



CRYOGENIC SYSTEMS

at a glance





Innovation. Experience. Performance.®

About Chart

Our focus is cryogenics. Chart is a recognized global brand for the design and manufacture of highly engineered cryogenic equipment used from the beginning to the end in the liquid gas supply chain.

We express our brand promise through our tagline

Innovation. Experience. Performance.®

Innovation – We are passionate about what we do and dedicated to continuous, innovative development.

Experience – Customers rely on our knowledge because we are experts in our field.

Performance – We fulfill expectations. We respect our customers and are committed to meeting their needs.

Chart Vacuum Technology®

Providing the best insulation system to protect your valuable gases from harsh ambient conditions results in lower pressure rise and lower losses, yielding better gas utilization. Chart Vacuum Technology® is at the core of why Chart is recognized around the world as the premier supplier of cryogenic equipment.



Chart's production plants are fully audited and compliant with Quality System ISO 9001:2015 and Environmental System ISO 14001:2015





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Complete Service Scope for Storage & Regasification Units

Chart offers a complete service scope focused on optimizing the performance and longevity of your equipment. Application-focused cryogenic solutions designed to provide the highest levels of performance and lowest operating cost. Our complete liquid storage and regasification systems are delivered with the highest levels of quality, safety and engineering expertise.

Concept to Reality - offers the complete engineered and manufactured solution, from the front end engineering, through design and manufacturing and in to installation and on-site maintenance and service packages

Cost Optimization - focused on modularized solutions to reduce overall lead times and cost

Vertical Integration - principal equipment is designed and mainly built in house for guaranteed quality and lowest total overall cost of ownership

Strategic Partners - established network of specialist partner organizations to deliver balance of plant requirements as required

Proven Track Record - since pioneering the industry over 75 years industrial manufacturing experiences

Installation & Commissioning - everything from permitting assistance, to general contracting, final inspection/safety review, startup

Training - hands-on cryogenics and operator training in the classroom and the field, if required

Onsite Maintenance & Service Packages - from the first fill to fine tuning the system as well as warranty service

Chart guarantees on-time delivery, optimum performance and reliability.





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Engineered Systems – Definition

Industrial gases systems include storage and re-gasification stations, which are tailored according to individual customer storage capacity and flow gas withdrawal demand requirements. MicroBulk is safe, reliable and cost effective on-site liquid gases delivery. Trailers, semi-trailers, ISO containers and swap bodies for LIN, LOX, LAR and LCO₂ transportation. Euro-Cyl is a premium transportable liquid cylinder for cryogenic service with capacities from 120 up to 3 000 litres.

LNG product portfolio includes onboard fueling systems for ships and vehicles, onshore receiving terminals, compact storage and re-gasification satellite stations, bunkering, vehicle fueling stations. Complete range of solutions for transporting LNG by road, sea and rail including ISO intermodal containers, trailers, swap bodies and the LNG rail car.

Custom engineered stationary bulk tanks are used to store liquefied gases - oxygen, nitrogen, argon, nitrous oxide, carbon dioxide, natural gas and ethylene - with maximum efficiency. The systems functionality are mainly driven by individual customer requests and application needs.

Typical applications used by our customers:

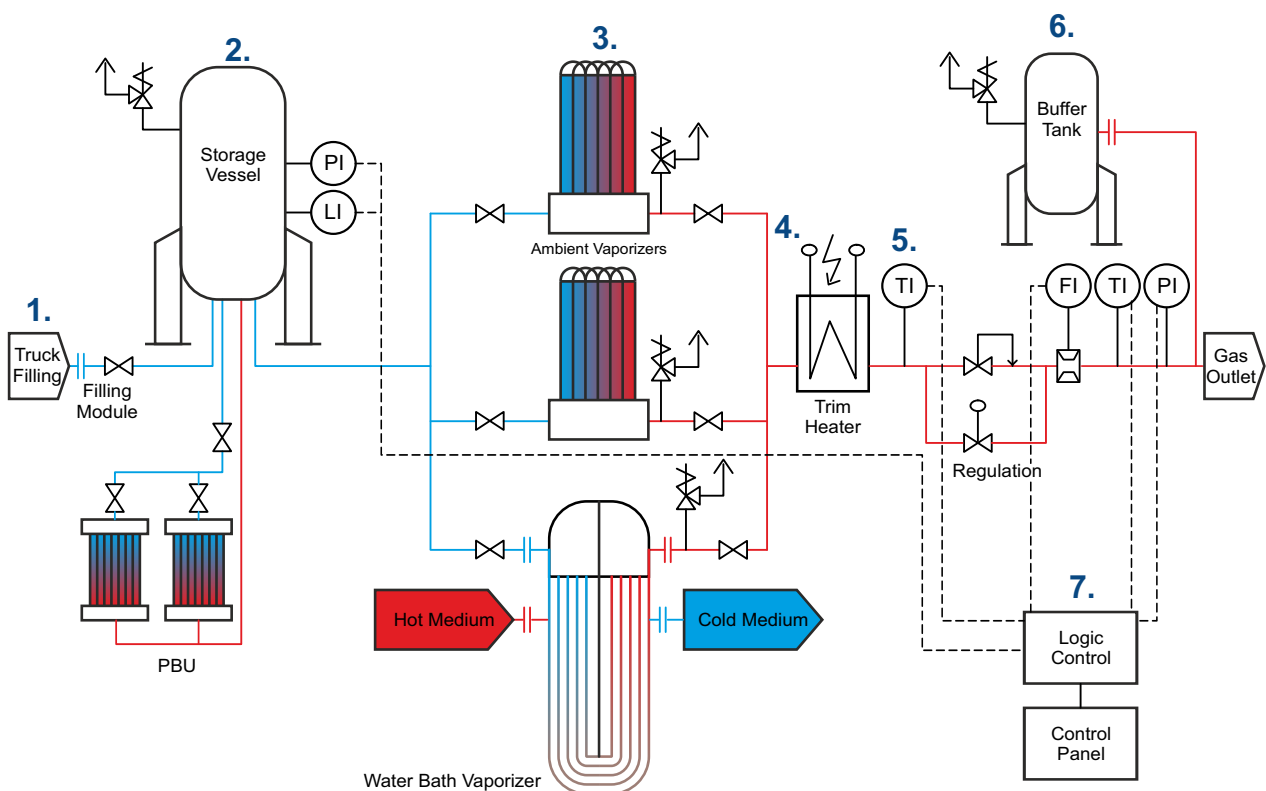
- Food and drink processing
- Breweries
- Aerospace projects
- Hospitals & Laboratories
- Universities & Research facilities
- Peak shaving plants for use during high demand periods
- Energy sources for industrial and residential consumption

Chart brings 30 years experiences of delivering cryogenic system solutions.



Storage and Re-gasification

- 1. Remote Fill Modules** – including the ability to fill multiple bulk tanks in a given system, if required.
- 2. Storage Vessels** - vertical or horizontal vacuum (typically perlite) insulated cryogenic storage tanks with volume up to 1 225m³ each.
- 3. Vaporizers** - Thermax aluminum star-fin type ambient vaporizers generate their own heat and require no external energy source. Electric and water bath options are also available.
- 4. Piping & Components** – Chart proprietary vacuum insulated pipe consists of double walled stainless steel piping where the combination of super insulation and a high level of vacuum ensures maximum heat insulation.
- 5. Skids** - skid mounted temperature control and pressure regulation.
- 6. Buffer Tanks** - provide contingency storage and additional supply for peak loading.
- 7. Programmable Logic Controller (PLC)** - fully integrated safety and control system.
- 8. Supervision, Start-up, Commissioning and Training** - optional packages for a complete turnkey solution and total lifecycle support. All work is carried out by Chart engineers or approved contractors.





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Innovative Solutions for Industrial Gases



Chart thermosyphon storage tanks provide fast filling of liquid cylinders and high pressure bottles for industrial and medical applications in South Africa.



Stacked Storage



A 4-pack stack of 300 m³ horizontal tanks minimizes footprint for the storage of nitrogen and oxygen.

Mega - Storage



Four million litres of liquid nitrogen and oxygen storage being installed at an industrial gas facility in Finland.

Road & Intermodal transport

The convenient and economical way to transport cryogenic technical gases and LNG is to use Gofa road trailers with one to four axles, swap bodies and ISO 20-ft, 40-ft, 45ft intermodal containers. The best quality, reliability and customer support.





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Liquid Nitrogen and Carbon Dioxide Packages for the Food Industry

Nitrogen and carbon dioxide are used as auxiliary media in the vaporization process and as inert gas for protecting sensitive liquids and the carbonation of soft drinks.

A precise amount of gas delivered by a Chart dosing system reduces the thickness of plastic bottles and provides significant cost and waste savings.



Cryotherapy

Whole-body cryotherapy is increasingly used in sports medicine, elite athlete training programs and beauty procedures as well as in clinical settings to treat conditions such as multiple sclerosis and rheumatoid arthritis.

Chart's Euro-Cyl stationary liquid cylinders offer storage capacities from 230 to 3 000 litres of liquid nitrogen and are an integral part of the cryosaunas that produce the very low temperatures required.

MicroBulk Distribution System Fill-on-Site Technology

Chart MicroBulk is recognized as the industry benchmark for the safe, reliable and cost effective delivery of liquid gases including oxygen, nitrogen, carbon dioxide and LNG.

It is the preferred solution across many sectors including medical institutions (critical oxygen), the food industry (nitrogen for preservation) and the world's leading restaurant chains (CO2 beverage carbonation).

MicroBulk incorporates Orca, a fast filling ADR and EN 13 530 compliant cryogenic tanker, and Perma-Cyl superior liquid cylinders.

Orca's submerged pump eliminates cool down losses and reduces delivery time. Perma-Cyl has a shut-off device that protects against cylinder overfilling.





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Liquid CO₂ Dosing System



Gas dosing systems for water desalination plants.

The pH value of desalinated sea water is kept neutral by adding dosed carbon dioxide. Chart delivers the complete system including dosers, storage tanks and atmospheric CO₂ vaporizers.

Chart has established references for these projects in Algeria, Israel, Oman, Kingdom of Saudi Arabia and Latin America.



Nitrogen Storage and Vaporization Systems in LNG Terminals

Complete nitrogen solutions for LNG terminals incorporating storage, vaporization and control.

Our reference points include the major import terminals at Zeebrugge and Dunkerque.

Package comprising bulk tanks, ambient and/or electrical pressure building, product vaporizers, vaporizer skids, pressure control units and buffer tank for gaseous nitrogen.





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Liquid CO₂ Storage for Soft Drink Companies

The world's leading soft drink companies including Coca Cola and Pepsi choose Chart systems for lowest total cost of ownership.



Liquid CO₂ Storage for Breweries

Carbon dioxide is fundamental to beer quality, consistency and the customer's acceptance of the product. Treatment, control, dosing and recovery are vital aspects of the brewing process and why major brewers, including Heineken and InBev, trust Chart's integrated solutions.



Cryogenic Storage System for Research and Development Project with Birmingham University

University of Birmingham Institute for Forest Research (BIFoR) was established to study the impact of climate and environmental change on woodlands and the resilience of trees to pests and diseases.

Chart supplied the CO₂ system for their Free-Air Carbon Dioxide Enrichment (FACE) programme that sees an area of forest being fed extra carbon dioxide, over the course of at least a decade, to measure its effect on plant growth. The results will be used for improved forecasting about the effects of how tree growth will be affected by higher levels of CO₂ in the atmosphere.



Hydrogen Storage



Chart delivered the liquid hydrogen storage tank at the Kourou Centre Spatial Guyanais (CSG) site in Guyana. Guyana Space Centre is a French and European spaceport.



Helium Storage for ITER Project

Chart is supplied two 400 m³ capacity Quench Tanks for gaseous Helium as part of the prestigious international ITER project.

This project aims to build a fusion device to demonstrate the scientific and technical feasibility of fusion power. In order to function properly, the Tokamak (toroidal magnetic confinement chamber), requires huge refrigeration power for its magnets, where the fusion takes place, which is provided by the "Cryoplant".



Using electromagnetic fields, this sophisticated scientific instrument will make it possible to generate plasma to create the conditions necessary for the controlled fusion of atoms. This fusion process generates little waste and eliminates the risk of a nuclear meltdown or "runaway" reaction. The process generates the same type of energy as the sun, which eventually will be recovered in the form of electrical energy.

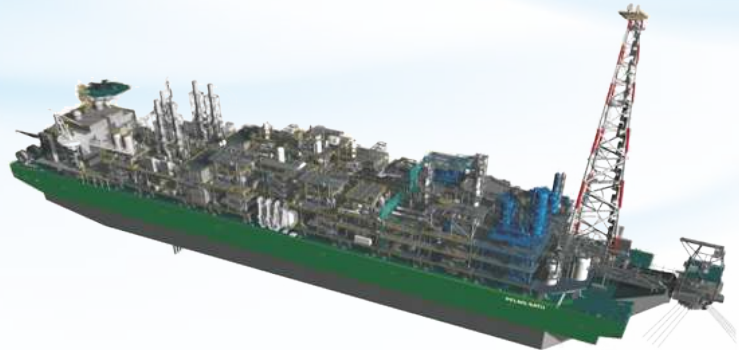
Chart's "LN₂ Plant and Auxiliary Systems" is a tailored solution that forms part of the large cryoplant system with 3 cooling loops at 4 K, 50 K and 80 K.



Floating LNG

Petronas - Design and manufacture of LIN storage, vaporization and distribution package

The floating platform is used for mining and processing of natural gas from deposits from the sea bottom. A reliable nitrogen source is used for common consumption, conditional inerting in the liquefaction and storage of LNG for maintenance and an important safety provision.



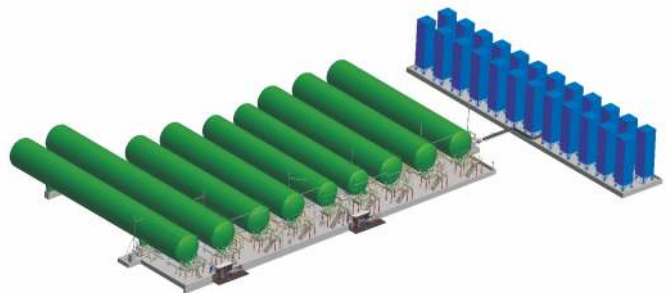
Liquid Nitrogen Injection Facility

Apache North Sea Terminal - Scottish Area Gas Evacuation (SAGE)

The facility processes feed gas from the pipeline systems through pressure reduction, NGL removal and conditioning to meet National Grid requirements (namely CO₂ & H₂S content and Calorific value).

LNG Multifunctional Terminal

ÖRA LNG terminal has a total liquid capacity of 6 414 m³ stored in bulk vacuum-insulated cryogenic tanks. It serves as a supply point for trailer deliveries to Skangass/Shell customers in Sweden and Norway as well as to pipeline customers in the Fredrikstad region from a 5 000 Nm³/h evaporation plant at the terminal. The terminal is supplied through jetty module from LNG carriers.





Contact us



We collaborate closely with our customers and listen.

You ask, we deliver.



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