

The SIAD Group

SIAD is a leading Italian chemical group and operates in the technical gases, engineering, healthcare, LPG and Natural Gas sectors.

The Group has been active for over 90 years in the technical gas business and is also acclaimed for its well-known and established presence in the engineering sector. In the Healthcare sector, it offers healthcare facilities and also operates in home care. Other services include: environmental management, marketing of consumer goods and

distribution of industrial goods. With the acquisition of the Istrabenz Plini Group, business activities extended to the sales and distribution of liquefied petroleum gas (LPG) and methane gas, even in urban networks, and to energy solutions.

For more information:
www.thesiadgroup.com

Values



Experience, Tradition and Strength



Reliability, Trustworthiness and Competency



Research, Technology and Innovation



Geographical and Sector Diversification

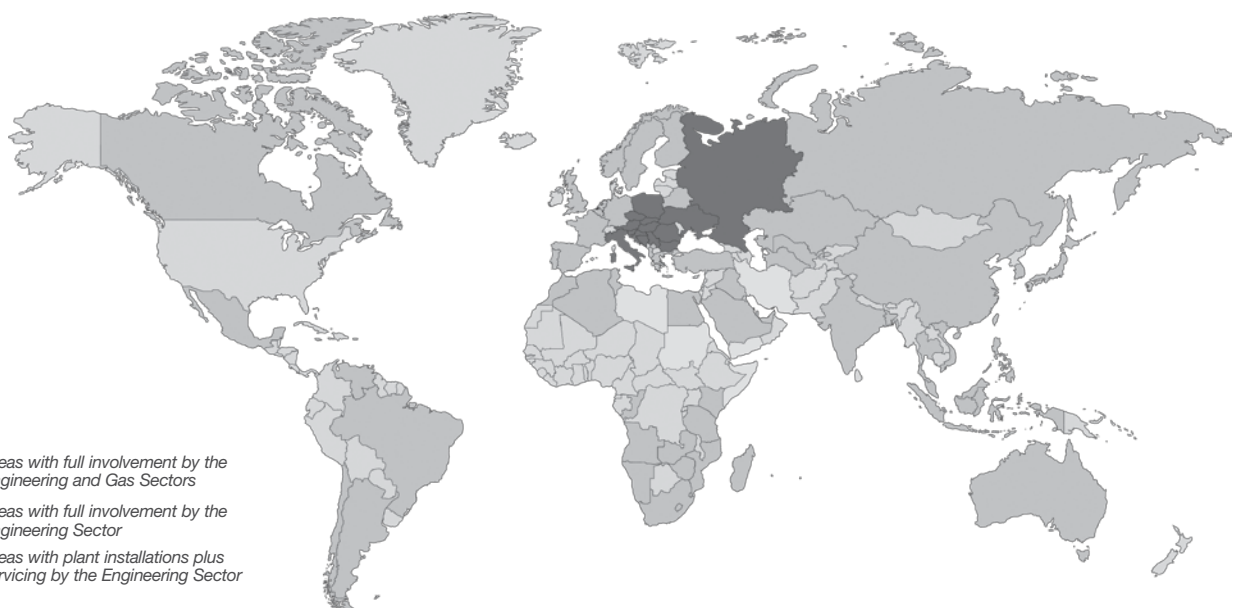


Commitment to Quality, Safety and the Environment



Attention to Social and Cultural Issues

The SIAD Group in the world



The SIAD Group

Engineering

Technical gases



LPG and Natural Gas

Healthcare

Technical gases

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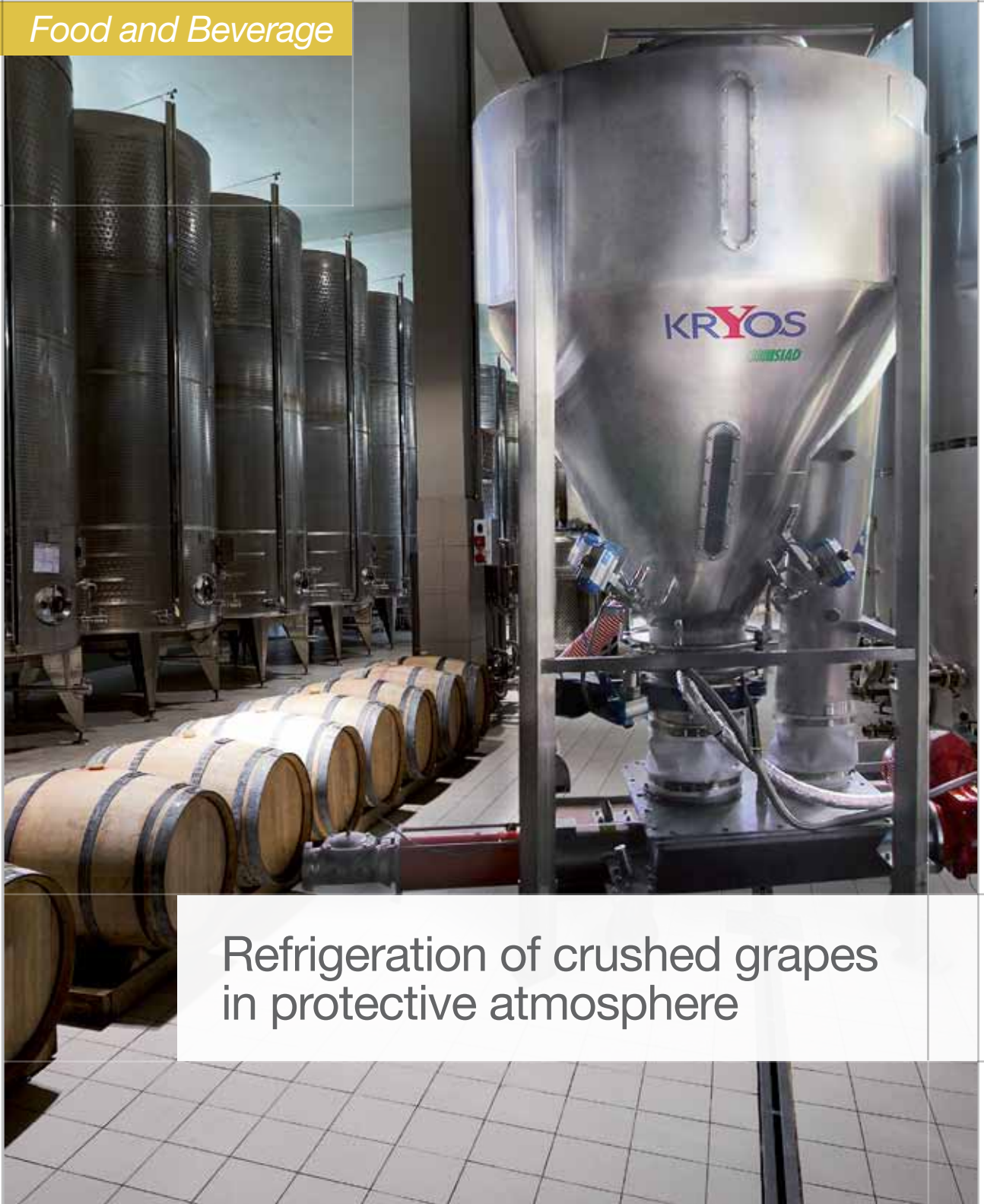
Printed in Italy
COM PUK 016 06/17



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Refrigeration of crushed grapes
in protective atmosphere

Refrigeration of crushed grapes in protective atmosphere

Industrial gases have many uses in winemaking, enabling the specific characteristics and potential of the grapes to be exploited through reliable and easily managed applications. Kryos is one of these, and allows the refrigeration of crushed grapes in protective atmosphere and reduced use of sulfur dioxide.

Method

The crushed grapes pass through a heat exchanger and come into contact and mix with carbonic snow and gaseous CO₂ which remove the dissolved air, saturate them with CO₂ and lower the temperature to the desired value.

After contact, the CO₂ completely in the gaseous state, is separated from the crushed grapes, conveyed to the outside and made available for possible other uses.

The method features:

- rapid and complete deaeration and saturation with CO₂;
- instant cooling;
- absence of thermal shocks and “cold burns” on the skins;
- high refrigerating power;
- a drastic reduction (compared to conventional tube in tube exchangers) of mechanical stress on the skins with consequent minimal lacerations and formation of dregs.

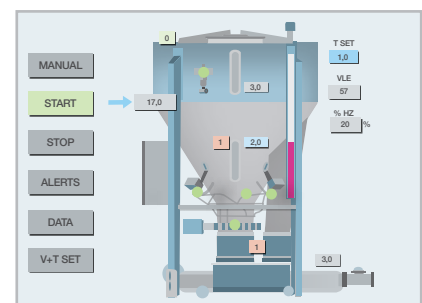
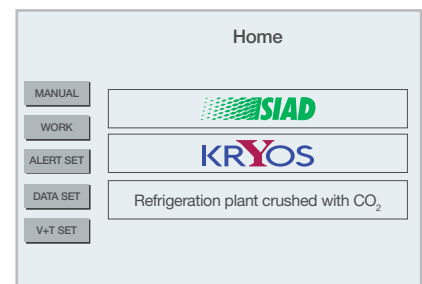
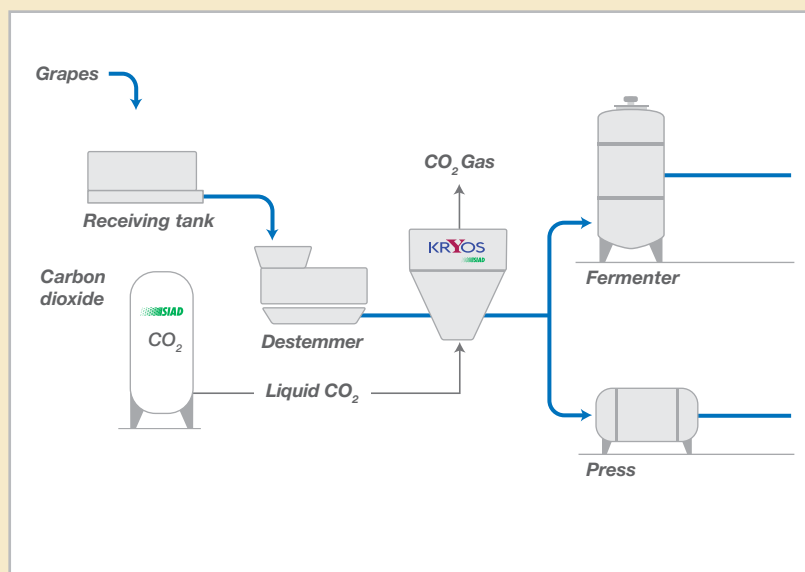
Mode

Kryos can be used in batch and continuous mode. In continuous mode it can operate with constant as well as variable crushed grape flow rates. In case of a temporary interruption of flow, it goes into standby mode and resumes normal operation when the flow is restored.

- KRYOS management is fully automated; dedicated software regulates the amount of CO₂ to be introduced and transfers the refrigerated crushed grapes.
- The operator only has to set the required crushed grapes outfeed temperature on the control panel and start the process.
- Operation can be viewed from the synoptic panel.

The heat exchanger is located downstream of the destemmer from whose pump it receives the crushed grapes and, after treatment, transfers them free of any previously absorbed oxygen, saturated with CO₂

and refrigerated, to the next stage of processing. The liquid CO₂ necessary for the formation of carbonic snow and gaseous CO₂ is drawn from a cryogenic storage tank.



Removal of dissolved oxygen and saturation with CO₂

Equipment

Its working mode logic is interconnected with that of the destemmer and the machines downstream (presses, tanks), it has no interference and does not modify their operating mode timing. The constructive, geometric and dimensional features allow easy cleaning and sanitizing.

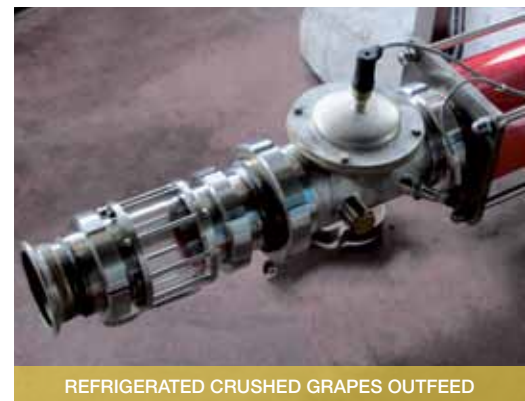
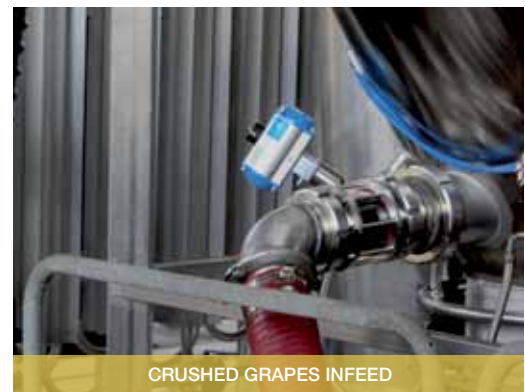
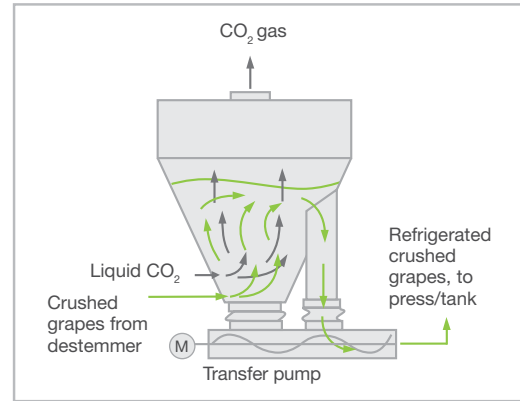
It comprises:

- liquid CO₂ cryogenic storage tank;
- heat exchanger for crushed grapes-snow-gas contact, in AISI 304;
- piping and valves for the supply of liquid CO₂ and its removal in the gaseous state;
- refrigerated crushed grapes transfer pump;
- control of crushed grapes level in the exchanger in order to manage the transfer pump;
- control of crushed grapes infeed and outfeed temperature in order to manage the flow rate of liquid CO₂;
- valve for emptying the exchanger at the end of operation;
- control and management panel with PLC and dedicated software.

The exchanger consists of a conical part and a cylindrical part, both internally smooth and free of moving parts. Two sight glasses allow visual inspection inside. The crushed grapes enter the bottom of the conical part, are cooled and, from the top, overflow into the suction tank of the pump which transfer them.

The conical part is sized to allow a height of crushed grapes sufficient to optimize the heat exchange, and a volume that minimizes the time the mass of refrigerated crushed grapes gas undergoes agitation by the gas.

The transfer pump can be disconnected from the rest of the equipment and, when the refrigeration equipment is not working, can be used in the winery for other operations.



For more information

Fully automatic management

Performance

- Refrigerating power: up to 400,000 Fr/h (*)
- Crushed grapes flow rate: up to 30 t/h (*)
- Working pressure: atmospheric
- Crushed grapes outfeed minimum temperature: +1/+2°C;
- Overall dimensions: 1800 x 2500 x 3500 mm;
- Total weight: approx. 900 kg.

CO₂ Consumption

Depends on required performance:

- for deaeration and saturation: 5 - 10 kg/t;
- for refrigeration: 11 - 12 kg/t, °C.

Refrigeration also involves deaeration and saturation with CO₂.

Utilities

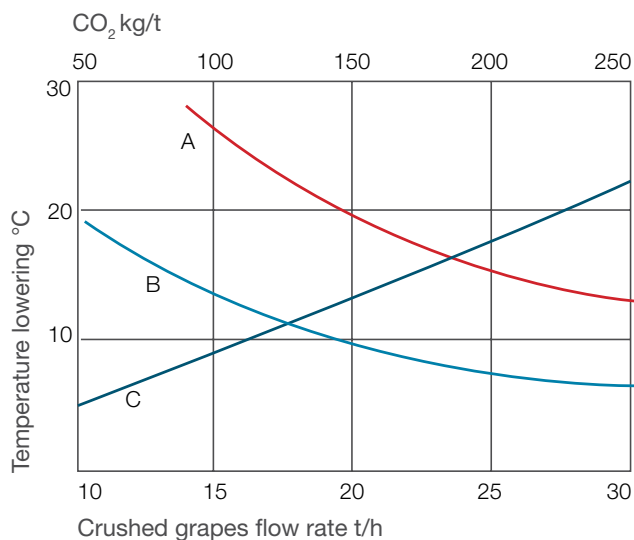
To run, Kryos requires:

- instrument air at a pressure greater than 6 bar;
- EE 400 V, 50 Hz, Three-phase, up to 6 kW depending on the crushed grapes flow rate.

(*): refers to standard types.

The refrigerating power and flow rate can be increased.

Performance and CO₂ consumption



- The points included in the underlying areas of the power curves represent possible performance in terms of flow rate of crushed grapes and lowering of temperature.
- The specific consumption of CO₂, according to the lowering of temperature, is represented by the curve C.

Legend:

- Curve A: 400 kFr/h power
- Curve B: 200 kFr/h power
- Curve C: CO₂ consumption

Carbon footprint*

- The CO₂ available on the market is obtained, almost entirely, by recovering it from other productive activities; the carbon footprint of this is due only to transformation and availability at the point of use.
- To cool by 10°C the amount of crushed grapes needed to produce 1 hl of wine, an average footprint of about 2 kg of CO₂ can be estimated, equivalent to traveling 15 km with a medium-sized car.



* Data from verified sources