MATERIAL SAFETY DATA SHEET
Silver Conductive Adhesive

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

1.1 Product Identifiers
Product name: Silver Conductive Adhesive
Brand: DML DM-AS
Product codes: DM-AS-10001, Research Sample, This MSDS is for product trials
REACH No.: Not available. Annual tonnage does not require a registration.

1.2 Relevant identified uses of the substance or mixture and uses advised against
Identified uses: Scientific research and development, professional use only. Screen Printing Paste

1.3 Details of the supplier of the safety data sheet
Company: Dycotec Materials Ltd
Unit 12 Star West, Westmead Drive, Westlea, Swindon, Wiltshire SN5 7SW, UK
Telephone: +44 (0) 1788 814025
E-mail address: info@dycotecmaterials.com

1.4 Emergency telephone number
Emergency Phone No.: +44 (0) 7495 248908 Only available during office hours

SECTION 2: Hazards Identification

2.1 Classification of the substance or mixture
Physical hazards:
Health hazards: H302, H317, H319, H332
Environmental hazards: H410
Physicochemical: Stable. Solidify/Cured by thermal process. Fully cured product residues are generally not regarded as hazardous waste

2.2 Label elements
Pictogram

Signal word: Warning
Hazard statements:
- H302 – Harmful if swallowed
- H317 – May Causes an allergic skin reaction
- H319 – Causes serious eye irritation
- H332 – Harmful if inhaled
- H335 – May cause respiratory irritation
- H410 – Very Toxic to aquatic life with long lasting effects

Precautionary statements:
- P264 – Wash hand thoroughly after handling.
- P270 – Do no eat, drink or smoke when using this product.
- P301+P312 – IF SWALLOWED: Call a POISON CENTER or doctor/physician if you feel unwell.
- P330 – If skin irritation or rash occurs: Get medical advice/attention.
- P363 – Wash contaminated clothing before reuse.
- P305+P351+P338 – IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
- P337+P313 – If eye irritation persists: Get medical advice / attention.
- P261 – Avoid breathing dust/fumes/gas/mist/vapours/spray.
P271 – Use only outdoors or in a well-ventilated area.
P304+P340+P312 – IF INHALED: Remove person to fresh air and keep comfortable for breathing. Call a POISON CENTER or doctor/physician if you feel unwell
P273 – Avoid release to the environment
P391 – Collect spillage
P501 – Dispose off contents/container in accordance with local/regional/national/international regulations.

2.3 Other hazards
No data available

SECTION 3: COMPOSITION/INFORMATION ON INGREDIENTS

3.2 Mixtures
For DM-AS-10001 Part A

<table>
<thead>
<tr>
<th>Blended Epoxy Resin; Synonyms:</th>
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<tr>
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<td>EC #:</td>
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<tr>
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<td>H317</td>
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<table>
<thead>
<tr>
<th>Silver; Synonyms:</th>
<th>&lt; 95%</th>
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</table>

For DM-AS-10001 Part B

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<th>Curing promoter; Synonyms:</th>
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<td>EC #:</td>
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<tr>
<td>Classification</td>
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<td>CAS #:7440-22-4</td>
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</table>

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<td>CAS #:</td>
<td>EC #:</td>
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<tr>
<td>Classification</td>
<td>H302, H332, H319</td>
</tr>
</tbody>
</table>

The full text for all Hazard Statements are displayed in Section 16.

SECTION 4: FIRST AID MEASURES

4.1 Description of first aid measures

General information
Remove affected person from source of contamination. Remove contaminated clothing. First aid personnel must be aware of own risk during rescue. Consult a physician. Show this safety data sheet to the doctor in attendance.

Inhalation
If breathed in, move person into fresh air. If not breathing, give artificial respiration. Consult a physician.

Ingestion
Never give anything by mouth to an unconscious person. Rinse mouth with penty of water. Consult a physician

Skin contact
Wash off with soap and plenty of water. Consult a physician

Eye contact
Rinse thoroughly with plenty of water for at least 15 minutes and consult a physician

4.2 Most important symptoms and effects, both acute and delayed
The most important known symptoms and effects are described in the labelling (see section 2.2) and or in section 11.
4.3 Indication of any immediate medical attention and special treatment needed
No data available

SECTION 5: FIRE-FIGHTING MEASURES

5.1 Extinguishing media
Suitable extinguishing media
Alcohol-resistant foam. Carbon dioxide. Dry powder.
Unsuitable extinguishing media for safety reasons: water jet

5.2 Special hazards arising from the substance or mixture
Decomposition and combustion products may be toxic.

5.3 Advice for firefighters
Wear self-contained breathing apparatus for firefighting if necessary

5.4 Further information
The product itself does not burn under normal storage condition.

SECTION 6: ACCIDENTAL RELEASE MEASURES

6.1 Personal precautions, protective equipment and emergency procedures
Use personal protective equipment. Avoid breathing vapors, mist or gas. Ensure adequate ventilation. Evacuate personnel to safe areas. Avoid breathing dust. For personal protection see section 8.

6.2 Environmental precautions
Prevent further leakage or spillage if safe to do so. Do not let product enter drains.

6.3 Methods and materials for containment and cleaning up
Wipe up with inert absorbent material and disposal of as hazardous waste. Keep in suitable, closed containers for disposal.

6.4 Reference to other sections
For disposal see section 13.

SECTION 7: HANDLING AND STORAGE

7.1 Precautions for safe handling
Avoid contact with skin and eyes. Avoid inhalation of vapour or mist. For precautions see section 2.2.

7.2 Conditions for safe storage, including any incompatibilities
Store in cool, dry and well-ventilated place. Store in tightly sealed containers to prevent moisture absorption and loss of volatiles. Excessive heat over long periods of time will degrade the resin. Kept upright to prevent leakage.

7.3 Specific end use(s)
Apart from the uses mentioned in section 1.2 no other specific uses are stipulated

SECTION 8: EXPOSURE CONTROLS/PERSONAL PROTECTION

8.1 Control parameters – Components with workplace control parameters
No occupational exposure limits known.

8.2 Exposure Controls

Protective equipment

Appropriate engineering controls
Handle in accordance with good industrial hygiene and safety practice. Wash hands before breaks and at the end of workday.

Eye/face protection
Use approved safety glasses with side shields. Eyewear complying with an approved standard should be worn if a risk assessment indicate eye contact is possible. The following protection should be worn: Chemical splash goggles or face shield.

Hand protection
Handle with gloves. Gloves must be inspected prior to use. The selected protective gloves have to satisfy the specifications of EU Directive 89/686/EEC and the standard EN 374 derived from it. Wear protective gloves made of the following material: Nitrile rubber. The most suitable glove should be chosen in consultation with the glove supplier/manufacturer, who can provide information about the breakthrough time of the glove material. Use proper glove removal technique (without touching glove’s outer surface) to avoid skin contact with this product. Dispose of contaminated gloves after use in accordance with applicable laws and good laboratory practices. Wash and dry hands.

**Other skin and body protection**

Wear appropriate clothing to prevent any possibility of liquid contact and repeated or prolonged vapour contact

**Hygiene measures**

Do not smoke in work area. Wash hands thoroughly after handling. Promptly remove any clothing that becomes contaminated. When using do not eat, drink or smoke. Contaminated clothing should be placed in a closed container for disposal of decontamination. Warn cleaning personnel of any hazardous properties of the product.

**Respiratory protection**

If ventilation is inadequate, suitable respiratory protection must be worn. Wear a respirator fitted with the following cartridge: Combination filter, type A2/P3. In confined or poorly ventilated spaces, a supplied air respirator must be worn.

**Control of environmental exposure**

Prevent further leakage or spillage if safe to do so. Do not let product enter drains.

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**SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES**

**9.1 Information on basic physical and chemical properties**

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Appearance</td>
<td>Paste</td>
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<td>Colour</td>
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<tr>
<td>Odour</td>
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<tr>
<td>pH</td>
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<td>Melting / freezing point</td>
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<td>Initial boiling point and boiling range</td>
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<td>Evaporation rate</td>
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<td>Flammability (solid, gas)</td>
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<tr>
<td>Upper/lower flammability or explosive limits</td>
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<tr>
<td>Vapour pressure</td>
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<td>Explosive properties</td>
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<tr>
<td>Oxidizing properties</td>
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</table>

**9.1 Other information**

No data available

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**SECTION 10: STABILITY AND REACTIVITY**

10.1 Reactivity

No data available

10.2 Chemical stability

Stable under recommended storage conditions. Stable at normal ambient temperatures.

10.3 Possibility of hazardous reactions

The product can polymerize if the shelf life or storage temperature are greatly exceeded. Heat develops during polymerization. Reacts with peroxide and other radical components.

10.4 Conditions to avoid

See section 7 – Handling and storage

10.5 Incompatible materials

Strong oxidizing agents, Strong acids. Strong alkalis. Peroxides. Amines

10.6 Hazardous decomposition products

Does not decompose when used and stored as recommended.

Other decomposition products - no data available

In the event of fire - see section 5

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**SECTION 11: TOXICOLOGICAL INFORMATION**

Acute toxicity:

DM-AS-10002A
LD50 rabbits (oral): 4000 mg/kg
DM-AS-10002B
LD50 rabbits (oral): 3000 mg/kg

This product has not been tested. The statement has been derived from the properties of the individual components.

**Skin corrosion/irritation:**
Irritant
This product has not been tested. The statement has been derived from the properties of the individual components.

**Serious eye damage/eye irritation:**
Irritant
This product has not been tested. The statement has been derived from the properties of the individual components.

**Respiratory or skin sensitization:**
Can cause skin and respiratory sensitization
This product has not been tested. The statement has been derived from the properties of the individual components.

**Germ cell mutagenicity:**
The substance was not mutagenic in bacteria. The substance was mutagenic in various cell culture test systems; however, these results could not be confirmed in test with mammals. The product has not been tested. The statement has been derived from the properties of the individual components.

**Carcinogenicity:** No data available

**Reproductive toxicity:** No data available

**Specific target organ toxicity – single exposure:**
A single exposure may have relevant toxic effects on organs named in section 2 of this safety data sheet

**Specific target organ toxicity – repeated exposure:**
After repeated exposure the prominent effect is local irritation. The product has not been tested. The statement has been derived from the properties of the individual components.

**Aspiration hazard:** No data available

**Signs and Symptoms of Exposure:** No data available

**Additional Information:** No data available.

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**SECTION 12: ECOLOGICAL INFORMATION**

**Ecotoxicity**
Do not empty into drains, soil or bodies of water. Toxic to aquatic organisms, may cause long term adverse effects in the aquatic environment

12.1 **Toxicity**
no data available

12.2 **Persistence and degradability**
no data available

12.3 **Bioaccumulative potential**
no data available

12.4 **Mobility in soil**
no data available

12.5 **Results of PBT and vPvB assessment**
no data available

12.6 **Other adverse effects**
no data available

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**SECTION 13: DISPOSAL CONSIDERATIONS**

13.1 **Waste treatment methods**

**General Information**
When handling waste, the safety precautions applying to handling of the product should be considered. Do not dump into any sewers, on the ground, or into any body of water. Not to be disposed of together with household waste. Any disposal practice must be in compliance with all local and national laws and regulations. Handle and dispose contaminated packages in the same way as the product itself. Fully cured product residues are generally not regarded as hazardous waste.

**Disposal methods**
Burn in a chemical incinerator equipped with an afterburner and scrubber but exert extra care in igniting as this material is highly flammable. Offer surplus and non-recyclable solutions to a licensed disposal company.

**Contaminated packaging**
Dispose of as unused product.
SECTION 14: TRANSPORT INFORMATION

14.1 UN number

ADR/RID  IMDG  IATA
UN3077  UN3077  UN3077

14.2 UN proper shipping name

ADR/RID  IMDG  IATA
ENVIRONMENTALLY HAZARDOUS SUBSTANCE, SOLID, N.O.S. :
-  Silver Adhesive

14.3 Transport hazard class(es)

ADR/RID  IMDG  IATA
9, EHSM

14.4 Packaging group

ADR/RID  IMDG  IATA
III

14.5 Environmental hazards

ADR/RID  IMDG  IATA
Marine pollutant  yes  yes

14.6 Special precautions for user
Read safety instructions, SDS and emergency procedures before handling

SECTION 15: REGULATORY INFORMATION

This safety datasheet complies with the requirements of Regulation (EC) No. 1907/2006.

15.1 Safety, health and environmental regulations/legislation specific for the substance or mixture
no data available

15.2 Chemical Safety Assessment
no data available

SECTION 16: OTHER INFORMATION

General Information
The above information is believed to be correct but does not purport to be all inclusive and shall be used only as a guide. The information in this document is based on the present state of our knowledge and is applicable to the product with regard to appropriate safety precautions. It does not represent any guarantee of the properties of the product. Employers should use this information only as a supplement to other information gathered by them, and should make independent judgement of suitability of this information to ensure proper use and protect the health and safety of employees.
This information is finished without warranty and any use of the product not in conformance with this Material Safety Data Sheet, or in combination with any other product or process, is the responsibility of the user.
This is an experimental product. This safety data sheet is for product trials only!

Hazard statements in full
H302 – Harmful if swallowed
H317 – Causes skin irritation
H319 – Causes serious eye irritation
H332 – Harmful if inhaled
H410 – Very Toxic to aquatic life with long lasting effects