



MATERIAL SAFETY DATA SHEET

PRODUCT: Paste
REVISION NUMBER: 2

REVISION DATE: 05/18/2007
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1. PRODUCT AND COMPANY IDENTIFICATION

MANUFACTURED BY: Ferro Corporation
251 West Wylie Avenue
P.O. Box 519
Washington, PA 15301
Prod Info 724-223-5900
CHEMTREC 800-424-9300

Use the CHEMTREC telephone number only in the event of chemical emergencies.

PREPARED BY: Mike Pellegrini
Environmental Engineer

PRODUCT CODE: **LMC-6044**

PRODUCT TRADE NAME: **LMC-6044 BLACK CERAMIC MARKING MATERIAL**

CAS NO: Mixture
CHEMICAL FAMILY: Decorative Borosilicate Coating
PRODUCT TYPE: Glass Enamel/Flux in Medium

2. COMPOSITION/INFORMATION ON INGREDIENTS

This product does not have exposure limit values. Exposure limit values for some of the components are listed below as a guideline for safe use of this product.

HAZARDOUS COMPONENTS

INGREDIENTS/CAS #	OSHA PEL:	ACGIH TLV:
Iron Oxide 1309-37-1	TWA 10 mg/m ³	TWA as Fe: 5 mg/m ³
Crystalline Silica 14808-60-7	TWA respirable dust: 0.1 mg/m ³	TWA respirable dust: 0.05 mg/m ³
Cobalt Compound NONE	TWA as Co (metal dust and fume) 0.1 mg/m ³	TWA as Co 0.02 mg/m ³
Zinc Oxide 1314-13-2	TWA total dust: 15.0 mg/m ³ ; respirable dust: 5.0 mg/m ³ ; TWA fume: 5.0 mg/m ³	TWA dust: 10.0 mg/m ³ ; TWA fume: 5.0 mg/m ³ ; STEL fume: 10.0 mg/m ³
Nickel Compound NONE	TWA as Ni: 1.0 mg/m ³	TWA as Ni: 0.2 mg/m ³
Chromium (III) Compound NONE	TWA as Cr (III) 0.5 mg/m ³	TWA as Cr (III) 0.5 mg/m ³
Crystalline Silica 14808-60-7	TWA (Total Dust): 30 mg/m ³ / (%Quartz + 2) TWA (Resp. Frt.): 250 mppcf / (%Quartz + 5) STEL (Resp. Frt.): 10 mg/m ³ / (%Quartz + 2)	TWA: Respirable Fraction: 0.05 mg/m ³
Borates NONE	NE	TWA 1.0 mg/m ³

3. HAZARDS IDENTIFICATION

PRINCIPLE ROUTES OF EXPOSURE: Inhalation, ingestion and dermal.

The key immediate hazards are:

Skin, eye, and respiratory irritant
May cause allergic skin and respiratory reactions.

Effects from Acute Exposure:

- EYE CONTACT :** Causes eye irritation.
- SKIN CONTACT:** Causes skin irritation. May cause an allergic skin reaction.
- INHALATION:** Causes lung irritation. May cause an allergic respiratory reaction.
- INGESTION:** May be harmful if swallowed.

AGGRAVATED MEDICAL CONDITIONS:

Allergic skin and respiratory reactions.

Effects from Chronic Exposure:

CARCINOGENIC INGREDIENTS:

The International Agency For Research On Cancer (IARC) has determined that Cobalt and Cobalt Compounds are substances that are possibly carcinogenic to humans (IARC group 2B).

This product contains greater than 0.1% crystalline silica. The International Agency for Research on Cancer (IARC) has determined that "there is sufficient evidence for the carcinogenicity of crystalline silica to experimental animals and limited evidence of carcinogenicity in humans. "The National Toxicology Program (NTP) Sixth Annual Report confirms this determination. It has listed crystalline silica as a substance reasonably anticipated to be a carcinogen.

Nickel and certain nickel compounds: There is sufficient evidence of the carcinogenicity of nickel and nickel compounds (NTP-1985) also, (IARC 1976, vol. 11) states there is sufficient evidence for the carcinogenicity of certain nickel compounds. Nickel subsulfide is carcinogenic in rats by inhalation, producing lung cancer. Nickel compounds (nickel powder, subsulfide, oxide, carbonate, and nickelocene) produced local sarcomas in mice, rats and hamsters when given intramuscularly. Inhalation of nickel carbonyl produced a low incidence of lung tumors in rats.

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OVEREXPOSURE EFFECTS:

CONTAINS BOROSILICATE FRIT:

Overexposure to borosilicate frit may cause skin, eye, and respiratory irritation due to the physical nature of the particulates. Repeated and prolonged breathing of these particulates might cause coughing, wheezing, impaired lung function, and increased sputum production. Smoking aggravates these effects.

CONTAINS CHROMIUM (III) COMPOUNDS:

Compounds of chromium, in its trivalent state, have no established toxicity. Skin contact has been reported to cause skin irritation. Allergic skin reactions may occur in sensitive individuals, although it is believed that the hexavalent (VI) form of chromium is responsible for most of the reported cases.

CONTAINS COBALT COMPOUNDS:

Cobalt compounds can cause allergic skin reactions, respiratory irritation, or contact dermatitis for sensitive individuals.

CONTAINS IRON OXIDE (AS REACTED INTO THE PIGMENT):

Long-term inhalation of iron oxide dust may lead to siderosis or iron deposition in the lung. This is not considered to be a hazardous condition.

CONTAINS NICKEL COMPOUNDS:

Nickel overexposure can cause allergic skin reactions and asthma. Inhalation can cause effects on the lungs such as bronchitis, emphysema, and impaired function, as well as kidney damage. Swallowing can result in nausea, vomiting, diarrhea and abdominal cramps. Chronic overexposure during nickel production has been shown to cause lung and nasal cavity cancers in workers; these effects are directly related to the degree of exposure. The compounds associated with the production environment included metallic nickel, nickel oxides and nickel sulfides. Workplaces other than those involved with mining, refining, and alloy manufacture have not been studied.

CONTAINS ZINC OXIDE (AS REACTED INTO THE FRIT/PIGMENT):

If processing can produce zinc oxide fumes, its inhalation may cause nausea, vomiting, fever, chills, metallic taste, and muscle pain.

<h2 style="text-align: center;">4. FIRST AID MEASURES</h2>
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INGESTION: If swallowed, give at least 3-4 glasses of water, but do not induce vomiting. Do not give anything by mouth to an unconscious or convulsing person. Get immediate medical attention.

SKIN: For skin contact, wash affected areas with plenty of water, and soap if available, for several minutes. Get medical attention if irritation occurs.

INHALATION: If inhaled, remove from area to fresh air. Get medical attention if respiratory irritation develops or if breathing becomes difficult.

EYES: For eye contact, immediately flush eyes for at least 15 minutes with running water. Hold eyelids apart to ensure rinsing of the entire eye surface and lids with water. Get immediate medical attention if irritation develops.

NOTES TO PHYSICIAN: None specified.

5. FIRE FIGHTING MEASURES

OSHA FLAMMABILITY CLASS: NON-COMBUSTIBLE

FLASH POINT: >200 F

Lower Explosive Limit: Not Available

Upper Explosive Limit: Not Available

EXTINGUISHING MEDIA: Carbon Dioxide, Dry Chemical, Foam or Water Mist

FIRE FIGHTING PROCEDURES: Fire-Fighters should wear self-contained breathing apparatus and full protective clothing when fighting chemical fires.

Use water spray to cool nearby containers and structures exposed to fire.

UNUSUAL HAZARDS: Decomposition and combustion products may be toxic.

6. ACCIDENTAL RELEASE MEASURES

SPILL PROCEDURES: Wear appropriate protective equipment. Avoid the generation of dust. Collect material and place in closable container(s) for disposal.

7. HANDLING AND STORAGE

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE: Avoid contact with eyes, skin and clothing.

NOTES ON HANDLING INFORMATION: Minimize dust generation during handling. Use adequate ventilation.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

VENTILATION: Adequate ventilation should be provided to keep concentrations below acceptable Exposure Limits. Discharge from the ventilation system should comply with the applicable air pollution control regulations.

EYE PROTECTION: Wear safety glasses or goggles to protect against exposure.

PROTECTIVE GLOVES: Use gloves as a standard industrial handling procedure.

RESPIRATORY PROTECTION: Appropriate respiratory protection is required when exposure to airborne contaminant is likely to exceed acceptable limits. Respirators should be selected and used in accordance with OSHA Subpart I (29 CFR 1910.134) and manufacturer's recommendations.

OTHER PERSONAL PROTECTIVE EQUIPMENT: None specified.

9. PHYSICAL AND CHEMICAL PROPERTIES

APPEARANCE: Black Paste

BOILING POINT: Not Available

VAPOR DENSITY (AIR=1): Heavier than air

EVAP. RATE(BUTYL ACETATE=1): Slower than n-Butyl Acetate

VOC, Wt.% (EPA METH.24): 0

BULK DENSITY: Not Available

SOLUBILITY (in water): Insoluble

10. STABILITY AND REACTIVITY

STABILITY DATA: STABLE

POLYMERIZATION: WILL NOT OCCUR

HAZARDOUS DECOMPOSITION PRODUCTS: Carbon monoxide, carbon dioxide and depending on conditions, some hydrocarbon fragments may also be formed.

INCOMPATIBILITY

(MATERIALS TO AVOID): Strong oxidizing agents

CONDITIONS/HAZARDS TO AVOID: None known.

11. TOXICOLOGICAL INFORMATION

No Toxicological data known.

12. ECOLOGICAL INFORMATION

ECOTOXICOLOGICAL INFORMATION: No data at this time

CHEMICAL FATE INFORMATION: No data at this time.

PERSISTENCE/DEGRADABILITY: No data at this time.

APPRAISAL: No data at this time.

MOBILITY: No data at this time.

13. DISPOSAL CONSIDERATIONS

DISPOSAL OF WASTE METHOD: Dispose in accordance with Federal, State and Local regulations.

14. TRANSPORT INFORMATION

DOT Shipping Name: DOT data is available upon request. Contact the Environmental, Health, & Safety Department at (724) 223-5900.

15. REGULATORY INFORMATION

SARA SECTION 302: None Found

SARA (311, 312) HAZARD CLASS: ACUTE HEALTH HAZARD

CHRONIC HEALTH HAZARD

SARA 313 Title III Toxic Chemical List:

The following chemicals are subject to the reporting requirements of Section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 and 40 CFR part 372.

< 1	%	Glycol ethers	< 1	%	
25	%	Cobalt compounds	6	%	Metal as Co
26	%	Zinc compounds	5	%	Metal as Zn
25	%	Nickel compounds	2	%	Metal as Ni
25	%	Chromium (III) compounds	6	%	Metal as Cr

TSCA Inventory Status: This product (and/or all of its components) is in compliance with the U.S. EPA Toxic Substance Control Act, TSCA, (15 U.S.C. 2604).

This product and all of its components is listed on the DSL inventory.

16. OTHER INFORMATION

Revisions: The Format has been changed to meet the requirements of the new ANSI Standard Z400.1.

LABEL INFORMATION:

WARNING!

Skin, eye, and respiratory irritant.

May cause allergic skin and respiratory reactions.

Contains nickel which may cause respiratory effects, including cancer.

Avoid contact with eyes, skin and clothing.

Avoid breathing mist or vapor.

Keep away from food products.

Wash thoroughly after handling and before eating, drinking or using cosmetic or tobacco products or toilet facilities.

Use with adequate ventilation.

Keep container closed when not in use.

FIRST AID: If inhaled, remove to fresh air. If breathing is difficult, give oxygen. In case of contact, immediately flush eyes or skin with plenty of water. Remove contaminated clothing. Get medical attention.

IN CASE OF FIRE: Use water, dry chemical or carbon dioxide.

IN CASE OF SPILL: Collect and dispose in accordance with federal, state and local regulations.

FOR INDUSTRIAL USE ONLY.

PRODUCT TRADE NAME: LMC-6044 BLACK CERAMIC MARKING MATERIAL

DEFINITIONS AND ABBREVIATIONS :

ACGIH = American Conference of Governmental Industrial Hygienists
C (CEIL) = The concentration that shall not be exceeded during any part of the working exposure.
CAS # = Chemical Abstracts Service Registry Number
EPA = Environmental Protection Agency
IARC = International Agency for Research on Cancer
NIOSH = National Institute for Occupational Safety and Health
NTP = National Toxicology Program
OSHA = Occupational Safety and Health Administration
PEL = Permissible Exposure Limit
SARA = Superfund Amendments and Reauthorization Act
STEL = Short Term Exposure Limit. Usually a 15 minute time weighted average exposure.
TLV = Threshold Limit Values
TSCA = Toxic Substance Control Act
TWA = Time Weighted Average. Exposure concentration for a normal 8 hour day or 40 hour week.
VOC = Volatile Organic Content

DISCLAIMER: The information contained in this Material Safety Data Sheet (MSDS) has been compiled from sources believed to be reliable and to represent the most reasonable current opinion on the subject when the MSDS was prepared. No guarantee is made as to the correctness or sufficiency of the information. The user of this product must decide what safety measures are necessary to safely use this product, either alone or in combination with other products, and determine the regulatory compliance obligations under any applicable federal or state laws.

*** END OF MSDS ***