

The Complete CO₂ Solution

ascoco2.com



Editorial

“All about CO₂” – Actually, our credo says it all: At ASCO, we are exclusively committed to this specialty gas in all its facets and variations. In more than 130 years, our technical experience has grown out from our customers’ needs and market requirements. Based on this knowledge in the recovery, production and application of CO₂ and dry ice, we create added value for our customers.

Innovation is the key for our mutual success in the future. This means more than just the development of new products: We focus exclusively on the individual requirements of our customers. In addition to technologically advanced machinery and equipment, our product range includes special-purpose-projects, security concepts, training and consulting – simply all the components to bring a CO₂ project to a successful conclusion.

Personally, I am convinced that our combination of innovations in product performance and service brings a competitive advantage to our customers. We look forward to playing our part to ensure you reach your goals.



Marco Pellegrino, Managing Director / CEO



All about ASCO

Competence in the CO₂ market

The Swiss company ASCO CARBON DIOXIDE LTD is a global company and provides complete solutions in the field of CO₂ and dry ice.

We know the needs of the CO₂ market because we have served customers for decades and this results in a wide-ranging basis of knowledge in every area. We have a global network in the range of sales and technology. Our product portfolio includes CO₂ Production and CO₂ Recovery Plants, Dry Ice Blasting Equipment, Dry Ice Production Machines, as well as CO₂ Cylinder Filling Systems, CO₂ Vaporisers and finally CO₂ Storage Tanks, CO₂ Dosing Systems for Water Neutralisation and other CO₂ and dry ice equipment. Thanks to this broad range of products, our customers benefit from having a one-stop provider of individual, complete CO₂ solutions.

Innovative in developing

Our research and development team is constantly working on new concepts to find the best solution for you.

Our main focus lies on the benefits for our customers and this is why we are committed to ensure contemporary and innovative products, latest technologies for highest quality products and seamless workflows. Your economic and technological objectives are our mission.

Experienced and field-tested

Since 1883 we have developed strongly: We have come from being mineral water producers to gas producers and distributors to specialists for dry ice and plant engineering.

Our product portfolio is based on the expertise of over 130 years of practice in the field of CO₂ and dry ice. During this time, we have recognised that only a continuous development and improvement of products ensures our future and the success of our customers.

Globally networked

Since 2007 we belong to the international industrial gas enterprise Messer Group and we are the competence centre for CO₂. The merger with the German BUSE Gastek GmbH & Co. KG, headquartered in Bad Hönningen, in 2014 allowed us to focus and substantially expand our expertise and product portfolio, especially on the complex field of CO₂ recovery.

We have production and operating facilities as well as development/service centres in Switzerland, Germany and France. The administration incorporating the areas Sales, Marketing/Communications, Customer Service, Finance and Development of Dry Ice Technology is based at our headquarters in Romanshorn, Switzerland.

The operating facility at Bad Hönningen, Germany, houses the Production of the CO₂ Production and CO₂ Recovery Plants, Project and Process Engineering as well as the Central Warehouse for Spare Parts and Equipment.

The Swiss operating facility in Eschlikon produces dry ice production equipment and all dry ice blasting equipment.

In cooperation with the Customer Service and Engineering in Romanshorn, our French location develops new products and offers services.



More information about ASCO:
ascoco2.com

All about CO₂

What is carbon dioxide?

Carbon dioxide or CO₂ is an odourless, inert gas and approximately 1.5 times heavier than air. Usually, about 0.03 percent of the earth's atmosphere is composed of CO₂. It is also found in great quantities in volcanoes, earth cracks, other sources and in the metabolism of plants, animals and human beings.

Moreover, CO₂ is a by-product of various industrial processes from which it can be recovered. CO₂ is stored in storage tanks.

Carbon dioxide exists in:

- gaseous form (for the beverage and food industries)
- liquid form (in a storage tank under pressure)
- solid form (called dry ice for blasting, cooling etc.)

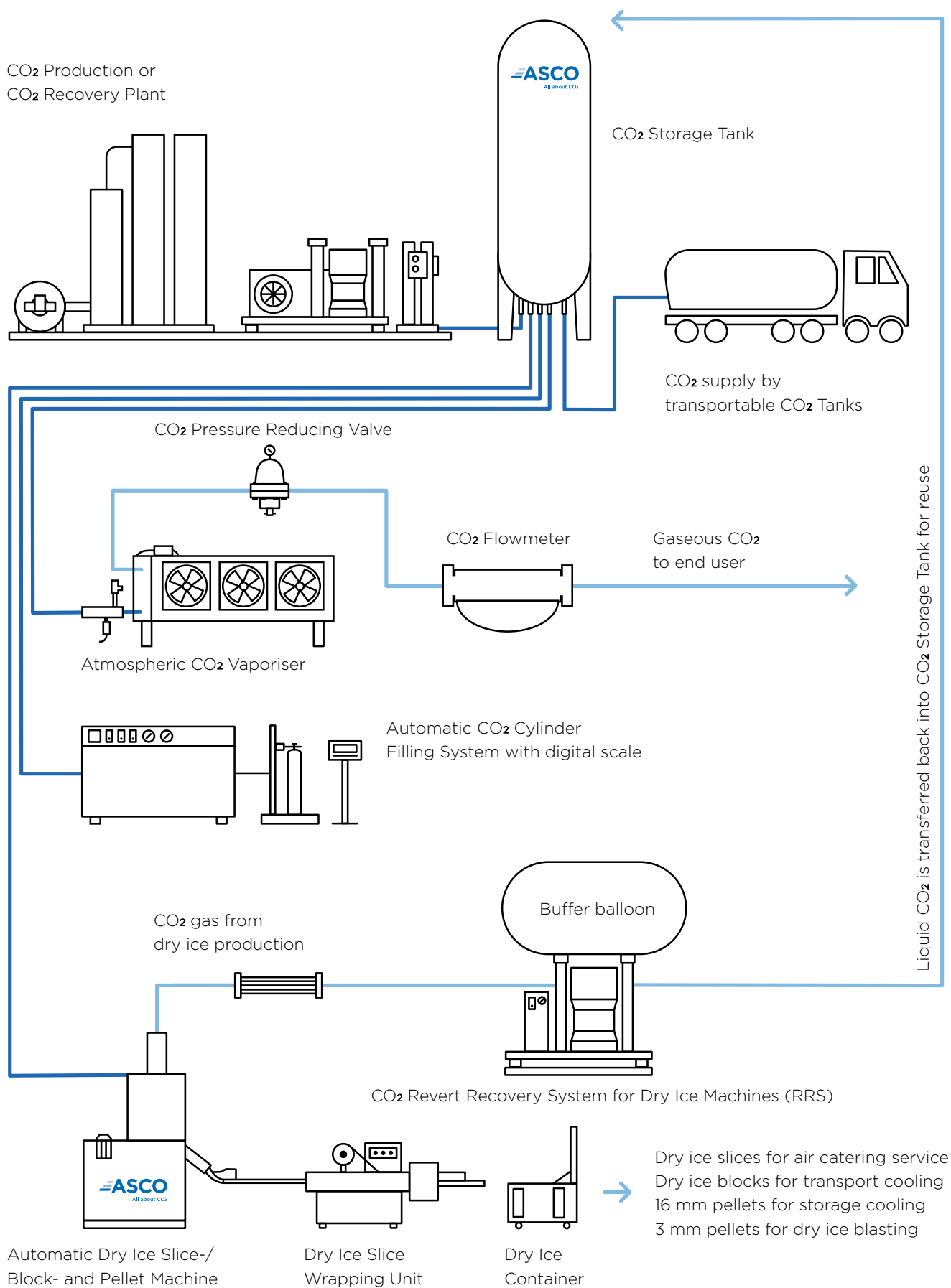
Typical CO₂ applications:

- carbonisation of beverages
- dry ice blasting
- transport cooling
- catering (e.g. airline-catering)
- treatment of drinking water

What is dry ice?

Dry ice is the name for solid CO₂. At atmospheric pressure it has a temperature of approx. -79°C. Dry ice is produced from 100% liquid CO₂. The dry ice pelletizer “relaxes” the dry ice under controlled conditions and thus dry ice snow is produced. This dry ice snow will be pressed to round, hard pellets by an extruder plate or press chamber. Dry ice is non-toxic, non-flammable, inert, taste- and odourless.

Dry ice is an ideal cooling device which can be used for many applications. It has a high cooling capacity. Dry ice blocks/slices or dry ice pellets are used for cooling purposes, while dry ice pellets are also used for dry ice blasting.





Plant Technology

Innovative and reliable

Our innovative engineering team covers all market needs around CO₂ Production and CO₂ Recovery Plants.

Using the latest plant technology, we offer our customers the highest level of reliability to produce and recover profitable and competitive, high purity carbon dioxide for industrial and food applications.

Of course, all systems and plants are adapted to your individual needs because ASCO Process Engineering develops tailored solutions.

Comprehensive offer

We offer plant solutions for very different CO₂ sources: natural sources, stack gas from combustion of fossil fuels, breweries and other fermentation processes, exhaust gases from ammonia production, hydrogen reforming or ethylene oxide production and many other industrial sources.

Experienced and successful

Our system experts have decades of knowledge in the highly complex field of CO₂ production and CO₂ recovery.

Countless customers are using ASCO plants successfully all over the world.

By investing in an ASCO plant, you choose maximum efficiency and independence from external CO₂ supply.

Sectors/Industries

We supply all different industries worldwide. These include:

- beverage industry
- industrial gases
- chemical industry
- pH neutralisation used together with desalination plants
- dry ice production
- stack gas recovery
- pressure treatment



More information about Plant Technology:
ascoco2.com → CO₂ Production and CO₂ Recovery Plants

Plant Technology for CO₂ Recovery from High-purity Sources

With an ASCO plant for CO₂ recovery from sources with a purity of over 90 percent you invest in a sustainable, environment-friendly and future-oriented all-in-one concept. When needed, preliminary purification stages and finishing processes, such as liquefying and compression of CO₂ are fully integrated.

CO₂ By-Product Recovery Plants (BPR)

We offer customised solutions for CO₂ recovery from different exhaust fumes. These are produced, for example, in brewing and other fermentation processes (e.g. ethanol operations, distilleries or wineries) and other industrial sources (e.g. ammonia production, hydrogen reforming or ethylene oxide production) or natural sources (e.g. fumaroles).

CO₂ Revert Recovery Systems for Dry Ice Machines (RRS)

With an ASCO CO₂ Revert Recovery System for Dry Ice Machines most of the CO₂ which would be lost in the dry ice production can be recovered. This reduces dry ice costs by up to 50 percent.

Advantages of CO₂ recovery from high-purity sources:

- independent CO₂ supply
- cost-effective alternative to conventional CO₂ production or purchase of liquid CO₂
- resale of CO₂ to end customers



More information about Plant Technology:
ascoco2.com → CO₂ Production and CO₂ Recovery Plants





Plant Technology for Combustion Processes

We offer two advanced plant technologies for the production or recovery of high-quality CO₂ generated during combustion processes. The CO₂ obtained fully complies with the specifications of the ISBT (International Society of Beverage Technologists).

CO₂ Stackgas Recovery Plants (SGR)

Thanks to the innovative ASCOSORB technology ASCO CO₂ Stackgas Recovery Plants are able to recover the CO₂ from vent flue gas generated by combustion processes in an energy-efficient way.

CO₂ Production Plants (CPS)

This self-sufficient plant for CO₂ production produces high quality, gaseous CO₂ by burning diesel, kerosene or natural gas.

ASCO CO₂ Production Plants are compact, simple to maintain and work fully automatically.

Advantages of a CO₂ Production Plant (CPS):

- in-house CO₂ production on demand
- no logistic and transport costs
- independent CO₂ supply
- in-house CO₂ quality control

Advantages of a CO₂ Stackgas Recovery Plant (SGR):

- reliable source of CO₂ for the end user
- cost-effective alternative to conventional CO₂ production or purchase of liquid CO₂
- the ASCOSORB technology brings a tremendous reduction in total energy usage offering greatly reduced OPEX
- reduced solvent consumption



More information about Plant Technology:
ascoco2.com → CO₂ Production and CO₂ Recovery Plants

ASCOJET Dry Ice Blasting Technology

Technology

ASCOJET Dry Ice Blasting means powerful and gentle cleaning of all kinds of surfaces.

Dry ice pellets are accelerated and fired on the dirty surface where they cause a punctual thermal shock through which the coating that is to be removed shrinks and separates from the base material. The subsequent pellets and the resulting kinetic energy bring the contamination to flake. The pellets turn into a gaseous state as soon as they hit the surface, leaving it clean and dry. What remains is only the detached contamination. The environment-friendly and dry cleaning method causes no residue of blasting material and does not require dismantling of installations.

Application areas

The ASCOJET Dry Ice Blasting Technology removes every material which strongly reacts to differences in temperature. Paint, varnish, adhesive, oil, wax, residues in bakery, bitumen, synthetic residues and foams, release agent etc. are removed easily without damaging or altering the surface.

The ASCOJET technology has been used very efficiently for decades. Amongst others in industries such as:

- Foundries
- Plastic industry
- Rubber industry
- PU (polyurethane) production
- Food industry
- Printing industry
- Maintenance / cleaning industry

Extensive industry expertise

Decades of experience in dry ice blasting and a highly motivated team have brought us in the dry ice blasting technology to where we stand today: We are the specialists when it comes to introduce or optimise dry ice cleaning in your company. Our ASCOJET Dry Ice Blasting System offers a one-stop service for individual all-in-one solutions.

Range overview

We offer a wide range of blasting units for different applications:

- **ASCOJET Dry Ice Blasting Units**
Pure dry ice blasting with dry ice pellets for an extremely gentle and powerful cleaning of surfaces.
- **ASCOJET Dry Ice Blasting Units with additional additive**
Optimal combination of gentle cleaning with dry ice pellets and the additional abrasive effect of an additive.

ASCOJET - Gentle. Powerful. Cost-saving. Unique.

ASCOJET is a cleaning method that is tailored to your individual needs – for more quality and flexibility in the daily working process.



More information about
ASCOJET Dry Ice Blasting Technology:
ascoco2.com → Dry Ice Blasting





ASCOJET Dry Ice Blasting Technology

Individual blasting solutions

In the dry ice blasting market we specialised in providing individual and complete solutions for specific customer needs. Such individual solutions can start with a single blasting unit and go further to in-house dry ice production, CO₂ delivery or special projects like noise control booths or automation projects which increase the quality and flexibility in the working process.

Dry ice logistics

The better the quality of the dry ice, the better the blasting results. For this reason, we deliver top quality dry ice in selected markets or we develop in cooperation with you an individual system solution for in-house dry ice production. In-house dry ice production turns out to be economical at a quantity of several hundred kg per week.

Advantages of ASCOJET technology:

- gentle
- dry
- non-abrasive
- cost-saving
- no dismantling of moulds is required
- no secondary waste
- ecologically friendly

Advantages of an in-house dry ice production:

- just-in-time production
- constant cleaning results
- less logistical effort
- around-the-clock availability
- best possible dry ice quality



More information about
ASCOJET Dry Ice Blasting Technology:
ascoco2.com → Dry Ice Blasting

Dry Ice Production

Technology

ASCO Dry Ice Production Machines convert liquid CO₂ quickly and economically into dry ice.

For decades, numerous satisfied clients worldwide have been using our wide product range. We provide expert advice as to which model will meet your requirements best and can be integrated individually into your production process on-site.

Application areas

Dry ice can be used in very different sectors, such as:

- transport refrigeration
- refrigeration of food, pharmaceutical products
- catering sector
- blast cleaning with dry ice pellets
- reseller

Extensive industry expertise

From dry ice production to the right packaging, efficient CO₂ recovery as well as the optimal storage: We provide complete all-in-one concepts for the development and expansion of an own in-house dry ice production.

Our product range

We offer a wide range of dry ice production machines with different production capacities:

- **ASCO Dry Ice Pelletizer** for the production of dry ice pellets in different sizes
- **ASCO Dry Ice Block Machine** for the production of dry ice blocks in different sizes
- **ASCO Dry Ice Reformer** for the production of dry ice blocks in various sizes by compressing dry ice pellets



More information about
Dry Ice Production:

ascoco2.com → Dry Ice Production





Dry Ice Production

Customised solutions

We want to find the best possible solutions for our customers and therefore we develop customised products on demand. Frequently, these solutions become part of our standard product range which has the positive effect that customers save respective development costs.

Individual all-in-one concepts

Decades of experience in this field have taught us one thing: Having the right quantity of dry ice at the right time means a maximum of quality and flexibility in the daily working process and leads to remarkable cost savings.

We are specialised to support our customers in building complete dry ice production centres. So we take care not only of the production of dry ice, but also of the packaging and the recovery of CO₂. We also advise our customers on the correct storage and logistics of dry ice and offer solutions for room monitoring.

Advantages of an in-house dry ice production:

- reproducible quality
- just-in-time production
- less logistical effort
- less dry ice loss due to sublimation
- more flexibility as you always have freshly produced dry ice at your disposal
- better cleaning results (the better the dry ice quality, the more effective the cleaning)
- less dry ice consumption
- shorter production standstills

Together with our dry ice experts you can develop your personalised all-in-one concept – for greater cost effectiveness and more efficient production processes.



More information about
Dry Ice Production:
ascoco2.com → Dry Ice Production

Dry Ice Production: A one-stop service

In selected markets, we offer a convenient and reliable full service when it comes to CO₂ and dry ice supply. In addition, we provide you with cost-effective all-in-one concepts on a rental basis which can be realised without making major investments. The supply of CO₂ will be arranged automatically. Our CO₂ solutions will meet your dry ice requirements.

Dry ice supply

Depending on requirements, we provide you with dry ice in blocks and slices in various sizes and pellets with different diameters in adequate insulated dry ice boxes.

CO₂ supply and in-house dry ice production

For your own in-house dry ice production, a dry ice production machine, a CO₂ storage tank and liquid CO₂ are needed. For that reason, we have a variety of dry ice production machines with different production capacities and CO₂ storage tanks in various standard sizes. The CO₂ supply is carried out automatically.

Rental concept

We provide customers with a higher demand of dry ice with complete supply devices for dry ice production on a rental basis. Such a concept also consists of a dry ice production machine, a CO₂ storage tank and the supply of liquid CO₂ inclusive service contract.

This is how it works:

You provide us with the necessary rooms and run the plant. We take care of your whole dry ice production plant. This enables you to fully concentrate on your core business and still enjoy freshly produced top quality dry ice. Of course, the dry ice production plant can be easily adapted as your needs change.

Focus on your core competence – We do the rest.



More information about Dry Ice Production:
ascoco2.com → CO₂ and Dry Ice Logistics





CO₂ Equipment

According to our credo “All about CO₂” we provide, in connection with CO₂ and dry ice, a wide range of CO₂ accessories – simply everything you need for a successful realisation of your CO₂ project.

CO₂ Storage

We offer a variety of high quality CO₂ Storage Tanks in various capacities for liquid CO₂ and other liquefied cryogen gases (Nitrogen, Oxygen, Argon).

Additional CO₂ Accessories

Our range of services extends from CO₂ Cylinder Filling Systems, CO₂ Vaporisers to CO₂ Testing Equipment as well as CO₂ Gas Detectors.

Additional Dry Ice Accessories

Optimum dry ice logistics require optimum dry ice storage. We offer several ways to minimise sublimation loss and keep the dry ice in best condition. This applies both for the storage of dry ice pellets and dry ice blocks.

CO₂ Dosing Systems for Water Neutralisation

Wherever you need to have an exact quantity of CO₂ gas to be dosed, the ASCO CO₂ Gas Dosing System is the ideal solution. Typically, it is used together with water desalination plants. The pH value of desalinated sea water is kept neutral by adding dosed CO₂. This CO₂ dosing combined with the addition of mineral salt is an important factor in the preparation of drinking water from seawater.

CO₂ Pressure Treatment with PEX

With our modern PEX CO₂ Pressure Treatment we allow you active protection of stored products. It is the only alternative to the use of toxins for disinfestation with very short treatment times. Here, too, we offer customised solutions consisting of CO₂ supply device, CO₂ dosing, piping, pumps and autoclaves.



More information about
CO₂ Equipment: ascoco2.com → **CO₂
and Dry Ice Equipment**

Convincing in service

Our service does not end with a sale! We provide a highly motivated customer service to offer most professional support for your ASCO CO₂ products and CO₂ plants. Furthermore, we have a global network of sales partners and a range of offers and services that are tailored to your specific requirements.

ASCO has most spare parts on stock. This ensures a short delivery time to satisfy our customers. ASCO spare parts help you to get maximum efficiency of your ASCO CO₂ product.

We support our customers worldwide with training and comprehensive service packages and on-site support, beginning with the planning stage to a long-lasting partnership.



More information about our services:
ascoco2.com → Customer Service



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