MATERIAL SAFETY DATA SHEET

Ferro Corporation
Liquid Coatings & Dispersions
1301 N. Flora Street
Plymouth, IN 46563 USA

Emergency telephone number
CHEMTREC: 1-800-424-9300
CHEMTREC (outside U.S.): 1-703-527-3887
Plant Number: 1-574-935-5131

1. IDENTIFICATION OF THE SUBSTANCE/PREPARATION AND OF THE COMPANY/UNDERTAKING

Product Name: Orange Ultra Plus
CAS-No.: Mixture
Product Code: PL81-610010
Date of Preparation: 09/09/2011

2. HAZARDS IDENTIFICATION

Emergency Overview
Warning
Flammable liquid and vapor. Vapors may travel to a source and flash back. May cause respiratory tract, eye and skin irritation.

		HMIS	NFPA 704
Color:	Orange	2*	2
Physical state:	Liquid	3	3
Odor:	Solvent-like	2	2

Potential Health Effects

Principle routes of exposure: Inhalation, ingestion, skin and eye contact.

Eye contact: Contact with eyes may cause irritation with discomfort, tearing or blurring of vision.

Skin contact: Repeated or prolonged skin contact may cause skin irritation and/or dermatitis and sensitization of susceptible persons.

Inhalation: Inhalation of high vapor concentrations may cause symptoms like headache, dizziness, tiredness, nausea and vomiting. During heating, polymer fume fever may result with symptoms of chest pain or tightness, shortness of breath, cough, malaise, muscle aches, increased heart rate, fever, chills, sweats, nausea and headache. Polymer thermal decomposition products may be absorbed through inhalation and cause target organ effects.

Ingestion: May cause central nervous system depression or effects.

3. COMPOSITION/INFORMATION ON INGREDIENTS

Components	CAS Number	Weight %
Styrene	100-42-5	30 - 40%
Resin	Proprietary	30 - 40%
Aluminum hydroxide	21645-51-2	5 - 10%
C.I. Pigment Red 104 (a lead chromate)	12656-85-8	5 - 10%
Methyl Methacrylate Monomer	80-62-6	1 - 5%
Xylene	1330-20-7	1 - 5%
Barium sulfate	7727-43-7	1 - 5%
Ethylbenzene	100-41-4	0.1 - 0.5%

The specific chemical identities are being withheld as a trade secret (29CFR1910.1200).

4. FIRST AID MEASURES

Eye contact: Rinse immediately with plenty of water, also under the eyelids. Get medical attention if irritation develops.

Skin contact: Wash off immediately with soap and plenty of water. Remove and wash contaminated clothing before re-use. If symptoms persist call a physician.

Inhalation: Move to fresh air. If breathing is difficult, give oxygen. If symptoms persist, call a physician.

Ingestion: Drink plenty of water. Do not induce vomiting. Consult a physician if necessary.

Notes to physician: Treat symptomatically.

5. FIRE-FIGHTING MEASURES

Flash point (°C): 28.33 (83°F) Method: Tag closed cup

Suitable extinguishing media: Foam. Dry chemical. Carbon dioxide (CO2).

Hazardous decomposition products: Carbon monoxide. Carbon dioxide (CO2). Formaldehyde vapors.

Special protective equipment for firefighters: As in any fire, wear self-contained breathing apparatus (pressure-demand, NIOSH approved or equivalent) and full protective gear.

Unusual hazards: Flammable. Vapours may form explosive mixture with air. Vapors are heavier than air and may spread along floors. Vapor may travel considerable distance to source of ignition and flash back.

6. ACCIDENTAL RELEASE MEASURES

Personal precautions: Avoid contact with skin, eyes and clothing. Wear personal protective equipment.

Environmental precautions: Do not flush with water. Do not flush into surface water. Water pollutant. Water runoff can cause environmental damage.

Methods for cleaning up: Absorb spill with inert material (e.g. dry sand or earth), then place in a chemical waste container.

7. HANDLING AND STORAGE

Handling:
Use only in area provided with appropriate exhaust ventilation. Keep away from open flames, hot surfaces and sources of ignition. Wear personal protective equipment.

Storage:
Store at room temperature in the original container. Keep in a dry, cool place. Keep tightly closed in a dry and cool place.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Exposure limits

Minimize exposure in accordance with good hygiene practice.

Components	OSHA	ACGIH
Styrene	100 ppm TWA 200 ppm Ceiling	40 ppm STEL 20 ppm TWA
Methyl Methacrylate Monomer	100 ppm TWA 410 mg/m³ TWA	100 ppm STEL 50 ppm TWA
Xylene	100 ppm TWA 435 mg/m³ TWA	150 ppm STEL 100 ppm TWA
Ethylbenzene	100 ppm TWA 435 mg/m³ TWA	20 ppm TWA
Barium sulfate	15 mg/m³ TWA total dust 5 mg/m³ TWA respirable fraction	10 mg/m³ TWA

Engineering measures: Provide adequate ventilation. In case of insufficient ventilation wear suitable respiratory equipment.

Eye protection:	Safety glasses with side-shields. If splashes are likely to occur, wear:. Goggles.
Skin and body protection:	If conditions warrant, use butyl rubber apron and boots.
Hand protection:	Impervious butyl rubber gloves.
Respiratory protection:	In case of insufficient ventilation wear suitable respiratory equipment . Seek professional advise prior to respirator selection and use. NIOSH-approved respirators should be worn where engineering controls and work practices do not reduce exposure to or below the PEL.

9. PHYSICAL AND CHEMICAL PROPERTIES

Color:	Orange	**Physical state:**	Liquid
Odor:	Solvent-like	**Molecular weight:**	No data available
Boiling point/range (°C):	100-145	**pH:**	No data available
Melting point/range (°C):	No data available	**Specific gravity (Water =1):**	1.18341
Vapor pressure :	4.5 @ 68F	**Water solubility:**	Negligible
VOC content (%)	43.79	**HAPS content (%):**	43.32

10. STABILITY AND REACTIVITY

Stability:	May be unstable resulting in polymerization.
Polymerization	Polymerization can occur when contacted with bases such as amines, e.g. two part epoxy glue.
Hazardous decomposition products:	Carbon monoxide. Carbon dioxide (CO2).
Materials to avoid:	Incompatible with strong acids and bases. Incompatible with oxidizing agents. Peroxides.
Conditions to avoid	Excessive temperatures.

11. TOXICOLOGICAL INFORMATION

Acute toxicity:	Information given is based on data on the components and the toxicology of similar products
Carcinogenic Effects:	IARC has classified Styrene as a possible carcinogen (Class 2B). There is currently not sufficient evidence to indicate that Styrene is a human carcinogen. The IARC 2B classification is based on animal data generated from Styrene oxide. Styrene oxide is a metabolite of Styrene.

Component information, if any, is listed below

Styrene

LD50s and LC50s:	Oral LD50 (Rat) = 1000 mg/kg Inhalation LC50 (Rat) = 11.8 mg/L
OSHA - Select Carcinogens:	Present
NTPS. Carcinogen:	Reasonably Anticipated To Be A Human Carcinogen
IARC - Group 2B:	Listed

Aluminum hydroxide

LD50s and LC50s:	Oral LD50 (Rat) = 5000 mg/kg

C.I. Pigment Red 104 (a lead chromate)

LD50s and LC50s:	Oral LD50 (Rat) = 5000 mg/kg
OSHA - Select Carcinogens:	Present
NTPS. Carcinogen:	Reasonably Anticipated To Be A Human Carcinogen
IARC - Group 1:	Listed
IARC - Group 2A:	Listed

Methyl Methacrylate Monomer

LD50s and LC50s:	Inhalation LC50 (Rat) = 400 ppm Inhalation LC50 (Rat) = 4632 ppm Oral LD50 (Rat) = 7872 mg/kg Dermal LD50 (Rabbit) = 5 g/kg

Styrene

Xylene

LD50s and LC50s: Oral LD50 (Rat) = 4300 mg/kg
Inhalation LC50 (Rat) = 47635 mg/L
Inhalation LC50 (Rat) = 5000 ppm
Dermal LD50 (Rabbit) = 1700 mg/kg

12. ECOLOGICAL INFORMATION

Aquatic toxicity: No data is available on the product itself. Information given is based on data on the components and the ecotoxicology of similar products.

Styrene

Ecotoxicity - Fish Species Data:
96 h LC50 (Lepomis macrochirus) = 19.03 - 33.53 mg/L static
96 h LC50 (Pimephales promelas) = 3.24 - 4.99 mg/L flow-through
96 h LC50 (Poecilia reticulata) = 58.75 - 95.32 mg/L static
96 h LC50 (Pimephales promelas) = 6.75 - 14.5 mg/L static
Ecotoxicity - Water Flea Data:
48 h EC50 (Daphnia magna) = 3.3 - 7.4 mg/L
Ecotoxicity - Freshwater Algae Data:
96 h EC50 (Pseudokirchneriella subcapitata) = 0.15 - 3.2 mg/L static
72 h EC50 (Pseudokirchneriella subcapitata) = 0.46 - 4.3 mg/L static
96 h EC50 (Pseudokirchneriella subcapitata) = 0.72 mg/L
72 h EC50 (Pseudokirchneriella subcapitata) = 1.4 mg/L

C.I. Pigment Red 104 (a lead chromate)

Ecotoxicity - Fish Species Data:
96 h LC50 (Leuciscus idus) = 2500 mg/L static

Methyl Methacrylate Monomer

Ecotoxicity - Fish Species Data:
96 h LC50 (Pimephales promelas) = 125.5 - 190.7 mg/L static
96 h LC50 (Lepomis macrochirus) = 153.9 - 341.8 mg/L static
96 h LC50 (Lepomis macrochirus) = 170 - 206 mg/L flow-through
96 h LC50 (Pimephales promelas) = 243 - 275 mg/L flow-through
96 h LC50 (Poecilia reticulata) = 326.4 - 426.9 mg/L static
96 h LC50 (Oncorhynchus mykiss) = 79 mg/L flow-through
96 h LC50 (Oncorhynchus mykiss) = 79 mg/L static
Ecotoxicity - Water Flea Data:
48 h EC50 (Daphnia magna) = 69 mg/L
Ecotoxicity - Freshwater Algae Data:
96 h EC50 (Pseudokirchneriella subcapitata) = 170 mg/L

Xylene

Ecotoxicity - Fish Species Data:
96 h LC50 (Lepomis macrochirus) = 13.1 - 16.5 mg/L flow-through
96 h LC50 (Oncorhynchus mykiss) = 13.5 - 17.3 mg/L
96 h LC50 (Oncorhynchus mykiss) = 2.661 - 4.093 mg/L static
96 h LC50 (Pimephales promelas) = 23.53 - 29.97 mg/L static
96 h LC50 (Poecilia reticulata) = 30.26 - 40.75 mg/L static
96 h LC50 (Lepomis macrochirus) = 7.711 - 9.591 mg/L static
96 h LC50 (Pimephales promelas) = 13.4 mg/L flow-through
96 h LC50 (Lepomis macrochirus) = 19 mg/L
96 h LC50 (Cyprinus carpio) = 780 mg/L semi-static
Ecotoxicity - Water Flea Data:
48 h LC50 (Gammarus lacustris) = 0.6 mg/L
48 h EC50 (water flea) = 3.82 mg/L

Persistence and degradability: Not determined

13. DISPOSAL CONSIDERATIONS

Waste from residues / unused products: Waste must be disposed of in accordance with federal, state and local environmental control regulations

14. TRANSPORT INFORMATION

DOT (U.S.)

UN/ID No: UN1866
Proper shipping name: Resin solution (Contains Styrene Monomer, Inhibited)
U.S. DOT - Hazard Class: 3
Packing group: III
ERG No: 127

TDG (Canada)

Proper shipping name: Resin solution (Contains Styrene Monomer, Inhibited)
Packing group: III

15. REGULATORY INFORMATION

U.S. Regulations:

TSCA: Not subject to TSCA 12(b) Export Notification

Components	TSCA 12(b)
C.I. Pigment Red 104 (a lead chromate)	Section 5 0.1%

SARA 313: Not subject to the provisions of SARA 313 Title III

Components	U.S. - CERCLA/SARA - Section 313 - Emission Reporting
Styrene (30 - 40%)	0.1 % de minimis concentration
Methyl Methacrylate Monomer (1 - 5%)	1.0 % de minimis concentration
Xylene (1 - 5%)	1.0 % de minimis concentration
Ethylbenzene (0.1 - 0.5%)	0.1 % de minimis concentration

State Regulations

This product or its ingredients have been evaluated for New Jersey, Pennsylvania, and California Prop 65 supplier notification requirements. Substances that are subject to notification requirements, if any, are listed below.

Components	PARTK:
Styrene	Listed (PARTK)
Methyl Methacrylate Monomer	Listed (PARTK)
Xylene	Listed (PARTK)
Ethylbenzene	Listed (PARTK)

Components	NJRTK:
Ethylbenzene	Listed (NJRTK)
Styrene	Listed (NJRTK)
Diisobutylketone	Listed (NJRTK)
Xylene	Listed (NJRTK)
Methyl Methacrylate Monomer	Listed (NJRTK)
Resin	Listed (NJRTK)
Barium sulfate	Listed (NJRTK)
Polymer, oxirane, methyl with oxirane, monobutyl ether	Listed (NJRTK)
2-ethylhexanol	Listed (NJRTK)
2- Heptanone	Listed (NJRTK)
Aluminum hydroxide	Listed (NJRTK)
Ethylene Glycol	Listed (NJRTK)
Silica, fumed	Listed (NJRTK)
Antioxidant	Listed (NJRTK)
Cobalt oxide (CoO)	Listed (NJRTK)
Copper naphthenate	Listed (NJRTK)
Potassium carbonate	Listed (NJRTK)
Naphtha	Listed (NJRTK)
Aluminum silicate	Listed (NJRTK)

Components	NJRTK:
Methanol	Listed (NJRTK)
Unsaturated Polyester	Listed (NJRTK)
Bis(hydrogenated tallow alkyl)dimethylammonium bentonite	Listed (NJRTK)
Diallyldimethylammonium chloride	Listed (NJRTK)
C.I. Pigment Red 254	Listed (NJRTK)
1,2,4-trimethylbenzene	Listed (NJRTK)
Polymer	Listed (NJRTK)
Resin	Listed (NJRTK)
Resin	Listed (NJRTK)
C.I. Pigment Red 104 (a lead chromate)	Listed (NJRTK)

Components	State Regulation - CA Prop65
Ethylbenzene	Carcinogen
Cobalt oxide (CoO)	Carcinogen

Canadian WHMIS

WHMIS hazard class: B2 Flammable liquid D2A Very toxic materials D2B Toxic materials

Components	Canada - WHMIS Ingredient Disclosure:
Aluminum hydroxide	1
Ethylbenzene	0.1

International Inventories

TSCA 8(b):	Listed or exempt.
Canadian DSL/NDSL list	All ingredient(s) are listed on the DSL or NDSL
EC-No.	One or more ingredient(s) are not on the EINECS list.
Philippines (PICCS):	Listed.
Japan (ENCS):	One or more ingredient(s) are not on the ENCS list.
Korea (KECL):	One or more ingredient(s) are not on the KECL list.
China (IECS):	Listed.
Australia (AICS):	One or more ingredient(s) are not on the AICS list.
New Zealand (NZIoC):	One or more ingredient(s) are not on the NZIoC list.

16. OTHER INFORMATION

For Industrial Use Only

Prepared by: Ferro Technical Center

The information and recommendations contained in this Material Safety Data Sheet have 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 warranty, guaranty or representation 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 its environmental regulatory compliance obligations under any applicable federal or state laws.

End of Safety Data Sheet