Dry ICE 4 ENGINEERING

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Shrink Fitting of Bearings:

Dry ice is the solid form of carbon dioxide (CO_2) at a temperature of -78.5 °C. Mechanical engineers and artisans commonly use dry ice in a process referred to as shrink fitting (also known as freeze fitting).
Bearings are an integral part of a machine's moving components and reduce the amount of friction on rotating parts. Bearing failure is common in older machines and vehicles, particularly those in high-wear conditions such as a mining or chemical environment.
Shrink fitting is commonly used in engineering to fit together bearings, collars, shafts and other components which require an interference fit. The component to be "fitted in" to the other part is packed in dry ice causing it to contract. While still cold, it is assembled with its mating part and allowed to return to ambient temperature. On doing so, the cold part returns to its original size and creates the tight interference fit required. This process is quick, simple to use and causes no changes in the physical properties of the components, unlike heating the respective components which can change the hardness or toughness of the materials. Dry ice is also much easier to handle and safer compared to liquid nitrogen cooling.

Pipe and Valve Repairs:

Dry ice is commonly used in civil engineering for pipe and valve repairs. If a stop valve or isolating valve is not available in a section of the pipe where repairs are needed, or a joint needs to be inserted, dry ice can be used to stop the flow of the water. By using dry ice, it is possible to freeze the water inside the pipe, so the pipe can be cut or repaired without a continual flow of water to hamper the work.

Refrigeration Emergencies:

Refrigeration emergencies can be caused by power failures or refrigeration compressor failures. Dry ice is a quick, cost-effective and safe solution to this problem. Dry ice can be placed on top of the frozen product so that, as the dry ice sublimates, the CO_2 vapour falls onto the product and keeps it chilled or frozen. This will allow the refrigeration technician sufficient time to complete the repairs efficiently.

Cold Grinding of Rubber and Plastics:

Cold grinding is also known as cryogenic grinding. During the cold grinding process, uniform size particles of plastics, rubber or chemicals are formed. Dry ice is spread onto the grinding material so that it cools down to its embrittlement point on passing into a grinding mill. This means that grinding of tough thermostatic and other soft or pliable materials is possible, becoming brittle enough to be ground to very fine particle sizes. Grinding processes usually produce extremely high temperatures. Dry ice regulates heat and allows higher material output. The grinding of organic materials has a high risk of explosion as very fine particles combine. The use of dry ice to inert the atmosphere during the grinding process reduces the safety hazard. Cold grinding does not alter the chemical composition of the materials.

De-flashing in Chemical Processes:

When rubber or plastic moulded components are produced, they commonly have thin "flashes" of material or mould marks where the two halves of the mould join. Mould trimming by hand is time consuming. Once moulded, the components can be placed into a rotating barrel tumbler with dry ice. The components are then taken down in temperature to their embrittlement point. The flashes are removed solely by contact with each other as the tumbler rotates, leaving a flash free product. No detrimental effects occur from the process and all the components' physical attributes are retained once they have returned to ambient temperature.

Process Cooling:

In certain process applications, it is useful to be able to quickly cool, chill or freeze material in a process. Dry ice can be added directly onto the material or it can be mixed into the batch. The temperature of the product is reduced as the dry ice sublimates.

Cold Traps:

Cold traps are used in many scientific and manufacturing applications to collect evaporated liquids and prevent them from moving throughout a process. The cold trap provides a very low temperature surface on which such molecules can condense. Dry ice is used to create the extreme cold required to condense these vapours, capturing them in liquid form and preventing them from contaminating instrumentation and plant – such as vacuum pumps.

Delivery:

Dry Ice International executes deliveries countrywide on a 24 - 48 hour basis.
Dry ice may be ordered on our website and be delivered at your doorstep
(refer "Dry Ice @ Your DoorstepTM")
Dry ice may also be collected at any of our retail outlets (refer "Where to buy dry ice")

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Our Company

Dry Ice International has been recognised as the leader of dry ice manufacturing, distribution and dry ice blast cleaning in South Africa, as well as other parts of Africa since 1994. We are known for our dedicated client service nationally, creativity, innovation and team of highly qualified and experienced engineers and technicians. Dry Ice International specialises in the manufacturing of dry ice in different shapes and sizes, as well as the application and distribution of these products. Deliveries are executed nationwide or cross-border throughout the year on a 24/7 basis.
From dry ice refrigeration to a future of fully automated robotic dry ice cleaning systems, we are looking forward to serving our clients in the same dedicated manner while pushing at the forefront of engineering to create even more user-friendly dry ice applications.

Specific Industry Applications

- Mechanical engineering: shrink fitting of bearings, shafts and mechanical components
- Civil engineering: pipe freezing for pipe and valve repairs
- Refrigeration emergencies
- Process engineering:
  - Cold grinding of rubber and plastic compounds
  - De-flashing of rubber and plastic parts
  - Process cooling
  - Cold traps

Dry ICE INTERNATIONAL

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