SECTION 1.0 IDENTIFICATION

MANUFACTURED BY : Hammond Lead Products
Hammond Plant
A Division of Hammond Group, Inc.
2308 165th Street
Hammond, IN 46323

Product/Technical Information: 1-219-931-9360 (Hammond Group, Inc)
1-219-845-0031 (Hammond Plant)
Emergency Information: 1-800-424 -9300 **Chemtrec7**
1-219-845-0031 Ask for Environmental Coordinator

SECTION 2.0 HAZARDOUS COMPOSITION/INGREDIENTS

Product Identification Number (PIN) United Nations Identification Number (UN): This product may be subject to both domestic and international transportation regulations. For further information refer to Section 14.0.

Trade names for Lead Monosilicate: Lead Monosilicate, Lead Monosilicate UHP Grade
This MSDS represents the above stated Hammond Lead Products products.

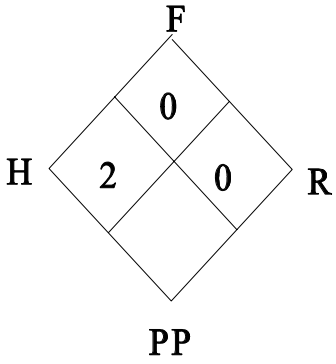
Product Uses: Inorganic lead compounds are used in the manufacture of vitreous enamels, glazes for ceramics, lead in glass for x-ray protection, and electronic ceramics.

Component Name Synonym/Trade Name	CAS No.	EINECS Number	Canadian Domestic Substance List	% Composition Range
Lead Monosilicate	65997-18-4	266-047-6	Yes. See CAS number.	100

EMERGENCY OVERVIEW: This material is an odorless, light yellow granule or powder.

! This material is not flammable; however, if involved in a fire, it may emit toxic fumes of lead.
! Excessive airborne concentrations may obscure vision and present an inhalation and ingestion hazard.
! Spill materials and associated run-off should not be allowed to reach waterways.
! Danger of cumulative effects.
! Substance may be irritating to the eyes and skin.

HAZARD RATING IDENTIFICATION SYSTEMS



Lead Monosilicate

HEALTH	2
FLAMMABILITY	0
REACTIVITY	0
PERSONAL PROTECTION	*

(NPCA8, 1981)

***Recommended personal protective measures are identified within this document.**

SECTION 3.0 HAZARDS IDENTIFICATION

POTENTIAL HEALTH EFFECTS

Routes of Exposure: Inhalation, ingestion, eye, and skin contact.

INHALATION

Acute exposures: Inhalation is the main route of lead intoxication. Symptoms which may be experienced from the inhalation of lead dust or fume may not develop quickly, therefore there may be no immediate effects from exposure. Increasing amounts can build up in the body and may reach a point where symptoms and disability occur. The effects of exposure to fumes and dusts of inorganic lead may include decreased physical stamina, fatigue, sleep disturbances, headaches, aching bones and muscles, constipation, abdominal pains and decreased appetite. Inhalation of large amounts may lead to seizures, coma or possibly death.

Chronic exposures: Lead is a cumulative poison. Increasing amounts can build up in the body and may reach a point where symptoms and disability can occur. These may include anemia, pale skin, a blue line at the gum margin, decreased hand-grip strength, abdominal pain, severe constipation, nausea, vomiting, and paralysis of the wrist joint. Prolonged exposure may result in kidney damage. If the nervous system is affected, usually due to very high exposures, the resulting effects include severe headaches, convulsions, delirium, coma, and possibly death. Continuous exposure may result in decreased fertility. Lead is a teratogen. Elevated lead exposure of either parent before pregnancy may increase the chances of miscarriage or birth defects. Exposure of the mother during pregnancy may cause birth defects.

Carcinogenic Potential (listed under):

IARC	2B	**NTP**	Not Listed	**ACGIH**	A3
OSHA	Not Listed	**NIOSH**	Not Listed	**DFG-MAK**	Not Listed

Medical Conditions which may be aggravated by exposure: Any previously existing lung or pulmonary condition.

INGESTION

Acute exposures: Symptoms which may be experienced from the ingestion of lead dust or fume may not develop quickly, therefore there may be no immediate effects from exposure. Increasing amounts can build up in the body and may reach a point where symptoms and disability may occur. The effects of exposure to fumes and dusts of inorganic lead may include decreased physical stamina, fatigue, sleep disturbance, headaches, aching bones and muscles, constipation, abdominal pains and decreased appetite.

Chronic exposures: Lead is a cumulative poison. Increasing amounts can build up in the body and may reach a point where symptoms and disability may occur. These may include anemia, pale skin, a blue line at the gum margin, decreased hand-grip strength, abdominal pain, severe constipation, nausea, vomiting, and paralysis of the wrist joint. Prolonged exposure may result in kidney damage. If the nervous system is affected, usually due to very high exposures, the resulting effects include severe headaches, convulsions, coma, delirium and death. Continuous exposure may result in decreased fertility. Elevated lead exposure of either parent before pregnancy may increase the chances of miscarriage or birth defects. Exposure of the mother during pregnancy may cause birth defects.

Carcinogenic Potential (listed under):

IARC	2B	**NTP**	Not listed.	**ACGIH**	A3
OSHA	Not listed.	**NIOSH**	Not listed.	**DFG-MAK**	Not listed.

Medical Conditions which may be aggravated by exposure: Any previously existing digestive, renal or nervous system condition.

EYE CONTACT

Acute Exposure: Exposure to dust may cause irritation.

Chronic Effects: No chronic effects are anticipated.

Note: The temporary effects of eye contact or obscured vision due to excessive airborne concentrations may directly impair an individual's ability to locate emergency exits and/or eyewash stations to receive first aid.

Medical Conditions which may be aggravated by exposure: None anticipated.

SKIN CONTACT

Acute Exposure: Skin contact with material may cause irritation.

Chronic Effects: No chronic effects are anticipated.

Medical Conditions which may be aggravated by exposure: None anticipated.

Health effects described above are based on published scientific information available for review, and evaluated on behalf of this product. Actual signs and symptoms experienced may vary due to conditions at the time of exposure.

SECTION 4.0 FIRST AID MEASURES

Inhalation:	! Remove victim to fresh air. ! If conscious, have victim clear nasal passages. ! Restore breathing. (e.g., Artificial Respiration, CPR) ! Seek medical attention, as necessary, if symptoms develop or persist.
Ingestion:	If victim is conscious and alert, ! Give large quantities of water and induce vomiting. ! Seek medical attention immediately.
Eye:	Holding eyelids open, ! Do not allow victim to rub their eyes. ! Gently flush eyes for 15 minutes with large quantities of water. ! Seek medical attention if irritation develops or persists.
Skin:	! Wash area with soap and water. ! Seek medical attention if irritation develops or persists.

SECTION 5.0 FIREFIGHTING MEASURES

Flash Point: Not applicable. **Method:** Not applicable.	**Flammability Range:**	**LEL (%):**	Not applicable.
Auto Ignition Temperature: Not applicable.		**UEL (%):**	Not applicable.

Extinguishing Media: This material is not combustible and is not anticipated to react with commercially employed extinguishing media. Use appropriate extinguishing media for surrounding fire.

Special Firefighting Procedures: As part of responding to any fire, firefighters should wear full turnout gear with a positive pressure demand mode Self-Contained Breathing Apparatus (SCBA). Contain all fire suppression run-off.

Hazardous Thermal Decomposition Byproducts: This product, when heated to decomposition temperature, may emit toxic fumes of lead.

Unusual Fire & Explosion Hazards: None anticipated.

SECTION 6.0 ACCIDENTAL RELEASE MEASURES

Actions to be Taken for Spills: Personnel responding to a spill should:

- Protect against identified hazards through use of prescribed personal protection equipment, proper work and hygiene practices.
- Limit foot and vehicular traffic to minimize mechanical agitation and dispersion.
- Employ a vacuum, equipped with HEPA (High Efficiency Particulate Air) filter, for clean-up of the spill material.
- If no vacuum is available, use a broom and shovel to collect excess powder in the area. Residual material should then be cleared, utilizing the process of wet sweeping, to avoid dust generation.

Containment Techniques: This is a solid material and will not travel far from the spill location unless mechanically agitated. Therefore, no specific containment techniques are recommended outside of restricting access to the spill location.

Lead Monosilicate is considered hazardous material. During spill cleanup, residual wash waters should be contained and collected for proper disposal. Precautionary measures should be exercised to prevent this substance or associated wash waters from entering the waterways.

Spill Response Equipment: The following equipment is recommended for spill response:

- vacuum, equipped with a HEPA filter
- broom, wet mop
- dustpan, shovel, or scoop
- bags, drums, or sacks for collection

Note: Non-sparking equipment may be selected, based on location specific requirements and individual work site evaluations.

Spill Response Personal Protective Equipment: Employees should utilize the following protective equipment when performing spill response activities:

- gloves (rubber or leather)
- cotton or tyvek coveralls
- chemical/safety impact goggles
- respiratory equipment as recommended in Section 8.0.

SECTION 7.0 HANDLING AND STORAGE

Handling Procedures and Equipment: When handling this product, all personnel are directed to:

- Wear all specified elements of PPE, as directed by this document, or under location specific requirements, whichever is more conservative.
- Avoid creating dust, where possible.
- Be familiar with the requirements set forth in the OSHA Lead Standard 29 CFR 1910.1025.

Storage Requirements: The following information provides the appropriate and recommended methods for safe storage and maintenance of product integrity:

- Store in a cool, dry, well-ventilated area.
- Product containers (paper bags, nylon bags, drums, etc.) are prone to physical damage. Care should be taken in storage and handling in order to prevent damage.
- Avoid contact with oxidizers and chemically active metals, since violent reactions may occur.

SECTION 8.0 PERSONAL PROTECTIVE MEASURES

Engineering Controls: If user operations generate dusts or fumes, use process enclosures, local exhaust ventilation, or other engineering controls to keep airborne levels below recommended exposure limits. Where any employee is exposed to lead above the permissible limits for more than 30 days per year, the employer shall implement engineering and work practice controls including administrative controls to reduce and maintain employee exposure to lead in accordance with the implementation schedule specified in 29 CFR 1910.1025(e)(1), except to the extent that the employer can demonstrate that such controls are not feasible. Wherever the engineering and work practice controls which can be instituted are not sufficient to reduce employee exposure to or below the permissible exposure limit, the employer shall nonetheless use them to reduce exposure to the lowest feasible level and shall supplement them by the use of respiratory protection which complies with the requirements of 29 CFR 1910.1025(f).

EMPLOYEE PROTECTIVE MEASURES

Respiratory Protection: The following NIOSH/MSHA approved respiratory protection is recommended for use in airborne concentrations exceeding the exposure limits identified in this section.

! Not in excess of 0.5 mg/m3 (10 X PEL)	Half mask, air purifying respirator (APR) equipped with P100 filters.
! Not in excess of 2.5 mg/m3 (50 x PEL).	Full facepiece, APR with P100 filters
! Not in excess of 50 mg/m3 (1000 x PEL).	Any powered air purifying respirator with P100 filters or half mask supplied-air respirator operated in positive pressure mode.
! Not in excess of 100 mg/m3 (2000 x PEL)	Supplied-air respirators with full facepiece, hood, helmet, or suit, operated in positive pressure mode.
! Greater than 100 mg/m3, unknown concentration or fire fighting.	Full facepiece, self-contained breathing apparatus operated in positive pressure mode.

Utilization of respiratory equipment should be in accordance with 29 CFR 1910.1025 and 29 CFR 1910.134.

Chemical Protective Clothing/Gloves: Leather or rubber gloves and full body cotton coveralls are recommended to prevent direct skin contact.

Eye/Face Protection: Chemical/safety impact goggles are recommended to be used where excessive dust concentrations may exist. In situations where respiratory protection is required to be used for excessive dust concentrations, a full-face APR may be used in place of a half-face APR with chemical/safety impact goggles.

Head and Feet: Hard hats and safety shoes are not recommended based on product considerations. These items, however, may be location specific requirements and should be employed as directed.

Note: Protective clothing is required if the lead exposure exceeds the PEL or TLV. Full body, cotton or disposable coveralls should be worn during use and handling, be left at the work site and be properly disposed of or laundered after use, with the wash water disposed of in accordance with local, state and federal regulations. Personal clothing should be protected from contamination.

Other: An emergency eye wash is recommended in the work area to offer first aid assistance for incidental contact with eyes. All emergency eye wash stations should, at a minimum, meet requirements as established under ANSI Z.358.1 (latest version) for location, design, and operation.

Work Hygiene Practices: To control potential exposures, avoid creating dust. Always wear appropriate protective equipment when handling lead chemicals. To avoid skin contact, gloves (leather or rubber) should be worn when handling containers of lead chemicals. Do not eat, drink, smoke or apply cosmetics while using/handling lead chemicals. Always wash hands and face after handling lead chemicals. Before using this product, be familiar with the OSHA Standard for Occupational Exposure to Lead, 29 CFR 1910.1025.

- ! Avoid direct skin contact when possible.
- ! Do not eat, drink, smoke, or perform other hand-to-mouth activities in product use or handling area.
- ! Wash thoroughly after handling this product.

EXPOSURE GUIDELINES									
Component Name	**CAS No.**	**% Composition Range**	**OSHA PEL mg/m^3**		**ACGIH TLV mg/m^3**			**DFG-MAK mg/m^3**	
			TWA	**STEL**	**TWA**	**STEL**	**BEI**	**TWA**	**STEL**
Lead Monosilicate (as Lead)	65997-18-4	100	0.05	N.E.[2]	0.05	N.E.	30[1]	0.1	1.0[3]
1) μg/100 ml of blood 2) N.E. = None Established 3) Once/shift - 30 minutes									

SECTION 9.0 CHEMICAL AND PHYSICAL PROPERTIES

Boiling Point (at 760 mm Hg):	Not applicable.	**Vapor Pressure (mmHg):**	Not applicable.
Freezing Point:	Not available.	**Vapor Density (Air = 1):**	Not applicable.
Melting Point:	700-784°C; 1292-1443°F.	**Evaporation Rate:**	Not applicable.
Solubility in Cold Water:	<0.005 g/100cc.	**Percent Volatility:**	Not applicable.
Apparent Density:	Not available.	**Mean Particle Size (μm):**	Not available.
Coefficient Water/Oil Distribution:	Not applicable.	**Specific Gravity (Water = 1):**	6.50 - 6.65.
Odor/Odor Threshold:	Odorless.	**Molecular Weight:**	263.27.
Appearance:	Light yellow powder or granule.	**Weight per gallon (lbs.):**	Not available.

SECTION 10.0 STABILITY AND REACTIVITY

Product Stability: Stable.	**Conditions of Reactivity:** Excessive temperatures.
Incompatibility (materials to avoid): None anticipated.	**Hazardous Polymerization:** Will not occur.
Hazardous Decomposition Byproducts (Non-thermal): None anticipated.	

SECTION 11.0 TOXICOLOGICAL INFORMATION

OCCUPATIONALLY RELEVANT ROUTES OF EXPOSURE

Inhalation:	Human TCLo: 10mg/m3 Gastrointestinal tract effects (For LEAD).	**Skin:**	No quantitative information found.
Ingestion:	No quantitative information found.	**Eye:**	No quantitative information found.

SECTION 12.0 ECOLOGICAL INFORMATION

Lead and its compounds have been known as metals since ancient times. It occurs widely in the earth=s crust and can be dissolved from rocks and minerals into surface waters. Lead and its compounds have a variety of commercial and industrial uses, such as lead pipes, lead-lined containers for corrosive gases and liquids, tetraethyl lead, paint pigments, alloys in metallurgy, storage batteries, ceramics, electronic devices, and plastics.

Acute (short-term) Ecological Effects: Acute toxic effects to excessive concentrations may include death of some animals, birds, or fish, and possible death or low growth rate in some plants. Acute effects are seen two to four days after animals or plants come in contact with a toxic chemical substance. Toxicity to aquatic life is affected by water hardness - the softer the water the greater the toxicity. Lead and its compounds have high acute toxicity to aquatic life. Insufficient data are available to evaluate or predict the short-term effects of lead and its compounds to plants, birds, or land animals.

Chronic (long-term) Ecological Effects: Chronic toxic effects may include shortened lifespan, reproductive problems, lower fertility, and changes in appearance or behavior. Chronic effects can be seen long after first exposure(s)to a toxic chemical. Lead and its compounds have high chronic toxicity to aquatic life. Lead causes nerve and behavioral effects in humans and could cause similar long-term effects in birds and land animals exposed to lead and its compounds.

Water Solubility: Lead and its compounds range in their respective water solubilities from highly soluble to practically insoluble. The solubility of this material in cold water is < 0.005 g/100cc.

Distribution and Persistence in the Environment: Lead and its compounds are highly persistent in water, with a half-life greater than 200 days. The half-life of a pollutant is the amount of time it takes for one-half of the chemical to be degraded.

Bioaccumulation in Aquatic Organisms: Some substances increase in concentration, or bioaccumulate, in living organisms as they breathe contaminated air, drink contaminated water, or eat contaminated food. These chemicals can become concentrated in the tissues and internal organs of animals and humans. The concentration of lead and its compounds found in fish tissues is expected to be much higher than the average concentration of lead in the water from which the fish was taken.

Permissible Concentration in Water: To protect freshwater aquatic life $e^{[\ 2.35\ \ln\ (\text{hardness})\ -\ 9.48\ ]}$ never to exceed $e^{[\ 1.22\ \ln\ (\text{hardness})\ -\ 0.47\ ]}$. To protect saltwater aquatic life 668 μg/l on a acute toxicity basis and 25 μg/l on a chronic basis. To protect humans, maintain water concentrations to less than 50 μg/l.

SECTION 13.0 DISPOSAL CONSIDERATIONS

Physical/Chemical Properties: This material is a stable solid.

Recommended Disposal Method: Reblend spilled, unused, off-specification materials with other materials, where possible, in support of waste minimization. Where this is not possible, dispose of material according to Federal (country-specific), state, and local requirements.

Empty Containers: This product may be shipped in paper or nylon bags, steel drums, plastic or steel pails, or intermediate bulk containers. All residual material should be emptied and the containers recycled where possible. Where recycling is not possible, all containers should be disposed of in accordance with Federal (country-specific), state, and local requirements.

If questions exist about disposal, please contact the manufacturer for additional information.

SECTION 14.0 TRANSPORTATION INFORMATION

This material in not regulated by current US DOT regulations. However, elemental lead metal is regulated by the DOT. If the packaged product contains an amount of elemental lead metal less than 100 micron in particle size and in an amount of 10 pounds or greater in each package, then it is classified as a DOT hazardous material. The following shipping information will apply only in the situation described above:

Proper Shipping Name: Environmental hazardous substance, solid, N.O.S., R.Q. (Contains lead metal) (ERG #171)

U.N. Identification No.: 3077	**Class or Division:** 9
Subsidiary Risk: None Listed	**Labels:** Class 9
State Variation: None Listed	**Special Provision:** 8, B54, N50 (172.102)
U.N. Packing Group: III	**Passenger Aircraft:** NONE **Max. Quantity Per Package:** No Limit **Packaging Instruction:** 911

Cargo Aircraft: NONE
Max. Quantity Per Package: No Limit
Packaging Instruction: 911

Packaging Authorization: DOT 173.155 (EXCEPTIONS); 173.213 (Nonbulk Packaging); 173.240 (Bulk Packaging)

Notes: The primary guidance for this information is the USDOT.

SECTION 15.0 REGULATORY INFORMATION

The following regulations and guidelines apply to the product and/or product components.

SARA Supplier Notification:
The product or component(s) of the product we sell to you is subject to the reporting requirements of Section 313, Title III of the Superfund Amendments and Reauthorization Act of 1986 (SARA), 40 CFR Part 372.

Product	Chemical	CAS Number	% By Weight
Lead Monosilicate	Lead Compounds	Not Applicable	85

ACGIH TLV
Australia Exposure Standards for Atmospheric Contaminants in the Occupational Environment
California Prop 65 – **WARNING:** This product contains a chemical known to the state of California to cause cancer and birth defects, or other reproductive harm.
Canadian Ingredient Disclosure List
Canadian Domestic Substance List
CERCLA Hazardous Substances listed as lead
Clean Water Act Section 304 Water Quality Criteria Substances as lead
Clean Water Act Section 307 Priority Pollutants listed as lead and lead compounds
European Inventory of Existing Commercial Chemical Substances
European Union Occupational Exposure Limits (See individual member states)
Federal Republic of Germany DFG-MAK
NIOSH Recommendation Substances
NTP Testing Program Substances
OSHA PEL
United Kingdom Occupational Exposure Limit
Clean Air Act [Lead is regulated as a Hazardous Air Pollutant (HAP)]

16.0 LABELING INFORMATION

Product Name: Lead Monosilicate

Ingredient(s): Lead Monosilicate

Signal Word: Warning !

Hazard Description: This product contains inorganic lead compounds. When handling contents, do not inhale or swallow. Overexposure through inhalation and/or ingestion could cause damage to the blood or nervous, digestive, and/or renal systems.

Precautionary Measures: Avoid contact with the skin, eyes, and mucous membranes. Use with adequate ventilation. Wear appropriate personal protective equipment. When handling contents, use NIOSH/MSHA approved respirators, clean protective clothing and gloves. Keep out of reach of children. Keep away from feed and food products. Continued exposure without these precautions could lead to lead poisoning. Wash thoroughly after use.

First aid Procedures:

Inhalation: Remove victim to fresh air. Restore breathing if necessary. If conscious, have victim clear nasal passages.

Ingestion: If victim is conscious and alert, give large amounts of water and induce vomiting.

Eyes: Holding eyelids open, gently flush eyes for 15 minutes with large quantities of water. Do not allow the victim to rub their eyes.

Skin: Wash area with soap and water.

In all cases of administered first aid, seek medical attention if symptoms develop or persist.

Fire Instructions: This material is not flammable; however, it may contribute toxic fumes of lead if involved in a fire. Select fire extinguishment media for surrounding materials.

Spill or Leak Procedures: Wear appropriate protective equipment. Limit foot and vehicular traffic to minimize agitation and dispersion. Employ a vacuum (equipped with a HEPA filter), broom and shovel, and wet sweeping for spill clean-up. Avoid creating dust. Do not allow this product or run-off to reach waterways.

Handling and Storage Instructions: Wear specified elements of personal protective equipment, as defined in the Material Safety Data Sheet (MSDS), or follow location specific instructions for handling this product. Store in a cool, dry, well-ventilated area. Specific instructions concerning directions for use and handling may be found in the MSDS or may be supplied by the manufacturer.

For additional information on this product, see the MSDS or contact the manufacturer.

Manufactured by:
Hammond Lead Products
Hammond Plant
2308 165th Street
Hammond, IN 46323
1-219-845-0031

Phone: General Information: (219) 931-9360
EMERGENCY PHONE (24 HRS/DAY): 1-800-424-9300 **Chemtrec7**
1-219-845-0031 Ask for Environmental Coordinator

DOCUMENT STATUS REPORT

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This information is given in good faith, but no warranty is expressed or implied. The above information is believed to be accurate, and represents the most up-to-date information available to us. Hammond Lead Products Division does not, however, represent that the information included herein is comprehensive or all-inclusive. It is, therefore, recommended that this document be used as a guide. Hammond Lead Products Division shall not be held liable for any damage or injury resulting from use of such information. Hammond Lead Products Division further encourages users of this product to investigate and determine any potential hazards associated with the users= intended use of this product, and to determine the suitability of this information with respect to the users= particular applications.

Prepared by: Hammond Group, Inc., Environmental, Health, and Safety Department