

CRYOTEC
Anlagenbau GmbH



PLANTS FOR TECHNICAL GASES

MADE IN GERMANY



Made-to-measure plant construction. That's CRYOTEC.

Industrial plants have been built in Wurzen since 1880. From this time onwards, this small Saxony town near Leipzig gained a worldwide reputation. CRYOTEC Anlagenbau GmbH is proud to be a part of this long history and also to continue our strong reputation as the worldwide-leading manufacturer of cryogenic plants and a reliable engineering partner.

Our company merges tradition with the modern world. We place great value on the feasibility and environmental friendliness of our projects – which is ensured by the high standard of engineering. Satisfied clients are our highest priority. Our team will work closely together with you to develop new ideas and set trends for the future.

Our employees have vast experience and understands exactly the wishes and requirements of our clients. They will guide you competently from day one of our co-operation starting from the engineering, through manufacturing and assembly until the start-up of the plant. And definitely we will not forget about After-Sales-Service! As a member of the worldwide active EPC Group, we are able to offer large turnkey projects. Our modular design offers you flexibility of handling and installation of the plant. At the same time, the plant fulfills the highest safety and quality standards all within a small space.

For further information about our products and services, you are most welcome to contact us.

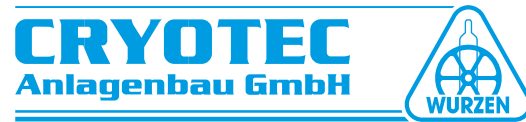
Kind regards,

Corinne Ziege

Corinne Ziege
Managing Director



Headquarter of CRYOTEC Anlagenbau GmbH with manufacturing and storage hall in Wurzen, Saxony.



CRYOTEC is part of a strong, worldwide engineering company – the EPC Group

For generations, industrial plant construction and engineering have been at the center of the Henkel Family, the founders of the EPC Group. The passion for intelligent engineering is still alive and well after more than 140 years. With vast experience and huge enthusiasm for engineering challenges, the EPC Group has successfully completed more than 1,000 projects in over 40 countries, since its founding in 1994. Starting with an idea all the way to plant handover, EPC will plan and deliver the most advance and resource-efficient plant to you – Made in Germany.

In 2009 CRYOTEC Anlagenbau GmbH joined the internationally active EPC Group. This further expanded the possibilities for the Wurzen-based company to fulfill the individual needs of their clients with an even wider range of services. Since then, engineers from diverse fields and specializations work together hand-in-hand, sharing a vast pool of knowledge. This allows them to always have the best ideas in order to solve even the most complex technical challenges.



About us



Our Services

OVERVIEW OF OUR CERTIFICATES



- Conformity of factory production control according to **DIN EN 1090-1** (steel structures up to **EXC2** according to **EN 1090-2**)
- Welding certificate according to **DIN EN 1090** for processes 111, 135, 138 and 141
- **DIN EN ISO 9606-1** - Welder tests and EN 287-1
- **DIN EN ISO 9001:2015** - Quality management system
- **AD2000 – HP0** – Manufacturer approval according to Pressure Equipment Directive 2014/68/EU
- **Module A2** – according to Annex III 2014/68/EU Pressure Equipment Directive
- **AD2000 – HP0** – Proof of proper re-stamping of materials
- **DIN EN ISO 3834-2** - Quality requirements for fusion welding of metallic materials (Comprehensive quality requirements)
- **DIN EN ISO 15614-1 / AD2000 – HP2/1** – Procedural tests and inspections

SERVICES



We offer you comprehensive services from maintenance and servicing of plants, the sale of wear and spare parts, extensive remote maintenance work, right up to the modernization of existing plants and the relocation (dismantling) of plants as well as on-site training courses at the customer's site after commissioning.

Our expertise is based on decades of experience in the following areas:

- „Plug & Play“ principle for production, assembly and commissioning of plants
- Spare parts management
- Optimum plant configuration and process design
- Reliable After-Sales-Service
- In-depth training in regard to the operating and functioning of the plant

TECHNOLOGIES MADE IN GERMANY

- N₂
- CO₂
- O₂
- H₂
- Ar
- LNG
- BIO
LNG



AIR SEPARATION PLANTS

- Cryogenic Processes
- Membrane Technologies
- Storage & Handling of O₂ / N₂ / Ar

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CO₂ TECHNOLOGIES

- Gas Drying & Purification
- Plants for Liquefaction of CO₂
- Storage and Handling of CO₂
- Plants for the Manufacture of Dry Ice

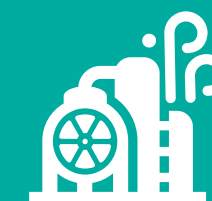
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LIQUEFACTION PLANTS

- Gas Drying & Purification
- Plants for Liquefaction of Gases
- Purification & Handling of Noble Gases
- Small Scale LNG-Plants

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SPECIAL APPLICATIONS FOR TECHNICAL GASES

- Purification and Liquefaction of H₂
- Energy Storage (e.g. H₂ & LNG)
- Purification & Handling of Noble Gases
- Containerization
- Construction of Industrial Refrigeration Plants

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- N₂
- CO₂
- O₂
- H₂
- Ar
- LNG
- BIO
LNG



- N₂
- CO₂
- O₂
- H₂
- Ar
- LNG
- BIO LNG

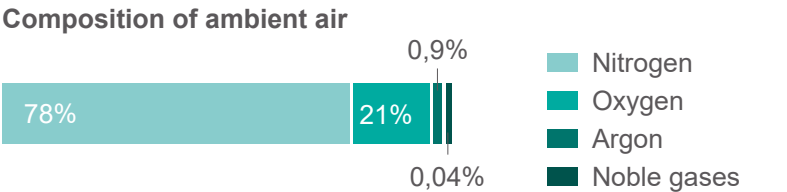
Air Separation Plants

CRYOGENIC AIR SEPARATION

The production of the technical gases oxygen and nitrogen can be realized in different ways. The choice of the right process depends on the required purity of the end products. A further criterion is the requirement for storage in liquid form.

Cryogenic air separation plants are particularly suitable for the production of liquid and/or gaseous oxygen (O₂), nitrogen (N₂) and argon (Ar). Air separation is based on the cryogenic rectification process, in which the air is cooled down to -195°C and partially liquefied. During rectification, the individual air components are separated due to their different boiling points. The end products are gases / liquids in the highest purity and can be used for numerous applications, e.g. industrial and medical.

Alternatively, we also offer Membrane plants for the production of gaseous nitrogen at a lower purity level, for applications where this is sufficient.



CRYOGENIC PROCESSES



		O ₂ GOX / LOX	N ₂ GN / LN	Ar GAR / LAR
CAPACITY	GASEOUS	150 - 5,000 Nm³/h	300 - 20,000 Nm³/h	15 - 50 Nm³/h
	LIQUID	10 - 2,000 Nm³/h	15 - 3,000 Nm³/h	15 - 50 Nm³/h
PURITY	>99.7 Vol. %		up to 1 ppm (v) O ₂	up to 5 ppm (v) O ₂
PRESSURE	0.2 - 25 bar g for storage in liquid gas tanks 4 - 50 bar g for network supply max. 300 bar g for filling into high-pressure steel cylinders			

- N₂
- CO₂
- O₂
- H₂
- Ar
- LNG
- BIO LNG



MEMBRANE TECHNOLOGIES		
		<div>N₂</div> <div>GN</div>
CAPACITY	GASEOUS	23 - 310 Nm³/h
PURITY		≥ 95 Vol. % (O ₂ residual concentration ≤ 5 Vol. %)

BENEFITS & CHARACTERISTICS

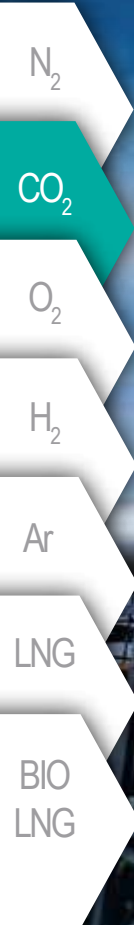
- Low investment and operating costs through optimized processes and highest technical reliability
- Prefabricated plants or plant sections for short commissioning times
- Selection of suppliers with good reputation and state-of-the-art technologies
- In-depth training for operating personnel
- High quality manufacturing in our own workshop
- Certified production to international standards (API, GOST, ASME, DIN)

We offer optimal solutions tailored to the needs of customers. For the manufacture of oxygen, nitrogen and argon, we design, build and supply worldwide:

- ✓ Prefabricated **skid-mounted plants** (modular design) have many advantages, e.g. simple maintenance and service
- ✓ **Containerized** plants can be used in any climate zone. They are transportable, i.e. via air transport, and can be used in a mobile manner due to their closed construction and short dismounting time.
- ✓ **Custom-made products**, e.g. stationary plants, which we construct and bring into operation directly on the construction site.

References

OANL 500	NG 7,000T	NG 600
Production of liquid oxygen (O ₂), nitrogen (N ₂) and argon (Ar)	Production of gaseous and liquid nitrogen (N ₂) with a capacity of 7,000 Nm³/h	Production of ultrapure, gaseous & liquid nitrogen N ₂ with a capacity of 600 Nm³/h GN, 60 Nm³/h LIN
Location: Azerbaijan	Location: Middle East	Location: Middle East
Services: <ul style="list-style-type: none">• General Engineering• Plant Delivery• Manufacturing• Supervision of Assembly• Commissioning• After-Sales / Services / Delivery of Wear & Spare Parts	Services: <ul style="list-style-type: none">• Consulting• Basic & Detail Engineering• Equipment Delivery• Commissioning / Start-Up / Training	Services: <ul style="list-style-type: none">• Consulting• General Engineering• Equipment Delivery• Supervision at the Construction Site• After Sales, Commissioning and Training on Site



CO₂ Technologies

Carbon dioxide (CO₂) is a greenhouse gas, yet it is also an important raw material in many industrial sectors. We offer intelligent technologies to reduce carbon dioxide emissions, benefiting both the environment and plant operators. Our CO₂ recovery plants offer the most efficient way to produce high purity CO₂, e.g. from flue gas. This can be used, in breweries, chemical plants or in the production of dry ice, etc.

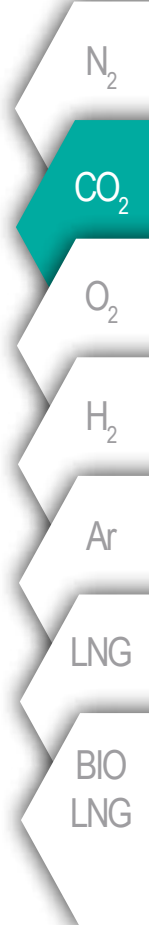
PROCESS DESCRIPTION

At the beginning of the CO₂ recovery process, the raw gas is pretreated according to pressure, temperature and composition. The pretreatment includes cooling the raw gas and removing solids as well as odorant and flavor substances. The CO₂ is then compressed, dried and further purification steps are carried out depending on the impurities in the raw gas. Finally, the CO₂ is liquefied and possibly further purified to remove traces of non-condensable gases. These process steps produce a high-purity liquid carbon dioxide that meets the requirements of the food industry. The liquid CO₂ is then temporarily stored in storage tanks.

Our CO₂ liquefaction plants are highly automated, to ensure continuous production of high-quality CO₂.

SOURCES OF RAW CO₂ GAS

- Separation from industrial / fuel gases
- Separation from combustion gases of power plants, hydrogen production, synthesis gas production
- Incinerators for associated gas from „Enhanced Oil Recovery“ applications in oil and gas exploration
- From natural sources
- From dry ice production
- From fermentation process in breweries / distilleries
- From biomethane production (CO₂ removal)
- From methanation process of synthetic natural gas production (SNG)



TECHNICAL DATA

CO₂

CAPACITY	150 - 15,000 kg/h (further capacities on request)
PURITY	99.5 - 99.999 Vol. %
PRESSURE	≥ 15 bar g



BENEFITS & CHARACTERISTICS

In-house engineering & manufacturing

Our CO₂ plants are designed, engineered and manufactured at our site in Würzen. They are also subjected to the highest quality and functional tests in our production facility..

Optimal solutions & design

We supply all services from a single source. All components are optimally matching and work to the highest efficiency.

Pre-Assembly

The CO₂ plants can be erected pre-assembled on base frames or in containers and are suitable for indoor and outdoor installation. The prefabricated units enable a shortened assembly / commissioning time on site.

High Automation

Our carbon dioxide plants are fully automated. Even after commissioning and staff training, our engineers are at your side, for example by remote access.

With our competitive plant solutions, we guarantee efficient plant operation and high product purity.

References

CCK 15,000



CO₂ purification plant with a capacity of approx. 15,000 kg/h high quality CO₂

Location: Baku, Azerbaijan

Services:

- Basic & Detail Engineering
- Equipment Delivery
- Supervision of Construction
- Commissioning/ Start-Up
- Training

CTK 350



CO₂-Liquefaction plant for the production of 350 kg/h LCO₂

Location: Germany

Services:

- Consulting
- General Engineering
- Equipment Delivery
- Project Management
- Commissioning / Start-Up
- After Sales / Service

CBK 800



Recovery Plant for purification and liquefaction of CO₂ exhaust gas from BIOGAS Upgrading plants with a capacity of 850 kg/h

Location: Italy

Services:

- Consulting
- Pre-Engineering
- Basic / Detail Engineering
- Plant Delivery
- Project Management
- Operation Start-Up
- After Sales Services

N₂CO₂O₂H₂

Ar

LNG

BIO

LNG

Liquefaction Plants

With our vast experience & know-how with cryotechnology we offer liquefaction plants for various gases, e.g. natural gas, carbon dioxide, organic methane, boil-off gas. The basic steps are generally cleaning, drying and liquefying.

Our liquefaction plants are designed, engineered and manufactured in-house as containerized or modular solutions - MADE IN GERMANY. We offer all services from a single source, this includes peripheral systems such as electricity and cooling water supply. We also offer filling station solutions and storage systems (bunkering) for LNG-powered trucks, buses, cars or ships.

LNG LIQUEFACTION AS AN EXAMPLE

LNG is the sustainable and economically feasible alternative to diesel fuel and has a very high energy density. In the field of LNG, we offer a full range of services - including liquefaction plants, filling stations or re-gasification plants.

Natural gas (NG) is transported from a pipeline to an LNG liquefaction plant, where the gas is firstly dried and purified. After liquefaction the gas can be stored. Semitrailers and / or ISO containers are used to deliver the stored LNG to decentralized locations. Through re-gasification of LNG (satellite stations) into NG, the gas can be fed into the local grid for power generation or gas supply. In this way, even the most remote regions can be efficiently supplied with cheap natural gas.

TECHNICAL DATA

- Our typical plant sizes for natural gas (LNG) liquefaction plants are between 1,000 and 10,000 kg/h.
- The drying and cleaning stages are designed individually. If you have any questions, please send us your gas analysis.

OUR SOLUTION ALSO APPLIES TO BIO-LNG!

Bio-LNG can be produced, e.g. from organic methane at organic gas plants.

ADDITIONAL SERVICES



- Desulphurization
- Drying / CO₂ separation
- Compression
- Separation of propane / butane (LPG)
- Storage and filling

N₂CO₂O₂H₂

Ar

LNG

BIO

LNG

BENEFITS & CHARACTERISTICS

Made in Germany

We plan and produce our liquefaction plants directly at our site in Wurzen. We also carry out the necessary functional and quality tests based on the applicable standards and guidelines. All our services come from one source, MADE IN GERMANY. In this way, we ensure that all components mesh optimally and work with great efficiency.

Pre-Assembly

The liquefaction plants can be pre-assembled on base frames or erected in containers. They are suitable for indoor and outdoor installation. The prefabricated units ensure shorter assembly and commissioning times on site.

High Automation

Our plants are fully automated. Using a gas turbine / CHP unit these can be operated also self-sufficiently. In addition to cooling with water, the plant can also be cooled with air.

After-Sales-Service

Furthermore, we offer a large portfolio of services, even after commissioning and staff training. For example, our engineers can continue to support remote access.

With our competitive plant solutions, we guarantee a highly efficient plant operation.



References

LNG 1,500



Production plant for liquid gas with a capacity of 1,500 kg/h

Location: Chabarovsk, Russian Federation

Services:

- Basic & Detail Engineering
- Manufacturing
- Equipment Delivery
- Supervision of Assembly
- Commissioning
- Training

LNG 1,500



Plant for the production of Liquid Natural Gas (LNG)

Location: Perm, Russian Federation

Services:

- Basic & Detail Engineering
- Manufacturing of Equipment
- Supervision of Assembly
- Commissioning / Start-Up
- After-Sales-Services

SATELLITE STATION



LNG-Satellite stations for the regasification of LNG with a max. capacity of 60 Nm³/h

Location: Germany

Services:

- Consulting
- General Engineering
- Equipment Delivery
- Start-Up

N₂CO₂O₂H₂

Ar

LNG

BIO
LNG

Special Applications for Technical Gases

Our experience with cryogenic plant construction are implemented successfully outside the world of air separation.

Resource scarcity increases demands for environmental protection and energy optimization. To achieve this, the purification of special gases and energy storage in the form of gases play an increasingly important role. We are not only your partner for standard gases but also for special gases. We deliver tailor-made plants which suit all of your requirements.

One example is our solution for energy storage. Natural gas and hydrogen are two important gases that are used for energy storage due to their high energy density. Liquefied air and CO₂ can also store energy. We offer solutions based on our years of experience & know how at cryogenic technologies.

ENERGY STORAGE & HANDLING

Hydrogen Handling

Hydrogen is produced by electrolysis. The hydrogen produced is dried, cleaned and compressed. The gas, now in liquid form, is an ideal energy store. Hydrogen can be used as a fuel.

Liquid Air Energy Storage (LAES)

Depending on local conditions, liquid air storage can be used as an energy storage option. In a subsequent re-gasification step, the liquid air can be used to cover required energy peaks.

N₂CO₂O₂H₂

Ar

LNG

BIO
LNG

HANDLING OF SPECIAL GASES

For many industry branches the use of special gases with high requirements on purity and plant safety is necessary. We develop suitable cost-effective solutions for our customers. In some cases, completely new engineering and manufacturing are required for such special applications. Thanks to our experienced employees and cooperation with universities and research institutes, we are the ideal partner for challenging applications.

Tanks, filling and distribution plants for special gases such as monosilane are a specialty of CRYOTEC Anlagenbau GmbH. We are the leading supplier of such plants in the semiconductor industry.



SPECIAL PLANTS FOR TECHNICAL GASES & NOBLE GASES (E.G. FOR HELIUM GAS)



Helium Purification Plants

Gaseous helium will be purified and reused in a process through various process steps, such as freezing.

Helium Liquefaction Plants

The industrial demand for helium is increasing. One possibility to extract this valuable noble gas is from boil-off gases (BOG), which is produced in LNG liquefaction plants and storage systems.

With our helium liquefaction plants, pure helium (99.999 %) can be obtained from this BOG.

References

MOBILE LOX PLANT



Mobile LOX Plant in two containers incl. cold box with a capacity of 15 Nm³/h

Location: Mobile
(climatic conditions -20°C to 50°C)

Services:

- Turn Key Realization:
 - ✓ General Engineering
 - ✓ Plant Delivery
 - ✓ Manufacturing
 - ✓ Commissioning
 - ✓ Training
 - ✓ Regular Maintenance

HEXANE LIQUEFACTION



Cooling unit for hexane liquefaction plant for a cooling capacity of 1,120 kW

Location: Middle East

Services:

- Consulting
- General Engineering
- In House Manufacturing
- Equipment Delivery

HELIUM PURIFICATION



Helium purification plant for reliquefaction

Location: Germany

Services:

- Engineering
- Design and Process Design
- Equipment Delivery

N₂CO₂O₂H₂

Ar

LNG

BIO
LNG

APPLICATIONS IN COUNTLESS BUSINESS FIELDS

N₂CO₂O₂H₂

Ar

LNG

BIO
LNG

Chemical /
Petrochemical
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Medicine &
Pharma-
ceuticals
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Industrial
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Metal
Processing /
Metallurgy
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Energy
Supply
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Food &
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Chemical / Petrochemical

In the chemical and petrochemical industry, oxygen (O₂) is used for a variety of oxidation processes. Nitrogen (N₂) is mainly used for inerting processes. As an inert gas (N₂) it is used for the safe storage of flammable liquids, as a protective gas during the annealing of metals and as a refrigerant in the cryogenic liquefied state (in industrial production).

COMBUSTION PROCESS



Many industrial processes, such as combustion or other chemical processes, produce large amounts of carbon dioxide. The resulting CO₂ can be used for other industry branches.

METHANE SUPPLY



In the chemical industry, methane is an important raw material for the production of basic chemicals such as methanol or for the manufacture of synthetic materials. We offer satellite stations for the chemical industry for methane supply. Oxygen (O₂) is used for a variety of oxidation processes. Nitrogen is mainly used for inerting processes.

One of our Specialties:
Modularization and Standardization for Flexible Production in the Chemical Sector

In our modern world, speed is key. This also applies to the plant construction sector with its various parameters. Time to market and short product life cycles are the key driver for a modern plant. Modularized and standardized plants allow an optimized production process with increased flexibility.

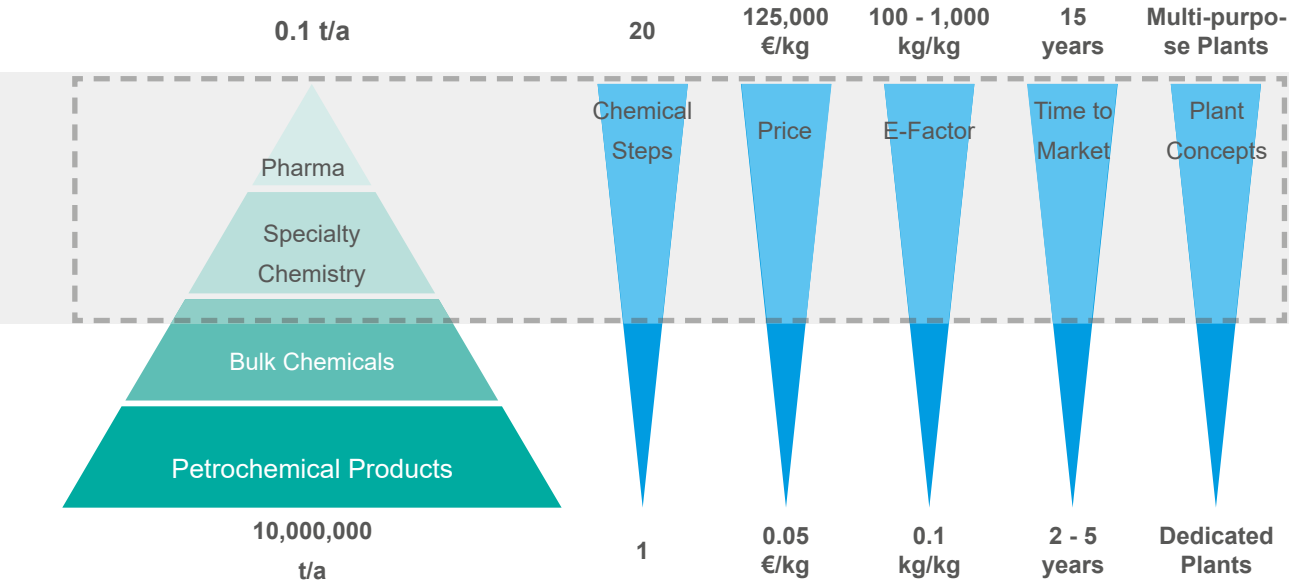
Within the EPC Group two exceptional expert companies have joined forces to plan and construct modular plants in the chemical industry providing well thought-out process and construction know-how in an innovative area. CRYOTEC Anlagenbau is not only a specialist for technical gases, but it is also well-experienced in the planning and construction of tailor-made modular plants, looking back on well over 10 years of experience. EPC Engineering & Technologies GmbH brings in great experience and expertise in the fields of chemistry, fine chemistry and pharmaceuticals.

OUR SERVICES INCLUDE

- Installation and commissioning
- Component production, skid construction
- Prefabrication of connecting pipelines and pipelines in transportable sections
- Manufacturing in our own workshop facilities
- Renovation, maintenance, repair and spare parts service
- Dismantling, relocation, conversion or extension



APPLICABILITY OF A MODULAR PLANT



Source: Schmalz D.; Dtenger F.; Brodhagen A.; Schweiger A.; Bieringer T.; Dreiser C.; Towards modularization and standardization of chemical production units: status quo, development needs and current activities, Dechema Praxisforum Future Production Concepts in Chemical Industry, April 27-28th 2016, Frankfurt.

Medicine and Pharmaceuticals

Special quality requirements apply to the use of oxygen (O₂) and nitrogen (N₂) in clinical applications and in the pharmaceutical industry.

PATIENT CARE



Oxygen is often used for patient care during medical treatment. Medical oxygen therefore has to be continuously available in hospitals. On the other hand nitrogen is required for cryosurgery.

For these applications, CRYOTEC supplies plants for the production of medical oxygen and nitrogen to the highest standards for patient care.

REFRIGERATION AND FREEZING



Liquid nitrogen is used for the cryogenic conservation of blood cells, egg and sperm cells and other biological materials.

Organs and blood reserves are kept cool in special containers during transport. An end-to-end cold chain shall be maintained for cooling these organic materials. This can be done with dry ice.



Industrial

AVIATION



Oxygen is used in civil and military aviation. Pure nitrogen is used for inflating tires and filling shock absorbers to enhance safety during take off and landing.

CRYOTEC designs and supplies oxygen and nitrogen plants for these purposes and other applications. Producing the gases on-site ensures a constant security of supply, that is independent from external gas suppliers.

FIRE PROTECTION



Nitrogen (N₂) serves as an inert gas to prevent fires and explosions.

Carbon dioxide, argon, and nitrogen are among other gases used in modern fire extinguishing systems. The benefits of using these gases is that water ingress during extinguishing is avoided. Equipment and functionality are not damaged. Nitrogen also serves as an inert gas to prevent fires and explosions. Carbon dioxide is an important component of modern extinguishing systems and fire extinguishers. In particular, carbon dioxide has gained acceptance in fire fighting of electrical control rooms.

DRY ICE BLASTING



CO₂ dry ice is an excellent abrasive for industrial blasting. This enables sensitive surfaces, for example, to be gently cleaned. This minimal abrasive process is environmentally friendly as no hazardous or toxic chemicals are used. CO₂ pellets are becoming increasingly important as a residue-free abrasive for a wide range of industrial cleaning processes.

Metal Processing / Metallurgy

METALWORKING / METALLURGY



Oxygen (O₂), nitrogen (N₂) and argon (Ar) are of great importance in the metalworking industry. Oxygen is mainly used for oxyacetylene welding, flame cutting and laser cutting as well as for melting processes. Nitrogen is used in bright annealing processes and in liquid form in shrinking technologies. Argon is mainly used as an inert gas during welding, but also in metal melting processes.

The construction of plants for generating oxygen, nitrogen and argon is a core competence of CRYOTEC. Decades of experience and engineering at the highest level guarantee technically reliable solutions.

The installation of an on-site air separation plant enables the required technical gases (O₂, N₂, Ar) to be produced without independent of external suppliers.

WELDING / SHIELDING GAS



The use of carbon dioxide in welding technology is widespread. Mixed gases containing CO₂ are also becoming increasingly important here. In addition to carbon dioxide cleaning and liquefaction plants, the scope of supply also includes gas mixing plants and filling plants.

Transportation

LNG FILLING STATIONS



LNG is the fuel of the future for heavy-duty and long-haul traffic. It has a high energy density, it is a clean fuel (low emissions of sulfur, soot particles, nitrogen oxides, carcinogens) and improves air quality. In addition, LNG contributes to the reduction of greenhouse gas emissions and fulfills the requirements of Euro-norm VI. LNG-powered vehicles can reduce noise emissions as compared to diesel vehicles. This makes LNG especially useful in the city center. A combination of LNG / L-CNG filling stations is an efficient option to serve a wider range of vehicles.

SHIPPING INDUSTRY



Many ports nowadays have emission limits in place to improve air quality in neighboring cities. In the shipping industry, liquefied natural gas is therefore manifesting itself as an alternative propulsion fuel.

We develop and construct LNG tank farms and filling stations for the maritime sector.

ALTERNATIVE FUEL



Energy from hydrogen: In transportation, hydrogen is an environmentally friendly and valuable fuel. With our plants hydrogen can be moved around safely.

Energy Supply

SATELLITE STATIONS



Natural gas is gaining importance for energy supply. Diesel-powered back-up generator systems can be replaced with LNG satellite stations. Switching to LNG energy supply enables energy to be generated with low-emissions. CHP plants as well as power plants burn natural gas with very low residues. LNG eliminates the need to connect to a pipeline as the satellite station is refilled by a tanker. Alternatively, a LNG infrastructure can also be planned as a back-up system for large gas turbine power plants.

FILLING STATIONS



LNG filling stations are designed primarily for refueling buses and trucks. Long-distance buses, trucks and public transport all benefit from clean combustion and lower costs. LNG is also an interesting way of significantly reducing costs in the municipal sector, for example for waste disposal and delivery traffic. Noise and emissions can be reduced at the same time. LNG is increasingly being used as a fuel in shipping. The shift towards low-emission LNG is not only taking place in freight transport, but also in passenger transport.

SUPPLY SYSTEMS



Constant supply systems ensure a completely self-sufficient power supply. The entire required power is derived from LNG.

Peak load systems are designed to compensate for supply bottlenecks during peak load periods (winter, increased production, etc.).

Reserve systems / emergency systems are designed to ensure the continued operation of plants in the event of a power failure or gas supply failure.

BOIL-OFF GAS TREATMENT



LNG storage produces boil-off gas, which can be harnessed with our solutions. This boil-off gas can be reliquefied and returned to the LNG tank or converted into electrical energy.

ENERGY STORAGE



Energy from hydrogen

In times of an oversupply of energy, this excess energy can be stored in the form of hydrogen. In turn, hydrogen can be used as an energy source to cover peak loads. Hydrogen can be used as a fuel in transportation as well.

LAES – Liquid Air Energy Storage

Liquid air is a storage form of excess energy which can be fed back into the supply network at peak load times.

Agriculture

PLANT FERTILIZATION



Plants need carbon dioxide to grow. The enrichment of the greenhouse atmosphere with carbon dioxide promotes this process and increases production. The carbon dioxide supplied acts as a fertilizer. It is obtained or recycled from various sources, such as factories and combined heat and power plants, breweries or organic gas plants.

PRODUCE STORAGE



Carbon dioxide is also used for optimal storage of fruit and vegetables in warehouses. The monitoring and control of the CO₂ concentration as a component of fruit and vegetable storage ensures the optimal quality of the products.

ORGANIC CO₂



The carbon dioxide from organic gas plants is often utilized. With our technologies it is possible to extract the unused carbon dioxide and reprocess it for other purposes (as fertilizer in greenhouses, food industry). The repurposing and monetization of CO₂ separated from organic gas and liquid organic methane increases profitability and improves environmental balance.

PREPARATION OF ORGANIC LNG



The liquefaction of organic methane from organic gas plants is an excellent way to store and release energy. The liquefaction process allows organic methane to be stored and transported to the end consumer. This results in new utilization concepts and possibilities to operate an organic gas plant cost-effectively. The environmental balance can be improved by adding organic methane to fossil natural gas. The organic gas can be purified to natural gas quality, in order to be fed into the natural gas network.

Food and Beverage Industry

Carbon dioxide is odorless and tasteless. These properties make it ideal for use in the food industry. For example as soda for beverages, for the manufacture of dry ice for cooling food and beverages and for food and pharmaceutical quality according to EIGA standard (European Industrial Gases Association) or Coca-Cola standard.

BOTTLING OF BEVERAGES



Carbon dioxide is produced as raw gas in fermentation processes. With the recovery plants of CRYOTEC Anlagenbau GmbH this raw gas can be collected, cleaned and liquefied.

The processed carbon dioxide is used in the food and beverage industry. Carbonated beverages are more taste-intensive and have a longer shelf life because carbon dioxide prevents the growth of microorganisms.

BREWERIES



The recovery of CO₂ from fermentation processes is particularly suitable for the manufacture of food grade CO₂. Large breweries recover this CO₂ via gas scrubber systems.

PACKAGING



Today, many foods are packaged in a protective gas atmosphere. For food manufacturers, this is a way to extend their shelf-life without changing their characteristics or taste.

Various mixtures of nitrogen, carbon dioxide and argon are used as protective gas.

Liquid nitrogen (approx. -196 °C) and carbon dioxide (as dry ice snow approx. -78 °C) are versatile refrigerants and are characterized by their wide performance range. Due to their high cooling energy, they are indispensable especially in the food industry.

COOLING



Odorless and tasteless carbon dioxide and nitrogen are used in the food industry for preservation, cooling and freezing. In order to preserve the taste, appearance, ingredients and quality of foods, they are shock frozen using a special process with cryogenic nitrogen.

The cooling of food, using dry ice from CO₂, offers a considerable benefit over conventional cooling methods. Dry ice in the form of blocks or pellets evaporates completely residue-free and thus does not provide a breeding ground for bacteria. Dry ice is widely used in restaurants and catering to cool food and drinks.

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