MATERIAL SAFETY DATA SHEET

1. IDENTIFICATION OF THE MATERIAL AND SUPPLIER

Material name **HumiSeal 1B12**

Recommended use Protective Coating for Printed Circuit Board

Version No. 01

CAS # Mixture

Product code HumiSeal 1B12

Manufacturer information

CHASE CORPORATION Zeta Drive Plant
201 Zeta Drive
Pittsburgh, Pa 15238
United States

1-866-932-0800
1-800-424-9300 Chemtrec, US
(+1)703-527-3887 Chemtrec, outside of US

2. HAZARDS IDENTIFICATION

HAZARDOUS SUBSTANCE. DANGEROUS GOODS. This preparation is classified as dangerous according to Directive 1999/45/EC and its amendments.

Classification F;R11, Repr. Cat. 3;R63, Xn;R48/20, Xi;R36/38, R66-67

Risk phrase(s)

R11 Highly flammable.
R36/38 Irritating to eyes and skin.
R48/20 Harmful: danger of serious damage to health by prolonged exposure through inhalation.
R63 Possible risk of harm to the unborn child.
R66 Repeated exposure may cause skin dryness or cracking.
R67 Vapours may cause drowsiness and dizziness.

Safety phrase(s)

S9 Keep container in a well-ventilated place.
S16 Keep away from sources of ignition - No smoking.
S23 Do not breathe gas/fumes/vapour/spray.
S24/25 Avoid contact with skin and eyes.
S26 In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.
S36/37 Wear suitable protective clothing and gloves.
S60 This material and its container must be disposed of as hazardous waste.

3. COMPOSITION/INFORMATION ON INGREDIENTS

Components	CAS #	Percent
Toluene	108-88-3	30 - 60
Methyl ethyl ketone	78-93-3	10 - < 30
Other components below reportable levels		10 - < 30

4. FIRST-AID MEASURES

Inhalation Move to fresh air. Oxygen or artificial respiration if needed. Do not use mouth-to-mouth method if victim inhaled the substance. Induce artificial respiration with the aid of a pocket mask equipped with a one-way valve or other proper respiratory medical device. Get medical attention immediately.

Skin contact Take off immediately all contaminated clothing. Wash off immediately with plenty of water. Get medical attention if irritation develops and persists.

Eye contact Immediately flush eyes with plenty of water for at least 15 minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Get medical attention if irritation develops and persists.

Ingestion Rinse mouth thoroughly. Do not induce vomiting without medical advice. If ingestion of a large amount does occur, call a poison control centre immediately.

General advice	In case of shortness of breath, give oxygen. If you feel unwell, seek medical advice (show the label where possible). Ensure that medical personnel are aware of the material(s) involved, and take precautions to protect themselves. Keep victim under observation. Keep victim warm.
Notes to physician	Oxygen, if needed. Keep victim warm. Keep victim under observation. Symptoms may be delayed.

5. FIRE-FIGHTING MEASURES

Suitable extinguishing media	Water fog. Foam. Dry chemical powder. Carbon dioxide (CO2).
Extinguishing media which must not be used for safety reasons	Do not use water jet as an extinguisher, as this will spread the fire.
Unusual fire & explosion hazards	Heat may cause the containers to explode.
Specific hazards	Fire may produce irritating, corrosive and/or toxic gases.
Special protective equipment for fire-fighters	Wear full protective clothing, including helmet, self-contained positive pressure or pressure demand breathing apparatus, protective clothing and face mask. Structural firefighters protective clothing will only provide limited protection.
Fire fighting equipment/instructions	Firefighters must use standard protective equipment including flame retardant coat, helmet with face shield, gloves, rubber boots, and in enclosed spaces, SCBA. Use standard firefighting procedures and consider the hazards of other involved materials. If tank, rail car or tank truck is involved in a fire, ISOLATE for 800 meters (1/2 mile) in all directions; also consider initial evacuation for 800 meters (1/2 mile) in all directions. ALWAYS stay away from tanks engulfed in flame. Move containers from fire area if you can do so without risk. Withdraw immediately in case of rising sound from venting safety device or any discolouration of tanks due to fire. For massive fire in cargo area, use unmanned hose holder or monitor nozzles, if possible. If not, withdraw and let fire burn out.
Specific methods	Use standard firefighting procedures and consider the hazards of other involved materials. Move containers from fire area if you can do so without risk. Self-contained breathing apparatus and full protective clothing must be worn in case of fire. In the event of fire and/or explosion do not breathe fumes.
Hazchem Code	None.

6. ACCIDENTAL RELEASE MEASURES

Personal precautions	Keep unnecessary personnel away. Keep upwind. Keep out of low areas. Wear appropriate protective equipment and clothing during clean-up. Avoid inhalation of vapours or mists. Do not touch damaged containers or spilled material unless wearing appropriate protective clothing. Ventilate closed spaces before entering them. For personal protection, see section 8.
Environmental precautions	Contact local authorities in case of spillage to drain/aquatic environment. Prevent further leakage or spillage if safe to do so. Avoid discharge into drains, water courses or onto the ground.
Containment procedures	Eliminate all ignition sources (no smoking, flares, sparks, or flames in immediate area). Stop the flow of material, if this is without risk. Dike the spilled material, where this is possible. Prevent entry into waterways, sewer, basements or confined areas.
Methods for cleaning up	Extinguish all flames in the vicinity. This product is miscible in water. Large Spills: Stop the flow of material, if this is without risk. Dike the spilled material, where this is possible. Cover with plastic sheet to prevent spreading. Use a non-combustible material like vermiculite, sand or earth to soak up the product and place into a container for later disposal. Following product recovery, flush area with water. Small Spills: Wipe up with absorbent material (e.g. cloth, fleece). Clean surface thoroughly to remove residual contamination. Never return spills to original containers for re-use. This material and its container must be disposed of as hazardous waste. For waste disposal, see section 13.

7. HANDLING AND STORAGE

Handling	May be ignited by open flame. Keep away from sources of ignition - No smoking. Do not breathe dust/fume/gas/mist/vapors/spray. Avoid contact with skin. Avoid contact with eyes. Avoid prolonged exposure.
Storage	Do not handle or store near an open flame, heat or other sources of ignition. Prevent electrostatic charge build-up by using common bonding and grounding techniques. Store in original tightly closed container. Store in a well-ventilated place. Store away from incompatible materials (see Section 10 of the MSDS).

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Occupational exposure limits

US. ACGIH Threshold Limit Values

Components	Type	Value
2-Butanone (Methyl ethyl ketone) (CAS 78-93-3)	STEL	300 ppm
	TWA	200 ppm
Toluene (CAS 108-88-3)	TWA	20 ppm

Australia. National Workplace OELs (Workplace Exposure Standards for Airborne Contaminants, Appendix A)

Components	Type	Value
2-Butanone (Methyl ethyl ketone) (CAS 78-93-3)	STEL	890 mg/m3
		300 ppm
	TWA	445 mg/m3
		150 ppm
Toluene (CAS 108-88-3)	STEL	574 mg/m3
		150 ppm
	TWA	191 mg/m3
		50 ppm

Australia. OELs. (Adopted National Exposure Standards for Atmospheric Contaminants in the Occupational Environment)

Components	Type	Value
2-Butanone (Methyl ethyl ketone) (CAS 78-93-3)	STEL	890 mg/m3
		300 ppm
	TWA	445 mg/m3
		150 ppm
Toluene (CAS 108-88-3)	STEL	574 mg/m3
		150 ppm
	TWA	191 mg/m3
		50 ppm

Biological limit values

ACGIH Biological Exposure Indices

Components	Value	Determinant	Specimen	Sampling time
2-Butanone (Methyl ethyl ketone) (CAS 78-93-3)	2 mg/l	MEK	Urine	*
Toluene (CAS 108-88-3)	0.3 mg/g	o-Cresol, with hydrolysis	Creatinine in urine	*
	0.03 mg/l	Toluene	Urine	*
	0.02 mg/l	Toluene	Blood	*

* - For sampling details, please see the source document.

Recommended monitoring procedures

Additional exposure data Not available.

Australia OELs: Skin designation

Toluene (CAS 108-88-3) Can be absorbed through the skin.

Engineering measures Good general ventilation (typically 10 air changes per hour) should be used. Ventilation rates should be matched to conditions. If applicable, use process enclosures, local exhaust ventilation, or other engineering controls to maintain airborne levels below recommended exposure limits. If exposure limits have not been established, maintain airborne levels to an acceptable level.

Personal protective equipment

Respiratory protection Use a positive-pressure air-supplied respirator if there is any potential for an uncontrolled release, exposure levels are not known, or any other circumstances where air-purifying respirators may not provide adequate protection.

Hand protection Wear protective gloves.

Eye protection Face-shield. Avoid contact with eyes.

Skin and body protection Avoid contact with the skin. Wear chemical protective equipment that is specifically recommended by the manufacturer.

Environmental exposure controls Environmental manager must be informed of all major releases.

Hygiene measures When using do not smoke. Wash hands after handling.

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance

Physical state	Liquid.
Form	Liquid.
Colour	Clear.
Odour	Aromatic
Odour threshold	Not available.
pH	Does not apply.
Vapour pressure	65.51 hPa estimated
Vapour density	Not available.
Boiling point	79.59 °C (175.26 °F) estimated
Melting point/freezing point	-94.9 °C (-138.82 °F) estimated
Solubility (water)	Negligible
Specific gravity	0.89
Flash point	<= 4.0 °C (<= 39.2 °F)
Flammability limits in air, upper, % by volume	11.2 %
Flammability limits in air, lower, % by volume	1.5 %
Auto-ignition temperature	404 °C (759.2 °F) estimated
VOC	714 g/l
Evaporation rate	3.6 BuAc
Percent volatile	75 - 85 % v/v

Other data

Brookfield viscosity	25 - 35 cP
Density	0.89 g/cm3
Miscible (water)	Negligible

10. STABILITY AND REACTIVITY

Chemical stability	Risk of ignition.
Conditions to avoid	Heat, flames and sparks. Avoid temperatures exceeding the flash point. Contact with incompatible materials.
Materials to avoid	Strong oxidising agents. Ammonia. Amines. Isocyanates Caustics.
Hazardous decomposition products	No hazardous decomposition products are known.

11. TOXICOLOGICAL INFORMATION

Toxicological data

Product	Species	Test results
HumiSeal 1B12 (CAS Mixture)		
Acute		
Dermal		
LD50	Rabbit	12923.3223 mg/kg estimated
		26.4062 ml/kg estimated
Inhalation		
LC50	Mouse	41244.8438 ppm, 45 Minutes estimated
Oral		
LD50	Mouse	2512.186 mg/kg estimated
	Rat	4.8692 g/kg estimated
Other		
LD50	Mouse	6224.2222 g/kg, 24 Hours estimated
		110.4941 mg/kg estimated
	Rat	2366.4426 mg/kg estimated

Components	Species	Test results
Methyl ethyl ketone (CAS 78-93-3)		
Acute		
Dermal		
LD50	Rabbit	> 8000 mg/kg
Inhalation		
LC50	Mouse	11000 ppm, 45 Minutes
	Rat	11700 ppm, 4 Hours
Oral		
LD50	Mouse	670 mg/kg
	Rat	2300 - 3500 mg/kg
Other		
LD50	Mouse	1660 g/kg, 24 Hours
	Rat	12290 mg/kg, 24 Hours
Toluene (CAS 108-88-3)		
Acute		
Dermal		
LD50	Rabbit	12124 mg/kg
		14.1 ml/kg
Inhalation		
LC50	Mouse	5320 ppm, 8 Hours
		400 ppm, 24 Hours
	Rat	26700 ppm, 1 Hours
		12200 ppm, 2 Hours
		8000 ppm, 4 Hours
Oral		
LD50	Rat	2.6 g/kg
Other		
LD50	Mouse	59 mg/kg
	Rat	1332 mg/kg

* Estimates for product may be based on additional component data not shown.

Routes of exposure Inhalation. Skin contact. Eye contact.

Chronic toxicity Prolonged inhalation may be harmful. Danger of serious damage to health by prolonged exposure.

Carcinogenicity Not classifiable as to carcinogenicity to humans.

IARC Monographs. Overall Evaluation of Carcinogenicity

Toluene (CAS 108-88-3) 3 Not classifiable as to carcinogenicity to humans.

Mutagenicity No data available to indicate product or any components present at greater than 0.1% are mutagenic or genotoxic.

Teratogenicity Avoid exposure to women during early pregnancy.

Reproductivity Potential embryo-foetal toxicity and teratogenicity.

Epidemiology No epidemiological data is available for this product.

Local effects Harmful by inhalation. Irritating to eyes and skin.

12. ECOLOGICAL INFORMATION

Ecotoxicological data

Product		Species	Test results
HumiSeal 1B12 (CAS Mixture)			
Aquatic			
Crustacea	EC50	Daphnia	19.1203 mg/l, 48 hours estimated
Fish	LC50	Fish	162.9113 mg/l, 96 hours estimated

Components		Species	Test results
Methyl ethyl ketone (CAS 78-93-3)			
Aquatic			
Crustacea	EC50	Water flea (Daphnia magna)	4025 - 6440 mg/l, 48 hours
Fish	LC50	Sheepshead minnow (Cyprinodon variegatus)	> 400 mg/l, 96 hours
Toluene (CAS 108-88-3)			
Aquatic			
Crustacea	EC50	Water flea (Daphnia magna)	5.46 - 9.83 mg/l, 48 hours
Fish	LC50	Coho salmon,silver salmon (Oncorhynchus kisutch)	8.11 mg/l, 96 hours

* Estimates for product may be based on additional component data not shown.

Ecotoxicity Not expected to be harmful to aquatic organisms.

Mobility This product is miscible in water.

Bioaccumulation

Bioaccumulative potential

Octanol/water partition coefficient log Kow

Methyl ethyl ketone	0.29
Toluene	2.73

Environmental effects An environmental hazard cannot be excluded in the event of unprofessional handling or disposal.

Aquatic toxicity Not available.

13. DISPOSAL CONSIDERATIONS

Disposal instructions Collect and reclaim or dispose in sealed containers at licensed waste disposal site. This material and its container must be disposed of as hazardous waste. Must be incinerated in a suitable incineration plant holding a permit delivered by the competent authorities. Do not discharge into drains, water courses or onto the ground. Dispose in accordance with all applicable regulations.

Waste from residues / unused products Dispose of in accordance with local regulations. Empty containers or liners may retain some product residues. This material and its container must be disposed of in a safe manner (see: Disposal instructions). Avoid discharge into water courses or onto the ground.

Contaminated packaging Empty containers should be taken to an approved waste handling site for recycling or disposal. Since emptied containers may retain product residue, follow label warnings even after container is emptied.

14. TRANSPORT INFORMATION

ADG

UN number 1263
UN proper shipping name Paint
Transport hazard class(es)
Class 3
Subsidiary risk -
Packing group II
Environmental hazards Not available.
Hazchem Code D3YE
Special precautions for user Read safety instructions, SDS and emergency procedures before handling.

IATA

UN number 1263
UN proper shipping name PAINT
Transport hazard class(es)
Class 3
Subsidiary risk -
Packing group II
Environmental hazards No.
ERG Code 3L
Special precautions for user Read safety instructions, MSDS and emergency procedures before handling.
Other information
Passenger and cargo aircraft Allowed.
Cargo aircraft only Allowed.

IMDG

UN number	1263
UN proper shipping name	PAINT
Transport hazard class(es)	
Class	3
Subsidiary risk	-
Packing group	II
Environmental hazards	
Marine pollutant	No.
EmS	F-E, S-E*
Special precautions for user	Read safety instructions, MSDS and emergency procedures before handling.
Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code	Not available.

ADG

IATA; IMDG

15. REGULATORY INFORMATION

National regulations This Material Safety Data Sheet was prepared in accordance with the Australia National Code of Practice for the Preparation of Material Safety Data Sheets (NOHSC: 2011.)

Australia HVIC: Listed substance

Methyl ethyl ketone (CAS 78-93-3)	Listed.
Toluene (CAS 108-88-3)	Listed.

Australia Medicines & Poisons Schedule 5: Use/Concentration/Exceptions

Methyl ethyl ketone (CAS 78-93-3)	Exception was applied to data.
Toluene (CAS 108-88-3)	Exception may apply, see the regulation for relevance.

Australia Medicines & Poisons Schedule 6: Use/Concentration/Exceptions

Toluene (CAS 108-88-3)	Exception may apply, see the regulation for relevance.

International Inventories

Country(s) or region	Inventory name	On inventory (yes/no)*
Australia	Australian Inventory of Chemical Substances (AICS)	Yes
Canada	Domestic Substances List (DSL)	Yes
Canada	Non-Domestic Substances List (NDSL)	No
China	Inventory of Existing Chemical Substances in China (IECSC)	Yes
Europe	European Inventory of Existing Commercial Chemical Substances (EINECS)	No
Europe	European List of Notified Chemical Substances (ELINCS)	No
Japan	Inventory of Existing and New Chemical Substances (ENCS)	Yes
Korea	Existing Chemicals List (ECL)	Yes
New Zealand	New Zealand Inventory	Yes

Country(s) or region	Inventory name	On inventory (yes/no)*
Philippines	Philippine Inventory of Chemicals and Chemical Substances (PICCS)	Yes
United States & Puerto Rico	Toxic Substances Control Act (TSCA) Inventory	Yes

*A "Yes" indicates that all components of this product comply with the inventory requirements administered by the governing country(s)
A "No" indicates that one or more components of the product are not listed or exempt from listing on the inventory administered by the governing country(s).

16. OTHER INFORMATION

Disclaimer The information offered in this data sheet is designed only as guidance for the safe use, storage and handling of the product. This information is correct to the best of our knowledge and belief at the date of publication, however, no guarantee is made to its accuracy. This information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any other process. This material is intended for industrial use only. No warranty, expressed or implied is made.

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