

# GENERATORS

NITROGEN

N<sub>2</sub>



Industrial solution supplier Airsyst has started its journey in 2004.

We design and manufacture oxygen generators, nitrogen generators and special purifiers for gas generators in our 5000 m<sup>2</sup> factory located in Istanbul Turkey.

Airsyst serves high quality tailor made solutions to its customers with PSA Gas Generators for industrial and medical applications.

Airsyst provides after sales service to gas generators operating in more than 40 countries with its 15 people technical service team and local service partners.



**PRODUCE YOUR OWN NITROGEN GAS** WITH AIRSYST NITROGEN GENERATORS, **FORGET** ABOUT THE **COST FOR BUYING** CYLINDER OR LIQUID NITROGEN! **IN ADDITION TO THESE;**

- The amount that you require exactly,
- The level of purity that your production process requires,
- The level of pressure that should be, All under your own control...

# 99,999% PURITY

## Production of nitrogen gas up to 99.999% purity with PSA technology

Thanks to the PSA technology utilized by **AIRSYST NITROGEN GENERATORS**, you can produce nitrogen gas with up to **99.999%** purity within the capacity range of 0.5-5000 Nm<sup>3</sup>/h.



These generators produce nitrogen from the compressed air available. The air is cleaned by pre-filtration which eliminates impurities, such as humidity, oil vapours, particles and hydrocarbons.

The filtrated compressed air stream is channelled into CMS filled two columns. While the air is passing through the filter, the oxygen and carbon dioxide molecules are removed and the pressure dew point is lowered. The generated nitrogen gas is clean, dry and of high purity so that it can be used for a wide variety of applications.

The parameters such as compressed air temperature, pressure, nitrogen purity and nitrogen pressure are all monitored continuously. **AIRSYST NITROGEN GENERATORS** guarantee sustainable and high efficiency production.

## Models

Nitrogen Purity (%)	95,0	97,0	98,0	99,0	99,5	99,9	99,99	99,995	99,999
Quality Connection			10.000 ppm	5.000 ppm	1.000 ppm	100 ppm	50 ppm	10 ppm	
O <sub>2</sub> Contents									
GN 25	5,8	4,9	4,2	3,2	2,5	1,6	1,0	0,7	0,5
GN 50	10,9	8,9	8,0	6,0	5,0	3,2	1,5	1,2	1,0
GN 80	17,0	13,5	12,1	9,2	8,0	4,9	2,5	1,8	1,4
GN 100	21,0	17,5	16,0	12,9	10,0	6,5	3,3	2,5	1,9
GN 150	31,5	26,0	24,0	19,0	15,0	9,5	5,0	3,7	2,5
GN 250	50,0	40,5	35,8	28,5	25,0	13,0	6,5	5,0	3,5
GN 400	85,0	60,0	55,0	48,0	40,0	25,0	13,0	9,5	6,0
GN 500	108,0	85,0	78,0	65,0	50,0	37,8	23,7	16,9	10,7
GN 700	145,0	120,0	100,0	80,0	70,0	48,3	28,0	21,1	14,3
GN 1000	215,0	175,0	148,0	115,0	100,0	72,0	42,0	31,6	21,4
GN 1200	260,0	215,0	190,0	145,0	120,0	87,0	51,0	39,0	27,0
GN 1700	375,0	310,0	270,0	208,0	170,0	130,0	75,0	56,0	38,5
GN 2000	445,0	370,0	320,0	242,0	200,0	152,0	89,0	67,0	45,0
GN 3000	635,0	525,0	460,0	360,0	300,0	217,0	126,0	95,0	65,0
GN 4000	920,0	760,0	660,0	500,0	400,0	313,0	182,5	137,5	93,8
GN 5500	1150,0	950,0	830,0	635,0	550,0	392,0	227,0	172,0	116,5
GN 6500	1380,0	1140,0	990,0	755,0	650,0	470,0	273,0	206,9	140,0
GN 7500	1600,0	1325,0	1160,0	880,0	750,0	565,0	325,0	245,0	167,0
GN 8500	1830,0	1515,0	1325,0	1000,0	850,0	625,0	362,0	275,0	186,5
GN 10000	2300,0	1900,0	1650,0	1260,0	1000,0	740,0	455,0	344,0	232,0
GN 12500	2750,0	2275,0	1985,0	1500,0	1250,0	945,0	550,0	415,0	282,0

\* All values were measured under 7 bars compressor pressure and +25oC air/ambient temperature.

\* Please consult our engineers for different capacity and purity values.

### COMPRESSED AIR REQUIREMENTS

**Temperature Range** +5 ... +50°C

**Air Quality** ISO 8573.1 Class 1.4.1

**Dew Point** +3°C

### AMBIENT CONDITIONS

**Temperature Range** +5 ... +40°C

**Option** -50 ... +60°C

### TECHNICAL FEATURES

**Max. Working Pressure** 11 bar

**Power Connection** 230V, 50Hz

**Noise Level** 55 → max. 85 dB(A)

**Energy Consumption** 150W

**Protection Class** IP54



GERMAN  
MADE  
CMS



## NON-STOP PRODUCTION GUARANTEED WITH STAINLESS STEEL VALVE SYSTEM!

Pneumatic valves that ensure regular flow of air and nitrogen during the process are manufactured from AISI 316L noncorrosive material. Owing to its long operation life, it provides problem free production for long years. Moreover, 316L stainless steel valves no need for maintenances.

## 10 YEARS OF GUARANTEE

Carbon Molecular Sieve material which is one of the most important parts of Nitrogen Generator is capable of absorbing oxygen molecules inside compressed air thanks to the semi-permeable molecular structure. Nitrogen molecules that are free inside the compressed air are stored within the nitrogen buffer tank.

CMS material which is manufactured in Germany is guaranteed for 60,000 operational hours or for a period of 10 years.



## TECHNOLOGICAL, INNOVATIVE

REMOTE MANAGEMENT USING  
APPLE APPLICATIONS!



You can check your Nitrogen Generator using  
the internet from any point across the world.





## SIMPLE AND EASY MANAGEMENT

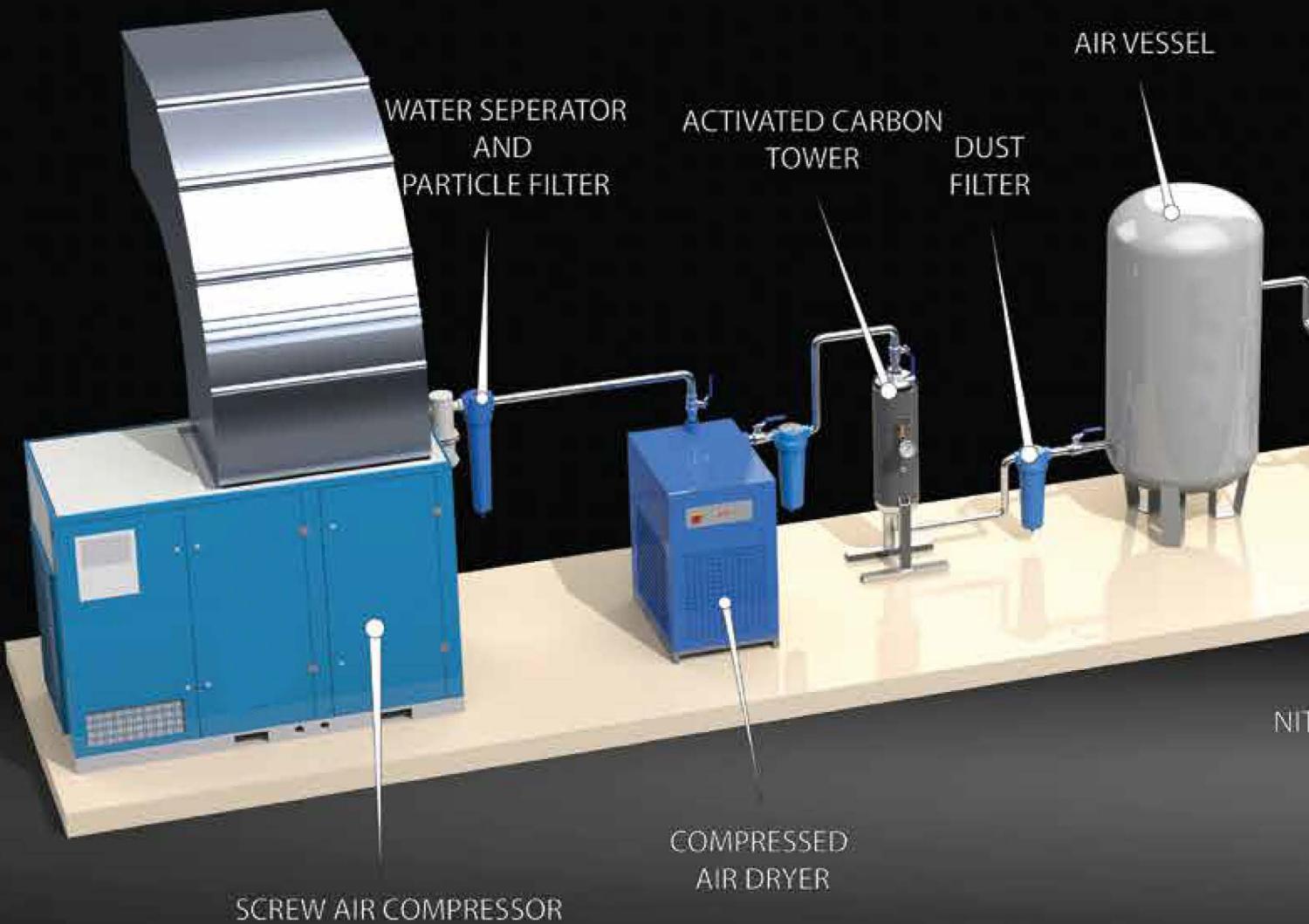
With AIRSYST NITROGEN PRODUCTION SYSTEMS

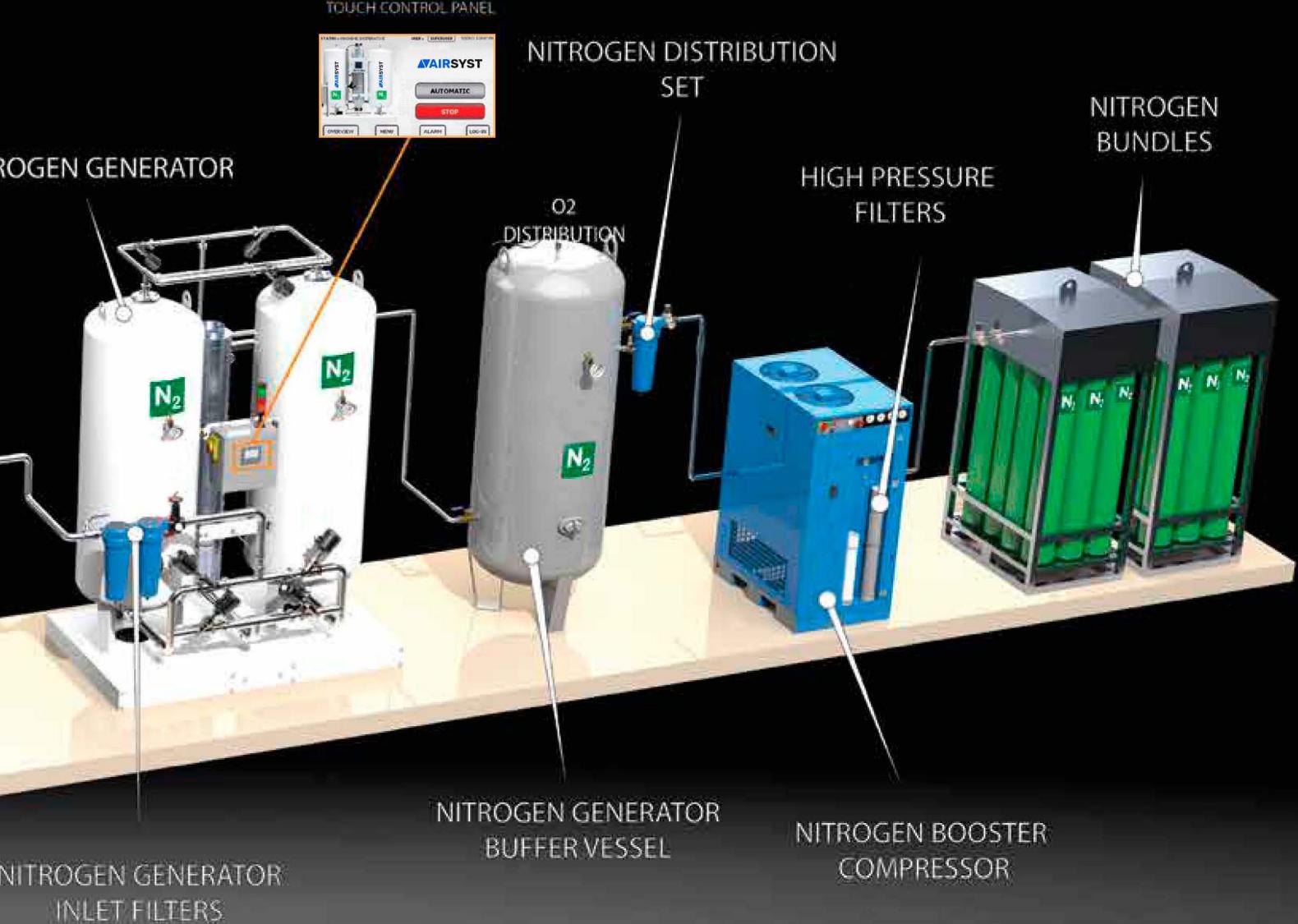
"Touchscreen Control Panel" enables the generator to operate as fully automated. User-friendly design and ergonomic touchscreen panel ensures that sensitive measurements for all parameters can be displayed instantaneously and you can store these data.

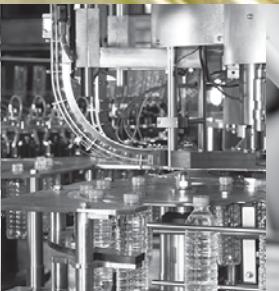
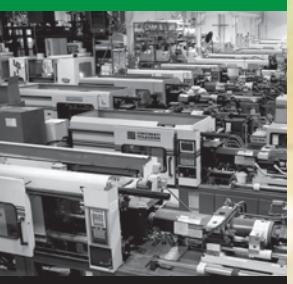
The alarm that will appear on the screen through the sensors which sense deviations apart from the requested parameters warns the user.

## ADDITIONAL ADVANTAGES

- Dew Point Sensor
- Flowmeter
- Profibus / Modbus Data Transmission
- GSM Communication
- Lan
- RS232
- Skid Mounted Mobile System
- Containerized Mobile System







## CHEMICALS INDUSTRY

Nitrogen gas is most commonly used within the chemicals industry during the inertization, sweeping and blanket procedures of flammable and explosive chemicals by preventing their contact with air or oxygen.

### Blanketing

During tank blanketing, nitrogen is frequently used to reduce the risk of burning highly flammable materials, to prevent the oxidation of the materials that are stored and to eliminate product losses which occur as a result of vaporization. Moreover, it is also used to protect the chemicals from other factors coming from the air such as humidity and particles and to prevent the harmful vapor from spreading into the atmosphere air that we breathe.

### Transfer

High pressure nitrogen gas is used to transfer chemical products from one tank to another tank in a safe manner.

### Sweeping

Nitrogen is used to remove atmosphere residue oxygen and humidity found in procedure areas such as tanks, silos and pipelines in a safe manner. Sweeping procedure protects procedure areas from contamination and chemical reactions.

### Production

Practices such as drying and mixing processes which cause oxidation reactions in chemical production areas can be taken under control with an atmosphere comprised of nitrogen.

### Cooling

Reactors can be cooled with nitrogen in a rapid manner in order to control the reactions and to guarantee product quality. Moreover, the nitrogen used here can be reused in the system.

## OUR REFERENCES

Akkim Kimya A.Ş.	Yalova - Turkey
Konya Şeker	Konya - Turkey
İba Valresia	Ankara - Turkey
İba Kimya	Ankara - Turkey
MKE Barut Fabrikası	Kırıkkale - Turkey
Aksa Akrilik	Yalova - Turkey
Akdeniz Kimya	İzmir - Turkey
Organik Kimya	İstanbul - Turkey
Orgachem2	İstanbul - Turkey
Türk Henkel A.Ş.	Kocaeli - Turkey
Hayat Kimya	Kocaeli - Turkey
Ravago Petrokimya	Kocaeli - Turkey
Eyüp Sabun	İstanbul - Turkey
PPG Kimya	Bursa - Turkey
Gübreler Gübre	İzmir - Turkey
Bak Ambalaj	İzmir - Turkey
Koruma Klor	Kocaeli, Denizli - Turkey
Ece Boya	(3 Systems)
Mayr Melnhof Packing	İstanbul - Turkey
Baerlocher Kimya	Iran
Esan Eczacıbaşı	Manisa - Turkey
Ece Boya	Eskişehir - Turkey
Pulca Kimya	İstanbul - Turkey
	Kocaeli - Turkey





## FOOD INDUSTRY

Nitrogen gas is a popular gas in the food industry. It is used in order to prolong the shelf life of food packages in a healthy manner and to protect them from microorganisms or to protect the fluid raw material during production. As İdeal Makina, we continue our leadership within the industry with the systems that we established in Turkey and surrounding countries.

### Packaging-MAP

A modified atmosphere is created inside the package in order to prolong the shelf life whilst packaging foods such as dry nuts and potato chips. Here unwanted elements such as oxygen, air, humidity are removed and nitrogen gas is filled inside the package. In the end, oxidation is prevented in the environment and products remain fresh for a long period of time. Moreover, as nitrogen gas cannot be metabolized and adsorbed by microorganisms, they protect the existence in the environment and the creation of a vacuum environment inside the package is prevented. Dry nuts, chips, confectionary, coffee, tea and dried foods are among the examples to be given in this field.

### MAP – Food Gas

As different than packaging dry nuts, food gas applications use nitrogen gas produced in the generator to mix with CO<sub>2</sub> and to send to the packages. Due to the bacteriostatic and fungal static properties of CO<sub>2</sub> gas, microorganisms are prevented from developing on products such as meat, chicken and dairy products which have been subject to advanced procedures. By preventing microorganisms to develop on the food, fungus and bacteria effect is not observed inside the packages. This practice is used for packaging products such as pastry dough, chicken-meat which have undergone advanced procedures, milk and dairy products, ravioli, sausages-salamis.

### Blanket – Fruit Juice and Carbonated Beverages

Blanket applications are mostly used at fruit juice and carbonated beverage packaging facilities. Nitrogen is used to remove the oxygen inside the packaged bottle and a modified atmosphere is created as a result. This way, product's shelf life is also prolonged. Moreover, compressed nitrogen gas prevents the package from deflating.

### Production

While transferring fluid raw materials such as hot cacao, nitrogen gas is given to prevent burning or spoiling as a result of contact with oxygen in the pipeline. This way, whilst production continues without any raw material loss, transfer of the fluid is supported as a driving power.

## OUR REFERENCES

### Dry Nuts

Malatya Pazan A.Ş.	İstanbul - Turkey
Papagın Kuruyemiş A.Ş.	Çerkezköy - Turkey
Saracoğlu Kuruyemiş	Samsun - Turkey
Nefis Kuruyemiş A.Ş.	Gaziantep - Turkey (2 Systems)
Elmas Gida Kuruyemiş	Aydın - Turkey
An Gıda(Sera Food)	Aydın - Turkey
Tıryoki Agro Gıda A.Ş.	Gaziantep - Turkey
Sevilen Kuruyemiş	Antalya - Turkey
Celik Kuruyemiş	Antalya - Turkey
Aydın Kuruyemiş	Sırrı - Turkey
Transtest SRL Kuruyemiş	Moldova
Gilan Holding	Azerbaijan
Hıldır Kuruyemiş	Iraq
Meynə Kuruyemiş	Omanıye - Turkey
Okullu Gıda Ltd. Şti.	Balıkesir - Turkey
Altınpur Kuruyemiş	Denizli - Turkey
An Gıda A.Ş.	Aydın - Turkey
Dadaş Barader	Iran
Güngör Gıda Ltd. Şti.	Bursa - Turkey
Azerşun	Azerbaijan
Al-Qerat Snack Food	Iraq
İsiger Müh.	Saudi Arabia

### Dry Nuts

T.I.P. Gıda Ltd. Şti.	Gaziantep - Turkey
Muhiddin Hammod Co.	Lebanon
Novac Makine San.	Sakarya - Turkey
Pınar Kuruyemiş A.Ş.	Konya - Turkey
Öltan Gıda A.Ş.	Sakarya - Turkey
Adalar Kuruyemiş	Sakarya - Turkey
Atesler Kuruyemiş	Mersin - Turkey
Mıhlans Gıda	Kocaeli - Turkey
Ulker Çikolata San. A.Ş.	İstanbul - Turkey
Dr.Oetker	İzmir - Turkey

### Chocolate

Ferrero (Nutella, Kinder)	Manisa - Turkey
Ulker Çikolata 1 Fab.	İstanbul - Turkey
Sölen Çikolata A.Ş.	İstanbul - Turkey
Sölen Çikolata A.Ş.	Gaziantep - Turkey
Ulker Öhem Gıda A.Ş.	Giresun - Turkey
Çağla Şekerli Mam. San.	Sakarya - Turkey

### Pastry Dough

Darin Gıda (Afilo) Ltd.	İstanbul - Turkey
Öz-El Ünlu Gıda Ltd.	Kayseri - Turkey
Nipa Gıda(Yu-Ka) Ltd.	İstanbul - Turkey
Unifa Gıda A.Ş.	Kocaeli - Turkey
Özşunlu Mamilleri Ltd.	Tekirdağ - Turkey
Özalp Ünlu Mamilleri Ltd.	Kayseri - Turkey

### Tea, Dairy Products

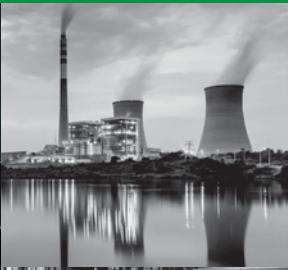
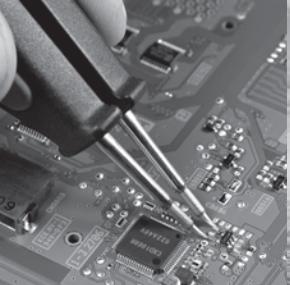
Doğuş Çay A.Ş.	İstanbul - Turkey
Kraft Gıda - Doğuş Çay A.Ş.	Aksaray - Turkey
Gürsüt A.Ş.	İzmir - Turkey
Altaner Gıda A.Ş.	İstanbul - Turkey
Aral Gıda A.Ş.	Mersin - Turkey
Alaverdi Wine Ltd.	Georgia
Pal Food	Azerbaijan
Altıparmak Gıda A.Ş.	İstanbul - Turkey
Fresa İçecek A.Ş.	Bursa - Turkey
A+CO	Azerbaijan

### Drinks

Fresa İçecek San.	Bursa - Turkey
Nova Fruts International	İzmir - Turkey



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## LASER CUT INDUSTRY

Nitrogen gas is a popular gas in the food industry. It is used in order to prolong the shelf life of food packages in a healthy manner and to protect them from microorganisms or to protect the fluid raw material during production. As Airsyst, we continue our leadership within the industry with the systems that we established in Turkey and surrounding countries.

### CO<sub>2</sub> Laser Counters

Laser beams in CO<sub>2</sub> laser machines are created with a mixture of gases where CO<sub>2</sub> gas forms the majority. Nitrogen gas is used to clean the particles, other gases and water vapour inside the beam path within the counter and it is also used as a cooler. Moreover, oxidation and similar reactions can be prevented while cutting thanks to the compressed nitrogen gas and clinker does not form on the cutting surface. CO<sub>2</sub> counters can be used to cut thicker and harder metals compared to other types of counters with nitrogen.

### Fiber Laser Counters

Fiber laser cutting counters have become more widespread over the past years. Compared to CO<sub>2</sub> counters, thinner metals are processed on these counters which are faster. As the laser beams are transferred with the help of fiber cables, there is no need to clean the beam path here. Whilst the compressed nitrogen gas is directly transferred to the cutting area, cutting quality is increased. Another advantage of the nitrogen gas is the possibility to carry out faster cuts compared to other gases thanks to the repelling force.

### Impact of Nitrogen Gas on the Material

It is possible to deduce the following conclusions with regards to INMATEC Nitrogen Generators based on our experience within the industry as Airsyst.

- **Stainless Steel** While transferring fluid raw materials such as hot cacao, nitrogen gas is given to prevent burning or spoiling as a result of contact with oxygen in the pipeline. This way, whilst production continues without any raw material loss, transfer of the fluid is supported as a driving power.
- **Soft Steel** (Black Sheet, DKP) It prevents tarnishing on the cutting surface of the material. Cutting surface blisters the dye while painting and black sheets are removed. For the materials which exceed a certain thickness, we recommend compressed nitrogen gas that has high purity levels as Airsyst.
- **Aluminum** sheet is softer compared to other types of sheets, therefore oxygen in the environment causes the cutting surface to turn yellow whilst cutting. Moreover, nitrogen gas is used while cutting to cool the cutting surface and blurring on the surface is prevented.

### Advantages of Airsyst Inmatec Nitrogen Generator

- Non-stop, low cost gas production
  - Reduced cutting costs that will allow you to quote lower cutting offers and to obtain more work.
  - You can store the nitrogen gas generated within 230 barg compressed manifolds.
  - Increase productivity and cutting speed.
  - Prevent corrosion, oxidation and clinker formation
  - Manufacture your own manifold with approximately 14 \$ costs!
- Do not lose time for procedures such as changing tubes.

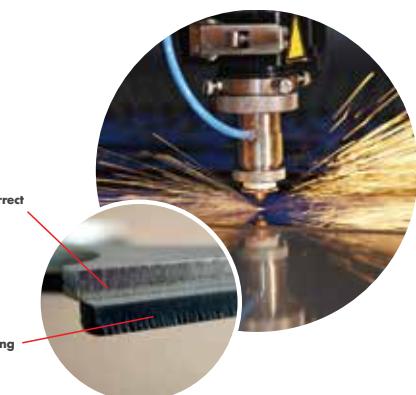
### OUR REFERENCES

Teknogon Teşhir	Cerkezköy - Turkey
Simsa Metal	İzmir - Turkey
Demirciçiglu Makine	İstanbul - Turkey
Nuri Körüştan	Bursa - Turkey
Teknik Lazer	İstanbul - Turkey
Yıldız Lazer	İstanbul - Turkey
Mysilo	Aksaray - Turkey
Kozanlıoğlu Otomotiv	İzmir - Turkey
Zeenin Steel	Lebanon
Bilge Inoks	Dilovası - Turkey
Öz-Soc İmalat	Çorlu - Turkey
Teknikel Lazer	İzmir - Turkey
PSL Fiberli Elektronik	Antalya - Turkey
Akyurek Kardeşler	Mersin - Turkey
Tırsan	Sakarya - Turkey

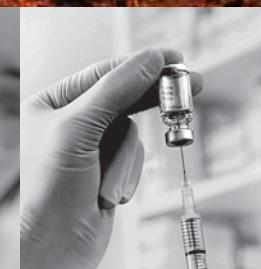
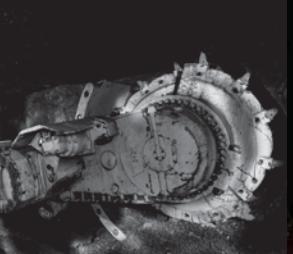
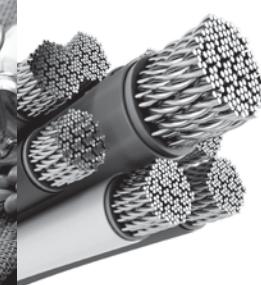
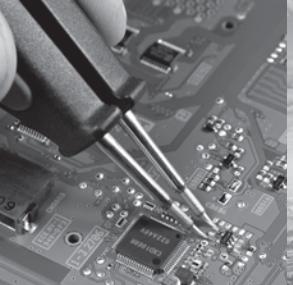
Merih Asansör	Ankara - Turkey
Diktas Soğutma	Ankara - Turkey
Genç Bayraklar	Bursa - Turkey
Poyraz PaslanmazPirge	İstanbul - Turkey
(Yeşilyayla Kesici Aletler)	Bursa - Turkey
Kocaksaç	Konya - Turkey
Sumak Metal	Konya - Turkey
Ornek Öküna	Gaziantep - Turkey
Gülezler Metal	Adana - Turkey
Üğur Soğutma	Aydın - Turkey
Silospor (Mysilo)	Aksaray - Turkey
MUPS LTD.	Bulgaria
Zenini Steel	Lebanon
Target Metal	Qatar
Dzenemi	Bosnia

### OUR REFERENCE COUNTERS

- Bystronic / Switzerland
- Trumpl / Germany
- Nukon / Turkey
- Durma / Turkey
- Ermakson / Turkey
- LVD / Belgium
- Prima Power / Italy
- Amada / Japan
- Mazak / Japan
- MVD / Turkey
- Dener / Turkey



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## HEAT TREATMENT INDUSTRY

Due to the structure of the metals which is appropriate for creating compounds during heat treatment procedure as a result of high temperatures, nitrogen gas is used to prevent harmful effects such as oxidation, corrosion, rust etc.

### Tempering

The stretching of materials is preventing during tempering procedures and their mechanical properties are improved. During the procedure, the material which reaches high temperatures should be separated from oxygen, humidity and other air elements. By preventing oxidation and formation of rust or corrosion layer and in order to create high quality surfaces, a nitrogen atmosphere is created with INMATEC Nitrogen Generator inside the stove. Normalization tempering uses this procedure continuously.

### Soldering

Nitrogen atmosphere is required to establish high quality levels on the combination surfaces of the soldering material which melts at high temperatures inside soldering stoves.

### Carburization and Cementation

Within thermochemical processes, for example during cementation, steel material's surface is infused with carbon at a temperature between 850-950°C and it is hardened as a result. During this procedure, water vapour, oxygen and CO<sub>2</sub> gas in the environment is removed with the help of the nitrogen gas to prevent decarburization on the surface.

### Hardening

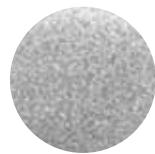
You can also use INMATEC nitrogen generators for hardening procedures to create a nitrogen atmosphere that would prevent oxidation and decarburization as in the case of carburization.

### Galvanization

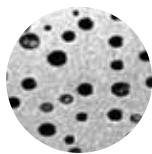
Galvanization procedure uses nitrogen to scrape the excessive zinc on the surfaces that are galvanized. Nitrogen gas generated with INMATEC Nitrogen Generators can be given to these systems via manual or automatic systems.

### Degassing

Oxygen molecules are present inside the aluminum found as melted mostly at aluminum melting mines. The structure of aluminum allows creating compounds with oxygen at high temperatures. Here nitrogen atmosphere is created inside the stove to prevent oxidation. Moreover, air bubbles are prevented from being created inside the solid aluminum thanks to the nitrogen atmosphere.



N<sub>2</sub> Degasification



Air Bubbles



Air Bubbles

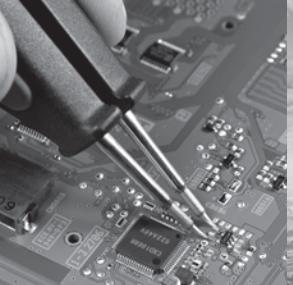


## OUR REFERENCES

Tusaş Taı Havacılık	Ankara - Turkey	Sistem Alüminyum	Russia
Yılmaz Redüktör	İstanbul - Turkey	Teknik Bağlantı El.	Adana - Turkey
Kardeş Elektrik	İstanbul - Turkey	Birler Çelik	Bursa - Turkey
Samsun Yurt Savunma	Samsun - Turkey	Norm Civata	İzmir - Turkey
Kanca El Atelleri	İstanbul - Turkey	Norm Somun	İzmir - Turkey
Eti Alüminyum	Konya - Turkey	Norm Sözlülli	Manisa - Turkey
Akış Asansör	Konya - Turkey	Sistem İnkıpk	Kocaeli - Turkey
Has Çelik Halat	Kayseri - Turkey	Temel Tel	Kocaeli - Turkey
Steel Structures	Azerbaijan	Gemciler Güven Metal	Kahramanmaraş - Turkey
Sistem Teknik	Kocaeli - Turkey		



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## WIRE AND CABLING INDUSTRY

Cable and wire production is one of the growing industries both in Turkey and across the globe. Nitrogen gas is used both during cable production and wire coating processes. Another field of use for the nitrogen gas during wire manufacture is the process of galvanized coating. Ideal Makina continues its industrial leadership for cable and wire production.

### **Cable Manufacturing**

During cable manufacturing, air, humidity and oxygen particles should not enter between the coating material and the wire when the wire is being coated. Therefore, when coating material is being injected on the wire, nitrogen gas generated by ideal Makina systems create a closed nitrogen atmosphere.

### **Wire Coating**

Galvanization refers to the coating of the iron dipped into zinc that is melted at 450-455°C temperature. Here zinc forms strong bonds with the iron and increases its resistance against the oxidation of metals. Galvanized wires taken out of the zinc bath are then sprayed with nitrogen gas to remove the residue liquid zinc on them. During the process, this procedure has two advantages: Galvanized coating thickness becomes homogeneous for the entire diameter of the wire. Together with this procedure, residue zinc material is returned to the bath and significant amounts of the material are saved.

### **Copper Wire Tempering**

In order to increase the resistance of the copper wire material and to increase its flexibility, they are subject to tempering procedures. During this tempering process, nitrogen gas is injected inside the stove to prevent oxidation at high temperatures created inside the stove. The result clearly shows that nitrogen atmosphere is successful in preventing oxidation.

### **Heating - Cooling**

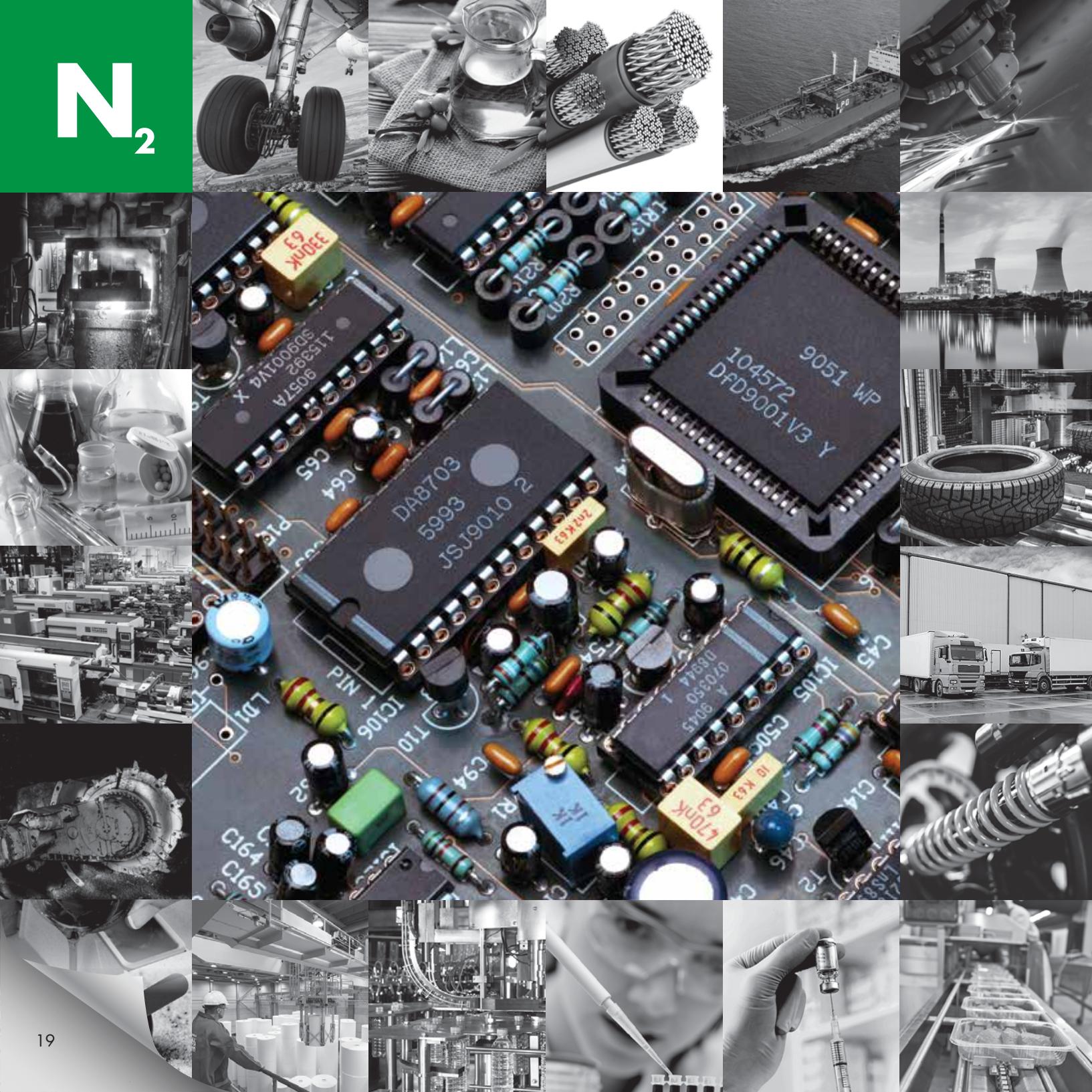
Climatization, air conditioning and industrial heating-cooling devices use copper pipes. In order to create a leakage test on the copper wires, nitrogen gas is given for checking purposes.

## OUR REFERENCES

Elsan Elektrik Gereçleri A.Ş.	Denizli - Turkey
Has Çelik A.Ş.	Kayseri - Turkey
Güney Çelik A.Ş.	Adana - Turkey
Hes Kablo A.Ş.	Kayseri - Turkey
İlke Çelik A.Ş.	Denizli - Turkey
IMC Galvaniz A.Ş.	Osmaniye - Turkey
Erikoğlu Emaye Bakır Tel A.Ş.	Denizli - Turkey
Aslan Bakır San. ve Tic. A.Ş.	Kocaeli - Turkey
Seval Kablo A.Ş.	Denizli - Turkey
Güney Çelik A.Ş.	Adana - Turkey
Özler Kablo A.Ş.	Gebze - Turkey
CSM Metalurji	Albania
Beyazıt Tel	Hatay - Turkey



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## ELECTRONICS INDUSTRY

Nitrogen gas is used within the electronics and communication industry to prevent oxidation by ensuring an oxygen-free environment during the assembly of circuit cards, packaging and soldering procedures and it ensures superior quality products are obtained. Moreover, it is used in various cleaning procedures applied inside the ovens. Nitrogen gas ensures that several errors are eliminated.

### ► Lead-free Soldering

During lead-free soldering, nitrogen gas is used to eliminate a number of errors. It is possible to prevent the oxidation layer on metal surfaces. The resistance of joint points of the solders are increased. Less clinker is accumulated on the surfaces where the procedures take place. One of the most important mistakes which causes Head-In-Pillow problem can be prevented. And together with all of these advantages, workmanship costs are reduced for production.

### ► Soldering After Remelting

Nitrogen gas is used inside remelting ovens to reduce a number of errors. It is possible to prevent the oxidation layer on metal surfaces. Resistance of the joints on the solders are increased. Less clinker is accumulated on the surfaces where procedures take place. One of the most crucial mistakes, which is the Head-in-Pillow problem can be prevented via this method. And together with all of these advantages, workmanship costs related to production are also reduced.

### ► Wave Soldering

Nitrogen gas is used during wave soldering to reduce the amount of clinker formed significantly. Operator spends less time on pieces that contain lead. The errors on the solder are reduced completely. As a result of all of these advantages, this equation is obtained: Minimum Error = Minimum Costs

### ► Protective Atmosphere During Assembly

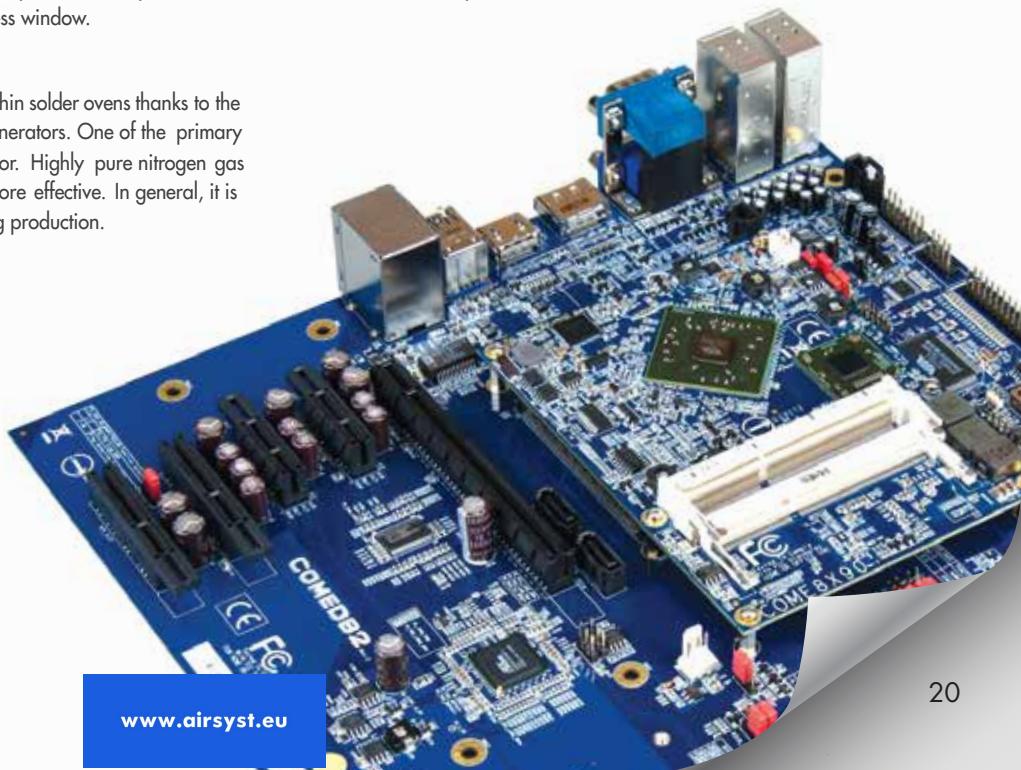
The nitrogen gas used during assembly allows lower procedure temperatures. Moreover, it ensures that the procedures can be done with ease and allows the creation of a wider process window.

### ► Effective Production with Airsyst

Airsyst reduces the rate of erroneous production within solder ovens thanks to the systems that it establishes with Airsyst Nitrogen Generators. One of the primary errors in this sense is called Head-In-Pillow error. Highly pure nitrogen gas prevents these errors and production becomes more effective. In general, it is possible to save time, temperature and costs during production.

### OUR REFERENCES

Karel Elektronik A.S.	Ankara - Turkey
Ortem Elektronik A.Ş.	İstanbul - Turkey
Kunt Elektronik A.Ş.	İstanbul - Turkey
Assan Elektronik A.Ş.	İstanbul - Turkey
Simpri Elektronik Ltd.	Kocaeli - Turkey
Siemens Türkiye A.Ş.	İstanbul - Turkey
Vestel Beyaz Eşya A.Ş.	Manisa - Turkey
Arcelik Beyaz Eşya A.Ş.	(3 Systems)
Arcelik Beyaz Eşya A.Ş.	South Africa
No-De Elektronik San. Tic. A.Ş.	Eskişehir - Turkey
Nafraoline Enterprise	İstanbul - Turkey
Tübitak Mam	Malaysia
Grup ARGE	Kocaeli - Turkey
Meric PCB	İstanbul - Turkey
Samsung Electronics	İstanbul - Turkey



# N<sub>2</sub>



## VEGETABLE OIL INDUSTRY

When vegetable oils come into contact with oxygen, they become especially prone to spoiling. Atmospheric oxygen causes a chemical reaction when fatty acid attacks triglyceride molecules. Oxygen and humidity is removed from the environment thanks to nitrogen gas practices and oil's structure is preserved.

### Blanket

Nitrogen gas creates an inert atmosphere inside the storage tanks and ensures that the oxygen and humidity is removed. Products remain stable and they are stored in a humid free environment without changing the amount of acidity and the taste does not change. The pressure of the nitrogen gas compressed into blanket tanks is increased to help with the transfer of the oil.

### Line Cleaning

Due to the hygiene requirement in food processes, this application type that is constantly applied keeps equipment and pipelines free of any microbiological contamination and oxygen increase (rust) and they are swept with compressed nitrogen gas for this purpose.

### Bottle Cleaning and Drying

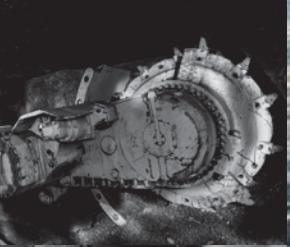
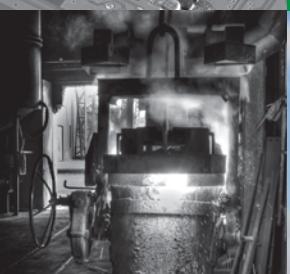
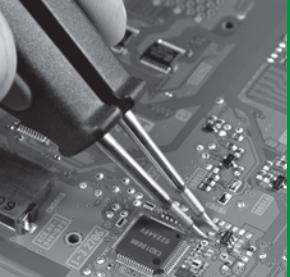
Prior to the commencement of the bottling procedure, it is important for the bottles to be clean. Before oil is filled, bottles are filled with dry and clean nitrogen to remove any gas and dusts inside the bottle. This way, oxidization reactions are prevented. After the bottles are filled, the space left at the top is filled with nitrogen gas. During storage and packaging stages, this procedure is carried out to prevent any contact with oxygen and to keep the products fresh ensuring that the shelf life is prolonged.

### OUR REFERENCES

İskul Gida (Zeytin İiskelesi Ltd Şti.)	Izmir - Turkey
Lütfü Yüksel Yağ Ltd. Şti.	Eskişehir - Turkey
Polimeks İnsaat A.Ş.	Turkmenistan
Ülker Çikolata 1 Fab.	İstanbul - Turkey
Felda IFFCO Gida A.Ş.	Izmir - Turkey
Trakya Yağ Yem San. A.Ş.	Kırklareli - Turkey
Ferrero Çikolata	Manisa - Turkey
Sölen Çikolata	Gaziantep - Turkey
Savolra Gida San. ve Tic. A.Ş.	Balıkesir - Turkey
(2 Systems)	



# N<sub>2</sub>



## AVIATION INDUSTRY

N<sub>2</sub> is used as a reliable gas within the aviation industry to fulfill various requirements such as and including inflating tires and landing gears.

### Inflating Tires

The air inside the tires starts to condense at high altitudes and very low temperatures due to the humidity inside the air and it starts to damage the structure of the tire. Nitrogen gas is used to prevent condensation oxidation. Moreover, the tires filled with nitrogen gas lose their pressure 3 times slower compared to the tires with air.

### Filling Gas

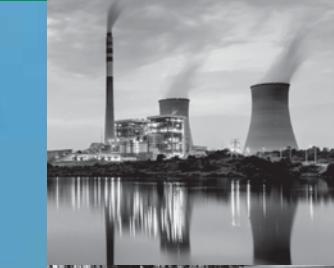
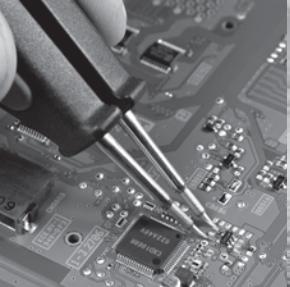
Emergency slides in airplanes, inflatable boats and life jackets are all inflated with nitrogen gas. Moreover, nitrogen gas is used inside the shock absorbers of the landing gears of airplanes. As Airsyst, we render services with Tube Filling Stations that store nitrogen gas generated at the requested purity and dryness level inside high compression tubes.

### OUR REFERENCES

Türk Hava Yolları Teknik A.Ş.  
Türk Hava Yolları Teknik A.Ş.  
TAI (TUSAS)  
Yardımcılar Ltd. Şti.  
Uz-Tur Otel Ins. Taah. Tic. Ltd. Şti.

Atatürk Airport / İstanbul - Turkey  
Sabiha Gökçen Airport / İstanbul - Turkey  
Ankara - Turkey  
Ashgabat - Airport / Turkmenistan  
Ankara - Turkey  
(3 Systems)





## MARITIME INDUSTRY

Nitrogen gas is used essentially during blanket applications when the hazardous materials carried by tankers are stored.

### ► Blanket

For blanket applications, the air inside the warehouses is removed and the environment is turned into an inert state with nitrogen gas. Nitrogen blankets are indispensable for fuels such as chemical substances, LNG-LPG which are flammable.

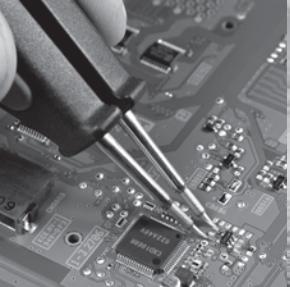
### ► Sweeping, Scraping

Maritime industry prefers nitrogen gas also for the cleaning and transportation of fluids such as oils.

### OUR REFERENCES

Vaysel Vardal Denizcilik A.S.	İstanbul - Turkey	MRC Hatice Ana Akaryakıt Tankeri	İstanbul - Turkey
MRC Semiramis Akaryakıt Tankeri	İstanbul - Turkey	Genka Denizcilik	İstanbul - Turkey
MRC Emirhan Akaryakıt Tankeri	İstanbul - Turkey	Emden Denizcilik	İstanbul - Turkey
Dearson Gemi İnşaat A.Ş.	Turkmenistan	Akbaba Holding	İstanbul - Turkey
Denizsan A.Ş.	İstanbul - Turkey	Düzgit Gemi İns. San. A.Ş.	İstanbul - Turkey
Akva Tek Su Ürünleri	Izmir - Turkey		





## MINING INDUSTRY

The ores mined within the mining industry are purified from soil and other additives by using nitrogen gas. As Airsyst, we offer the most appropriate solutions for the processes within the industry.

### Ore Purification

In order to mine the raw material that is underground and to process it, certain additives or chemicals are used. These chemicals should not have any risk of oxidation and should not damage the ore therefore removing them with nitrogen gas is the most suitable method.

### Ore Processing

While starting to process the ore that has been mined, an inert environment is created with nitrogen gas and oxidation is prevented.

### OUR REFERENCES

Tüprag Altın Madeni	Izmir - Turkey
Kuzey Ege Bakır Madeni	Balıkesir - Turkey
Tüprag Altın Madeni	Usak - Turkey
Kuzey Ege Bakır Madeni	Balıkesir - Turkey
Mng Gold	Liberia
Türkiye Taşkömürüleri	Zonguldak - Turkey
Esan Eczacıbaşı A.S.	Eskişehir - Turkey
TKİ Kurumu	Kütahya - Turkey





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## POWER AND ENERGY INDUSTRY

There are several processes taking place inside the Thermal Power Plants where electric energy is generated. Using nitrogen gas at different points inside this structure has several advantages. These plants which are generally established at those locations far away from the cities need nitrogen gas where Airsyst provides significant advantages by offering these plants the possibility to generate their own gas "on-site".

- ▶ Blanket is created on demineralized water tanks with nitrogen gas and water's conductivity is prevented from increasing.
- ▶ Nitrogen gas is used to ensure that the mechanical seals of turbo compressors are leakproof.
- ▶ Nitrogen gas is used to wash and prevent corrosion and rusting when the boilers and pipelines are not in use.
- ▶ In order to calculate the calorific value of raw materials such as coal before they burn accurately and to purify them of other factors such as humidity and oil, nitrogen gas is used.

### OUR REFERENCES

Aksa Enerji A.S.  
Çalık Enerji A.S.  
Enka İnşaat A.S.  
Enerjisa Enerji Üretim A.S.  
Enka Doğalgaz Kombine Çevrim Santrali  
Enka Doğalgaz Kombine Çevrim Santrali  
Enka Doğalgaz Kombine Çevrim Santrali  
Eke Endüstri Ltd. Şti.  
Gelze Elektrik Üretim Ltd. Şti.  
Sakarya Elektrik Üretim Ltd. Şti.  
İzmir Elektrik Üretim Ltd. Şti.  
Enka İnşaat ve San. A.Ş.  
Aksa Enerji A.Ş.  
Mass Energy Group  
Azerenergy

Antalya - Turkey  
Turkmenistan (3 Systems)  
North Iraq  
Kayseri - Turkey  
Sakarya - Turkey  
Kocaeli - Turkey  
İzmir - Turkey  
İstanbul - Turkey  
Kocaeli - Turkey  
Sakarya - Turkey  
İzmir - Turkey  
Libya  
Uzbekistan  
Jordan  
Azerbaijan





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## GAS SPRING INDUSTRY

For the production of gas-filled shock absorbers, gases are used to absorb impact rather than springs. High pressure nitrogen gas filled gas shock absorbers are used in several fields ranging from aviation, furniture, automotive, vacuum-press machines.

### ► Gas-Filled Shock Absorbers

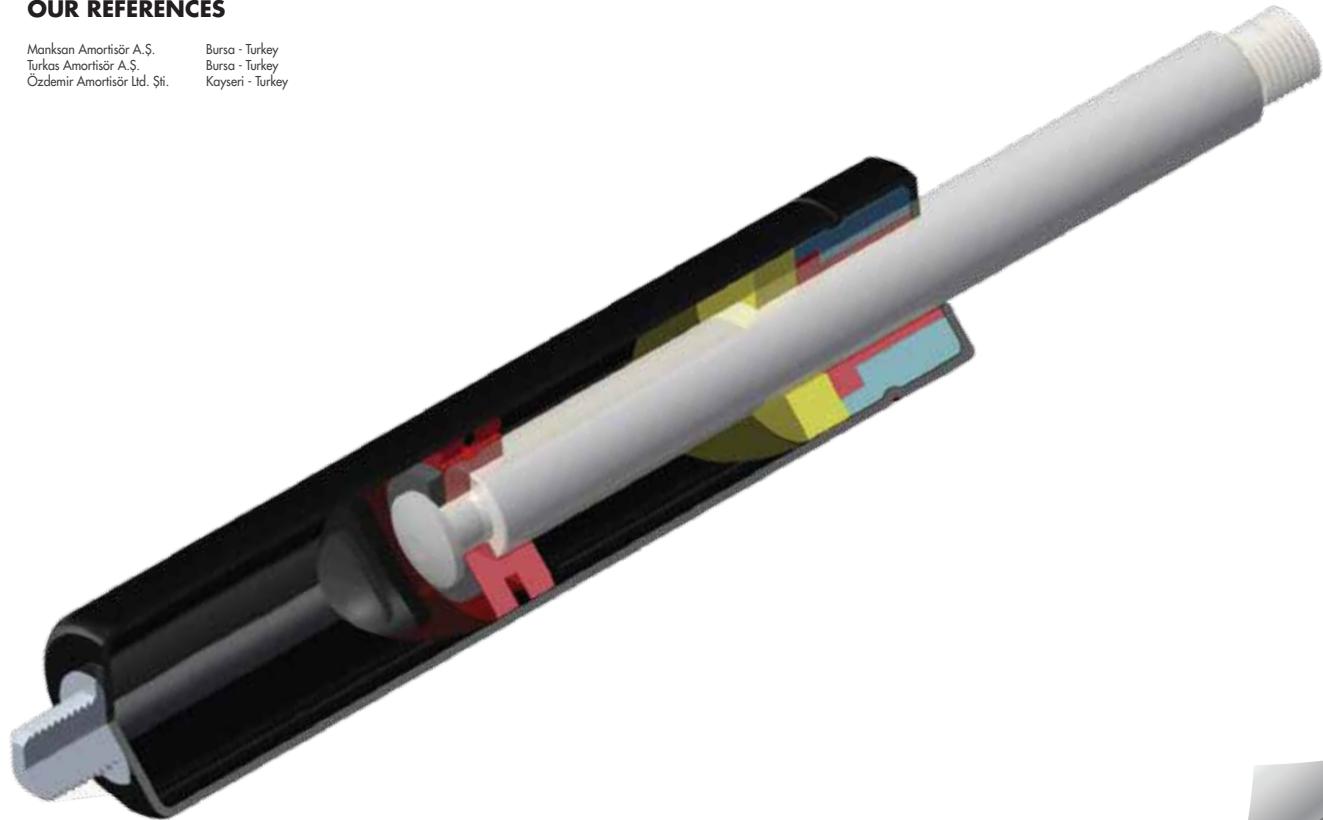
Gas-filled shock absorbers fulfill certain functions such as lifting weights, carrying, pulling and damping owing to the damping capability of approximately 200 bars of nitrogen gas inside. As Airsyst, we offer 6-7 bar nitrogen gas that we generate at the generators for use and store at 200 bars thanks to the special compressors.

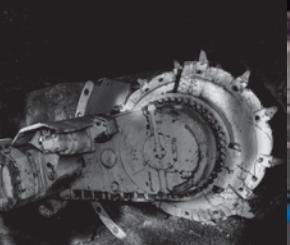
### ► Heat Treatment

The pistons which are the most important part of the shock absorbers filled with 200 bars of nitrogen gas are subject to heat treatment through the ovens. During the heat treatment, nitrogen gas is used to create an inert atmosphere inside the oven to prevent oxidation at high temperatures. Pistons have a higher resistance and sensitive surface tolerances after heat treatment.

## OUR REFERENCES

Manksan Amortisör A.Ş. Bursa - Turkey  
Turkas Amortisör A.Ş. Bursa - Turkey  
Özdemir Amortisör Ltd. Şti. Kayseri - Turkey





## PLASTIC INJECTION INDUSTRY

The nitrogen gas produced by Airsyst-Inmatec Nitrogen Generators is used to render services to the plastics industry on a number of different products ranging from stadium seats to white appliances at different points across the globe.

### ▶ Production

Plastic manufacturers use highly pure nitrogen gas during the production of the raw material to prevent any kind of oxidation on the pieces. For example, the parts that people frequently come into contact with such as the door holder of a refrigerator, are prevented from turning yellow due to the contact of the fatty acids on people's hands and oxygen.

### ▶ Injection

Nitrogen gas injected inside plastic pieces help them to take the shape of the mold. Compressed gas ensures that less bubbles are formed inside the plastic. Moreover, they create a space inside the molds creating lighter and more resistant structures. This way, assembly and raw material costs are reduced as well.

## OUR REFERENCES

Alp Plastik A.Ş.	Bolu - Turkey
Yücel Büro Mobilyaları	Gaziantep - Turkey
Savaş Plastik A.Ş.	İstanbul - Turkey
Murat Plastik San. Tic. Ltd. Şti.	Gaziantep - Turkey
Farpas Otomotiv A.Ş.	Kocaeli - Turkey





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## PHARMACEUTICAL INDUSTRY

### Transfer

High pressure nitrogen gas is used to ensure that the chemical products are carried from one tank to the other in a safe manner.

### Purging

The equipment used during production and for analytical assays may be cleaned by purging with nitrogen gas to remove the oxygen and water vapour within process lines.

### Blanket

Blanket with nitrogen prevents contamination from the air such as humidity and bacteria, creates an inert atmosphere, protects the products and prevents any lumps to be formed.

### Drug Manufacturing

Nitrogen gas is used to manufacture API (Active Pharmaceutical Ingredient) and to manufacture final drug products.

### Sterile Packaging

It is used to create the appropriate atmosphere during sterile packaging and during filter control tests.

## OUR REFERENCES

Oubari Pharma	Syria
İmmu-Nat Biyksel İlaç	Muğla - Turkey
Naturin İlaç San.Tic. Ltd. Şti.	İzmir - Turkey
Farmatek İlaç A.S.	Kırklareli - Turkey
Alvimedica Tıbbi Ürün A.Ş.	Tekirdağ - Turkey



## OUR NITROGEN GENERATOR REFERENCES



AKBAŞOĞLU  
HOLDİNG

AKCAN SA

Akdeniz Kimya

akinal teknik

Akkim



Akçik Kimya Sanayi A.Ş.



ASSAN  
ELEKTRONİK

ASCHEM



AzərEnerji

BÄRLOCHER



bafparmak



BOZKURT  
Tarım Makineleri



CİHANSER  
LAZER METAL



DEARSAN  
GİRA İNSAAT SANAYİ A.Ş.

DEMİRDÖĞÜ MİHNE  
KİMİK TİCARET VE SAN.

DENİZSAN

DENİM  
DENİZLİ KİMYA SAN. VE TİC. A.Ş.

DENSO EUROPE



dioki



eke  
DE İNŞAAT TEŞkilatı



ELSAN

ENERJİ SA  
Türkiye'nin Enerjisi

ENKA



ERİKOĞLU  
erkoğlu bateri teknolojileri a.ş.





**esan**  
Eczacıbaşı



**ETİ**  
ALUMINYUM



**farplas**



**FERRERO**



**Fresa®**



**GÜBRETAS**



**güngör®**  
GÜL İHLAKI VE İHLAKI SAN. TIC. LTD. ŞTİ.



**HASCELİK**



**HEMERA®**  
*Art of jewellery*



**HYOSUNG**



**İLKE ÇELİK**



**IMMU-NAT**  
LIQUID EXTRACT  
İthalatçı Ülkenin İcrası



**KAREL**  
Unifying Communications



**Legoraf**  
shop fitting

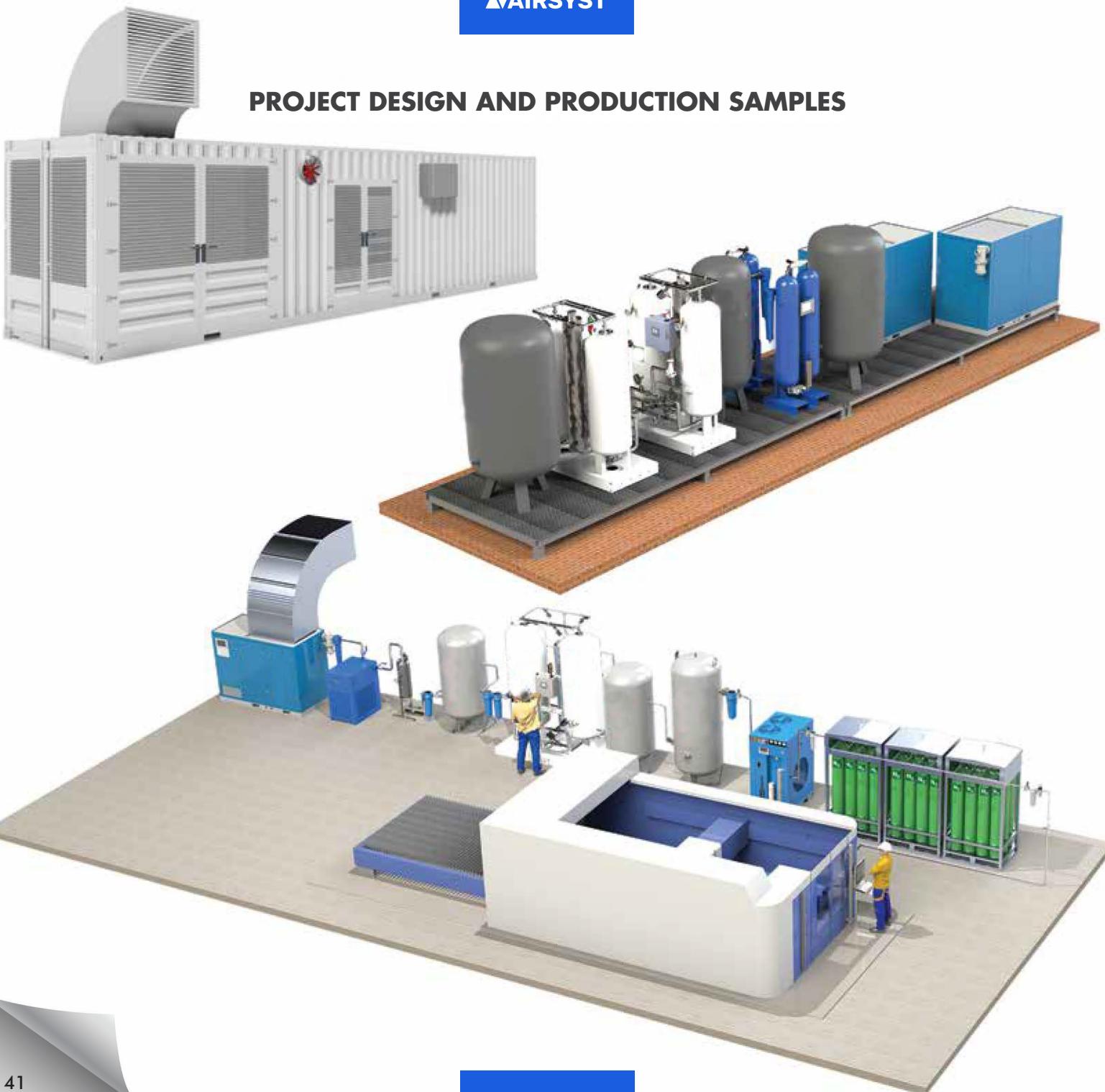


## OUR NITROGEN GENERATOR REFERENCES





## PROJECT DESIGN AND PRODUCTION SAMPLES



## PROJECT DESIGN AND PRODUCTION SAMPLES





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