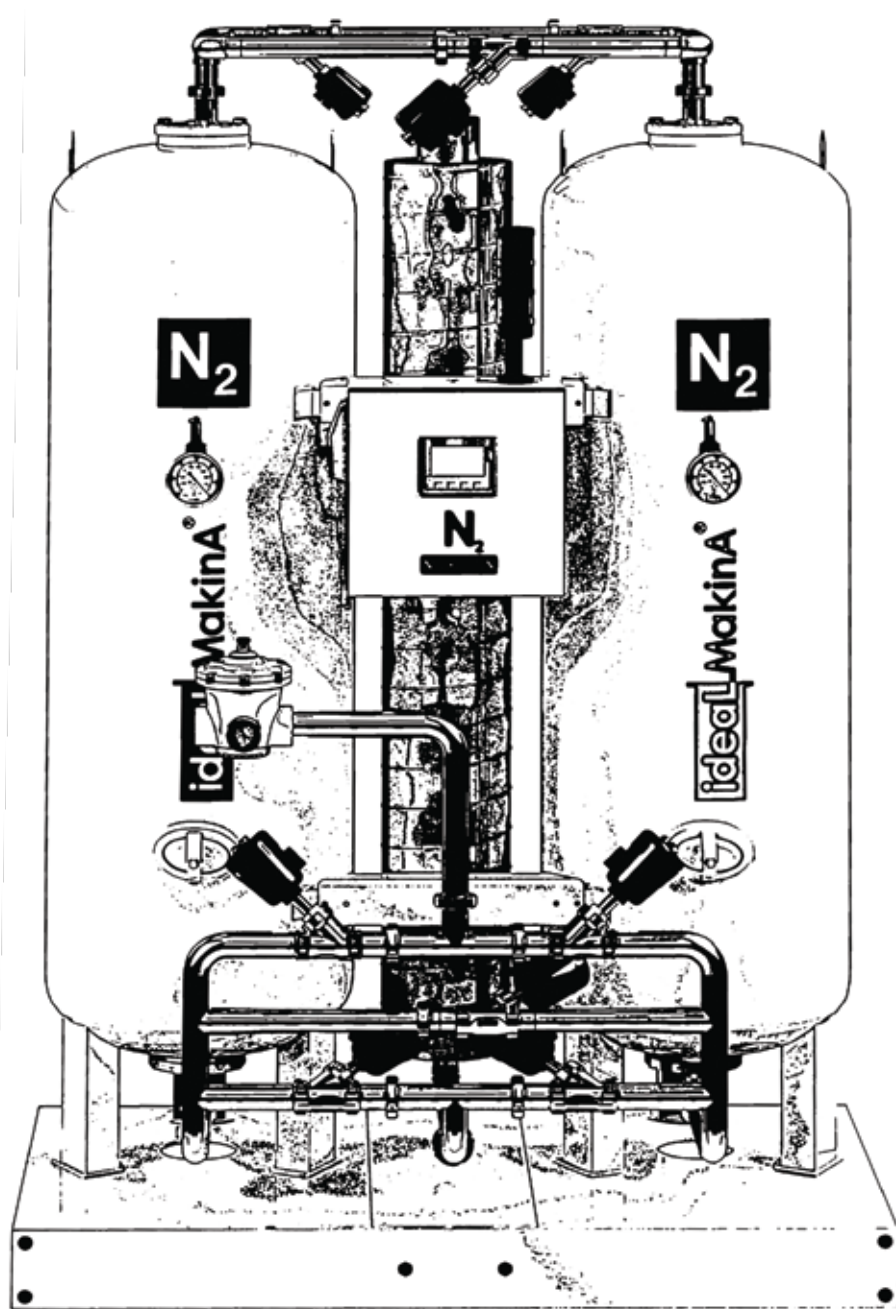


# NITROGEN

# GENERATORS

# N<sub>2</sub>



Industrial solution supplier Ideal Makina 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.

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

Ideal Makina 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 IDEAL MAKINA 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 **IDEAL MAKINA 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.

## UNINTERRUPTABLE **N<sub>2</sub>** PRODUCTION

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. **IDEAL MAKINA NITROGEN GENERATORS** guarantee sustainable and high efficiency production.

## OUR NITROGEN GENERATOR MODELS

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

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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

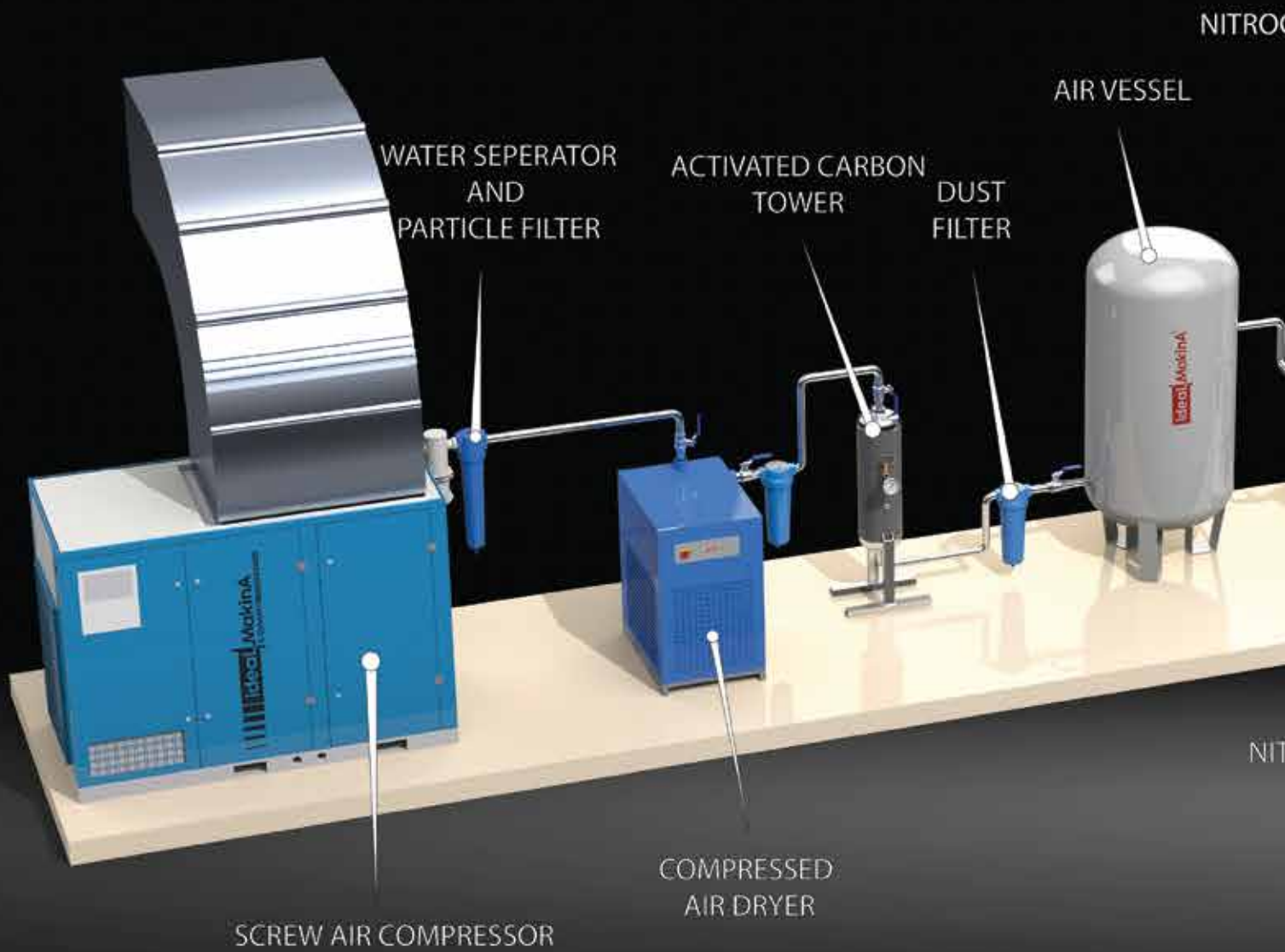
### With IDEAL MAKINA NITROGEN PRODUCTION SYSTEMS

"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



WATER SEPERATOR  
AND  
PARTICLE FILTER

ACTIVATED CARBON  
TOWER

DUST  
FILTER

AIR VESSEL

SCREW AIR COMPRESSOR

COMPRESSED  
AIR DRYER

NITRO

NIT

TOUCH CONTROL PANEL



NITROGEN DISTRIBUTION SET

NITROGEN GENERATOR



NITROGEN GENERATOR INLET FILTERS

O2 DISTRIBUTION



NITROGEN GENERATOR BUFFER VESSEL

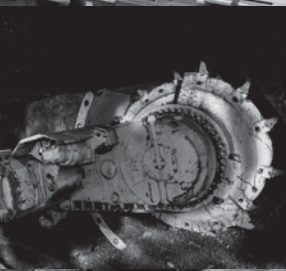
HIGH PRESSURE FILTERS



NITROGEN BOOSTER COMPRESSOR

NITROGEN BUNDLES





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## 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.S.	Yalova - Turkey	
Konya Şeker	Konya - Turkey	
Iba Valresa	Ankara - Turkey	
Iba Kimya	Ankara - Turkey	
MKE Barut Fabrikası	Kırıkkale - Turkey	
Aksa Akrilik	Yalova - Turkey	
Akdeniz Kimya	Izmir - Turkey	(3 Systems)
Organik Kimya	Istanbul - Turkey	(2 Systems)
Orgachem2	Istanbul - Turkey	
Türk Henkel A.S.	Kocaeli - Turkey	(2 Systems)
Hayat Kimya	Kocaeli - Turkey	(2 Systems)
Ravago Petrokimya	Kocaeli - Turkey	
Eyyap Sabun	Istanbul - Turkey	
PPG Kimya	Bursa - Turkey	
Gübretaş Gübre	Izmir - Turkey	
Bak Ambalaj	Izmir - Turkey	
Koruma Klor	Kocaeli, Denizli - Turkey	(3 Systems)
Ece Boya	Istanbul - Turkey	
Mayr Melnhof Packing	Iran	
Baerlocher Kimya	Manisa - Turkey	
Esan Eczacıbaşı	Eskişehir - Turkey	(2 Systems)
Ece Boya	Istanbul - Turkey	
Pulcra Kimya	Kocaeli - Turkey	

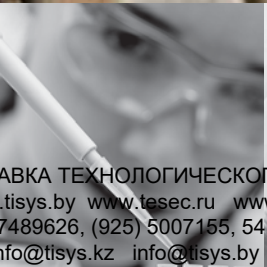
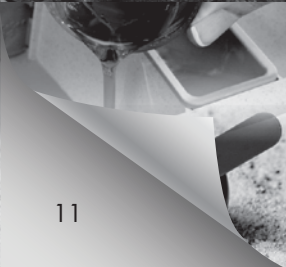


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## FOOD INDUSTRY

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 Ideal 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 CO2 and to send to the packages. Due to the bacteriostatic and fungal static properties of CO2 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-salami.

### 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 Pazari A.Ş.  
Papagan Kuruyemiş A.Ş.  
Sarıaçoğlu Kuruyemiş  
Nefis Kuruyemiş A.Ş.  
Elmas Gıda Kuruyemiş  
An Gıda(Sera Food)  
Tiryaki Agro Gıda A.Ş.  
Sevilan Kuruyemiş  
Çelik Kuruyemiş  
Aydın Kuruyemiş  
Transtest SRL Kuruyemiş  
Gilan Holding  
Hilal Kuruyemiş  
Meyna Kuruyemiş  
Okullu Gıda Ltd. Şti.  
Alhntop Kuruyemiş  
An Gıda A.Ş.  
Dadash Barader  
Güngör Gıda Ltd. Şti.  
Azersun  
Al-Qerati Snack Food  
Isiger Müh.

Istanbul - Turkey  
Çerkezköy - Turkey  
Samsun - Turkey  
Gaziantep - Turkey (2 Systems)  
Aydın - Turkey  
Gaziantep - Turkey  
Antalya - Turkey  
Antalya - Turkey  
Siirt - Turkey  
Moldavia  
Azerbaijan  
Iraq  
Osmaniye - Turkey  
Balıkesir - Turkey  
Denizli - Turkey  
Aydın - Turkey  
Iran  
Bursa - Turkey  
Azerbaijan  
Iraq  
Saudi Arabia

### Dry Nuts

T.L.P. Gıda Ltd. Şti.  
Muhieddine Hammoud Co.  
Novac Makine San.  
Pinar Kuruyemiş A.Ş.  
Oltan Gıda A.Ş.  
Adalılar Kuruyemiş  
Ateşler Kuruyemiş  
Milhans Gıda  
Ülker Çikolata San. A.Ş.  
Dr.Oetker

Gaziantep - Turkey  
Lebanon  
Sakarya - Turkey  
Konya - Turkey  
Sakarya - Turkey  
Sakarya - Turkey  
Mersin - Turkey  
Kocaeli - Turkey  
Istanbul - Turkey  
Izmir - Turkey

### Chocolate

Ferrero (Nutella, Kinder)  
Ülker Çikolata 1 Fab.  
Sölen Çikolata A.Ş.  
Sölen Çikolata A.Ş.  
Ülker Onem Gıda A.Ş.  
Çağla Şekerli Mam. San.

Manisa - Turkey  
Istanbul - Turkey  
Istanbul - Turkey  
Gaziantep - Turkey  
Giresun - Turkey  
Sakarya - Turkey

### Pastry Dough

Darin Gıda (Afilo) Ltd.  
Öz-El Unlu Gıda Ltd.  
Nivpa Gıda(Yu-Ka) Ltd.  
Unifo Gıda A.Ş.  
Özsoy Unlu Mamülleri Ltd.  
Özalp Unlu Mamülleri Ltd.

Istanbul - Turkey  
Kayseri - Turkey  
Istanbul - Turkey  
Kocaeli - Turkey  
Tekirdağ - Turkey  
Kayseri - Turkey

### Tea, Dairy Products

Doğuş Çay A.Ş.  
Kraft Gıda - Doğuş Çay A.Ş.  
Gürsüt A.Ş.  
Altanea Gıda A.Ş.  
Aral Gıda A.Ş.  
Alaverdi Wine Ltd.  
Pal Food  
Alhparmak Gıda A.Ş.  
Freşa İçecek A.Ş.  
A+CO

Istanbul - Turkey  
Aksaray - Turkey  
Izmir - Turkey  
Istanbul - Turkey  
Mersin - Turkey  
Georgia  
Azerbaijan  
Istanbul - Turkey  
Bursa - Turkey  
Azerbaijan

### Drinks

Freşa İçecek San.  
Nova Fruşt International

Bursa - Turkey  
Izmir - Turkey



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**N<sub>2</sub>**

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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 Ideal Makina, 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 deduct the following conclusions with regards to INMATEC Nitrogen Generators based on our experience within the industry as Ideal Makina.

- **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 Ideal Makina.
- **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 Ideal Makina 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

Teknoçan Teshir  
Simya Metal  
Demircioğlu Makine  
Nuri Körüstan  
Teknik Lazer  
Yünsel Lazer  
Mysilo  
Kozanoğlu Otomatik  
Zeenni Steel  
Bilge Inoks  
Öz-Saç İmalat  
Teknikel Lazer  
PSL Fiberli Elektronik  
Akyürek Kardeşler  
Tırσαν

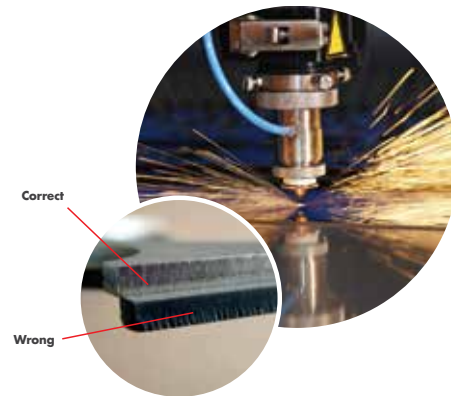
Çerkezköy - Turkey  
İzmir - Turkey  
İstanbul - Turkey  
Bursa - Turkey  
İstanbul - Turkey  
İstanbul - Turkey  
Aksaray - Turkey  
İzmir - Turkey  
Lebanon  
Dilovası - Turkey  
Çarlı - Turkey  
İzmir - Turkey  
Antalya - Turkey  
Mersin - Turkey  
Sakarya - Turkey

Merih Asansör  
Diktaş Soğutma  
Genç Bayraktar  
Poyraz PaslanmazPirge  
(Yesilyayla Kesici Aletler)  
Kocaksac  
Sumak Metal  
Örnek Çakına  
Gülezer Metal  
Uğur Soğutma  
Siloport (Mysilo)  
MLPS LTD.  
Zeenni Steel  
Target Metal  
Dzenemi

Ankara - Turkey  
Ankara - Turkey  
Bursa - Turkey  
İstanbul - Turkey  
Bursa - Turkey  
Konya - Turkey  
Konya - Turkey  
Gaziantep - Turkey  
Adana - Turkey  
Aydın - Turkey  
Aksaray - Turkey  
Bulgaria  
Lebanon  
Qatar  
Bosnia

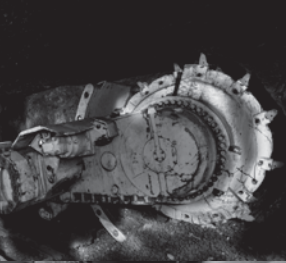
### OUR REFERENCE COUNTERS

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





**N<sub>2</sub>**



ООО «ТИ-СИСТЕМС», ИНЖИНИРИНГ И ПОСТАВКА ТЕХНОЛОГИЧЕСКОГО ОБОРУДОВАНИЯ  
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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

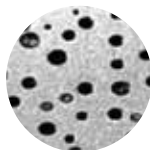
Galvanization procedure uses nitrogen to scrape the excessive zinc on the surfaces that are galvanized. Nitrogen gas generated with INMATEC Nitrogen Generators can be given to these systems via manual or automatic systems.

### Degasification

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

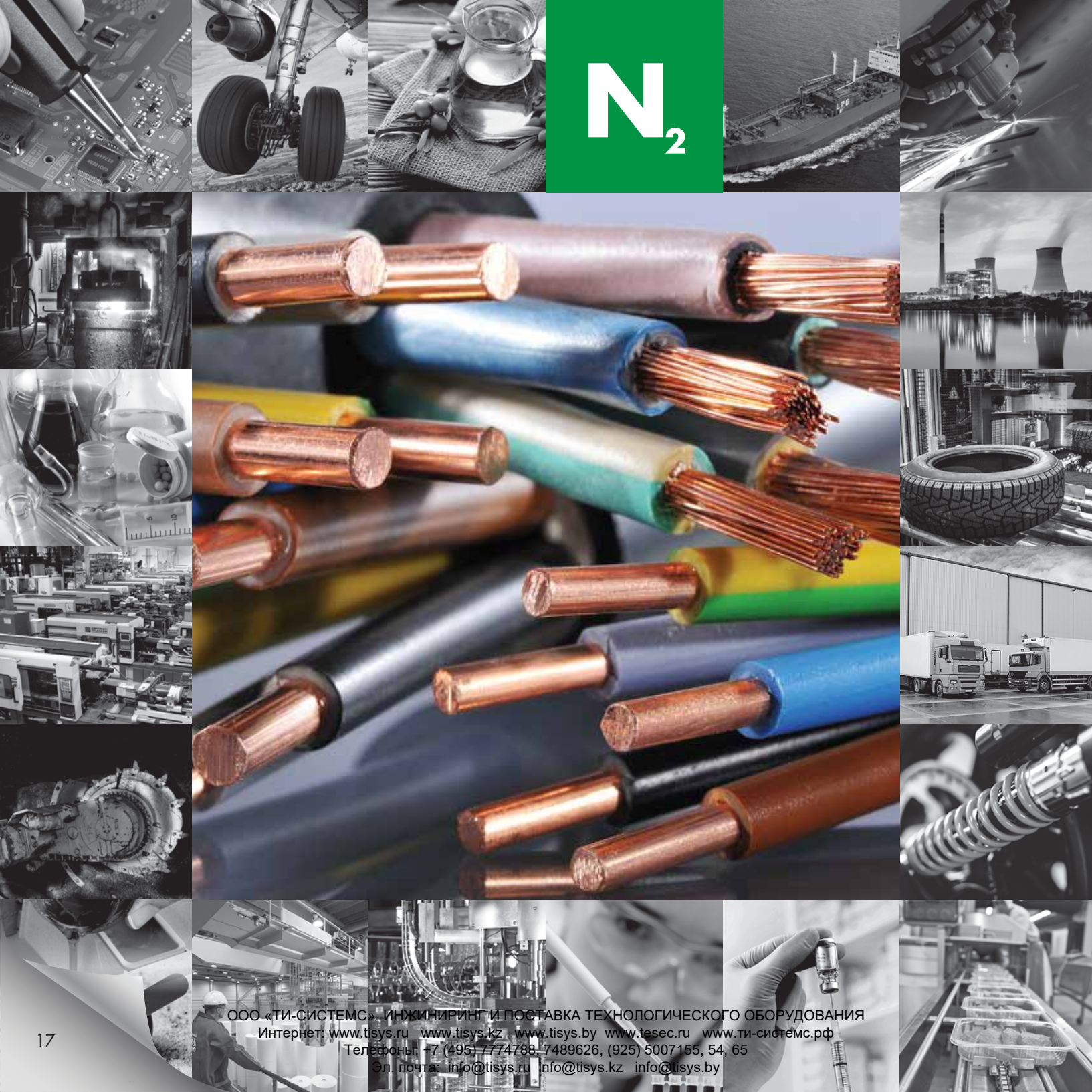
Tuşaş Tai Havacılık  
Yılmaz Redüktör  
Kardeş Elektrik  
Samsun Yurt Savunma  
Kanca El Aletleri  
Eti Alüminyum  
Akış Asansör  
Has Çelik Halat  
Steel Structures  
Sistem Teknik

Ankara - Turkey  
İstanbul - Turkey  
İstanbul - Turkey  
Samsun - Turkey  
İstanbul - Turkey  
Konya - Turkey  
Konya - Turkey  
Kayseri - Turkey  
Azerbajjan  
Kocaeli - Turkey

Sistem Alüminyum  
Teknik Bağlantı El.  
Birlir Çelik  
Norm Civata  
Norm Somun  
Norm Salihli  
Sistem Teknik  
Temel Tel  
Gemciler Güven Metal

Russia  
Adana - Turkey  
Bursa - Turkey  
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Kocaeli - Turkey  
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Kahramanmaraş - 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
İMC 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

(2 Systems)



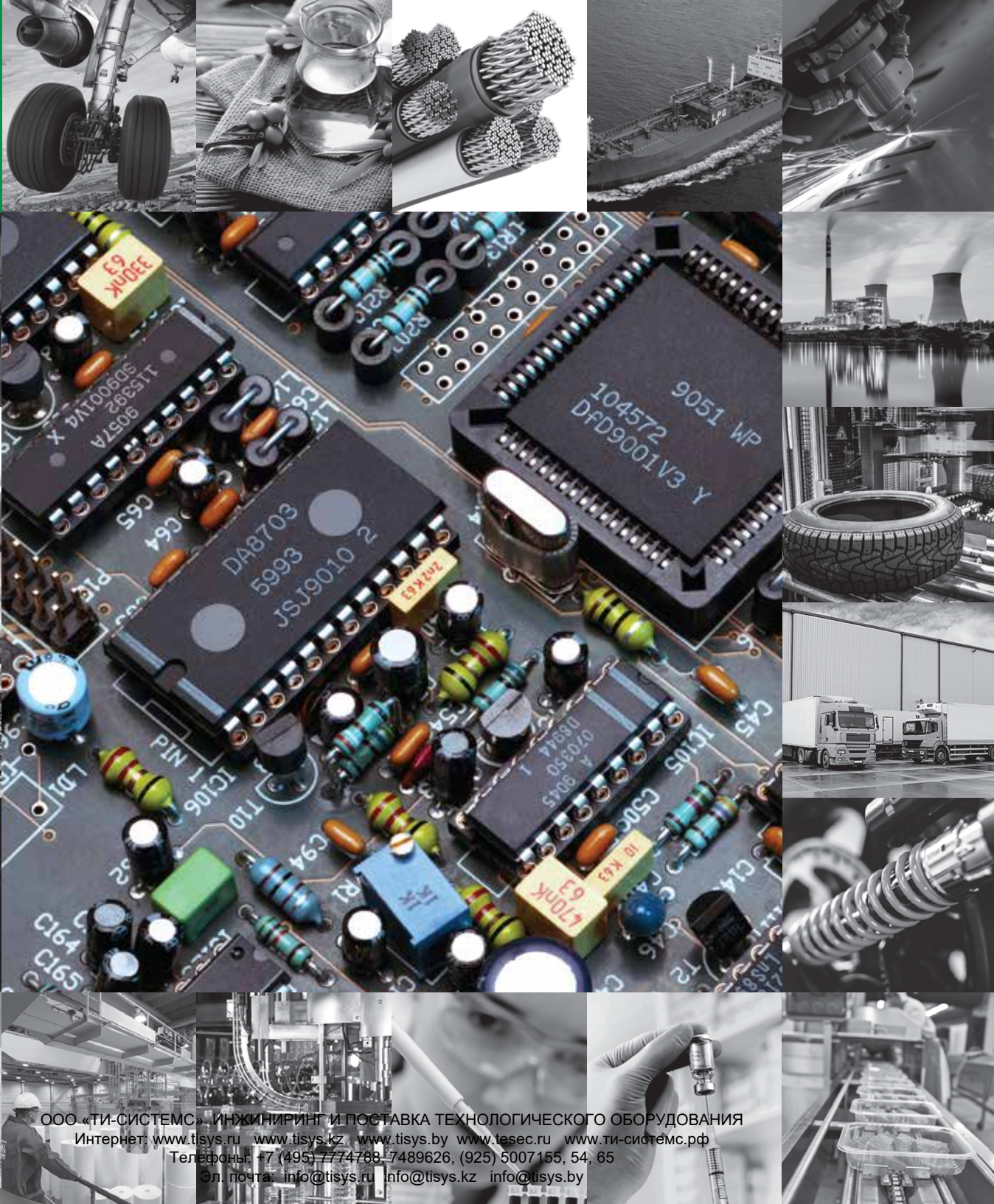
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## ELECTRONICS INDUSTRY

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

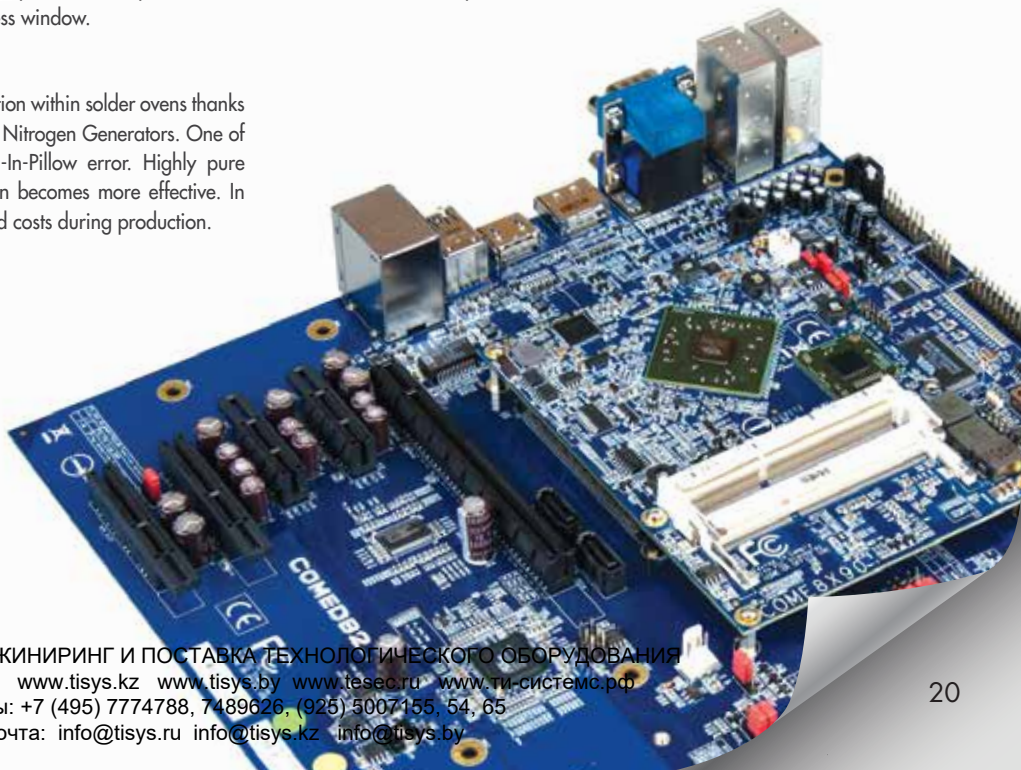
The nitrogen gas used during assembly allows lower procedure temperatures. Moreover, it ensures that the procedures can be done with ease and allows the creation of a wider process window.

### ▶ Effective Production with Ideal Makina

Ideal Makina reduces the rate of erroneous production within solder ovens thanks to the systems that it establishes with Ideal Makina 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.Ş.	Ankara - Turkey	
Ortem Elektronik A.Ş.	Istanbul - Turkey	
Kunt Elektronik A.Ş.	Istanbul - Turkey	
Assan Elektronik A.Ş.	Istanbul - Turkey	
Simpro Elektronik Ltd.	Kocaeli - Turkey	
Siemens Türkiye A.Ş.	Istanbul - Turkey	(3 Systems)
Vestel Beyaz Eşya A.Ş.	Manisa - Turkey	(2 Systems)
Arçelik Beyaz Eşya A.Ş.	South Africa	
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Na-De Elektronik San. Tic. A.Ş.	Istanbul - Turkey	
Nafaline Enterprise	Malaysia	
Tübitak Mam	Kocaeli - Turkey	
Grup ARGE	Istanbul - Turkey	
Merç PCB	Istanbul - Turkey	
Samsung Electronics	Istanbul - Turkey	





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## 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.

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İskul Gıda (Zeytin İskelesi Ltd Şti.)  
Lütfü Yüksel Yağ Ltd. Şti.  
Polimeks İnşaat A.Ş.  
Ülker Çikolata 1 Fab.  
Felda İFFCO Gıda A.Ş.  
Trakya Yağ Yem San. A.Ş.  
Ferrero Çikolata  
Şölen Çikolata  
Savola Gıda San. ve Tic. A.Ş.

Izmir - Turkey  
Eskişehir - Turkey  
Turkmenistan  
Istanbul - Turkey  
Izmir - Turkey  
Kırklareli - Turkey  
Manisa - Turkey  
Gaziantep - Turkey  
Balıkesir - Turkey (2 Systems)



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## 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

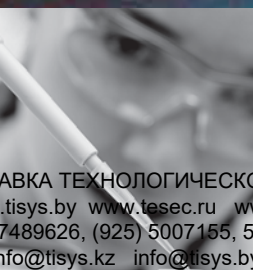
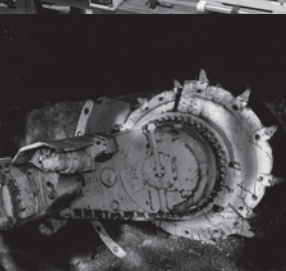
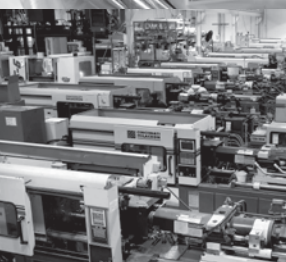
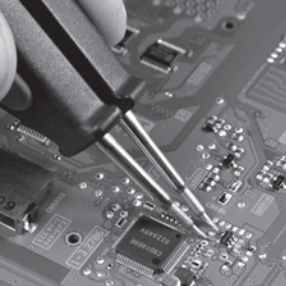
Emergency slides in airplanes, inflatable boats and life jackets are all inflated with nitrogen gas. Moreover, nitrogen gas is used inside the shock absorbers of the landing gears of airplanes. As İdeal Makina, we render services with Tube Filling Stations that store nitrogen gas generated at the requested 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 İnş. Taah. Tic. Ltd. Şti.

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





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## 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

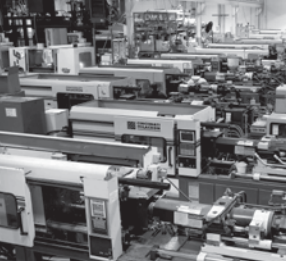
Veysel Vardal Denizcilik A.Ş.  
MRC Semiramis Akaryakıt Tankeri  
MRC Emirhan Akaryakıt Tankeri  
Dearsan Gemi İnşaat A.Ş.  
Denizsan A.Ş.  
Akva Tek Su Ürünleri

İstanbul - Turkey  
İstanbul - Turkey  
İstanbul - Turkey  
Turkmenistan  
İstanbul - Turkey  
İzmir - Turkey

MRC Hatice Ana Akaryakıt Tankeri  
Genka Denizcilik  
Emden Denizcilik  
Akbaşoğlu Holding  
Düzgüt Gemi İnş. San. A.Ş.

İstanbul - Turkey  
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## MINING INDUSTRY

The ores mined within the mining industry are purified from soil and other additives by using nitrogen gas. As İdeal Makina, 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.

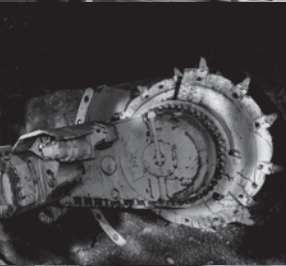
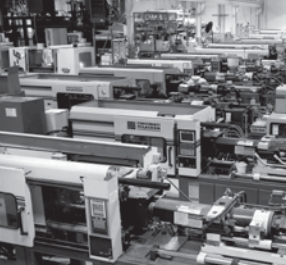
### ▶ Ore Processing

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

### OUR REFERENCES

Tüprağ Alın Madeni	İzmir - Turkey
Kuzey Ege Bakır Madeni	Balıkesir - Turkey
Tüprağ Alın Madeni	Uşak - Turkey
Kuzey Ege Bakır Madeni	Balıkesir - Turkey
Mng Gold	Liberia
Türkiye Taşkömürleri	Zonguldak - Turkey
Esan Eczacıbaşı A.Ş.	Eskişehir - Turkey
TKİ Kurumu	Kütahya - Turkey





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## POWER AND ENERGY INDUSTRY

There are several processes taking place inside the Thermal Power Plans 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 İdeal Makina provides significant advantages by offering these plants the possibility to generate their own gas "on-site".

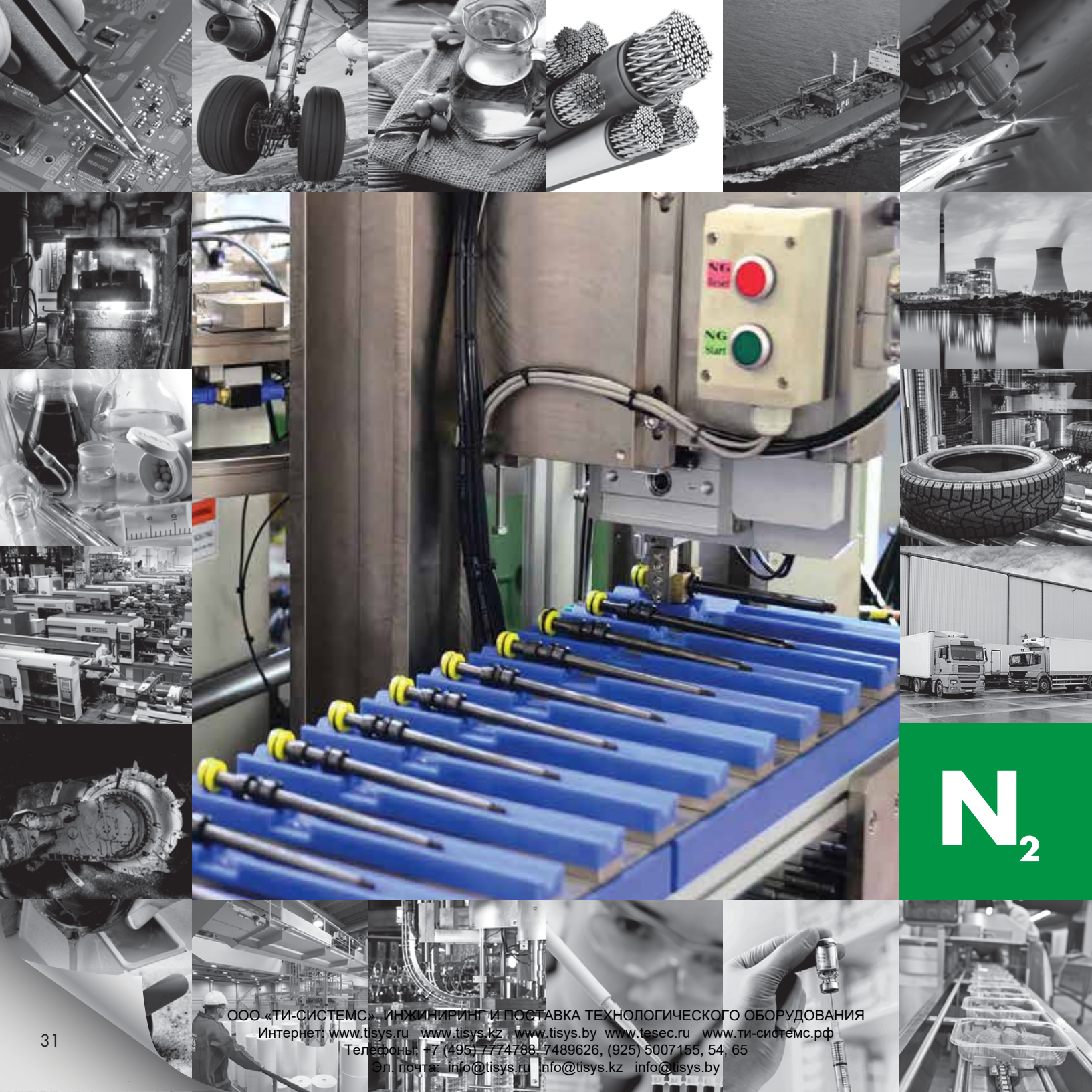
- ▶ Blanket is created on demineralized water tanks with nitrogen gas and water's conductivity is prevented from increasing.
- ▶ Nitrogen gas is used to ensure that the mechanical seals of turbo compressors are leakproof.
- ▶ Nitrogen gas is used to wash and prevent corrosion and rusting when the boilers 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.

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Çalık Enerji A.Ş.  
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Enka Doğalgaz Kombine Çevrim Santrali  
Enka Doğalgaz Kombine Çevrim Santrali  
Enka Doğalgaz Kombine Çevrim Santrali  
Eke Endüstri Ltd. Şti.  
Gebze 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  
Azereenergy

Antalya - Turkey  
Turkmenistan (3 Systems)  
North Iraq (2 Systems)  
Kayseri - Turkey  
Sakarya - Turkey  
Kocaeli - Turkey  
İstanbul - Turkey  
Kocaeli - Turkey  
İzmir - Turkey  
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Телефоны: +7 (495) 774788, 7489626, (925) 5007155, 54, 65  
Эл. почта: [info@tisys.ru](mailto:info@tisys.ru) [info@tisys.kz](mailto:info@tisys.kz) [info@tisys.by](mailto:info@tisys.by)

## 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

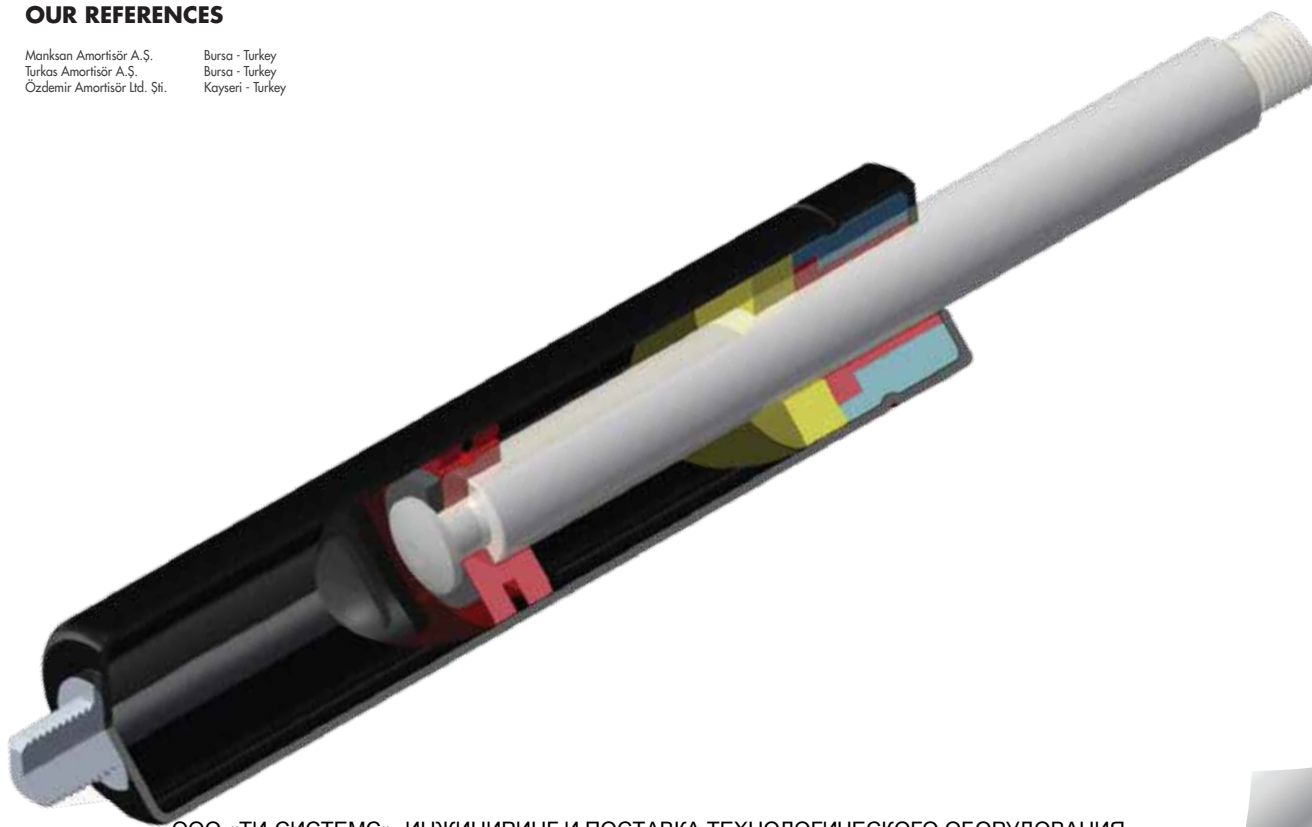
Gas-filled shock absorbers fulfill certain functions such as lifting weights, carrying, pulling and damping owing to the damping capability of approximately 200 bars of nitrogen gas inside. As İdeal Makina, we offer 6-7 bar nitrogen gas that we generate at the generators for use and store at 200 bars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

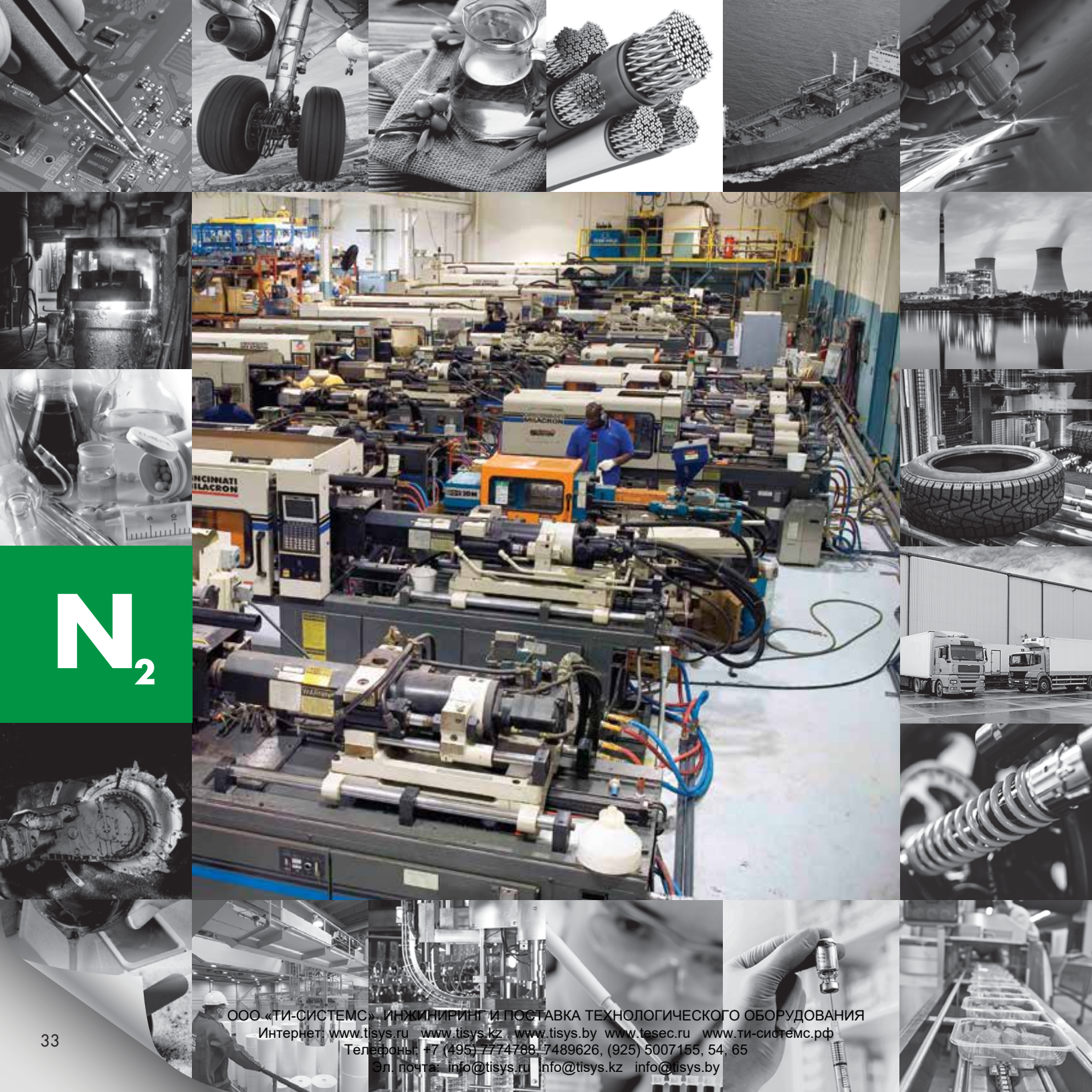
### ▶ Heat Treatment

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

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





**N<sub>2</sub>**

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## PLASTIC INJECTION INDUSTRY

The nitrogen gas produced by ideal Makina-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

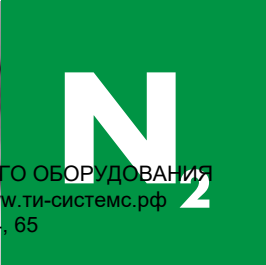
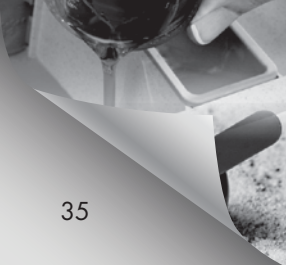
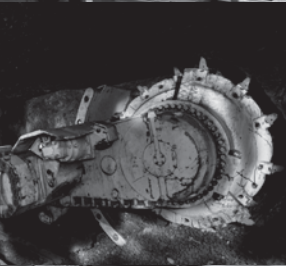
Nitrogen gas injected inside plastic pieces help them to take the shape of the mold. Compressed gas ensures that less bubbles are formed inside the plastic. Moreover, they create a space inside the molds creating lighter and more resistant structures. This way, assembly and raw material costs are reduced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

### OUR REFERENCES

Alp Plastik A.Ş.  
Yücel Büro Mobilyaları  
Savaş Plastik A.Ş.  
Murat Plastik San. Tic. Ltd. Şti.  
Farplas Otomotiv A.Ş.

Bolu - Turkey  
Gaziantep - Turkey  
İstanbul - Turkey  
Gaziantep - Turkey  
Kocaeli - Turkey





## 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  
İmmu-Nat Birkisel İlaç  
Naturin İlaç San.Tic. Ltd. Şti.  
Farmatek İlaç A.Ş.  
Alvimedica Tibbi Ürün A.Ş.

Syria  
Muğla - Turkey  
İzmir - Turkey  
Kırklareli - Turkey  
Tekirdağ - Turkey



## OUR NITROGEN GENERATOR REFERENCES







## OUR NITROGEN GENERATOR REFERENCES





## SAMPLES FROM OUR PROJECTS



İSTANBUL - TURKEY



YALOVA - TURKEY

## SAMPLES FROM OUR PROJECTS

**ENKA**

**NORTH IRAQ**



 **CALIK ENERJİ**

**TURKMENISTAN**

## SAMPLES FROM OUR PROJECTS

HASCELİK

KAYSERİ - TURKEY



HAYAT

KOCAELİ - TURKEY

## SAMPLES FROM OUR PROJECTS



KONYA - TURKEY



ADANA - TURKEY

## SAMPLES FROM OUR PROJECTS



KAYSERİ - TURKEY



DENİZLİ - TURKEY



## SAMPLES FROM OUR PROJECTS

 **ORGANİKKİMYA**  
the chemistry between us

İSTANBUL - TURKEY



  
ortem elektronik

İSTANBUL - TURKEY

## SAMPLES FROM OUR PROJECTS



BALIKESİR - TURKEY



ANKARA - TURKEY

## SAMPLES FROM OUR PROJECTS

**akinal**  
tekstil

GAZİANTEP - TURKEY



**Simya Metal**  
Aeril teknolojisi, yüksek kaliteli, ucuzluk egilimi.

İZMİR - TURKEY

## SAMPLES FROM OUR PROJECTS

nuri körüstan  
makina metal sanayi ve ticaret a.ş.

BURSA - TURKEY



teknik  
lazer  
çözüm ortakları

İSTANBUL - TURKEY

## SAMPLES FROM OUR PROJECTS



LIBERIA



ZONGULDAK - TURKEY

## SAMPLES FROM OUR PROJECTS



İSTANBUL - TURKEY



SEIYUN INDUSTRIAL  
GASES FACTORY

YEMEN

## SAMPLES FROM OUR PROJECTS

**MYSiLO<sup>®</sup>**

TANIL DEPOLAMA SİSTEMLERİ  
GRAIN STORAGE SYSTEMS

AKSARAY - TURKEY



*başparmak*

İSTANBUL - TURKEY

## SAMPLES FROM OUR PROJECTS



MERCAN GROUP

İSTANBUL - TURKEY



KÜTAHYA - TURKEY



## SAMPLES FROM OUR PROJECTS

J&P STEEL

LEBANON



IRAN

## SAMPLES FROM OUR PROJECTS

Xtekniket  
LAZER

İZMİR - TURKEY



DIKTAS  
TEKNOLOJİK VE SANAYİ

ANKARA - TURKEY

## SAMPLES FROM OUR PROJECTS

 arçelik

ESKİŞEHİR - TURKEY



 AYVAZ

İSTANBUL - TURKEY

## SAMPLES FROM OUR PROJECTS

NURLU YATIRIM

TURKMENSTAN



petlas®

KIRŞEHİR - TURKEY

## SAMPLES FROM OUR PROJECTS

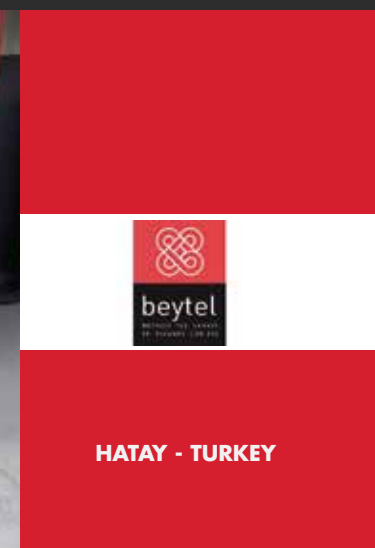
 TIRSAN

SAKARYA - TURKEY



BOSNIA AND  
HERZEGOVINA

## SAMPLES FROM OUR PROJECTS



HATAY - TURKEY

## OUR CERTIFICATES AND INTERNATIONAL QUALITY CERTIFICATES



## PROJECT DESIGN AND PRODUCTION SAMPLES





## PROJECT DESIGN AND PRODUCTION SAMPLES



## HEAD OFFICE



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## FACTORY

### DESIGN



We design the gas generators by our R&D engineers on CAD program. Software of PLC control systems design by our electronic engineers.

### PRODUCTION



All the pipe welding, mechanical connection and electric cabling works completing in our factory. Our special V/V technology supported by CAM methods present to gas generator a long lifetime.

### TEST



After the production, generators are tested in our factory, on the test stands. Test reports are prepared based on capacity, purity, pressure, temperature and dew point parameters. In case of request we can organise FAT (Factory acceptance test) and SAT (Site acceptance test).

### SHIPMENT



All products that pass the test are packaged according to Ideal Makina standards. We also supply special wooden boxes and packages according sea Cargo and air Cargo.