MATERIAL SAFETY DATA SHEET

Format compatible with OSHA (1910.1200), ANSI (Z400.1-1993) and proposed ISO 14000 standards.

SECTION 1: Chemical Product & Company Identification

Thermoseal Inc.	Information Phone:	937-498-2222
2350 Campbell Road	Emergency Phone:	937-498-2222
Sidney, OH 45365-9573	Date Prepared:	April 1, 2000
	Supersedes MSDS Dated:	August 5, 1996
Product Name:	**KLINGER®sil C-4401 SS**	

SECTION 2: Composition/Information on Ingredients

Hazardous Component	% by Weight	CAS #	OSHA PEL	ACGIH TLV
Amorphous Silica	1-10%	7631-86-9	20 mppcf	10 mg/m^3
Aluminum Silicate	5-25%	1335-30-4	NE	10 mg/m^3
Calcium Metasilicate	35-65%	13983-17-0	NE	10 mg/m^3
Aramid Fiber	1-15%	26125-61-1	NE	NE
Mineral Fiber	1-10%	65997-17-3	NE	10 mg/m^3

Other hazardous ingredients may be used in product formulations but are below OSHA reportable values.

SECTION 3: Hazards Identification

Emergency Overview: Releases of large amounts of dust may cause upper respiratory tract irritation and dust-related lung diseases. Dermal irritation and allergic skin reactions may occur if dust contacts skin for prolonged or repeated periods. Burning of nitrile-based rubber products produce toxic gases such as hydrogen cyanide. WARNING: *Contains fibers and particulates. Avoid creating dust. Breathing gasket dust may cause permanent lung damage.*

Potential Health Effects

EYE: Eye contact may cause slight chemical and mechanical irritation.

SKIN: Dermal irritation and allergic skin reactions may occur if dust contacts skin for prolonged or repeated contact. May cause abrasion with resulting irritation and rash.

INHALATION: Releases of large amounts of dust may cause upper respiratory tract irritation and dust-related lung diseases (fibrosis).

INGESTION: Low toxicity if ingested.

Carginogenicity: NA

Medical Conditions Aggravated: Respiratory conditions such as asthma, COPD, and chronic bronchitis may be exacerbated by inhalation of free synthetic vitreous fibers and fillers.

Chronic Effects: Overexposure to large amounts of gasket dusts is not expected during routine gasket handling and processing. Thus potential health effects under these conditions are considered minimal. Residual dusts generated during cutting activities may cause dermal irritation, rashes, or sensitization if left in contact with exposed skin. Overexposure to gasket filler components is possible but limited to the following conditions: abrasive activities such as sanding, grinding, abrading, drilling and wire brushing, and pile driving. Chronic lung diseases (industrial bronchitis, fibrosis) are possible under high dust conditions.

SECTION 4: First Aid Measures

EYES: Immediately wash eyes with water for at least 5 minutes. Seek medical attention if discomfort persists.
SKIN: Frequent washing will deter transitory chemical and mechanical dermatitis. If rash develops consult a physician.
INHALATION: Remove to fresh air. Seek medical attention.
INGESTION: Induce vomiting and seek medical attention.

SECTION 5: Fire-Fighting Measures

Flash Point: Does not flash.

Flammable Limits: *LEL:* NA *UEL:* NA

Extinguishing Media: Water, carbon dioxide, dry powder, or foam.

Fire-Fighting Procedures: Fire fighters should wear SCBA for protection against hazardous thermal decomposition products. They include carbon monoxide, hydrogen cyanide, ammonia, aldehydes, aliphatic hydrocarbons, nitrogen dioxides, and carbon dioxide.

Unusual Fire or Explosion Hazards: When ground to a fine powder, clouds of rubber particles finer than 840 µm may produce a weak explosion. Organic fibers may become electrostatically charged when ground. Discharge may cause ignition of nearby flammable vapors. Provide extra water cooling to prevent spontaneous reignition once rubber fires are extinguished.

SECTION 6: Accidental Release Measures

As sheet gasketing, product does not spill or create a release. Accumulated dusts may be vacuumed using a vacuum cleaner fitted with a HEPA filter or wet mopped for cleanup.

SECTION 7: Handling, Use & Storage

Handling: In the normal handling of sheet and cut gaskets, no significant release of dust occurs. Where dust-producing activities occur, local ventilation and respirators should be used to reduce gasket dust exposures. Good ventilation and dust extraction should always be employed even when the dust is considered to be non-hazardous.

Use: The limitations of use, as shown in the graphs, are for guidance only, and are based on 1/16" thick material. The limitations of use decrease significantly as gasket thickness increases. Do not use a thicker gasket material or "double gaskets" to solve a gasket problem without first consulting the manufacturer. **Thermoseal engineers can advise on gasket selection and installation based on specified operating conditions. If you are in any doubt, visit our website at www.thermosealinc.com, fax us at 937-498-4911 or phone us at 937-498-2222.**

All gaskets should be cut by trained personnel only. Incorrect cutting can produce weaknesses in a gasket that may not be visible, but could cause failure. Gasket installation should be carried out by trained personnel only.

The ability of a gasket material to make and maintain a seal depends not only on the quality of the gasket material, but also on medium being sealed, the flange design, the amount of pressure applied to the gasket by the bolts and how the gasket is assembled into the flanges and tightened.

The higher the operating pressure and/or temperature, the greater the care and expertise required in selecting and installing gaskets. This includes, but is not limited to: confirmation that the flanges are suitable for the intended use; the finish on the flange faces; the parallelism of the flange faces; confirmation that the studs, bolts, washers and nuts are suitable for the intended use and in good condition; no antistick compound is applied to the flanges or gaskets; confirmation that the gasket material and thickness are suitable for the intended use; and the gasket is evenly loaded by the correct tightening sequence of the bolts or studs, and to the correct torque to give the required gasket assembly stress. The use of torque wrenches, hydraulic bolt tensioners or other loading devices can assist achievement of the correct gasket stress.

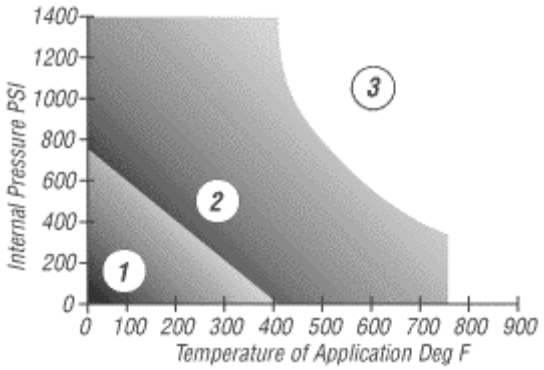
The application of release agents to the gasket or flanges may cause gasket failure.

Because conditions of use are beyond the manufacturer's control, it is the responsibility of the user to ensure that the product is suitable for the intended use.

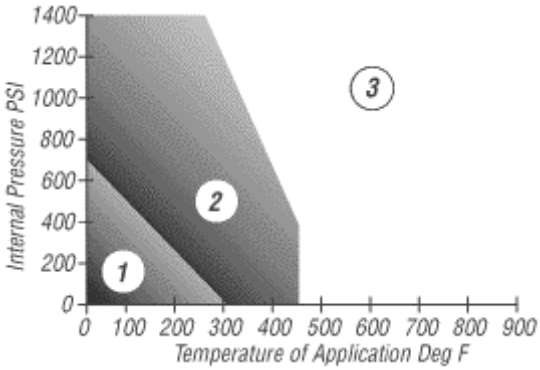
WARNING: Catastrophic gasket failure can be caused by steam or water hammer. Steam or water hammer can cause an instantaneous increase in internal pressure on the assembly that far exceeds the design or test pressures. Where water hammer exists, the basic problem should be corrected. DO NOT USE KLINGER®SIL C-4401 SS IN APPLICATIONS WHERE WATER OR STEAM HAMMER MAY STRESS THE GASKET BEYOND ITS DESIGN LIMITS.

MATERIAL THICKNESS:

Liquids:



Gases and Steam:



About the Pressure and Temperature Graphs: The pressure/temperature charts shown for KLINGER®sil compressed and graphite materials are the most current method of determining the suitability of a gasket material in a known environment. Use the pressure and temperature graphs to select the most suitable KLINGER®sil material for your application.

① In area one, the gasket material is suitable using common installation practices subject to chemical compatibility.

② In area two, appropriate measures are necessary for installation of the gasket to ensure maximum performance. Please call or refer to the KLINGERexpert® software system for assistance.

③ In area three, do not install gaskets in these applications without first referring to the KLINGERexpert® software system or contacting Thermoseal Inc.'s technical support service.

These graphs were developed from testing Thermoseal's materials. Do not use them for competitors' materials since non-asbestos gasketing materials do not have service equivalents.

Storage: KLINGER®sil materials are like all elastomer containing materials subject to a natural aging process, depending on type and quality of elastomer, its vulcanization process and the storage conditions.

All KLINGER®sil sheets and gaskets contain less than 20% elastomer. The relatively small proportion of components which are subject to an aging process makes it evident that the influence exerted on the whole product is smaller than on a pure elastomer.

Nevertheless, poor storage conditions can lead to premature quality reduction of these materials. These include high temperature, low humidity and the strong action of light. We therefore recommend the following storage conditions: storage temperature below 75°F; humidity between 50% - 60%; darkened storage room.

If these conditions are met, a useful life of at least 5 years can be expected. When these storage conditions are not met, it is not possible to determine the absolute life limit or the reduction in useful life. However it is known that if the material is stored at a room temperature over 85°F for a long period, the material may become unsuitable for use in as little as two years.

SECTION 8: Exposure Controls/Personal Protection

Respiratory Protection: Respiratory protection is not required under normal processing of sheet gaskets. Respiratory protection is required when dust-emitting activities (grinding, pile driving, sanding, etc.) are performed. Use only NIOSH/MSHA approved air-purifying respirators or positive pressure, self-contained breathing apparatus when exposure guidelines are greatly exceeded. In confined or poorly ventilated areas, use an approved SCBA device.

Skin Protection: For brief contact, no precautions other than clean body-covering clothing should be needed. When prolonged or frequent repeated contact could occur, use protective clothing such as butyl rubber to prevent skin irritation and dermatitis.

Eye Protection: Safety glasses are recommended when dust-emitting activities occur.

Engineering Controls: Ventilation needed only for dust-producing activities. Maintain airborne levels below exposure guidelines. Local exhaust may be necessary for some applications.

SECTION 9: Physical & Chemical Properties

Appearance:	Rubber-like consistency	Odor:	Slight aromatic odor
Color:	Green	Vapor Pressure:	NA
Boiling Point:	NA	Solubility in Water:	Insoluble
Vapor Density:	NA	Freezing Point:	NA
Specific Gravity:	1.8 g/cc	% Volatile:	<0.1%
PH:	Not Relevant		

SECTION 10: Stability & Reactivity

Stability: (Conditions to avoid) Avoid open flames, welding arcs, or other high temperature sources which induce thermal decomposition.

Incompatibility: (Specific materials to avoid) Avoid strong oxidizers, strong acids and bases. Exposure to these chemicals may cause premature product degradation.

Hazardous Decomposition Products: Carbon monoxide, carbon dioxide, and small amounts of nitrogen oxides, aromatic and aliphatic hydrocarbons are emitted when material is combusted.

Pyrolytic products from nitrile butadiene rubber must be considered toxic. They include hydrogen cyanide and 1,3-butadiene.

Hazardous Polymerization: Will not occur.

SECTION 11: Toxicological Information

For detailed toxicological information on individual ingredients, write to or call the company listed in Section 1 of this MSDS.

SECTION 12: Ecological Information

Components of sheet gasketing are essentially nonbiodegradable in the environment. No studies have been performed on the end gasket product, however.

SECTION 13: Disposal Considerations

Scrap sheet gasketing and used gaskets are generally *not* considered hazardous waste as defined under RCRA.

SECTION 14: Transport Information

No special precautions necessary. DOT Hazard Class: Not regulated.

SECTION 15: Regulatory Information

OSHA: This MSDS is provided to comply with provisions of the Hazard Communication Standard (29 CFR 1910.1200).

	HMIS Ratings	NFPA Ratings
Health	1	1
Flammability	0	0
Reactivity	0	0

SARA Title III:

302/304 Zinc oxide (<1%), a component of this product, is listed.
311/312 Acute, delayed health hazard.
313/372 Contains no Section 313 notification chemicals at or above the *de minimus* concentration

TSCA: Components of this product are listed under TSCA Chemical Substances Inventory.

Exposure Limits: The aramid fiber manufacturer recommends that airborne fibril levels should not exceed 2 fibrils/cc (8-hour TWA, respirable) or 5 mg/m^3 (total dust).

SECTION 16: Other Information:

MSDS Status Revised Sections: All

LIMITED WARRANTY: All goods sold by Thermoseal Inc. are warranted to be free from defects in material and workmanship for a period of thirty (30) days from the date goods are shipped. Damage due to misuse, field alterations, lack of maintenance, improper storage, neglect, accident, or any other reason of any description whatsoever not under the control of Thermoseal Inc. is EXCLUDED FROM THIS LIMITED WARRANTY. Any claim by Buyer with reference to the goods sold herein shall be deemed waived by Buyer, unless submitted to Thermoseal Inc., in writing, within thirty (30) days from the date Buyer discovered or should have discovered, any claimed breach. THIS LIMITED WARRANTY IS IN LIEU OF ALL OTHER EXPRESSED OR IMPLIED WARRANTIES, INCLUDING ANY WARRANTY OF MERCHANTABILITY OR FITNESS FOR ANY PARTICULAR PURPOSE. THERE ARE NO WARRANTIES WHICH EXTEND BEYOND THE DESCRIPTION HEREINABOVE.

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