

SECTION 1: Identification

1.1. Identification

Product form : Mixture
 Product name : RAKU® TOOL EH-2904-1 Hardener
 Product code : 07.03.0025

1.2. Recommended use and restrictions on use

Use of the substance/mixture : model building material

1.3. Supplier

RAMPF Group, Inc.
 49037 Wixom Tech Drive
 Wixom, 48393
 T 2482950223 - F 2482950224

1.4. Emergency telephone number

Emergency number : CHEMTREC 1-800-424-9300 or +1-703-527-3887 CCN 649907

SECTION 2: Hazard(s) identification

2.1. Classification of the substance or mixture

GHS-US classification

Acute toxicity (oral) Category 4	Harmful if swallowed
Acute toxicity (inhalation) Category 4	Harmful if inhaled
Skin corrosion/irritation Category 1A	Causes severe skin burns and eye damage
Skin sensitization, Category 1	May cause an allergic skin reaction
Hazardous to the aquatic environment - Chronic Hazard Category 3	Harmful to aquatic life with long lasting effects

2.2. GHS Label elements, including precautionary statements

GHS-US labeling

Hazard pictograms (GHS-US) :



Signal word (GHS-US) :

Danger

Hazard statements (GHS-US) :

Harmful if swallowed or if inhaled
 Causes severe skin burns and eye damage
 May cause an allergic skin reaction
 Harmful to aquatic life with long lasting effects

Precautionary statements (GHS-US) :

Do not breathe dust/fume/gas/mist/vapors/spray.
 Avoid breathing dust/fume/gas/mist/vapors/spray.
 Wash hands, forearms and face thoroughly after handling.
 Do not eat, drink or smoke when using this product.
 Use only outdoors or in a well-ventilated area.
 Contaminated work clothing must not be allowed out of the workplace
 Avoid release to the environment.
 Wear protective gloves, protective clothing, eye protection, face protection.
 If swallowed: Call a poison center or doctor if you feel unwell
 If swallowed: rinse mouth. Do NOT induce vomiting
 If on skin: Wash with plenty of soap and water
 If on skin (or hair): Take off immediately all contaminated clothing. Rinse skin with water/shower
 If inhaled: Remove person to fresh air and keep comfortable for breathing
 If in eyes: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing
 Immediately call a doctor, a POISON CENTER
 Call a poison center or doctor if you feel unwell
 Specific treatment (see supplemental first aid instruction on this label)
 Rinse mouth.
 If skin irritation or rash occurs: Get medical advice/attention.

RAKU® TOOL EH-2904-1 Hardener

Safety Data Sheet

according to Federal Register / Vol. 77, No. 58 / Monday, March 26, 2012 / Rules and Regulations

Wash contaminated clothing before reuse.
Store locked up.
Dispose of contents/container to hazardous or special waste collection point, in accordance with local, regional, national and/or international regulation

2.3. Other hazards which do not result in classification

No additional information available

2.4. Unknown acute toxicity (GHS US)

Not applicable

SECTION 3: Composition/Information on ingredients

3.1. Substances

Not applicable

3.2. Mixtures

Name	Product identifier	%	GHS-US classification
benzyl alcohol	(CAS-No.) 100-51-6	40 - 45	Acute Tox. 4 (Oral), H302 Acute Tox. 4 (Dermal), H312 Acute Tox. 4 (Inhalation), H332
3-aminomethyl-3,5,5-trimethylcyclohexylamine	(CAS-No.) 2855-13-2	30 - 35	Acute Tox. 4 (Oral), H302 Acute Tox. 4 (Dermal), H312 Acute Tox. 3 (Inhalation:vapour), H331 Skin Corr. 1A, H314 Eye Dam. 1, H318 Skin Sens. 1A, H317 STOT SE 3, H335 Aquatic Chronic 3, H412
trimethylhexane-1,6-diamine	(CAS-No.) 25620-58-0	10 - 15	Acute Tox. 4 (Oral), H302 Skin Corr. 1C, H314 Eye Dam. 1, H318 Skin Sens. 1, H317 Aquatic Chronic 3, H412
m-xylene-a,a-diamine	(CAS-No.) 1477-55-0	1 - 5	Acute Tox. 4 (Oral), H302 Acute Tox. 4 (Dermal), H312 Acute Tox. 4 (Inhalation), H332 Skin Corr. 1B, H314 Eye Dam. 1, H318 Skin Sens. 1, H317 Aquatic Chronic 3, H412

Full text of hazard classes and H-statements : see section 16

SECTION 4: First-aid measures

4.1. Description of first aid measures

- First-aid measures general : Immediately remove any clothing soiled by product. If you feel unwell, seek medical advice.
- First-aid measures after inhalation : Remove person to fresh air and keep comfortable for breathing. If experiencing respiratory symptoms: Call a poison center or a doctor.
- First-aid measures after skin contact : Wash off immediately with soap and plenty of water while removing all contaminated clothes and shoes. Get immediate medical advice/attention. May cause an allergic skin reaction. Remove material from skin immediately. Wash off immediately with soap and plenty of water for at least 15 minutes. Do not use solvents or thinners to dissolve the material. Take off contaminated clothing and wash before reuse. Get medical attention immediately if symptoms occur. Allergic symptoms may be delayed.
- First-aid measures after eye contact : In case of contact with eyes, rinse immediately with plenty of water and seek medical advice. Remove contact lenses, if present and easy to do. Continue rinsing.
- First-aid measures after ingestion : Rinse mouth with water. Never give anything by mouth to an unconscious person. Drink plenty of water. Immediately call a poison center or doctor/physician.

4.2. Most important symptoms and effects (acute and delayed)

- Potential Adverse human health effects and symptoms : Causes severe skin burns. Causes serious eye damage.

4.3. Immediate medical attention and special treatment, if necessary

No additional information available

RAKU® TOOL EH-2904-1 Hardener

Safety Data Sheet

according to Federal Register / Vol. 77, No. 58 / Monday, March 26, 2012 / Rules and Regulations

SECTION 5: Fire-fighting measures

5.1. Suitable (and unsuitable) extinguishing media

- Suitable extinguishing media : Use extinguishing measures that are appropriate to local circumstance and the surrounding environment. Carbon dioxide. Dry powder. Water spray. Alcohol-resistant foam.
- Unsuitable extinguishing media : Do not use a heavy water stream.

5.2. Specific hazards arising from the chemical

- Fire hazard : Fire may produce: Nitrous oxides (NO_x), carbon monoxide and carbon dioxide.

5.3. Special protective equipment and precautions for fire-fighters

- Protection during firefighting : Use self-contained breathing apparatus and chemically protective clothing.
- Other information : Do not release chemically contaminated water into drains, soil or surface waters. Sufficient measures must be taken to retain water used for extinguishing.

SECTION 6: Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

- General measures : In case of vapor formation use adequate respirator. Avoid breathing dust, mist or spray. Ensure adequate ventilation. Use personal protective equipment as required. Attention! Corrosive material. Clean up any spills as soon as possible, using an absorbent material to collect it.

6.1.1. For non-emergency personnel

No additional information available

6.1.2. For emergency responders

No additional information available

6.2. Environmental precautions

Prevent liquid from entering sewers, watercourses, underground or low areas. Notify authorities if product enters sewers or public waters.

6.3. Methods and material for containment and cleaning up

- For containment : Absorb spilled material with sand or earth. Contain any spills with dikes or absorbents to prevent migration and entry into sewers or streams.
- Methods for cleaning up : Small quantities of liquid spill: take up in non-combustible absorbent material and shovel into container for disposal.

6.4. Reference to other sections

No additional information available

SECTION 7: Handling and storage

7.1. Precautions for safe handling

- Precautions for safe handling : Use only outdoors or in a well-ventilated area. Avoid contact with skin, eyes and clothing. Keep container tightly closed.
- Hygiene measures : Take off immediately all contaminated clothing and wash it before reuse. Wash hands and other exposed areas with mild soap and water before eating, drinking or smoking and when leaving work.

7.2. Conditions for safe storage, including any incompatibilities

- Storage conditions : Keep container tightly closed. Protect from sunlight. Store in a well-ventilated place. Keep only in original container.

SECTION 8: Exposure controls/personal protection

8.1. Control parameters

m-xylene-a,a-diamine (1477-55-0)		
ACGIH	Local name	m-Xylene α,α'-diamine
ACGIH	ACGIH Ceiling (mg/m ³)	0.1 mg/m ³
ACGIH	Remark (ACGIH)	Eye, skin, & GI irr
ACGIH	Regulatory reference	ACGIH 2018
OSHA	OSHA PEL (Ceiling) (mg/m ³)	0.1 mg/m ³ (vacated)
3-aminomethyl-3,5,5-trimethylcyclohexylamine (2855-13-2)		
Not applicable		

RAKU® TOOL EH-2904-1 Hardener

Safety Data Sheet

according to Federal Register / Vol. 77, No. 58 / Monday, March 26, 2012 / Rules and Regulations

benzyl alcohol (100-51-6)		
DNEL	DNEL	90 mg/m ³ long-term, systemic, dermal
PNEC	PNEC	1 mg/l Freshwater
OSHA	OSHA PEL (TWA) (mg/m ³)	44.2 mg/m ³
trimethylhexane-1,6-diamine (25620-58-0)		
Not applicable		

8.2. Appropriate engineering controls

Appropriate engineering controls : Ensure good ventilation of the work station.

8.3. Individual protection measures/Personal protective equipment

Personal protective equipment:

Ensure that eyewash stations and safety showers are close to the workstation location.

Materials for protective clothing:

Wear appropriate chemical resistant clothing.

Hand protection:

Chemically resistant protective gloves. butyl rubber (Butyl) -0.7 mm thickness; Nitrile rubber (Nitrile) - 0.4 mm thickness; Select the appropriate glove material adhering to the breakthrough time, permeation rate and the degradation. Because of the great variety of glove types, the manufacturer's instructions for use must be adhered to.

Eye protection:

Chemical goggles or safety glasses

Skin and body protection:

Wear suitable protective clothing. Wear impervious rubber safety shoes

Respiratory protection:

In case of inadequate ventilation wear respiratory protection.

SECTION 9: Physical and chemical properties

9.1. Information on basic physical and chemical properties

Physical state	: Liquid
Color	: Light yellow
Odor	: characteristic
Odor threshold	: No data available
pH	: 12
Melting point	: No data available
Freezing point	: No data available
Boiling point	: No data available
Flash point	: > 100 °C
Relative evaporation rate (butyl acetate=1)	: No data available
Flammability (solid, gas)	: No data available
Vapor pressure	: 0.1 hPa
Relative vapor density at 20 °C	: No data available
Relative density	: No data available
Specific gravity / density	: 1 g/cm ³
Solubility	: Partly soluble in water.
Log Pow	: No data available
Auto-ignition temperature	: 380 °C
Decomposition temperature	: No data available
Viscosity, kinematic	: 150 mm ² /s
Viscosity, dynamic	: 150 mPa.s

RAKU® TOOL EH-2904-1 Hardener

Safety Data Sheet

according to Federal Register / Vol. 77, No. 58 / Monday, March 26, 2012 / Rules and Regulations

Explosion limits	: LEL: 1.3 vol % UEL: 13 vol %
Explosive properties	: No data available
Oxidizing properties	: No data available

9.2. Other information

No additional information available

SECTION 10: Stability and reactivity

10.1. Reactivity

No additional information available

10.2. Chemical stability

Stable under normal conditions of use.

10.3. Possibility of hazardous reactions

Strong exothermic reaction with: Acids.

10.4. Conditions to avoid

Do no overheat. Protect against direct sun radiation.

10.5. Incompatible materials

Acids. Bases. Oxidizing agents.

10.6. Hazardous decomposition products

Carbonoxides. Nitrogen oxides (NOx). Thermal decomposition can lead to release of irritating and toxic gases and vapors. Ammonia.

SECTION 11: Toxicological information

11.1. Information on toxicological effects

Acute toxicity (oral)	: Oral: Harmful if swallowed.
Acute toxicity (dermal)	: Not classified
Acute toxicity (inhalation)	: Inhalation: Harmful if inhaled.

ATE US (oral)	1035.6 mg/kg body weight
ATE US (vapors)	17.5 mg/l
ATE US (dust, mist)	1.5 mg/l/4h

m-xylene-a,a-diamine (1477-55-0)	
LD50 oral rat	≈ 660 mg/kg
LD50 dermal rabbit	≈ 2 g/kg
LC50 inhalation rat (mg/l)	1.9496 mg/l 4-Hour-Vapor
LC50 inhalation rat (ppm)	≈ 700 ppm/1h
ATE US (oral)	500 mg/kg body weight
ATE US (dermal)	1100 mg/kg body weight
ATE US (gases)	4500 ppmV/4h
ATE US (vapors)	1.95 mg/l/4h
ATE US (dust, mist)	1.95 mg/l/4h

3-aminomethyl-3,5,5-trimethylcyclohexylamine (2855-13-2)	
LD50 oral rat	1030 mg/kg
LD50 dermal rat	> 2000 mg/kg
LC50 inhalation rat (mg/l)	> 5.01 mg/l/4h
ATE US (oral)	1030 mg/kg body weight
ATE US (dermal)	1100 mg/kg body weight
ATE US (vapors)	3 mg/l/4h

benzyl alcohol (100-51-6)	
LD50 oral rat	1230 mg/kg
LD50 dermal rabbit	2000 mg/kg
LC50 inhalation rat (mg/l)	> 4.178 ml/m ³
ATE US (oral)	1230 mg/kg body weight
ATE US (dermal)	2000 mg/kg body weight
ATE US (gases)	4500 ppmV/4h

RAKU® TOOL EH-2904-1 Hardener

Safety Data Sheet

according to Federal Register / Vol. 77, No. 58 / Monday, March 26, 2012 / Rules and Regulations

benzyl alcohol (100-51-6)	
ATE US (vapors)	11 mg/l/4h
ATE US (dust, mist)	1.5 mg/l/4h

trimethylhexane-1,6-diamine (25620-58-0)	
ATE US (oral)	500 mg/kg body weight

Skin corrosion/irritation	: Causes severe skin burns and eye damage. pH: 12
Serious eye damage/irritation	: Eye damage, category 1, implicit pH: 12
Respiratory or skin sensitization	: May cause an allergic skin reaction.
Germ cell mutagenicity	: Not classified (Based on available data, the classification criteria are not met)
Carcinogenicity	: Not classified (Based on available data, the classification criteria are not met)
Reproductive toxicity	: Not classified (Based on available data, the classification criteria are not met)
Specific target organ toxicity – single exposure	: Not classified

3-aminomethyl-3,5,5-trimethylcyclohexylamine (2855-13-2)	
Specific target organ toxicity – single exposure	May cause respiratory irritation.

Specific target organ toxicity – repeated exposure	: Not classified
Aspiration hazard	: Not classified
Viscosity, kinematic	: 150 mm ² /s
Potential Adverse human health effects and symptoms	: Causes severe skin burns. Causes serious eye damage.

SECTION 12: Ecological information

12.1. Toxicity

3-aminomethyl-3,5,5-trimethylcyclohexylamine (2855-13-2)	
LC50 fish 1	110 mg/l 96 hours, Leuciscus
EC50 Daphnia 1	23 mg/l 48 hours, Daphnia magna
EC50 other aquatic organisms 1	> 50 mg/l 72 hours, Scenedesmus subspicatus
NOEC (chronic)	3 mg/l 21 days; Daphnia magna

benzyl alcohol (100-51-6)	
LC50 fish 1	460 mg/l 96 hours, Fathead minnow
EC50 Daphnia 1	202 mg/l 48 hours,
EC50 other aquatic organisms 1	700 mg/l 72 hours, Algae

12.2. Persistence and degradability

3-aminomethyl-3,5,5-trimethylcyclohexylamine (2855-13-2)	
Persistence and degradability	Not readily biodegradable in water.

12.3. Bioaccumulative potential

3-aminomethyl-3,5,5-trimethylcyclohexylamine (2855-13-2)	
Bioaccumulative potential	Low potential for bioaccumulation (Log Kow < 4).

benzyl alcohol (100-51-6)	
Log Pow	1.05

12.4. Mobility in soil

3-aminomethyl-3,5,5-trimethylcyclohexylamine (2855-13-2)	
Surface tension	3.47 N/m
Log Koc	2.97 (log Koc, Other, QSAR)

RAKU® TOOL EH-2904-1 Hardener

Safety Data Sheet

according to Federal Register / Vol. 77, No. 58 / Monday, March 26, 2012 / Rules and Regulations

3-aminomethyl-3,5,5-trimethylcyclohexylamine (2855-13-2)

Ecology - soil : Low potential for adsorption in soil.

12.5. Other adverse effects

No additional information available

SECTION 13: Disposal considerations

13.1. Disposal methods

- Waste treatment methods : Where possible recycling is preferred to disposal.
Can be incinerated, when in compliance with local regulations. Waste from residues/unused products: Should not be released into the environment. Dispose of in accordance with local regulations. Dispose of waste in accordance with environmental legislation.
- Product/Packaging disposal recommendations : Contaminated packagings are to be treated like the product itself.
Contaminated packaging should be emptied as far as possible and after appropriate cleansing may be taken for reuse.
Empty containers should be taken for local recycling, recovery or waste disposal.

SECTION 14: Transport information

Department of Transportation (DOT)

In accordance with DOT

- Transport document description : 2735 Environmentally hazardous substances, liquid, n.o.s. (AMINES, LIQUID, CORROSIVE,N.O.S.), 8, II
- UN-No.(DOT) : 2735
- Proper Shipping Name (DOT) : Environmentally hazardous substances, liquid, n.o.s.
AMINES, LIQUID, CORROSIVE,N.O.S.,
- Class (DOT) : 8 - Class 8 - Corrosive material 49 CFR 173.136
- Packing group (DOT) : II - Medium Danger
- Hazard labels (DOT) : 8 - Corrosive



- DOT Quantity Limitations Passenger aircraft/rail (49 CFR 173.27) : No limit
- Other information : No supplementary information available.

Transportation of Dangerous Goods

- Transport document description : 2735 AMINES, LIQUID, CORROSIVE,N.O.S., (3-aminomethyl-3,5,5-trimethylcyclohexylamine, trimethylhexane-1,6-diamine), 8, II
- UN-No. (TDG) : 2735
- Proper Shipping Name (Transportation of Dangerous Goods) : AMINES, LIQUID, CORROSIVE,N.O.S.,
- TDG Primary Hazard Classes : 8 - Class 8 - Corrosives
- Packing group : II - Medium Danger

Transport by sea

- Transport document description (IMDG) : UN 2735 ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S. (AMINES, LIQUID, CORROSIVE,N.O.S.,3-aminomethyl-3,5,5-trimethylcyclohexylamine, trimethylhexane-1,6-diamine), 8, II
- UN-No. (IMDG) : 2735
- Proper Shipping Name (IMDG) : ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S.
- Class (IMDG) : 8 - Corrosive substances

RAKU® TOOL EH-2904-1 Hardener

Safety Data Sheet

according to Federal Register / Vol. 77, No. 58 / Monday, March 26, 2012 / Rules and Regulations

Packing group (IMDG) : II - substances presenting medium danger

Air transport

Transport document description (IATA) : UN 2735 Aviation regulated liquid, n.o.s. (AMINES, LIQUID, CORROSIVE,N.O.S.,3-aminomethyl-3,5,5-trimethylcyclohexylamine, trimethylhexane-1,6-diamine), 9, II

UN-No. (IATA) : 2735

Proper Shipping Name (IATA) : Aviation regulated liquid, n.o.s.

Class (IATA) : 8 - Corrosives

Packing group (IATA) : II - Medium Danger

SECTION 15: Regulatory information

15.1. US Federal regulations

All components of this product are listed, or excluded from listing, on the United States Environmental Protection Agency Toxic Substances Control Act (TSCA) inventory

15.2. International regulations

CANADA

m-xylene-a,a-diamine (1477-55-0)

Listed on the Canadian DSL (Domestic Substances List)

3-aminomethyl-3,5,5-trimethylcyclohexylamine (2855-13-2)

Listed on the Canadian DSL (Domestic Substances List)

benzyl alcohol (100-51-6)

Listed on the Canadian DSL (Domestic Substances List)

trimethylhexane-1,6-diamine (25620-58-0)

Listed on the Canadian DSL (Domestic Substances List)

EU-Regulations

No additional information available

National regulations

No additional information available

15.3. US State regulations

California Proposition 65 - This product does not contain any substances known to the state of California to cause cancer, developmental and/or reproductive harm

Component	State or local regulations
m-xylene-a,a-diamine (1477-55-0)	U.S. - New Jersey - Right to Know Hazardous Substance List; U.S. - Pennsylvania - RTK (Right to Know) List
3-aminomethyl-3,5,5-trimethylcyclohexylamine(2855-13-2)	U.S. - New Jersey - Right to Know Hazardous Substance List
benzyl alcohol(100-51-6)	U.S. - Pennsylvania - RTK (Right to Know) List
trimethylhexane-1,6-diamine(25620-58-0)	U.S. - New Jersey - Right to Know Hazardous Substance List

SECTION 16: Other information

according to Federal Register / Vol. 77, No. 58 / Monday, March 26, 2012 / Rules and Regulations

Revision date : 04/19/2022

RAKU® TOOL EH-2904-1 Hardener

Safety Data Sheet

according to Federal Register / Vol. 77, No. 58 / Monday, March 26, 2012 / Rules and Regulations

Full text of H-phrases:

H302	Harmful if swallowed
H312	Harmful in contact with skin
H314	Causes severe skin burns and eye damage
H317	May cause an allergic skin reaction
H318	Causes serious eye damage
H331	Toxic if inhaled
H332	Harmful if inhaled
H335	May cause respiratory irritation
H412	Harmful to aquatic life with long lasting effects

SDS US (GHS HazCom 2012)

This information is based on our current knowledge and is intended to describe the product for the purposes of health, safety and environmental requirements only. It should not therefore be construed as guaranteeing any specific property of the product