

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

Identification of the substance/preparation C34™and C38™ Cement and GR37™ Grout Liquid Component

Use of the substance/preparation Bonding of Carbon and Graphite.

Version No. 01

CAS No. Mixture

SDS Number 4025

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2. HAZARDS IDENTIFICATION

Classification Carc. Cat. 3;R40, T;R23, Xn;R21/22-48/20, Xi;R36/37

Physical hazards Not classified as a physical hazard.

Health hazards Harmful in contact with skin and if swallowed. Toxic by inhalation. Irritating to eyes and respiratory system. Limited evidence of a carcinogenic effect. Harmful: danger of serious damage to health by prolonged exposure through inhalation.

Environmental hazards Not classified as an environmental hazard.

Specific hazards Toxic by inhalation. Harmful in contact with skin and if swallowed. Harmful: danger of serious damage to health by prolonged exposure through inhalation. Irritating to eyes and respiratory system. Limited evidence of a carcinogenic effect. Do not breathe dust/fume/gas/mist/vapors/spray. Danger of serious damage to health by prolonged exposure.

Main symptoms Irritating to eyes and respiratory system.

3. COMPOSITION/INFORMATION ON INGREDIENTS

| Components | CAS No. | Percent | EC-No. | Classification |
|------------------|---------|---------|-----------|---|
| Furfuryl alcohol | 98-00-0 | < 90 | 202-626-1 | Carc. Cat. 3;R40, T;R23, Xn;R21/22-48/20, Xi;R36/37 |

4. FIRST-AID MEASURES

Inhalation In case of accident by inhalation: remove casualty to fresh air and keep at rest. Oxygen or artificial respiration if needed. Do not use mouth-to-mouth method if victim inhaled the substance. Induce artificial respiration with the aid of a pocket mask equipped with a one-way valve or other proper respiratory medical device. Call a physician or poison control centre immediately.

Skin contact Remove and isolate contaminated clothing and shoes. Immediately flush skin with plenty of water. Get medical attention immediately. For minor skin contact, avoid spreading material on unaffected skin. Wash clothing separately before reuse.

Eye contact Immediately flush eyes with plenty of water for at least 15 minutes. Get medical attention immediately.

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| Ingestion | If swallowed, seek medical advice immediately and show this container or label. Do not induce vomiting without advice from poison control center. If vomiting occurs, keep head low so that stomach content doesn't get into the lungs. Do not use mouth-to-mouth method if victim ingested the substance. Induce artificial respiration with the aid of a pocket mask equipped with a one-way valve or other proper respiratory medical device. |
| General advice | Take off contaminated clothing and shoes immediately. In case of shortness of breath, give oxygen. In the case of accident or if you feel unwell, seek medical advice immediately (show the label where possible). Ensure that medical personnel are aware of the material(s) involved, and take precautions to protect themselves. Keep victim under observation. Keep victim warm. |
| Notes to physician | Oxygen, if needed. Keep victim warm. Keep victim under observation. Symptoms may be delayed. |

5. FIRE-FIGHTING MEASURES

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| Suitable extinguishing media | Water fog. Carbon dioxide (CO ₂). Foam. Dry chemical powder. |
| Extinguishing media which must not be used for safety reasons | Do not use water jet as an extinguisher, as this will spread the fire. |
| Unusual fire & explosion hazards | None known. |
| Specific hazards | During fire, gases hazardous to health may be formed. |
| Special protective equipment for fire-fighters | Self-contained breathing apparatus and full protective clothing must be worn in case of fire. |
| Fire fighting equipment/instructions | Move containers from fire area if you can do so without risk. |
| General fire hazards | No unusual fire or explosion hazards noted. |

6. ACCIDENTAL RELEASE MEASURES

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| Containment procedures | Stop the flow of material, if this is without risk. Dike the spilled material, where this is possible. Prevent entry into waterways, sewer, basements or confined areas. |
| Personal precautions | Keep unnecessary personnel away. Keep upwind. Keep out of low areas. Wear appropriate protective equipment and clothing during clean-up. Fully encapsulating, vapour protective clothing should be worn for spills and leaks with no fire. Do not touch damaged containers or spilled material unless wearing appropriate protective clothing. Ventilate closed spaces before entering them. For personal protection, see section 8. |
| Environmental precautions | Contact local authorities in case of spillage to drain/aquatic environment. Prevent further leakage or spillage if safe to do so. Avoid discharge into drains, water courses or onto the ground. |
| Methods for cleaning up | <p>Large Spills: Stop the flow of material, if this is without risk. Dike the spilled material, where this is possible. Cover with plastic sheet to prevent spreading. Use a non-combustible material like vermiculite, sand or earth to soak up the product and place into a container for later disposal. Following product recovery, flush area with water.</p> <p>Small Spills: Wipe up with absorbent material (e.g. cloth, fleece). Clean surface thoroughly to remove residual contamination.</p> <p>Never return spills to original containers for re-use. This material and its container must be disposed of as hazardous waste. For waste disposal, see section 13 of the SDS.</p> |

7. HANDLING AND STORAGE

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| Handling | Do not breathe dust/fume/gas/mist/vapors/spray. Avoid prolonged exposure. When using do not eat or drink. |
| Storage | Store in original tightly closed container. Keep away from food, drink and animal feeding stuffs. Store away from incompatible materials (see section 10 of the SDS). |

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

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| Occupational exposure limits | No exposure limits noted for ingredient(s). |
| Recommended monitoring procedures | |
| Additional exposure data | Not available. |
| Engineering measures | Good general ventilation (typically 10 air changes per hour) should be used. Ventilation rates should be matched to conditions. If applicable, use process enclosures, local exhaust ventilation, or other engineering controls to maintain airborne levels below recommended exposure limits. If exposure limits have not been established, maintain airborne levels to an acceptable level. General ventilation normally adequate. |
| Personal protective equipment | |
| Respiratory protection | Use a positive-pressure air-supplied respirator if there is any potential for an uncontrolled release, exposure levels are not known, or any other circumstances where air-purifying respirators may not provide adequate protection. |
| Hand protection | Wear suitable gloves. |

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| Eye protection | If contact is likely, safety glasses with side shields are recommended. |
| Skin and body protection | Wear suitable protective clothing. |
| Environmental exposure controls | Environmental manager must be informed of all major releases. |
| Hygiene measures | When using, do not eat, drink or smoke. |
| Control parameters | Follow standard monitoring procedures. |

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance

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| Physical state | Liquid. |
| Form | Liquid. |
| Colour | Brown. |
| Odour | Pungent. |
| Odour threshold | Not applicable. |
| pH | Not available. |
| Melting point/freezing point | Not applicable. |
| Boiling point, initial boiling point, and boiling range | 170 °C (338 °F) @ 750 mm Hg |
| Flash point | 73,0 °C (163,4 °F) Open cup |
| Auto-ignition temperature | No data available. |
| Flammability limit - lower (%) | 1,8 (Furfuryl Alcohol) |
| Flammability limit - upper (%) | 16,3 (Furfuryl Alcohol) |
| Vapour pressure | No data available. |
| Vapour density | 3,4 |
| Evaporation rate | No data available. |
| Solubility(ies) | |
| Solubility (water) | Soluble. |
| Partition coefficient (n-octanol/water) | Not available. |
| Decomposition temperature | Not available. |
| Other data | |
| Relative density | 1,1 |

10. STABILITY AND REACTIVITY

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| Conditions to avoid | Avoid temperatures exceeding the flash point. Contact with incompatible materials. |
| Hazardous decomposition products | No hazardous decomposition products are known. |
| Stability | Material is stable under normal conditions. |
| Materials to avoid | Strong oxidising agents. |

11. TOXICOLOGICAL INFORMATION

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| Acute toxicity | Toxic by inhalation. |
| Routes of exposure | Inhalation. Ingestion. Skin contact. |
| Chronic toxicity | Prolonged inhalation may be harmful. Danger of serious damage to health by prolonged exposure. |
| Carcinogenicity | Not classifiable as to carcinogenicity to humans. |
| Mutagenicity | No data available to indicate product or any components present at greater than 0.1% are mutagenic or genotoxic. |
| Reproductivity | Not classified. |
| Epidemiology | No epidemiological data is available for this product. |
| Local effects | Toxic by inhalation. Irritating to respiratory system. Irritating to eyes. |
| Symptoms and target organs | Irritating to eyes and respiratory system. |

12. ECOLOGICAL INFORMATION

Ecotoxicological data

| Components | Species | Test results |
|--|---------|--|
| Furfuryl alcohol (CAS 98-00-0) | | |
| Aquatic | | |
| Fish | LC50 | Fathead minnow (<i>Pimephales promelas</i>) 32 mg/l, 96 h |
| Ecotoxicity | | The product is not classified as environmentally hazardous. However, this does not exclude the possibility that large or frequent spills can have a harmful or damaging effect on the environment. |
| Environmental effects | | An environmental hazard cannot be excluded in the event of unprofessional handling or disposal. |
| Bioaccumulation | | |
| Bioaccumulative potential | | |
| Octanol/water partition coefficient log Kow | | |
| Furfuryl alcohol (CAS 98-00-0) | | 0,28 |
| Aquatic toxicity | | Not available. |
| Mobility | | The product is soluble in water. |

13. DISPOSAL CONSIDERATIONS

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| Disposal instructions | Collect and reclaim or dispose in sealed containers at licensed waste disposal site. This material and its container must be disposed of as hazardous waste. Must be incinerated in a suitable incineration plant holding a permit delivered by the competent authorities. Do not discharge into drains, water courses or onto the ground. Dispose in accordance with all applicable regulations. |
| Waste from residues / unused products | Dispose of in accordance with local regulations. Empty containers or liners may retain some product residues. This material and its container must be disposed of in a safe manner (see: Disposal instructions). Avoid discharge into water courses or onto the ground. |
| Contaminated packaging | Since emptied containers may retain product residue, follow label warnings even after container is emptied. Empty containers should be taken to an approved waste handling site for recycling or disposal. |

14. TRANSPORT INFORMATION

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| IATA | |
| UN number | 2874 |
| UN proper shipping name | Furfuryl alcohol |
| Transport hazard class(es) | |
| Class | 6.1(PGIII) |
| Subsidiary risk | - |
| Packing group | III |
| Environmental hazards | No. |
| ERG Code | 6L |
| Special precautions for user | Read safety instructions, SDS and emergency procedures before handling. |
| IMDG | |
| UN number | 2874 |
| UN proper shipping name | FURFURYL ALCOHOL |
| Transport hazard class(es) | |
| Class | 6.1(PGIII) |
| Subsidiary risk | - |
| Packing group | III |
| Environmental hazards | |
| Marine pollutant | No. |
| EmS | F-A, S-A |
| Special precautions for user | Read safety instructions, SDS and emergency procedures before handling. |
| Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code | Not available. |
| General information | The transportation information provided represents the regulatory transport classification of the product without consideration to packaging, quantity, or modal restrictions and exceptions. It is the user's responsibility to determine the appropriate packaging and modal requirements and/or limitations for the product quantity being shipped. |

15. REGULATORY INFORMATION

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|------------------|------------------|
| Labelling | |
| Contains | Furfuryl alcohol |

Symbol(s)

Toxic

R-phrases(s)

R21/22 Harmful in contact with skin and if swallowed.
 R23 Toxic by inhalation.
 R36/37 Irritating to eyes and respiratory system.
 R40 Limited evidence of a carcinogenic effect.
 R48/20 Harmful: danger of serious damage to health by prolonged exposure through inhalation.

S-phrases(s)

S13 Keep away from food, drink and animal feeding stuffs.
 S20 When using do not eat or drink.
 S23 Do not breathe fumes, vapour.
 S36/37 Wear suitable protective clothing and gloves.
 S45 In case of accident or if you feel unwell, seek medical advice immediately (show label where possible).
 S60 This material and its container must be disposed of as hazardous waste.
 S63 In case of accident by inhalation: remove casualty to fresh air and keep at rest.

Regulatory information

Pregnant women should not work with the product, if there is the least risk of exposure. This Safety Data Sheet complies with the requirements of Regulation (EC) No 1907/2006, as amended. Young people under 18 years old are not allowed to work with this product according to EU Directive 94/33/EC on the protection of young people at work, as amended.

16. OTHER INFORMATION**Wording of the R-phrases in sections 2 and 3**

R21/22 Harmful in contact with skin and if swallowed.
 R23 Toxic by inhalation.
 R36/37 Irritating to eyes and respiratory system.
 R40 Limited evidence of a carcinogenic effect.
 R48/20 Harmful: danger of serious damage to health by prolonged exposure through inhalation.

International Inventories

| Country(s) or region | Inventory name | On inventory (yes/no)* |
|----------------------|--|------------------------|
| Europe | European Inventory of Existing Commercial Chemical Substances (EINECS) | Yes |
| Europe | European List of Notified Chemical Substances (ELINCS) | No |

*A "Yes" indicates this product complies with the inventory requirements administered by the governing country(s).

A "No" indicates that one or more components of the product are not listed or exempt from listing on the inventory administered by the governing country(s).

Disclaimer

GRAFTECH INTERNATIONAL HOLDINGS INC. ADVISES THE USERS OF THIS PRODUCT TO STUDY THIS SAFETY DATA SHEET (SDS) AND BECOME AWARE OF PRODUCT HAZARDS AND SAFETY INFORMATION. TO PROMOTE SAFE USE OF THIS PRODUCT, USERS SHOULD NOTIFY THEIR EMPLOYEES, AGENTS AND CONTRACTORS OF THE INFORMATION ON THIS SDS AND ANY PRODUCT HAZARDS AND SAFETY INFORMATION.

This information is provided without warranty. The information is believed to be correct. This information should be used to make an independent determination of the methods to safeguard workers and the environment.

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Revision date

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