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RENGEL® 4026 US

Version Revision Date: 1.1 11/20/2018

Product name

: SDS Number: 400001012676 Date of last issue: 02/14/2017 Date of first issue: 02/14/2017

SECTION 1. IDENTIFICATION

Manufacturer or supplier's details					
Company name of supplier Address	 Huntsman Advanced Materials Americas LLC P.O. Box 4980 The Woodlands, TX 77387 United States of America (USA) 				
Telephone	: Non-Emergency: (800) 257-5547				
E-mail address of person responsible for the SDS	: SDS@huntsman.com				
Emergency telephone number	: Chemtrec: (800) 424-9300 or (703) 527-3887				
Recommended use of the chemical and restrictions on use					
Recommended use	: Adhesives				

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SECTION 2. HAZARDS IDENTIFICATION

GHS classification in accordance with 29 CFR 1910.1200 Skin irritation : Category 2 Serious eye damage : Category 1 Skin sensitisation : Category 1 Short-term (acute) aquatic : Category 2 hazard Long-term (chronic) aquatic : Category 2 hazard GHS label elements Hazard pictograms : Signal word : Danger Hazard statements : H315 Causes skin irritation. H317 May cause an allergic skin reaction. H318 Causes serious eye damage. H411 Toxic to aquatic life with long lasting effects. Precautionary statements : Prevention:





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SAFETY DATA SHEET





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P261 Avoid breathing dust/ fume/ gas/ mist/ vapours/ spray. P264 Wash skin thoroughly after handling. P272 Contaminated work clothing should not be allowed out of the workplace. P273 Avoid release to the environment. P280 Wear protective gloves/ eye protection/ face protection. Response: P302 + P352 IF ON SKIN: Wash with plenty of soap and water. P305 + P351 + P338 + P310 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. P333 + P313 If skin irritation or rash occurs: Get medical advice/ attention. P362 Take off contaminated clothing and wash before reuse. P391 Collect spillage. Storage: Not available Disposal: P501 Dispose of contents/container to an approved facility in accordance with local, regional, national and international regulations.

Other hazards

None known.

SECTION 3. COMPOSITION/INFORMATION ON INGREDIENTS

Substance / Mixture : Mixture

Hazardous components

Chemical name	CAS-No.	Concentration (% w/w)
aluminium	7429-90-5	30 - 50
2,2'-[(1-methylethylidene)bis(4,1- phenyleneoxymethylene)]bisoxirane	1675-54-3	30 - 50
Epoxyphenol Novolac Resin	28064-14-4	10 - 20
1,4-bis(2,3-epoxypropoxy)butane	2425-79-8	5 - 10
p-tert-butylphenyl 1-(2,3-epoxy)propyl ether	3101-60-8	1 - 2.5
quartz (SiO2)	14808-60-7	0.1 - 1

The specific chemical identity and/or exact percentage (concentration) of composition may be withheld as a trade secret.

Both 25068-38-6 and 1675-54-3 can be used to describe the epoxy resin which is produced through the reaction of bisphenol A and epichlorohydrin

SECTION 4. FIRST AID MEASURES

General advice

 Move out of dangerous area. Consult a physician. Show this safety data sheet to the doctor in attendance. Do not leave the victim unattended.





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lf inha	aled	advice.	, place in recovery position and seek medical ersist, call a physician.
In cas	se of skin contact	If on skin, rinse	persists, call a physician. e well with water. emove clothes.
In ca	se of eye contact	tissue damage In the case of of water and s Continue rinsir Remove conta Protect unharr Keep eye wide	
lf swa	allowed	Never give any If symptoms p	
	important symptoms ffects, both acute and ed	: None known.	

SECTION 5. FIREFIGHTING MEASURES

Unsuitable extinguishing media	:	High volume water jet
Specific hazards during firefighting	:	Do not allow run-off from fire fighting to enter drains or water courses.
Hazardous combustion products	:	No hazardous combustion products are known
Specific extinguishing methods	:	No data is available on the product itself.
Further information	:	Collect contaminated fire extinguishing water separately. This must not be discharged into drains. Fire residues and contaminated fire extinguishing water must be disposed of in accordance with local regulations.
Special protective equipment for firefighters	:	Wear self-contained breathing apparatus for firefighting if necessary.

SECTION 6. ACCIDENTAL RELEASE MEASURES





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р	Personal precautions, protective equipment and emergency procedures	: Use personal protective equipment.	
E	nvironmental precautions	 Prevent product from entering drains. Prevent further leakage or spillage if safe to do so. If the product contaminates rivers and lakes or drai respective authorities. 	ns inform
	Nethods and materials for containment and cleaning up	: Soak up with inert absorbent material (e.g. sand, si acid binder, universal binder, sawdust). Keep in suitable, closed containers for disposal.	lica gel,

SECTION 7. HANDLING AND STORAGE

Advice on protection against fire and explosion	:	Normal measures for preventive fire protection.
Advice on safe handling	:	Do not breathe vapours/dust. Avoid exposure - obtain special instructions before use. Avoid contact with skin and eyes. For personal protection see section 8. Smoking, eating and drinking should be prohibited in the application area. To avoid spills during handling keep bottle on a metal tray. Dispose of rinse water in accordance with local and national regulations. Persons susceptible to skin sensitisation problems or asthma, allergies, chronic or recurrent respiratory disease should not be employed in any process in which this mixture is being used.
Conditions for safe storage	:	Keep container tightly closed in a dry and well-ventilated place. Containers which are opened must be carefully resealed and kept upright to prevent leakage. Observe label precautions. Electrical installations / working materials must comply with the technological safety standards.
Further information on storage stability	:	No decomposition if stored and applied as directed.

SECTION 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Components with workplace control parameters

Components	CAS-No.	Value type	Control	Basis
		(Form of	parameters /	
		exposure)	Permissible	
			concentration	
aluminium	7429-90-5	TWA (total	15 mg/m3	OSHA Z-1
		dust)	(Aluminium)	
		TWA	5 mg/m3	OSHA Z-1
		(respirable	(Aluminium)	





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				fraction)		
				TWA (Respirable fraction)	1 mg/m3 (Aluminium)	ACGIH
				TWA (total dust)	15 mg/m3 (Aluminium)	OSHA Z-1
				TWA (respirable fraction)	5 mg/m3 (Aluminium)	OSHA Z-1
				TWA (Respirable fraction)	1 mg/m3 (Aluminium)	ACGIH
	nal protective equip	ment				
Hand Rema	protection rks			for a specific w icers of the prot	orkplace should be ective gloves.	discussed
Eye pi	rotection	Tigh Wei	ntly fitting s	tle with pure was safety goggles ield and protecti	ter ve suit for abnorma	I processing
Skin a	ind body protection	Cho		protection acco	rding to the amount us substance at the	
Hygiei	ne measures	Wh	en using d	o not eat or drin o not smoke. pefore breaks ar	ik. nd at the end of wo	rkday.

SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance	:	liquid
Colour	:	grey
Odour	:	No data is available on the product itself.
Odour Threshold	:	No data is available on the product itself.
pН	:	No data is available on the product itself.
Freezing point	:	No data is available on the product itself.
Melting point	:	No data is available on the product itself.
Boiling point	:	> 350.01 °F / > 176.67 °C
Flash point	:	> 300.00 °F / > 148.89 °C Method: Pensky-Martens closed cup
Evaporation rate	:	No data is available on the product itself.
Flammability (solid, gas)	:	No data is available on the product itself.





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Flam	mability (liquids)	:	No data is availa	able on the product itself.
	er explosion limit / Upper nability limit	:	No data is availa	able on the product itself.
	er explosion limit / Lower nability limit	:	No data is availa	able on the product itself.
Vapo	our pressure	:	0.01333 hPa (77	7 °F / 25 °C)
Relat	live vapour density	:	No data is availa	able on the product itself.
Relat	tive density	:	1.49	
Dens	ity	:	No data is availa	able on the product itself.
	bility(ies) ater solubility	:	negligible	
So	lubility in other solvents	:	No data is availa	able on the product itself.
	tion coefficient: n-	:	No data is availa	able on the product itself.
	ool/water ignition temperature	:	No data is availa	able on the product itself.
Therr	mal decomposition	:	No data is availa	able on the product itself.
	Accelerating mposition temperature T)	:	No data is availa	able on the product itself.
Visco	osity	:	No data is availa	able on the product itself.
Explo	osive properties	:	No data is availa	able on the product itself.
Oxidi	zing properties	:	No data is availa	able on the product itself.
Partic	cle size	:	No data is availa	able on the product itself.

SECTION 10. STABILITY AND REACTIVITY

Reactivity	: No decomposition if stored and applied as directed.
Chemical stability	: No decomposition if stored and applied as directed.
Possibility of hazardous reactions	: No decomposition if stored and applied as directed.
Conditions to avoid	: No data available

SECTION 11. TOXICOLOGICAL INFORMATION

Information on likely routes of : No data is available on the product itself.





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	exposu	re					
	Acute t	oxicity					
				Acute toxicity estin Method: Calculation	mate : > 5,000 mg/kg on method		
				: Acute toxicity estimate: 130.53 mg/l Exposure time: 4 h Test atmosphere: vapour Method: Calculation method			
	Acute d Product	lermal toxicity - t	:	Acute toxicity esti Method: Calculation	mate : > 5,000 mg/kg on method		
		oxicity (other routes of stration)	:	No data available			
	Skin co	prrosion/irritation					
	Produc Remark	: <u>t:</u> (s: Extremely corrosive	an	d destructive to tiss	sue.		
	Serious	s eye damage/eye irri	tati	on			
	Produc	·+·					
		ks: May cause irreversi	ble	eye damage.			
	-	atory or skin sensitis	atio	'n			
	Produc Remark	: <u>t:</u> <s: causes="" sensitisatio<="" td=""><td>n.</td><td></td><td></td></s:>	n.				
	Assess	ment:	No	o data available			
		ell mutagenicity					
	<u>Components:</u> 2,2'-[(1-methylethylidene)bis(4,1- Genotoxicity in vitro				on: with and without metabolic activation		
				Concentration: 0 - 5000 ug/plate Metabolic activation: with and without metabolic activatio Method: OECD Test Guideline 471 Result: positive			
		henol Novolac Resin: xicity in vitro	:	: Metabolic activation: with and without metabolic activati Result: positive			
				Concentration: 0 -	5000 ug/plate		





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Versi 1.1	on Revision Dat 11/20/2018	te: SDS Number: 40000101267		st issue: 02/14/2017 st issue: 02/14/2017			
		Metabolic Result: po		I without metabolic activation			
	1,4-bis(2,3-epoxypro Genotoxicity in vitro	: Concentra Metabolic Method: C Result: po Remarks:	ECD Test Guidelin sitive	l without metabolic activation e 471 to data which are conclusive			
		Metabolic Method: C Result: po Remarks:	ECD Test Guidelin sitive	o data which are conclusive			
	p-tert-butylphenyl 1-(Genotoxicity in vitro	Test syste Concentra Metabolic Method: C	 r)propyl ether: Test Type: Chromosome aberration test in vitro Test system: Chinese hamster ovary cells Concentration: 50 ug/plate Metabolic activation: negative Method: OECD Test Guideline 473 Result: positive 				
		Test syste Metabolic	ECD Test Guidelin	I without metabolic activation			
:	Components: 2,2'-[(1-methylethylid Genotoxicity in vivo		Germ n Route: Oral ECD Test Guidelin				
		Dose: 0 - 5	n Route: Oral 5000 mg/kg PPTS 870.5395				
	Epoxyphenol Novola Genotoxicity in vivo	: Cell type:	n Route: Oral				
			n Route: Oral 5000 mg/kg				

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Result: negative



Genotoxicity in vivo

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1,4-bis(2,3-epoxypropoxy)butane: Test Type: In vivo micronucleus test • Species: Mouse Cell type: Somatic Application Route: Oral Exposure time: 4 d Dose: 187.5 - 750 mg/kg Method: OECD Test Guideline 474

> Test Type: unscheduled DNA synthesis assay Species: Rat Cell type: Liver cells Application Route: Oral Method: OECD Test Guideline 486 Result: negative

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Components:

1,4-bis(2,3-epoxypropoxy)butane:							
Germ cell mutagenicity-	:	Weight of evidence does not support classification as a germ					
Assessment		cell mutagen.					

Germ cell mutagenicity-	:	No data available
Assessment		

Carcinogenicity

Components:

2,2'-[(1-methylethylidene)bis(4,1-phenyleneoxymethylene)]bisoxirane: Species: Rat, male and female Application Route: Oral Exposure time: 24 month(s) Dose: 15 mg/kg Frequency of Treatment: 7 days/week Method: OECD Test Guideline 453 Result: negative

Species: Mouse, male Application Route: Dermal Exposure time: 24 month(s) Dose: 0.1 mg/kg Frequency of Treatment: 3 days/week Method: OECD Test Guideline 453 Result: negative

Species: Rat, female Application Route: Dermal Exposure time: 24 month(s) Dose: 1 mg/kg Frequency of Treatment: 5 days/week Method: OECD Test Guideline 453 Result: negative

Epoxyphenol Novolac Resin:







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Versio 1.1		Revision Date: 1/20/2018	SDS Number: 400001012676	Date of last issue: 02/14/2017 Date of first issue: 02/14/2017			
A E C F N	Application Exposure Dose: 15 Frequence	cy of Treatment: 7 da OECD Test Guideline	ily				
Species: Mouse, male Application Route: Dermal Exposure time: 24 month(s) Dose: .1 mg/kg Frequency of Treatment: 3 daily Method: OECD Test Guideline 453 Result: negative							
Species: Rat, female Application Route: Dermal Exposure time: 24 month(s) Dose: 1 mg/kg Frequency of Treatment: 5 daily Method: OECD Test Guideline 453 Result: negative Carcinogenicity - : No data available Assessment IARC ACGIH Suspected human carci							
			arcinogen				
			quartz (SiO2)				
C	OSHA		No component of this product present at levels greater than or equal to 0.1% is on OSHA's list of regulated carcinogens.				
N	NTP						
F	Reprodu	ctive toxicity					
_	Compon						
mg/kg body weight		eneration study le and female :: Oral ram per kilogram - Parent: No-observed-effect level: 540 ht F1: No-observed-effect level: 540 mg/kg dverse effects est Guideline 416 s on fertility and early embryonic					
E	Epoxyph	enol Novolac Resin:	Species: Rat, ma Application Route				





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RENG	GEL® 4026 US					
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		Result: No e	CD Test Guideline effects on fertility an t were detected.			
2,2 Eff	mponents: '-[(1-methylethylidene)bis(ects on foetal velopment	 4,1-phenyleneoxymethylene)]bisoxirane: Species: Rabbit, female Application Route: Dermal General Toxicity Maternal: No observed adverse effect level: 30 mg/kg body weight Method: Other guidelines Result: No teratogenic effects Species: Rabbit, female Application Route: Oral General Toxicity Maternal: No observed adverse effect level: 60 mg/kg body weight Method: OECD Test Guideline 414 Result: No teratogenic effects Species: Rat, female Application Route: Oral 				
		180 mg/kg l Method: OE	CD Test Guideline	bbserved adverse effect level: 414		
Ep	oxyphenol Novolac Resin:	Species: Ra Application General To: 30 mg/kg bo		bserved adverse effect level:		
		Application General To: 60 mg/kg bo Method: OE	kicity Maternal: No o	bserved adverse effect level: 414		
		180 mg/kg l Method: OE	Route: Oral	observed adverse effect level: 414		
	productive toxicity - sessment	: No data ava	ilable			

STOT - single exposure

No data available





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STOT - repeated exposure

No data available

Repeated dose toxicity

Components:

2,2'-[(1-methylethylidene)bis(4,1-phenyleneoxymethylene)]bisoxirane: Species: Rat, male and female NOAEL: 50 mg/kg Application Route: Ingestion Exposure time: 14 Weeks Number of exposures: 7 d Method: Subchronic toxicity

Species: Rat, male and female NOEL: 10 mg/kg Application Route: Skin contact Exposure time: 13 Weeks Number of exposures: 5 d Method: Subchronic toxicity

Species: Mouse, male NOAEL: 100 mg/kg Application Route: Skin contact Exposure time: 13 Weeks Number of exposures: 3 d Method: Subchronic toxicity

Epoxyphenol Novolac Resin: Species: Rat, male and female NOAEL: 50 mg/kg Application Route: Ingestion Exposure time: 14 Weeks Number of exposures: 7 d Method: Subchronic toxicity

Species: Rat, male and female NOEL: 10 mg/kg Application Route: Skin contact Exposure time: 13 Weeks Number of exposures: 5 d Method: Subchronic toxicity

Species: Mouse, male NOAEL: 100 mg/kg Application Route: Skin contact Exposure time: 13 Weeks Number of exposures: 3 d Method: Subchronic toxicity

1,4-bis(2,3-epoxypropoxy)butane: Species: Rat, male and female NOAEL: 200 mg/kg Application Route: Ingestion





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	Numbe	re time: 28 d r of exposures: 7 d : Subacute toxicity			
	Repeat Assess	ed dose toxicity - ment	: No data available	e	
	-	t ion toxicity a available			
	-				
	-	ence with human	•		
	Genera	I Information:	No data available		
	Inhalati	on:	No data available		
	Skin co	ntact:	No data available		
	0				
	Eye cor	ntact:	No data available		
	Ingestic	on:	No data available		
	-	logy, Metabolism			
		available	, Diotinguitori		
	. to date	a randoro			
	Neurol	ogical effects			
		available			
	-				
	Further	rinformation			

Product:

Remarks: No data available

SECTION 12. ECOLOGICAL INFORMATION

Ecotoxicity

Components:

2,2'-[(1-methylethylidene)bis(4,1-phenyleneoxymethylene)]bisoxirane:							
: LC50 (Oncorhynchus mykiss (rainbow trout)): 1.5 mg/l							
Exposure time: 96 h							
Test Type: static test							
Test substance: Fresh water							
Method: OECD Test Guideline 203							

Epoxyphenol Novolac Resin:





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Toxicit	Toxicity to fish		 LC50 (Oncorhynchus mykiss (rainbow trout)): 1.5 mg/l Exposure time: 96 h Test Type: static test Test substance: Fresh water Method: OECD Test Guideline 203 					
	s(2,3-epoxypropoxy)but ty to fish	: LC50 (Brachyo Exposure time Test Type: sta Test substance	ic test					
	butylphenyl 1-(2,3-epox ty to fish	: LC50 (Oncorh) Exposure time Test Type: stat Test substance	 Propyl ether: LC50 (Oncorhynchus mykiss (rainbow trout)): 7.5 mg/l Exposure time: 96 h Test Type: static test Test substance: Fresh water Method: OECD Test Guideline 203 					
2,2'-[(1 Toxicit	Components: 2,2'-[(1-methylethylidene)bis(4,1 Toxicity to daphnia and other aquatic invertebrates		ethylene)]bisoxirane: a magna (Water flea)): 2.7 mg/l : 48 h tic test a: Fresh water					
Toxicit	phenol Novolac Resin: ty to daphnia and other c invertebrates	: EC50 (Daphnia Exposure time Test Type: stat Test substance Method: OECE EC50 (Daphnia Exposure time	tic test a: Fresh water) Test Guideline 202 a magna (Water flea)): 2.7 mg/l : 48 h					
	s(2,3-epoxypropoxy)but							
	c invertebrates	Exposure time Test Type: sta Test substance	: 24 h iic test					
Toxicit	butylphenyl 1-(2,3-epox ty to daphnia and other c invertebrates	: EC50 (Daphnia Exposure time Test Type: star Test substance	lic test					

Components:

2,2'-[(1-methylethylidene)bis(4,1-phenyleneoxymethylene)]bisoxirane:





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ersion 1	Revision Date: 11/20/2018	SDS Number: 400001012676	Date of last issue: 02/14/2017 Date of first issue: 02/14/2017		
Toxicity	∕ to algae	Exposure time Test Type: sta	tic test e: Fresh water		
Epoxyphenol Novolac Resin: Toxicity to algae		: EC50 (Selena Exposure time Test Type: sta			
	(2,3-epoxypropoxy)but / to algae	: EL50: > 160 n Exposure time Test Type: sta Test substanc	EL50: > 160 mg/l Exposure time: 72 h Test Type: static test Test substance: Fresh water Method: OECD Test Guideline 201		
p-tert-butylphenyl 1-(2,3-epox Toxicity to algae M-Factor (Acute aquatic toxicity)		 y)propyl ether: EbC50 (Selenastrum capricornutum (green algae)): ca Exposure time: 72 h Test Type: static test Test substance: Fresh water Method: OECD Test Guideline 201 			
		: No data availa	ble		
Ерохур	onents: ohenol Novolac Resin: / to fish (Chronic)	: GLP: yes			
Compo	onents:				
2,2'-[(1 Toxicity aquatic	-methylethylidene)bis(/ to daphnia and other : invertebrates ic toxicity)	: NOEC (Daphr Exposure time Test Type: set Test substance	nia magna (Water flea)): 0.3 mg/l e: 21 d		
Toxicity aquatic	ohenol Novolac Resin: y to daphnia and other invertebrates ic toxicity)	: NOEC (Daphr Exposure time Test Type: set Test substanc			
M-Fact toxicity	or (Chronic aquatic	: No data availa	ble		

2,2'-[(1-methylethylidene)bis(4,1-phenyleneoxymethylene)]bisoxirane: Toxicity to microorganisms : IC50 (activated sludge): > 100 mg/l





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				Exposure time: 3 Test Type: static t Test substance: F	est			
		nenol Novolac Resin: to microorganisms	:	IC50 (activated slu Exposure time: 3 Test Type: static t Test substance: F	h est			
1,4-bis(2,3-epoxypropoxy)butar Toxicity to microorganisms				e: : IC50 (activated sludge): > 100 mg/l Exposure time: 3 h Test Type: static test Test substance: Fresh water Method: OECD Test Guideline 209				
		itylphenyl 1-(2,3-epox to microorganisms		opyl ether: EC50: > 1,000 mg Exposure time: 3 Test Type: static t Test substance: F Method: OECD Te	h est resh water			
	Toxicity organisr	to soil dwelling ns	:	No data available				
	Plant to	kicity	:	No data available				
	Sedimer	nt toxicity	:	No data available				
	Toxicity organisr	to terrestrial ns	:	No data available				
		cology Assessment quatic toxicity	:	No data available				
	Chronic	aquatic toxicity	:	No data available				
	Toxicity	Data on Soil	:	No data available				
	Other or the envi	ganisms relevant to ronment	:	No data available				
	Persiste	ence and degradabili	ity					
	Compos							
	2,2'-[(1-r Biodegra	nethylethylidene)bis(4 adability	+,1-¦ :	Inoculum: Sewage Concentration: 20 Result: Not readily Biodegradation: 5 Exposure time: 28	e (STP effluent) mg/l y biodegradable. 5 %			

Method: OECD Test Guideline 301F

Epoxyphenol Novolac Resin:





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Biodegra	adability	:	Inoculum: Sewage Concentration: 20 Result: Not readily Biodegradation: 5 Exposure time: 28 Method: OECD Te	mg/l y biodegradable. 5 %	
	1,4-bis(2,3-epoxypropoxy)buta Biodegradability		: Inoculum: activated sludge Concentration: 20 mg/l Result: Not readily biodegradable. Biodegradation: 43 % Exposure time: 28 d Method: OECD Test Guideline 301F		
p-tert-bu Biodegra	tylphenyl 1-(2,3-epox adability		Test Type: aerobic Inoculum: activate Concentration: 5 r Result: Not readily Biodegradation: ca Exposure time: 28	ed sludge ng/l y biodegradable. a. 1.1 %	
Biochem Demand	iical Oxygen (BOD)	:	No data available		
Chemica (COD)	al Oxygen Demand	:	No data available		
BOD/CC	D	:	No data available		
ThOD		:	No data available		
BOD/Th	OD	:	No data available		
Dissolve (DOC)	d organic carbon	:	No data available		
Physico- removab	chemical ility	:	No data available		
Compor	nents:				
2,2'-[(1-r Stability	nethylethylidene)bis(4 in water			ife(DT50): 4.83 d (77 °F / 25 °C) pH: 4 est Guideline 111	
			Degradation half I Method: OECD Te Remarks: Fresh w		
			Degradation half I Method: OECD Te	ife(DT50): 3.58 d (77 °F / 25 °C) pH: 7 est Guideline 111	





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			Remarks: Fresh	water
	Epoxyphenol Novolac Resin: Stability in water			life(DT50): 4.83 d (77 °F / 25 °C) pH: 4 Test Guideline 111 water
				life(DT50): 7.1 d (77 °F / 25 °C) pH: 9 Test Guideline 111 water
				life(DT50): 3.58 d (77 °F / 25 °C) pH: 7 ⁻ est Guideline 111 water
	-butylphenyl 1-(2,3-epo ity in water		Degradation half	life(DT50): ca. 17 d (77 °F / 25 °C) pH: 7 ⁻ est Guideline 111 water
				life(DT50): ca. 7.98 d (77 °F / 25 °C) pH: 4 [°] est Guideline 111 water
				life(DT50): ca. 10.8 d (77 °F / 25 °C) pH: 9 Test Guideline 111 water
Photo	degradation	:	No data available	9
Impac Treat	ct on Sewage ment	:	No data available	9
Bioad	cumulative potential			
	oonents:			
	1-methylethylidene)bis(cumulation		Bioconcentration	
	yphenol Novolac Resin: cumulation		Bioconcentration Remarks: Does r	factor (BCF): 31 not bioaccumulate.
Comp	oonents:			
Partiti	1-methylethylidene)bis(on coefficient: n- ol/water		log Pow: 3.242 (7 pH: 7.1	
Partiti	yphenol Novolac Resin: on coefficient: n- ol/water		log Pow: 3.242 (7 pH: 7.1 Method: OECD T	77 °F / 25 °C) est Guideline 117





N L	NGE				
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		(2,3-epoxypropoxy)but n coefficient: n- /water	:	log Pow: -0.269 (pH: 6.7 Method: OECD T	77 °F / 25 °C) est Guideline 117
		utylphenyl 1-(2,3-epox n coefficient: n- /water	:	log Pow: 3.59 (68 pH: 7	⁸ °F / 20 °C) est Guideline 107
	Mobilit	y in soil			
	Mobility	-	:	No data available	•
	Compo	onents:			
	2,2'-[(1 Distribu environ	-methylethylidene)bis(ition among imental compartments		henyleneoxymeth Koc: 445	ylene)]bisoxirane:
	Distribu	henol Novolac Resin: ution among mental compartments		Koc: 445	
	Distribu	(2,3-epoxypropoxy)but ition among imental compartments	:	Koc: 12.59 Method: OECD T	est Guideline 121
	Distribu	utylphenyl 1-(2,3-epox ution among mental compartments	:	OECD Test Guide Koc: ca. 755, log	
	Stability	y in soil	:	No data available	
	Other a	adverse effects			
	Enviror pathwa	nmental fate and ys	:	No data available	•
	Results assess	of PBT and vPvB ment	:	No data available	•
	Endocr potentia	ine disrupting al	:	No data available	
		ed organic bound ns (AOX)	:	No data available	
	Hazard	lous to the ozone lay	er		
		Depletion Potential	:	Protection of Stra Substances Remarks: This pr manufactured wit	FR Protection of Environment; Part 82 tospheric Ozone - CAA Section 602 Class I oduct neither contains, nor was h a Class I or Class II ODS as defined by the ct Section 602 (40 CFR 82, Subpt. A, App.A +





RENGEL® 4026 US

Version	Revision Date:	SDS Number:	Date of last issue: 02/14/2017
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Additional ecological		 An environmental hazard cannot be excluded in the even	
information - Product		unprofessional handling or disposal. Toxic to aquatic life with long lasting effects.	
Globa (GWI	al warming potential P)	: No data availa	ble

SECTION 13. DISPOSAL CONSIDERATIONS

Disposal methods	
Waste from residues	 The product should not be allowed to enter drains, water courses or the soil. Do not contaminate ponds, waterways or ditches with chemical or used container. Send to a licensed waste management company.
Contaminated packaging	 Empty remaining contents. Dispose of as unused product. Do not re-use empty containers.

SECTION 14. TRANSPORT INFORMATION

International Regulations

IATA UN/ID No. Proper shipping name Class Packing group	:	UN 3082 Environmentally hazardous substance, liquid, n.o.s. (BISPHENOL A EPOXY RESIN, EPOXY PHENOL NOVOLAC RESIN) 9 III
Labels	:	Miscellaneous
Packing instruction (cargo aircraft)	:	964
Packing instruction (passenger aircraft)	:	964
IMDG		
UN number	:	UN 3082
Proper shipping name	:	ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S.
		(BISPHENOL A EPOXY RESIN, EPOXY PHENOL NOVOLAC RESIN)
Class Packing group Labels EmS Code Marine pollutant	:	9 III 9 F-A, S-F yes





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Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code

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Not applicable for product as supplied.

National Regulations

DOT Classification

UN/ID/NA number	:	UN 3082
Proper shipping name	:	ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S.
		(BISPHENOL A EPOXY RESIN, EPOXY PHENOL NOVOLAC RESIN)
Class	:	9
Packing group	:	III
Labels	:	CLASS 9
ERG Code	:	171
Marine pollutant	:	yes(BISPHENOL A EPOXY RESIN, EPOXY PHENOL NOVOLAC RESIN)

Special precautions for user

The transport classification(s) provided herein are for informational purposes only, and solely based upon the properties of the unpackaged material as it is described within this Safety Data Sheet. Transportation classifications may vary by mode of transportation, package sizes, and variations in regional or country regulations.

SECTION 15. REGULATORY INFORMATION

EPCRA - Emergency Planning and Community Right-to-Know Act

SARA 311/312 Hazards	:	Skin corrosion or irritation Serious eye damage or eye irritation Respiratory or skin sensitisation
SARA 313	:	This material does not contain any chemical components with known CAS numbers that exceed the threshold (De Minimis) reporting levels established by SARA Title III, Section 313.

This product does not contain any hazardous air pollutants (HAP), as defined by the U.S. Clean Air Act Section 112 (40 CFR 61).

California Prop. 65

This product does not contain any chemicals known to State of California to cause cancer, birth defects, or any other reproductive harm.

WARNING: This product can expose you to chemicals including quartz (SiO2), 1-chloro-2,3epoxypropane, which is/are known to the State of California to cause cancer, and 1-chloro-2,3epoxypropane, which is/are known to the State of California to cause birth defects or other reproductive harm. For more information go to www.P65Warnings.ca.gov.

The components of this product are reported in the following inventories:			
CH INV	: Low volume exemption, The formulation contains substances listed on the Swiss Inventory, On the inventory, or in		
DSL	compliance with the inventory : All components of this product are on the Canadian DSL		





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AICS NZIOC ENCS KECI PICCS IECSC TCSI TSCA	5	: Not in complian : On the inventor : On the inventor : On the inventor : On the inventor : On the inventor	y, or in compliance with the inventory ce with the inventory y, or in compliance with the inventory

Inventories

AICS (Australia), DSL (Canada), IECSC (China), REACH (European Union), ENCS (Japan), ISHL (Japan), KECI (Korea), NZIoC (New Zealand), PICCS (Philippines), TCSI (Taiwan), TSCA (USA)

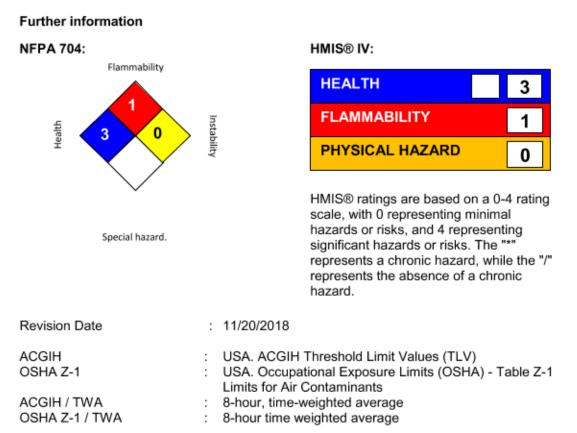
TSCA - 5(a) Significant New Use Rule List of Chemicals

No substances are subject to a Significant New Use Rule.

US. Toxic Substances Control Act (TSCA) Section 12(b) Export Notification (40 CFR 707, Subpt D)

No substances are subject to TSCA 12(b) export notification requirements.

SECTION 16. OTHER INFORMATION



The information and recommendations in this publication are to the best of our knowledge, information and belief accurate at the date of publication, NOTHING HEREIN IS TO BE CONSTRUED AS A WARRANTY, EXPRESS OR OTHERWISE.





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IN ALL CASES, IT IS THE RESPONSIBILITY OF THE USER TO DETERMINE THE APPLICABILITY OF SUCH INFORMATION AND RECOMMENDATIONS AND THE SUITABILITY OF ANY PRODUCT FOR ITS OWN PARTICULAR PURPOSE.

THE PRODUCT MAY PRESENT HAZARDS AND SHOULD BE USED WITH CAUTION. WHILE CERTAIN HAZARDS ARE DESCRIBED IN THIS PUBLICATION, NO GUARANTEE IS MADE THAT THESE ARE THE ONLY HAZARDS THAT EXIST.

Hazards, toxicity and behaviour of the products may differ when used with other materials and are dependent upon the manufacturing circumstances or other processes. Such hazards, toxicity and behaviour should be determined by the user and made known to handlers, processors and end users.

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REN® 1500 US

Version Revision Date: 1.0 06/02/2016

Product name

n Date: SDS Number: 016 400001010557 Date of last issue: -Date of first issue: 06/02/2016

SECTION 1. IDENTIFICATION

Manufacturer or supplier's details					
Company name of supplier Address	:	Huntsman Advanced Materials Americas LLC P.O. Box 4980 The Woodlands, TX 77387 United States of America			
Telephone	:	Non-Emergency: (800) 257-5547			
E-mail address of person responsible for the SDS	:	MSDS@huntsman.com			
Emergency telephone number	:	Chemtrec: (800) 424-9300 or (703) 527-3887			

: REN® 1500 US

Recommended use of the chemical and restrictions on use

Recommended use	:	Hardener
-----------------	---	----------

SECTION 2. HAZARDS IDENTIFICATION

GHS Classification Acute toxicity (Dermal)	: Category 4
Skin corrosion	: Category 1B
Serious eye damage	: Category 1
Skin sensitisation	: Category 1
Acute aquatic toxicity	: Category 3
Chronic aquatic toxicity	: Category 3
GHS label elements Hazard pictograms	
Signal word	: Danger
Hazard statements	 H312 Harmful in contact with skin. H314 Causes severe skin burns and eye damage. H317 May cause an allergic skin reaction. H412 Harmful to aquatic life with long lasting effects.
Precautionary statements	: Prevention:





REN® '	REN® 1500 US			
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P261 Avoid breathing dust/ fume/ gas/ mist/ vapours/ spray. P264 Wash skin thoroughly after handling. P272 Contaminated work clothing should not be allowed out of the workplace. P273 Avoid release to the environment. P280 Wear protective gloves/ protective clothing/ eye protection/ face protection. Response: P301 + P330 + P331 IF SWALLOWED: Rinse mouth. Do NOT induce vomiting. P303 + P361 + P353 IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water/shower. P304 + P340 + P310 IF INHALED: Remove person to fresh air and keep comfortable for breathing. Immediately call a POISON CENTER/doctor. P305 + P351 + P338 + P310 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. P333 + P313 If skin irritation or rash occurs: Get medical advice/ attention. P363 Wash contaminated clothing before reuse. Storage: P405 Store locked up. Disposal: P501 Dispose of contents/ container to an approved waste disposal plant.

Date of last issue: -

Date of first issue: 06/02/2016

Other hazards

None known.

SECTION 3. COMPOSITION/INFORMATION ON INGREDIENTS

Substance / Mixture : Mixture

Hazardous components

Chemical name	CAS-No.	Concentration (% w/w)
triethylenetetramine	112-24-3	30 - 60
metaxylenediamine	1477-55-0	13 - 30
1-methylimidazole	616-47-7	3 - 7
2,2,4(or 2,4,4)-trimethylhexane-1,6-diamine	25513-64-8	0.1 - 1

The specific chemical identity and/or exact percentage (concentration) of composition has been withheld as a trade secret.

SECTION 4. FIRST AID MEASURES

General advice	 Move out of dangerous area. Consult a physician. Show this safety data sheet to the doctor in attendance. Do not leave the victim unattended.
If inhaled	: If unconscious place in recovery position and seek medical





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		advice. If symptoms p	ersist, call a physician.
In cas	se of skin contact	wounds from o difficulty. If on skin, rinse	dical treatment is necessary as untreated corrosion of the skin heal slowly and with e well with water. emove clothes.
In cas	se of eye contact	tissue damage In the case of of water and s Continue rinsi Remove conta Protect unharr Keep eye wide	
lf swa	allowed	Never give an If symptoms p	
	important symptoms ffects, both acute and ed	: None known.	
Notes	s to physician		and supportive therapy as needed. Following ire medical follow-up should be monitored for at .

SECTION 5. FIREFIGHTING MEASURES

Suitable extinguishing media	:	No data is available on the product itself.
Unsuitable extinguishing media	:	High volume water jet
Specific hazards during firefighting	:	Do not allow run-off from fire fighting to enter drains or water courses.
Hazardous combustion products	:	No data is available on the product itself.
Specific extinguishing methods	:	No data is available on the product itself.
Further information	:	Collect contaminated fire extinguishing water separately. This must not be discharged into drains.





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			d contaminated fire extinguishing water must a accordance with local regulations.
	ial protective equipment refighters	: Wear self-contai necessary.	ned breathing apparatus for firefighting if

SECTION 6. ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures	e personal protective equipme	ent.
Environmental precautions	event product from entering dr event further leakage or spillag ne product contaminates rivers pective authorities.	je if safe to do so.
Methods and materials for containment and cleaning up	ak up with inert absorbent ma d binder, universal binder, sav ep in suitable, closed containe	vdust).

SECTION 7. HANDLING AND STORAGE

Advice on protection against fire and explosion	Norn	nal measures for preventive fire protection.
Advice on safe handling	Avoi Avoi For p Smo appli To a Disp regu Pers aller	ot breathe vapours/dust. d exposure - obtain special instructions before use. d contact with skin and eyes. Dersonal protection see section 8. king, eating and drinking should be prohibited in the ication area. void spills during handling keep bottle on a metal tray. ose of rinse water in accordance with local and national lations. ons susceptible to skin sensitisation problems or asthma, gies, chronic or recurrent respiratory disease should not mployed in any process in which this mixture is being l.
Conditions for safe storage	Conta uprig Obse Elect	container tightly closed in a dry and well-ventilated place. ainers which are opened must be carefully resealed and kept th to prevent leakage. rve label precautions. rical installations / working materials must comply with the cological safety standards.

SECTION 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Components with workplace control parameters

Components	CAS-No.	Value type	Control	Basis
		(Form of	parameters /	





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				exposure)	Permissible concentration	
metax	kylenediamine		1477-55-0	С	0.1 mg/m3	ACGIH
				С	0.1 mg/m3	OSHA P0
Engir	neering measures	:	Maintain air c standards.	oncentrations b	pelow occupational ex	posure
Perso	onal protective equip	ment				
Resp	iratory protection	:			ncentrations above the ate certified respirators	
Resp	iratory protection	:	No personal respiratory protective equipment normally required.			nally
Hand Rema	protection arks	:		o for a specific v ucers of the pro	workplace should be d tective gloves.	iscussed
Еуе р	rotection	:	Tightly fitting	tle with pure wa safety goggles ield and protec	ater tive suit for abnormal	processing
Skin a	and body protection	:	 Impervious clothing Choose body protection according to the amount and concentration of the dangerous substance at the work place. 			
Hygie	ne measures	:	When using o		nk. and at the end of work	day.

SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance	:	liquid
Colour	:	light yellow
Odour	:	No data is available on the product itself.
Odour Threshold	:	No data is available on the product itself.
pН	:	No data is available on the product itself.
Boiling point	:	> 204 °C
Flash point	:	> 110 °CMethod: closed cup
Evaporation rate	:	No data is available on the product itself.
Flammability (solid, gas)	:	No data is available on the product itself.
Flammability (liquids)	:	No data is available on the product itself.





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	Upper	explosion limit	:	No data is availa	ble on the product itself.
	Lower	explosion limit	:	No data is availa	ble on the product itself.
	Vapour	pressure	:	No data is availa	ble on the product itself.
	Relativ	e vapour density	:	No data is availa	ble on the product itself.
	Relativ	e density	:	1.04	
	Density	/	:	No data is availa	ble on the product itself.
	Solubil Wate	ity(ies) er solubility	:	No data is availa	ble on the product itself.
	Solu	bility in other solvents	:	No data is availa	ble on the product itself.
		n coefficient: n-	:	No data is availa	ble on the product itself.
	octano Auto-ig	/water nition temperature	:	No data is availa	ble on the product itself.
	Therma	al decomposition	:	No data is availa	ble on the product itself.
	decom	celerating position temperature	:	No data is availa	ble on the product itself.
	(SADT) Visc	,	:	No data is availa	ble on the product itself.

SECTION 10. STABILITY AND REACTIVITY

Reactivity Chemical stability Possibility of hazardous reactions	 No decomposition if stored and applied as directed. No decomposition if stored and applied as directed. No decomposition if stored and applied as directed.
Conditions to avoid	: No data available

SECTION 11. TOXICOLOGICAL INFORMATION

Information on likely routes of exposure	:	No data is available on the product itself.
Acute toxicity Acute oral toxicity - Product	:	Acute toxicity estimate : 2,043 mg/kg Method: Calculation method
Acute inhalation toxicity - Product	:	Acute toxicity estimate: 9.31 mg/l Exposure time: 4 h Test atmosphere: dust/mist Method: Calculation method
Acute dermal toxicity -	:	Acute toxicity estimate : 1,477 mg/kg





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Product

Method: Calculation method

Acute toxicity (other routes of : No data available administration)

Skin corrosion/irritation

Product:

Remarks: Extremely corrosive and destructive to tissue.

Serious eye damage/eye irritation

Product:

Remarks: May cause irreversible eye damage.

Respiratory or skin sensitisation

Product: Remarks: Causes sensitisation.

Components:

metaxylenediamine: Assessment: Harmful if swallowed or if inhaled, May be harmful in contact with skin., Causes severe skin burns and eye damage. May cause an allergic skin reaction.

Germ cell mutagenicity

Components:

triothylopototraminos	
triethylenetetramine: Genotoxicity in vitro	: Concentration: 0 - 200 μg/L Metabolic activation: negative Method: OECD Test Guideline 482 Result: negative
metaxylenediamine:	
Genotoxicity in vitro	: Test Type: Ames test Species: Salmonella typhimurium Metabolic activation: with and without metabolic activation Method: OECD Test Guideline 471 Result: negative GLP: yes
	Test Type: Chromosome aberration test in vitro Species: Chinese hamster lung cells Metabolic activation: with and without metabolic activation Method: OECD Test Guideline 473 Result: negative GLP: yes
	Test Type: In vitre memorylian cell gone mutation test

Test Type: In vitro mammalian cell gene mutation test Species: mouse lymphoma cells Metabolic activation: with and without metabolic activation





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		Method: OE Result: neg GLP: yes	ECD Test Guideline 4 ative	176
	ylimidazole: oxicity in vitro	: Metabolic a Result: neg		ithout metabolic activation
			CD Test Guideline 4	ithout metabolic activation I71
			CD Test Guideline 4	ithout metabolic activation 176
	r 2,4,4)-trimethylhexar oxicity in vitro	: Test Type: Species: Sa Concentrati Metabolic a	almonella typhimuriun on: 5000 ug/plate ctivation: with and wi rective 67/548/EEC, /	ithout metabolic activation
		Species: Ch Metabolic a	ECD Test Guideline 4	y cells ithout metabolic activation
		Species: Ch Concentrati Metabolic a	hinese hamster ovary ion: 2 mg/ml ctivation: with and w ECD Test Guideline 4	ithout metabolic activation
triethyl	onents: enetetramine: oxicity in vivo	Dose: 0 - 60	ECD Test Guideline 4	-
	/lenediamine: oxicity in vivo	Species: Me Cell type: B Application Exposure ti Dose: 750 r	In vivo micronucleus ouse (male and fema one marrow Route: Oral me: single dose mg/kg body weight ECD Test Guideline 4 ative	ale)





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	or 2,4,4)-trimethylhexa	: Species: Chines Cell type: Bone Application Rou Dose: 825 - 100	ite: Oral)0 mg/kg Test Guideline 4	-
		Species: Mouse Application Rou Dose: 850 - 100)0 mg/kg Test Guideline 4	le)
Com	oonents:			
meta: Germ	xylenediamine: cell mutagenicity- ssment			n cell cultures did not show ng did not show any mutagenic
	cell mutagenicity- ssment	: No data availab	le	
Carci	nogenicity			
triethy Speci Applia Dose Frequ Metho	venetetramine: venetetramine: ies: Mouse, (male) cation Route: Dermal : 42 mg/kg uency of Treatment: 3 od: OECD Test Guidel It: negative			
Applio Expose Dose Frequ	ies: Mouse, (male) cation Route: Dermal sure time: 104 weeks : 16.8 mg/kg iency of Treatment: 3 o od: OECD Test Guidel			
	nogenicity - ssment	: No data availab	le	
IARC	;		entified as proba	ent at levels greater than or ble, possible or confirmed
OSH	A		entified as a card	ent at levels greater than or cinogen or potential
NTP		No component of t	his product prese	ent at levels greater than or





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		equal to 0.1% by NTP.	is identified as a kno	wn or anticipated carcinogen
Repro	ductive toxicity			
metaxy	onents: /lenediamine: on fertility	Application Dose: 0, 50 General To: mg/kg body General To: body weigh Method: OE Result: No e	, 150 and 450 mg/kg xicity - Parent: No-ob weight xicity F1: No-observe	served-effect level: 50 - 150 ed-effect level: 450 mg/kg 21
1-meth	ylimidazole:	GLP: yes	it were detected.	
Theu	yimidazole.	Application Method: OE Result: No e	at, male and female Route: Oral CD Test Guideline 4 effects on fertility and nt were detected.	
2,2,4(o	r 2,4,4)-trimethylhexan	Species: Ra Application Dose: 10, 6 Method: OE Result: No 6	at, male and female Route: Oral 0, 120 mg/kg bw/day CD Test Guideline 4 effects on fertility and ht were detected.	16
triethyle	onents: enetetramine: on foetal pment	> 750 mg/kg Method: OE Result: No t	Route: Oral xicity Maternal: No ol g body weight CD Test Guideline 4 teratogenic effects	bserved adverse effect level: 14
		General To: 125 mg/kg l Method: OE	Route: Dermal	bserved adverse effect level: 14
2,2,4(o	r 2,4,4)-trimethylhexan	Species: Ra Application	xicity Maternal: No of	bserved adverse effect level:





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Result: No teratogenic effects

Components:

metaxylenediamine: Reproductive toxicity -Assessment : No evidence of adverse effects on sexual function and fertility, or on development, based on animal experiments.

STOT - single exposure

No data available

STOT - repeated exposure

No data available

Repeated dose toxicity

Components:

triethylenetetramine: Species: Rat, male and female NOAEL: 50 mg/kg/d Application Route: Ingestion Exposure time: 26 Weeks Number of exposures: 7 d Method: Subchronic toxicity

metaxylenediamine: Species: Rat, male and female NOEL: 150 mg/kg Application Route: oral (gavage) Exposure time: 672 h Number of exposures: 7 d Dose: 0, 10, 40, 150 and 600 mg/kg/d Method: OECD Test Guideline 407 GLP: yes

Species: Rat, male and female : 0.6 mg/m3 Application Route: Inhalation Exposure time: 13 weeks Number of exposures: 6 hours per day, 5 days per we Dose: 0, 0.64, 5.1, 31 mg/m3 Method: OECD Test Guideline 413 GLP: yes Target Organs: Lungs

1-methylimidazole: Species: Rat, male and female NOAEL: 30 mg/kg/d Application Route: Ingestion Number of exposures: 7 d Method: Subacute toxicity





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2,2,4(or 2,4,4)-trimethylhexane-1,6-diamine: Species: Rat, male and female NOAEL: 10 mg/kg bw/day Application Route: Ingestion Exposure time: 13 Weeks Number of exposures: Daily Dose: 10, 60, 180mg/kg bw Target Organs: Liver

Species: Rat, male and female LOAEL: 60 mg/kg bw/day Application Route: Ingestion Exposure time: 13 Weeks Number of exposures: Daily Dose: 10, 60, 180mg/kg bw Target Organs: Liver

Components:

metaxylenediamine: Repeated dose toxicity -Assessment

: Harmful if swallowed or if inhaled, May be harmful in contact with skin., Causes severe skin burns and eye damage. No adverse effect has been observed in chronic toxicity tests.

Aspiration toxicity

No data available

Experience with human exposure

General Information:	No data available
Inhalation:	No data available
Skin contact:	No data available
Eye contact:	No data available
Ingestion:	No data available

Toxicology, Metabolism, Distribution

No data available

Neurological effects

No data available

Further information

Product: Remarks: No data available





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SECTION 12. ECOLOGICAL INFORMATION

Ecotoxicity	
<u>Components:</u> triethylenetetramine: Toxicity to fish	 LC50 (Pimephales promelas (fathead minnow)): 330 mg/l Exposure time: 96 h Test Type: static test Test substance: Fresh water Method: Fish Acute Toxicity Test
metaxylenediamine: Toxicity to fish	 LC50 (Oryzias latipes (Orange-red killifish)): 87.6 mg/l Exposure time: 96 h Test Type: semi-static test Method: OECD Test Guideline 203 GLP: yes
1-methylimidazole: Toxicity to fish	 LC50 (Leuciscus idus (Golden orfe)): > 100 - < 215 mg/l Exposure time: 96 h Test Type: static test Test substance: Fresh water Method: DIN 38412
2,2,4(or 2,4,4)-trimethylhexane- Toxicity to fish	 1,6-diamine: LC50 (Leuciscus idus (Golden orfe)): 174 mg/l Exposure time: 48 h Method: DIN 38412
Components: triethylenetetramine: Toxicity to daphnia and other aquatic invertebrates	 EC50 (Daphnia magna (Water flea)): 31.1 mg/l Exposure time: 48 h Test Type: static test Test substance: Fresh water Method: Directive 67/548/EEC, Annex V, C.2.
metaxylenediamine: Toxicity to daphnia and other aquatic invertebrates	 EC50 (Daphnia magna (Water flea)): 15.2 mg/l Exposure time: 48 h Test Type: static test Method: OECD Test Guideline 202 GLP: yes
1-methylimidazole: Toxicity to daphnia and other aquatic invertebrates	 EC50 (Daphnia magna (Water flea)): 267.9 mg/l Exposure time: 48 h Test Type: static test Test substance: Fresh water Method: Directive 67/548/EEC, Annex V, C.2.





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2,2,4(or 2,4,4)-trimethylhexane-1 Toxicity to daphnia and other aquatic invertebrates	I,6-diamine: EC50 (Daphnia magna (Water flea)): 31.5 mg/l Exposure time: 24 h Method: DIN 38412
Components:	
triethylenetetramine: Toxicity to algae	ErC50 (Selenastrum capricornutum (green algae)): 20 mg/l Exposure time: 72 h Test Type: semi-static test Test substance: Fresh water Method: OECD Test Guideline 201
metaxylenediamine:	
Toxicity to algae	ErC50 (Selenastrum capricornutum (green algae)): 32.1 mg/l Exposure time: 72 h Test Type: static test Method: OECD Test Guideline 201 GLP: yes
1-methylimidazole:	
Toxicity to algae	ErC50 (Desmodesmus subspicatus (Scenedesmus subspicatus)): 180.7 mg/l Exposure time: 72 h Test Type: static test Test substance: Fresh water Method: OECD Test Guideline 201
2,2,4(or 2,4,4)-trimethylhexane-1	6-diamine:
	 ErC50 (Pseudokirchneriella subcapitata (algae)): 43.5 mg/l Exposure time: 72 h Method: OECD Test Guideline 201
	EC50 (Pseudokirchneriella subcapitata (algae)): 37.1 mg/l Exposure time: 72 h Method: OECD Test Guideline 201
	NOEC (Pseudokirchneriella subcapitata (algae)): 16 mg/l Exposure time: 72 h Method: OECD Test Guideline 201
M-Factor (Acute aquatic : toxicity)	No data available
Componente	
Components: 2,2,4(or 2,4,4)-trimethylhexane-1	.6-diamine:
	NOEC (Brachydanio rerio (zebrafish)): 10.9 mg/l Exposure time: 30 d Method: OECD Test Guideline 210
	Lowest Observed Effect Concentration (Brachydanio rerio (zebrafish)): 10.9 mg/l Exposure time: 30 d Method: OECD Test Guideline 210





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Components:

triethylenetetramine: Toxicity to daphnia and other : aquatic invertebrates (Chronic toxicity)	EC10 (Daphnia magna (Water flea)): 1.9 mg/l Exposure time: 21 d Test Type: semi-static test Test substance: Fresh water Method: OECD Test Guideline 202
metaxylenediamine: Toxicity to daphnia and other : aquatic invertebrates (Chronic toxicity)	NOEC (Daphnia magna (Water flea)): 4.7 mg/l Exposure time: 21 d Test Type: semi-static test Method: OECD Test Guideline 211 GLP: yes
2,2,4(or 2,4,4)-trimethylhexane-1, Toxicity to daphnia and other : aquatic invertebrates (Chronic toxicity)	
	Lowest Observed Effect Concentration (Daphnia magna (Water flea)): 1.02 mg/l Exposure time: 21 d Method: OECD Test Guideline 211
M-Factor (Chronic aquatic : toxicity)	No data available
Components: triethylenetetramine: Toxicity to bacteria :	EC50 (activated sludge): 800 mg/l Exposure time: 0.5 h Test Type: static test Test substance: Fresh water
metaxylenediamine: Toxicity to bacteria :	EC50 (activated sludge): > 1,000 mg/l Exposure time: 0.5 h Test Type: static test Method: OECD Test Guideline 209 GLP: yes
1-methylimidazole: Toxicity to bacteria :	EC50 (activated sludge): 1,050 mg/l Exposure time: 7 h Method: DIN 38 412 Part 8
2,2,4(or 2,4,4)-trimethylhexane-1, Toxicity to bacteria :	,6-diamine: IC50 (Pseudomonas putida): 89 mg/l Exposure time: 17 h

Components:

2,2,4(or 2,4,4)-trimethylhexane-1,6-diamine:





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	Toxicity to soil dwelling organisms		:	NOEC (Eisenia fe Exposure time: 56 Method: OECD Te	
				EC50 (Eisenia feti Exposure time: 56 Method: OECD Te	
	Plant to	xicity	:	No data available	
	Sedime	nt toxicity	:	No data available	
	Toxicity organisi	to terrestrial ms	:	No data available	
		cology Assessment quatic toxicity	:	No data available	
	Chronic	aquatic toxicity	:	No data available	
	Toxicity	Data on Soil	:	No data available	
		rganisms relevant to ronment	:	No data available	
		information: available			
	Persist	ence and degradabili	ty		
	Compo	-	-		
		netetramine: adability	:	Inoculum: activate Result: Not readily Biodegradation: 0 Exposure time: 16 Method: OECD Te	/ biodegradable.) %
				Inoculum: activate Result: Not readily Biodegradation: 2 Exposure time: 84 Method: Inherent	/ biodegradable. 20 %
		enediamine: adability	:	Inoculum: activate Concentration: 14 Result: Not readily Biodegradation: 4 Exposure time: 28 Method: OECD Te GLP: yes	.2 mg/l / biodegradable. !9 %
		/limidazole: adability	:	Inoculum: activate Result: Not readily	





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			Biodegradation: Exposure time: 2 Method: OECD T	
			Inoculum: activat Concentration: 9 Result: Inherently Biodegradation: Exposure time: 6 Method: ISO Met	,000 mg/l y biodegradable. 79 % 50 d
	or 2,4,4)-trimethylhexan gradability	1e-1, :	Inoculum: activat Concentration: 1	1.4 mg/l ly biodegradable. 7 %
	emical Oxygen and (BOD)	:	No data available	e
Chem (COD	nical Oxygen Demand	:	No data available	e
BOD/	COD	:	No data available	e
ThOD)	:	No data available	e
BOD/	ThOD	:	No data available	e
Disso (DOC	lved organic carbon	:	No data available	e
	co-chemical vability	:	No data available	9
Stabil	ity in water	:	No data available	9
Photo	degradation	:	No data available	9
Impao Treat	ct on Sewage ment	:	No data available	Э
Bioad	cumulative potential			
metax	oonents: kylenediamine: cumulation	:		us carpio (Carp) factor (BCF): < 0.3 not bioaccumulate.
triethy	oonents: vlenetetramine: ion coefficient: n-	:	log Pow: -2.65 (2	20 °C)





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	octanol/water	Method: OECD	Test Guideline 117
	metaxylenediamine: Partition coefficient: n- octanol/water	: log Pow: 0.18 (pH: 10.3 - 10.4 Method: OECD GLP: yes	25 °C) Test Guideline 107
	1-methylimidazole: Partition coefficient: n- octanol/water	: log Pow: -0.19 pH: 9.25 - 9.85 Method: OECD	
	2,2,4(or 2,4,4)-trimethylhexan Partition coefficient: n- octanol/water	: log Pow: -0.3 (2	25 °C) Test Guideline 117
	Mobility in soil		
	Mobility	: No data availat	ble
	Components: triethylenetetramine: Distribution among environmental compartments 1-methylimidazole:	: Koc: 1584.9 - 5	012Method: OECD Test Guideline 106
	Distribution among environmental compartments	: Koc: 27Method	: Calculation method
	Stability in soil	: No data availat	ble
	Other adverse effects		
	Environmental fate and pathways	: No data availat	ble
	Results of PBT and vPvB assessment	: No data availat	ble
	Endocrine disrupting potential	: No data availat	ble
	Adsorbed organic bound halogens (AOX)	: No data availat	ble
	Hazardous to the ozone laye	er	
	Ozone-Depletion Potential	: Regulation: 40 Protection of Si Substances Remarks: This manufactured v	CFR Protection of Environment; Part 82 tratospheric Ozone - CAA Section 602 Class I product neither contains, nor was with a Class I or Class II ODS as defined by the Act Section 602 (40 CFR 82, Subpt. A, App.A +
	Additional ecological information - Product		tal hazard cannot be excluded in the event of handling or disposal.





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Globa (GWF	al warming potential	Harmful to aqu : No data availal	atic life with long lasting effects.

SECTION 13. DISPOSAL CONSIDERATIONS

Disposal methods	
Waste from residues	 The product should not be allowed to enter drains, water courses or the soil. Do not contaminate ponds, waterways or ditches with chemical or used container. Send to a licensed waste management company.
Contaminated packaging	 Empty remaining contents. Dispose of as unused product. Do not re-use empty containers.

SECTION 14. TRANSPORT INFORMATION

International Regulation

ΙΑΤΑ		
UN/ID No.	: UN 2735	
Proper shipping name	: Polyamines, liquid, corrosive, n.o.s. (TRIETHYLENE TETRAMINE, M-XYLYLENE DIAMINE	:)
Class	: 8	
Packing group	: 11	
Labels	: Corrosive	
Packing instruction (cargo aircraft)	: 855	
Packing instruction (passenger aircraft)	: 851	
IMDG		
UN number	: UN 2735	
Proper shipping name	: POLYAMINES, LIQUID, CORROSIVE, N.O.S. (TRIETHYLENE TETRAMINE, M-XYLYLENE DIAMINE	:)
Class	: 8	
Packing group	: 11	
Labels	: 8	
EmS Code	: F-A, S-B	
Marine pollutant	: no	

Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code Not applicable for product as supplied.

National Regulations

DOT Classification





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DOT Classification		
UN/ID/NA number	:	UN 2735
Proper shipping name	:	POLYAMINES, LIQUID, CORROSIVE, N.O.S. (TRIETHYLENE TETRAMINE, M-XYLYLENE DIAMINE)
Class	:	8
Packing group	:	II
Labels	:	CORROSIVE
ERG Code	:	153
Marine pollutant	:	no

SECTION 15. REGULATORY INFORMATION

EPCRA - Emergency Planning and Community Right-to-Know Act

SARA 311/312 Hazards	:	Acute Health Hazard
SARA 313	:	This material does not contain any chemical components with known CAS numbers that exceed the threshold (De Minimis) reporting levels established by SARA Title III, Section 313.

This product does not contain any hazardous air pollutants (HAP), as defined by the U.S. Clean Air Act Section 112 (40 CFR 61).

California Prop. 65		This product does not contain any chemicals known to State of California to cause cancer, birth defects, or any other reproductive harm.	
The components of this prod	uc	t are reported in the following inventories:	
CH INV	:	The formulation contains substances listed on the Swiss Inventory, Not in compliance with the inventory	
TSCA	:	On the inventory, or in compliance with the inventory	
DSL	:	All components of this product are on the Canadian DSL	
AICS	:	Not in compliance with the inventory	
NZIoC	:	not determined	
ENCS	:	Low volume exemption, On the inventory, or in compliance with the inventory	
KECI	:	On the inventory, or in compliance with the inventory	
PICCS	:	On the inventory, or in compliance with the inventory	
IECSC		On the inventory, or in compliance with the inventory	
TCSI	:	On the inventory, or in compliance with the inventory	

Inventories

AICS (Australia), DSL (Canada), IECSC (China), REACH (European Union), ENCS (Japan), ISHL (Japan), KECI (Korea), NZIoC (New Zealand), PICCS (Philippines), TCSI (Taiwan), TSCA (USA)

TSCA - 5(a) Significant New Use Rule List of Chemicals

No substances are subject to a Significant New Use Rule.

US. Toxic Substances Control Act (TSCA) Section 12(b) Export Notification (40 CFR 707, Subpt D)





HMIS III:



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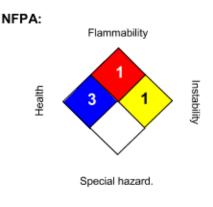
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No substances are subject to TSCA 12(b) export notification requirements.

SECTION 16. OTHER INFORMATION

Further information



HEALTH	3
FLAMMABILITY	1
PHYSICAL HAZARD	1
0 = not significant, 1 =Slight,	

2 = Moderate, 3 = High

4 = Extreme, * = Chronic

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: 06/02/2016

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THE PRODUCT MAY PRESENT HAZARDS AND SHOULD BE USED WITH CAUTION. WHILE CERTAIN HAZARDS ARE DESCRIBED IN THIS PUBLICATION, NO GUARANTEE IS MADE THAT THESE ARE THE ONLY HAZARDS THAT EXIST.

Hazards, toxicity and behaviour of the products may differ when used with other materials and are dependent upon the manufacturing circumstances or other processes. Such hazards, toxicity and behaviour should be determined by the user and made known to handlers, processors and end users.

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Version Revision Date: 06/29/2017 1.1

Product name

SDS Number: 400001012618

Date of last issue: 07/02/2016 Date of first issue: 07/02/2016

SECTION 1. IDENTIFICATION

Manufacturer or supplier's details						
Company name of supplier Address	:	Huntsman Advanced Materials Americas LLC P.O. Box 4980 The Woodlands, TX 77387 United States of America (USA)				
Telephone	:	Non-Emergency: (800) 257-5547				
E-mail address of person responsible for the SDS	:	MSDS@huntsman.com				
Emergency telephone number	:	Chemtrec: (800) 424-9300 or (703) 527-3887				
Recommended use of the chemical and restrictions on use						

: REN® 1501 US

Recommended use : Hardener

SECTION 2. HAZARDS IDENTIFICATION

GHS classification in accordance with 29 CFR 1910.1200

Acute toxicity (Inhalation)	: Category 3
Acute toxicity (Dermal)	: Category 4
Skin corrosion	: Category 1B
Serious eye damage	: Category 1
Skin sensitisation	: Category 1
Reproductive toxicity	: Category 1B
Specific target organ toxicity - single exposure	: Category 3 (Respiratory system)
Acute aquatic toxicity	: Category 3
Chronic aquatic toxicity	: Category 3
GHS label elements Hazard pictograms	
Signal word	: Danger





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Hazard statements	 H312 Harmful in contact with skin. H314 Causes severe skin burns and eye damage. H317 May cause an allergic skin reaction. H331 Toxic if inhaled. H335 May cause respiratory irritation. H360F May damage fertility. H412 Harmful to aquatic life with long lasting effects. 			
Precautionary statements	 P202 Do not handle and understood. P261 Avoid breathin P264 Wash skin thou P271 Use only outdo P272 Contaminated the workplace. P273 Avoid release P280 Wear protective face protection. Response: P301 + P330 + P331 induce vomiting. P303 + P361 + P353 all contaminated close P304 + P340 + P310 and keep comfortable CENTER/doctor. P305 + P351 + P338 water for several mir and easy to do. Com CENTER/doctor. P308 + P313 IF expendit attention. P333 + P313 If skin attention. P363 Wash contami Storage: P403 + P233 Store i tightly closed. P405 Store locked u Disposal: 	 re gloves/ protective clothing/ eye protection 1 IF SWALLOWED: Rinse mouth. Do NOT 3 IF ON SKIN (or hair): Take off immediatel thing. Rinse skin with water/shower. 0 IF INHALED: Remove person to fresh air le for breathing. Immediately call a POISON 8 + P310 IF IN EYES: Rinse cautiously with nutes. Remove contact lenses, if present tinue rinsing. Immediately call a POISON osed or concerned: Get medical advice/ irritation or rash occurs: Get medical advice nated clothing before reuse. n a well-ventilated place. Keep container 		

None known.

SECTION 3. COMPOSITION/INFORMATION ON INGREDIENTS

Substance / Mixture : Mixture

Hazardous components





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Chemical name	CAS-No.	Concentration (% w/w)
2,2'-iminodi(ethylamine)	111-40-0	30 - 50
4,4'-isopropylidenediphenol	80-05-7	10 - 20
metaxylenediamine	1477-55-0	10 - 20
Accelerator	-	3 - 5
2,2,4(or 2,4,4)-trimethylhexane-1,6-diamine	25620-58-0	0.25 - 1

The specific chemical identity and/or exact percentage (concentration) of composition may be withheld as a trade secret.

SECTION 4. FIRST AID MEASURES

General advice	 Move out of dangerous area. Consult a physician. Show this safety data sheet to the doctor in attendance. Symptoms of poisoning may appear several hours later. Do not leave the victim unattended.
If inhaled	 Call a physician or poison control centre immediately. If unconscious, place in recovery position and seek medical advice.
In case of skin contact	 Immediate medical treatment is necessary as untreated wounds from corrosion of the skin heal slowly and with difficulty. If on skin, rinse well with water. If on clothes, remove clothes.
In case of eye contact	 Small amounts splashed into eyes can cause irreversible tissue damage and blindness. In the case of contact with eyes, rinse immediately with plenty of water and seek medical advice. Continue rinsing eyes during transport to hospital. Remove contact lenses. Protect unharmed eye. Keep eye wide open while rinsing. If eye irritation persists, consult a specialist.
If swallowed	 Keep respiratory tract clear. Do NOT induce vomiting. Do not give milk or alcoholic beverages. Never give anything by mouth to an unconscious person. If symptoms persist, call a physician. Take victim immediately to hospital.
Most important symptoms and effects, both acute and delayed	: None known.

SECTION 5. FIREFIGHTING MEASURES





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	Suitable extinguishing media		:	: Use extinguishing measures that are appropriate to loca circumstances and the surrounding environment.		
	Unsuitable extinguishing media		:	: High volume water jet		
Specific hazards during firefighting		:	: Do not allow run-off from fire fighting to enter drains or water courses.			
Hazardous combustion products		:	No hazardous combustion products are known			
	Specific extinguishing methods		:	: No data is available on the product itself.		
Further information		:	Collect contaminated fire extinguishing water separately. must not be discharged into drains. Fire residues and contaminated fire extinguishing water r be disposed of in accordance with local regulations.			
	Specia for firef	I protective equipment ighters	:	Wear self-contain necessary.	ed breathing apparatus for firefighting if	

SECTION 6. ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures	Use personal protective equipment. Ensure adequate ventilation. Evacuate personnel to safe areas.	
Environmental precautions	Prevent product from entering drains. Prevent further leakage or spillage if safe to do If the product contaminates rivers and lakes or respective authorities.	
Methods and materials for containment and cleaning up	Soak up with inert absorbent material (e.g. san acid binder, universal binder, sawdust). Keep in suitable, closed containers for disposa	_

SECTION 7. HANDLING AND STORAGE

Advice on protection against fire and explosion	:	Normal measures for preventive fire protection.
Advice on safe handling	:	Avoid formation of aerosol. Do not breathe vapours/dust. Avoid exposure - obtain special instructions before use. Avoid contact with skin and eyes. For personal protection see section 8. Smoking, eating and drinking should be prohibited in the application area. Provide sufficient air exchange and/or exhaust in work rooms. To avoid spills during handling keep bottle on a metal tray. Dispose of rinse water in accordance with local and national regulations.





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			allergies, chronic	ble to skin sensitisation problems or asthma, or recurrent respiratory disease should not ny process in which this mixture is being
Conditions for safe storage		 Prevent unauthorized access. Keep container tightly closed in a dry and well-ventilated place. Containers which are opened must be carefully resealed and kept upright to prevent leakage. Observe label precautions. Electrical installations / working materials must comply with the technological safety standards. 		
Materi	als to avoid	: No materials to be especially mentioned.		e especially mentioned.
	r information on e stability	:	No decomposition	n if stored and applied as directed.

SECTION 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Components with workplace control parameters

Components	CAS-No.	Value type (Form of exposure)	Control parameters / Permissible concentration	Basis		
2,2'-iminodi(ethylamine)	111-40-0	TWA	1 ppm	ACGIH		
metaxylenediamine	1477-55-0	С	0.1 mg/m3	ACGIH		
Personal protective equipment	t					
Respiratory protection	: In the case of approved filter		n use a respirator wit	h an		
Hand protection Remarks		The suitability for a specific workplace should be discussed with the producers of the protective gloves.				
Eye protection	Tightly fitting	Eye wash bottle with pure water Tightly fitting safety goggles Wear face-shield and protective suit for abnormal processing problems.				
Skin and body protection	Choose body	Impervious clothing Choose body protection according to the amount and concentration of the dangerous substance at the work place.				
Hygiene measures	When using d When using d	Avoid contact with skin, eyes and clothing. When using do not eat or drink. When using do not smoke. Wash hands before breaks and immediately after handling the product.				

SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES





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Ap	pearance	:	liquid		
Co	olour	:	amber, clear		
Oc	lour	:	No data is available on the product itself.		
Oc	our Threshold	:	No data is availa	ble on the product itself.	
pН	I	:	No data is available on the product itself.		
Fre	eezing point	:	No data is availa	ble on the product itself.	
Me	elting point		No data is availa	ble on the product itself.	
Bo	iling point	:	> 204 °C		
Fla	ash point	:	121 °C Method: Pensky-	Martens closed cup, closed cup	
Ev	aporation rate	:	No data is availa	ble on the product itself.	
Fla	ammability (solid, gas)	:	No data is availa	ble on the product itself.	
Fla	ammability (liquids)	:	No data is availa	ble on the product itself.	
	oper explosion limit / Upper mmability limit	:	No data is availa	ble on the product itself.	
	wer explosion limit / Lower mmability limit	:	No data is availa	ble on the product itself.	
Va	pour pressure	:	0.1333 hPa (25 °	C)	
Re	elative vapour density	:	No data is availa	ble on the product itself.	
Re	elative density	:	1.06		
De	ensity	:	No data is availa	ble on the product itself.	
	lubility(ies) Water solubility	:	partly soluble		
	Solubility in other solvents	:	No data is availa	ble on the product itself.	
	rtition coefficient: n- tanol/water	:	No data is availa	ble on the product itself.	
	to-ignition temperature	:	No data is availa	ble on the product itself.	
Th	ermal decomposition	:	No data is availa	ble on the product itself.	
de	If-Accelerating composition temperature ADT)	:	No data is availa	ble on the product itself.	
Vis	scosity	:	No data is availa	ble on the product itself.	





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Explo	sive properties	: No data is ava	ailable on the product itself.
Oxidiz	zing properties	: No data is ava	ailable on the product itself.
Partic	le size	: No data is ava	ailable on the product itself.

SECTION 10. STABILITY AND REACTIVITY

Reactivity Chemical stability Possibility of hazardous reactions	: S	No dangerous reaction known under conditions of normal use. Stable under normal conditions. No hazards to be specially mentioned.	
Conditions to avoid	:	None known.	
Incompatible materials	:	None known.	

SECTION 11. TOXICOLOGICAL INFORMATION

Information on likely routes of exposure	:	No data is available on the product itself.
Acute toxicity		
Acute oral toxicity - Product	:	Acute toxicity estimate : 2,475 mg/kg Method: Calculation method
Acute inhalation toxicity - Product	:	Acute toxicity estimate: 0.52 mg/l Exposure time: 4 h Test atmosphere: dust/mist Method: Calculation method
Acute dermal toxicity - Product	:	Acute toxicity estimate : 1,846 mg/kg Method: Calculation method
Acute toxicity (other routes of administration)	:	No data available

Skin corrosion/irritation

Product:

Remarks: Extremely corrosive and destructive to tissue.

Serious eye damage/eye irritation

Product:

Remarks: May cause irreversible eye damage.

Respiratory or skin sensitisation

Product:



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Remarks: Causes sensitisation.

<u>Components:</u> metaxylenediamine: Assessment:	Harmful if swallowed or if inhaled., May be harmful in contact with skin., Causes severe skin burns and eye damage. May cause an allergic skin reaction.
Germ cell mutagenicity	
Components:	
4,4'-isopropylidenediphenol: Genotoxicity in vitro	: : Metabolic activation: with and without metabolic activation Result: negative
metaxylenediamine: Genotoxicity in vitro	: Test Type: Ames test Test system: Salmonella typhimurium Metabolic activation: with and without metabolic activation Method: OECD Test Guideline 471 Result: negative
	Test Type: Chromosome aberration test in vitro Test system: Chinese hamster lung cells Metabolic activation: with and without metabolic activation Method: OECD Test Guideline 473 Result: negative
	Test Type: In vitro mammalian cell gene mutation test Test system: mouse lymphoma cells Metabolic activation: with and without metabolic activation Method: OECD Test Guideline 476 Result: negative
Accelerator:	
Genotoxicity in vitro	: Metabolic activation: with and without metabolic activation Result: negative
	Metabolic activation: with and without metabolic activation Method: OECD Test Guideline 471 Result: negative
	Metabolic activation: with and without metabolic activation Method: OECD Test Guideline 476 Result: negative
2,2,4(or 2,4,4)-trimethylhexa Genotoxicity in vitro	ane-1,6-diamine: : Test Type: Ames test Test system: Salmonella typhimurium Concentration: 5000 ug/plate Metabolic activation: with and without metabolic activation Method: Directive 67/548/EEC, Annex, B.13/14 Result: negative

Test Type: Chromosome aberration test in vitro





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REN® 1501 US			
Version Revision Date: 1.1 06/29/2017	SDS Number: 400001012618		issue: 07/02/2016 issue: 07/02/2016
	Metabolic activ	D Test Guideline	without metabolic activation
	Test system: C Concentration Metabolic activ	Chinese hamster : 2 mg/ml vation: with and v D Test Guideline	without metabolic activation
Components: 2,2'-iminodi(ethylamine):			
Genotoxicity in vivo	: Cell type: Som Application Ro Dose: 85 - 850 Method: OECI Result: negativ	ute: Oral) mg/kg) Test Guideline	474
	Application Ro Result: negativ		
4,4'-isopropylidenediphenol: Genotoxicity in vivo	: Method: OECI Result: negativ	D Test Guideline /e	474
metaxylenediamine: Genotoxicity in vivo	Cell type: Bon Application Ro Exposure time Dose: 750 mg	e (male and ferr e marrow oute: Oral :: single dose /kg body weight D Test Guideline	nale)
2,2,4(or 2,4,4)-trimethylhexan Genotoxicity in vivo	: Species: Chine Cell type: Bon Application Ro Dose: 825 - 10	e marrow oute: Oral 000 mg/kg 0 Test Guideline	
	Species: Mous Application Ro Dose: 850 - 10)00 mg/kg D Test Guideline	nale)
<u>Components:</u> metaxylenediamine: Germ cell mutagenicity-	: Tests on bacte	erial or mammalia	an cell cultures did not show





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ersion .1	Revision Date: 06/29/2017		S Number:)001012618	Date of last issue: 07/02/2016 Date of first issue: 07/02/2016
Asses	sment		mutagenic effects effects.	., Animal testing did not show any mutagenic
	cell mutagenicity- sment	:	No data available	
Carci	nogenicity			
2,2'-in Specie Applic Dose: Freque	onents: hinodi(ethylamine): es: Mouse, (male) ation Route: Dermal 56.3 mg/kg ency of Treatment: 3 da t: negative	ily		
Specie Applic Expos Freque	opropylidenediphenol: es: Rat, (male and fema ation Route: Oral sure time: 103 weeks ency of Treatment: 7 da t: negative			
	nogenicity - sment	:	No data available	
IARC		eq		s product present at levels greater than or ntified as probable, possible or confirmed y IARC.
OSH	A			s product present at levels greater than or DSHA's list of regulated carcinogens.
NTP		eq		s product present at levels greater than or ntified as a known or anticipated carcinogen
Repro	ductive toxicity			
Comp	onents:			
2,2'-in	ninodi(ethylamine): s on fertility	:	Species: Rat, mal Application Route General Toxicity - 30 mg/kg wet weig Method: OECD Te Result: positive	: Oral Parent: No observed adverse effect level: ght
4,4'-is	opropylidenediphenol:		Species: Rat, mal Application Route Method: OECD Te Result: Embryoto offspring were det	: Oral est Guideline 416 kic effects and adverse effects on the





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metax	vylenediamine:	Species: Rat, n	nale and female		
		Application Route: Oral Dose: 0, 50, 150 and 450 mg/kg General Toxicity - Parent: No-observed-effect level: 50 - 1 mg/kg body weight General Toxicity F1: No-observed-effect level: 450 mg/kg body weight Method: OECD Test Guideline 421 Result: No effects on fertility and early embryonic development were detected.			
Accel	erator:				
		Species: Rat, n Application Rou	nale and female ute: Oral		
		Method: OECD	Test Guideline 422 cts on fertility and early embryonic		
224(or 2,4,4)-trimethylhexa				
2,2,4	01 2,4,4)-unitedityinexa	Species: Rat, n	nale and female		
		Application Rou Dose: 10, 60, 1	ute: Oral 20 mg/kg bw/day		
		Method: OECD	Test Guideline 416		
		Result: No effe development w	cts on fertility and early embryonic ere detected.		
Com	oonents:				
	ninodi(ethylamine): is on foetal	: Species: Rat			
	opment	Application Rou General Toxicit 100 mg/kg bod	y Maternal: No observed adverse effect level: y weight Test Guideline 421		
4.41 :-		Nesult. No advi			
4,4 -15	opropylidenediphenol:	< 160 mg/kg bo	ute: Oral y Maternal: No observed adverse effect level: ody weight Test Guideline 416		
metax	ylenediamine:		-		
		Strain: Sprague Application Rou Dose: 0, 30, 10 Duration of Sin Frequency of T General Toxicit 100 mg/kg bod	nale and female e-Dawley ute: Oral 0, 300 mg/kg milligram per kilogram gle Treatment: 19 d reatment: 1 daily y Maternal: No observed adverse effect level:		





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		Result: No e	weight CD Test Guideline 414 effects on fertility and early embryonic nt were detected.				
2,2,4(6	or 2,4,4)-trimethylhexar	Species: Ra Application I General Tox 50,000 ppm	kicity Maternal: No observed adverse effect le	vel:			
4,4'-is	onents: opropylidenediphenol: ductive toxicity - sment		nce of adverse effects on sexual function and ed on animal experiments.				
	ylenediamine: ductive toxicity - sment		e of adverse effects on sexual function and fe opment, based on animal experiments.	rtility,			

STOT - single exposure

Components:

2,2'-iminodi(ethylamine): Target Organs: Respiratory Tract Assessment: May cause respiratory irritation.

4,4'-isopropylidenediphenol:

Assessment: The substance or mixture is classified as specific target organ toxicant, single exposure, category 3 with respiratory tract irritation.

STOT - repeated exposure

No data available

Repeated dose toxicity

Components:

2,2'-iminodi(ethylamine): Species: Rat, male and female NOEC: 70 - 80 mg/m3 Application Route: Ingestion Test atmosphere: vapour Exposure time: 360 h Number of exposures: 7 d Method: Subchronic toxicity

Species: Rat, male and female NOAEL: 114 mg/kg/d Application Route: Skin contact Exposure time: 9,600 h Number of exposures: 6 d





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1.1	06/29/2017

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Date of last issue: 07/02/2016 Date of first issue: 07/02/2016

Method: Chronic toxicity

4,4'-isopropylidenediphenol: Species: Dog, male and female NOEC: 75 mg/kg, 10 mg/m3 Application Route: Ingestion Test atmosphere: dust/mist Exposure time: 2,160 h Number of exposures: 7 d Method: Subchronic toxicity

Species: Rat, male and female LOAEL: 600 mg/kg Application Route: Ingestion Exposure time: 672 h Number of exposures: 7 d Method: Subchronic toxicity

metaxylenediamine: Species: Rat, male and female NOEL: 150 mg/kg Application Route: oral (gavage) Exposure time: 672 h Number of exposures: 7 d Dose: 0, 10, 40, 150 and 600 mg/kg/d Method: OECD Test Guideline 407

Species: Rat, male and female NOEC: 0.6 mg/m3 Application Route: Inhalation Exposure time: 13 weeks Number of exposures: 6 hours per day, 5 days per we Dose: 0, 0.64, 5.1, 31 mg/m3 Method: OECD Test Guideline 413 Target Organs: Lungs

Accelerator: Species: Rat, male and female NOAEL: 30 mg/kg/d Application Route: Ingestion Number of exposures: 7 d Method: Subacute toxicity

2,2,4(or 2,4,4)-trimethylhexane-1,6-diamine: Species: Rat, male and female NOAEL: 10 mg/kg bw/day Application Route: Ingestion Exposure time: 13 Weeks Number of exposures: Daily Dose: 10, 60, 180mg/kg bw Target Organs: Liver





Version	Revision Date:
1.1	06/29/2017

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Species: Rat, male and female LOAEL: 60 mg/kg bw/day Application Route: Ingestion Exposure time: 13 Weeks Number of exposures: Daily Dose: 10, 60, 180mg/kg bw Target Organs: Liver

Components:

metaxylenediamine: Repeated dose toxicity -Assessment

 Harmful if swallowed or if inhaled., May be harmful in contact with skin., Causes severe skin burns and eye damage. No adverse effect has been observed in chronic toxicity tests.

Aspiration toxicity

No data available

Experience with human exposure

General Information:	No data available
Inhalation:	No data available
Skin contact:	No data available
Eye contact:	No data available
Ingestion:	No data available

Toxicology, Metabolism, Distribution

No data available

Neurological effects

No data available

Further information

Product: Remarks: No data available

SECTION 12. ECOLOGICAL INFORMATION

Ecotoxicity

Components:





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Version 1.1	Revision Date: 06/29/2017	SDS Number:Date of last issue: 07/02/2016400001012618Date of first issue: 07/02/2016		
Expos Test 1 Test s		: LC50: 430 mg/l Exposure time: 96 h Test Type: semi-static test Test substance: Fresh water Method: Directive 67/548/EEC, Annex V, C.1.	kposure time: 96 h est Type: semi-static test est substance: Fresh water	
4,4'-isopropylidenediphenol: Toxicity to fish		: LC50 (Oncorhynchus mykiss (rainbow trout)): 7.5 mg Exposure time: 96 h	ı/I	
	axylenediamine: icity to fish	 LC50 (Oryzias latipes (Orange-red killifish)): 87.6 mg/l Exposure time: 96 h Test Type: semi-static test Method: OECD Test Guideline 203 		
	elerator: icity to fish	 LC50 (Leuciscus idus (Golden orfe)): > 100 - < 215 n Exposure time: 96 h Test Type: static test Test substance: Fresh water Method: DIN 38412 	ng/l	
	4(or 2,4,4)-trimethylhexar icity to fish	e-1,6-diamine: : LC50 (Leuciscus idus (Golden orfe)): 174 mg/l Exposure time: 48 h Method: DIN 38412		
Co	nponents:			
2,2 To	-iminodi(ethylamine): icity to daphnia and other atic invertebrates	 EC50 (Daphnia magna (Water flea)): 32 mg/l Exposure time: 48 h Test Type: static test Test substance: Fresh water 		
Tox	-isopropylidenediphenol: icity to daphnia and other atic invertebrates	: EC50: 3.9 - 10.2 mg/l Exposure time: 48 h		
		(Ceriodaphnia dubia (Water flea)):		
То	axylenediamine: icity to daphnia and other atic invertebrates	 EC50 (Daphnia magna (Water flea)): 15.2 mg/l Exposure time: 48 h Test Type: static test Method: OECD Test Guideline 202 		
Tox	elerator: icity to daphnia and other atic invertebrates	 EC50 (Daphnia magna (Water flea)): 267.9 mg/l Exposure time: 48 h Test Type: static test Test substance: Fresh water Method: Directive 67/548/EEC, Annex V, C.2. 		





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Version 1.1	Revision Date: 06/29/2017	SDS Number: 400001012618		sue: 07/02/2016 sue: 07/02/2016
Toxici	or 2,4,4)-trimethylhexan ty to daphnia and other ic invertebrates			ea)): 31.5 mg/l
2,2'-in	oonents: ninodi(ethylamine): ty to algae	mg/l Exposure til Test Type: s Test substa	me: 72 h	um (green algae)): 1,164 01
	opropylidenediphenol: ty to algae	: EC50 (Sele mg/l Exposure tir		m (green algae)): 2.5 - 3.1
	ylenediamine: ty to algae	Exposure til Test Type: s	me: 72 h	um (green algae)): 32.1 mg/l 01
	erator: ty to algae	Exposure til Test Type: s Test substa	me: 72 h	tus (green algae)): 180.7 mg/l 01
	or 2,4,4)-trimethylhexan ty to algae	: ErC50 (Pse Exposure tin Method: OE EC50 (Pseu Exposure tin Method: OE NOEC (Pse	me: 72 h CD Test Guideline 20 udokirchneriella subca me: 72 h CD Test Guideline 20 udokirchneriella subc	apitata (algae)): 37.1 mg/l
M-Fac toxicit	ctor (Acute aquatic y)	Exposure tin Method: OE : No data ava	CD Test Guideline 20	01
2,2'-in	ponents: ninodi(ethylamine): ty to fish (Chronic y)	Test substa		10



Ero



		Freeman Manufacturing & www.freemansupply.com 80	Supply Co.	Fourielais e litre e Alexander income atie
REN ® ²	1501 US	www.neemansuppry.com of	JO-521-0511 FREEMAN	Enriching lives through innovatio
Version 1.1	Revision Date: 06/29/2017	SDS Number: 400001012618		ssue: 07/02/2016 ssue: 07/02/2016
	sopropylidenediphenol: ity to fish (Chronic y)	Exposure time Test Type: flo Test substand Method: Fish		
	or 2,4,4)-trimethylhexan ity to fish (Chronic y)	: NOEC (Brach Exposure time Method: OEC Lowest Obser (zebrafish)): 1 Exposure time	D Test Guideline : ved Effect Concer 0.9 mg/l	210 ntration (Brachydanio rerio
2,2'-ir Toxic aquat	oonents: ninodi(ethylamine): ity to daphnia and other ic invertebrates nic toxicity)	Exposure time Test Type: se Test substand		
Toxic aquat	kylenediamine: ity to daphnia and other ic invertebrates nic toxicity)	Exposure time Test Type: se		
Toxic aquat	or 2,4,4)-trimethylhexan ity to daphnia and other ic invertebrates nic toxicity)	: NOEC (Daphi Exposure time	nia magna (Water e: 21 d D Test Guideline 3	
		(Water flea)): Exposure time	1.02 mg/l	ntration (Daphnia magna 211

Components:

oomponenta.	
4,4'-isopropylidenediphenol: M-Factor (Chronic aquatic toxicity)	: 1
Components:	
metaxylenediamine:	
Toxicity to microorganisms	: EC50 (activated sludge): > 1,000 mg/l
	Exposure time: 0.5 h
	Test Type: static test
	Method: OECD Test Guideline 209





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ersion .1	Revision Date: 06/29/2017		OS Number: 0001012618	Date of last issue: 07/02/2016 Date of first issue: 07/02/2016
	erator: ity to microorganisms	:	EC50 (activated s Exposure time: 7 Method: DIN 38 4	h
	or 2,4,4)-trimethylhexan ity to microorganisms			nas putida): 89 mg/l 7 h
2,2'-in	oonents: ninodi(ethylamine): ity to soil dwelling isms	:	EC50 (Eisenia feti Exposure time: 56 Method: OECD Te	
	or 2,4,4)-trimethylhexan ity to soil dwelling isms			
			EC50 (Eisenia fet Exposure time: 56 Method: OECD Te	
Plant	toxicity	:	No data available	
Sedin	nent toxicity	:	No data available	
Toxici organ	ity to terrestrial isms	:	No data available	
Ecoto	xicology Assessment			
2,2'-in	oonents: ninodi(ethylamine): aquatic toxicity	:	This product has r	no known ecotoxicological effects.
4,4'-is	oonents: opropylidenediphenol:		T	
	ic aquatic toxicity	:		fe with long lasting effects.
Toxici	ity Data on Soil	:	No data available	
	organisms relevant to ivironment	:	No data available	
Persi	stence and degradabil	ity		
	oonents:			
	ninodi(ethylamine): gradability	:	Inoculum: activate Result: Readily bi Biodegradation: 8 Exposure time: 21	odegradable. 37 %





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			Method: OECD T	est Guideline 301D	
	sopropylidenediphenol: egradability	:	Result: Not readil Biodegradation: Exposure time: 23	1 - 2 %	
	metaxylenediamine: Biodegradability		Inoculum: activated sludge Concentration: 14.2 mg/l Result: Not readily biodegradable. Biodegradation: 49 % Exposure time: 28 d Method: OECD Test Guideline 301B		
	Accelerator: Biodegradability		 Inoculum: activated sludge Result: Not readily biodegradable. Biodegradation: 0 - 10 % Exposure time: 28 d Method: OECD Test Guideline 301F 		
			Inoculum: activate Concentration: 9, Result: Inherently Biodegradation: Exposure time: 60 Method: ISO Met	000 mg/l / biodegradable. 79 % 0 d	
	(or 2,4,4)-trimethylhexa egradability		6-diamine: Inoculum: activate Concentration: 11 Result: Not readil Biodegradation: Exposure time: 28	I.4 mg/l y biodegradable. 7 %	
	nemical Oxygen and (BOD)	:	No data available	1	
Chen (COE	nical Oxygen Demand))	:	No data available		
BOD	/COD	:	No data available	1	
ThO	D	:	No data available	1	
BOD	/ThOD	:	No data available	,	
Disso (DOC	blved organic carbon	:	No data available		
	ico-chemical vability	:	No data available		
Stabi	lity in water	:	No data available		



Degradation (direct photolysis): 50 %



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2,2'-ir	ponents: ninodi(ethylamine): odegradation	: Test Type: Air	
Fliote	Juegradation	Rate constant:	500000

Impact on Sewage : No data available Treatment

Bioaccumulative potential

Components:

2,2'-iminodi(ethylamine): Bioaccumulation	: Species: Cyprinus carpio (Carp) Bioconcentration factor (BCF): 0.3 - 6.3 Exposure time: 42 d Test substance: Fresh water Method: flow-through test Remarks: Bioaccumulation is unlikely.
metaxylenediamine:	

Bioaccumulation : Species: Cyprinus carpio (Carp) Bioconcentration factor (BCF): < 0.3 Remarks: Does not bioaccumulate.

Components:

2,2'-iminodi(ethylamine):	
Partition coefficient: n-	: log Pow: -1.58 (20 °C)
octanol/water	pH: 7

metaxylenediamine: Partition coefficient: noctanol/water Partition coefficient: noctanol/water PH: 10.3 - 10.4 Method: OECD Test Guideline 107

Accelerator.		
Partition coefficient: n-	: 10	og Pow: -0.19 (25 °C)
octanol/water	р	H: 9.25 - 9.85
	N	lethod: OECD Test Guideline 107

2,2,4(or 2,4,4)-trimethylhexane-1,6-diamine:				
Partition coefficient: n-	:	log Pow: -0.3 (25 °C)		
octanol/water		Method: OECD Test Guideline 117		

Mobility in soil

Accelerator:

: No data available

Components:

2,2'-iminodi(ethylamine): Distribution among : Koc: 19111 environmental compartments Accelerator:





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		ution among imental compartments	:	Koc: 27 Method: Calculation	on method
	Stability	y in soil	:	No data available	
	Other a	adverse effects			
	Enviror pathwa	nmental fate and lys	:	No data available	
	Results assess	s of PBT and vPvB ment	:	No data available	
	Endocr potentia	ine disrupting al	:	No data available	
		ed organic bound ns (AOX)	:	No data available	
	Hazard	lous to the ozone laye	er		
	Ozone-	Depletion Potential	:	Protection of Strat Substances Remarks: This pro manufactured with	R Protection of Environment; Part 82 tospheric Ozone - CAA Section 602 Class I oduct neither contains, nor was n a Class I or Class II ODS as defined by the t Section 602 (40 CFR 82, Subpt. A, App.A +
		nal ecological ation - Product	:	unprofessional ha	hazard cannot be excluded in the event of ndling or disposal. c life with long lasting effects.
	Global (GWP)	warming potential	:	No data available	

SECTION 13. DISPOSAL CONSIDERATIONS

Disposal methods	
Waste from residues	 The product should not be allowed to enter drains, water courses or the soil. Do not contaminate ponds, waterways or ditches with chemical or used container. Send to a licensed waste management company.
Contaminated packaging	: Empty remaining contents. Dispose of as unused product. Do not re-use empty containers.

SECTION 14. TRANSPORT INFORMATION

International Regulations





ΙΑΤΑ	
UN/ID No.	: UN 2735
Proper shipping name	 Polyamines, liquid, corrosive, n.o.s. (DIETHYLENE TRIAMINE, M-XYLYLENE DIAMINE)
Class	: 8
Packing group	: 11
Labels	: Corrosive
Packing instruction (cargo aircraft)	: 855
Packing instruction (passenger aircraft)	: 851
IMDG	
UN number	: UN 2735
Proper shipping name	: POLYAMINES, LIQUID, CORROSIVE, N.O.S. (DIETHYLENE TRIAMINE, M-XYLYLENE DIAMINE)
Class	: 8
Packing group	:
Labels	: 8
EmS Code	: F-A, S-B
Marine pollutant	: no

Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code

Not applicable for product as supplied.

National Regulations

DOT Classification UN/ID/NA number Proper shipping name	: UN 2735 : POLYAMINES, LIQUID, CORROSIVE, N.O.S.
Proper snipping name	(DIETHYLENE TRIAMINE, M-XYLYLENE DIAMINE)
Class	: 8
Packing group	: 11
Labels	: CORROSIVE
ERG Code	: 153
Marine pollutant	: no

SECTION 15. REGULATORY INFORMATION

EPCRA - Emergency Planning and Community Right-to-Know Act

SARA 311/312 Hazards	:	Acute Health Hazard		
SARA 313	:	The following components a established by SARA Title II		g levels
		4,4'- isopropylidenediphenol	80-05-7	16.65 %

This product does not contain any hazardous air pollutants (HAP), as defined by the U.S. Clean





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Air Act Section 112 (40 CFR 61).

California Prop. 65

WARNING: This product contains a chemical known to the State of California to cause birth defects or other reproductive harm.

The components of this product are reported in the following inventories:				
CH INV	:	The formulation contains substances listed on the Swiss Inventory, Not in compliance with the inventory		
DSL	:	All components of this product are on the Canadian DSL		
AICS	:	Not in compliance with the inventory		
NZIoC	:	Not in compliance with the inventory		
ENCS	:	Low volume exemption, On the inventory, or in compliance with the inventory		
KECI	:	On the inventory, or in compliance with the inventory		
PICCS	:	On the inventory, or in compliance with the inventory		
IECSC	:	On the inventory, or in compliance with the inventory		
TCSI	:	On the inventory, or in compliance with the inventory		
TSCA	:	On the inventory, or in compliance with the inventory		

Inventories

AICS (Australia), DSL (Canada), IECSC (China), REACH (European Union), ENCS (Japan), ISHL (Japan), KECI (Korea), NZIoC (New Zealand), PICCS (Philippines), TCSI (Taiwan), TSCA (USA)

TSCA - 5(a) Significant New Use Rule List of Chemicals

No substances are subject to a Significant New Use Rule.

US. Toxic Substances Control Act (TSCA) Section 12(b) Export Notification (40 CFR 707, Subpt D)

No substances are subject to TSCA 12(b) export notification requirements.





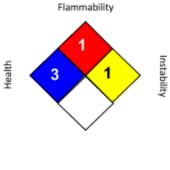
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1.1	06/29

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SECTION 16. OTHER INFORMATION

Further information





Special hazard.

HMIS® IV:



HMIS® ratings are based on a 0-4 rating scale, with 0 representing minimal hazards or risks, and 4 representing significant hazards or risks. The "*" represents a chronic hazard, while the "/" represents the absence of a chronic hazard.

Revision Date	: 06/29/2017
ACGIH ACGIH / TWA ACGIH / C	 USA. ACGIH Threshold Limit Values (TLV) 8-hour, time-weighted average Ceiling limit

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THE PRODUCT MAY PRESENT HAZARDS AND SHOULD BE USED WITH CAUTION. WHILE CERTAIN HAZARDS ARE DESCRIBED IN THIS PUBLICATION, NO GUARANTEE IS MADE THAT THESE ARE THE ONLY HAZARDS THAT EXIST.

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Version Revision Date: 1.1 06/29/2017 SDS Number: 400001012618

Date of last issue: 07/02/2016 Date of first issue: 07/02/2016





REN 1510 US

Version Revisi 1.0 08/12/

Revision Date: 08/12/2015

Date of last issue: -Date of first issue: 08/12/2015

SECTION 1. IDENTIFICATION

Product name	: REN 1510 US
Manufacturer or supplier's d	etails
Company name of supplier Address	 Huntsman Advanced Materials Americas LLC P.O. Box 4980 The Woodlands, TX 77387 United States of America
Telephone	: Non-Emergency: (800) 257-5547
E-mail address of person responsible for the SDS	: MSDS@huntsman.com
Emergency telephone	: Chemtrec: (800) 424-9300 or (703) 527-3887

SDS Number:

400001012653

Recommended use of the chemical and restrictions on use

Recommended use	:	Hardener
Recommended use	:	Hardene

SECTION 2. HAZARDS IDENTIFICATION

GHS Classification Acute toxicity (Oral)	: Category 4
Acute toxicity (Inhalation)	: Category 4
Skin corrosion	: Category 1B
Serious eye damage	: Category 1
Skin sensitization	: Category 1
Acute aquatic toxicity	: Category 3
Chronic aquatic toxicity	: Category 3
GHS Label element	
Hazard pictograms	
Signal Word	: Danger
Hazard Statements	: H302 + H332 Harmful if s H314 Causes severe skir

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REN 15			
Version 1.0	Revision Date: 08/12/2015	SDS Number: 400001012653	Date of last issue: - Date of first issue: 08/12/2015
		H412 Harmful	to aquatic life with long lasting effects.
Preca	autionary Statements	SDS Number: Date of last issue: - 400001012653 Date of first issue: 08/12/2015 H412 Harmful to aquatic life with long lasting effects. : Prevention: P261 Avoid breathing dust/ fume/ gas/ mist/ vapours/ sprep264 Wash skin thoroughly after handling. P270 Do not eat, drink or smoke when using this product. P271 Use only outdoors or in a well-ventilated area. P272 Contaminated work clothing must not be allowed outhe workplace. P273 Avoid release to the environment. P280 Wear protective gloves/ protective clothing/ eye proface protection. Response: P301 + P312 + P330 IF SWALLOWED: Call a POISON CENTER or doctor/ physician if you feel unwell. Rinse mode P301 + P330 + P331 IF SWALLOWED: Rinse mouth. Do induce vomiting. P303 + P361 + P353 IF ON SKIN (or hair): Take off immed all contaminated clothing. Rinse skin with water/shower. P304 + P340 + P310 IF INHALED: Remove person to free and keep comfortable for breathing. Immediately call a POIS CENTER or doctor/ physician. P305 + P351 + P338 + P310 IF IN EYES: Rinse cautious water for several minutes. Remove contact lenses, if pres and easy to do. Continue rinsing. Immediately call a POIS CENTER or doctor/ physician. P333 + P313 If skin irritation or rash occurs: Get medical attention. P363 Wash contaminated clothing before reuse. Storage: P405 Store locked up. <t< td=""></t<>	

Other hazards

The following percentage of the mixture consists of ingredient(s) with unknown acute toxicity: 43.55 %

SECTION 3. COMPOSITION/INFORMATION ON INGREDIENTS

Substance / Mixture : Mixture

Hazardous ingredients

Chemical Name	CAS-No.	Concentration (%)
Cyclohexanemethanamine, 5-amino-1,3,3-	2855-13-2	30 - 60
trimethyl-		
metaxylenediamine	1477-55-0	13 - 30
1-methylimidazole	616-47-7	3 - 7
1,6-Hexanediamine, C,C,C-trimethyl-	25620-58-0	0.1 - 1

SECTION 4. FIRST AID MEASURES







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Gene	ral advice	: No hazards	which require special first aid measures.		
If inhaled		fumes from (Move to fresh air in case of accidental inhalation of dust or fumes from overheating or combustion. If symptoms persist, call a physician. 		
In cas	se of skin contact		taminated clothing and shoes immediately. h soap and plenty of water.		
In case of eye contact		Remove cor Protect unha			
lf swa	allowed	Do not give	n with water and drink afterwards plenty of water. milk or alcoholic beverages. anything by mouth to an unconscious person.		
	important symptoms ffects, both acute and ed	: None known	l.		

SECTION 5. FIRE-FIGHTING MEASURES

Suitable extinguishing media	: Use extinguishing measures that are appropriate to local circumstances and the surrounding environment.
Unsuitable extinguishing media	: No data is available on the product itself.
Specific extinguishing methods	: No data is available on the product itself.
Further information	: Standard procedure for chemical fires.
Special protective equipment for fire-fighters	: In the event of fire, wear self-contained breathing apparatus.

SECTION 6. ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures	: Not applicable for product as supplied.
Environmental precautions	: No special environmental precautions required.
Methods and materials for containment and cleaning up	: Wipe up with absorbent material (e.g. cloth, fleece). Keep in suitable, closed containers for disposal.

SECTION 7. HANDLING AND STORAGE

Advice on protection against : Normal measures for preventive fire protection.





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fire ar	nd explosion			
Advice	e on safe handling	• •	rotection see section 8. dling advice required.	
Conditions for safe storage		: Keep container tightly closed in a dry and well-ventilated place.		
Mater	ials to avoid	: No special rest	rictions on storage with other products.	

SECTION 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Ingredients with workplace control parameters

ingreatents with workplace	oona or paramor			
Ingredients	CAS-No.	Value type (Form of exposure)	Control parameters / Permissible concentration	Basis
metaxylenediamine	1477-55-0	С	0.1 mg/m3	ACGIH
		С	0.1 mg/m3	NIOSH REL
		С	0.1 mg/m3	OSHA P0
Respiratory protection	: No personal required.	respiratory prote	ective equipment no	rmally
Hand protection	·			
Remarks	: For prolonge	ed or repeated co	ontact use protective	e gloves.
Eye protection	: Safety glass	es		
Skin and body protection	: Protective su	uit		
Hygiene measures	: General indu	ustrial hygiene p	ractice.	

SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance	: liquid
Color	: amber, clear
Odor	: No data is available on the product itself.
Odor Threshold	: No data is available on the product itself.
рН	: No data is available on the product itself.
Boiling point	: > 204.44 °C
Flash point	: > 121 °C Method: Pensky-Martens closed cup, closed cup
Evaporation rate	: No data is available on the product itself.





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Flam	nmability (solid, gas)	:	No data is availa	able on the product itself.
Upp	er explosion limit	:	No data is availa	able on the product itself.
Low	er explosion limit	:	No data is availa	able on the product itself.
Vapo	or pressure	:	No data is availa	able on the product itself.
Rela	tive vapor density	:	No data is availa	able on the product itself.
Rela	tive density	:	1.04 - 1.06	
Den	sity	:	No data is availa	able on the product itself.
	bility(ies) /ater solubility	:	partly soluble	
S	olubility in other solvents	:	No data is availa	able on the product itself.
	ition coefficient: n-	:	No data is availa	able on the product itself.
	nol/water vignition temperature	:	No data is availa	able on the product itself.
The	rmal decomposition	:	No data is availa	able on the product itself.
Vi	iscosity	:	No data is availa	able on the product itself.
	Accelerating omposition temperature DT)	:	No data is availa	able on the product itself.

SECTION 10. STABILITY AND REACTIVITY

Reactivity Chemical stability Possibility of hazardous reactions	 Stable under recommended storage conditions. No decomposition if stored and applied as directed. No hazards to be specially mentioned.
Conditions to avoid	: No data available

SECTION 11. TOXICOLOGICAL INFORMATION

Information on likely routes of exposure	:	No data is available on the product itself.
Acute toxicity Acute oral toxicity - Product	:	Acute toxicity estimate : 1,011 mg/kg Method: Calculation method
Acute inhalation toxicity - Product	:	Acute toxicity estimate: 3.64 mg/l Exposure time: 4 h Test atmosphere: dust/mist Method: Calculation method





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Acute dermal toxicity -	:	Acute toxicity estimate : 3,421 mg/kg
Product		Method: Calculation method

Acute toxicity (other routes of : No data available administration)

Skin corrosion/irritation

Product:

Remarks: According to the classification criteria of the European Union, the product is not considered as being a skin irritant.

Serious eye damage/eye irritation

Product:

Remarks: According to the classification criteria of the European Union, the product is not considered as being an eye irritant.

Respiratory or skin sensitization

Product:

Remarks: No data available

Assessment:

No data available

Germ cell mutagenicity

Ingredients:

metaxylenediamine: Genotoxicity in vitro	 Metabolic activation: with and without metabolic activation Method: OECD Test Guideline 471 Result: negative
	Metabolic activation: with and without metabolic activation Method: OECD Test Guideline 473 Result: negative
	Metabolic activation: with and without metabolic activation Method: OECD Test Guideline 476 Result: negative
1-methylimidazole:	
	Metabolic activation: with and without metabolic activation Result: negative
	5
	Metabolic activation: with and without metabolic activation Method: OECD Test Guideline 471 Result: negative
	Metabolic activation: with and without metabolic activation Method: OECD Test Guideline 471





ersion .0	Revision Date: 08/12/2015	SDS Number: 400001012653	Date of last issue: - Date of first issue: 08/12/2015
meta	dients: xylenediamine: toxicity in vivo	: Application Ro Method: OECE Result: negativ	Test Guideline 474
	i nogenicity ata available		
	nogenicity - ssment	: No data availa	ble
IARC	2		nis product present at levels greater than or dentified as probable, possible or confirmed n by IARC.
ACG	IH		nis product present at levels greater than or dentified as a carcinogen or potential GIH.
OSH	A		nis product present at levels greater than or dentified as a carcinogen or potential HA.
NTP			nis product present at levels greater than or dentified as a known or anticipated carcinogen
Repr	oductive toxicity		
meta	dients: xylenediamine: ts on fertility	Application Ro	nale and female ute: Oral) Test Guideline 421
1-me	thylimidazole:	Application Ro	nale and female ute: Oral) Test Guideline 422
1,6-H	lexanediamine, C,C,C	Species: Rat, r Application Ro	nale and female ute: Oral 9 Test Guideline 416
Cyclo	dients: hexanemethanamine ts on fetal developme	Application Ro General Toxici body weight	emale





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Result: No teratogenic effects.

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1,6-Hexanediamine, C,C,C-trimethyl-:

		Species: Rabbit, female Application Route: Oral General Toxicity Maternal: NOAEL (No observed adverse effect level): 50,000 ppm Result: No teratogenic effects.	
Reproductive toxicity -	:	No data available	

Assessment

STOT-single exposure

No data available

STOT-repeated exposure

No data available

Repeated dose toxicity

Ingredients:

Cyclohexanemethanamine, 5-amino-1,3,3-trimethyl-: Species: Rat, male and female NOEC: 60 mg/kg, 200 mg/m3 Application Route: Ingestion Test atmosphere: dust/mist Exposure time: 216 h Number of exposures: 6 h Method: Subchronic toxicity

metaxylenediamine: Species: Rat, male and female No-observed-effect level: 150 mg/kg Application Route: Ingestion Exposure time: 672 h Number of exposures: 7 d Method: Subacute toxicity

1-methylimidazole: Species: Rat, male and female NOAEL (No observed adverse effect level): 30 mg/kg/d Application Route: Ingestion Number of exposures: 7 d Method: Subacute toxicity

1,6-Hexanediamine, C,C,C-trimethyl-: Species: Rat, male and female NOAEL (No observed adverse effect level): 10 mg/kg Application Route: Ingestion Exposure time: 13 Weeks Method: Subchronic toxicity





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Repeated dose toxicity -Assessment : No data available

Aspiration toxicity

No data available

Experience with human exposure

- General Information: No data available
- Inhalation: No data available
- Skin contact: No data available
- Eye contact: No data available
- Ingestion: No data available

Toxicology, Metabolism, Distribution

No data available

Neurological effects

No data available

Further information

Product:

Remarks: No data available

SECTION 12. ECOLOGICAL INFORMATION

Ecotoxicity	
Ingredients:	
Cyclohexanemethanamine	•
Toxicity to fish	 LC50 (Leuciscus idus (Golden orfe)): 110 mg/l Exposure time: 96 h Test Type: semi-static test Test substance: Fresh water Method: Directive 67/548/EEC, Annex V, C.1.
metaxylenediamine:	
Toxicity to fish	 LC50 (Oryzias latipes (Orange-red killifish)): 87.6 mg/l Exposure time: 96 h Test Type: semi-static test Test substance: Fresh water Method: OECD Test Guideline 203





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REN 15	10 US						
Version 1.0	Revision Date: 08/12/2015		S Number: 0001012653		Date of last is Date of first i	ssue: - ssue: 08/12/2015	
	nylimidazole: ty to fish	:	LC50 (Leuc Exposure tir Test Type: s Test substa Method: DIN	me: 96 static te nce: Fr	h est resh water	orfe)): > 100 - < 215 m	ng/l
Ingred	lients:						
Cycloł Toxicit	nexanemethanamine, 5- ty to daphnia and other c invertebrates		EC50: 23 m Exposure tir Test Type: s Test substa	ng/l me: 48 static te nce: Fr	est	202	
Toxicit	ylenediamine: ty to daphnia and other c invertebrates	:	EC50: 15.2 Exposure tir Test Type: s Test substa Method: OE	me: 48 static te nce: Fr	est	202	
Toxicit	nylimidazole: ty to daphnia and other c invertebrates	:	Exposure tir Test Type: s Test substa	me: 48 static te nce: Fr	h est resh water	ilea)): 267.9 mg/l Annex V, C.2.	
Ingred	<u>lients:</u>						
	nexanemethanamine, 5- ty to algae		EC50: 37 m Exposure tir Test Type: s Test substa	ng/l me: 72 static te nce: Fr	est resh water	Annex V, C.3.	
	ylenediamine: ty to algae	:	Exposure tir Test Type: s	me: 72 static te	h	tum (green algae)): 3 201	2.1 mg/l
	nylimidazole: ty to algae	:	subspicatus Exposure tir Test Type: s Test substa	s)): 180 me: 72 static te nce: Fr	.7 mg/l h est	atus (Scenedesmus 201	
	exanediamine, C,C,C-tri ty to algae					atus (Scenedesmus	





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			Exposure time: 72	2 h
M-Fa toxic	actor (Acute aquatic ity)	:	No data available	
	Toxicity to fish (Chronic toxicity)		No data available	
meta Toxio aqua	edients: axylenediamine: city to daphnia and other tic invertebrates onic toxicity)	:	NOEC (Daphnia r Exposure time: 21 Test Type: semi-s Test substance: F Method: OECD Te	static test Fresh water
M-Fa toxic	actor (Chronic aquatic ity)	:	No data available	
Ingre	edients:			
	ohexanemethanamine, 5- city to bacteria		ino-1,3,3-trimethyl- EC10: 1,120 mg/l Exposure time: 18 Method: Measure	3 h
		:	(Pseudomonas p Exposure time: 18 Test Type: static t Test substance: F	3 h test
	axylenediamine: city to bacteria	:	EC50 (activated s Exposure time: 0. Test Type: static t Method: OECD Te	test
	ethylimidazole: city to bacteria	:	EC50 (activated s Exposure time: 7 Method: DIN 38 4	h
	Hexanediamine, C,C,C-tri city to bacteria			nas putida): 89 mg/l 7 h
	city to soil dwelling nisms	:	No data available	
Plant	t toxicity	:	No data available	
Sedi	ment toxicity	:	No data available	
	city to terrestrial nisms	:	No data available	





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	xicology Assessment		
Acute	aquatic toxicity	: No data availab	le
Chron	ic aquatic toxicity	: No data availab	le
Toxici	ity Data on Soil	: No data availab	le
	organisms relevant to nvironment	: No data availab	le
The fo	er information blowing percentage of ic environment: 43.55 %		f ingredient(s) with unknown hazards to the
Persi	stence and degradabi	lity	
Ingre	dients:		
	hexanemethanamine, { gradability	: Inoculum: active Concentration: 6 Result: Not read Biodegradation: Exposure time:	ated sludge 6.9 mg/l lily biodegradable. 8 %
	ylenediamine: gradability	Biodegradation: Exposure time:	14.2 mg/l lily biodegradable. 49 %
	hylimidazole:		
Biode	gradability	Biodegradation: Exposure time:	lily biodegradable. 0 - 10 %
		Inoculum: active Concentration: 9 Result: Inherent Biodegradation: Exposure time: Method: ISO Me	9,000 mg/l ly biodegradable. 79 % 60 d
1,6-H	exanediamine, C,C,C-t	rimethyl-:	
	gradability	: Inoculum: activa Concentration:	11.4 mg/l lily biodegradable. 7 %
	emical Oxygen Ind (BOD)	: No data availab	le





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	Chemic (COD)	cal Oxygen Demand	:	No data available	
	BOD/C			No data available	
	ThOD		•	No data available	
	BOD/T		:	No data available	
	Dissolv (DOC)	ed organic carbon	:	No data available	
	Physico remova	o-chemical ability	:	No data available	
	Stability	y in water	:	No data available	
	Photod	egradation	:	No data available	
	Impact Treatm	on Sewage ent	:	No data available	
	<u>Ingredi</u> metaxy	umulative potential i <u>ents:</u> denediamine: umulation	:	Species: Cyprinus	
				Bioconcentration f Remarks: Does no	factor (BCF): < 0.3 ot bioaccumulate.
	Ingredi			in a 4 0 0 trim attack	
	Partitio	exanemethanamine, 5 n coefficient: n-		log Pow: 0.99 (23	
	octanol	/water		pH: 6.34 Method: OECD Te	est Guideline 107
		lenediamine: n coefficient: n- /water	:	log Pow: 0.18 (25 pH: 10.3 - 10.4 Method: OECD Te	
		ylimidazole: n coefficient: n- /water	:	log Pow: -0.19 (25 pH: 9.25 - 9.85 Method: OECD Te	
				hyl-: log Pow: 0.77 (23 Method: OECD Te	
	Mobilit	y in soil			
	Mobility	/	:	No data available	





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	10 00							
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Cycloł Distrib enviro 1-metł Distrib	lients: nexanemethanamine, 5 ution among nmental compartments nylimidazole: ution among	: Koc: 928.	-: Calculation method					
	nmental compartments ty in soil	: No data available						
	adverse effects nmental fate and ays	: No data available	9					
	s of PBT and vPvB	: No data available	9					
Endoc potent	rine disrupting ial	: No data available	9					
	ped organic bound ens (AOX)	: No data available	9					
Hazar	dous to the ozone lay	er						
	e-Depletion Potential	: Regulation: 40 C Protection of Stra Substances Remarks: This p manufactured wi	FR Protection of Environment; Part 82 atospheric Ozone - CAA Section 602 Class I roduct neither contains, nor was th a Class I or Class II ODS as defined by the ct Section 602 (40 CFR 82, Subpt. A, App.A +					
inform	onal ecological ation - Product warming potential)	: There is no data : No data available	available for this product.					

SECTION 13. DISPOSAL CONSIDERATIONS

Disposal methods	
Waste from residues	: Offer surplus and non-recyclable solutions to a licensed disposal company.
Contaminated packaging	 Empty remaining contents. Empty containers should be taken to an approved waste handling site for recycling or disposal.

SECTION 14. TRANSPORT INFORMATION

International Regulation





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ΙΑΤΑ	
UN/ID No.	: UN 2735
Proper shipping name	: Polyamines, liquid, corrosive, n.o.s. (ISOPHORONE DIAMINE, M-XYLYLENE DIAMINE)
Class	: 8
Packing group	: 11
Labels	: Corrosive
Packing instruction (cargo aircraft)	: 855
Packing instruction (passenger aircraft)	: 851
IMDG	
UN number	: UN 2735
Proper shipping name	: POLYAMINES, LIQUID, CORROSIVE, N.O.S. (ISOPHORONE DIAMINE, M-XYLYLENE DIAMINE)
Class	: 8
Packing group	: 11
Labels	: 8
EmS Code	: F-A, S-B
Marine pollutant	: no

Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code

Not applicable for product as supplied.

Domestic regulation

DOT Classification UN/ID/NA number Proper shipping name	: UN 2735 : POLYAMINES, LIQUID, CORROSIVE, N.O.S. (ISOPHORONE DIAMINE, M-XYLYLENE DIAMINE)
Class	: 8
Packing group	: 11
Labels	: CORROSIVE
ERG Code	: 153
Marine pollutant	: no

SECTION 15. REGULATORY INFORMATION

TSCA - 5(a) Significant New	:	Not relevant
Use Rule List of Chemicals		

EPCRA - Emergency Planning and Community Right-to-Know

SARA 311/312 Hazards	: No SARA Hazards
SARA 313	: This material does not contain any chemical components with known CAS numbers that exceed the threshold (De Minimis) reporting levels established by SARA Title III, Section 313.





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Clean Air Act

This product neither contains, nor was manufactured with a Class I or Class II ODS as defined by the U.S. Clean Air Act Section 602 (40 CFR 82, Subpt. A, App.A + B).

This product does not contain any hazardous air pollutants (HAP), as defined by the U.S. Clean Air Act Section 12 (40 CFR 61).

This product does not contain any chemicals listed under the U.S. Clean Air Act Section 111 SOCMI Intermediate or Final VOC's (40 CFR 60.489).

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Pennsylvania Right To Know

68738-77-2	30 - 50 %
2855-13-2	30 - 50 %
1477-55-0 616-47-7	20 - 30 % 1 - 5 %
	2855-13-2 1477-55-0

California Prop 65

This product does not contain any chemicals known to the State of California to cause cancer, birth, or any other reproductive defects.

The ingredients of this product are reported in the following inventories:

TSCA DSL AICS NZIOC ENCS ISHL KECI	 The mixture contains substances listed on the Swiss Inventory On TSCA Inventory All components of this product are on the Canadian DSL. Not in compliance with the inventory Not in compliance with the inventory On the inventory, or in compliance with the inventory On the inventory, or in compliance with the inventory On the inventory, or in compliance with the inventory On the inventory, or in compliance with the inventory On the inventory, or in compliance with the inventory On the inventory, or in compliance with the inventory
	: On the inventory, or in compliance with the inventory
PICCS	: On the inventory, or in compliance with the inventory

Inventories

AICS (Australia), DSL (Canada), IECSC (China), REACH (European Union), ENCS (Japan), ISHL (Japan), KECI (Korea), NZIOC (New Zealand), PICCS (Philippines), TSCA (USA)



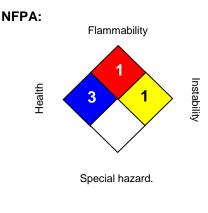


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SECTION 16. OTHER INFORMATION

Further information



HMIS III:

HEALTH	3
FLAMMABILITY	1
PHYSICAL HAZARD	1
0 - not aignificant 1 - Slight	

0 = not significant, 1 =Slight,

2 = Moderate, 3 = High

4 = Extreme, * = Chronic

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While the information and recommendations in this publication are to the best of our knowledge, information and belief accurate at the date of publication, NOTHING HEREIN IS TO BE CONSTRUED AS A WARRANTY, EXPRESS OR OTHERWISE.

IN ALL CASES, IT IS THE RESPONSIBILITY OF THE USER TO DETERMINE THE APPLICABILITY OF SUCH INFORMATION AND RECOMMENDATIONS AND THE SUITABILITY OF ANY PRODUCT FOR ITS OWN PARTICULAR PURPOSE. THE PRODUCT MAY PRESENT HAZARDS AND SHOULD BE USED WITH CAUTION. WHILE CERTAIN HAZARDS ARE DESCRIBED IN THIS PUBLICATION, NO GUARANTEE IS MADE THAT THESE ARE THE ONLY HAZARDS THAT EXIST.

Hazards, toxicity and behaviour of the products may differ when used with other materials and are dependent upon the manufacturing circumstances or other processes. Such hazards, toxicity and behaviour should be determined by the user and made known to handlers, processors and end users.

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