

MATERIAL SAFETY DATA SHEET

This document supersedes the MSDS revision 02 dated 17<sup>th</sup> June, 2021

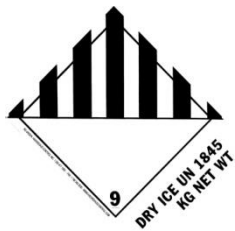
Requirements	Description
1. IDENTIFICATION AND COMPANY NAME	<p>Product details: <u>CARBON DIOXIDE, SOLID (CO<sub>2</sub>) DRY ICE</u></p> <p>Supplier Name: National Industrial Gas Plants Address: Salwa Industrial Area Street 45, Gate 75 - Doha Qatar P.O. Box: 1391 Telephone: : <u>Head Office</u> + 974 4468-9083, <u>Sales</u>: 4442-8844, <u>Plant</u>: 4450-00-08 Fax : <u>Head Office</u> +974 4458-3333, <u>Sales</u>: 4450-00-33, <u>Plant</u>: 4460-35-32 E-mail: <a href="mailto:nigp@qatar.net.qa">nigp@qatar.net.qa</a> , <a href="mailto:sales45@nigpqatar.com">sales45@nigpqatar.com</a> Emergency HOT LINE Tel.: + 974-7776-6277 Web Site: <a href="https://www.almanaholding.com.qa">https://www.almanaholding.com.qa</a></p>
2. HAZARD IDENTIFICATION	<p>Hazard pictogram : Not Applicable</p> <p>Signal word : Danger</p> <p>Hazard statements: May displace oxygen and cause rapid suffocation, May increase respiration and heart rate, May cause cryogenic burns or injury, May cause frostbite. <u>Hazard Class and Category Code Regulation EC 1272/2008 (CLP)</u></p> <ul style="list-style-type: none"> <li>Not regulated</li> </ul> <p>Classification EC 67/548or EC 1999/45 :</p> <ul style="list-style-type: none"> <li>Not classified as dangerous substance/mixture.</li> </ul>
3. COMPOSITION / INGREDIENT IDENTIFICATION	<p>Substance Name : Carbon Dioxide (Solid) UN Number : 1845 Chemical Formula : CO<sub>2</sub> Contents: 100% CAS No. : 124-38-9 EC No. : 204-696-9 Contains no other components or impurities which will influence the classification of the product.</p>
4. FIRST AID MEASURES	<p>Inhalation : In high concentrations may cause asphyxiation. Symptoms may include loss of mobility/consciousness. Victim may not be aware of asphyxiation. Low concentrations of CO<sub>2</sub> cause increased respiration and headache. Remove victim to uncontaminated area wearing self contained breathing apparatus. Keep victim warm and rested. Call a doctor. Apply artificial respiration if breathing stopped.</p> <p>Eye/Skin Contact</p> <ul style="list-style-type: none"> <li>In case of frostbite spray with water for at least 15 minutes. Apply a sterile dressing. Obtain medical assistance.</li> <li>Adverse effects not expected from this product.</li> </ul> <p>Ingestion: Potential choking hazard exists for dry ice pellets to lodge in the airway if swallowed. Seek urgent medical advice.</p>
5. FIRE-FIGHTING MEASURES	<p>Suitable extinguishing media:</p> <ul style="list-style-type: none"> <li>All known extinguishants can be used.</li> </ul> <p>Specific hazards:</p> <ul style="list-style-type: none"> <li>Exposure to fire may cause containers to rupture/explode.</li> </ul> <p>Hazardous combustion products:</p> <ul style="list-style-type: none"> <li>None</li> </ul>



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	<p>Specific methods:</p> <ul style="list-style-type: none"> <li>• If possible, stop flow of product</li> <li>• Coordinate fire measure to the surrounding fire. Cool endangered containers with water spray jet from a protected position. Do not empty contaminated fire water into drains.</li> </ul> <p>Special protective equipment for fire fighters:</p> <ul style="list-style-type: none"> <li>• In confined space use self-contained breathing apparatus.</li> </ul>
<p>6. ACCIDENTAL RELEASE MEASURES</p>	<p>Personal Precautions:</p> <ul style="list-style-type: none"> <li>• Try to stop release.</li> <li>• Evacuate area.</li> <li>• Ensure adequate air ventilation.</li> <li>• Use protective clothing.</li> <li>• Wear self-contained breathing apparatus when entering area unless atmosphere is proved to be safe.</li> </ul> <p>Environmental Precautions:</p> <ul style="list-style-type: none"> <li>• Try to stop release.</li> <li>• Prevent from entering sewers, basements and work pits, or any place where its accumulation can be dangerous.</li> </ul> <p>Clean Up Methods:</p> <ul style="list-style-type: none"> <li>• Ventilate area.</li> </ul>
<p>7. STORAGE AND HANDLING</p>	<p>Safe use of the product:</p> <ul style="list-style-type: none"> <li>• The product must be handled in accordance with good industrial hygiene and safety procedure.</li> </ul> <p>Handling:</p> <ul style="list-style-type: none"> <li>• Use insulating glove.</li> <li>• Avoid contact with skin and eyes! Dry ice is extremely cold, -109°F (-79°C) and can cause severe frostbite within seconds of direct contact. (Frostbite is a freezing injury resembling a burn.)</li> <li>• Never Handle Dry ice with your bare hands. Always wear insulated gloves. Safety glasses, long-sleeved shirt, long pants and shoes are also recommended. Use tongs to handle blocks of dry ice.</li> <li>• Do not put dry ice in your mouth or otherwise ingest it. If dry ice is accidentally ingested, it can cause severe internal injury. Never put dry ice in beverages to cool them.</li> <li>• Refer to supplier's container handling instructions.</li> </ul> <p>Storage:</p> <ul style="list-style-type: none"> <li>• Observe all regulations and local requirements regarding storage of containers.</li> <li>• Minimize exposure to water contacting this material.</li> <li>• Ventilate to prevent pressure buildup.</li> <li>• Closed containers may generate internal gas pressure. Ensure lids on containers are loose-fitting to avoid buildup of gas pressure.</li> <li>• Keep container below 50°C in a well ventilated place.</li> </ul>
<p>8. EXPOSURE CONTROLS/ PERSONAL PROTECTION</p>	<p><u>Control parameters</u></p> <p>Occupational Exposure Limits / Carbon dioxide (solid)</p> <ul style="list-style-type: none"> <li>• Value 8h (CZ) [mg/ m<sup>3</sup>] : 9000</li> <li>• ILV (EU) - 8H - [mg/m<sup>3</sup>] : 9000</li> <li>• ILV (EU) - 8H - [ppm] : 5000</li> <li>• TLV<sup>©</sup> - TWA [ppm] : 5000</li> <li>• TLV<sup>©</sup> - STEL [ppm] : 30000</li> <li>• AGW (8h) - Germany [mg/m<sup>3</sup>] TRGS 900 : 9100</li> <li>• AGW (8h) - Germany [ppm] TRGS900 : 5000</li> <li>• MAK (AU) Tagesmittelwert (ml/m<sup>3</sup>) : 5000</li> <li>• MAK (AU) Tagesmittelwert (mg/m<sup>3</sup>) : 9000</li> <li>• MAK (AU) Kurzzeitwerte (ml/m<sup>3</sup>) : 10000</li> <li>• MAK (AU) Kurzzeitwerte (mg/m<sup>3</sup>) : 18000</li> </ul>

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	<ul style="list-style-type: none"> <li>• VLA-ED - Spain [ppm] : 5000</li> <li>• VLA-ED - Spain [mg/ m<sup>3</sup>] : 9150</li> <li>• VLA-EC - Spain [ppm] : 15000</li> <li>• VLA-EC - Spain [mg/ m<sup>3</sup>] : 27400</li> <li>• NGV- [ppm] : 5000</li> <li>• NGV- [mg/m<sup>3</sup>] : 9000</li> <li>• KTV- [ppm] : 10</li> <li>• KTV- [mg/m<sup>3</sup>] : 10</li> <li>• HTP-värden (FI)-8H - [ppm] : 5000</li> <li>• HTP-värden (FI)-8H - [mg/m<sup>3</sup>] : 9100</li> <li>• Grænserværdier (DK) (ppm) : 5000</li> <li>• Grænserværdier (DK) (ppm) : 9000</li> <li>• Grænserværdier (DK) : 9000</li> <li>• GV Value Limit (Norway) [ppm] : 5000</li> <li>• GV Value Limit (Norway) [mg/m<sup>3</sup>] : 9000</li> <li>• 8-HourTWA (PL) (NDS) (mg/m<sup>3</sup>) : 9000</li> <li>• 15-Minute STEL (PL) (NDSch) (mg/m<sup>3</sup>) : 27000</li> <li>• Valori Limite di Soglia (IT) 8ore [ppm]: 5000</li> <li>• Valori Limite di Soglia (IT) 8ore [mg/m<sup>3</sup>] : 9000</li> <li>• TLV-TWA (Belgium) (ppm) : 5000</li> <li>• TLV-STEL (Belgium) (ppm) : 30000</li> <li>• Value 15 min. (CZ) [mg/ m<sup>3</sup>] : 45000</li> </ul> <p>DNEL: Derived no effect level : None available.  PNEC: Predicted no effect concentration: None available.</p> <p>Appropriate engineering Controls:</p> <ul style="list-style-type: none"> <li>• Systems under pressure should be regularly checked for leakages.</li> <li>• Provide adequate general and local exhaust ventilation.</li> <li>• Consider work permit system e.g. for maintenance activities.</li> </ul> <p>Personal Protection / Protective equipment:</p> <ul style="list-style-type: none"> <li>• A risk assessment should be conducted and documented in each work area to assess the risks related to the use of the product and to select the PPE that matches the relevant risk.</li> <li>• The following recommendations should be considered.</li> <li>• Wear safety glasses with side shields.</li> <li>• Wear leather safety gloves and safety shoes when handling cylinders.</li> <li>• Ensure adequate ventilation.</li> <li>• Protect eyes, face and skin from contact with product.</li> </ul> <p>Other Environmental exposure controls:</p> <ul style="list-style-type: none"> <li>• Refer to local regulations for restriction of emissions to the atmosphere. See section 13 for specific methods for waste gas treatment.</li> </ul>
<p>9. PHYSICAL AND CHEMICAL PROPERTIES</p>	<p>Information on basic physical and chemical properties</p> <p>Appearance</p> <p>Physical state at 20°C /101.3kPa : Gas</p> <p>Colour : Colourless.</p> <p>Odour : No odour warning properties.</p> <p>Odour threshold : Odour threshold is subjective and in adequate to warn for over exposure.</p> <p>pH : Not applicable for gas-mixtures.</p> <p>Molar mass [g/mol] : 31.998</p> <p>Melting point [°C] : -56.6</p> <p>Boiling point [°C] : -78.5(s)</p>

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	<p>Critical Temperature [°C] : 30  Flash point [°C] : Not flammable  Evaporation rate (ether=1) : Not applicable for gas-mixtures.  Flammability rang [2vol% / in air] : Non flammable  Vapour pressure [20°C] : 57.3 bar  Relative density, liquid (water=1) : 1.03  Relative density, gas (air=1) : 1.52  Solubility in water [mg/l] : 2000  Partition coefficient n-octanol/water : Not applicable for gas-mixtures.  Viscosity at 20°C [mPa.s] : Not applicable  Explosive Properties : Not applicable  Dew Point °F : -60  Molecular Weight : 44</p> <p><u>Other information</u>  Other data: Gas/vapour heavier than air. May accumulate in confined spaces, particularly at or below ground level.</p>
<p>10. STABILITY AND REACTIVITY</p>	<p>Stability and Reactivity :</p> <ul style="list-style-type: none"> <li>No reactivity hazard other than the effects described in sub-sections below.</li> <li>Stable under normal conditions.</li> <li>Water on solid carbon dioxide increase sublimation and greatens the risk of asphyxiation.</li> </ul> <p>Chemical stability: Stable under normal conditions.  Possibility of hazardous reactions: Water on solid carbon dioxide increase sublimation and greatens the risk of asphyxiation.</p> <p>Hazardous decomposition products: Under normal conditions of storage and use, hazardous decomposition products should not be produced.</p>
<p>11. TOXICOLOGICAL INFORMATION</p>	<p>Toxicity information: In high concentrations cause rapid circulatory insufficiency even at normal levels of oxygen concentration. Symptoms are headache, nausea and vomiting, which may lead to unconsciousness and death.</p> <p>Skin corrosion/irritation : No known effects from this product.  Serious eye damage/irritation : No known effects from this product.  Respiratory or skin Sensitization: No known effects from this product.  Acute toxicity : No known toxicological effects from this product.  Rat inhalation LC50 (ppm/4h) : No data available.  STOT-single exposure : No known effects from this product.  STOT-repeated exposure : No known effects from this product.  Aspiration Hazard : Not applicable for gases and gas-mixtures</p>
<p>12. ECOLOGICAL INFORMATION</p>	<p>Toxicity: No data available  Ecological Effects Information:</p> <ul style="list-style-type: none"> <li>Can cause frost damage to vegetation</li> <li>When discharged in large quantities may contribute to the greenhouse effect.</li> </ul>
<p>13. DISPOSAL CONSIDERATIONS</p>	<p>Waste treatment methods</p> <ul style="list-style-type: none"> <li>May be vented to atmosphere in a well ventilated place.</li> <li>Do not discharge in to any place where its accumulation could be dangerous.</li> <li>Refer to the code of practice of EIGA (Doc.30/10“Disposal of Gases, downloadable at <a href="http://www.eiga.org">http://www.eiga.org</a>) for more guidance on suitable disposal methods.</li> <li>Contact supplier if guidance is required.</li> </ul> <p>General</p> <ul style="list-style-type: none"> <li>Do not discharge into any place where its accumulation could be dangerous.</li> </ul>

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	<ul style="list-style-type: none"> <li>Discharge to atmosphere in large quantities should be avoided.</li> <li>Contact supplier if guidance is required.</li> </ul>
<p>14. TRANSPORT INFORMATION</p>	<p>UN number : 1845            HS Code : 30021099            Labeling</p> <div style="text-align: center;">  </div> <p><u>Land transport</u>            Proper shipping name : CARBON DIOXIDE, SOLID, III            Transportation hazard class (es) : 9            Classification code : M11 III            Packing group : III            HAZCHEM – Emergency Action Code: 2T            2 = Fine water spray.            T= Recommended personal protective equipment: Full fire kit and breathing apparatus.            Appropriate measures: dilute</p> <p><u>Sea transport</u>            Proper shipping name : CARBON DIOXIDE, SOLID            Emergency Schedule (EmS) - Fire : F-C S-V            Emergency Schedule (EmS) - Spillage : S-V            Packing Instruction(s) : P003            IMDG-Marine pollution : No</p> <p><u>Air transport</u>            Proper shipping name : CARBON DIOXIDE, SOLID            Hazard class (es) : 9            Passenger and Cargo Aircraft : Allowed            Packing instruction – Passenger and Cargo Aircraft : 904            Packing instruction – Cargo Aircraft only : 904</p> <p><u>Special precautions for user</u></p> <ul style="list-style-type: none"> <li>Avoid transport on vehicles where the load space is not separated from the driver's compartment.</li> <li>Ensure vehicle driver is aware of the potential hazards of the load and knows what to do in the event of an accident or an emergency.</li> <li>Before transporting product containers.</li> <li>Ensure there is adequate ventilation.</li> <li>Ensure that containers are firmly secured.</li> <li>Ensure cylinder valve is closed and not leaking.</li> <li>Ensure valve outlet cap nut or plug (where provided) is correctly fitted.</li> <li>Ensure valve protection device (where provided) is correctly fitted.</li> </ul> <p>Personal precautions:</p> <ul style="list-style-type: none"> <li>The driver shall not attempt to deal with any of the load.</li> </ul> <p>Emergency action in case of accident:</p> <ul style="list-style-type: none"> <li>Stop the engine</li> <li>No naked lights. No smoking</li> <li>Mark roads and warns other road users.</li> </ul>

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	<ul style="list-style-type: none"> <li>• Keep public away from danger users.</li> <li>• NOTIFY POLICE AND FIRE BRIGADE IMMEDIATELY.</li> </ul>
15. REGULATORY INFORMATION	<p><u>Safety, health and environmental regulations/legislation specific for the substance or mixture</u></p> <ul style="list-style-type: none"> <li>• EU Legislation / Seveso directive 96/82/EC : Not covered</li> <li>• National legislation: Ensure all national/local regulations are observed.</li> <li>• Restrictions on use : None</li> <li>• Chemical safety Assessment: A CSA does not need to be carried out for this product.</li> </ul>
16. OTHER INFORMATION	<p>Indication of changes:</p> <ul style="list-style-type: none"> <li>• Revised safety data sheet in accordance with commission regulation (EU) No 453/2010.</li> </ul> <p>Training Advice:</p> <ul style="list-style-type: none"> <li>• Asphyxiant in high concentrations.</li> <li>• Keep container in a well-ventilated place.</li> <li>• Do not breathe the gas.</li> <li>• May cause frostbite.</li> <li>• The hazard of asphyxiation is often overlooked and must be stressed during operator training.</li> <li>• Ensure all national/local regulations are observed.</li> </ul> <p>Further information</p> <ul style="list-style-type: none"> <li>• Classification in accordance with calculation methods of regulation (EC) 1272/2008CLP / (EC) 1999/45DPD.</li> </ul> <p>This information is based on our present knowledge. However, this shall not constitute a guarantee for any specific product features and shall not establish a legally valid contractual relationship.</p>

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