

# Kilfrost DF Plus (88)<sup>®</sup>

## MATERIAL SAFETY DATA SHEET



<p><b>1. PRODUCT NAME &amp; DESCRIPTION</b></p> <p><b>Kilfrost DF Plus (88)<sup>®</sup></b>          Aircraft Deicing fluid, Type I          Complies with Specification ISO 11075 and AMS 1424</p> <p><b>MANUFACTURED AND SUPPLIED IN THE USA BY</b>          Cryotech Deicing Technology          6103 Orthoway          Fort Madison, IA 52627          United States</p> <p><b>Cryotech Contact Information</b>          Telephone: (800)346-7237          FAX: (319)372-2662          email: <a href="mailto:deicers@cryotech.com">deicers@cryotech.com</a>          website: <a href="http://www.cryotech.com">http://www.cryotech.com</a></p> <p><b>MANUFACTURED AND SUPPLIED IN EUROPE BY</b>          Kilfrost Limited          Albion Works, HALTWHISTLE          Northumberland, NE49 0HJ          ENGLAND</p> <p><b>Kilfrost Contact Numbers (direct dial from USA)</b>          Working hours: (011)(44)1434 321 500          Other Times: (011)(44)1228 573 614          FAX: (011)(44)1434 321 463          email: <a href="mailto:kilfrost.haltwhistle@virgin.net">kilfrost.haltwhistle@virgin.net</a></p>	<p><b>5. FIRE FIGHTING MEASURES</b></p> <p><b>FLASH POINT (close cup):</b> None below boiling point.  <b>AUTO IGNITION:</b> 446°C  <b>EXPOSURE LIMITS:</b> No data.  <b>EXTINGUISHING MEDIA:</b> Water, foam, Carbon Dioxide, dry powder.  <b>FIRE FIGHTING PROCEDURES:</b> None  <b>HAZARDOUS DECOMPOSITION PRODUCTS:</b> Incomplete combustion may produce Carbon Monoxide and other harmful gases/vapors.  <b>UNUSUAL FIRE HAZARDS:</b> The product may become combustible after prolonged heating at the boiling point.  <b>NFPA RATINGS:</b>  <b>Health 0; Flammability 1; Reactivity 0; Special NDA:</b>          (Least - 0, Slight - 1, Moderate - 2, High - 3, Extreme - 4)          These values are obtained using the guidelines or published evaluations prepared by the National Fire Protection Association (NFPA) or the National Paint Coating Association.</p>															
<p><b>2. CHEMICAL COMPOSITION</b></p> <p>Aqueous monopropylene glycol mixture.          Contains a minimum of 88% monopropylene glycol (CAS 57-55-6)</p>	<p><b>6. ACCIDENTAL RELEASE MEASURES</b></p> <p>Chemical Emergency: Spill, leak, fire, or accident call          Chemtrec day or night (800)424-9300;          Outside continental USA call (703)527-3887</p> <p><b>SPILL/LEAK PRECAUTIONS:</b>          Contain spillage and absorb on suitable material e.g. sawdust, sand or earth. Transfer to a container for disposal. See section 13.          Wash the spillage area with plenty of water.</p>															
<p><b>3. HAZARD IDENTIFICATION</b></p> <p><b>RESPIRATORY/INHALATION:</b> Considered to be non-hazardous.  <b>SKIN IRRITATION:</b> Unlikely to cause irritation.  <b>EYE CONTACT:</b> May cause temporary irritation.  <b>INGESTION:</b> Considered to be non-hazardous.  <b>OCCUPATIONAL EXPOSURE LIMITS:</b>          An exposure limit has been set for Monopropylene Glycol (synonym Propane-1,2-diol). This applies to the UK only.          UK (EH 40) OES</p> <table style="width: 100%; border: none;"> <tr> <td style="width: 30%;">Total (vapor &amp; Particulates)</td> <td style="width: 30%;">150 ppm ( 10 mg/m<sup>3</sup>)(8hr TWA)</td> <td style="width: 40%;"></td> </tr> <tr> <td>Particulates</td> <td>- ppm ( 10 mg/m<sup>3</sup>)(8hr TWA)</td> <td></td> </tr> <tr> <td>ACGIH</td> <td>TLV - TWA</td> <td>No limit assigned.</td> </tr> <tr> <td>FRANCE</td> <td>VME</td> <td>No limit assigned.</td> </tr> <tr> <td>GERMANY</td> <td>MAK</td> <td>No limit assigned.</td> </tr> </table>	Total (vapor & Particulates)	150 ppm ( 10 mg/m <sup>3</sup> )(8hr TWA)		Particulates	- ppm ( 10 mg/m <sup>3</sup> )(8hr TWA)		ACGIH	TLV - TWA	No limit assigned.	FRANCE	VME	No limit assigned.	GERMANY	MAK	No limit assigned.	<p><b>7. HANDLING AND STORAGE</b></p> <p><b>STORAGE:</b> Store in tightly sealed original containers, away from direct heat and strong oxidizing agents.  <b>SPECIAL PRECAUTIONS:</b> Avoid contact with skin and eyes. Avoid breathing mists/vapors when spraying.</p>
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<p><b>4. FIRST AID MEASURES</b></p> <p>Chemical Emergency: Spill, leak, fire, or accident call          Chemtrec day or night (800)424-9300;          Outside continental USA call (703)527-3887</p> <p><b>EYE CONTACT:</b> Irrigate with water for 5 minutes. Obtain medical assistance if irritation persists.  <b>SKIN CONTACT:</b> Wash off in flowing water. Launder contaminated clothing before re-use.  <b>INHALATION:</b> Remove to fresh air if feeling unwell. Consult medical personnel if symptoms persist.  <b>INGESTION:</b> Give large quantities of water to drink. Consult medical personnel.</p>	<p><b>8. EXPOSURE CONTROLS/PERSONAL PROTECTION</b></p> <p><b>EYE PROTECTION:</b> Wear eye protection if splashing is possible. An eye wash bottle should be available.  <b>SKIN PROTECTION:</b> Gloves and protective overalls recommended if prolonged contact is likely.  <b>VENTILATION:</b> Maintain sufficient ventilation to comply with 'Occupational Exposure Standard'.</p>															
<p><b>9. PHYSICAL AND CHEMICAL PROPERTIES</b></p> <p><b>APPEARANCE:</b> Clear, orange fluid.  <b>ODOR:</b> None  <b>pH (20°C):</b> 8.0-9.0  <b>BOILING POINT:</b> ~117°C  <b>FLAMMABILITY DATA:</b> See Section 5  <b>VAPOR PRESSURE (20°C):</b> 10 mm Hg  <b>SPECIFIC GRAVITY (20°C):</b> 1.043  <b>VAPOR DENSITY (AIR = 1):</b> 1.6 (estimated)  <b>FREEZING POINT:</b></p> <table style="width: 100%; border: none;"> <tr> <td style="width: 50%;">100%</td> <td style="width: 50%;">below -60°C</td> </tr> <tr> <td>50% v/v</td> <td>-25.3°C</td> </tr> </table> <p><b>VISCOSITY:</b></p> <table style="width: 100%; border: none;"> <tr> <td style="width: 50%;">20°C</td> <td style="width: 50%;">38 mPas</td> </tr> <tr> <td>0°C</td> <td>79 mPas</td> </tr> <tr> <td>-20°C</td> <td>290 mPas</td> </tr> </table> <p><b>SPECIFIC HEAT:</b></p> <table style="width: 100%; border: none;"> <tr> <td style="width: 50%;">20°C</td> <td style="width: 50%;">2.9 J/g/°C</td> </tr> <tr> <td>70°C</td> <td>3.2 J/g/°C</td> </tr> </table> <p><b>SOLUBILITY IN WATER:</b> Completely miscible.</p>	100%	below -60°C	50% v/v	-25.3°C	20°C	38 mPas	0°C	79 mPas	-20°C	290 mPas	20°C	2.9 J/g/°C	70°C	3.2 J/g/°C		
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<p><b>10. STABILITY &amp; REACTIVITY</b> Stable under normal storage conditions. Incompatible materials - strong oxidizing agents.</p>	<p><b>15. REGULATORY INFORMATION</b> <b>DOT SHIPPING NAME:</b> Not designated as a hazardous material by the Federal DOT. <b>DOT HAZARD CLASS:</b> Not Applicable <b>DOT IDENTIFICATION NUMBER:</b> Not Applicable <b>SARA 311 CATEGORIES:</b> 1. Immediate (Acute) Health Effects: Yes 2. Delayed (Chronic) Health Effects: No 3. Fire Hazard: No 4. Sudden Release of Pressure Hazard: No 5. Reactivity Hazard: No <b>REGULATORY LISTS SEARCHED:</b> 01 = SARA 313 02 = MASS RTK 03 = NTP Carcinogen 04 = CA Prop. 65 05 = MI 406 06 = IARC Group 1 07 = IARC Group 2A 08 = IARC Group 2B 09 = SARA 302/304 10 = PA RTK 11 = NJ RTK 12 = CERCLA 302.4 13 = MN RTK 14 = ACGIH TLV 15 = ACGIH STEL 16 = ACGIH Calculated TLV 17 = OSHATWA 18 = OSHA STEL 20 = EPA Carcinogen 21 = TSCA Sect 4(e) 22 = TSCA Sect 5(a)(e)(f) 23 = TSCA Sect 6 24 = TSCA Sect 12(b) 25 = TSCA Sect 8(a) 26 = TSCA Sect 8(d) 28 = Canadian WHMIS 29 = OSHA CEILING The ingredient mono-propylene glycol appears on the above regulatory lists 10, 13 and 28. None of the other components of this material are found on the regulatory lists indicated.</p>
<p><b>11. TOXICOLOGICAL INFORMATION</b> Considered to have low oral toxicity. See also section 3 LD<sub>50</sub> rat - oral &gt;10g/Kg (est.) LC<sub>50</sub> Pimephales Promelas 5,475 mg/L (96h)(est) LC<sub>50</sub> Daphnia Magnia &gt;10,000 mg/L (48h)(est)</p>	
<p><b>12. ECOLOGICAL INFORMATION</b> COD: 0.11 kg O<sub>2</sub>/kg fluid BOD<sub>5</sub>: 0.08 kg O<sub>2</sub>/kg fluid 5 day BOD/COD: 0.73</p>	
<p><b>13. DISPOSAL CONSIDERATION</b> Controlled incineration or landfill in accordance with local, state or national regulations.</p>	
<p><b>14. TRANSPORT INFORMATION</b> Not restricted under any transport regulations.</p>	
	<p><b>16. OTHER INFORMATION</b> All components are registered in accordance with EINECS AND TSCA. This Material Safety Data Sheet contains environmental, health and toxicology information for your employees. Please make sure this information is given to them. It also contains information to help you meet community right-to-know/emergency response reporting requirements under SARA Title III and many other laws. If you resell this product, this MSDS must be given to the buyer or the information incorporated in your MSDS. Discard any previous edition of this MSDS. <b>Latest version of this MSDS can be found at <a href="http://www.cryotech.com">http://www.cryotech.com</a></b></p>

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