

SAFETY DATA SHEET

in accordance with REACH (1907/2006/EC, as amended by 2020/878/EU)

Revision date: 4 November 2023 **Date of previous issue:** 28 September 2023 **SDS No.** 472B-2

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

1.1. Product identifier

ARC S5 (Part B)

Unique Formula Identifier (UFI): 3X25-7V76-39FK-755S

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:

EU: Chesterton International GmbH, Am Lenzenfleck 23,
D85737 Ismaning, Germany – Tel. +49-89-996-5460

1.4. Emergency telephone number

24 hours per day, 7 days per week
Call Infotrac: +1 352-323-3500 (collect)

SECTION 2: HAZARDS IDENTIFICATION

2.1. Classification of the substance or mixture

2.1.1. Classification according to Regulation (EC) No 1272/2008 [CLP]

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

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

Labelling according to Regulation (EC) No 1272/2008 [CLP]

Hazard pictograms:



Signal word:

Danger

Hazard statements:	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.
	H412 Harmful to aquatic life with long lasting effects.
Precautionary statements:	P260 Do not breathe mist/vapours.
	P264 Wash skin thoroughly after handling.
	P273 Avoid release to the environment.
	P280 Wear protective gloves/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.
	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.
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./ EC No.	REACH Reg. No.	CLP Classification	SCL, M-factor, ATE
1,2-Cyclohexanediamine	85-95	694-83-7 211-776-7	NA	Acute Tox. 4, H302/312/332 Skin Corr. 1A, H314 Eye Dam. 1, H318 STOT SE 3, H335	ATE (oral): 1,170 mg/kg ATE (dermal): 1,870 mg/kg ATE (inhalation, mist): 1.5 mg/l
4,4'-Methylenebis(cyclohexylamine)	1-7	1761-71-3 217-168-8	NA	Acute Tox. 4, H302 Skin Corr. 1B, H314 Eye Dam. 1, H318 Skin Sens. 1B, H317 STOT RE 2, H373 (liver, muscles)	ATE (oral): 625 mg/kg ATE (dermal): 2,110 mg/kg
3-Aminomethyl-3,5,5-trimethylcyclohexylamine	1-7	2855-13-2 220-666-8	NA	Acute Tox. 4, H302 Skin Corr. 1B, H314 Eye Dam. 1, H318 Skin Sens. 1A, H317 Aquatic Chronic 3, H412	Skin Sens. 1A, H317: C ≥ 0.001 % ATE (oral): 1,030 mg/kg ATE (dermal): > 2,000 mg/kg 43275 mg/l
Diethylmethylbenzenediamine	1-<2.5	68479-98-1 270-877-4	NA	Acute Tox. 4, H302/312 Eye Irrit. 2, H319 STOT RE 2, H373 (pancreas) Aquatic Acute 1, H400 Aquatic Chronic 1, H410	M-factor acute/chronic = 1 ATE (oral): 485 mg/kg ATE (dermal): 1,100 mg/kg

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

¹ Classified according to: 1272/2008/EC, REACH

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: FIREFIGHTING 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.

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**

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

¹ American Conference of Governmental Industrial Hygienists threshold limit values

² EH40 Workplace exposure limits, Health & Safety Executive

Biological limit values

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

Derived No Effect Level (DNEL) according to Regulation (EC) No 1907/2006:**Workers** (Source: GESTIS)

Substance	Route of exposure	Potential health effects	DNEL
1,2-Cyclohexanediamine	Inhalation	Chronic effects, local	0.27 mg/m ³
4,4'-Methylenebis(cyclohexylamine)	Inhalation	Chronic effects, systemic	0.13 mg/m ³
3-Aminomethyl-3,5,5-trimethylcyclohexylamine	Inhalation	Chronic effects, local	0.073 mg/m ³
Diethylmethylbenzenediamine	Inhalation	Chronic effects, systemic	0.13 mg/m ³

Predicted No Effect Concentration (PNEC) according to Regulation (EC) No 1907/2006:

Not available

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	Vapour density (air=1)	> 1
Flammability	not determined	Rate of evaporation (ether=1)	< 1
Lower/upper flammability or explosion limits	not determined	% Aromatics by weight	none
Flash point	70°C (158°F)	Particle characteristics	not applicable
Method	component data	Explosive properties	not determined
Autoignition temperature	340°C (644°F)	Oxidising properties	not determined
Decomposition temperature	>300°C (>572°F)		

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 hazard classes as defined in Regulation (EC) No 1272/2008**

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	1,170 mg/kg
4,4'-Methylenebis(cyclohexylamine)	LD50, rat	625 mg/kg
3-Aminomethyl-3,5,5-trimethylcyclohexylamine	LD50, rat	1,030 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	1,870 mg/kg
4,4'-Methylenebis(cyclohexylamine)	LD50, rabbit	2,110 mg/kg
3-Aminomethyl-3,5,5-trimethylcyclohexylamine	LD50, rabbit	> 2,000 mg/kg
Diethylmethylbenzenediamine	cATpE	1,100 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 International Agency for Research on Cancer (IARC) 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: 4,4'-Methylenebis(cyclohexylamine) : may cause damage to organs through prolonged or repeated exposure if swallowed (liver, muscles). 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.

11.2. Information on other hazards

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. Results of PBT and vPvB assessment

This mixture does not contain any substances that are assessed to be a PBT or a vPvB.

12.6. Endocrine disrupting properties

None known

12.7. 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. The unhardened product is classified as a hazardous waste according to 2008/98/EC. 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**

ADR/RID/ADN/IMDG/ICAO: UN2735

14.2. UN proper shipping name

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

14.3. Transport hazard class(es)

ADR/RID/ADN/IMDG/ICAO: 8

14.4. Packing group

ADR/RID/ADN/IMDG/ICAO: 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

IMDG: EMS F-A, S-B, IMDG SEGREGATION GROUP 18-ALKALIS

ADR: CLASSIFICATION CODE C7, TUNNEL RESTRICTION CODE (E)

SECTION 15: REGULATORY INFORMATION**15.1. Safety, health and environmental regulations/legislation specific for the substance or mixture****15.1.1. EU regulations**

Authorisations under Title VII: Not applicable

Restrictions under Title VIII: None

Other EU regulations: Directive 94/33/EC on the protection of young people at work.

15.1.2. National regulations

National implementation of the EC Directive referred to in section 15.1.1.

15.2. Chemical safety assessment

No Chemical Safety Assessment has been carried out for this substance/mixture by the supplier.

SECTION 16: OTHER INFORMATION

Abbreviations and acronyms: 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
 CLP: Classification Labelling Packaging Regulation (1272/2008/EC)
 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
 PBT: Persistent, Bioaccumulative and Toxic substance
 (Q)SAR: Quantitative Structure-Activity Relationship
 REACH: Registration, Evaluation, Authorisation and Restriction of Chemicals Regulation (1907/2006/EC)
 REL: Recommended Exposure Limit
 RID: Regulations concerning the International Carriage of Dangerous Goods by Rail
 SCL: Specific Concentration Limit
 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
 vPvB: very Persistent and very Bioaccumulative substance
 WEL: Workplace Exposure Limit
 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)
 Swedish Chemicals Agency (KEMI)
 U.S. National Library of Medicine Toxicology Data Network (TOXNET)

Procedure used to derive the classification for mixtures according to Regulation (EC) No 1272/2008 [CLP]:

Classification	Classification procedure
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
Aquatic Chronic 3, H412	Calculation method

Relevant H-statements: 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.
 H412: Harmful to aquatic life with long lasting effects.

Further information: None

Changes to the SDS in this revision: Section 1.1.

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.