NCI CHEMICAL INDUSTRY LTD

SAFETY DATA SHEET

according to Regulation (EU) No. 1907/2006

Version 3.1 Revision Date 20.10.2010 Print Date 21.10.2010

1. IDENTIFICATION OF THE SUBSTANCE/MIXTURE AND OF THE COMPANY/UNDERTAKING

Product identifier

Trade name : POLYCOLD 100 PART A
Chemical Name(REACH Registration) : Aspartic Acid, N,N'-(methylenedi-4,1-cyclohexanediyl)bis-,
REACH Registration Number : 01-0000017556-64-0000

Relevant identified uses of the substance or mixture and uses advised against
Use : TOP COAT POLYASPARTIC COATING

Details of the supplier of the safety data sheet:
NCI CHEMICAL INDUSTRY LTD
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2. HAZARDS IDENTIFICATION

Classification of the substance or mixture

GHS Classification:

Sensitization of the skin, Category 1 (H317)
Hazardous to the aquatic environment, Category 3 (H412)

Classification (67/548/EEC, 1999/45/EC):

May cause sensitization by skin contact.
Harmful to aquatic organisms, may cause long-term adverse effects in the aquatic environment.

Hazardous components which must be listed on the label

hexamethylene-1,6-diisocyanate homopolymer
Identification no.: 28182-81-2

Label elements

Hazardous components which must be listed on the label

Aspartic Acid, N,N'-(methylenedi-4,1-cyclohexanediyl)bis-, 1,1',4,4'-tetraethyl éster

Labelling (1272/2008/CE):

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POLYCOLD 100 PART A

Hazard statements:
H317 May cause an allergic skin reaction.
H412 Harmful to aquatic life with long lasting effects.

Precautionary statements:
P273 Avoid release to the environment.
P280 Wear protective gloves.
P302 + P352 IF ON SKIN: Wash with plenty of soap and water.

Labelling (67/548/EEC, 1999/45/EC):
Labelling according to Directive 2006/121 Annex VI:
Xi Irritant

Aspartic Acid, N,N'-(methylenedi-4,1-cyclohexanediyl)bis-, 1,1',4,4'-tetraethyl éster
EC-Label EC-No.: 429-270-1

R-phrase(s)

R43	May cause sensitization by skin contact.
R52/53	Harmful to aquatic organisms, may cause long-term adverse effects in the aquatic environment.

S-phrase(s)

S36/37	Wear suitable protective clothing and gloves.
S61	Avoid release to the environment. Refer to special instructions/ Safety data sheets.

3. COMPOSITION/INFORMATION ON INGREDIENTS

Type of product: Substance
Aspartic Acid Ester
Hazardous components
Aspartic Acid, N,N'-(methylenedi-4,1-cyclohexanediyl)bis-, 1,1',4,4'-tetraethyl ester
Concentration [wt.-%]: ca. 100
REACH Registration Number: 01-0000017556-64-0000
CAS-No.: 136210-30-5
ELINCS No.: 429-270-1
Index-No.: 607-521-00-8
GHS Classification: Skin Sens. 1 H317 Aquatic Chronic 3 H412

Classification (67/548/EEC): Xi R43 R52/53
this contains as impurities:

Fumaric acid diethyl ester
Concentration [wt.-%]: ca. 3
CAS-No.: 623-91-6
EINECS-No.: 210-819-7
GHS Classification: Acute Tox. 4 Oral H302

Classification (67/548/EEC): Xn R22
Classification/labelling according to Directive 2006/121 Annex VI

4. FIRST AID MEASURES

Description of first aid measures

General advice: Take off all contaminated clothing immediately

If inhaled: Take the person into the fresh air and keep him warm, let him rest; if there is difficulty in breathing, medical advice is required.

In case of skin contact: In case of skin contact wash affected areas thoroughly with soap and plenty of water. Consult a doctor in the event of a skin reaction.

In case of eye contact: Hold the eyes open and rinse with preferably lukewarm water for a sufficiently long period of time (at least 10 minutes). Contact an ophthalmologist

If swallowed: DO NOT induce the patient to vomit, medical advice is required.

5. Fire-fighting measures

Suitable extinguishing media: Carbon dioxide (CO2), Foam, extinguishing powder, in cases of larger fires, water spray should be used.

Unsuitable extinguishing media: High volume water jet

Special hazards arising from the substance or mixture:
Burning releases carbon monoxide, carbon dioxide, oxides of nitrogen and traces of hydrogen cyanide. In the event of fire and/or explosion do not breathe fumes.

Advice for fire-fighters:
Firemen must wear self-contained breathing apparatus.
Do not allow contaminated extinguishing water to enter the soil, ground-water or surface waters

6. ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures: Put on protective equipment (see chapter 8). Ensure adequate ventilation/exhaust extraction. Keep unauthorized persons away.

Environment related measures: Do not allow to escape into waterways, wastewater or soil.

Methods and material for containment and cleaning up: Take up with absorbent for chemicals or, if necessary with dry sand and store in closed containers.

Reference to other sections: For further disposal measures see chapter 13.

7. HANDLING AND STORAGE

Precautions for safe handling:

Ensure adequate ventilation and, if necessary, exhaust ventilation when handling or transferring the product.
The personal protective measures described in Chapter 8 must be observed. Avoid contact with skin and eyes absolutely.

Keep away from foodstuffs, drinks and tobacco. Wash hands before breaks and at end of work and use skin-protecting ointment. Keep working clothes separately. Change contaminated or soaked clothing immediately.

Conditions for safe storage, including any incompatibilities:

Keep container dry and tightly closed in a cool and well ventilated place. Further information on the storage conditions which must be observed to preserve quality can be found in our product information sheet.

VCI storage class (VCI = German Association of the Chemical Industry): 10

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Control parameters

Derived No Effect Level (DNEL) or Derived Minimal Effect Level (DMEL):

Aspartic Acid, N,N'-(methylenedi-4,1-cyclohexanediyl)bis-, 1,1',4,4'-tetraethyl ester
Worker (Long-term) Exposure oral and dermal , systemic: 4 mg/kg body weight/day
Worker (Long-term) exposure by inhalation , systemic: 28 mg/m³ air

Predicted No Effect Concentration (PNEC):
Aspartic Acid, N,N'-(methylenedi-4,1-cyclohexanediyl)bis-, 1,1',4,4'-tetraethyl ester
Fresh water: 0,00013 mg/l
Marine water: 0,000013 mg/l
Sediment: 0,045 mg/kg dry weight
Soil: 0,1 mg/kg dry weight
STP (sewage-treatment plant): 31,1 mg/l

Exposure controls
Respiratory protection:
Respiratory equipment required during spraying. An air-fed mask, or for short periods of work, a combination of charcoal filter and particulate filter is recommended.

Persons who suffer from skin complaints or other hypersensitivity reactions of skin should not work with the product.

Hand protection:
Suitable materials for safety gloves; EN 374-3:
Laminate glove - PE/EVOH/PE; breakthrough time >=480 min.
Recommendation: contaminated gloves should be disposed of.

Eye protection:
Wear eye/face protection.

Skin and body protection:
Wear suitable protective clothing.

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance:	**liquid**	
Colour:	**colourless**	
Odour:	**slight inherent odour**	
Odour Threshold:	**not established**	
pH:	**not established**	
Melting point/range:	**ca. -2 °C**	**ISO 3016**
Initial boiling point:	**> 300 °C at 1.013 hPa**	**DIN 53171**
Flash point:	**ca. 100 °C at 1.013 hPa**	**DIN EN 22719**
Evaporation rate:	**not established**	
Flammability (solid, gas):	**not applicable**	
Burning number:	**not applicable**	
Vapour pressure:	**ca. 0,00001 hPa at 20 °C**	**EG A4**
	ca. 0,00002 hPa at 50 °C	EG A4
	ca. 0,00012 hPa at 55 °C	EG A4
Vapour density:	not established	
Density:	ca. 1,08 g/cm³ at 20 °C	DIN 51757
Miscibility with water:	immiscible at 15 °C	
Surface tension:	not established	
Partition coefficient (n−octanol/water):	not established	
Autoignition temperature:	not applicable	
Ignition temperature:	ca. 375 °C at 1.013 hPa	DIN 51794
Decomposition temperature:	not established	
Viscosity, dynamic:	ca. 2.030 mPa.s at 20 °C	DIN EN ISO 3219/A.3
Explosive properties:	not established	
Dust explosion class:	not applicable	

Oxidising properties:	not established
Other information:	The indicated values do not necessarily correspond to the product specification Please refer to the technical information sheet for specification data.

10. STABILITY AND REACTIVITY

Hazardous decomposition products: No hazardous decomposition products when stored and handled correctly

11. TOXICOLOGICAL INFORMATION

Information on toxicological effects

Acute toxicity, oral:
Aspartic Acid, N,N'-(methylenedi-4,1-cyclohexanediyl)bis-, 1,1',4,4'-tetraethyl ester
LD50 rat: > 2.000 mg/kg
Method: Directive 67/548/EEC, Annex V, B.1.
Toxicological studies of a comparable product.

Acute toxicity, dermal:
Aspartic Acid, N,N'-(methylenedi-4,1-cyclohexanediyl)bis-, 1,1',4,4'-tetraethyl ester
LD50 rat: > 2.000 mg/kg
Method: Directive 67/548/EEC, Annex V, B.3.
Toxicological studies of a comparable product.

Acute toxicity, inhalation:
Aspartic Acid, N,N'-(methylenedi-4,1-cyclohexanediyl)bis-, 1,1',4,4'-tetraethyl ester
LC50 rat: > 4.224 mg/m3, 4 h
Method: OECD Test Guideline 403
Toxicological studies of a comparable product.

Primary skin irritation:
Aspartic Acid, N,N'-(methylenedi-4,1-cyclohexanediyl)bis-, 1,1',4,4'-tetraethyl ester
rabbit
Result: slight irritant
Method: OECD Test Guideline 404
Toxicological studies of a comparable product

Primary mucosae irritation:
Aspartic Acid, N,N'-(methylenedi-4,1-cyclohexanediyl)bis-, 1,1',4,4'-tetraethyl ester
rabbit
Result: slight irritant
Method: OECD Test Guideline 405
Toxicological studies of a comparable product.

Sensitisation:
Aspartic Acid, N,N'-(methylenedi-4,1-cyclohexanediyl)bis-, 1,1',4,4'-tetraethyl ester
Skin sensitisation according to Magnusson/Kligmann (maximizing test):
Result: In the guinea-pig the product has a sensitising effect.
Method: OECD Test Guideline 406
Toxicological studies of a comparable product

Respiratory sensitization
Toxicological studies on the product are not yet available.

Subacute, subchronic and prolonged toxicity:
Aspartic Acid, N,N'-(methylenedi-4,1-cyclohexanediyl)bis-, 1,1',4,4'-tetraethyl ester
Application Route: Subacute oral toxicity
Species: rat
Dose Levels: 0 - 40 - 200 - 1.000 mg/kg
NOAEL: 1.000 mg/kg
Method: OECD Test Guideline 407
Toxicological studies of a comparable product.

Carcinogenicity:
Aspartic Acid, N,N'-(methylenedi-4,1-cyclohexanediyl)bis-, 1,1',4,4'-tetraethyl ester
Toxicological studies on the product are not yet available.

Reproductive toxicity/Fertility:
Aspartic Acid, N,N'-(methylenedi-4,1-cyclohexanediyl)bis-, 1,1',4,4'-tetraethyl ester
Toxicological studies on the product are not yet available.

Genotoxicity in vitro:
Aspartic Acid, N,N'-(methylenedi-4,1-cyclohexanediyl)bis-, 1,1',4,4'-tetraethyl ester
Test type: Salmonella/microsome test (Ames test)
Result: No indication of mutagenic effects.
Method: OECD Test Guideline 471
Toxicological studies of a comparable product.

Test type: Chromosome aberration test in vitro
Result: negative
Method: OECD Test Guideline 473
Toxicological studies of a comparable product
Genotoxicity in vivo:
Aspartic Acid, N,N'-(methylenedi-4,1-cyclohexanediyl)bis-, 1,1',4,4'-tetraethyl ester
Test type: Micronucleus test
Species: mouse
Result: negative
Method: OECD Test Guideline 474
Toxicological studies of a comparable product.

STOT evaluation – one-time exposure:
Aspartic Acid, N,N'-(methylenedi-4,1-cyclohexanediyl)bis-, 1,1',4,4'-tetraethyl ester
The substance or mixture is not classified as specific target organ toxicant, single exposure.

STOT evaluation – repeated exposure:
Aspartic Acid, N,N'-(methylenedi-4,1-cyclohexanediyl)bis-, 1,1',4,4'-tetraethyl ester
The substance or mixture is not classified as specific target organ toxicant, repeated exposure.

CMR Assessment:
Aspartic Acid, N,N'-(methylenedi-4,1-cyclohexanediyl)bis-, 1,1',4,4'-tetraethyl ester
Carcinogenicity: Based on available data, the classification criteria are not met.
Mutagenicity: In vitro an in vivo tests did not show mutagenic effects. On the basis of this data, the substance is not classified as mutagenic.
Reproductive toxicity/Teratogenicity: Based on available data, the classification criteria are not met.
Reproductive toxicity/Fertility: Based on available data, the classification criteria are not met.

Toxicology Assessment:
Aspartic Acid, N,N'-(methylenedi-4,1-cyclohexanediyl)bis-, 1,1',4,4'-tetraethyl ester
Acute effects: Based on available data, the classification criteria are not met.
Sensitization: May cause sensitization by skin contact.
Repeated dose toxicity: Based on available data, the classification criteria are not met.

Additional information:
Aspartic Acid, N,N'-(methylenedi-4,1-cyclohexanediyl)bis-, 1,1',4,4'-tetraethyl ester
Aspiration hazard: Based on available data, the classification criteria are not met.

12. ECOLOGICAL INFORMATION

Do not allow to escape into waterways, wastewater or soil.
Toxizität
Acute Fish toxicity:
Aspartic Acid, N,N'-(methylenedi-4,1-cyclohexanediyl)bis-, 1,1',4,4'-tetraethyl ester
LC50 66 mg/l
Species: Danio rerio (zebra fish)
Exposure duration: 96 h
Method: OECD Test Guideline 203
Ecotoxicological reports on a comparable product

Acute toxicity for daphnia:
Aspartic Acid, N,N'-(methylenedi-4,1-cyclohexanediyl)bis-, 1,1',4,4'-tetraethyl ester
EC50 88,6 mg/l
Species: Daphnia magna (Water flea)
Exposure duration: 48 h
Method: Proposal from the German UBA May 1984
Studies of a comparable product.
Chronic toxicity to daphnia:

Aspartic Acid, N,N'-(methylenedi-4,1-cyclohexanediyl)bis-, 1,1',4,4'-tetraethyl ester
NOEC (Reproduction) 0,01 mg/l
Species: Daphnia magna (Water flea)
Exposure duration: 21 d
Method: Directive 67/548/EEC, Annex V, C.20.
Studies of a comparable product.

Acute toxicity for algae:
Aspartic Acid, N,N'-(methylenedi-4,1-cyclohexanediyl)bis-, 1,1',4,4'-tetraethyl ester
IC50 113 mg/l
Tested on: scenedesmus subspicatus Duration of test: 72 h
Method: Directive 67/548/EEC, Annex V, C.3.
Ecotoxicological reports on a comparable product

Acute bacterial toxicity:
Aspartic Acid, N,N'-(methylenedi-4,1-cyclohexanediyl)bis-, 1,1',4,4'-tetraethyl ester
EC50 3.110 mg/l
Tested on: activated sludge Duration of test: 3 h
Method: ISO test method 8192-1986 E
Ecotoxicological reports on a comparable product

Toxicity to soil dwelling organisms:
Aspartic Acid, N,N'-(methylenedi-4,1-cyclohexanediyl)bis-, 1,1',4,4'-tetraethyl ester
NOEC (mortality) >= 1.000 mg/kg
Species: Eisenia fetida (earthworms)
Exposure duration: 14 d
Method: OECD Test Guideline 207
Studies of a comparable product.

Toxicity to terrestrial plants:
Aspartic Acid, N,N'-(methylenedi-4,1-cyclohexanediyl)bis-, 1,1',4,4'-tetraethyl ester
NOEC (seedling emergence) >= 100 mg/kg
Species: Allium cepa (onion)
Test period: 14 d
Method: OECD Test Guideline 208
Studies of a comparable product.
NOEC (seedling emergence) >= 100 mg/kg
Species: Avena sativa (oats)
Test period: 14 d
Method: OECD Test Guideline 208
Studies of a comparable product.
NOEC (seedling emergence) >= 100 mg/kg
Species: Brassica napus (rape)
Test period: 14 d
Method: OECD Test Guideline 208
Studies of a comparable product.

Ecotoxicology Assessment:
Aspartic Acid, N,N'-(methylenedi-4,1-cyclohexanediyl)bis-, 1,1',4,4'-tetraethyl ester
Acute aquatic toxicity: Harmful to aquatic organisms.
Chronic aquatic toxicity: May cause long-term adverse effects in the aquatic environment.
Impact on Sewage Treatment: Because of the low bacterial toxicity, there is no risk of an adverse effect on the performance of biological waste water treatment plants.
Persistence and degradability

Biodegradability:
Aspartic Acid, N,N'-(methylenedi-4,1-cyclohexanediyl)bis-, 1,1',4,4'-tetraethyl ester
Biodegradation: 13 %, 28 d, i.e. not readily degradable
Method: OECD Test Guideline 301 F
Ecotoxicological reports on a comparable product

Biodegradation: 0 %, 28 d, i.e. not inherently degradable
Method: OECD Test Guideline 302 C
Ecotoxicological studies of the product

Stability in water:
Aspartic Acid, N,N'-(methylenedi-4,1-cyclohexanediyl)bis-, 1,1',4,4'-tetraethyl ester
Half life: 655 h at 25 °C (pH 4)
Method: OECD Test Guideline 111
Studies of a comparable product.

Half life: 25,4 h at 25 °C (pH 7)
Method: OECD Test Guideline 111
Studies of a comparable product.

Half life: 16,8 h at 25 °C (pH 9)
Method: OECD Test Guideline 111
Studies of a comparable product.

Volatility (Henry's Law constant):
Aspartic Acid, N,N'-(methylenedi-4,1-cyclohexanediyl)bis-, 1,1',4,4'-tetraethyl ester
Calculated value = 0,01 Pa*m3/mol
The substance has to be scored as non-volatile from water.

Bioaccumulative potential
Bioaccumulation:
Aspartic Acid, N,N'-(methylenedi-4,1-cyclohexanediyl)bis-, 1,1',4,4'-tetraethyl ester
Species: value calculated
Bioconcentration factor (BCF): 1.872
The substance hydrolyzes rapidly in water. An accumulation in aquatic organisms is not to be expected.
Partition coefficient (n–octanol/water):
Aspartic Acid, N,N'-(methylenedi-4,1-cyclohexanediyl)bis-, 1,1',4,4'-tetraethyl ester
log Pow: 5,2(value calculated)
Mobility in soil

Distribution among environmental compartments:
Aspartic Acid, N,N'-(methylenedi-4,1-cyclohexanediyl)bis-, 1,1',4,4'-tetraethyl ester
Adsorption/Soil
log Koc value: 4,2 - 5,1
Method: EU Method C.19
Studies of a comparable product.

Results of PBT and vPvB assessment

Aspartic Acid, N,N'-(methylenedi-4,1-cyclohexanediyl)bis-, 1,1',4,4'-tetraethyl ester
Results of PBT assessment: This substance does not meet the criteria for classification as PBT or vPvB.

13. DISPOSAL CONSIDERATIONS

Dispose in accordance with applicable international, national and local laws, ordinances and statutes. For disposal within the EC, the appropriate code according to the European Waste Catalogue (EWC) should be used.

Waste treatment methods
After containers have been emptied as thoroughly as possible (e.g. by pouring, scraping or draining until "drip-dry"), they can be sent to an appropriate collection point set up within the framework of the existing take-back scheme of the chemical industry. Containers must be recycled in compliance with national legislation and environmental regulations.

None disposal into waste water

14. TRANSPORT INFORMATION

ADR/RID	Not dangerous goods
ADNR	Not dangerous goods

This classification data does not apply to transportation by tanker. If required, additional information can be requested from the manufacturer.

IATA	Not dangerous goods
IMDG	Not dangerous goods
Special precautions for user :	Not dangerous cargo. Keep dry. Slight smell. Keep away from foodstuffs, acids and alkalis.

15. REGULATORY INFORMATION

Safety, health and environmental regulations/legislation specific for the substance or mixture
Water contaminating class (Germany): 1 slightly water endangering
(in accordance with Annex 4 to the Directive on Water-Hazardous Substances)

Any existing national regulations on the handling of irritant or corrosive substances must be observed.

A Chemical Safety Assessment has been carried out for:
Aspartic Acid, N,N'-(methylenedi-4,1-cyclohexanediyl)bis-, 1,1',4,4'-tetraethyl ester

16. OTHER INFORMATION

Full text of hazardous (H) warnings referred to under sections 2 and 3 of the CLP classification (1272/2008/CE).

H302	Harmful if swallowed.
H317	May cause an allergic skin reaction.
H412	Harmful to aquatic life with long lasting effects.

Full text of R-phrases referred to under sections 2 and 3 of the EU classification (67/548/EEC,1999/45/EC).

R22	Harmful if swallowed.
R43	May cause sensitization by skin contact.
R52/53	Harmful to aquatic organisms, may cause long-term adverse effects in the aquatic environment.

Further information
The information provided in this Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information given is designed only as a guidance for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process, unless specified in the text.

NCI CHEMICAL INDUSTRY LTD

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according to Regulation (EU) No. 1907/2006

POLYCOLD 100 PART A

Annex - Exposure Scenario

Manufacture of the substance: industrial (ES1)
Use for formulation of preparations: industrial (ES2)
Use of preparations containing the substance: industrial (ES3)
Use of preparations containing the substance: professional (ES4)

1. Short title of Exposure Scenario

Manufacture of the substance: industrial (ES1)

Sector of use : Industrial uses: Uses of substances as such or in mixtures at industrial sites, Manufacture of bulk, large scale chemicals (including petroleum products) (SU3, SU8)

Process category : Use in closed, continuous process with occasional controlled exposure, Use in closed batch process (synthesis or formulation), Use in batch and other process (synthesis) where opportunity for exposure arises, Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities, Transfer of substance or mixture into small containers (dedicated filling line, including weighing) (PROC2, PROC3, PROC4, PROC8b, PROC9)

Environmental release category : Manufacture of substances (ERC1)

Substance: Aspartic Acid, N,N'-(methylenedi-4,1-cyclohexanediyl)bis-, 1,1',4,4'-tetraethyl ester (ES1)

2. Description of activities/process(es) covered in the Exposure Scenario

see chapter 1 of the annex

3. Operational conditions

Duration and frequency

Workers

duration of exposure at workplace: 8 hours/day
frequency of exposure at workplace: 220 days/year

Environment

amount produced per site: 440 tonnes/year (t/y)
emission days per site: 300

4.1 Physical form

Liquid

4.2 Concentration of substance in the mixture

not applicable

4.3 Amount used per time or per activity

not applicable

5. Other operational conditions
No waste water is occurring during production.
Waste gases are transferred to an incineration plant.
Organic solvent used for cleaning procedures is disposed off via a hazardous waste combustion unit.
During waste treatment, exposure of the environment is not expected.

6. Risk Management Measures

6.1.1 Occupational measures

Organizational protective measures: Persons who suffer from skin complaints or other hypersensitivity reactions of skin should not work with the product.

Technical protective measures: Procedural and/or control technologies are used to minimise emissions and the resulting exposure during cleaning and maintenance procedures. Local exhaust ventilation is used for sampling and (dis)charging operations.

Personal protective measures: An air-fed mask, or for short periods of work, a combination of charcoal filter and particulate filter is recommended if the appearance of vapours cannot be excluded. For processes where the opportunity for exposure arises, the use of gloves is stipulated. Suitable materials for safety gloves; EN 374-3: Laminate glove - PE/EVOH/PE; breakthrough time >=480 min. Recommendation: contaminated gloves should be disposed of. Wear eye/face protection. Wear suitable protective clothing.

Keep away from foodstuffs, drinks and tobacco. Wash hands before breaks and at end of work and use skin-protecting ointment. Keep working clothes separately. Change contaminated or soaked clothing immediately

6.1.2 Consumer related measures

not applicable

6.2 Environment related measures

Air: All waste gases from production and (dis)charging steps are transferred to a combustion unit.

Water: No waste water occurs.
Soil: Sealing of all relevant soil surfaces in the facility is required.
Procedural and/or control technologies are used to minimise emissions and the resulting exposure during cleaning and maintenance procedures.

7. Waste related measures
Disposal method: The waste is disposed of by incineration in a hazardous waste combustor

Type of waste: Solvent used for cleaning procedures
No emission to the environment during waste treatement

8. Prediction of exposure

Workers (oral)
No significant oral exposure

Workers (dermal)
PROC 2, PROC 3 : 0 mg/kg/day
Method: Ecetoc TRA
PROC 4, PROC 8b, PROC 9 : 0,69 mg/kg/day
Method: Ecetoc TRA

Workers (inhalation)
PROC 2, PROC 3, PROC 4, PROC 8b, PROC 9 : 2,31 mg/m³
Method: Ecetoc TRA

Environment
Water : 0 mg/l
Soil : 0 mg/kg wet weight
STP (sewage-treatment plant) : 0 mg/l
Humans via the environment : 0 mg/kg body weight/day

9. Guidance to downstream user

A downstream user may evaluate whether he operates within the conditions set in the exposure scenario by using the information provided in sections 1-8. This evaluation may be based on an expert judgement or on the utilisation of risk assessment tools that are recommended by ECHA.

1. Short title of Exposure Scenario

Use for formulation of preparations: industrial (ES2)

Sector of use	: Industrial uses: Uses of substances as such or in mixtures at industrial sites, Formulation [mixing] of preparations and/or repackaging (excluding alloys) (SU3, SU 10)
Process category	: Use in closed, continuous process with occasional controlled exposure, Use in closed batch process (synthesis or formulation), Use in batch and other process (synthesis) where opportunity for exposure arises, Mixing or blending in batch processes for formulation of mixtures and articles (multistage and/or significant contact), Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities, Transfer of substance or mixture into small containers (dedicated filling line, including weighing), Production of mixtures or articles by tabletting, compression, extrusion, pelletisation (PROC2, PROC3, PROC4, PROC5, PROC8b, PROC9, PROC14)
Environmental release Category	: Formulation of mixtures (ERC2)

Substance: Aspartic Acid, N,N'-(methylenedi-4,1-cyclohexanediyl)bis-, 1,1',4,4'-tetraethyl ester (ES2)

2. Description of activities/process(es) covered in the Exposure Scenario
see chapter 1 of the annex

NCI CHEMICAL INDUSTRY LTD

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POLYCOLD 100 PART A

2. Operational conditions

Duration and frequency

Workers

duration of exposure at workplace: 8 hours/day
frequency of exposure at workplace: 220 days/year

Environment

annual amount used per site: < 440 tonnes/year (t/y)
emission days per site: 300

4.1 Physical form

Liquid

4.2 Concentration of substance in the mixture

< 100 % Aspartic Acid, N,N'-(methylenedi-4,1-cyclohexanediyl)bis-, 1,1',4,4'-tetraethyl ester

4.3 Amount used per time or per activity

typical batch size less than 10 t

5. Other operational conditions

No waste water is occurring during production.
Waste gases are transferred to an incineration plant.
Organic solvent used for cleaning procedures is disposed off via a hazardous waste combustion unit.
During waste treatment, exposure of the environment is not expected.

6. Risk Management Measures

6.1.1 Occupational measures

Organizational protective measures: Persons who suffer from skin complaints or other hypersensitivity reactions of skin should not work with the product.

Technical protective measures: Procedural and/or control technologies are used to minimise emissions and the resulting exposure during cleaning and maintenance procedures. Local exhaust ventilation is used for sampling and (dis)charging operations.

Personal protective measures: An air-fed mask, or for short periods of work, a combination of charcoal filter and particulate filter is recommended if the appearance of vapours cannot be excluded. For processes where the opportunity for exposure arises, the use of gloves is stipulated. Suitable materials for safety gloves; EN 374-3: Laminate glove - PE/EVOH/PE; breakthrough time >=480 min. Recommendation: contaminated gloves should be disposed of. Wear eye/face protection. Wear suitable protective clothing.

Keep away from foodstuffs, drinks and tobacco. Wash hands before breaks and at end of work and use skin-protecting ointment. Keep working clothes separately. Change contaminated or soaked clothing immediately.

6.1.2 Consumer related measures

not applicable

6.2 Environment related measures

Air: All waste gases from production and (dis)charging steps are transferred to a combustion unit.

Water: No waste water occurs.

Soil: Sealing of all relevant soil surfaces in the facility is required.

Procedural and/or control technologies are used to minimise emissions and the resulting exposure during cleaning and maintenance procedures.

7. Waste related measures

Disposal method: The waste is disposed of by incineration in a hazardous waste combustor

Type of waste: Solvent used for cleaning procedures
No emission to the environment during waste treatement

8. Prediction of exposure

Workers (oral)
No significant oral exposure

Workers (dermal)
PROC 2, PROC 3 : 0 mg/kg/day
Method: Ecetoc TRA
PROC 4, PROC 8b, PROC 9 : 0,69 mg/kg/day
Method: Ecetoc TRA
PROC 5 : 1,37 mg/kg/day
Method: Ecetoc TRA
PROC 14 : 0,34 mg/kg/day
Method: Ecetoc TRA

Workers (inhalation)
PROC 2, PROC 3, PROC 4, PROC 5, PROC 8b, PROC 9, PROC 14 : 2,31 mg/m³
Method: Ecetoc TRA

Environment
Water : 0 mg/l
Soil : 0 mg/kg wet weight
STP (sewage-treatment plant) : 0 mg/l
Humans via the environment : 0 mg/kg body weight/day

9. Guidance to downstream user

A downstream user may evaluate whether he operates within the conditions set in the exposure scenario by using the information provided in sections 1-8. This evaluation may be based on an expert judgement or on the utilisation of risk assessment tools that are recommended by ECHA.

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1. Short title of Exposure Scenario

Use of preparations containing the substance: industrial (ES3)

Sector of use	: Industrial uses: Uses of substances as such or in mixtures at industrial sites (SU3)
Process category	: Use in closed process, no likelihood of exposure, Use in closed, continuous process with occasional controlled exposure, Use in closed batch process (synthesis or formulation), Use in batch and other process (synthesis) where opportunity for exposure arises, Mixing or blending in batch processes for formulation of mixtures and articles (multistage and/or significant contact), Industrial spraying, Transfer of substance or mixture (charging/discharging) from/to vessels/large containers at non dedicated facilities, Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities, Transfer of substance or mixture into small containers (dedicated filling line, including weighing), Roller application or brushing, Treatment of articles by dipping and pouring, Use as a laboratory reagent (PROC1, PROC2, PROC3, PROC4, PROC5, PROC7, PROC8a, PROC8b, PROC9, PROC10, PROC13, PROC15)
Environmental release category	: Industrial use resulting in inclusion into or onto a matrix (ERC5)

Substance: Aspartic Acid, N,N'-(methylenedi-4,1-cyclohexanediyl)bis-, 1,1',4,4'-tetraethyl ester (ES3)

2. Description of activities/process(es) covered in the Exposure Scenario

see chapter 1 of the annex

3. Operational conditions

Duration and frequency

Workers

duration of exposure at workplace: 8 hours/day
frequency of exposure at workplace: 220 days/year

Environment

annual amount used per site: < 440 tonnes/year (t/y)
emission days per site: 300

4.1 Physical form

Liquid

4.2 Concentration of substance in the mixture

< 50 % Aspartic Acid, N,N'-(methylenedi-4,1-cyclohexanediyl)bis-, 1,1',4,4'-tetraethyl ester
The substance is chemically bound in the matrix and will thus not occur in articles.

4.3 Amount used per time or per activity

Up to 100 g/m2 in typical coating applications. Up to 1.100 g/m2 in floor coating. Other fields: < 100 kg per use. When preparations containing the substance are sprayed (PROC 7), the use of a long-sleeved suit and gloves is stipulated.

5. Other operational conditions

The application of preparations containing the substance takes place at room temperature, whereas curing is possible at room temperature as well as at elevated temperatures.
Circulating water from spray cabins is transferred to a sewage treatment plant after mechnical pretreatement.
Waste gases are transferred to an incineration plant.
Organic solvent used for cleaning procedures, filter mats as well as coagulated material separated from the circulating water of spray cabins are disposed of via a hazardous waste combustion unit.
During waste treatment, exposure of the environment is not expected.

6. Risk Management Measures

6.1.1 Occupational measures

Organizational protective measures: Persons who suffer from skin complaints or other hypersensitivity reactions of skin should not work with the product.

Technical protective measures: Procedural and/or control technologies are used to minimise emissions and the resulting exposure during cleaning and maintenance procedures. Local exhaust ventilation is used for sampling and (dis)charging operations.

Personal protective measures: Respiratory equipment is required during spraying An air-fed mask, or for short periods of work, a combination of charcoal filter and particulate filter is recommended if the appearance of vapours cannot be excluded. For processes where the opportunity for exposure arises, the use of gloves is stipulated. Suitable materials for safety gloves; EN 374-3: Laminate glove - PE/EVOH/PE; breakthrough time >=480 min.
Recommendation: contaminated gloves should be disposed of. Wear eye/face protection. Wear suitable protective clothing.
Keep away from foodstuffs, drinks and tobacco. Wash hands before breaks and at end of work and use skin-protecting ointment. Keep working clothes separately. Change contaminated or soaked clothing immediately.

6.1.2 Consumer related measures

not applicable

6.2 Environment related measures

Air: All waste gases are transferred to a combustion unit.

Water: Waste water is transferred to a sewage treatement plant after a mechanical pretreatment

Soil: Sealing of all relevant soil surfaces in the facility is required.

Procedural and/or control technologies are used to minimise emissions and the resulting exposure during cleaning and maintenance procedures.

7. Waste related measures

Disposal method: The waste is disposed of by incineration in a hazardous waste combustor
No emission to the environment during waste treatement
Type of waste: Solvent used for cleaning procedures
Filter mats of spray cabins
Coagulated material, e.g. separated from the circulating water of spray cabins.

8. Prediction of exposure

Workers (oral)

No significant oral exposure

Workers (dermal)

PROC 1, PROC 2, PROC 3 : 0 mg/kg/day
Method: Ecetoc TRA
PROC 4, PROC 5, PROC 8b, PROC 9, PROC 13 : 0,69 mg/kg/day
Method: Ecetoc TRA
PROC 8a, PROC 10 : 1,37 mg/kg/day
Method: Ecetoc TRA
PROC 7 : 2,14 mg/kg/day
PROC 15 : 0,03 mg/kg/day
Method: Ecetoc TRA

Workers (inhalation)

PROC 1, PROC 2, PROC 3, PROC 4, PROC 8a, PROC 8b, PROC 9, PROC 15 : 2,31 mg/m³
Method: Ecetoc TRA
PROC 5, PROC 7, PROC 10, PROC 13 : 1,16 mg/m³

Environment

Water : 0 mg/l
Soil : 0 mg/kg wet weight
STP (sewage-treatment plant) : 0 mg/l
Humans via the environment : 0 mg/kg body weight/day

9. Guidance to downstream user

A downstream user may evaluate whether he operates within the conditions set in the exposure scenario by using the information provided in sections 1-8. This evaluation may be based on an expert judgement or on the utilisation of risk assessment tools that are recommended by ECHA.

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1. Short title of Exposure Scenario

Use of preparations containing the substance: professional (ES4)

Sector of use	**:** Professional uses: Public domain (administration, education, entertainment, services, craftsmen) (SU 22)
Process category :	Use in closed, continuous process with occasional controlled exposure, Use in closed batch process (synthesis or formulation), Use in batch and other process (synthesis) where opportunity for exposure arises, Mixing or blending in batch processes for formulation of mixtures and articles (multistage and/or significant contact), Transfer of substance or mixture (charging/discharging) from/to vessels/large containers at non dedicated facilities, Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities, Transfer of substance or mixture into small containers (dedicated filling line, including weighing), Roller application or brushing, Non industrial spraying, Treatment of articles by dipping and pouring, Handmixing with intimate contact and only PPE available (PROC2, PROC3, PROC4, PROC5, PROC8a, PROC8b, PROC9, PROC10, PROC11, PROC13, PROC19)

NCI CHEMICAL INDUSTRY LTD

SAFETY DATA SHEET

according to Regulation (EU) No. 1907/2006

POLYCOLD 100 PART A

Environmental release Category : Wide dispersive indoor use resulting in inclusion into or onto a matrix, Wide dispersive outdoor use resulting in inclusion into or a matrix (ERC8c, ERC8f)

Substance: Aspartic Acid, N,N'-(methylenedi-4,1-cyclohexanediyl)bis-, 1,1',4,4'-tetraethyl ester (ES4)

2. Description of activities/process(es) covered in the Exposure Scenario

see chapter 1 of the annex

3. **Operational conditions**

Duration and frequency

Workers

duration of exposure at workplace: 8 hours/day

frequency of exposure at workplace: 220 days/year

Environment

annual amount used per site: < 440 tonnes/year (t/y)

emission days per site: 300

4.1 Physical form

Liquid

4.2 Concentration of substance in the mixture

<= 50 % Aspartic Acid, N,N'-(methylenedi-4,1-cyclohexanediyl)bis-, 1,1',4,4'-tetraethyl ester

The substance is chemically bound in the matrix and will thus not occur in articles.

4.3 Amount used per time or per activity

Up to 100 g/m2 in typical coating applications. Up to 1.100 g/m2 in floor coating. Other fields: < 10 kg per use. When preparations containing the substance are sprayed (PROC 11), the use of a long-sleeved suit and gloves is stipulated. In case of hand-mixing with intimate contact (PROC 19), the use of gloves is stipulated and the duration of that task should not exceed 1 h each day.

5. Other operational conditions

The application of preparations containing the substance takes place at room temperature, whereas curing is possible at room temperature as well as at elevated temperatures.

Circulating water from spray cabins is transferred to a sewage treatment plant after mechnical pretreatement.

Organic solvent used for cleaning procedures, filter mats as well as coagulated material separated from the circulating water of spray cabins are disposed of via a hazardous waste combustion unit.

During waste treatment, exposure of the environment is not expected.

6. Risk Management Measures

6.1.1 Occupational measures

Organizational protective measures: Persons who suffer from skin complaints or other hypersensitivity reactions of skin should not work with the product. The systems that contain the substance are only available to professional users and are not made available to the do-ityourself market.

Technical protective measures: Procedural and/or control technologies are used to minimise emissions and the resulting exposure during cleaning and maintenance procedures.

Personal protective measures: Respiratory equipment is required during spraying An air-fed mask, or for short periods of work, a combination of charcoal filter and particulate filter is recommended if the appearance of vapours cannot be excluded. For processes where the opportunity for exposure arises, the use of gloves is stipulated. Suitable materials for safety gloves; EN 374-3: Laminate glove - PE/EVOH/PE; breakthrough time >=480 min.
Recommendation: contaminated gloves should be disposed of. Wear eye/face protection.

Keep away from foodstuffs, drinks and tobacco. Wash hands before breaks and at end of work and use skin-protecting ointment. Keep working clothes separately. Change contaminated or soaked clothing immediately.

6.1.2 Consumer related measures

not applicable

6.2 Environment related measures

Air: Waste gases are transferred to a combustion unit if significant amounts of waste gas are to be expected

Water: Waste water is transferred to a sewage treatement plant after a mechanical pretreatment

Soil: Do not allow to escape into waterways, wastewater or soil.

Procedural and/or control technologies are used to minimise emissions and the resulting exposure during cleaning and maintenance procedures.

7. Waste related measures

Disposal method: **The waste is disposed of by incineration in a hazardous waste combustor**

No emission to the environment during waste treatement
Type of waste: Solvent used for cleaning procedures
Filter mats of spray cabins
Coagulated material, e.g. separated from the circulating water of spray cabins.

8. Prediction of exposure

Workers (oral)

No significant oral exposure

Workers (dermal)

PROC 2, PROC 3 : 0 mg/kg/day

Method: Ecetoc TRA
PROC 4, PROC 5, PROC 8b, PROC 9, PROC 13 : 0,69 mg/kg/day
Method: Ecetoc TRA
PROC 8a, PROC 10 : 1,37 mg/kg/day
Method: Ecetoc TRA
PROC 11 : 1,71 mg/kg/day
Method: Ecetoc TRA
PROC 19 : 1,41 mg/kg/day
Method: Ecetoc TRA

Workers (inhalation)
PROC 2, PROC 3, PROC 4, PROC 8a, PROC 8b, PROC 9 : 2,31 mg/m³
Method: Ecetoc TRA
PROC 5, PROC 10, PROC 11, PROC 13, PROC 19 : 1,16 mg/m³
Method: Ecetoc TRA

Environment
Water : 0 mg/l
Soil : 0 mg/kg wet weight
STP (sewage-treatment plant) : 0 mg/l
Humans via the environment : 0 mg/kg body weight/day

9. Guidance to downstream user

A downstream user may evaluate whether he operates within the conditions set in the exposure scenario by using the information provided in sections 1-8. This evaluation may be based on an expert judgement or on the utilisation of risk assessment tools that are recommended by ECHA.