

Air Products Cryo Solutions for Metal Treatment

A complete solution for residual austenite transformation and other cryogenic treatment applications



A cryo cooling chamber for cryogenic processing for austenite to martensite transformation

In metal processing, the primary objective of exposing metals to sub-zero temperatures is to transform retained austenite to martensite. To achieve this, steel parts are subjected to cryogenic temperatures using special chambers and exposed to conditions below martensite finish temperature.

In some cases, the parts need tempering or drying at higher temperatures up to 300°C. As an additional feature, Air Products offers the cryogenic chamber that includes a heating function to allow tempering without additional handling.

Air Products Cryo Solutions offer metal treatment manufacturers a complete solution for residual austenite transformation using liquid nitrogen, which can also be used for deep cryogenic treatment of other metals to improve mechanical properties.

Cryo Solutions for Metal Treatment is designed as a front-loading system and is delivered fully assembled in two parts (cryogenic chamber and electronic panel) with a pre-configured connection cable to provide flexibility for on-site installation.

Applications

Air Products Cryo Solutions for Metal Treatment is mainly addressed to carburised and hardened steel components. Additionally, it can be used as a post treatment for improving the physical properties of parts made from other metals and those made through the additive manufacturing process.

Benefits

- Complete solution for cryogenic treatment, available with tempering feature and customer designed liquid nitrogen supply
- Reduced overall cost of investment, available on a monthly fee basis
- Includes Air Products Smart Technology cloud-based process documentation and evaluation tool to optimise recipes and reduce operating costs
- Reduced maintenance cost
- Combined with our Tank level monitoring system, operating costs can be monitored on a charge-based level
- Could be used to run tempering or cryo-cycles



Tailored to each need

Cryo Solutions for Metal Treatment can be supplied in different sizes and capabilities to meet customer needs.

- Standard Size from 0.7 up to 1.5 m³
- Load weight: from 500 kg up to 1500 kg
- Capabilities:
 - with tempering feature up to 300°C
 - supports AMS 2750E standard as an option

Please contact our specialists for other dimensions and specification

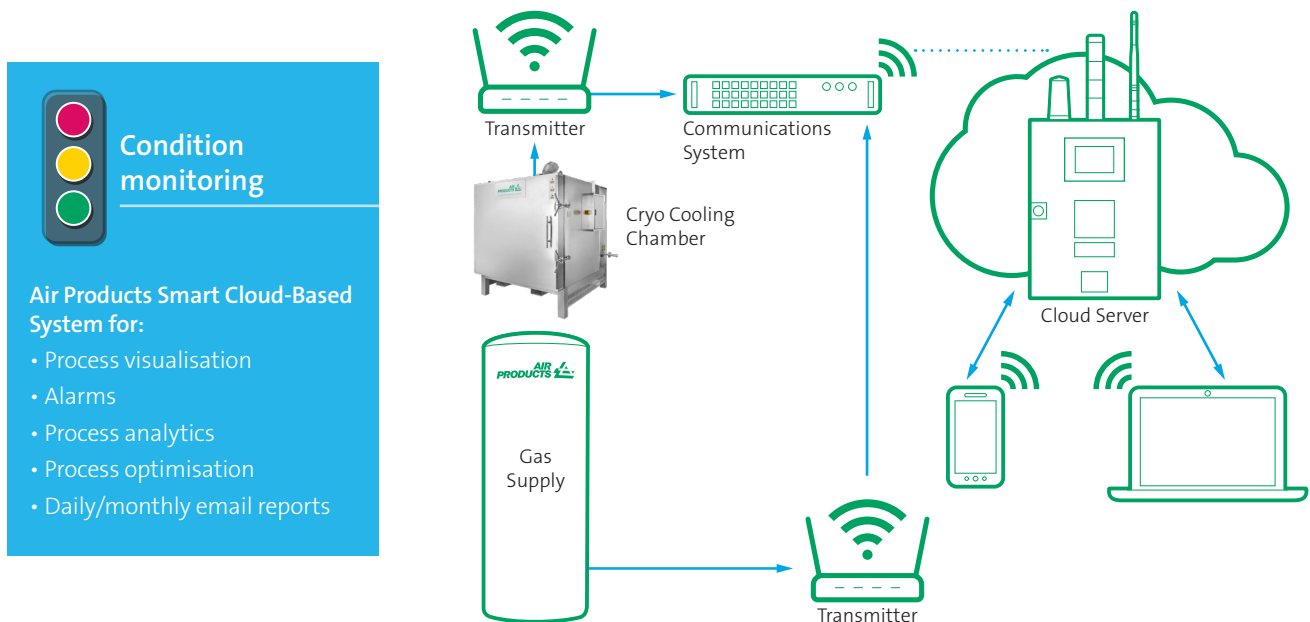


Operation parameters (standard):

Cooling temperature:	-120°C	Cooling type	Liquid Nitrogen
Heating temperature:	250°C	Heating	Electrical
Cooling rate (with full charge) max	7°C/min	Temperature control	Type T thermocouples
Heating rate (with full charge) max	Up to 5°C/min	Controller	Siemens PLC S7-1200
Temperature uniformity	+/- 6°C (AMS 2750 class 2)	Programs/Recipes	Up to 10 steps in recipe

Integration with Air Products SMART Technology

The cryo chamber can be integrated with Air Products Smart Technology. A platform developed by Air Products that can provide insights into process optimisation thanks to smart features, sensors, and cloud technology tracking key process parameters. You can also take advantage of the Smart system for the cryogenic chamber which monitors the N₂ tank status and N₂ usage per charge or treatment.



Please contact us for any additional information and to discuss your needs:

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