MATERIAL SAFETY DATA SHEET

1. COMPANY AND PRODUCT IDENTIFICATION

DUNCAN ENTERPRISES
5673 East Shields Avenue
Fresno, CA 93727
559-291-4444
559-291-9444 (Fax)

EMERGENCY TELEPHONE NUMBERS

Health Emergency:	559-291-4444	7:00 am – 3:30 pm Pacific Standard Time
Spill and Off-Hour Health Emergencies:	800-424-9300	U.S. and Canada
	703-527-3887	Outside U.S. and Canada (Collect)

Product Name: **DUNCAN RED COAT UNDERGLAZES**
Product Type: Ceramic Underglaze

2. COMPOSITION / INFORMATION ON INGREDIENTS

The ingredients in this formulation are a trade secret. All ingredients in the formula are non-hazardous, unless specified in Sections 3 and 15.

3. HAZARDS IDENTIFICATION

HMIS Hazard Ratings for Product

Health:	3*	0 = Minimal
Flammability:	0	1 = Slight
Reactivity:	0	2 = Moderate
Personal Protection:	F (if spraying)	3 = Serious
		4 = Severe
		* = Chronic Effects

Frit is a fused silicate glass substance. The components of this glass product listed below are from the inventory of potentially hazardous substances referenced by FED/OSHA in 29 CFR 1910.1200.

Components	**OSHA PEL**	**ACGIH TLV**
Barium compounds, as Ba	0.5 mg/m^3	0.5 mg/m^3
Cadmium compounds, as Cd	0.2 mg/m^3	0.05 mg/m^3
Crystalline Silica	10/(2% respirable quartz)	0.1 mg/m^3

Other Information

Frits are produced from the chemical reactions which occur during the high temperature smelting of various raw materials to form a molten glass. This glass is rapidly cooled and then ground to produce powdered frit. The lead listed for this product is incorporated into the glass structure of the frit, chemically reacted in the form of silicates of other essentially insoluble complexes. Exposure to the hazardous ingredients can occur if spray mist is inhaled or glaze ingested and the ingredient dissolves out of the glass. Because of the chemical stability of frit and its resistance to attack by acids or alkali, this is anticipated to occur very slowly. This product contains the following component(s) that require reporting under Section 313 of the Emergency Planning and Community Right-to-Know Act, also known as Title III of SARA (Superfund Amendments and Reauthorization Act), and 40 CFR Part 372:

COMPONENT	**PERCENT PRESENT[(a)]**
Barium compounds	Up to 11% (as BaO)
Cadmium compounds	Up to 5% (as CdO)
Zinc Compounds	Up to 12% (as Zn)

(a) The percent reported is based on the theoretical composition of this frit. While existing in theory, the component(s) mentioned are only present as part of FRIT CAS #65997-18-4*).

4. FIRST AID MEASURES

Eye Contact: Flush eyes with large amounts of water until irritation subsides. Consult a physician.
Skin Contact: Wash affected skin areas thoroughly with soap and water. Consult a physician if irritation persists.
Inhalation: Move subject to fresh air; if breathing is difficult give oxygen. Consult a physician.
Ingestion: If swallowed, consult a physician. Induce vomiting if prescribed under medical supervision. Never give anything by mouth to an unconscious person.

5. FIRE FIGHTING MEASURES

Autoignition Temperature:	Nonflammable
Flash Point:	Not Applicable
Upper Explosive Limit (%):	Not Applicable
Lower Explosive Limit (%):	Not Applicable
Extinguisher Media:	Product is nonflammable – Use extinguishing media appropriate for surrounding fire
Special Firefighting Procedures:	Not Applicable
Fire & Explosion Hazards:	Not Applicable
NFPA Flammability Hazard Class:	0 = Insignificant

6. ACCIDENTAL RELEASE MEASURES

Spill or Leak Procedures: Uncontaminated material may be recovered and re-used. If contaminated scoop, vacuum, or wash into a receptacle for disposal.

7. HANDLING AND STORAGE

Handling: When product in use, do not eat, drink, or smoke. Wash hands immediately after use. Keep sealed. **Keep out of reach of children. Do not use this product if pregnant or contemplating pregnancy.**

Storage: Protect containers against physical damage; store in dry area away from feed and food products.

8. EXPOSURE CONTROL AND PERSONAL PROTECTION

Respiratory Protection:	If spraying, do not inhale mist. Use respirator that is NIOSH approved for sprays and mists.
Ventilation:	Local exhaust ventilation recommended
Mechanical (General):	Recommended when spraying
Protective Gloves:	Not needed for foreseeable conditions of use
Eye Protection:	Wear safety glasses with side shields
Other Protective Clothing Or Equipment:	None needed
Work/Hygienic Practices:	Good hygiene practices should be followed. When product in use, do not eat, drink, or smoke. Wash hands immediately after use. Keep sealed. **Keep out of reach of children. Do not use this product if pregnant or contemplating pregnancy.**

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance / Physical Description:	Colored liquid. Odorless
pH:	7 - 10
Boiling Point:	212°F
Freezing Point:	32°F
Melting Point:	1800°F
Solubility in Water:	Insoluble
Specific Gravity (Water = 1):	1.5 – 1.8
Bulk Density:	12.5 – 15.0 lb / gal
Evaporation Rate (Water = 1):	1
Vapor Pressure:	17.5 mm Hg @ 20°C (68°F)
Autoignition Temperature:	Not Applicable
Flash Point:	Not Applicable
Oxidizing Properties:	Not Applicable

10. STABILITY AND REACTIVITY

Stability:	Stable
Incompatible Materials:	None known
NFPA Reactivity Hazard Class:	0 = Insignificant
Hazardous Decomposition Products:	Avoid fumes when firing
Hazardous Polymerization:	Will not occur
Conditions to Avoid:	None Known

11. TOXICOLOGICAL INFORMATION

Primary Routes of exposure: Inhalation, Skin Contact, and Ingestion

Overexposure Effects

Overexposure to cadmium by inhalation can result in a metallic taste in the mouth, headache, shortness of breath, chest pain, weakness, leg pains and fluid in the lungs. These signs and symptoms may be delayed, sometimes occurring four to eight hours following exposure. Kidney and liver damage may also occur. Swallowing can result in severe nausea, vomiting, diarrhea, stomach cramps, salivation, headache, muscle cramps and dizziness.

Long term exposure to the fumes and dust of cadmium have been associated with emphysema, bronchitis, and kidney damage. Chronic overexposure to the metal and cadmium compounds, such as cadmium oxide, cadmium sulfide, cadmium sulfate and cadmium chloride, may result in lung cancer, although a definite cause-effect relationship has not been fully established.

Excessive ingestion of barium containing frit may cause inflammation of the gastrointestinal tract, muscular paralysis, slow pulse rate, irregular heart contractions, and low blood potassium levels.

Metal fumes from firing may cause lung inflammation and injury in terms of hours with symptoms of chest pains, chills, cough, headache, and diarrhea.

Prolonged contact with frit dust can be very irritating to the eyes and / or skin. High dust levels can be irritating to the respiratory tract. Excessive inhalation of crystalline silica containing dusts over many years can result in silicosis, a disabling lung disease.

With adequate ventilation, dust control, and good personal hygiene, symptoms of overexposure should not occur. Advise regular medical monitoring of employees by a physician competent in industrial health.

11. TOXICOLOGICAL INFORMATION (Continued)

Carcinogenicity

NIOSH (Current Intelligence Bulletin 42, September 27, 1984) "recommends that cadmium and its compounds be considered as potential occupational carcinogens". In IARC Monograph 58, cadmium and its compounds are undifferentiated as Group I human carcinogens. NTP's SIXTH ANNUAL REPORT ON CARCINOGENS ranks respirable crystalline silica as "reasonably anticipated to be a carcinogen.

Medical Conditions Aggravated by Overexposure

Populations at increased risk to cadmium include individuals with kidney disease, genetic differences in induction of metallothionein and dietary deficiencies in metal ions and/or protein.

12. ECOLOGICAL INFORMATION

No Data Available

13. DISPOSAL CONSIDERATIONS

Waste Disposal Method: Follow Federal or State and Local regulations for disposal. Cadmium and barium are listed in US-EPA CFR 40, Part 261.24. Testing of the waste may be required to determine status under the hazardous waste regulations.

14. TRANSPORT INFORMATION

U.S. Department of Transportation Information

DOT Shipping Name: Consumer Commodity ORM-D Glazes or Stains
DOT Hazard Class: OA/OG 88690 Sub. 1

15. REGULATORY INFORMATION

This product contains cadmium and barium compounds, which require reporting under Section 313 of the Emergency Section of the Emergency Planning and Community Right-To-Know Act, also known as Title III of the SARA (Superfund Amendments and Reauthorization Act), and 40 CFR Part 372:

Products bearing the Caution Label are certified to be properly labeled in a program of toxicological evaluation by a nationally recognized toxicologist. The products are certified by the toxicologist to be labeled in accordance with the chronic hazard labeling standard ASTM D-4236.

California Proposition 65:

WARNING: This product contains cadmium and crystalline silica, chemicals known to the State of California to cause cancer. This product contains cadmium, a chemical known to the State of California to cause birth defects or other reproductive harm.

16. OTHER INFORMATION

Table of Abbreviations

ACGIH American Conference of Governmental Industrial Hygienists
ANSI American National Standards Institute
ASTM American Society for Testing Materials

16. OTHER INFORMATION (Continued)

Table of Abbreviations, Continued

°C	Degrees Centigrade
CAS	Chemical Abstract Service
CERCLA	Comprehensive Environmental Response, Compensation and Liability Act
CFR	Code of Federal Regulations
CPR	Controlled Products Regulations
DOT	Department of Transportation
EPA	Environmental Protection Agency
°F	Degrees Fahrenheit
FDA	Food & Drug Administration
Hg	Mercury
HMIS	Hazardous Materials Identification System
IARC	International Agency for Research on Cancer
LD	Lethal Dose
mg / kg	Milligram per kilogram
mm	Millimeter
MSDS	Material Safety Data Sheet
MSHA	Mine Safety and Health Administration
N / A	Not Applicable
NFPA	National Fire Protection Association
NIOSH	National Institute for Occupational Safety and Health
NTP	National Toxicology Program
OSHA	Occupational Safety and Health Administration
ppm	Parts per million
SARA	Superfund Amendment and Reauthorization Act
STEL	Short-Term Exposure Limit
TSCA	Toxic Substances Control Act
TWA	Time - Weighted Average
U.N.	United Nations
WHMIS	Workplace Hazardous Materials Information System
>	Greater Than
<	Less Than

Creation Date: 07/87
Revision Date: 08/31/07
Technical Contact: Frank Peters
Senior R&D Chemist
Duncan Enterprises
5673 East Shields Avenue
Fresno, CA 93727
559-291-4444
559-291-9444 (Fax)

Disclaimer

The information given and the recommendations made herein apply to our product(s) alone and not combined with any other product(s). Such are based on our research and on data from other reliable sources and are believed to be accurate. No guarantee of accuracy is made. It is the purchaser's responsibility before using any product to verify this data under their own operating conditions and to determine whether the product is suitable for their purposes.