

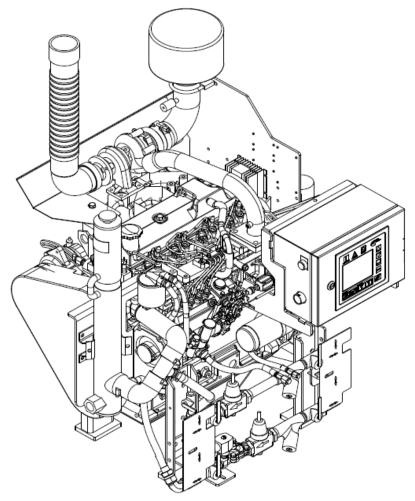
Engine Specification Sheet Cummins Fire Power

De Pere, WI 54115

http://www.cumminsfirepower.com

Basic Engine Model CFP33-F25, F35

Curve Number: FR - 30203
Revision Date: March 2010



Operating Speed (RPM)									
Model	2600								
CFP33-F25	62 (46)								
CFP33-F35	77 (57)								
Ratings are:	HP (kW)								

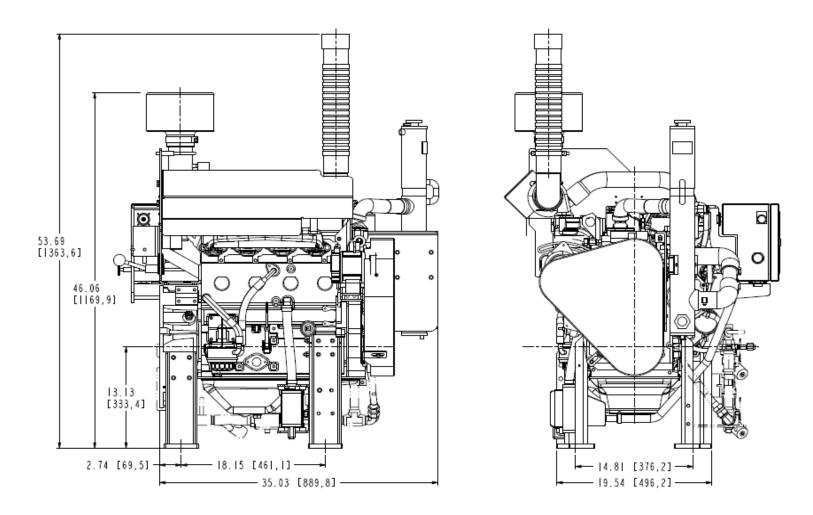
Specifi	cations	
Aspiration	Turboch	narged
Rotation	Counter clockwise from flywhe	el end
Weight - lb (kg) Est	800	(360)
Displacement - in ³ (litre)	199	(3.3)
Engine Type	4 Cycle; In-Line, 4 C	ylinder
Engine Series	Cummins B3.3	Series
Exhaust Emissions	EPA/CARB	Tier 2

Equipment	Standard	Optional
Air Cleaner	Disposable, Direct Mounted,	N/A
	Indoor Service	
Alternator	12V-DC, 35 AMPS; With Belt	N/A
	Guard	
Cooling Loop	N/A	Maximum Pressure of 400
200m.g 200p		PSI
Exhaust Protection	Metal Guards on Manifolds and	N/A
Extradot i Totootion	Turbo	, , , , ,
Exhaust Flex	SS Flex. NPT	SS Flex, 150# Flange
Connection	JJ FICK, INF T	33 Flox, 130# Flange
Flywheel Power	Flywheel	Drive Shaft System
Take-Off	i iywiicci	Stub Shaft
Fuel Connections	Fire Resistant Flexible Supply	N/A
l dei Comiections	and Return Lines	IWA
Fuel Injection	Direct Injection	N/A
Fuel Filter	Primary Filter with Priming Pump	
i del Fillel	i mary riner with Philling Pump	IN/A
Engine Heater	120V-AC, 1500 Watts	240V-AC, 1500 Watts
Governor, Speed	Constant Speed	N/A
Heat Exchanger	Tube & Shell Type, 60 PSI with	N/A
ricat Exchanger	NPTF Connections	IV/A
Instrument Panel	English and Metric, Tachometer,	N/A
motrament raner	Hourmeter, Water Temperature,	11/1/1
	Oil Pressure & Two (2)	
	Voltmeters	
Junction Box	Integral with Instrument Panel;	N/A
	For DC Wiring Interconnection to	
	Engine Controller	
Lube Oil Cooler	Engine Water Cooled, Plate	N/A
Lube Oil Coolei	Type	IWA
Lube Oil Filter	Full Flow with By-Pass Valve	N/A
Lube Oil Pump	Gear Driven	N/A
Manual Start	On Instrument Panel	N/A
Overspeed	Electronic with Reset & Test on	N/A
Controls	Instrument Panel	1473
Raw Water	Automatic from Engine	N/A
	Controller & from Emergency	
,	Local Control	
Run-Stop Control	On Instrument Panel	N/A
Run Solenoid	12V-DC	N/A
Starters	12V-DC	N/A
Throttle Control	Adjustable Speed Control	N/A
Water Pump	Vee Belt Drive with Guard	N/A









Engine Ratings Baselines

- Engines are rated at standard SAE conditions of 29.61 in. (7521 mm) Hg barometer and 77°F (25°C) inlet air temperature (approximates 300ft. (91.4 m) above sea level) by the testing laboratory (see SAE Standard J1349).
- A deduction of 3 percent from engine horsepower rating at standard SAE conditions shall be made for diesel engines for each 1000 ft. (305 m) altitude above 300 ft. (91.4 m).
- A deduction of 1 percent from engine horsepower rating as corrected to standard SAE conditions shall be made for diesel engines for every 10°F above 77°F (24°C) ambient temperature.

Certified Power

This Cummins Fire Power fire pump driver is built to comply with NFPA-20, and is UL listed and FM approved.

* Subject to change without notification

For additional information, click the hyperlinks below.

CFP33-F25 CFP33-F35



Compression Ratio:

No. of Cylinders:

Fuel System:

Engine Performance Curve

Cummins Fire Power

17.5:1

Zexel

4

DePere, WI 54115

http://www.cumminsfirepower.com

Basic Engine Model CFP33-F25

Curve Number: FR - 30005
Revision Date: March 2010

Engine Family: G-Drive CPL Code:
Displacement - in.3 (litre): 199 (3.3) Emission Certification

Emission Certification: 2004 EPA/CARB Tier 2

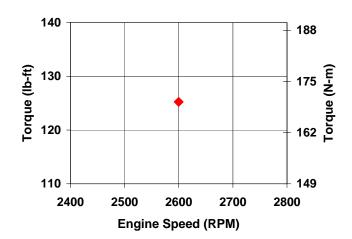
NA

Aspiration: Turbocharged Engine Configuration: D782002GX03

Minimum rating: 62 HP @ 2600 RPM Maximum rating: 62 HP @ 2600 RPM

Torque Output *

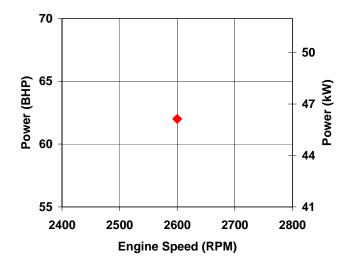
Torque Output										
RPM	lb-ft	N-m								
2600	125	170								



Horsepower Output *

110100	po o. o	atput
RPM	BHP	kW
2600	62	46

*CFP33-F25 is not a speed rated engine



- 1. Curves shown above represent mature gross engine performance capabilities obtained and corrected in accordance with SAE J1349 conditions of 29.61 in Hg (100 kPa) barometric pressure [300 ft. (91.4 m) altitude], 77 °F (25 °C) inlet air temperature, and 0.30 in. Hg (1 kPa) water vapor pressure with No. 2 diesel fuel.
- 2. The engine may be operated without changing the fuel setting up to 300 ft. (91.4 m) altitude and up to 77°F (25 °C) ambient temperature. For sustained operation at high altitudes, the fuel rate of the engine should be adjusted to limit performance by 3% per 1,000 ft. (305 m) above 300 ft. (91.4 m) altitude. For sustained operation at high ambient temperatures, the fuel rate of the engine should be adjusted to limit performance by 1% per 10 °F above 77 °F (2% per 11 °C above 25 °C).
- 3. Engine is certified at only 2600 RPM.

Jim Vanden Boogard
Director of Engineering

Certified Within 5%



Fire Engine Datasheet Cummins Fire Power **Engine Datasheet** De Pere, WI 54115 http://www.cumminsfirepower.com

CFP33-F25, F35 FR - 30005 Curve Number:

CPL Code: NA

Basic Engine Model

Configuration Number: D782002GX033

Installation Drawing: 15541

Engine Family: **G-Drive** Revision Date: March 2010

General Engine Data		
Type	4 Cycle: In-	l ine: 4 Cylinder
Aspiration	•	•
Bore & Stroke - in. (mm).		
Displacement - in. ³ (litre)		` ,
		(3.3)
Compression Ratio		
Valves per Cylinder - Intake		
- Exhaust		(40.45)
Maximum Allowable Bending Moment @ Rear Face of Block - lbft. (N-m)	918	(1245)
Air Induction System		
Max. Temperature Rise Between Ambient Air and Engine Air Inlet - °F (°C)	18	(10.0)
Maximum Inlet Restriction with Dirty Filter - in. H ₂ O (mm H ₂ O)		(762)
	AH1138	(. 0=)
Recommended Air Cleaner Liement - (Standard)	AIIII30	
Lubrication System		
Oil Pressure Range at Rated - PSI (kPa)	50-80	(345-551)
Oil Capacity of Pan (High - Low) - U.S. quarts (litre)		(7.0-5.5)
Total System Capacity - U.S. Gal. (litre)		(8)
Recommended Lube Oil Filter		(C6002112110)
Recommended Labe Oil Filter	LITOUTT	(C0002112110)
Cooling System		
Raw Water Working Pressure Range at Heat Exchanger - PSI (kPa)	60	(413) MAX
Recommended Min. Water Supply Pipe Size to Heat Exchanger - in. (mm)	0.75	(19.05)
Recommended Min. Water Disch. Pipe Size From Heat Exchanger - in. (mm)	1.00	(25.40)
Coolant Water Capacity (Engine Side) - U.S. quarts (litre)	9.3	(8.8)
Standard Thermostat - Type	Modulating	
- Range - deg F (deg C)	180-203	(82-95)
Minimum Raw Water Flow		
with Water Temperatures to 90 °F (32 °C) - U.S. GPM (litre/s)	12	(0.76)
Recommended Cooling Water FilterFleetguard (Cummins)	None	(011 0)
A jacket water heater is mandatory on this engine. The recommended heater wattage is 1500 d	own to 40°	F (4 °C).
Exhaust System		
Max. Back Pressure Imposed by Complete Exhaust System in in. H ₂ O (kPa)	40.8	(10.2)
Exhaust Pipe Size Normally Acceptable - in. (mm)	3.0	(76)
Noise Emissions		
Top	01 6 dBa	
Right Side		
Left Side		
Front		
Exhaust	93.∠ dBa	
The noise emission values are estimated sound pressure levels at 3.3 ft. (1 m.).		

Fuel Supply / Drain System	<u>2600</u>	
CFP33-F35 Nominal Fuel Consumption - Gal./hr. (L/hr)		
CFP33-F25 Nominal Fuel Consumption - Gal./hr. (L/hr)		
Fuel Type		Diesel Only
Minimum Supply Line Size - in. (mm)	0.25	(6.35)
Minimum Drain Line Size - in. (mm)	0.125	(3.18)
Maximum Fuel Height above C/L Fuel Pump ft (m)	24	(7)
Recommended Fuel Filter - Primary Fleetguard (Cummins)	FS5114	(C6003112110
- Secondary		•
Maximum Restriction @ Lift Pump-Inlet - With Clean Filter - in. Hg (mm Hg)	3.0	(76)
Maximum Restriction @ Lift Pump-Inlet - With Dirty Filter - in. Hg (mm Hg)		(203)
Maximum Return Line Restriction - Without Check Valves - in. Hg (mm Hg)		(381)
Minimum Fuel Tank Vent Capability - ft ³ /hr (m ³ /hr)		(0.36)
Maximum Fuel Temperature @ Lift Pump Inlet - °F (°C)		, ,
Maximum Fuel Temperature @ Lift Pump Inlet - F (C)	158	(70)
Starting and Electrical System	12V	24V
	<u>12 V</u>	<u> </u>
Min. Recommended Batt. Capacity - Cold Soak at 0°F (-18°C) or Above	000	0.4
Engine Only - Cold Cranking Amperes - (CCA)		24 volt
Engine Only - Reserve Capacity - Minutes		option is
Battery Cable Size (Maximum Cable Length Not to Exceed 5 ft. [1.5 m] AWG)		not
Maximum Resistance of Starting Circuit - Ohms		offered
Typical Cranking Speed - RPM		
Alternator (Standard), Internally Regulated - Ampere		
Wiring for Automatic Starting (Negative Ground)	Standard	
Reference Wiring Diagram	16122	
Performance Data		
All data is based on the engine operating with fuel system, water pump, lubricating oil pump, ai		
included are compressor, fan, optional equipment, and driven components. Data is based on optional equipment and driven components.	peration at	SAE standard J1394
conditions of 300 ft. (91.4 m) altitude, 29.61 in. (752 mm) Hg dry barometer, and 77 °F (25 °C) i	ntake air te	mperature, using
No.2 diesel or a fuel corresponding to ASTM-D2.		
Altitude Above Which Output Should be Limited - ft. (m)	300	(91.4)
Correction Factor per 1000 ft. (305 m) above Altitude Limit	3%	
Temperature Above Which Output Should be Limited - °F (°C)		(25)
Correction Factor per 10 °F (11 °C) Above Temperature Limit		(2%)
Correction ractor per 10 1 (11 C) Above reinperature Limit	1 /0	(270)
Exhaust Emissions (EPA Tier T2) [Reference Emissions Data Doc. 9805]	g/kW-hr	g/BHP-hr
Hydrocarbons (HC/OMHCE).		0.26
Oxides of Nitrogen (NOx)		4.36
Non-Methane Hydrocarbons + NOx (NMHC+NOx)	6.20	4.62
Carbon Monoxide (CO)		0.82
Particulate.		0.19
1 artiouate	0.20	0.19

FM Approved and UL Listed Ratings for CFP33-F25, F35

Engine Speed - RPM	<u> 2600</u>
CFP33-F35 Output - BHP (kW)	77 (57)
Ventilation Air Required for Combustion - CFM (litre/sec)	195 (92)
Exhaust Gas Flow - CFM (litre/sec)	475 (224)
Exhaust Gas Temperature - °F (°C)	1075 (579)
Engine Heat Rejection to Coolant- BTU/min. (kW)	2201 (39)
Engine Heat Rejection to Ambient - BTU/min. (kW)	881 (15)
CFP33-F25 Output - BHP (kW)	62 (46)
Ventilation Air Required for Combustion - CFM (litre/sec)	166 (78)
Exhaust Gas Flow - CFM (litre/sec)	404 (191)
Exhaust Gas Temperature - °F (°C)	914 (490)
Engine Heat Rejection to Coolant- BTU/min. (kW)	1871 (33)
Engine Heat Rejection to Ambient - BTU/min. (kW)	749 (13)
	()

All Data is Subject to Change Without Notice.

Director of Engineering: Jim Vanden Boogard

Cummins Fire Power, De Pere, WI 54115 U.S.A.



EPA Tier 2 Emission Data Fire Pump NSPS Compliant

CFP33-F25 Fire Pump Driver

Type: 4 Cycle; In-Line; 4 Cylinder

Aspiration: Turbocharged, Charge Air Cooled

	15 PPM Diesel Fuel													
Fuel Consumption D2 Cycle Exhaust Emissions Exhaust									aust					
				Grams p	Grams per BHP - HR			Grams per kW - HR			Temperature		Gas Flow	
RPM	BHP	Gal/Hr	L/hr	NMHC+NOx	CO	PM	NMHC+NOx	CO	PM	°F	°C	CFM	L/sec	
2600	62	3.4	12.9	4.238	0.820	0.170	5.683	1.100	0.228	914	490	404	191	

The emissions values above are based on CARB approved calculations for converting EPA (500 ppm) fuel to CARB 15 ppm fuel.

300-500 PPM Diesel Fuel														
Fuel Consumption D2 Cycle Exhaust Emissions Exhaust														
				Grams p	Grams per BHP - HR			Grams per kW - HR			Temperature		Gas Flow	
RPM	BHP	Gal/Hr	L/hr	NMHC+NOx	CO	PM	NMHC+NOx	CO	PM	°F	°C	CFM	L/sec	
2600	62	3.4	12.9	4.623	0.820	0.194	6.200	1.100	0.260	914	490	404	191	

B3.3T Base Model Manufactured by Cummins Inc.

- Using fuel rating 30203

Reference EPA Standard Engine Family: D782001CX03

No special options needed to meet current regulation emissions for all 50 states

Test Methods:

EPA/CARB Nonroad emissions recorded per 40CFR89 (ref. ISO8178-1) and weighted at load points prescribed in Subpart E, Appendix A, for Constant Speed Engines (ref. ISO8178-4, D2).

Diesel Fuel Specifications:

Cetane Number: 40-48

Reference: ASTM D975 No. 2-D

Reference Conditions:

Air Inlet Temperature: 25°C (77°F)
Fuel Inlet Temperature: 40°C (104°F)
Barometric Pressure: 100 kPa (29.53 in Hg)

Humidity: 10.7 g/kg (75 grains H₂O/lb) of dry air; required for NOx correction

Restrictions: Intake Restriction set to a maximum allowable limit for clean filter; Exhaust Back Pressure set to maximum allowable

limit.

Tests conducted using alternate test methods, instrumentation, fuel or reference conditions can yield different results.



California ATCM Tier 2 Emission Data EPA Tier 2 Emission Data

CFP33-F25 Fire Pump Driver

Type: 4 Cycle; In-Line; 4 Cylinder

Aspiration: Turbocharged, Charge Air Cooled

	15 PPM Diesel Fuel													
Fuel Consumption D2 Cycle Exhaust Emissions Exhaust														
				Grams p	Grams per BHP - HR			Grams per kW - HR			Temperature		Gas Flow	
RPM	BHP	Gal/Hr	L/hr	NMHC+NOx	CO	PM	NMHC+NOx	CO	PM	°F	°C	CFM	L/sec	
2600	62	3.4	12.9	4.238	0.820	0.170	5.683	1.100	0.228	914	490	404	191	

The emissions values above are based on CARB approved calculations for converting EPA (500 ppm) fuel to CARB (15 ppm) fuel.

	300-500 PPM Diesel Fuel													
Fuel Consumption D2 Cycle Exhaust Emissions Exh								aust						
				Grams p	Grams per BHP - HR			Grams per kW - HR			Temperature		Gas Flow	
RPM	BHP	Gal/Hr	L/hr	NMHC+NOx	СО	PM	NMHC+NOx	CO	PM	°F	°C	CFM	L/sec	
2600	62	3.4	12.9	4.623	0.820	0.194	6.200	1.100	0.260	914	490	404	191	

B3.3T Base Model Manufactured by Cummins Inc.

- Using fuel rating 30203

Reference EPA Standard Engine Family: 7CEXL03.3ABB

No special options needed to meet current emission regulations for all 50 states

Test Methods:

EPA/CARB Nonroad emissions recorded per 40CFR89 (ref. ISO8178-1) and weighted at load points prescribed in Subpart E, Appendix A, for Constant Speed Engines (ref. ISO8178-4, D2).

Diesel Fuel Specifications:

Cetane Number: 40-48

Reference: ASTM D975 No. 2-D

Reference Conditions:

Air Inlet Temperature: 25°C (77°F) Fuel Inlet Temperature: 40°C (104°F) Barometric Pressure: 100 kPa (29.53 in Hg)

Humidity: 10.7 g/kg (75 grains H₂O/lb) of dry air; required for NOx correction

Restrictions: Intake Restriction set to a maximum allowable limit for clean filter; Exhaust Back Pressure set to maximum allowable

limit.

Tests conducted using alternate test methods, instrumentation, fuel or reference conditions can yield different results.



Installation Drawing: 8701

Engine Materials and Construction

Cummins Fire Power

DePere, WI 54115

http://www.cumminsfirepower.com

 CFP33-F35, F25

 Curve Number:
 FR - 30203

 CPL Code:
 Tier2B3.3T

Basic Engine Model

Engine Family: Construction
Revision Date: June 2006

Engine

Camshaft

Type......Precision Ground

Material.....Forged Steel

Location.....In Block

Drive.....Gear

Configuration Number: D782001CX03

Connecting Rods

Type.....I-Beam, Fracture-split

Material....Nickel Chrome Molybdenum

Crankshaft

Type.....Precision Ground Material....Forged Steel

Crankshaft Main Bearings

Type.....Precision Half Shells

Material.....Steel, Copper with Soft Metal Overlay

Crankshaft Rod Bearings

Type.....Precision Half Shells

Material.....Steel, Copper with Soft Metal Overlay

Cylinder Block

Type......Parent bored, plateau honed

Material......Cast Iron Alloy

Cylinder Head

Type......1 Common, 8 Valve Material......Cast Iron Alloy

Cylinder Liners

Type......Parent bored, plateau honed

Material......Cast Iron from Block

Pistons

Type......1 Piece Cast Material......Aluminum Alloy

Piston Pins

Type.....Fixed

Material....Forged Steel

Piston Rings

First......Chrome Coated Ductile Cast Iron Second......Keystone, Hardened Grey Cast Iron

Third......Chrome Coated Composite

Valves

Type.....Poppet

Arrangement...... Overhead Valve
Number per Cylinder...1 Intake, I Exhaust
Mechanism Type...... Mechanical Rocker Arm

Lifter Type..... Solid Push Tube

Air Handling

Air Cleaner

Type......Single Element, Disposable

Material.....Cellulose

Turbocharger

Type......Mitsubishi TD04

Design......Wastegated

Cooling System

Charge Air Cooler Heat Exchanger

Type......None

Material.....

Covers.....Not Applicable Headers.....Not Applicable

Plumbing.....

Not Applicable

Tubes..... Not Applicable

Coolant Heat Exchanger

Type.....Tube and Shell

Material.....Zinc

Electrode.....Zopper

Shell....Copper

Tubes....Copper

Coolant Pump

Type.....Centrifugal
Drive.....Belt, Multi VCC

Thermostat

Type.....Modulating

Quantity......1

Fuel System

Fuel Injection Pump

Type.....Rotary Distributor

Drive...... Mechanical, Gear Driven

Fuel Lift Pump

Type.....Piston

Drive...... Mechanical, Gear Driven

Lubrication System

Oil Pump

Type.....Gerotor

Lubrication Cooler

Type.....Plate

Material.....Braised Stainless Steel



TECHNICAL BULLETIN

15937RAF 60 Red High Solids Air Dry Enamel

PRODUCT DESCRIPTION

This product has been formulated to comply with Cummins' Engineering Standard #21055 and exhibits fast dry, good exterior durability, and is 3.50 VOC compliant.

HANDLING & STORAGE

The containers should be stored away from direct sunlight and heat. Freezing is not harmful if reheated gently to room temperature prior to use.

PHYSICAL CHARACTERISTICS

 Weight per Gallon:
 $8.43 \text{ lbs.} \pm .2 \text{ lbs.}$

 Weight Solids:
 $58.83\% \pm 1.0\%$

 Volume Solids:
 $49.71\% \pm 1.0\%$

 VOC:
 Less than 3.50

 Viscosity:
 17 ± 2 " @ #3 Zahn

Theoretical Coverage - sq. ft./gl.

@ 1.0 mil dry film thickness: 797.3

Cure Schedule - Air Dry @ 77°F &

50% Relative Humidity:

Dust Free:15-30 minutesDry to Touch:45-60 minutesDry to Handle:OvernightDry Hard:2-3 weeksGloss: 90° @ 1.5 mils

ENVIRONMENTAL REPORT

Volatile Content (Wt.%):

Organic Volatile Content (Wt.%):

Water Content (Wt.%):

Water Content (Vol.%):

VOC Minus Water:

41.17%

0.00

0.00

3.50 maximum

DIRECTIONS FOR USE

Thoroughly agitate the paint before using. This is a 3.50 VOC compliant coating that requires no reduction. When testing this product for film properties, use Bonderite 1000 P60 type panels. Cure times may vary depending on environmental conditions and film thickness.

PRECAUTIONS & SAFETY

- Do not apply at temperatures below 50°F.
- Read all container labels.
- Read Material Safety Data Sheet.

CLEAN-UP

Clean equipment immediately after use with Aromatic or Ketone Solvents.

February 24, 2003

6937 WEST MILL ROAD • MILWAUKEE, WI 53218-1225 • TELEPHONE 414-353-4200 • FAX 414-353-0286 • EMAIL coatings@hentzen.com



Date Printed: 11/28/2007 Page: 1

Product Code: 15937RAF

Product Name: 60 RED HIGH SOLIDS ENAMEL

Hentzen Coatings, Inc., 6937 W. Mill Road, Milwaukee, WI 53218-1225

Chemtrec 24-hour Emergency Phone: 800-424-9300

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

(See top of page)

2. COMPOSITION/INFORMATION ON INGREDIENTS

This product contains one or more reported carcinogens or suspected carcinogens which are noted below and in Section 11.

This product contains a component or components that are Federally classified as a hazardous air pollutant.

Component/Exposure Limits	CAS#	% by Wt.
METHYL AMYL KETONE ACGIH TLV/TWA - 50 PPM, 233 MG/M3 OSHA PEL - 100 PPM, 465 MG/M3 OTHER LIMITS:	110-43-0	20.18
NIOSH REL/TWA: 100 PPM, 465 MG/MEXYLENE(PURE) ACGIH TLV/TWA - 100 PPM, 434 MG/MEOSHA PEL - 100 PPM(TWA), 435 MG/MEOTHER LIMITS:	1330-20-7 3; STEL: 150 PPM	7.82
NIOSH REL: 100 PPM(TWA), 435 MG/MM METHYL PROPYL KETONE ACGIH TLV/TWA - NOT ESTABLISHED OSHA PEL - 200 PPM, 700MG/M3 OTHER LIMITS: NIOSH REL/TWA: 150PPM, 530MG/M3	3(TWA) 107-87-9	5.97
ACGIH STEL/CEIL: 150PPM, 529MG/M3 METHYL ISOAMYL KETONE ACGIH TLV/TWA - 50 PPM, 234 MG/M3 OSHA PEL - 100 PPM, 475 MG/M3 OTHER LIMITS: NIOSH REL/TWA : 50 PPM, 240 MG/M3	110-12-3	2.65
IRON (III) OXIDE ACGIH TLV/TWA - 5 MG/M3 (Fume) OSHA PEL - 10 MG/M3 (Fume)	1309-37-1	0-10%
ETHYLBENZENE ACGIH TLV/TWA - 100 PPM,434 MG/M3 OSHA PEL - 100 PPM, 435 MG/M3 OTHER INFORMATION: Listed by IARC possibly carcinogenic to humans. 3 OTHER LIMITS: NIOSH REL: 100 PPM(TWA), 435 MG/M3	as Group 2B, See Section 11.	1.733
TOLUENE ACGIH TLV/TWA - 20 PPM, 75MG/M3 OSHA PEL: 200PPM, STEL: 300PPM, 5	108-88-3	1.49

Date Printed: 11/28/2007 Page: 2

Product Code: 15937RAF

Product Name: 60 RED HIGH SOLIDS ENAMEL

Hentzen Coatings, Inc., 6937 W. Mill Road, Milwaukee, WI 53218-1225

Chemtrec 24-hour Emergency Phone: 800-424-9300

* For a 10 minute interval during an 8-hour shift.

OTHER LIMITS:

NIOSH REL: 100PPM(TWA), 375MG/M3(TWA) NIOSH STEL/CEIL: 150PPM, 560MG/M3

3. HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW:

Harmful if inhaled. May cause the following effects: Nose, throat and respitory tract irritation. Allergic respitory reaction. May cause lung damage. Eye and skin irritation. Allergic skin reaction.

FLAMMABLE LIQUID

Keep away from heat, sparks, and flame. Vapors may cause flash fire. Toxic gases/fumes are given off during burning or thermal decomposition.

EYE CONTACT:

Severe irritant. Prolonged contact may result in chemical burns to the eyes. Blindness may occur.

SKIN CONTACT:

Severe irritant. Contact with skin causes severe irritation and pain. Prolonged contact may result in chemical burns. Product may be absorbed through the skin in harmful amounts.

PRIMARY ROUTES OF ENTRY:

Skin absorption.
Dermal and inhalation.

INGESTION:

If swallowed, consult a physician immediately.

INHALATION:

Anesthetic. Can cause irritation of the respiratory tract or acute nervous system depression characterized by the following progressive steps if severe overexposure is continued: headache, dizziness, staggering gait, confusion or unconsciousness.

CHRONIC INFORMATION:

See Section 11.

CARCINOGENICITY:

Date Printed: 11/28/2007 Page: 3

Product Code: 15937RAF

Product Name: 60 RED HIGH SOLIDS ENAMEL

Hentzen Coatings, Inc., 6937 W. Mill Road, Milwaukee, WI 53218-1225

Chemtrec 24-hour Emergency Phone: 800-424-9300

See Section 11.

MEDICAL CONDITIONS PRONE TO AGGRAVATION BY EXPOSURE:

Asthma and other respiratory ailments; chemical sensitization.

4. FIRST AID MEASURES

EYE CONTACT:

Flush immediately with large amounts of running water for at least 15 minutes while lifting eyelids. Take to a physician for medical treatment.

SKIN CONTACT:

Wash affected areas with soap and water. Remove contaminated clothing and wash before reuse. Consult a physician if irritation develops or persists.

INGESTION:

If swallowed, CALL A PHYSICIAN OR POISON CONTROL CENTER IMMEDIATELY.

INHALATION:

Remove from exposure. Restore breathing. Keep warm and quiet. Notify a physician.

5. FIRE FIGHTING MEASURES

FIRE AND EXPLOSION PROPERTIES:

FLASH POINT (deg.F):

45

METHOD:

Tag Closed Cup

FLAMMABLE LIMITS % :

Lower limit: 1.05 Upper limit: 8.7

AUTOIGNITION TEMPERATURE:

N/A

EXTINGUISHING MEDIA:

Carbon Dioxide, Dry Chemical or Foam.

FIREFIGHTING PROCEDURES AND EQUIPTMENT:

Keep containers tightly closed. Isolate from heat,

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electrical equipment, sparks and open flames.
Closed container may explode when exposed to extreme heat.
Do not apply to hot surfaces. Never use welding or cutting torch on or near product container (even empty) because product (even residue) can ignite explosively.
Full protective equipment including self-contained breathing apparatus should be worn.
Water spray may be ineffective. Water may be used to cool closed containers to prevent pressure build-up or possible autoignition or explosion when exposed to extreme heat. If

autoignition or explosion when exposed to extreme heat. If water is used, fog nozzles are preferable.

6. ACCIDENTAL RELEASE MEASURES

STEPS TO BE TAKEN IN CASE MATERIAL IS SPILLED:

Evacuate all non-essential personnel and remove all sources of ignition (flames, hot surfaces, electrical, static and frictional sparks). Ventilate area. Equip clean-up crew with appropriate protective equipment. Avoid breathing vapors. Avoid skin contact. Prevent entry into drains, sewers and waterways. Notify appropriate authorities if necessary. Contain and remove with inert absorbent and nonsparking tools.

7. HANDLING AND STORAGE

HANDLING:

Use only with adequate ventilation. Avoid prolonged breathing of vapors. Wear an appropriate, properly fitted respirator (NIOSH/MSHA approved) during and after application unless air monitoring demonstrates that vapor/mist levels are below applicable exposure limits. Follow respirator manufacturer's directions for use. Use grounding and bonding connection when transferring material to prevent static discharge, fire or explosion. Avoid free fall of liquid in excess of a few inches. Use sparkproof tools and explosion proof equipment.

STORAGE:

Do not store above 120 F or below 32 F. Store large quantities in buildings designed to comply with OSHA's 29 CFR 1910.106. Keep away from heat, sparks and open flame. Keep containers closed when not in use. Keep closures tight and upright to prevent leakage. Emptied containers may retain hazardous residue. Follow al

Emptied containers may retain hazardous residue. Follow all hazard precautions in this data sheet until container is thoroughly cleaned or destroyed. To avoid spontaneous

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combustion during temporary storage, soak soiled rags and waste immediately after use in a water-filled, closed container.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

ENGINEERING CONTROLS:

Provide general dilution or local exhaust ventilation in volume and pattern to keep the air contaminant concentration below current applicable OSHA safety and health requirements in the mixing, application and curing areas; and to remove decomposition products during welding and flame cutting on surfaces coated with this product.

RESDIRATORY PROTECTION:

When spray applied and when used in limited ventilation areas, wear a NIOSH/MSHA approved organic vapor/particulate respirator designed to remove a combination of particulate, gas and vapor. When used in confined areas or poorly ventilated areas, use a NIOSH/MSHA approved air line type respirator or hood. During sanding or grinding operations, use a NIOSH approved particulate respirator to remove solid airborne particles of sanding dust. Use NIOSH approved respirators when flame cutting, welding or hazing material coated with this product. Observe OSHA regulations for respirator use (29 CFR 1910.134). Air monitoring of the workplace may be required to determine appropriate respirator selection.

EYE PROTECTION:

Use safety eyewear with splash guards or side shields. A full face shield may be appropriate. Contact lenses should not be worn.

SKIN PROTECTION:

It is good industrial hygiene practice to minimize skin contact. Chemical resistant gloves are required for prolonged or repeated contact. An apron may be appropriate to protect against skin contact. Prevent prolonged skin contact with contaminated clothing. Wash contaminated clothing before reuse.

OTHER PROTECTIVE EQUIPMENT AND GUIDLINES:

Safety showers and eye wash stations should be available. Educate and train employees in the safe use of this product.

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9. PHYSICAL AND CHEMICAL PROPERTIES

PHYSICAL STATE:

Liquid.

APPEARANCE:

Opaque.

ODOR:

Solvent odor.

VOC (LB/GL):

 $3.46 \, lb/gl$

VOC (grams/liter):

415 g/l

WEIGHT PER GALLON:

8.4358 lb/gl

SPECIFIC GRAVITY:

1.0131

%EXEMPT SOLVENT by WEIGHT:

%EXEMPT SOLVENT by VOLUME:

BOILING POINT (deg. F):

213

WATER SOLUBILITY:

Negligible.

FREEZING POINT (deg. F):

N/A

10. STABILITY AND REACTIVITY

STABILITY:

Stable under normal conditions.

HAZARDOUS POLYMERZATION:

Will not occur.

HAZARDOUS DECOMPOSITION PRODUCTS:

May produce hazardous fumes when heated to decomposition as in welding. Fumes may contain the following: Carbon Monoxide, Carbon Dioxide and other toxic vapors depending upon the temperature reached.

INCOMPATIBILITIES (MATERIALS TO AVOID):

Strong oxidizers.

11. TOXICOLOGICAL INFORMATION

ACUTE EFFECTS:

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Toluene:

LD50 Oral Rat = 5000mg/kg LC50 Inhalation Rat = 8000 ppm for 4 hours LD50 Dermal Rabbit = 14000mg/kg

Xylene (Mixed Isomers):

LD50 Oral Rat = 4300mg/kg LC50 Inhalation Rat = 6700 ppm for 4 hours LD50 Dermal Rabbit = >2000mg/kg

Ethyl Benzene:

Oral Rat LD50 = 3.5 g/kg Dermal Rabbit LD50 = 17 g/kg

Has not been tested as a whole for acute effects.

CHRONIC EFFECTS:

Reports have associated repeated and prolonged occupational overexposure to solvents with permanent brain and nervous system damage, liver and kidney damage. Long term overexposure effects are not currently known. There are reports that long-term repeated exposure to Xylene may result in some loss of hearing. There are reports that long-term repeated exposure to Toluene may result in some loss of hearing.

Has not been tested as a whole for chronic effects.

CARCINOGENICITY:

Contains Ethylbenzene which IARC has listed as Group 2B, possibly carcinogenic to humans, based upon laboratory animal studies.

Has not been tested as a whole for carcinogenicity effects.

MUTAGENICITY:

Has not been tested as a whole for mutagenicity effects.

REPRODUCTIVE EFFECTS:

Has not been tested as a whole for reproductive effects.

DEVELOPMENTAL EFFECTS:

Has not been tested as a whole for developmental effects.

12. ECOLOGICAL INFORMATION

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ECOLOGICAL EFFECTS:

Has not been tested as a whole for ecological effects.

13. DISPOSAL CONSIDERATIONS

DISPOSAL METHODS:

Recycle, fuel blend or incinerate.
Dispose of in accordance with applicable laws and regulations. It is the responsibility of the owner of the waste to dispose of it properly. Laboratory analysis is recommended to profile the waste for proper disposal determination.

U.S E.P.A WASTE NUMBER AND DESCRIPTION:

D001 Waste Paint

HAZARDOUS WASTE CHARACTERISTICS:

Ignitable.

14. TRANSPORT INFORMATION

UN NUMBER:

UN 1263

DOT PROPER SHIPPING NAME:

Paint

3

DOT HAZARD CLASS:

DOT LABEL:

Flammable Liquid

DOT PACKAGING GROUP:

PG II

U.S POSTAL SERVICE:

Will not handle.

15. REGULATORY INFORMATION

(Not meant to be all inclusive - selected regulations represented)

This product contains the following toxic chemicals subject to the reporting requirements of Section 313 of the Emergency Planning and Community Right-To-Know Act of 1986 and of 40 CFR 372:

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CAS#100-41-4 Ethyl Benzene

CAS#1330-20-7 Xylene CAS#108-88-3 Toluene

TSCA STATUS:

All ingredients are listed on the TSCA inventory.

STATE REGULATIONS:

Toluene is listed by the State of California as a substance known to cause reproductive toxicity. The California Safe Drinking Water and Toxic Enforcement Act requires clear and reasonable warning be given before exposing any person to toluene. Toluene may also contain traces of benzene which the State of California has found to cause cancer. This product may contain chemicals that fall under individual state Right-to-Know regulatory requirements. See Section 2 for material listings. For details on regulatory requirements, contact the appropriate agency in your state.

16. OTHER INFORMATION

Date of issue: 11/28/2007

Last Revision Date: 11/23/05

HMIS Information

HEALTH: 2

FLAMMABILITY: 3
REACTIVITY: 1

PERSONAL PROTECTIVE EQUIPMENT: X

DISCLAIMER:

This MSDS is provided as an informational resource only. The information is received from a combination of sources, including raw material suppliers and is believed to be reliable and accurate. It does not intend to be all inclusive and shall only be used as a guide. Changing reporting requirements and other uncontrolled variables make it impossible to guarantee the accuracy of the information contained in this document. It is the responsibility of the user to verify its information as well as determine the proper personal protection based on conditions of use. The buyer assumes all responsibility for the use and handling of this product in accordance with the Federal, State and Local laws and regulations. Hentzen Coatings, Inc. makes no representation or warranty regarding the accuracy of this information nor that the information or data will not change.

______ Section 1 -- PRODUCT AND COMPANY IDENTIFICATION PRODUCT NUMBER HMIS CODES Health Flammability B54AF407 3 Reactivity PRODUCT NAME MERCURY AIR-O-JET* Enamel, Gray Flash Primer MANUFACTURER'S NAME EMERGENCY TELEPHONE NO. THE SHERWIN-WILLIAMS COMPANY (216) 566-2917 101 Prospect Avenue N.W. Cleveland, OH 44115 DATE OF PREPARATION INFORMATION TELEPHONE NO. 07-JAN-07 (216) 566-2902 ______

==== % by	r WT	Section 2 CAS No.	COMPOSITION/INFORM	IOITAN	N ON INGREDIENTS UNITS	S VAPOR PRESSURE
			OSHA PEL	300 300 300 400	ppm	12 mm
	1	25013-15-4	Vinyl Toluene ACGIH TLV ACGIH TLV OSHA PEL	50 100 100	ppm ppm STEL ppm	1.1 mm
	1	100-41-4	Ethylbenzene ACGIH TLV ACGIH TLV OSHA PEL OSHA PEL	100 125 100 125	ppm ppm STEL ppm ppm STEL	7.1 mm
	6	1330-20-7		100 150 100 150	ppm ppm STEL ppm ppm STEL	5.9 mm
	22	14807-96-6	Talc ACGIH TLV OSHA PEL	2 2		Dust Dust
	6	7727–13–7	Barium Sulfate ACGIH TLV OSHA PEL OSHA PEL	10 10 5	mg/m3 as Dust mg/m3 Total Dus mg/m3 Respirab	st le Fraction
	10		Titanium Dioxide ACGIH TLV OSHA PEL OSHA PEL	10 10 5	mg/m3 as Dust	st
	5	1314-13-2	Zinc Oxide ACGIH TLV OSHA PEL OSHA PEL	10 10 5		st le Fraction

Continued on page 2

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Section 3 -- HAZARDS IDENTIFICATION

ROUTES OF EXPOSURE

INHALATION of vapor or spray mist.

EYE or SKIN contact with the product, vapor or spray mist.

EFFECTS OF OVEREXPOSURE

EYES: Irritation.

SKIN: Prolonged or repeated exposure may cause irritation.

INHALATION: Irritation of the upper respiratory system.

May cause nervous system depression. Extreme overexposure may result in unconsciousness and possibly death. SIGNS AND SYMPTOMS OF OVEREXPOSURE

Headache, dizziness, nausea, and loss of coordination are indications of excessive exposure to vapors or spray mists.

Redness and itching or burning sensation may indicate eye or excessive skin exposure.

MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE

None generally recognized.

CANCER INFORMATION

For complete discussion of toxicology data refer to Section 11.

Section 4 -- FIRST AID MEASURES

Flush eyes with large amounts of water for 15 minutes. EYES:

Get medical attention.

Wash affected area thoroughly with soap and water. SKIN:

Remove contaminated clothing and launder before re-use.

INHALATION: If affected, remove from exposure. Restore breathing.

Keep warm and quiet.

INGESTION:

Do not induce vomiting.
Get medical attention immediately.

Section 5 -- FIRE FIGHTING MEASURES

LEL UEL 0.9 11.0 FLASH POINT

50 F PMCC FLAMMABILITY CLASSIFICATION

RED LABEL -- Flammable, Flash below 100 F (38 C)

EXTINGUISHING MEDIA

Carbon Dioxide, Dry Chemical, Foam UNUSUAL FIRE AND EXPLOSION HAZARDS

Closed containers may explode when exposed to extreme heat. Application to hot surfaces requires special precautions.

During emergency conditions overexposure to decomposition products may cause a health hazard. Symptoms may not be immediately apparent. Obtain medical attention.

SPECIAL FIRE FIGHTING PROCEDURES

Full protective equipment including self-contained breathing apparatus should be used.

Water spray may be ineffective. If water is used, fog nozzles are preferable. Water may be used to cool closed containers to prevent pressure build-up and possible autoignition or explosion when exposed to extreme heat.

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Section 6 -- ACCIDENTAL RELEASE MEASURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED Remove all sources of ignition. Ventilate the area.

Remove with inert absorbent.

Section 7 -- HANDLING AND STORAGE

STORAGE CATEGORY

DOL Storage Class IB

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE

Contents are FLAMMABLE. Keep away from heat, sparks, and open flame.

During use and until all vapors are gone: Keep area ventilated - Do not smoke - Extinguish all flames, pilot lights, and heaters - Turn off stoves, electric tools and appliances, and any other sources of ignition.

Consult NFPA Code. Use approved Bonding and Grounding procedures.

Keep container closed when not in use. Transfer only to approved containers with complete and appropriate labeling. Do not take internally. Keep out of the reach of children.

Section 8 -- EXPOSURE CONTROLS/PERSONAL PROTECTION

PRECAUTIONS TO BE TAKEN IN USE

Use only with adequate ventilation.

Avoid contact with skin and eyes. Avoid breathing vapor and spray mist.

Wash hands after using.

This coating may contain materials classified as nuisance particulates (listed "as Dust" in Section 2) which may be present at hazardous levels only during sanding or abrading of the dried film. If no specific dusts are listed in Section 2, the applicable limits for nuisance dusts are ACGIH TLV 10 mg/m3 (total dust), 3 mg/m3 (respirable fraction), OSHA PEL 15 mg/m3 (total dust), 5 mg/m3 (respirable fraction). VENTILATION

Local exhaust preferable. General exhaust acceptable if the exposure to materials in Section 2 is maintained below applicable exposure limits. Refer to OSHA Standards 1910.94, 1910.107, 1910.108. RESPIRATORY PROTECTION

If personal exposure cannot be controlled below applicable limits by ventilation, wear a properly fitted organic vapor/particulate respirator approved by NIOSH/MSHA for protection against materials in Section 2.

When sanding or abrading the dried film, wear a dust/mist respirator approved by NIOSH/MSHA for dust which may be generated from this product, underlying paint, or the abrasive. PROTECTIVE GLOVES

Wear gloves which are recommended by glove supplier for protection against materials in Section 2.

EYE PROTECTION

Wear safety spectacles with unperforated sideshields. OTHER PRECAUTIONS

Intentional misuse by deliberately concentrating and inhaling the contents can be harmful or fatal.

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Section 9 -- PHYSICAL AND CHEMICAL PROPERTIES

1.33

52 %

Not Available

PRODUCT WEIGHT

SPECIFIC GRAVITY BOILING POINT MELTING POINT

MELTING POINT VOLATILE VOLUME EVAPORATION RATE

VAPOR DENSITY Heavier than air SOLUBILITY IN WATER N.A.

VOLATILE ORGANIC COMPOUNDS (VOC Theoretical - As Packaged)

Slower than ether

11.03 lb/gal 1321 g/l

240 - 338 F 115 - 170 C

3.44 lb/gal 413 g/l Less Water and Federally Exempt Solvents 3.44 lb/gal 413 g/l Emitted VOC

______ Section 10 -- STABILITY AND REACTIVITY

STABILITY -- Stable CONDITIONS TO AVOID

None known. INCOMPATIBILITY

None known.

HAZARDOUS DECOMPOSITION PRODUCTS

By fire: Carbon Dioxide, Carbon Monoxide

HAZARDOUS POLYMERIZATION

Will not occur

Section 11 -- TOXICOLOGICAL INFORMATION

CHRONIC HEALTH HAZARDS

Ethylbenzene is classified by IARC as possibly carcinogenic to humans (2B) based on inadequate evidence in humans and sufficient evidence in laboratory animals. Lifetime inhalation exposure of rats and mice to high ethylbenzene concentrations resulted in increases in certain types of cancer, including kidney tumors in rats and lung and liver tumors in mice. These effects were not observed in animals exposed to lower concentrations. There is no evidence that ethylbenzene causes cancer in humans.

Prolonged overexposure to solvent ingredients in Section 2 may cause adverse effects to the liver, urinary and reproductive systems.

Rats exposed to titanium dioxide dust at 250 mg./m3 developed lung

cancer, however, such exposure levels are not attainable in the workplace.

Reports have associated repeated and prolonged overexposure to solvents with permanent brain and nervous system damage.

TOXICOLOGY DATA

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CAS No.	Ingredient Name	=====	======		=======		
64742-89-8	V. M. & P. Naphtha LC50 LD50	RAT RAT	4HR	Not Available Not Available			
25013-15-4	Vinyl Toluene LC50 LD50	RAT RAT	4HR	Not Available 2255 mg/kg	Э		
100-41-4	Ethylbenzene LC50 LD50	RAT RAT	4HR	Not Available			
1330-20-7	Xylene LC50 LD50	RAT RAT	4HR	5000 ppm 4300 mg/kg	व		
14807-96-6	Talc LC50 LD50	RAT RAT	4HR	Not Available	e		
7727–43–7	Barium Sulfate LC50 LD50	RAT RAT	4HR	Not Available Not Available	-		
13463-67-7	Titanium Dioxide LC50 LD50	RAT RAT	4HR	Not Available			
1314-13-2	Zinc Oxide LC50 LD50	RAT RAT	4HR	Not Available			
Section 12 ECOLOGICAL INFORMATION							
ECOTOXICOLOGICAL INFORMATION No data available.							
Section 13 DISPOSAL CONSIDERATIONS							

WASTE DISPOSAL METHOD

Waste from this product may be hazardous as defined under the Resource Conservation and Recovery Act (RCRA) 40 CFR 261.
Waste must be tested for ignitability to determine the applicable EPA

hazardous waste numbers.

Incinerate in approved facility. Do not incinerate closed container. Dispose of in accordance with Federal, State/Provincial, and Local regulations regarding pollution.

Section 14 -- TRANSPORT INFORMATION

No data available.

_____ Section 15 -- REGULATORY INFORMATION

SARA 313 (40 CFR 372.65C) SUPPLIER NOTIFICATION

B54AF407 page 6 ______ CAS No. CHEMICAL/COMPOUND % by WT % Element 100-41-4 Ethylbenzene 1330-20-7 Xylene 6 Zinc Compound 7

4.8

CALIFORNIA PROPOSITION 65

WARNING: This product contains chemicals known to the State of California to cause cancer and birth defects or other reproductive harm. TSCA CERTIFICATION

All chemicals in this product are listed, or are exempt from listing,

on the TSCA Inventory.

______ Section 16 -- OTHER INFORMATION

._____

This product has been classified in accordance with the hazard criteria of the Canadian Controlled Products Regulations (CPR) and the MSDS contains all of the information required by the CPR.

The above information pertains to this product as currently formulated, and is based on the information available at this time. Addition of reducers or other additives to this product may substantially alter the composition and hazards of the product. Since conditions of use are outside our control, we make no warranties, express or implied, and assume no liability in connection with any use of this information.