SECTION 1: Identification of the substance/mixture and of the company/undertaking

1.1. Product identifier

RAKU® TOOL EH-2973 Hardener

1.2. Relevant identified uses of the substance or mixture and uses advised against

Use of the substance/mixture

model building material
Hardener

1.3. Details of the supplier of the safety data sheet

Company name:	Suter Kunststoffe AG	
Street:	Aefligenstrasse 3	
Place:	CH-3312 Fraubrunnen	
Telephone:	+41 31 763 60 60	Telefax: +41 31 763 60 61
e-mail:	info@swiss-composite.ch	

1.4. Emergency telephone number:

ToxInfo Suisse, Tel. 145
International +41 44 251 51 51

SECTION 2: Hazards identification

2.1. Classification of the substance or mixture

Regulation (EC) No. 1272/2008

Hazard categories:
Acute toxicity: Acute Tox. 4
Skin corrosion/irritation: Skin Corr. 1B
Serious eye damage/eye irritation: Eye Dam. 1
Respiratory or skin sensitisation: Skin Sens. 1
Specific target organ toxicity - repeated exposure: STOT RE 2
Hazard Statements:
Harmful if swallowed.
Causes severe skin burns and eye damage.
Causes serious eye damage.
May cause an allergic skin reaction.
May cause damage to organs through prolonged or repeated exposure.

2.2. Label elements

Regulation (EC) No. 1272/2008

Hazard components for labelling

4,4'-methylenebis(cyclohexylamine);
2,4,6-tris(dimethylaminomethyl)phenol;
Triethylenetetramine

Signal word: Danger

Pictograms:

Hazard statements

H302	Harmful if swallowed.
H314	Causes severe skin burns and eye damage.
H317	May cause an allergic skin reaction.
H373	May cause damage to organs through prolonged or repeated exposure.

Precautionary statements

P260	Do not breathe dust/fume/gas/mist/vapours/spray.
P280	Wear protective gloves/protective clothing/eye protection/face protection.
P303+P361+P353	IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water or shower.

P305+P351+P338	IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P310	Immediately call a POISON CENTER/doctor.
P501	Dispose of contents/container to an appropriate recycling or disposal facility.

2.3. Other hazards

None known

SECTION 3: Composition/information on ingredients

3.2. Mixtures

Chemical characterization

Amine hardener

Hazardous components

CAS No	Chemical name			Quantity
	EC No	Index No	REACH No	
	Classification according to Regulation (EC) No. 1272/2008 [CLP]			
1761-71-3	4,4'-methylenebis(cyclohexylamine)			85 - < 90 %
	217-168-8		01-2119541673-38	
	Acute Tox. 4, Skin Corr. 1B, Skin Sens. 1B, STOT RE 2; H302 H314 H317 H373			
90-72-2	2,4,6-tris(dimethylaminomethyl)phenol			5 - < 10 %
	202-013-9	603-069-00-0	01-2119560597-27	
	Acute Tox. 4, Skin Corr. 1B, Eye Dam. 1; H302 H314 H318			
90640-67-8	Triethylenetetramine			5 - < 10 %
	203-950-6		01-2119487919-13	
	Acute Tox. 4, Acute Tox. 4, Skin Corr. 1B, Skin Sens. 1, Aquatic Chronic 3; H312 H302 H314 H317 H412			

Full text of H and EUH statements: see section 16.

Further Information

none

SECTION 4: First aid measures

4.1. Description of first aid measures

General information

Remove contaminated, saturated clothing immediately.
Remove affected person from the danger area and lay down.
In the event of persistent symptoms receive medical treatment.

After inhalation

Move to fresh air in case of accidental inhalation of vapours or decomposition products.
In case of respiratory tract irritation, consult a physician.

After contact with skin

Wash with plenty of soap and water.
If skin irritation or rash occurs: Get medical advice/attention.

After contact with eyes

In case of contact with eyes flush immediately with plenty of flowing water for 10 to 15 minutes holding eyelids apart and consult an ophthalmologist.

After ingestion

Rinse mouth immediately and drink plenty of water.
Never give anything by mouth to an unconscious person or a person with cramps.
Call a physician immediately.
Do NOT induce vomiting.

4.2. Most important symptoms and effects, both acute and delayed

There are no data available on the mixture itself.

4.3. Indication of any immediate medical attention and special treatment needed

There are no data available on the mixture itself.

SECTION 5: Firefighting measures

5.1. Extinguishing media

Suitable extinguishing media

Co-ordinate fire-fighting measures to the fire surroundings.
Foam, Carbon dioxide (CO2), Dry extinguishing powder, Water spray jet

Unsuitable extinguishing media

Full water jet

5.2. Special hazards arising from the substance or mixture

In case of fire may be liberated:
Nitrogen oxides (NOx), Carbon monoxide, Carbon dioxide (CO2)

5.3. Advice for firefighters

Wear a self-contained breathing apparatus and chemical protective clothing.

Additional information

Collect contaminated fire extinguishing water separately. Do not allow entering drains or surface water.

SECTION 6: Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

In case of vapour formation use respirator.
Provide adequate ventilation.
Keep away from sources of ignition - No smoking.

6.2. Environmental precautions

Clear contaminated areas thoroughly.
Do not allow to enter into surface water or drains.
Local authorities should be advised if significant spillages cannot be contained.

6.3. Methods and material for containment and cleaning up

Absorb with liquid-binding material (e.g. sand, diatomaceous earth, acid- or universal binding agents).
Take up mechanically, placing in appropriate containers for disposal.

6.4. Reference to other sections

Wear personal protection equipment (refer to section 8).

SECTION 7: Handling and storage

7.1. Precautions for safe handling

Advice on safe handling

Keep container tightly closed.
Provide adequate ventilation.
Avoid contact with skin, eyes and clothes.

Advice on protection against fire and explosion

No special fire protection measures are necessary.

7.2. Conditions for safe storage, including any incompatibilities

Requirements for storage rooms and vessels

Keep/Store only in original container.
Keep container tightly closed in a cool, well-ventilated place.
Protect against direct sunlight.

Further information on storage conditions

Keep away from food, drink and animal feedingstuffs.

7.3. Specific end use(s)

There are no data available on the mixture itself.

SECTION 8: Exposure controls/personal protection

8.1. Control parameters

DNEL/DMEL values

CAS No	Substance			
DNEL type		Exposure route	Effect	Value
90-72-2	2,4,6-tris(dimethylaminomethyl)phenol			
Worker DNEL, long-term		inhalation	systemic	0,31 mg/m³
90640-67-8	Triethylenetetramine			
Worker DNEL, long-term		inhalation	systemic	1 mg/m³
Worker DNEL, acute		inhalation	systemic	5380 mg/m³
Worker DNEL, long-term		dermal	systemic	0,57 mg/kg bw/day

PNEC values

CAS No	Substance	
Environmental compartment		Value
90-72-2	2,4,6-tris(dimethylaminomethyl)phenol	
Freshwater		0,084 mg/l
Freshwater (intermittent releases)		0,84 mg/l
Marine water		0,0084 mg/l
Micro-organisms in sewage treatment plants (STP)		0,2 mg/l

8.2. Exposure controls

Appropriate engineering controls

Provide adequate ventilation as well as local exhaustion at critical locations.

Protective and hygiene measures

Do not breathe vapour.
Wash hands before breaks and after work.
Do not eat, drink or smoke when using this product.
Avoid contact with skin, eyes and clothes.
Remove and wash contaminated clothes before re-use.

Eye/face protection

Tightly fitting goggles

Hand protection

Protective gloves resistant to chemicals made off nitrile, Minimum coat thickness 0.4 mm, Permeation resistance (wear duration) approx. 480 minutes, i.e. protective glove <Camatril Velours 730> made by www.kcl.de. ,
butyl rubber (Butyl) - = 0.7 mm thickness; i.e. < Butoject 898> made by KCL.
This recommendation refers exclusively to the chemical compatibility and the lab test conforming to EN 374 carried out under lab conditions.
Requirements can vary as a function of the use. Therefore it is necessary to adhere additionally to the recommendations given by the manufacturer of protective gloves.

Skin protection

Wear suitable protective clothing.
Safety Shoes

Respiratory protection

In case of insufficient ventilation, wear suitable respiratory equipment.
If product is sprayed, use fresh-air breathing apparatus or (only short-term use) a combination filter A2-P2.

Environmental exposure controls

There are no data available on the mixture itself.

SECTION 9: Physical and chemical properties

9.1. Information on basic physical and chemical properties

Physical state:	Liquid
Colour:	light yellow
Odour:	not determined
pH-Value:	not determined

Changes in the physical state

Melting point:	not determined
Initial boiling point and boiling range:	not determined
Flash point:	> 100 °C

Flammability

Solid:	not applicable
Gas:	not applicable

Explosive properties

Product does not present an explosion hazard.

Lower explosion limits:	not determined
Upper explosion limits:	not determined
Ignition temperature:	not determined
Decomposition temperature:	> 200 °C

Oxidizing properties

not applicable

Vapour pressure: (at 20 °C)	not determined
Density:	0,94 g/cm³
Water solubility: (at 20 °C)	Immiscible
Partition coefficient:	not determined
Viscosity / dynamic:	500 - 700 mPa·s
Vapour density:	not determined
Evaporation rate:	not determined

SECTION 10: Stability and reactivity

10.1. Reactivity

The product is stable under storage at normal ambient temperatures.

10.2. Chemical stability

The product is stable under storage at normal ambient temperatures.

10.3. Possibility of hazardous reactions

Exothermic reaction with: Acids

10.4. Conditions to avoid

To avoid thermal decomposition, do not overheat.
Protect against direct sunlight.

10.5. Incompatible materials

Oxidising agent, strong, Acids, Alkali (lye)

10.6. Hazardous decomposition products

Ammonia , Nitrogen oxides (NOx) , Carbon monoxide, Carbon dioxide

Further information

The product is stable under storage at normal ambient temperatures.

SECTION 11: Toxicological information

11.1. Information on toxicological effects

Acute toxicity

Harmful if swallowed.

ATEmix calculated

ATE (oral) 690,6 mg/kg

CAS No	Chemical name				
	Exposure route	Dose	Species	Source	Method
1761-71-3	4,4'-methylenebis(cyclohexylamine)				
	oral	LD50 625 mg/kg	Rat		
	dermal	LD50 2110 mg/kg	Rabbit		
90-72-2	2,4,6-tris(dimethylaminomethyl)phenol				
	oral	LD50 2169 mg/kg	Rat		
	dermal	LD50 > 971 mg/kg	Rat		
90640-67-8	Triethylenetetramine				
	oral	LD50 1716 mg/kg	Rat		
	dermal	LD50 1465 mg/kg	Rabbit		

Irritation and corrosivity

Causes severe skin burns and eye damage.

Sensitising effects

May cause an allergic skin reaction. (4,4'-methylenebis(cyclohexylamine); Triethylenetetramine)

Carcinogenic/mutagenic/toxic effects for reproduction

Based on available data, the classification criteria are not met.

STOT-single exposure

Based on available data, the classification criteria are not met.

STOT-repeated exposure

May cause damage to organs through prolonged or repeated exposure. (4,4'-methylenebis(cyclohexylamine))

Aspiration hazard

Based on available data, the classification criteria are not met.

Specific effects in experiment on an animal

There are no data available on the mixture itself.

Additional information on tests

There are no data available on the mixture itself.

Practical experience

Observations relevant to classification

There are no data available on the mixture itself.

Other observations

There are no data available on the mixture itself.

SECTION 12: Ecological information

12.1. Toxicity

There are no data available on the mixture itself.

CAS No	Chemical name						
	Aquatic toxicity	Dose		[h] | [d]	Species	Source	Method
1761-71-3	4,4'-methylenebis(cyclohexylamine)						
	Acute fish toxicity	LC50 mg/l	> 100	96 h	Leuciscus idus (golden orfe)		
	Acute algae toxicity	ErC50 mg/l	140 -200	72 h			
	Acute crustacea toxicity	EC50 mg/l	6,84	48 h	Daphnia magna (Big water flea)		
90-72-2	2,4,6-tris(dimethylaminomethyl)phenol						
	Acute fish toxicity	LC50	175 mg/l	96 h	Cyprinus carpio (Common Carp)		
	Acute algae toxicity	ErC50	84 mg/l	72 h	Desmodesmus subspicatus	ECHA	
	Acute crustacea toxicity	EC50	718 mg/l	48 h	Daphnia magna (Big water flea)	ECHA	
90640-67-8	Triethylenetetramine						
	Acute fish toxicity	LC50	330 mg/l	96 h	Pimephales promelas (fathead minnow)		
	Acute crustacea toxicity	EC50 mg/l	31,1	48 h	Daphnia magna (Big water flea)		

12.2. Persistence and degradability

There are no data available on the mixture itself.

12.3. Bioaccumulative potential

There are no data available on the mixture itself.

12.4. Mobility in soil

There are no data available on the mixture itself.

12.5. Results of PBT and vPvB assessment

The substance in the mixture does not meet the PBT/vPvB criteria according to REACH, annex XIII.

12.6. Other adverse effects

There are no data available on the mixture itself.

Further information

Do not allow to enter into surface water or drains.

SECTION 13: Disposal considerations

13.1. Waste treatment methods

Advice on disposal

Where possible recycling is preferred to disposal.
Can be incinerated, when in compliance with local regulations.
It is not possible to give this product a waste code number according to the European waste catalogue because only the intended use of the user consents the assignment of a specific code number.
The waste code number must be agreed with the disposer / manufacturer / competent authority.

Contaminated packaging

Handle contaminated packages in the same way as the substance itself.
Contaminated packages must be completely emptied and can be re-used following proper cleaning.
Packing which cannot be properly cleaned must be disposed of.

SECTION 14: Transport information

Land transport (ADR/RID)

14.1. UN number: UN 2735

14.2. UN proper shipping name: AMINES, LIQUID, CORROSIVE, N.O.S. (4,4'-methylenebis(cyclohexylamine))

14.3. Transport hazard class(es): 8

14.4. Packing group:	II
Hazard label:	8

Classification code:	C7
Special Provisions:	274
Limited quantity:	1 L
Excepted quantity:	E2
Transport category:	2
Hazard No:	80
Tunnel restriction code:	E

Marine transport (IMDG)

14.1. UN number:	UN 2735
14.2. UN proper shipping name:	AMINES, LIQUID, CORROSIVE, N.O.S. (4,4'-methylenebis(cyclohexylamine))
14.3. Transport hazard class(es):	8
14.4. Packing group:	II
Hazard label:	8

Marine pollutant:	No
Special Provisions:	274
Limited quantity:	1 L
Excepted quantity:	E2
EmS:	F-A, S-B

Air transport (ICAO-TI/IATA-DGR)

14.1. UN number:	UN 2735
14.2. UN proper shipping name:	AMINES, LIQUID, CORROSIVE, N.O.S. (4,4'-methylenebis(cyclohexylamine))
14.3. Transport hazard class(es):	8
14.4. Packing group:	II
Hazard label:	8

Special Provisions:	A3 A803
Limited quantity Passenger:	0.5 L
Passenger LQ:	Y840
Excepted quantity:	E2
IATA-packing instructions - Passenger:	851
IATA-max. quantity - Passenger:	1 L
IATA-packing instructions - Cargo:	855
IATA-max. quantity - Cargo:	30 L

14.5. Environmental hazards

ENVIRONMENTALLY HAZARDOUS: no

14.6. Special precautions for user

There are no data available on the mixture itself.

14.7. Transport in bulk according to Annex II of Marpol and the IBC Code

There are no data available on the mixture itself.

Other applicable information

There are no data available on the mixture itself.

SECTION 15: Regulatory information

15.1. Safety, health and environmental regulations/legislation specific for the substance or mixture

EU regulatory information

Additional information

This product does not contain substances of very high concern > 0,1% (Regulation (EC) No 1907/2006 (REACH), Article 57).

National regulatory information

Water contaminating class (D): 3 - highly water contaminating

Additional information

"ZH 1/129 ""Data Sheet: Irritating substances / corrosive substances (M 004)"""

15.2. Chemical safety assessment

For the following substances of this mixture a chemical safety assessment has been carried out:
4,4'-methylenebis(cyclohexylamine)
Triethylenetetramine

SECTION 16: Other information

Changes

This data sheet contains changes from the previous version in section(s) 3, 11

Classification for mixtures and used evaluation method according to Regulation (EC) No. 1272/2008 [CLP]

Classification	Classification procedure
Acute Tox. 4; H302	Calculation method
Skin Corr. 1B; H314	Calculation method
Eye Dam. 1; H318	Calculation method
Skin Sens. 1; H317	Calculation method
STOT RE 2; H373	Calculation method

Relevant H and EUH statements (number and full text)

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.
H373	May cause damage to organs through prolonged or repeated exposure.
H412	Harmful to aquatic life with long lasting effects.

Further Information

Classification for mixtures and used evaluation method according to regulation (EC) No 1272/2008 [CLP]

Data of items 4 to 8, as well as 10 to 12, do partly not refer to the use and the regular employing of the product (in this sense consult information on use and on product), but to liberation of major amounts in case of accidents and irregularities.
The information describes exclusively the safety requirements for the product (s) and is based on the present level of our knowledge.
The delivery specifications are contained in the corresponding product sheet.
This data does not constitute a guarantee for the characteristics of the product(s) as defined by the legal warranty regulations.

Key literature references and sources for data Regulation (EC) No 1907/2006; Regulation (EC) No. 1272/2008

(The data for the hazardous ingredients were taken respectively from the last version of the sub-contractor's safety data sheet.)