



GUIDELINES FOR SAFE AND HYGIENIC HANDLING OF DRY ICE

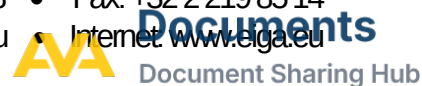
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GUIDELINES FOR SAFE AND HYGIENIC HANDLING OF DRY ICE

Prepared by WG-8 Food Gases and Carbon Dioxide

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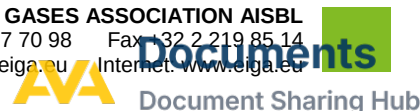


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Amendments from 150/08

Section	Change
	Title change
	Editorial to align style with IHC associations
3.1	Addition of new section 3.1 Publications terminology
15	Addition of new section on References
16	Addition of new section on Additional references
Appendices	Consolidation to one Appendix

Note: Technical changes from the previous edition are underlined

1 Introduction

Dry ice is carbon dioxide in its solid form. It is produced by expanding liquid carbon dioxide to atmospheric pressure.

The product can be supplied as blocks, slices or pellets and is generally packed into plastic, paper or composite bags that are stored and transported in insulated containers. Some products, particularly pellets, can also be supplied loose in containers, with no wrapping.

Dry ice is used in practically all types of industries, mainly because of its cooling properties. It is particularly interesting for applications where spot cooling is needed.

Common uses include:

- Cooling of catering trolleys in aircraft, trains;
- Cooling of food and pharmaceutical products during transport without direct contact between product and dry ice;
- Cooling of food with direct contact between dry ice and the product such as for meat, grapes;
- Direct application in food mixing processes in order to maintain the temperature;
- Cooling metal;
- Blast cleaning with dry ice;
- Use as a modified atmosphere packaging in food to produce a protective, bacteriostatic atmosphere.

When dry ice is added directly to food, it is important to consider its possible role as a carrier of contamination. The quality of the raw material, liquid carbon dioxide, shall conform to the purity criteria for food additives.

2 Scope

This publication covers the entire supply chain of all dry ice products, from the receipt of bulk liquid carbon dioxide to the delivery of finished products to end-users.

The publication provides specific guidelines for safe and hygienic handling of product, equipment and containers throughout the production and supply chain including food use.

In the gases industry, dry ice is the only solid product and, unlike other food gas products, is not kept in a closed pressurised system. It therefore requires that specific attention be paid to hygiene.

3 Definitions

3.1 Publication terminology

3.1.1 Shall

Indicates that the procedure is mandatory. It is used wherever the criterion for conformance to specific recommendations allows no deviation.

3.1.2 Should

Indicates that a procedure is recommended.

3.1.3 May

Indicates that the procedure is optional.

3.1.4 Will

Used only to indicate the future, not a degree of requirement.

3.1.5 Can

Indicates a possibility or ability.

3.2 Technical definitions**3.2.1 Cold chain**

Temperature control system for food transport.

3.2.2 Control measure

Action or activity that can be used to prevent or eliminate a hazard.

3.2.3 Dry ice

Solid carbon dioxide.

3.2.4 Dry ice - food application

Application in which dry ice is in direct contact with food during the manufacturing process. An example would be the direct use of dry ice as a cooling agent in a meat grinding or mixing application.

3.2.5 Dry ice – non-food application

Application in which dry ice does not come into direct contact with food. An example would be the use of packaged dry ice as a refrigerant for indirect cooling of food in insulated transport containers.

3.2.7 Hazard analysis of critical control points (HACCP)

Standard risk assessment process widely used in the food industry.

3.2.8 Pressure

This publication uses bar as the unit of pressure, and if not stated otherwise, the pressure is stated as bar gauge.

3.2.9 Recovery plant

The equipment used to collect and re-liquefy carbon dioxide which flashes off during the production of dry ice.

3.2.10 Threat assessment by critical points (TACCP)

Management process to defend a food supply chain from intentional contamination.

3.2.11 Vulnerability assessment by critical control points (VACCP)

Management process to defend a food supply chain from any form of dishonest conduct that impacts detrimentally on the quality or authenticity of food.