

## MATERIAL SAFETY DATA SHEET GRAPHENE PRINTING INK

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

#### 1.1 Product Identifiers

Product name : GRAPHENE PRINTING INK  
Brand : DML DM-GRA  
Product codes : DM-GRA-9002

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

Identified uses : Laboratory chemicals, Manufacture of substances

#### 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

### SECTION 2: Hazards Identification

#### 2.1 Classification of the substance or mixture

##### Classification (EC 1272/2008)

Skin irritation (Category 2), H315  
Eye irritation (Category 2), H319  
Specific target organ toxicity - single exposure (Category 3), Respiratory system, H335  
Acute toxicity, Oral (Category 4), H302  
Acute toxicity, Dermal (Category 4), H312  
Acute toxicity, Inhalation (Category 4), H332  
Serious eye damage (Category 1), H318

#### 2.2 Label elements

##### Pictogram



Signal word: Danger

##### Hazard statements:

H315 Causes skin irritation.  
H319 Causes serious eye irritation.  
H335 May cause respiratory irritation.  
H302 + H312 + H332 Harmful if swallowed, in contact with skin or if inhaled  
H318 Causes serious eye damage.

##### Precautionary statements:

P261 Avoid breathing dust/ fume/ gas/ mist/ vapours/ spray.  
P280 Wear protective gloves/ eye protection/ face protection.  
P305 + P351 + P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.

#### 2.3 Other hazards

This substance/mixture contains no components considered to be either persistent, bioaccumulative and toxic (PBT), or very persistent and very bioaccumulative (vPvB) at levels of 0.1% or higher.

### SECTION 3: COMPOSITION/INFORMATION ON INGREDIENTS

**3.2 Mixtures****Hazardous ingredients according to Regulation (EC) No 1272/2008**

| Component / CAS #         | EC #      | %     | Classification   |
|---------------------------|-----------|-------|--|
| Terpineol<br>98-55-5      | 233-986-8 | 50-90 | Skin Irrit. 2; Eye Irrit. 2; STOT<br>SE 3; H315, H319, H335  |
| Cyclohexanone<br>108-94-1 | 203-631-1 | 1-30  | Flam. Liq. 3; Acute Tox. 4;<br>Skin Irrit. 2; Eye Dam. 1;<br>H226, H302, H332, H312,<br>H315, H318 |

See Section 16 for full text of H phrases.

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**SECTION 4: FIRST AID MEASURES**

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**4.1 Description of first aid measures****Inhalation**

Remove to fresh air. If breathing is difficult, give oxygen. Apply artificial respiration if patient is not breathing. Obtain medical attention immediately.

**Ingestion**

If swallowed, call a physician immediately. Only induce vomiting at the instruction of a physician. Never give anything by mouth to an unconscious person. Seek immediate medical advice.

**Skin contact**

Remove contaminated clothing and shoes without delay. Wear impermeable gloves. Wash immediately with plenty of water. Pay particular attention to skin crevices, nail folds, etc. Do not reuse contaminated clothing without laundering. Do not reuse contaminated leatherware. Seek immediate medical advice.

**Eye contact**

Rinse thoroughly with plenty of water for at least 15 minutes. Obtain medical attention immediately.

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

Causes serious eye damage.

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

Not applicable

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**SECTION 5: FIRE-FIGHTING MEASURES**

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**5.1 Extinguishing media****Suitable extinguishing media**

Use water spray, alcohol foam, carbon dioxide or dry chemical to extinguish fires. Water stream may be ineffective.

**5.2 Special hazards arising from the substance or mixture**

Keep containers cool by spraying with water if exposed to fire.

**5.3 Advice for firefighters****Protective Equipment:**

Firefighters, and others exposed, wear self-contained breathing apparatus. Wear full firefighting protective clothing. See MSDS Section 8 (Exposure Controls/Personal Protection).

**5.4 Further information**

No data available

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**SECTION 6: ACCIDENTAL RELEASE MEASURES**

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**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. 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. Discharge into the environment must be avoided.

**6.3 Methods and materials for containment and cleaning up**

Wipe up with inert absorbent material (e.g. cloth, fleece) and arrange disposal without creating dust. Sweep up and shovel. Keep in suitable, closed containers for disposal.

**6.4 Reference to other sections**

For disposal see section 13.

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**SECTION 7: HANDLING AND STORAGE**

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**7.1 Precautions for safe handling**

Avoid contact with skin and eyes. Avoid inhalation of vapour or mist. Keep away from sources of ignition - No smoking. Take measures to prevent the build up of electrostatic charge.

For precautions see section 2.2.

### 7.2 Conditions for safe storage, including any incompatibilities

Areas containing this material should have fire safe practices and electrical equipment in accordance with applicable regulations and/or guidelines. Standards are primarily based on the material's flashpoint, but may also take into account properties such as miscibility with water or toxicity. All local and national regulations should be followed. Store in a cool, dry, well ventilated place and keep container tightly closed. Avoid flammable gas mixtures. Take precautionary measures against electrostatic loading - earthing necessary during loading operations.

### 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

| Component     | CAS-No.  | Value Form of exposure  | Control parameter                | Basis  |
|---------------|----------|---|----------------------------------|--|
| Cyclohexanone | 108-94-1 | STEL  | 20 ppm                           | UK. EH40 WEL – Workplace Exposure Limits   |
|               | Remarks  | Can be absorbed through skin. The assigned substances are those for which there are concerns that dermal absorption will lead to systemic toxicity. |                                  |  |
|               |          | TWA   | 10 ppm                           | UK. EH40 WEL – Workplace Exposure Limits   |
|               |          | Can be absorbed through skin. The assigned substances are those for which there are concerns that dermal absorption will lead to systemic toxicity. |                                  |  |
|               |          | TWA   | 10 ppm<br>40.8 mg/m <sup>3</sup> | Europe. Commission Directive 2000/39/EC establishing a first list of indicative occupational exposure limit values |
|               |          | Identifies the possibility of significant uptake through the skin Indicative  |                                  |  |
|               |          | STEL  | 20 ppm<br>81.6 mg/m <sup>3</sup> | Europe. Commission Directive 2000/39/EC establishing a first list of indicative occupational exposure limit values |
|               |          | Identifies the possibility of significant uptake through the skin Indicative  |                                  |  |

### 8.2 Exposure Controls

#### Protective equipment



#### Appropriate engineering controls

Avoid contact with skin, eyes and clothing. Wash hands before breaks and immediately after handling the product.

#### 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.

#### Skin protection

Prevent contamination of skin or clothing when removing protective equipment. Barrier creams may be used in conjunction with the gloves to provide additional skin protection. Wear impermeable gloves and suitable protective clothing.

#### Hand protection

Use neoprene, nitrile, or rubber gloves to prevent skin contact. 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.

#### 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

Where risk assessment shows air-purifying respirators are appropriate use a full-face particlerespirator type N100 (US) or type P3 (EN 143) respirator cartridges as a backup to engineering controls. If the respirator is the sole means of protection, use a full-face supplied air respirator. Use respirators and components tested and approved under appropriate government standards such as NIOSH (US) or GEN (EU).

#### Control of environmental exposure

Prevent further leakage or spillage if safe to do so. Do not let product enter drains. Discharge into the environment must be avoided.

## SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES

### 9.1 Information on basic physical and chemical properties

|            |                   |
|------------|-------------------|
| Appearance | Ink               |
| Colour     | Black             |
| Odour      | No data available |

|  |                   |
|--|-------------------|
| Odour Threshold                              | No data available |
| pH   | No data available |
| Melting / freezing point                     | No data available |
| Initial boiling point and boiling range      | No data available |
| Flash point                                  | No data available |
| Evaporation rate                             | No data available |
| Flammability (solid, gas)                    | No data available |
| Upper/lower flammability or explosive limits | No data available |
| Vapour pressure                              | No data available |
| Vapour density                               | No data available |
| Relative density                             | No data available |
| Water solubility                             | No data available |
| Partition coefficient                        | No data available |
| Auto-ignition temperature                    | No data available |
| Decomposition temperature                    | No data available |
| Viscosity                                    | No data available |
| Explosive properties                         | No data available |
| Oxidizing properties                         | No data available |

**9.1 Other information**

No data available

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

No data available

**10.2 Chemical stability**

Stable under recommended storage conditions.

**10.3 Possibility of hazardous reactions**

No data available

**10.4 Conditions to avoid**

Heat, flames and sparks.

**10.5 Incompatible materials**

Strong oxidizing agents, plastics.

**10.6 Hazardous decomposition products**

Carbon monoxide, carbon dioxide.

In the event of fire - see section 5

**SECTION 11: TOXICOLOGICAL INFORMATION****Acute toxicity:**

| Component / CAS #         | LD/LC50                      |  |
|---------------------------|------------------------------|--|
| Terpineol<br>98-55-5      | No data available            |  |
| Cyclohexanone<br>108-94-1 | Oral<br>Inhalation<br>Dermal | 1534 mg/kg (rat)<br>>6.2 mg/L (rat)<br>794 - 3160 mL/kg (rabbit) |

**Skin corrosion/irritation:**

May cause irritation.

**Serious eye damage/eye irritation:**

Causes serious eye damage.

**Respiratory or skin sensitization:**

No data available

**Germ cell mutagenicity:**

No data available

**Carcinogenicity**

This product is or contains a component that is not classifiable as to its carcinogenicity based on its IARC, ACGIH, NTP, or EPA classification.

**Reproductive toxicity:**

No data available

**Specific target organ toxicity – single exposure:**

No data available

**Specific target organ toxicity – repeated exposure:**

No data available

**Aspiration hazard:**

No data available

**Additional Information:** RTECS - No data available.**SECTION 12: ECOLOGICAL INFORMATION****TOXICITY, PERSISTENCE AND DEGRADABILITY, BIOACCUMULATIVE POTENTIAL, MOBILITY IN SOIL, OTHER ADVERSE EFFECTS**

**HAZARDOUS INGREDIENT TOXICITY DATA**

| Component / CAS #         | Toxicity to Algae | Toxicity to Fish  | Toxicity to Water Flea                              |
|---------------------------|-------------------|-------------------|---|
| Cyclohexanone<br>108-94-1 | No data available | No data available | EC50 - Daphnia magna (Water flea) - 820 mg/l - 24 h |

**Toxicity**

No data available

**Persistence and degradability**

No data available

**Bioaccumulative potential**

No data available

**Mobility in soil**

No data available

**Results of PBT and vPvB assessment**

No data available

**Other adverse effects**

No data available.

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

The company encourages the recycle and reuse of products and packaging, where possible and permitted.

**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.

**Disposal methods**

When recycle or reuse is not possible, the company recommends that our products, especially when classified as hazardous, be disposed of by thermal treatment or incineration at approved facilities. All local and national regulations should be followed. For disposal within the European Community, waste codes according to Directive 2008/98/EC should be assigned by the user based on the application for which the product was used.

**Disposal-relevant information**

Do not release directly or indirectly to surface water, ground water, soil or public sewage system.

**Contaminated packaging**

Dispose of as unused product.

**SECTION 14: TRANSPORT INFORMATION****14.1 UN number**

|         |      |      |
|---------|------|------|
| ADR/RID | IMDG | IATA |
| -       | -    | -    |

**14.2 UN proper shipping name**

|         |      |      |
|---------|------|------|
| ADR/RID | IMDG | IATA |
| -       | -    | -    |

**14.3 Transport hazard class(es)**

|         |      |      |
|---------|------|------|
| ADR/RID | IMDG | IATA |
| -       | -    | -    |

**14.4 Packaging group**

|         |      |      |
|---------|------|------|
| ADR/RID | IMDG | IATA |
| -       | -    | -    |

**14.5 Environmental hazards**

|         |                       |      |
|---------|-----------------------|------|
| ADR/RID | IMDG Marine pollutant | IATA |
| no      | no                    | no   |

**14.6 Special precautions for user**

No data available

**SECTION 15: REGULATORY INFORMATION**

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

This safety datasheet complies with the requirements of Regulation (EC) No. 453/2010.

**15.1 Safety, health and environmental regulations/legislation specific for the substance or mixture**

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

**15.2 Chemical Safety Assessment**

For this product a chemical safety assessment was not carried out.

**SECTION 16: OTHER INFORMATION**

**Revision Date:** 24-Apr-2017

**General Information**

The information contained herein is, to the best of our knowledge and belief, accurate. 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 furnished 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. Since the conditions of handling and use are beyond our control, we make no guarantee of results, and assume no liability for damages incurred by use of this material. It is the responsibility of the user to comply with all applicable local laws and regulations.

**Hazard statements in full**

|                    |  |
|--------------------|--|
| H315               | Causes skin irritation.                                  |
| H319               | Causes serious eye irritation                            |
| H335               | May cause respiratory irritation.                        |
| H302 + H312 + H332 | Harmful if swallowed, in contact with skin or if inhaled |
| H318               | Causes serious eye damage.                               |