SAFETY DATA SHEET

1. Product and Company Identification

Product identifier **BOILERMATE 3300C**

Other means of identification Not available

Recommended use Boiler Water Treatment

Recommended restrictions None known.

Manufacturer

Miura America Co., Ltd.
2200 Steven B Smith Blvd
Rockmart, GA 30153 U.S.A.
Phone: 678-685-0929
Toll Free: 1-888-309-557
Fax: 678-685-0930
Emergency Phone: 1-800-424-9300 (CHEMTREC)

2. Hazards Identification

Physical hazards	Flammable liquids	Category 3
Health hazards	Acute toxicity, oral	Category 3
	Acute toxicity, dermal	Category 4
	Skin corrosion/irritation	Category 1
	Serious eye damage/eye irritation	Category 1
	Reproductive toxicity (fertility)	Category 2

Environmental hazards Not classified.

OSHA defined hazards Not classified.

Label elements

Signal word Danger

Hazard statement

Flammable liquid and vapor.
Toxic if swallowed.
Harmful in contact with skin.
Causes severe skin burns and eye damage.
Suspected of damaging fertility.

Precautionary statement

Prevention

Keep away from heat/sparks/open flames/hot surfaces. - No smoking. Keep container tightly closed. Ground/bond container and receiving equipment. Use explosion-proof electrical/ventilating/lighting equipment. Use only non-sparking tools. Take precautionary measures against static discharge.
Do not breathe mist or vapor.
Do not eat, drink or smoke when using this product.
Wash thoroughly after handling.
Wear protective gloves/protective clothing/eye protection/face protection.
Obtain special instructions before use.
Do not handle until all safety precautions have been read and understood.

Response

In case of fire: Use appropriate media to extinguish.
If on skin (or hair): Take off immediately all contaminated clothing. Rinse skin with water/shower. Wash contaminated clothing before reuse.
If in eyes: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
If swallowed: Rinse mouth. Do NOT induce vomiting.
If inhaled: Remove person to fresh air and keep comfortable for breathing.
If exposed or concerned: Get medical advice/attention.
Immediately call a poison center/doctor.
Specific treatment (see this label).

Storage

Store in a well-ventilated place. Keep cool.
Store locked up.

Disposal

Dispose of contents/container in accordance with local/regional/national/international regulations.

Hazard(s) not otherwise classified (HNOC)	None known.
Supplemental information	60% of the mixture consists of component(s) of unknown acute inhalation toxicity.

3. Composition/Information on Ingredients

Mixture

Chemical name	Common name and synonyms	CAS number	%
Cyclohexylamine		108-91-8	10 - 30
Morpholine		110-91-8	10 - 30

Composition comments US GHS: The exact percentage (concentration) of composition has been withheld as a trade secret in accordance with paragraph (i) of §1910.1200.

4. First Aid Measures

Inhalation If inhaled: Remove person to fresh air and keep comfortable for breathing. Immediately call a poison center/doctor.

Skin contact If on skin (or hair): Take off immediately all contaminated clothing. Rinse skin with water/shower. Immediately call a poison center/doctor. Wash contaminated clothing before reuse. Specific treatment (see product label).

Eye contact If in eyes: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Immediately call a poison center/doctor.

Ingestion If swallowed: Rinse mouth. Do NOT induce vomiting. Immediately call a poison center/doctor.

Most important symptoms/effects, acute and delayed Burning pain and severe corrosive skin damage.
Causes serious eye damage. Symptoms may include stinging, tearing, redness, swelling, and blurred vision. Permanent eye damage including blindness could result.

Indication of immediate medical attention and special treatment needed Symptoms may be delayed.

General information Ensure that medical personnel are aware of the material(s) involved, and take precautions to protect themselves. Show this safety data sheet to the doctor in attendance. Keep away from sources of ignition. No smoking. Avoid contact with eyes and skin. Take off all contaminated clothing immediately. Wash contaminated clothing before reuse. Wear rubber gloves and chemical splash goggles. Keep out of reach of children.

5. Fire Fighting Measures

Suitable extinguishing media Alcohol resistant foam. Water fog. Dry chemical powder. Carbon dioxide (CO2).

Unsuitable extinguishing media Do not use water jet as an extinguisher, as this will spread the fire.

Specific hazards arising from the chemical Vapors may form explosive mixtures with air. Vapors may travel considerable distance to a source of ignition and flash back. During fire, gases hazardous to health may be formed.

Special protective equipment and precautions for firefighters Firefighters should wear full protective clothing including self contained breathing apparatus.

Fire-fighting equipment/instructions In case of fire and/or explosion do not breathe fumes. Move containers from fire area if you can do so without risk.

Specific methods Use standard firefighting procedures and consider the hazards of other involved materials.

General fire hazards Flammable liquid and vapor.

Hazardous combustion products May include and are not limited to: Oxides of nitrogen. Oxides of carbon. Ammonia.

Explosion data

- **Sensitivity to mechanical impact** Not available.
- **Sensitivity to static discharge** Not available.

6. Accidental Release Measures

Personal precautions, protective equipment and emergency procedures Keep people away from and upwind of spill/leak. Keep out of low areas. Eliminate all ignition sources (no smoking, flares, sparks, or flames in immediate area). Do not breathe mist or vapor. Do not touch damaged containers or spilled material unless wearing appropriate protective clothing. Ventilate closed spaces before entering them. Local authorities should be advised if significant spillages cannot be contained. For personal protection, see section 8 of the SDS.

Methods and materials for containment and cleaning up	Stop leak if you can do so 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. Never return spills to original containers for re-use. Clean surface thoroughly to remove residual contamination. Following product recovery, flush area with water. Prevent entry into waterways, sewer, basements or confined areas. For waste disposal, see section 13 of the SDS.
Environmental precautions	Do not discharge into lakes, streams, ponds or public waters.

7. Handling and Storage

Precautions for safe handling	DANGER -- CORROSIVE Obtain special instructions before use. Do not handle until all safety precautions have been read and understood. Avoid contact with eyes, skin and clothing. Do not breathe mist or vapor. Wear appropriate personal protective equipment. Use only with adequate ventilation. Avoid contact during pregnancy/while nursing. Avoid prolonged exposure. Do not handle, store or open near an open flame, sources of heat or sources of ignition. Protect material from direct sunlight. Vapors may form explosive mixtures with air. All equipment used when handling the product must be grounded. Use good industrial hygiene practices in handling this material. When using, do not eat, drink or smoke. Wash thoroughly after handling.
Conditions for safe storage, including any incompatibilities	Store locked up. Do not store at temperatures above 120°F (49°C). Store in a cool, dry place out of direct sunlight. Store in a well-ventilated place. Store away from incompatible materials (see Section 10 of the SDS). Keep out of reach of children.

8. Exposure Controls/Personal Protection

Occupational exposure limits

US. OSHA Table Z-1 Limits for Air Contaminants (29 CFR 1910.1000)

Components	Type	Value
Morpholine (CAS 110-91-8)	PEL	70 mg/m3 20 ppm

US. ACGIH Threshold Limit Values

Components	Type	Value
Cyclohexylamine (CAS 108-91-8)	TWA	10 ppm
Morpholine (CAS 110-91-8)	TWA	20 ppm

US. NIOSH: Pocket Guide to Chemical Hazards

Components	Type	Value
Cyclohexylamine (CAS 108-91-8)	TWA	40 mg/m3 10 ppm
Morpholine (CAS 110-91-8)	STEL	105 mg/m3 30 ppm
	TWA	70 mg/m3 20 ppm

Biological limit values	No biological exposure limits noted for the ingredient(s).
Exposure guidelines	See above
Appropriate engineering controls	Ensure adequate ventilation.

Individual protection measures, such as personal protective equipment

Eye/face protection	Chemical splash goggles.
Skin protection	
Hand protection	Impervious gloves. Confirm with reputable supplier first.
Other	As required by employer code.
Respiratory protection	Where exposure guideline levels may be exceeded, use an approved NIOSH respirator.

Thermal hazards	Not applicable.
General hygiene considerations	Handle in accordance with good industrial hygiene and safety practice. Wash hands before breaks and immediately after handling the product. When using do not eat or drink.

9. Physical and Chemical Properties

Appearance	Transparent
Physical state	Liquid.
Form	Liquid
Color	Colourless - yellow
Odor	Slight amine
Odor threshold	Not available.
pH	11.4 (1% water solution)
Melting point/freezing point	Not available.
Initial boiling point and boiling range	Not available.
Pour point	Not available.
Specific gravity	0.99
Partition coefficient (n-octanol/water)	Not available.
Flash point	129.2 °F (54.0 °C) Tag Closed Cup
Evaporation rate	Not available.
Flammability (solid, gas)	Not applicable.
Upper/lower flammability or explosive limits	
Flammability limit - lower (%)	Not available.
Flammability limit - upper (%)	Not available.
Explosive limit - lower (%)	Not available.
Explosive limit - upper (%)	Not available.
Vapor pressure	Not available.
Vapor density	Not available.
Relative density	Not available.
Solubility(ies)	Not available.
Auto-ignition temperature	Not available.
Decomposition temperature	Not available.
Viscosity	Not available.

10. Stability and Reactivity

Reactivity	Reacts vigorously with acids.
Possibility of hazardous reactions	Hazardous polymerization does not occur.
Chemical stability	Stable under recommended storage conditions.
Conditions to avoid	Avoid heat, sparks, open flames and other ignition sources. Avoid temperatures exceeding the flash point. Do not mix with other chemicals.
Incompatible materials	Oxidizers. Acids.
Hazardous decomposition products	May include and are not limited to: Oxides of nitrogen. Oxides of carbon. Ammonia.

11. Toxicological Information

Routes of exposure	Eye, Skin contact, Skin absorption, Inhalation, Ingestion.
Information on likely routes of exposure	
Ingestion	Toxic if swallowed. Causes digestive tract burns.
Inhalation	Prolonged inhalation may be harmful. May cause irritation to the respiratory system.
Skin contact	Causes severe skin burns.

US ACGIH Threshold Limit Values: Skin designation

Morpholine (CAS 110-91-8)	Can be absorbed through the skin.

US. NIOSH: Pocket Guide to Chemical Hazards

Morpholine (CAS 110-91-8)	Can be absorbed through the skin.

Eye contact Causes serious eye damage.

Symptoms related to the physical, chemical and toxicological characteristics Burning pain and severe corrosive skin damage.
Causes serious eye damage. Symptoms may include stinging, tearing, redness, swelling, and blurred vision. Permanent eye damage including blindness could result.

Information on toxicological effects

Acute toxicity Toxic if swallowed.

Components	Species	Test Results
Cyclohexylamine (CAS 108-91-8)		
Acute		
Dermal		
LD50	Rabbit	277 mg/kg
Inhalation		
LC50	Mouse	1.1 mg/l, Unknown duration
	Rat	16.2 mg/l, 4 Hours
		7.5 mg/l, Unknown duration
Oral		
LD50	Mouse	224 mg/kg
	Rat	156 mg/kg
		11 mg/kg
Morpholine (CAS 110-91-8)		
Acute		
Dermal		
LD50	Rabbit	500 mg/kg
Inhalation		
LC50	Mouse	1320 mg/m3, 2 Hours
		370 ppm, 2 Hours
		24 mg/l, 4 Hours
		1.3 mg/l, 2 Hours
	Rat	28.5 mg/l, 8 Hours
		18.1 mg/l, 6 Hours
		7.7 mg/l, 4 Hours
Oral		
LD50	Guinea pig	900 mg/kg
	Mouse	525 mg/kg
	Rat	1050 mg/kg

Skin corrosion/irritation Causes severe skin burns and eye damage.

Exposure minutes Not available.

Erythema value Not available.

Oedema value Not available.

Serious eye damage/eye irritation Causes serious eye damage.

Corneal opacity value Not available.

Iris lesion value Not available.

Conjunctival reddening value Not available.

Conjunctival oedema value Not available.

Recover days Not available.

Respiratory or skin sensitization

Respiratory sensitization Not available.

Skin sensitization Prolonged or repeated exposure can cause drying, defatting and dermatitis.

US ACGIH Threshold Limit Values: Skin designation

Morpholine (CAS 110-91-8)	Can be absorbed through the skin.

US. NIOSH: Pocket Guide to Chemical Hazards

Morpholine (CAS 110-91-8) Can be absorbed through the skin.

US ACGIH Threshold Limit Values: Skin designation

Morpholine (CAS 110-91-8) Can be absorbed through the skin.

US. NIOSH: Pocket Guide to Chemical Hazards

Morpholine (CAS 110-91-8) Can be absorbed through the skin.

Germ cell mutagenicity Not classified.

Mutagenicity Not classified.

Carcinogenicity See below.

ACGIH Carcinogens

Cyclohexylamine (CAS 108-91-8) A4 Not classifiable as a human carcinogen.

Morpholine (CAS 110-91-8) A4 Not classifiable as a human carcinogen.

IARC Monographs. Overall Evaluation of Carcinogenicity

Morpholine (CAS 110-91-8) Volume 47, Volume 71 - 3 Not classifiable as to carcinogenicity to humans.

Reproductive toxicity Suspected of damaging fertility.

Teratogenicity Not classified.

Specific target organ toxicity - single exposure Not classified.

Specific target organ toxicity - repeated exposure Not classified.

Aspiration hazard Not classified.

Chronic effects Toxic. Three of six rats inhaling 173 ppm of cyclohexylamine for 2 hours/day for 2 months died. Prolonged inhalation may be harmful.

Further information Not available.

Name of Toxicologically Synergistic Products Not available.

12. Ecological Information

Ecotoxicity See below

Components		Species	Test Results
Cyclohexylamine (CAS 108-91-8)			
Aquatic			
Fish	LC50	Rainbow trout,donaldson trout (Oncorhynchus mykiss)	44 mg/l, 96 hours
Morpholine (CAS 110-91-8)			
Aquatic			
Fish	LC50	Zebra danio (Danio rerio)	> 1 mg/l, 96 hours

Persistence and degradability No data is available on the degradability of this product.

Bioaccumulative potential No data available.

Mobility in soil No data available.

Mobility in general Not available.

Other adverse effects No other adverse environmental effects (e.g. ozone depletion, photochemical ozone creation potential, endocrine disruption, global warming potential) are expected from this component.

13. Disposal Considerations

Disposal instructions Dispose of contents/container in accordance with local/regional/national/international regulations.

Local disposal regulations Dispose in accordance with all applicable regulations.

Hazardous waste code The waste code should be assigned in discussion between the user, the producer and the waste disposal company.

Waste from residues / unused products 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).

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

General Canada: TDG Proof of Classification: In accordance with Part 2.2.1 (SOR/2014-152) of the Transportation of Dangerous Goods Regulations, we certify that the classification of this product is correct as of the SDS date of issue. If applicable, the technical name and the classification of the product will appear below.

U.S. Department of Transportation (DOT)

Basic shipping requirements:

UN number	UN2920
Proper shipping name	Corrosive liquids, flammable, n.o.s. (Morpholine)
Hazard class	8
Subsidiary hazard class	3
Packing group	I
Special provisions	A6, B10, T14, TP2, TP27
Packaging exceptions	None

Transportation of Dangerous Goods (TDG - Canada)

Basic shipping requirements:

UN number	UN2920
Proper shipping name	CORROSIVE LIQUID, FLAMMABLE, N.O.S. (Morpholine)
Hazard class	8
Subsidiary hazard class	3
Packing group	I
Special provisions	16

DOT

TDG

15. Regulatory Information

Canadian federal regulations This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the SDS contains all the information required by the Controlled Products Regulations.

Canada WHMIS Ingredient Disclosure: Threshold limits

Cyclohexylamine (CAS 108-91-8)	0.1 %
Morpholine (CAS 110-91-8)	1 %

WHMIS status Controlled

WHMIS classification Class B - Division 3 - Combustible Liquid, Class D - Division 1B, 2B, Class E - Corrosive Material

WHMIS labeling

US federal regulations This product is a "Hazardous Chemical" as defined by the OSHA Hazard Communication Standard, 29 CFR 1910.1200.

US EPCRA (SARA Title III) Section 302 - Extremely Hazardous Spill: Reportable quantity

Cyclohexylamine (CAS 108-91-8)	10000 LBS

US EPCRA (SARA Title III) Section 302 - Extremely Hazardous Substance: Threshold Planning Quantity

Cyclohexylamine (CAS 108-91-8)	10000 LBS

TSCA Section 12(b) Export Notification (40 CFR 707, Subpt. D)

Not regulated.

CERCLA Hazardous Substance List (40 CFR 302.4)

Cyclohexylamine (CAS 108-91-8)	Listed.
Morpholine (CAS 110-91-8)	Listed.

US CAA Section 111 Volatile Organic Compounds: Listed substance

Cyclohexylamine (CAS 108-91-8)	Listed.
Morpholine (CAS 110-91-8)	Listed.

US CAA Section 112(r) Accidental Release Prevention - Regulated Toxic Substance: Listed substance

Cyclohexylamine (CAS 108-91-8)	Regulated toxic substance.

US CAA Section 112(r) Accidental Release Prevention: Threshold quantity

Cyclohexylamine (CAS 108-91-8)	15000 LBS

Clean Air Act (CAA) Section 112(r) Accidental Release Prevention (40 CFR 68.130)

Cyclohexylamine (CAS 108-91-8)	Listed.

Clean Air Act (CAA) Section 112 Hazardous Air Pollutants (HAPs) List

Not regulated.

Superfund Amendments and Reauthorization Act of 1986 (SARA)

Hazard categories	Immediate Hazard - Yes Delayed Hazard - Yes Fire Hazard - Yes Pressure Hazard - No Reactivity Hazard - No
SARA 302 Extremely hazardous substance	No
SARA 311/312 Hazardous chemical	No

SARA 313 (TRI reporting)

Not regulated.

Other federal regulations

Safe Drinking Water Act (SDWA)	Not regulated.
Food and Drug Administration (FDA)	Not regulated.

US state regulations This product does not contain a chemical known to the State of California to cause cancer, birth defects or other reproductive harm.

US - California Hazardous Substances (Director's): Listed substance

Cyclohexylamine (CAS 108-91-8)	Listed.
Morpholine (CAS 110-91-8)	Listed.

US - California Proposition 65 - Carcinogens & Reproductive Toxicity (CRT): Listed substance

Not listed.

US - Illinois Chemical Safety Act: Listed substance

Cyclohexylamine (CAS 108-91-8)	Listed.
Morpholine (CAS 110-91-8)	Listed.

US - Louisiana Spill Reporting: Listed substance

Cyclohexylamine (CAS 108-91-8)	Listed.
Morpholine (CAS 110-91-8)	Listed.

US - Minnesota Haz Subs: Listed substance

Cyclohexylamine (CAS 108-91-8)	Listed.
Morpholine (CAS 110-91-8)	Listed.

US - New Jersey RTK - Substances: Listed substance

Cyclohexylamine (CAS 108-91-8)	Listed.
Morpholine (CAS 110-91-8)	Listed.

US - New York Release Reporting: Hazardous Substances: Listed substance

Cyclohexylamine (CAS 108-91-8)	Listed.

US - Texas Effects Screening Levels: Listed substance

Cyclohexylamine (CAS 108-91-8)	Listed.
Morpholine (CAS 110-91-8)	Listed.

US. Massachusetts RTK - Substance List

Cyclohexylamine (CAS 108-91-8)	Listed.
Morpholine (CAS 110-91-8)	Listed.

US. Pennsylvania RTK - Hazardous Substances

Cyclohexylamine (CAS 108-91-8)	Listed.
Morpholine (CAS 110-91-8)	Listed.

US. Rhode Island RTK

Cyclohexylamine (CAS 108-91-8)	Listed.

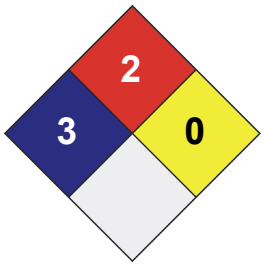
Inventory status

Country(s) or region	Inventory name	On inventory (yes/no)*
Canada	Domestic Substances List (DSL)	Yes
Canada	Non-Domestic Substances List (NDSL)	No
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)

16. Other Information

LEGEND	
Severe	4
Serious	3
Moderate	2
Slight	1
Minimal	0



Disclaimer

Information contained herein was obtained from sources considered technically accurate and reliable. While every effort has been made to ensure full disclosure of product hazards, in some cases data is not available and is so stated. Since conditions of actual product use are beyond control of the supplier, it is assumed that users of this material have been fully trained according to the requirements of all applicable legislation and regulatory instruments. No warranty, expressed or implied, is made and supplier will not be liable for any losses, injuries or consequential damages which may result from the use of or reliance on any information contained in this document.

Issue date 16-July-2015

Effective date 16-July-2015

Further information For an updated SDS, please contact the supplier/manufacturer listed on the first page of the document.

Prepared by Dell Tech Laboratories, Ltd. Phone: (519) 858-5021

Other information For an updated SDS, please contact the supplier listed on the first page of the document. This Safety Data Sheet was prepared to comply with the current OSHA Hazard Communication Standard (HCS) adoption of the Globally Harmonized System of Classification and Labeling of Chemicals (GHS).
This SDS conforms to the ANSI Z400.1/Z129.1-2010 Standard.