

SAFETY DATA SHEET

in accordance with 29 CFR 1910.1200, WHMIS 2015 and Safe Work Australia

Revision date: 28 September 2023 **Date of previous issue:** 14 December 2018 **SDS No.** 472B-1

SECTION 1: IDENTIFICATION OF THE SUBSTANCE/MIXTURE AND OF THE COMPANY/UNDERTAKING

1.1. Product identifier

ARC S5 (Part B)

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

Relevant identified uses: Combined with ARC S5 (Part A), for use as a thin film coating on properly prepared surfaces for high temperature applications.

Uses advised against: No information available

Reason why uses advised against: Not applicable

1.3. Details of the supplier of the safety data sheet

Company:

A.W. CHESTERTON COMPANY

860 Salem Street

Groveland, MA 01834-1507, USA

Tel. +1 978-469-6446 Fax: +1 978-469-6785

(Mon. - Fri. 8:30 - 5:00 PM EST)

SDS requests: www.chesterton.com

E-mail (SDS questions): ProductSDSs@chesterton.com

E-mail: customer.service@chesterton.com

Supplier:

Canada: A.W. Chesterton Company Ltd., 889 Fraser Drive,
Unit 105, Burlington, Ontario L7L 4X8 – Tel. 905-335-5055

1.4. Emergency telephone number

24 hours per day, 7 days per week

Call Infotrac: 1-800-535-5053

Outside N. America: +1 352-323-3500 (collect)

NSW Poisons Information Centre (Australia): 13 11 26

SECTION 2: HAZARDS IDENTIFICATION

2.1. Classification of the substance or mixture

2.1.1. Classification according to 29 CFR 1910.1200 / WHMIS 2015 / Safe Work Australia / GHS

Flammable liquid, Category 4, H227

Acute toxicity, Category 4, H302/312/332

Skin corrosion, Category 1A, H314

Serious eye damage, Category 1, H318

Skin sensitization, Category 1, H317

Specific target organ toxicity – single exposure, Category 3, H335

Specific target organ toxicity – repeated exposure, Category 2, H373 (oral)

Hazardous to the aquatic environment, Chronic, Category 3, H412

2.1.2. Additional information

For full text of H-statements: see SECTIONS 2.2 and 16.

2.2. Label elements

Labeling according to 29 CFR 1910.1200 / WHMIS 2015 / Safe Work Australia / GHS

Hazard pictograms:



Signal word:

Danger

Hazard statements:	H227	Combustible liquid.
	H302/312/332	Harmful if swallowed, in contact with skin or if inhaled.
	H314	Causes severe skin burns and eye damage.
	H317	May cause an allergic skin reaction.
	H335	May cause respiratory irritation.
	H373	May cause damage to organs through prolonged or repeated exposure if swallowed.
	H412	Harmful to aquatic life with long lasting effects.
Precautionary statements:	P210	Keep away from flames and hot surfaces. – No smoking.
	P260	Do not breathe vapours/spray.
	P264	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 out of the workplace.
	P273	Avoid release to the environment.
	P280	Wear protective gloves, protective clothing and eye/face protection.
	P301/330/331	IF SWALLOWED: rinse mouth. Do NOT induce vomiting.
	P303/361/353	IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water or shower.
	P304/340	IF INHALED: Remove person to fresh air and keep comfortable for breathing.
	P305/351/338	IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
	P310	Immediately call a POISON CENTER or doctor.
	P333/313	If skin irritation or rash occurs: Get medical advice/attention.
	P363	Wash contaminated clothing before reuse.
P403/233	Store in a well-ventilated place. Keep container tightly closed.	
P235	Keep cool.	
P405	Store locked up.	
P501	Dispose of contents/container to an approved waste disposal plant.	
Supplemental information:	None	

2.3. Other hazards

The safety and health hazards are detailed separately for Part A and Part B. The final cured material is considered nonhazardous. Upon machining, refer to the precautions in the safety data sheets for Part A and Part B.

SECTION 3: COMPOSITION/INFORMATION ON INGREDIENTS

3.2. Mixtures

Hazardous Ingredients ¹	% Wt.	CAS No.	GHS Classification
1,2-Cyclohexanediamine	85-95	694-83-7	Flam. Liq. 4, H227 Acute Tox. 4, H302/312/332 Skin Corr. 1A, H314 Eye Dam. 1, H318 STOT SE 3, H335 Aquatic Acute 3, H402
4,4'-Methylenebis(cyclohexylamine)	1-7	1761-71-3	Acute Tox. 4, H302 Skin Corr. 1B, H314 Eye Dam. 1, H318 Skin Sens. 1B, H317 STOT RE 2, H373 (liver, muscles)
3-Aminomethyl-3,5,5-trimethylcyclohexylamine (Synonym: Isophoronediamine)	1-7	2855-13-2	Acute Tox. 4, H302 Skin Corr. 1B, H314 Eye Dam. 1, H318 Skin Sens. 1A, H317 Aquatic Chronic 3, H412
Diethylmethylbenzenediamine	1-<2.5	68479-98-1	Acute Tox. 4, H302/312 Eye Irrit. 2, H319 STOT RE 2, H373 (pancreas) Aquatic Acute 1, H400 (M-factor = 1) Aquatic Chronic 1, H410

For full text of H-statements: see SECTION 16.

¹ Classified according to: 29 CFR 1910.1200, 1915, 1916, 1917, Mass. Right-to-Know Law (ch. 40, M.G.L..O. 111F), WHMIS 2015, Safe Work Australia, GHS

SECTION 4: FIRST AID MEASURES

4.1. Description of first aid measures

Inhalation: Remove to fresh air. If not breathing, administer artificial respiration. Contact physician.

Skin contact: Flood area with water while removing contaminated clothing. Wash clothing before reuse. Contact physician immediately.

Eye contact: Flush eyes for at least 15 minutes with large amounts of water. Remove contact lenses, if present and easy to do. Continue rinsing. Contact physician immediately.

Ingestion: Do not induce vomiting without medical advice. Never give anything by mouth to an unconscious person. Contact physician immediately.

Protection of first-aiders: No action shall be taken involving any personal risk or without suitable training. Avoid contact with the product while providing aid to the victim. Do not breathe mist/vapours. See section 8.2.2 for recommendations on personal protective equipment.

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

Causes severe skin burns and eye damage. High vapor concentrations and mist can cause severe eye and respiratory tract irritation. May cause skin sensitization as evidenced by rashes or hives. If ingested, severe burns of the mouth and throat, as well as a danger of perforation of the oesophagus and the stomach.

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

Treat symptoms.

SECTION 5: FIRE-FIGHTING MEASURES

5.1. Extinguishing media

Suitable extinguishing media: Carbon dioxide, dry chemical, foam, water spray

Unsuitable extinguishing media: Water jets

5.2. Special hazards arising from the substance or mixture

Hazardous combustion products: May generate: ammonia gas, toxic nitrogen oxide gases, carbon monoxide. Burning produces noxious and toxic fumes.

Other hazards: Vapors may travel considerable distance to a source of ignition and flash back.

5.3. Advice for firefighters

Cool exposed containers with water. Recommend Firefighters wear self-contained breathing apparatus and complete fire service protective equipment.

Australian HAZCHEM Emergency Action Code: 2 X

SECTION 6: ACCIDENTAL RELEASE MEASURES

6.1. Personal precautions, protective equipment and emergency procedures

Evacuate area. Provide adequate ventilation. Avoid skin contact. Utilize exposure controls and personal protection as specified in Section 8. Keep away from sources of ignition. If removal of ignition sources is not possible, then flush material away with water.

6.2. Environmental Precautions

Keep out of sewers, streams and waterways.

6.3. Methods and material for containment and cleaning up

Contain spill to a small area. Pick up with absorbent material (sand, sawdust, clay, etc.) and place in a suitable container for disposal.

6.4. Reference to other sections

Refer to section 13 for disposal advice.

SECTION 7: HANDLING AND STORAGE**7.1. Precautions for safe handling**

Do not breathe vapours/spray. Use only outdoors or in a well-ventilated area. Utilize exposure controls and personal protection as specified in Section 8. When using, do not eat, drink or smoke. Wash hands thoroughly after handling. Keep away from flames and hot surfaces. Do not contaminate with sodium nitrite or other nitrosating agents, which could cause the formation of cancer-causing nitrosamine. Remove contaminated clothing immediately. Wash clothing before reuse. Contaminated leather including shoes cannot be decontaminated and should be discarded. Avoid creating and breathing dust during removal, drilling, grinding, sawing or sanding.

7.2. Conditions for safe storage, including any incompatibilities

Keep container tightly closed. Store in a cool, dry and well-ventilated area. Keep from freezing. Do not store near food or feed.

7.3. Specific end use(s)

No special precautions.

SECTION 8: EXPOSURE CONTROLS/PERSONAL PROTECTION**8.1. Control parameters****Occupational exposure limit values**

Ingredients	OSHA PEL ¹		ACGIH TLV ²		AUSTRALIA ES ³	
	ppm	mg/m ³	ppm	mg/m ³	ppm	mg/m ³
1,2-Cyclohexanediamine	N/A	N/A	N/A	N/A	N/A	N/A
4,4'-Methylenebis(cyclohexylamine)	N/A	N/A	N/A	N/A	N/A	N/A
3-Aminomethyl-3,5,5-trimethylcyclohexylamine	N/A	N/A	N/A	N/A	N/A	N/A
Diethylmethylbenzenediamine	N/A	N/A	N/A	N/A	N/A	N/A

¹ United States Occupational Health & Safety Administration permissible exposure limits

² American Conference of Governmental Industrial Hygienists threshold limit values

³ Safe Work Australia, Workplace Exposure Standards for Airborne Contaminants

Biological limit values

No biological exposure limits noted for the ingredient(s).

8.2. Exposure controls**8.2.1. Engineering measures**

Use only in well-ventilated areas. If necessary, provide local exhaust. If it is necessary to alter the final cured product such that dust may be generated, use adequate dust extraction or damp down.

8.2.2. Individual protection measures

Respiratory protection: Use positive pressure, supplied-air respirators if there is a potential for uncontrolled release, if exposure levels are unknown, or under circumstances where air-purifying respirators may not provide adequate protection.

Protective gloves: Chemical resistant gloves (e.g., nitrile rubber, butyl rubber, neoprene, PVC)

Eye and face protection: Full face shield with goggles underneath.

Other: Impervious clothing as necessary to prevent skin contact.

8.2.3. Environmental exposure controls

Refer to sections 6 and 12.

SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES**9.1. Information on basic physical and chemical properties**

Physical state	viscous liquid	pH	not applicable
Colour	light brown	Kinematic viscosity	10.3 cSt @ 25°C
Odour	amine	Solubility in water	miscible
Odour threshold	not determined	Partition coefficient n-octanol/water (log value)	not applicable
Boiling point or range	191°C (376°F)	Vapour pressure @ 20°C	51.6 Pa @ 20°C
Melting point/freezing point	not determined	Density and/or relative density	0.97 kg/l
% Volatile (by volume)	none	Weight per volume	15.2 lbs/gal.
Flammability	not determined	Vapour density (air=1)	> 1
Lower/upper flammability or explosion limits	not determined	Rate of evaporation (ether=1)	< 1
Flash point	70°C (158°F)	% Aromatics by weight	none
Method	component data	Particle characteristics	not applicable
Autoignition temperature	340°C (644°F)	Explosive properties	not determined
Decomposition temperature	>300°C (>572°F)	Oxidising properties	not determined

9.2. Other information

None

SECTION 10: STABILITY AND REACTIVITY**10.1. Reactivity**

Refer to sections 10.3 and 10.5.

10.2. Chemical stability

Stable under normal conditions.

10.3. Possibility of hazardous reactions

No dangerous reactions known under conditions of normal use.

10.4. Conditions to avoid

Open flames, heat, sparks and red hot surfaces.

10.5. Incompatible materials

Strong acids and strong oxidizers like liquid Chlorine and concentrated Oxygen. Reaction with peroxides may result in violent decomposition of peroxide possibly creating an explosion. Do not contaminate with sodium nitrite or other nitrosating agents.

10.6. Hazardous decomposition products

Nitric acid, NOx, Ammonia, Carbon Monoxide, Carbon Dioxide, nitrosamines and other toxic fumes.

SECTION 11: TOXICOLOGICAL INFORMATION**11.1. Information on toxicological effects**

Primary route of exposure under normal use: Inhalation, skin and eye contact. Personnel with pre-existing allergies and skin and eye disorders may be aggravated by exposure.

Acute toxicity -**Oral:**

Harmful if swallowed. ATE-mix = 1053.7 mg/kg. If ingested, severe burns of the mouth and throat, as well as a danger of perforation of the oesophagus and the stomach.

Substance	Test	Result
1,2-Cyclohexanediamine	LD50, rat	1170 mg/kg
4,4'-Methylenebis(cyclohexylamine)	LD50, rat	625 mg/kg
3-Aminomethyl-3,5,5-trimethylcyclohexylamine	LD50, rat	1030 mg/kg
Diethylmethylbenzenediamine	LD50, rat	485 mg/kg

Dermal:

Harmful in contact with skin. ATE-mix = 1814.3 mg/kg.

Substance	Test	Result
1,2-Cyclohexanediamine	LD50, rat	1870 mg/kg
4,4'-Methylenebis(cyclohexylamine)	LD50, rabbit	2110 mg/kg
3-Aminomethyl-3,5,5-trimethylcyclohexylamine	LD50, rabbit	1840 mg/kg
Diethylmethylbenzenediamine	cATpE	1100 mg/kg

Inhalation:

Harmful if inhaled (aerosol/mist). ATE-mix = 1.36 mg/l (aerosol/mist).

Substance	Test	Result
1,2-Cyclohexanediamine	LCLo, rat, 4 h	3.2 mg/l (mist/vapor)
1,2-Cyclohexanediamine	LC50, rat, 4 h	1.225 (mist/vapor, analytical, similar material)
3-Aminomethyl-3,5,5-trimethylcyclohexylamine	LC50, rat, 4 h	> 5.01 mg/l (mist, analytical)
Diethylmethylbenzenediamine	LC50, rat, 1 h	> 2.45 mg/l (mist)

Skin corrosion/irritation:

Causes severe burns.

Substance	Test	Result
3-Aminomethyl-3,5,5-trimethylcyclohexylamine	Skin irritation, rabbit	Corrosive

Serious eye damage/irritation:

Causes serious eye damage.

Substance	Test	Result
1,2-Cyclohexanediamine	Eye irritation, rabbit	Corrosive
3-Aminomethyl-3,5,5-trimethylcyclohexylamine	Eye irritation, rabbit (OECD 405)	Corrosive

Respiratory or skin sensitisation:

May cause skin sensitization as evidenced by rashes or hives.

Substance	Test	Result
3-Aminomethyl-3,5,5-trimethylcyclohexylamine	Skin sensitization, guinea pig (OECD 406)	Sensitizing

Germ cell mutagenicity:

1,2-Cyclohexanediamine, 3-Aminomethyl-3,5,5-trimethylcyclohexylamine: based on available data, the classification criteria are not met.

Carcinogenicity:

This product contains no carcinogens as listed by the National Toxicology Program (NTP), the International Agency for Research on Cancer (IARC), the Occupational Safety and Health Administration (OSHA) or the European Chemicals Agency (ECHA).

Reproductive toxicity:

3-Aminomethyl-3,5,5-trimethylcyclohexylamine: not expected to cause toxicity.

STOT – single exposure:

May cause respiratory irritation.

STOT – repeated exposure:

May cause damage to organs through prolonged or repeated exposure (liver, muscles, pancreas). Diethylmethylbenzenediamine: NOEL, pancreas, 2 years, rat, male - 35 ppm; female - 70 ppm. 1,2-Cyclohexanediamine, 3-Aminomethyl-3,5,5-trimethylcyclohexylamine: not expected to cause organ damage from prolonged or repeated exposure.

Aspiration hazard:

Not classified due to lack of data.

Other information:

None known

SECTION 12: ECOLOGICAL INFORMATION

Ecotoxicological data have not been determined specifically for this product. The information given below is based on a knowledge of the components and the ecotoxicology of similar substances.

12.1. Toxicity

Harmful to aquatic life with long lasting effects. Diethylmethylbenzenediamine: 48 h EC50 (for daphnia) = 0.5 mg/l; 48 h LC50 (Leuciscus idus) = 194 mg/l.

12.2. Persistence and degradability

Unreacted components (Parts A and B), improperly released to the environment, can cause ground and water pollution. 1,2-Cyclohexanediamine: readily biodegradable (OECD 301D, 17 days). 4,4'-Methylenebis(cyclohexylamine), Diethylmethylbenzenediamine: expected to be resistant to biodegradation.

12.3. Bioaccumulative potential

4,4'-Methylenebis(cyclohexylamine): low potential for bioaccumulation (bioconcentration factor < 100, estimated). 1,2-Cyclohexanediamine: bioconcentration in aquatic organisms is not expected to be significant (log Kow < -0.9, OECD 107).

12.4. Mobility in soil

Liquid. Miscible in water. In determining environmental mobility, consider the product's physical and chemical properties (see Section 9).

12.5. Endocrine disrupting properties

None known

12.6. Other adverse effects

None known

SECTION 13: DISPOSAL CONSIDERATIONS**13.1. Waste treatment methods**

Combine resin and curative. The final cured material is considered nonhazardous. Unreacted components are a special waste. Incinerate waste product when in liquid form with a properly licensed facility. Check local, state and national/federal regulations and comply with the most stringent requirement.

SECTION 14: TRANSPORT INFORMATION**14.1. UN number or ID number**

ADG/ADR/RID/ADN/IMDG/ICAO: UN2735
TDG: UN2735
US DOT: UN2735

14.2. UN proper shipping name

ADG/ADR/RID/ADN/IMDG/ICAO: AMINES, LIQUID, CORROSIVE, N.O.S.
 (1,2-DIAMINOCYCLOHEXANE /4,4'-
 METHYLENEBISCYCLOHEXANAMINE,METHYLIMIDAZOLE, 1-)
TDG: AMINES, LIQUID, CORROSIVE, N.O.S.
 (1,2-DIAMINOCYCLOHEXANE /4,4'-
 METHYLENEBISCYCLOHEXANAMINE,METHYLIMIDAZOLE, 1-)
US DOT: AMINES, LIQUID, CORROSIVE, N.O.S.
 (1,2-DIAMINOCYCLOHEXANE /4,4'-
 METHYLENEBISCYCLOHEXANAMINE,METHYLIMIDAZOLE, 1-)

14.3. Transport hazard class(es)

ADG/ADR/RID/ADN/IMDG/ICAO: 8
TDG: 8
US DOT: 8

14.4. Packing group

ADG/ADR/RID/ADN/IMDG/ICAO: II
TDG: II
US DOT: II

14.5. Environmental hazards

NO ENVIRONMENTAL HAZARDS

14.6. Special precautions for user

NO SPECIAL PRECAUTIONS FOR USER

14.7. Maritime transport in bulk according to IMO instruments

NOT APPLICABLE

14.8. Other information

US DOT: MAY BE SHIPPED AS LIMITED QUANTITIES IN PACKAGING HAVING A RATED CAPACITY GROSS WEIGHT OF 66 LB. OR LESS AND IN INNER PACKAGES NOT OVER 1 LITER (49 CFR 173.154 (B,1) ERG NO. 153

IMDG: EMS F-A, S-B, IMDG SEGREGATION GROUP 18-ALKALIS**ADR:** CLASSIFICATION CODE C7, TUNNEL RESTRICTION CODE (E)**ADG HAZCHEM CODE:** 2X HIN: 88/80**SECTION 15: REGULATORY INFORMATION****15.1. Safety, health and environmental regulations/legislation specific for the substance or mixture****15.1.1. National regulations****US EPA SARA TITLE III****312 Hazards:**

Flammable liquid
 Acute toxicity
 Skin corrosion
 Serious eye damage
 Skin sensitization
 Specific target organ toxicity – single exposure
 Specific target organ toxicity – repeated exposure

Chemicals subject to reporting requirements of Section 313 of EPCRA and of 40 CFR 372:

None

TSCA: All components are listed or exempted.

Other national regulations: None

SECTION 16: OTHER INFORMATION

Abbreviations and acronyms: ADG: Australian Dangerous Goods Code
 ADN: European Agreement concerning the International Carriage of Dangerous Goods by Inland Waterways
 ADR: European Agreement concerning the International Carriage of Dangerous Goods by Road
 ATE: Acute Toxicity Estimate
 BCF: Bioconcentration Factor
 cATpE: Converted Acute Toxicity point Estimate
 ES: Exposure Standard
 GHS: Globally Harmonized System
 ICAO: International Civil Aviation Organization
 IMDG: International Maritime Dangerous Goods
 LC50: Lethal Concentration to 50 % of a test population
 LD50: Lethal Dose to 50% of a test population
 LOEL: Lowest Observed Effect Level
 N/A: Not Applicable
 NA: Not Available
 NOEC: No Observed Effect Concentration
 NOEL: No Observed Effect Level
 OECD: Organization for Economic Co-operation and Development
 (Q)SAR: Quantitative Structure-Activity Relationship
 REL: Recommended Exposure Limit
 RID: Regulations concerning the International Carriage of Dangerous Goods by Rail
 SDS: Safety Data Sheet
 STEL: Short Term Exposure Limit
 STOT RE: Specific Target Organ Toxicity, Repeated Exposure
 STOT SE: Specific Target Organ Toxicity, Single Exposure
 TDG: Transportation of Dangerous Goods (Canada)
 TWA: Time Weighted Average
 US DOT: United States Department of Transportation
 WHMIS: Workplace Hazardous Materials Information System
 Other abbreviations and acronyms can be looked up at www.wikipedia.org.

Key literature references and sources for data: Commission des normes, de l'équité, de la santé et de la sécurité du travail (CNESST)
 Chemical Classification and Information Database (CCID)
 European Chemicals Agency (ECHA) - Information on Chemicals
 Hazardous Chemical Information System (HCIS)
 National Institute of Technology and Evaluation (NITE)
 U.S. National Library of Medicine Toxicology Data Network (TOXNET)

Procedure used to derive the classification for mixtures according to GHS:

Classification	Classification procedure
Flam. Liq. 4, H227	On basis of components
Acute Tox. 4, H302/312/332	Calculation method
Skin Corr. 1B, H314	Calculation method
Eye Dam. 1, H318	Calculation method
Skin Sens. 1, H317	Calculation method
STOT RE 2, H373	Calculation method
Aquatic Chronic 3, H412	Calculation method

Relevant H-statements: H227: Combustible liquid.
 H302: Harmful if swallowed.
 H312: Harmful in contact with skin.
 H314: Causes severe skin burns and eye damage.
 H317: May cause an allergic skin reaction.
 H318: Causes serious eye damage.
 H319: Causes serious eye irritation.
 H332: Harmful if inhaled.
 H335: May cause respiratory irritation.
 H373: May cause damage to organs through prolonged or repeated exposure.
 H402: Harmful to aquatic life.
 H412: Harmful to aquatic life with long lasting effects.

Hazard pictogram names: Corrosion, health hazard, exclamation mark

Further information: None

Date of last revision: 28 September 2023

Changes to the SDS in this revision: Sections 1.2, 1.3, 2.1, 3.2, 5.2, 5.3, 8.1, 9.1, 12.5, 15.1, 16.

This information is based solely on data provided by suppliers of the materials used, not on the mixture itself. No warranty is expressed or implied regarding the suitability of the product for the user's particular purpose. The user must make their own determination as to suitability.