



Nature reflected and respected by SIAD in the food industry



In the food industry the ability to supply high quality products, with characteristics which remain constant over time and over geographically disparate distances - and to do so efficiently - has become an essential factor in increasing profits and enabling the growth of businesses operating in the sector.

The gas applications which SIAD offers the market, in fact, cover each and every aspect of production within the food sector and can be applied to any type of activity; from packaging in modified atmospheres to deep-freezing, from cooling to temperature regulation of minced meat based foods and oven-ready products to the carbonating of drinks. For years now SIAD has not just been one of the market leaders supplying gases and gas mixtures for use in the food sector, but is also a trustworthy partner able to offer its clients efficient, innovative and turn-key technological solutions capable of improving crucial aspects such as the lengthening of shelf-life, and guaranteeing the quality and safety of products.

SIAD's ongoing commitment to the development of gas applications is a guarantee to its clients that they too will benefit from new and emerging technological solutions which always have productivity optimisation as their goal.

The use of food gases in production and packaging processes result in notable benefits such as those listed below:

- fresh products with superior organoleptic characteristics;
- longer shelf-life and consequent higher sales of the products concerned;
- higher production volumes for the same fixed costs;
- optimisation of productivity cycles;
- reduction in product losses through having to discard food products;
- superior quality and food safety levels;
- lower production costs;
- the ability to achieve greater reach and to extend market distribution.

GAS	PRODUCTION PROCESS
NITROGEN	<i>Deep-freezing, I.Q.F. freezing and Surface coating (Crusting)</i>
	<i>Cryogrinding</i>
	<i>Food packaging in a protected atmosphere</i>
	<i>Inertization and blanketing of storage tanks</i>
	<i>Inertization and pressurisation of spaces at the top of containers (nitrogen droplets)</i>
	<i>Stripping of Oxygen from drinkable liquids</i>
	<i>Deodorising edible oils</i>
	<i>Cryogenic freeze-drying</i>
CARBON DIOXIDE	<i>Pneumatic transportation of oxidisable ingredients</i>
	<i>Treatments for the disinfestation and fumigation of grain</i>
	<i>Food packaging in a protected atmosphere</i>
	<i>Carbonating water and soft drinks</i>
	<i>Refrigerated transport maintaining the cold chain</i>
	<i>Dazing sheep and pigs</i>
	<i>Extraction of oils, aromas and volatile food essences</i>
	<i>Fertiliser and carbonic manure in greenhouses</i>
	<i>pH control</i>
	<i>Cryocleaning of conveyor belts and moulds</i>
<i>Maintenance and cleaning of water wells</i>	
OXYGEN	<i>Oxygenation of fish farms</i>
	<i>Biofermentation</i>
	<i>Food packaging in a protected atmosphere</i>
	<i>Disinfestation and sterilisation with ozone (O₃)</i>
	<i>Biological treatment of wastewaters</i>
OTHER GASES	<i>Purification of water from industrial processes (O₃)</i>
	<i>Argon, in the wine-making industry and in food packaging</i>
	<i>Hydrogen, in the hydrogenation process for fats</i>
	<i>Nitrous oxide for food use</i>
	<i>Ethylene for ripening fruit</i>

Inertization of grain bins and storage tanks

Using nitrogen in storage tanks

To keep liquid foodstuffs (which are perishable or chemically oxidisable) safe, and over the long term, it is necessary to replace the reactive atmosphere, normally the oxygen present in air, with one which is chemically inert. To this end, “protecting” products stored in tanks with gaseous nitrogen is one of the most economic and safe methods and is, moreover, easy to implement. Using distribution plants specifically developed for the purpose by SIAD, nitrogen gas is pumped into storage tanks and released into the atmosphere (via dual purpose valves) so that the atmosphere inside the tank is always inert and maintained at a constant pressure.

Through the use of pressure reducers and relief valves, the system keeps a covering cap of nitrogen in the space at the top of the tank at a pressure which can be regulated between 0.02 and 0.03 bar which, apart from guaranteeing the best safety management for the plant and better chemical protection for the stored products, does not involve any manual operations on the part of staff working in the division.

Chemically, nitrogen is inert vis à vis the total gamut of food products and is, moreover, a gas which is relatively insoluble in liquids.

Using nitrogen gas for the inertization of storage tanks holding liquid foodstuffs is not only an economic choice, but is also a safe and flexible means of protecting the organoleptic and qualitative aspects of foodstuffs such as fruit juices, drinks, edible oils and fats and of perishable products in general.

Stripping of edible liquids

The presence of volatile contaminants such as oxygen, organic substances and water dissolved in liquid foodstuffs is an obstacle to obtaining high quality products and, in some cases, can compromise the efficiency of the plants in which they are produced and warehoused. This is a problem which is of fundamental importance in food industries where oils and fats, fruit juices, wines and drinks are produced.

In a concrete response to this market requirement, SIAD has designed nitrogen gas injection plants which are capable of eliminating undesirable, volatile contaminants. These plants mean that high purity levels can be achieved in liquid food products subjected to this treatment.

Liquid nitrogen in droplets

The operation of bottling foodstuffs generally carries, with it, a problematic qualitative and technological component. Through the installation of ad hoc plants to deliver specific doses of liquid nitrogen to bottling production lines, SIAD is able to solve some of the specific problems linked to the beverage industry and non carbonated mineral water, fruit juices and edible liquids in general. By inserting a drop of liquid nitrogen into each container before it is hermetically sealed it is, in fact, possible to greatly reduce the oxidising effect of the oxygen ordinarily present in the gap at the top of the container.

These processes also increase the mechanical resistance of the packaging material being used, thanks to the evaporation of the liquid nitrogen and the consequent increase in pressure formed inside the packaging.



FOODLINE® Gases and Technologies for food packaging



Gases have an important application in the food sector for the conservation of foods and, in particular, for the retention of the organoleptic characteristics of products such as aroma, colour, fragrance and the general appearance of the product. Applying packaging in a protected atmosphere, commonly referred to as MAP, is now quite widespread and to this end SIAD has devised a line of products, called Foodline®, which is capable of satisfying each and every specific requirement.

Gases and gas mixtures for food use

The Foodline® range uses gases devised specifically for food use (nitrogen, oxygen, carbon dioxide and argon) which, either individually or as components of a mixture, are introduced inside the packaging so as to increase the shelf-life of foodstuffs and dissolved in drinks to achieve the desired fizz. The function of these gases is to block, or at least greatly reduce, the enzymatic or biochemical deterioration of products, as well as that caused by natural bacteria present. Foodline® gases and gas mixtures are generally supplied in pressurised containers of 14 or 40 litres together with the relevant anti-contaminating equipment, which guarantee the quality of the packaged contents in compliance with the norms for the sector.



Why protective atmospheres should be used

Modified and controlled atmospheres are an essential adjunct to every packaging technique involving food products. Currently gases and gas mixtures are widely used in the packaging of the following foods:

- fresh pasta, gnocchi and tortellini;
- oven-ready products;
- coffee, spices and dehydrated products;
- meat and poultry;
- sausage type products;
- fruits and vegetables;
- fruit juices;
- still drinks;
- cheeses in general;
- pre-cooked foods;
- fish.

Apart from prolonging the period of time over which food products can be kept, protective atmospheres also provide other advantages such as cost savings due to a reduction in product deterioration and the resulting longer shelf-life of the product enabling better production planning.

PRODUCTS	RECOMMEDED PACKAGING GASES	STORAGE TEMPERATURE
Red meats (<i>pieces/slices</i>)	Food 20-22-23-28OX-30OX	0+3°C
Red meats (<i>minced</i>)	Food 1-22-28OX-30OX	0+3°C
Poultry	Food 2-20-22-25	0+2°C
Pressed meats	Food 1-20-22-23-30OX	0+5°C
Fish	Food 24-30	0+2°C
Dairy products	Food 1-20-23	1+3°C, ambient
Dry or dehydrated products	Food 1-20-22	Ambient
Fresh pasta	Food 2-20-22-23	0+5°C
Bakery products	Food 1-2-20	Ambient
Pre-cooked foods	Food 20-22	0+5°C, ambient
Vegetables	Food 1-20-22-25-30N	0+5°C, ambient
Wine, oil	Food 1	Ambient
Beer	Food 2-20	Ambient
Fruit juices	Food 1	Ambient

The effects of protective atmospheres

Using controlled or modified atmospheres with both perishables and non-perishables makes it possible to achieve positive results with the majority of food products. The right protective atmosphere means that deterioration of the product and the loss of its original characteristics can be slowed down. The gases and gas mixtures used in food applications will differ depending on the desired effect you seek to achieve. When the goal is to prevent oxidation and bacterial growth, it is necessary to eliminate oxygen from the packaging, substituting air with nitrogen or a nitrogen-carbon dioxide mix. When, on the other hand, fresh meat is being packaged it is necessary to retain a high percentage of oxygen to keep the product's fresh appearance and to slow down the growth of some bacterial strains. The most appropriate gases, as recommended by SIAD's technical staff, combined with the correct packaging materials, will notably prolong the shelf-life of the product and retain, unaltered, its organoleptic and nutritional characteristics.

The advantages of protective atmospheres

One of the most important benefits to be gained from using controlled atmospheres for food protection is the prolongation of the shelf-life of the product. The taste, aroma, fragrance and original appearance of the product are retained, unaltered, given that the correct atmosphere will notably reduce enzymatic and biochemical deterioration.

Other benefits are:

- cost savings due to a reduction in product deterioration;
- a lowering of operating costs resulting from the extension of storage life and consequent ability to improve product scheduling;
- increased sales thanks to a product's fresher appearance.



Legend: Packaging material abbreviations

LDPE: low density polyethylene	PVDC: poly-vinylidene dichloride
HDPE: high density polyethylene	PET: polyethylene terephthalate
LLDPE: linear low density polyethylene	PA: polyamide
PP: polypropylene	PAN: polyacrylonitrile
PVC: polyvinyl chloride	EAA: ethylene-acrylic acid
	EVOH: ethylene vinyl alcohol
	EVA: ethylene vinyl acetate
	PS: polystyrene

TYPE OF PACKAGING MATERIAL			
Functional properties	Trays	Protective film	Flexible bags
Rigidity	PS HDPE PP PVC PET PA (amorfo) PAN (Barex)	-- -- -- -- -- --	PP HDPE PA PET (bo) Paper Regenerated cellulose --
Mechanical strength (punctures, scratches)	-- -- --	PET PP PA	PET PP PA
Waterproof against steam vapour from water	PP HDPE PVDC PAN -- --	PP LLDPE PVDC PET Aluminium Metallic oxides	PP PVDC HDPE PET Aluminium Metallic oxides
Airtight to O ₂ and CO ₂	EVOH PVDC PA PAN -- --	EVOH PVDC PA PET Aluminium -- Metallic oxides	EVOH PVDC PA PET Aluminium Regenerated cellulose Metallic oxides
Sealing options	EVA EAA LLDPE COPOL. PP/PE --	EVA EAA LLDPE COPOL. PP/PE Acrylics (lacquers)	EVA EAA LLDPE COPOL. PP/PE Acrylics (lacquers)

Dedicated food containers from the FOODLINE® range



The system for the preparation and manufacture of containers for the Foodline® range has been developed to ensure and guarantee maximum quality and integrity for the food gases and gas mixtures, which are prepared in strict accordance with the most recent European standards and guidelines:

- cylinders and cylinder bundles for exclusive use with foodstuffs;
- chrome-plated metallic valves with residual pressure systems to ensure gas quality;
- gas and vessel guarantee - seal of integrity;
- identification label for the product and manufacturing batch.

Hygiene and compliance with HACCP norms

To comply with the ever growing increase in controls and the on-going development of regulations for the food sector, SIAD has incorporated ISO 9001 into its own quality management system, i.e. the rules and management procedures, which deals with the topic of HACCP with regard to hygiene in food production.

All SIAD production plants adopt a self-imposed hygiene control system for the production of gases and gas mixtures destined for food use.

SIAD is able to guarantee that its gases and gas mixtures, destined for food use, are hygienically suitable and organoleptically unquestionable from a health and product conformity perspective by using production line, sensory, instrumentation, and certified documentation control techniques.

	COMPONENT GASES				RESIDUAL PRESSURE VALVE GROUP	
	NITROGEN E941	CARBON DIOXIDE E290	OXYGEN E948	ARGON E938		
TITRE	> 99,995%	> 99%	> 99,5%	> 99,996%	UNI	threads
FOOD 1	•				4409	21,7 mm female 14 f.p.p right-handed
FOOD 2		•			4406	21,7 mm male 14 f.p.p right-handed
FOOD 3			•		4406	21,7 mm male 14 f.p.p right-handed
FOOD 4				•	4412	24,5 mm female 14 f.p.p right-handed
FOOD 20	•	•			4409	21,7 mm female 14 f.p.p right-handed
FOOD 22	•	•			4409	21,7 mm female 14 f.p.p right-handed
FOOD 23	•	•			4409	21,7 mm female a 14 f.p.p right-handed
FOOD 24	•	•			4409	21,7 mm female 14 f.p.p right-handed
FOOD 25	•	•			4409	21,7 mm female 14 f.p.p right-handed
FOOD 27	•	•			4409	21,7 mm female 14 f.p.p right-handed
FOOD 20OX		•	•		4406	21,7 mm male 14 f.p.p right-handed
FOOD 27OX		•	•		4406	21,7 mm male 14 f.p.p right-handed
FOOD 28OX		•	•		4406	21,7 mm male 14 f.p.p right-handed
FOOD 30N	•	•	•		4409	21,7 mm female 14 f.p.p right-handed
FOOD 30OX	•	•	•		4406	21,7 mm male 14 f.p.p right-handed

Applications in oenology

Using technical gases in practical wine making, with the aim of improving the quality of the end product and increasing productivity from production processes, is a trend which has steadily been growing over the years. SIAD offers multiple applications and is continuously updating them in all areas of the wine making process - from the grape harvest through to bottling.

The Grape Harvest

Cooling the grapes with solid carbon dioxide, in the form of dry ice or CO₂ snow during their harvest, transportation to the wine making area or in the phases preceding fermentation.

Thanks to its excellent cooling qualities, solid CO₂ helps to stop the over-heating of the grapes, thereby preventing the start of premature fermentation.

When, furthermore, changing to a gaseous state from its solid form, CO₂ creates an inert atmosphere which protects the must from contact with oxygen and contributes to marked improvements in the organoleptic characteristics of wine such as colour, fragrance and aroma.

Crushing the Grapes

Rapid cooling of the crushed grapes, to around 8°C for 12 hours, and then maintaining the must at 18°C during fermentation, using liquid nitrogen or carbon dioxide stored in liquid form and then converted to its solid state.

Controlling the temperature allows the fresh fragrances and subtle varied characteristics - which make high quality wines stand apart - to be sealed in.

When it comes to the cooling plants themselves, the use of technical gases results in notable savings; not only in terms of investment cost but also as regards production costs.

Storage, decanting and bottling

The stored product is protected, pneumatically transported through the decanting process and various repositories, up to final bottling (or to the tap when available on draft), using nitrogen or inert gas mixtures.

By avoiding contact with the air, wine is protected from the phenomenon of oxidation and the resulting changes and, the need to use food quality SO₂ (E220) is reduced which brings notable benefits to the quality of the end product. With this in mind, the use of inert gases such as argon (rarely used in wine-making until now) has allowed SIAD to obtain even more satisfactory results than those achieved by gases which have hitherto been more traditionally used in the process.

With a heavier molecular weight than nitrogen, argon offers greater protection to stored wines. Thanks, furthermore, to its lower absorption into liquids, it reduces gasification of the wine during the bottling phase, with marked benefits in terms of quality and productivity, more so even for sparkling wines.

Gas removal from the production line

Eliminating the oxygen dissolved in wine during its transportation from storage containers to bottling.

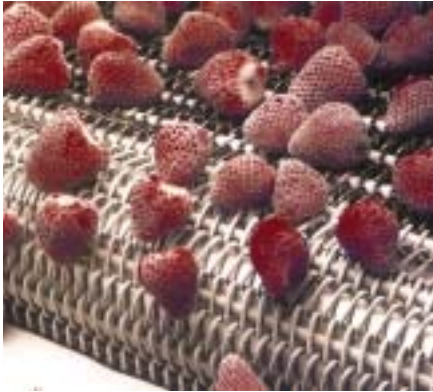
By employing a stripper during the production line process, gaseous nitrogen (emulsified in minute bubble form) is injected into the wine and captures oxygen and other volatile components which are then eliminated when returning to normal atmospheric pressure.

Macro and micro-oxygenation

Constant and controlled oxygen doses in some phases of the wine-making process using specific instruments, in different ways and at various times, depending on the characteristics and qualities one wishes to keep in the wine. These techniques make it possible, amongst other things, to periodically stop the fermentation process, avoid the reduction phenomenon and the formation of undesirable compounds and to maintain the stability of the colour in red wines.



Fast - freezing food products



Deep-freezing in the food sector is a conservation process used not only for the technical purposes linked to food product distribution, but also given the requirements of modern society wherein little time is available to dedicate to meal preparation and there is a growing trend to eat and drink outside the home (in canteens, restaurants, bars, etc...). These market-led demands have pushed food producers into perfecting deep-freezing techniques, so as to maintain product quality, as far as possible, from both the organoleptic and nutritional points of view. From here, too, has grown the importance of new technologies, which permit rapid temperature reduction to levels at below -18°C at the core of the product, so as to totally inhibit bacterial activity. If, in fact, this lowering of temperature is carried out too slowly, it leads to a progressive formation of ice-crystals (in meagre numbers but in large sizes) which can destroy the cellular structure of the product, damaging the tissues irreparably. If, on the other hand, these temperatures are reached rapidly, crystal formation can be avoided, creating an amorphous phase which promotes the stability of the product during the ensuing period for which it will be kept. The fastest method of cooling edible produce is by using liquid nitrogen, which is brought into direct contact with the food item to be frozen.

Nitrogen is a principal component in the earth's atmosphere; it is odourless, colourless, tasteless and inert and has no contaminating effect on foodstuffs. At atmospheric pressure, liquid nitrogen has a temperature of -196°C and its main characteristic is the fact that it is capable of absorbing a large amount of energy (even at very low temperatures), giving it high refrigerating properties and better energy transfer coefficients than mechanical systems. The inclusion of cryogenic equipment for deep freezing on food production lines has, undeniably, brought qualitative and economic benefits and has created new possibilities; for example enabling crusting or superficial hardening of products such as ice-creams, cakes and pizzas has made it possible to perform automated packaging operations. Deep-freezing with liquid nitrogen makes it possible to:

- reduce weight loss due to dehydration to less than 0.5% of the weight of the product;
- avoid damaging the cellular and superficial structure of foods;
- retain an unaltered outer appearance;
- conduct the deep-freezing and preservation process in the absence of oxygen;
- make marked savings on the investment required in production plants.



The benefits of deep-freezing with liquid nitrogen

- **Flexibility.** The various equipment available for cryogenic freezing is extremely flexible and capable of working highly efficiently in a range varying from 70% to 120% of its intended capacity. A further advantage of deep-freezing equipment for use with liquid nitrogen or solid carbon dioxide is that it covers the full range of cryogenic temperatures (down to -196°C in the case of liquid nitrogen). This makes it possible to reach fast deep-freezing speeds. Furthermore, only a few minutes are needed to reach the required work temperature from the time the equipment is started.
- **Investment and costs.** Installing nitrogen cryogenic freezing equipment requires low capital investment and, in any event, is not comparable to that required for a traditional deep-freezing plant of equal production capacity. Even maintenance and cleaning costs for cryogenic freezing machines are lower and do not require specialist staff.

Types of equipment for cryogenic deep-freezing

- **Cryogenic Freezer/Chest.** This is a freezer designed for occasional use and is aimed at users whose production requirements do not justify the installation of a continuous system. The product is laid out on trays positioned on stainless steel trolleys. An automatic system regulates nitrogen input in relation to the desired temperature and cycle duration.
- **Linear Tunnel.** This consists of an isolated chamber into which the product is fed by means of a belt made out of stainless steel net. In the pre-cooling zone, the product is passed through a counter-current of nitrogen gas giving it a first, superficial freezing; in the next area it is allowed to come into partial contact with liquid nitrogen which, as it evaporates, removes heat from the product making it freeze rapidly. In the final zone the product temperature becomes homogenized, bringing it down to the required temperature at the core. The tunnel is equipped with an automated system which regulates the level of cryogenic fluid, so as to maintain the pre-set temperature inside. There is also a system which regulates the speed of the belt and a series of homogenizing and extractor fans for the depleted gases.
- **Spiral freezers.** This is compact piece of equipment which permits high production levels even though it occupies a relatively tiny space. It consists of an isolated chamber which the product enters by means of a belt, made out of stainless steel net, which moves in a spiral. Liquid nitrogen is pumped in at the highest level where, as it vaporises, it creates a rapid deep-freezing area. Through a ventilation system, cold gases are redirected to the bottom where they pre-cool the product at the start of the spiral. The spiral freezer is also fitted with an automated system for regulating the temperature and speed of the belt.



- **Immersion Tunnel.** This system is ideal if limited space is a factor, or where extremely rapid freezing or the formation of a superficial crust is required. Product enters the tunnel via a stainless steel belt and passes through a bath of liquid nitrogen. Using this method, superficial crusting is instantaneous, whilst freezing “to the core” requires less time.

Average specific consumption of liquid nitrogen for some non-packed products

Product	kg of liq N ₂ /kg product
Poultry	0,90
Meat	0,85
Fish	0,85
Shellfish	1,00
Ice-cream	0,80
Uncooked brioche	0,70
Baking products	0,60
Vegetable	1,10
Strawberries	1,10
Mushrooms	1,10
Ice-cream cake	0,20

Equipment, plants and services



Centralised plants

The latest regulations, with regard to compressed gases, require gas cylinder stocks to be kept outside of industrial facilities and that, consequently, purpose built, centralised distribution plants be built.

The “turn-key” plants which SIAD designs and builds, give the end user a guarantee of safety from the way in which their gas storage facilities have been thought through and executed.

SIAD offers modular systems for primary decompression plants with manual, semi-automatic or automated change-over. Secondary adjustment, at the point of use, is usually handled via the installation of panel mounted, membrane lined, pressure reduction valves.



Pressure reducers for gas cylinders

SIAD offers a range of membrane lined pressure reducers for food use, made from chrome-plated brass, complete with security valves and cylinder connection in compliance with UNI regulations and which have been individually performance tested. The pressure reducers are supplied with test certificates.

Mixers and analysers

For specific mixing requirements in situ, binary or ternary mixers are available for different flows (100 - 300 l/min) and

pressures (ratio regulation or flow metres), equipped with warning and security alarm systems.

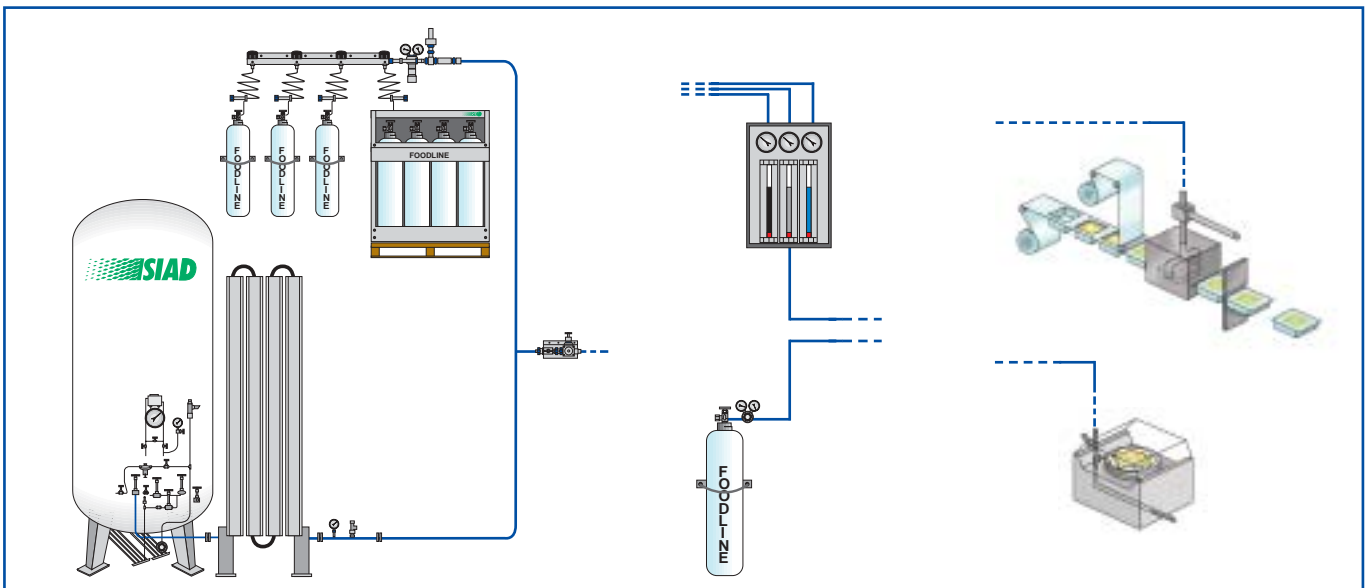
SIAD has at its disposal, furthermore, a range of portable gas analysers which are necessary for fine tuning packaging processes.

Services available to clients

Over and above supplying gases, gas mixtures and materials for the food line, SIAD is able to offer through the commercial arm of the organisation (with locations all over Europe), technical assistance and consultancy on the applications of its gases.

These SIAD subsidiaries are able to:

- provide the appropriate gases or gas mixtures for each food type, thanks to experience consolidated over many years and the use of specific analytical instrumentation;
- conduct tests on-site at client’s premises in order to fine tune mixtures, working methods and packaging processes;
- verify the effectiveness of gas applications through the use of specific analytical equipment;
- undertake the training of the client’s technical staff;
- offer all the services which come under SIAD’s “Total Gas Management” umbrella.



PLATINUM Gas management services

Choosing “Platinum”, SIAD’s “Total Gas Management” offer, means that you do not only outsource the supply and distribution of the gases themselves, but also offload responsibility for reordering gas product, handling gas containers and managing the gas distribution plants themselves. Engineers, service technicians and logistics personnel are at the client’s disposal to cover every eventuality, 24 hours/day, 365 days/year.

The Platinum Team analyses characteristics and needs, both from a production and safety viewpoint (using the operational solutions available as a starting point), so as to devise a tailored client support programme. Thanks to Platinum’s modular solution structure, many benefits can be gained, amongst which:

- a reduction in management costs;
- safety;
- total reliability from the use of the gases;
- increased productivity;
- continuous availability of the product.

Logistics Division

From automatic re-ordering, to transportation, delivery and distribution to the location where the product is actually to be used. Platinum’s Logistics division comprises of cylinder and gas management, with modules tailored to the specific requirements of the client:

- delivery to the point of use;
- management of on-site storage;
- automatic re-ordering;
- substitution of containers at the point of use.

Safety Checks and Maintenance Division

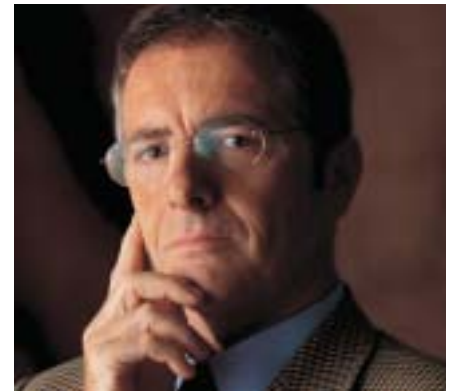
A complete, sophisticated and versatile system of monitoring; from the remote reading of the levels and functioning parameters of gas plants, through to the more technical aspects regarding safety and the guarantee of gas quality up to the point of use:

- remote control and remote sensing;
- analysis at the point of use;
- technical safety visits;
- distribution plant maintenance.

Training and Consultancy Division

Consolidated experience gained from working in the world of gases is used to provide the most appropriate solution to every technical, regulatory and training need:

- theoretical and practical training;
- technological consultancy;
- analytical assistance service;
- technical and regulatory compliance consultancy.



SIAD IN EUROPE

SIAD S.p.A.

Headquarters

Via S. Bernardino, 92
I-24126 BERGAMO
Tel. +39 035 328111
Fax +39 035 315486
www.siad.com
siad@siad.com



AUSTRIA

SIAD Austria GmbH

Head office

Trimmelkam 111
A-5120 ST. PANTALEON
Tel. +43 (6277) 7447-0
Fax +43 (6277) 7401
siad_vtg@praxair.com

Regional office

Hofherr-Schranz-Gasse, 4
A-1210 WIEN
Tel. +43 (1) 2719200
Fax +43 (1) 2719200-10

BOSNIA AND HERZEGOVINA

ISTRABENZ PLINI s.r.l.

Ulica Halilovići, 4
BIH-71000 SARAJEVO
Tel. +387 33546075
Fax +387 33470329

BULGARIA

SIAD Bulgaria EOOD

Head office

4, Amsterdam str.
P. O. Box 28
BG-1528 SOFIA
Tel. +359 (2) 9785636
Fax +359 (2) 9789787
siad@siad.bg

CROATIA

MONTKEMIJA d.o.o.

Senjska cesta b.b.
HR-51222 BAKAR (RIJEKA)
Tel. +385 (51) 761615
Fax +385 (51) 761175
montkemija@montkemija.hr

DISUPLIN PORTO RE d.o.o.

Obala kralja Tomislava, 8
HR-51262 KRALJEVICA
Tel. +385 (51) 281702
Fax +385 (51) 281702

CZECH REPUBLIC

SIAD Czech spol. s r.o.

Head office

č.p. 193
CZ-435 22 BRAŇANY U MOSTU
Tel. +420 476765000
Fax +420 476129286
siad@siad.cz

Regional office

Doubřavínova 25/330
CZ-163 00 PRAHA 6
Tel. +420 235097520
Fax +420 235097525

Production plant

U Sýpky 417
CZ-664 61 RAJHRADICE
Tel. +420 516102011
Fax +420 547232996

HUNGARY

SIAD Hungary Kft

Head office

H-3527 MISKOLC, Zsigmondy u. 38
Tel. +36 (46) 501130
Fax +36 (46) 411681
siad@siad.hu

ROMANIA

SIAD Romania s.r.l.

Head office

Drumul Osiei 75-79
Sector 6
RO-062395 BUCURESTI
Tel. +40 (21) 3103658
Fax +40 (21) 3149806
siad@siad.ro

SERBIA AND MONTENEGRO

ISTRABENZ PLINI s.r.l.

Despota Stefana, 12
SCG-BEOGRAD
Tel. +381 113340949
Fax +381 113341199

SLOVAKIA

SIAD Slovakia spol. s r.o.

Head office

Rožňavská č. 17
SK-831 04 BRATISLAVA
Tel. +421 (2) 44460347
Fax +421 (2) 44460348
siad@siad.sk

SLOVENIA

ISTRABENZ PLINI

Plini in plinske tehnologije, d.o.o.

Sermin 8/a
SLO-6000 KOPER
Tel. +386 (5) 6634600
Fax +386 (5) 6634699
info@istrabenzplini.si

PLINARNA MARIBOR d.d.

Plinarniška ulica 9
SLO-2000 MARIBOR
Tel. +386 (2) 2284300
Fax +386 (2) 2522272



SIAD S.p.A.
I-24126 Bergamo - Via San Bernardino, 92
Tel. +39 035 328111 - Fax +39 035 315486
www.siad.com - siad@siad.com