes. Get immediate medical attention.

INGESTION: If swallowed do not induce vomiting, give large quantities of water to drink. Never give anything to an unconscious person. Get immediate medical attention.

Section 5: Fire-fighting Measures

FLASH POINT: >250 ºC (Open Cup)
>94 ºC (Closed Cup)

FLAMMABLE LIMITS IN AIR (% by vol): Not measured

EXTINGUISHING MEDIA: Foam, Dry Chemical Powder, or Carbon Dioxide

SPECIAL FIREFIGHTING PROCEDURES: None

UNUSUAL FIRE AND EXPLOSION HAZARDS: Emits toxic fumes under fire conditions.

Section 6: Accidental Release Measures

ACTION TO BE TAKEN IF MATERIAL IS RELEASED OR SPILLED:

Wear proper protective equipment as specified in the protective equipment section.
Warn other co-workers and contain spills. Place material in a chemical waste container.

Disposal method: Reference Section 13 recommendations.

Section 7: Handling and Storage

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE:

Store at temperatures <25 ºC
Keep container closed when not in use.
Keep away from heat and flame.
Wear proper protective equipment and avoid contact with skin, eyes, or clothing.

Wash hands after handling this material.
Follow all applicable local regulations for handling and storage.
Utilize chemical segregation.

INFORMATION ON EMPTIED CONTAINER

Dispose of this container according to local, state, and federal regulations in your country.
Do not reuse this container. This container may be hazardous when emptied.

SPECIFIC USES:

This product is intended to aid in the thermal management of electronic devices.

Section 8: Exposure Controls/Personal Protection

EXPOSURE GUIDELINES

EXPOSURE LIMITS	Reference Section 2
VENTILATION:	Special ventilation precautions not required.
SPECIAL VENTILATION CONTROLS:	None required
RESPIRATORY PROTECTION:	None required
PROTECTIVE GLOVES:	Plastic film or rubber gloves
EYE PROTECTION:	Safety Glasses, Chemical Goggles, or Face shield
SKIN PROTECTION:	Suitable protective clothing to prevent skin contact
OTHER EQUIPMENT:	Make safety shower, eyewash stations and hand washing equipment available in the work area.
WORK/HYGIENE PRACTICES:	Avoid contact with eyes. Wash hands and face after handling.

Section 9: Physical and Chemical Properties

APPEARANCE - COLOR:	Gray
PHYSICAL STATE:	Grease / Paste
ODOR:	Slight Odor

ODOR THRESHOLD	Not Available for product
PH	Not Applicable
FLASH POINT:	>250 ºC (Open Cup); >94 ºC (Closed Cup)
LOWER EXPLOSIVE LIMIT; UPPER EXPLOSIVE LIMIT	Not Available for product
FLAMMABILITY (Solid, gas)	Not Applicable
EXPLOSIVE PROPERTIES	Not Applicable
OXIDIZING PROPERTIES	Not Applicable
SPECIFIC GRAVITY (@25 ºC):	2.8 [Water = 1.0]
EVAPORATION RATE:	Negligible (@ 25ºC)
% VOLATILE by VOLUME	Not Applicable
PARTITION COEFFICIENT	Not Applicable
AUTO IGNITION TEMPERATURE	Not Available for product
DECOMPOSITION TEMPERATURE	Not Available for product
BOILING POINT:	Not Applicable
MELTING POINT:	Not Applicable
VAPOR PRESSURE	Negligible (@ 25ºC)
VAPOR DENSITY (AIR = 1)	Not applicable
SOLUBILITY IN WATER:	Not soluble
WATER SOLUBILITY IN THE SOLVENT	Not Available for product
FREEZING POINT:	Not Available for product
VISCOSITY	269 Pa·s (@ 25ºC)

Section 10: Stability and Reactivity

STABILITY:	Stable
CONDITIONS TO AVOID:	None
INCOMPATIBILITY (MATERIALS TO AVOID):	None

HAZARDOUS DECOMPOSITION PRODUCTS: Thermal breakdown of this product during fire or very high heat condition may evolve the following hazardous decomposition product; Carbon oxides and traces of incompletely burned carbon compounds, silicon dioxide, formaldehyde, metal oxides.

HAZARDOUS POLYMERIZATION: Will not occur

Section 11: Toxicological Information

There is no toxicological information available for the product mixture.

GHS Required Criteria	Toxicity Criteria	Toxicity Information	Comments	Chemical Constituent
Acute Toxicity	TCLo (Human Inhalation)	206 mg/m3 @5 hours/30 days		AL
	TDLo (Oral/Mouse)	1260 mg/kg		AL
	LD50 (Oral/Rat)	>5000 mg/kg	No Mortality	ZnO
	LDLo (Human Oral)	500 mg/kg		ZnO
	LD (Oral/Rat)	>8437 mg/kg		ZnO
Skin Corrosion/Irritation	Rabbit	500mg/24 hours	Mild	ZnO
Serious Eye Damage / Eye Irritation	Rabbit	500mg/24 hours	Mild	ZnO
Respiratory or Skin Sensitization		No information is available.		
Germ Cell Mutagenicity		No information is available.		
Carcinogenicity		Not listed	NTP	
		Not listed	IARC	
		Not listed	OSHA	
Reproductive Toxicity		No information is available.		
STOST -- Single Exposure		No information is available.		
STOST – Repeated Exposure		No information is available.		
Aspiration Hazard		No information is available.		

STOST = Specific Target Organ Systemic Toxicity

OTHER INFORMATION:

Aluminum	Zinc Oxide
OEL-AUSTRIA: MAK 6 mg/m3, dust, JAN1999 OEL-BELGIUM: TWA 10 mg/m3, JAN1993 OEL-BELGIUM: TWA 2 mg/m3 (salts), JAN1993 OEL-BELGIUM: TWA 5 mg/m3 (fumes), JAN1993 OEL-THE NETHERLANDS: MAC-TGG 10 mg/m3, 2003 OEL-DENMARK: TWA 10 mg/m3, dust or fume, JAN1999 OEL-FINLAND: TWA 2 mg/m3 (salts), JAN1993 OEL-FRANCE: VME 10 mg/m3, JAN1999 OEL-FRANCE: VME 5 mg/m3 (fumes), JAN1999 OEL-FRANCE: VME 5 mg/m3 (respirable dust), JAN1993 OEL-GERMANY: MAK 6 mg/m3, JAN1999 OEL-HUNGARY: STEL 5 mg/m3, JAN1993 OEL-HUNGARY: TWA 2 mg/m3, STEL 4 mg/m3 (salts), JAN1993 OEL-NORWAY: TWA 5 mg/m3, JAN1999 OEL-RUSSIA: STEL 2 mg/m3, JAN1993 OEL-SWEDEN: NGV 4 mg/m3 (respirable dust), JAN1999 OEL-SWEDEN: NGV 10 mg/m3 (total dust), JAN1999 OEL-SWITZERLAND: MAK-W 6 mg/m3, JAN1999 OEL-UNITED KINGDOM: TWA 4 mg/m3, respirable dust, SEP2000	OEL-BELGIUM: TWA 10 mg/m3, JAN1993 OEL-DENMARK: TWA 4 mg(Zn)/m3, JAN1999 OEL-BELGIUM: TWA 5 mg/m3, STEL 10 mg/m3 (fume), JAN1993 OEL-FINLAND: TWA 5 mg/m3 (fume), JAN1999 OEL-THE NETHERLANDS: MAC-TGG 5 mg/m3, 2003 OEL-FRANCE: VME (fume) 5 mg/m3, JAN1999 OEL-GERMANY: MAK 5 mg/m3 (fume), JAN1999 OEL-HUNGARY: TWA 5 mg/m3, JAN1993 OEL-NORWAY: TWA 5 mg/m3, JAN1999 OEL-POLAND: MAC(TWA) fume 5 mg/m3, MAC(STEL) fume 10 mg/m3, JAN1999 OEL-SWEDEN: NGV 5 mg/m3, JAN1999 OEL-SWITZERLAND: MAK-W 5 mg/m3, JAN1999 OEL-TURKEY: TWA 5 mg/m3, JAN1993 OEL-UNITED KINGDOM: TWA 5 mg/m3, STEL 10 mg/m3, fume, SEP2000

Only selected Registry of Toxic Effects of Chemical Substances (RTECS) data is presented here. See actual entry in RTECS for complete information.

Section 12: Ecological Information

		Chemical
BIODEGRADATION:	No information is available.	
BIOACCUMULATION:	No information is available.	
ECO TOXICITY:	LC50 Pisidium casertanum (Ridged-beak peaclam) >1.0 mg/L/96 hr; static, 20-25 deg C, pH 3.5	Aluminum
	LC50 Salmo trutta (Brown trout, parr about 3 months) 105 ug/L/21 days	Aluminum
	LC50 Lepomis macrochirus (Bluegill sunfish, weight 0.38 g) >320 ppm/96 hr static	Zinc Oxide
	LC50 Oncorhynchus mykiss (Rainbow trout, weight 0.78 g) 1.1 ppm/96 hr	Zinc Oxide
MOBILITY:	No information is available.	

Not all of the ingredients have been tested for Ecotoxicity.

Section 13: Disposal Considerations

WASTE FROM RESIDUES / UNUSED PRODUCTS:
Recommend waste material be disposed of by using incineration. Follow the waste disposal requirements of your country, state, or local authorities.

CONTAMINATED PACKAGING:
Contaminated packaging material should be disposed of by incineration as stated above for residues and unused product.

RINSATE: Do not dispose of rinse water containing product in a sanitary sewer system, stormwater drainage system, or wastewater treatment system. Rinsate should be disposed of by incineration as stated above for residues and unused product.

Section 14: Transport Information

DOT TRANSPORT:	Not Regulated
ADR: International Carriage of Dangerous Goods by Road	Not Regulated
RAIL TRANSPORT:	Not Regulated
SEA TRANSPORT: IMDG	Not Regulated
AIR TRANSPORT: IATA/ICAO	Not Regulated

Section 15: Regulatory Information

TOXIC SUBSTANCES CONTROL ACT (TSCA) STATUS:

This product is in compliance with rules, regulations, and orders of TSCA and should be used in compliance with TSCA's Low Volume Exemption (LVE) regulations.

SUPERFUND AMENDMENTS AND REAUTHORIZATION ACT OF 1986 (SARA) TITLE III SECTION 313 SUPPLIER NOTIFICATION:

This regulation requires submission of annual reports of toxic chemical(s) that appear in section 313 of the Emergency Planning and Community Right To Know Act of 1986 and 40 CFR 372. This information must be included in all MSDS's that are copied and distributed for the material.
The Section 313 toxic chemicals contained in this product are: Aluminum, Zinc

CALIFORNIA PROPOSITION 65:

This regulation requires a warning for California Proposition 65 chemical(s) under the statute.
The California proposition 65 chemical(s) contained in this product are:
WARNING: This product contains a chemical (lead) known by the State of California to cause cancer, birth defects or other reproductive harm.

Lead is a naturally occurring impurity in Zinc Oxide.
Lead: No Significant Risk Level (NSRL) for carcinogens = 15 µg/day (Oral)
Lead: Maximum Allowable Dose Level (MADL) for reproductive toxicants = 0.55 µg/day

STATE RIGHT-TO-KNOW TOXIC SUBSTANCE OR HAZARDOUS SUBSTANCE LIST:

Florida Toxic Substance(s):	Not listed
Massachusetts's hazardous substance(s):	Aluminum, Zinc Oxide
Pennsylvania hazardous substance code(s):	Aluminum, Zinc Oxide
New Jersey	Aluminum, Zinc Oxide
Illinois	Aluminum
Michigan	Not listed

CANADA:
This MSDS/SDS will be non compliant 3 years after the issue date. This MSDS contains all of the information required by the Controlled Products Regulations (CPR).

WHMIS-INFORMATION:
This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations (CPR), SOR/88-66, Current to February 20, 2012. The classes of controlled products listed in the CPR, Section 32, Part IV, have been reviewed and based on Professional Judgment this product has been determined not to be WHMIS controlled.

EUROPEAN UNION:
This product has been reviewed for compliance with the following European Community Directives: REACH 1907/2006; Directive 67/548/EEC, Regulation (EC) No 1272/2008 on classification, labeling and packaging (CLP) of substances and mixtures.

RoHS CERTIFICATION: The Restriction of Hazardous Substances in Electrical and Electronic Equipment (RoHS), EU Directive (2002/95/EC-rescinded) and 2011/65/EU. We hereby certify that the hazardous substances regulated by the RoHS Directive 2011/65/EU are not used intentionally as ingredient(s) for X-23-7921-5 which is manufactured by Shin-Etsu Chemical Co. Ltd. This certification is valid only for this product, X-23-7921-5. Packaging materials were not considered for this certification.

WEEE CERTIFICATION: Waste Electrical and Electronic Equipment (WEEE), European Union Directive 2002/96/EC. Shin-Etsu MicroSi does not consider X-23-7921-5 a product that qualifies as one of the 10 categories of electrical and electronic equipment listed in Annex 1A of Directive 2002/96/EC. Also, the products manufactured by Shin-Etsu MicroSi do not intentionally contain any of the regulated substances, preparations, or components listed in Annex II of Directive 2002/96/EC. This certification is valid only for this product: X-23-7921-5. Packaging materials were not considered for this certification.

Section 16: Other Information

European Community Hazards Identification:

R: 15	Contact with water liberates extremely flammable gases	
R: 17	Spontaneously flammable in air.	
R: 50-53	Very Toxic to aquatic organisms. May cause long-term adverse effects in the aquatic environment.	
S: (2-)	Keep out of the reach of children.	
S: 7/8	Keep container tightly closed and dry.	
S: 43	In case of fire use Foam, dry chemical powder or Carbon Dioxide.	
S: 60	This material and its container must be disposed of as hazardous waste.	
S: 61	Avoid release to the environment. Refer to special instructions/Safety Data Sheets.	
Danger Symbol(s):	F	Flammability
	N	Dangerous to the Environment

Revision Comments:	Updated from April 4, 2012 to comply with the EU Regulation 453-2010 –REACH Amendment SDS.
Revision Number:	3
Information Sources:	RTECS, REACH, OSHA 29CFR 1910.1200

FOR INDUSTRIAL USE ONLY

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