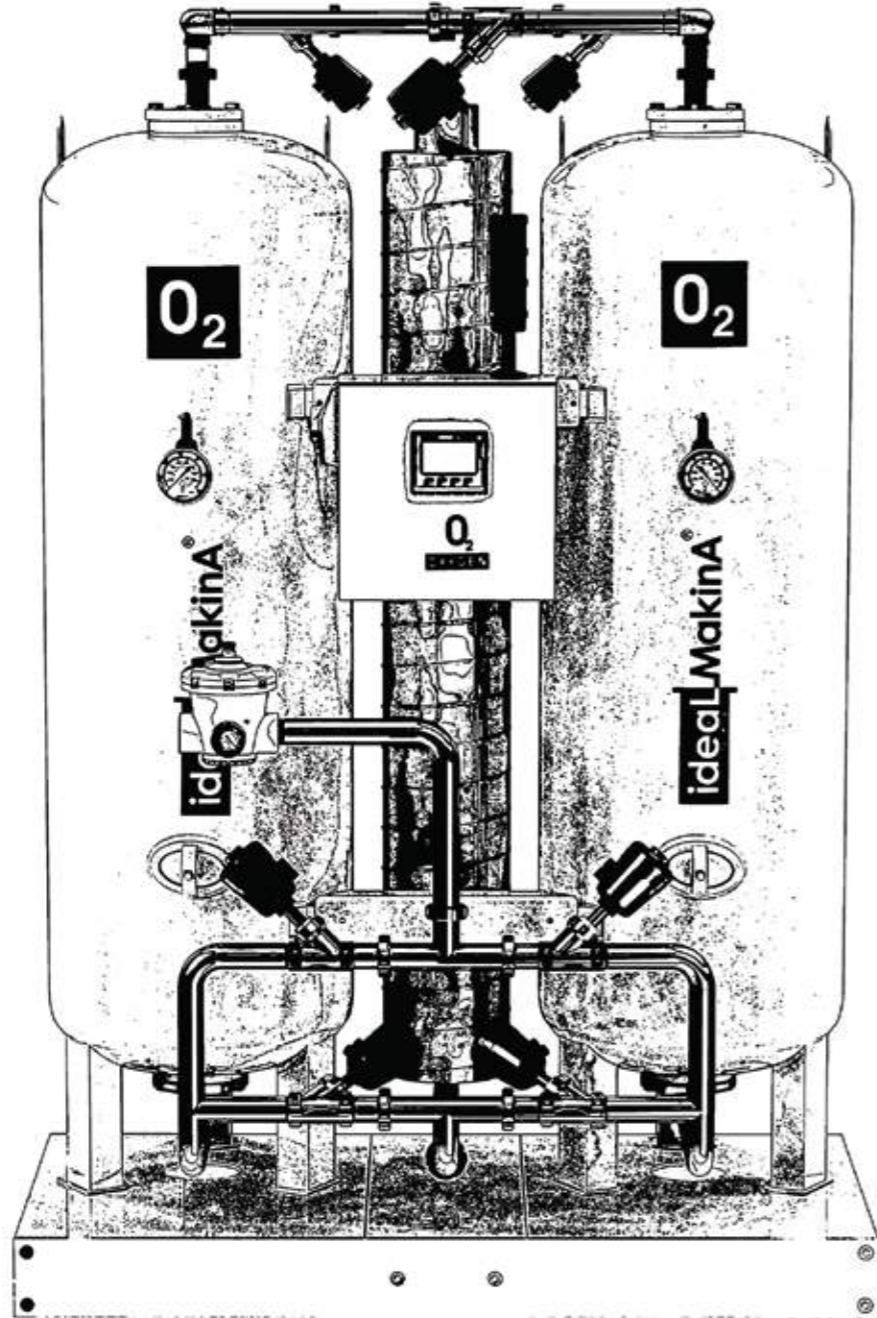


OXYGEN GENERATORS



2



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 m² 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 OXYGEN GAS WITH IDEAL MAKINA OXYGEN GENERATORS, **FORGET** ABOUT THE **COST FOR BUYING** CYLINDER OR LIQUID OXYGEN! **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...**



%95 PURITY

Production of Oxygen gas up to 95% purity with PSA technology

Thanks to the PSA technology utilized by **IDEAL MAKINA OXYGEN GENERATORS**, you can produce Oxygen gas with up to **95%** purity within the capacity range of **0.5-2000 Nm³/h**.

UNINTERRUPTABLE



PRODUCTION

These generators produce Oxygen 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 zeolite filled two columns. While the air is passing through the columns, the Nitrogen and Carbon Dioxide molecules are removed and the pressure dew point is lowered. The generated Oxygen gas is clean, dry and high purity so that it can be used for a wide variety of applications.

The parameters such as compressed air temperature, pressure, Oxygen purity and Oxygen pressure are all monitored continuously. The efficiency of **IDEAL MAKINA OXYGEN GENERATORS** guarantee sustainable and high efficiency production.

OXYGEN GENERATOR MODELS

Models	Capacity (Nm ³ /h)	Oxygen Purity (%)		
		90,0	93,0	95,0
IM-GO 10	0,8	0,7	0,6	
IM-GO 20	1,4	1,2	1,0	
IM-GO 30	2,6	2,4	2,1	
IM-GO 40	3,8	3,5	3,2	
IM-GO 60	5,6	5,1	4,5	
IM-GO 100	9,8	8,5	8,0	
IM-GO 120	12,5	11,5	10,0	
IM-GO 150	15,0	13,5	12,3	
IM-GO 200	20,0	17,0	16,0	
IM-GO 300	30,0	26,9	25,0	
IM-GO 400	42,0	38,0	35,0	
IM-GO 600	60,0	55,0	50,0	
IM-GO 800	80,0	73,5	67,0	
IM-GO 1000	105,0	95,0	90,0	
IM-GO 1400	140,0	125,0	110,0	
IM-GO 1500	155,0	140,0	128,0	
IM-GO 2000	195,0	176,0	160,0	
IM-GO 2500	245,0	225,0	205,0	
IM-GO 3000	295,0	265,0	245,0	
IM-GO 4000	390,0	355,0	325,0	

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

* Please contact our engineers for different capacity and purity values.

COMPRESSED AIR REQUIREMENTS

Temperature Range +10°C - +50°C
Air Quality ISO 8573.1 Class 1.4.1
Dew Point +3°C

AMBIENT CONDITIONS

Temperature Range +5°C - +40°C
Option -50°C ... +60°C

TECHNICAL FEATURES

Max. Working Pressure 10 bar
Power Connection 230V, 50Hz/60Hz
Noise Level from 55 to max 85 dB(A)



NON-STOP PRODUCTION GUARANTEED WITH STAINLESS STEEL VALVE SYSTEM!

- Pneumatic valves that ensure regular flow of air and oxygen 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 no need for maintenance.

10 YEARS OF GUARANTEE

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

Zeolite 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 Oxygen Generator using the internet from any point across the world.



SIMPLE AND EASY MANAGEMENT

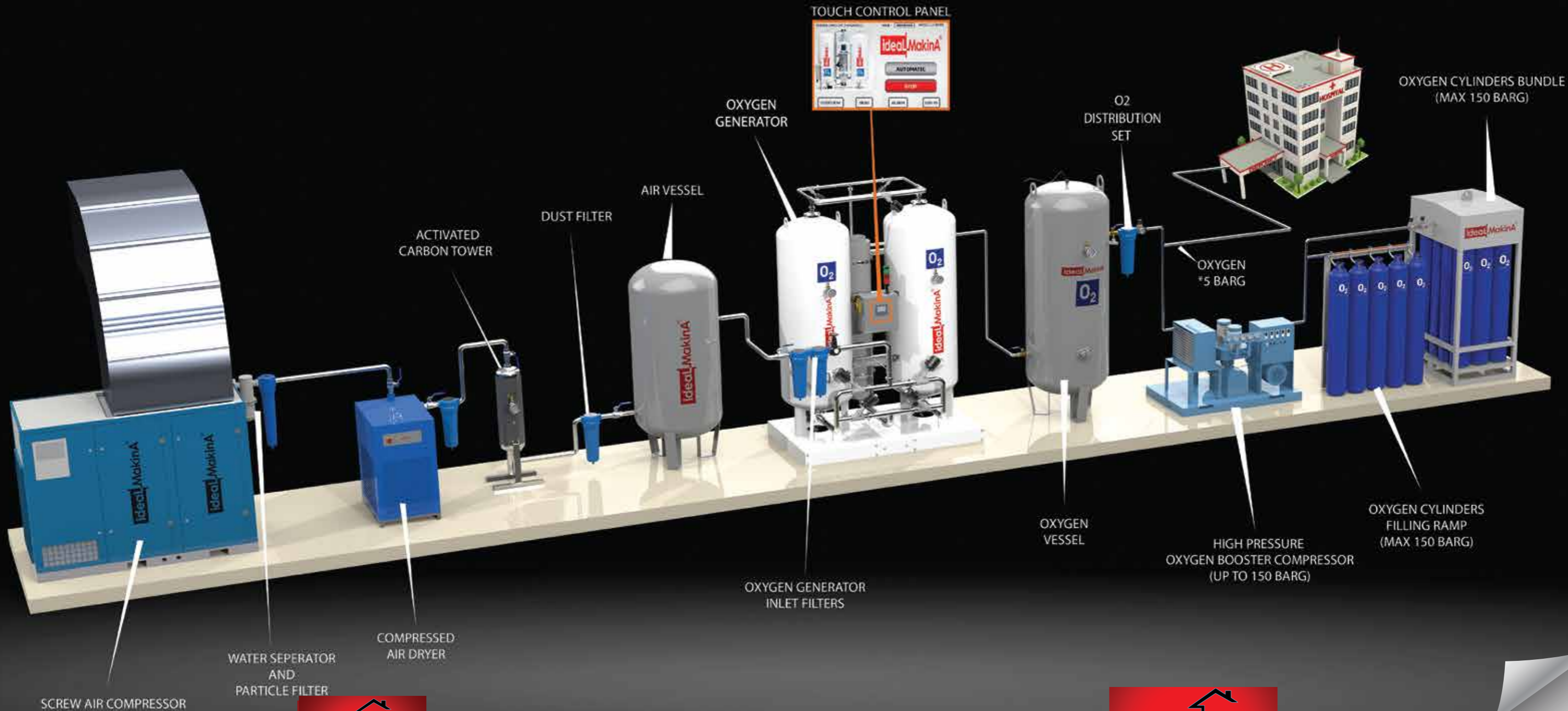
With IDEAL MAKINA OXYGEN PRODUCTION SYSTEMS

“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





ENGINEERING, INSTALLATION & AFTER SALES SERVICE

► Professional Engineering

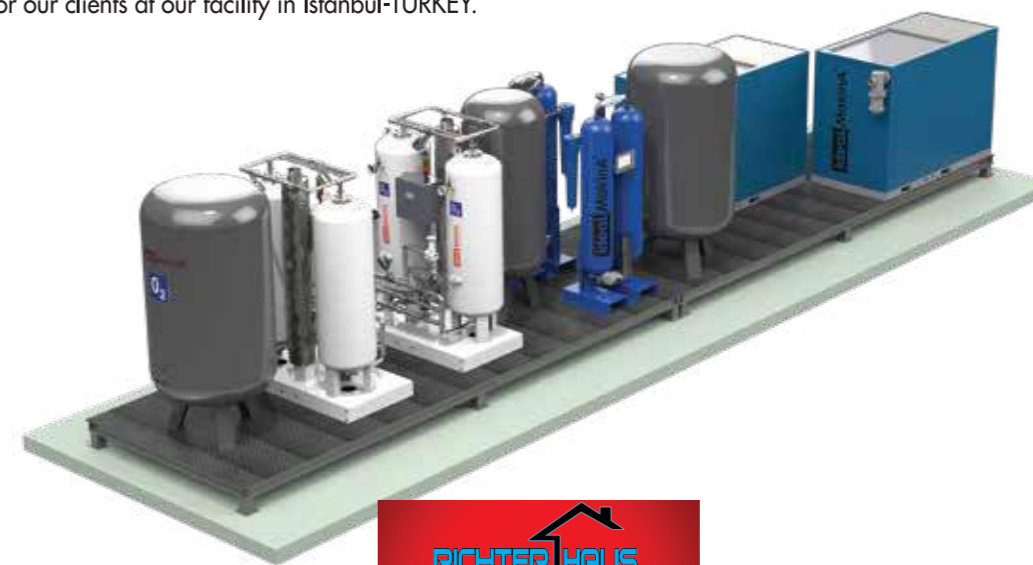
Ideal Makina provides comprehensive analysis of the medical oxygen consumption of each hospital, enabling to plan and design a system that is specially tailored to meet all of the medical oxygen requirements. The service combines tried and tested oxygen generators components, user advice and services with cutting edge technology to ensure maximum efficiency. Designed for maximum reliability, Ideal Makina oxygen generators provide exceptional efficiency and production medical grade oxygen at lowest possible cost. Use this expertise to your advantage and let Ideal Makina your oxygen system.

► Oxygen Cylinders Filling System

Ideal Makina HP system allows hospitals to reach a full autonomy by filling on-site their own high pressure oxygen cylinders. The oxygen produced by the oxygen generator can be pressurized up to 200 barg for back-up storage or to fill mobile oxygen cylinders.

► Engineering & After Sales Services

Ideal Makina engineering and after sales services remain at your disposal to help you at each stage of your project, by preparing installation and PID layouts, giving you installation operating advices and answering to any technical questions you may have regarding our products. Our engineering can also operate worldwide for startup, commissioning, inspection or maintenance purpose. One example of our commitment among others: training sessions are organized free of charge for our clients at our facility in Istanbul-TURKEY.





SKID MOUNTED OXYGEN GENERATOR SYSTEM

Accelerate your project with our skid-mounted generator systems.

This type of plant assembly offers many advantages over conventional stand-alone systems

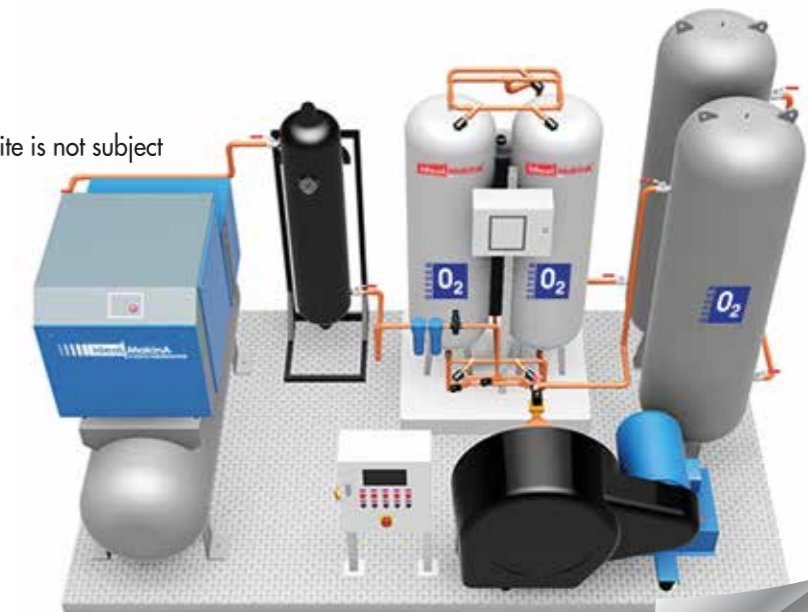
The equipment is mounted on a steel plate, assembled and pre-piped, pre-wired in the shop between individual equipment, inspected and tested prior to delivery.

Skid-mounted design helps reduce the erection, assembly and start-up time at the site; thus saving time and cost of labor, supervision, and coordination at customer's end. No need of any foundation required and shorten installation period accordingly and can save some cost.

All engineering, fabrication, controls, project management, start-up and commissioning work is carried out by IDEAL MAKINA.

Advantages:

- Easy to install on site
- Compactly in one place, saving space
- Low overall investment costs
- Reduced on-site erection and minimal site disruption
- Reliable prefabrication under workshop conditions
- Reduction of chances of errors similar installation at site is not subject to similar quality control
- Plug and play system on demand
- Reducing time and labor for installation at site
- Skid-mounted plants can be relocated more easily than site-built plants





OXYGEN CYLINDERS FILLING STATION

- ▶ IDEAL MAKINA has designed and supplied several Oxygen filling station units. We manufacture oxygen filling station units within the range of from 1 – 150 m³/hour oxygen.
- ▶ All models include oxygen monitoring and have an electrical connection to one central point. The steel frame units are pre-connected, but electrical connections are locally made.
- ▶ The containerized units has electrical equipment such as light, ventilation, emergency stop at high temperature.
- ▶ IDEAL MAKINA offers on-site installation and customer training worldwide on these plants.
- ▶ You can make your choice from the extensive selection of standard solutions or ask us to design a custom-made solution to match your needs. The prices are very competitive. Save your expenses by using our oxygen cylinders filling stations which can pay back themselves in a short time period.

Model	OFS03	OFS10	OFS15	OFS30	OFS50	OFS100	OFS150
Capacity @9 3% Purity	3 Nm ³ /h	10 Nm ³ /h	15 Nm ³ /h	30 Nm ³ /h	50 Nm ³ /h	100 Nm ³ /h	150 Nm ³ /h
40L Cylinders Pressure	150 barg	150 bar	150 barg	150 barg	150 barg	150 barg	150 barg
40L Cylinder Filling Per Day	12 pcs	40 pcs	60 pcs	120 pcs	200 pcs	400 pcs	600 pcs
Total Electricity Consumption	10 kW	21 kW	28 kW	56 kW	95 kW	190 kW	240 kW

*OFS: Oxygen Filling Station





CONTAINERIZED OXYGEN GENERATOR & CYLINDERS FILLING SYSTEMS

▶ IDEAL MAKINA manufacture and deliver a turnkey oxygen generation system mounted in a specifically designed cabin or ISO container for outdoor use, which can be ready for operation within two hours after arrival in the enduser site. The container does not require any technical room construction and could be placed anywhere outside the building. Besides, the system is completely mobile and can be easily moved to another location when necessary.

IDEAL MAKINA all in one containerized oxygen plants have been improved and developed throughout the years.

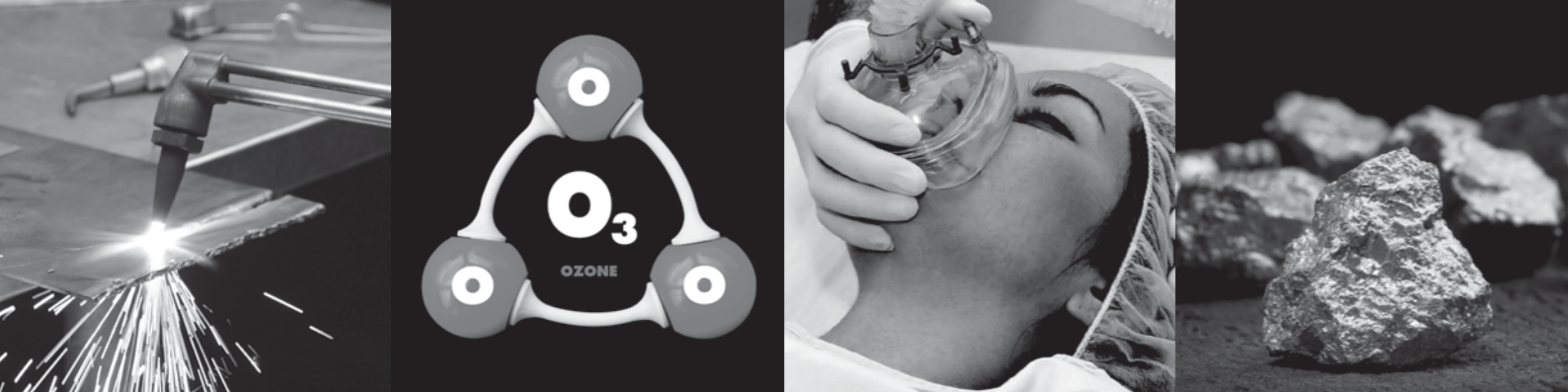
Most of our generator systems can be installed in a container as Plug & Play, ready-to-use units.

The quality and endurance of our most advanced and high tech container design has been proven through consecutive tests in:

- extreme temperatures (from -32°C to +55°C)
- humidity (90% RH at 40°C)
- altitude (2,000 m or higher)

The result is an outstanding containerized producing module with features that secure trouble free operation, in accordance with most common known regulations such as ISO, PED (Pressure Equipment Directive 97/23/EC) and MDD (Medical Devices Directive 93/42/EEC).





HEALTHCARE INDUSTRY

With the IDEAL MAKINA PSA oxygen generator, you get a secure and constant source of pure oxygen. Produced directly at the hospital, the oxygen is available where and when you need it.

Installation of on-site medical oxygen generation systems in healthcare facilities is growing all around the world as a safe alternative to oxygen from gas suppliers.

Our unique medical oxygen generators are available as Class IIB certified medical devices according to the European Medical Device Directive 93/42/CE and are allowed for any healthcare application, especially after the introduction of the Oxygen 93% Monograph as outlined in the European Pharmacopoeia Supplement 7.1, which has become effective starting from July 2011.

The **IDEAL MAKINA Oxygen generators** are also certified according to the ISO 13485:2003 for the manufacturing of medical devices.

With the **IDEAL MAKINA Oxygen Generators**, finally you have access to a fully safe and reliable oxygen source, which can be installed in your healthcare facility as per ISO 10083:2006 and HTM 2022.

We can provide a tailor-made solution that fits your exact needs; i.e. skid mounting, GSM modem, remote operating and monitoring. Other parameters can be measured on request, such as hydrocarbons, CO, CO2, flow and dew point. The Ideal Makina medical sales team is ready to consult each project with you to assure successful installation of the system. And our service department will make sure that your system is always in top condition.

► **Our Medical Oxygen Production, Inspection & Stocking System Concepts are as follow;**

- Stand-alone system
- Skid mounted unit
- Containerized Unit





▶ **Safety first - always**

IDEAL MAKINA can design and install a medical oxygen generating system with all its proper capabilities, monitoring and alarm system to reflect your local safety requirements.

The unit is equipped with touch controller for easy access and automatically calls alarms and switch to back up supply when malfunctioning occurs.

▶ **Nonstop operation**

Our oxygen generating systems are designed for 24 hour, 365 days per year operation.

Cylinder filling back up provides safe delivery of Oxygen to hospital pipeline system.

And you are no longer dependent on unstable deliveries and fluctuating gas prices.

▶ **Guaranteed lower operating cost**

Investing in an oxygen system is quickly earned in savings. The average oxygen production cost is 1.2 kWh per cubic meter of oxygen produced and pay off from most models is earned within the first months of operating.





MINING INDUSTRY

▶ The IDEAL MAKINA O₂ gas generator is often used in gold mining and is an excellent oxygen solution in the gold extraction process.

Furthermore, copper or nickel smelters consume large quantities of oxygen.

BENEFITS OF USING OXYGEN APPLICATION IN LEACHING PROCESS

- ▶ **Increased Gold Recovery**
Higher dissolved oxygen level in leaching process enhances the gold cyanidation thus increase gold extraction rate significantly up to 98%.
- ▶ **Decreased retention time by leaching**
Conventional leaching time of 96/72 hrs can be reduced up to 50%.
- ▶ **Increased Ore throughput**
- ▶ **Increased Silver Recovery**
Silver is being dissolved in the leaching process in the same process reaction as gold.
- ▶ **Decreased Cyanide Costs**
The Cyanidation kinetic depends on the gold, cyanide, water and oxygen in the leaching tanks. The sufficient level of oxygen reduces the amount of cyanide required.
- ▶ **Decreased Waste Treatment Costs**
The reduction in the amount of cyanide in the leaching process also decreases the amount of cyanide that must eventually be removed from the waste stream. The oxygen generated can be used as a fee gas to an ozone generator and injected directly into the waste stream as an environmentally friendly oxidizing agent.

Our PSA oxygen generation system will be specially prepared for the harsh ambient and operating conditions at the mine site. Due to the location the conventional supply of oxygen by means of truck transported liquid oxygen and local cryogenic storage tanks would not be possible so that the required oxygen has to be produced on-site through an air separation process. That's why IDEAL MAKINA Oxygen Generator Systems are the best solution for Gold and Silver Mines.

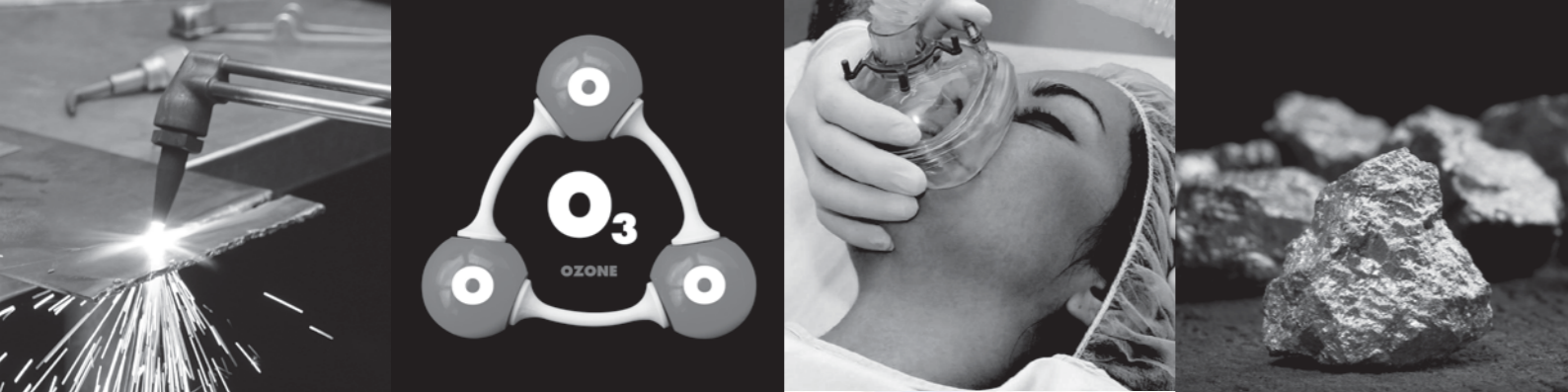




METAL INDUSTRY

- ▶ For cutting and brazing, pure oxygen is used instead of air to increase the flame temperature and allow localized melting of the work piece metal.
- ▶ **Blast Furnaces**
Blast furnaces account for up to 40 percent of the total amount of oxygen used in a typical integrated steel mill. Oxygen is injected into these furnaces through spargers devices used to spray gas into a system to enrich the air. This process increases the productivity of the furnace. It also serves to lower coke consumption by facilitating the addition of powdered coal and natural gas to the furnace. Using oxygen in a blast furnace lowers the overall cost of production.
- ▶ **Basic Oxygen Furnaces**
In basic oxygen furnaces, oxygen is used for decarburization the process of decreasing the level of carbon in metals and the conversion of hot metal formed in a blast furnace to liquid steel. This process typically accounts for about half the amount of oxygen used in an integrated steel mill. When oxygen reacts with silicon and carbon, it produces a large amount of heat. This heat is enough to melt scrap metal in large quantities.
- ▶ **Electric Arc Furnaces**
Electric arc furnaces have three primary uses for oxygen. Oxygen is used to run oxy-fuel burners used for heating and melting scrap metal. Oxygen is used in high-velocity lancing. High-velocity lancing is used in localized scrap melting processes, decarburization of steel and slag foaming. Oxygen is used in sub-sonic injection processes used for post combustion of carbon dioxide.
- ▶ **Rotary Furnaces**
Rotary furnaces used to depend on sulfur oxide and nitrogen oxides to heat metal. They have since switched to pure oxygen. Using pure oxygen allows for the avoidance of heat loss, thereby reducing the amount of time the furnace needs to complete tasks as well as its overall costs.
- ▶ **Steel Reheating, Cutting and Burning**
Oxygen is used in steel reheating furnaces. In particular, oxygen is used for enrichment or two run oxy-burners, as blast furnaces and rotary furnaces, respectively. Using oxy-fuel burners in this process contributes to reduced fuel consumption when compared to other gases. High-purity oxygen is used in cutting and burning processes to run automatic cutoff torches, as well as in the cutting of crops and other forms of mill scrap.





FISH FARMING INDUSTRY

▶ It's well known in the aquaculture industry that oxygen generation is extremely beneficial for fish farms and hatcheries. Since the quality of the water determines the quality of the fish, it's paramount that a steady oxygen supply is always available. Oxygenizing the water leads to healthier fish with better appetites, which means bigger fish to sell when the time comes.

▶ Key factors about aquaculture and oxygen:

- Feeding fish consume up to 3x more than inactive fish, it is therefore important to have versatile and efficient supply of oxygen
- Much higher stocking densities are possible $\geq 100 \text{ kg/m}^3$ is possible (depending on species) = higher output on same area and volume of water. Much more efficient than systems based on atmospheric air.
- Better use of feed = better economy.
- Higher growth rate of the fish = better economy.
- Oxygen cones are easy to operate and transfer of oxygen to the water is easy to adjust.
- Save money by operating your fish tanks at all time sufficient levels of oxygen to meet fish demands, at least 70 % saturation must be maintained at the outlet of the fish tank.
- Feed gas can be provided to an existing Ozone generator for disinfection.
- In many countries there are by regulation demand on minimum oxygen concentration at the outlet from the fish farm. By using pure oxygen, these levels can easily be maintained.

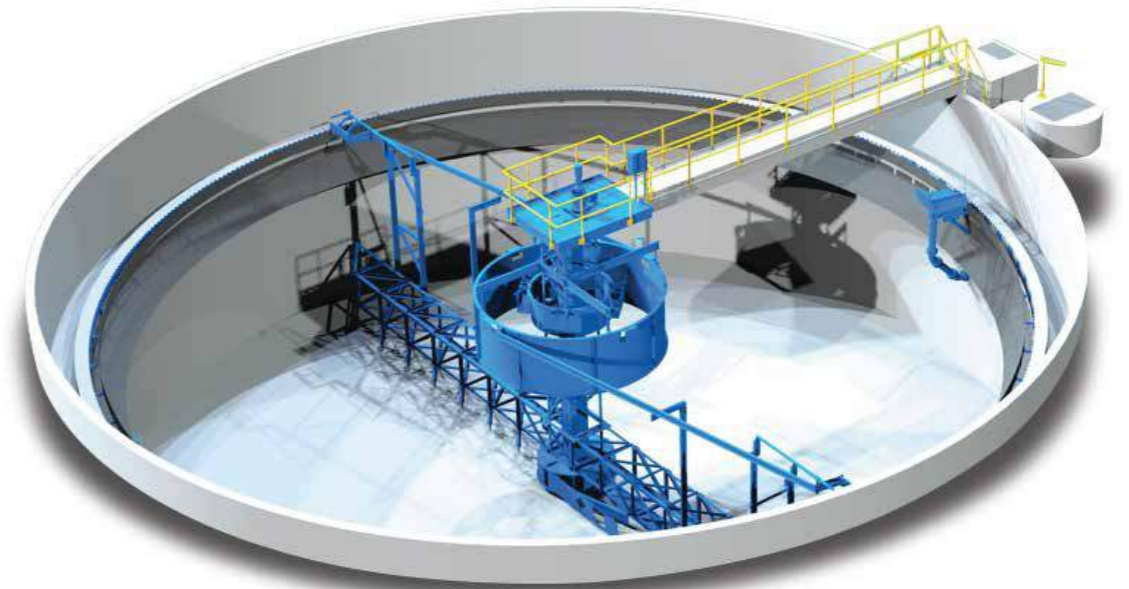




WASTE WATER TREATMENT INDUSTRY

▶ Injecting oxygen into your waste water treatment basin dramatically increases bacteriological survival and regeneration. Your aerobics are well protected by using supplemental O₂ to keep your PPM level up — regardless of the conditions, even in hot climates or summer months when O₂ levels are at their lowest, and consumption highest.

The consistent, level demand of injected oxygen makes a PSA oxygen generator ideal to keep your plant operating and capital costs down. A simple, reliable IDEAL MAKINA oxygen generation system will provide years of O₂ production, without the ongoing expense and hassle of delivered cryogenically produced oxygen.





GLASS MANUFACTURING INDUSTRY

- Oxygen supply for glass, neon and porcelain manufacturing applications and in particular:
- Glass blowing
- Flat glass manufacturing factories
- Forming of neon light tubes into the required shapes
- Flame polishing of porcelain articles

► Special Know-How & Services from IDEAL MAKINA

We at IDEAL MAKINA always do a detailed simulation and analysis of the oxygen consumption profile, including peak consumptions, to guarantee a correct dimensioning of the PSA oxygen generator which will bring the economical benefits you expect.

As each customer has different operating and manufacturing conditions, we will also provide consultancy regarding the most efficient and cost-effective oxygen distribution under consideration of all relevant parameters.





OZONE (O₃) INDUSTRY

▶ Oxygen supply for ozone generation. Still most ozone generators produce this gas out of compressed air. By using oxygen as feed gas instead of air, the ozone generator's efficiency will significantly increase and the risk of HNO₃ formation will be reduced.

▶ Special Know-How & Services from IDEAL MAKINA

We at IDEAL MAKINA are aware about the importance of a correct and stable dew point of the produced oxygen in order to avoid damages to the electrodes inside the ozone generator. Our PSA oxygen generators which be able to supply you the oxygen quality you need for a trouble-free operation of you ozone generators, even under harsh ambient and operation conditions.

Our PSA oxygen generators also offer you unique solutions for a turn-key ozone generation system solutions inside ISO freight containers.



OXYGEN GENERATORS REFERENCES

 AZERBAIJAN	 TURKEY	 IRAQ	 TURKEY	 SYRIA	 TURKEY	 LIBYA	 ALGERIA
 SYRIA	 TURKEY	 LIBERIA	 TURKEY	 IRAQ	 TURKEY	 SEYCHELLES	 TURKEY
 TURKEY	 ENGLAND	 TURKEY	 LIBYA	 TURKEY	 TURKMENISTAN	 ALGERIA	 ALGERIA
 LIBERIA	 TURKEY	 SYRIA	 TURKEY	 SYRIA	 TURKEY	 ALGERIA	 INDIA
 SYRIA	 TURKEY	 SYRIA	 TURKEY	 AZERBAIJAN	 TURKEY	 AZERBAIJAN	 AZERBAIJAN
 SYRIA	 TURKEY	 IRAQ	 KENYA	 IRAQ	 TURKEY	 TURKMENISTAN	 TURKEY
 GEORGIA	 TURKEY	 TURKEY	 TURKEY	 TURKEY	 TURKEY	 UKRAINE	 MALTA

OUR CERTIFICATES AND INTERNATIONAL QUALITY CERTIFICATES



SAMPLES FROM OUR PROJECTS

SAMPLES FROM OUR PROJECTS



LIBERIA



TURKEY



SEIYUN INDUSTRIAL
GASES FACTORY

YEMEN



DEARSAN
SHIPYARD

TURKMENISTAN

SAMPLES FROM OUR PROJECTS



Akdağ
MINERAL TAS YUNU

ELAZIĞ



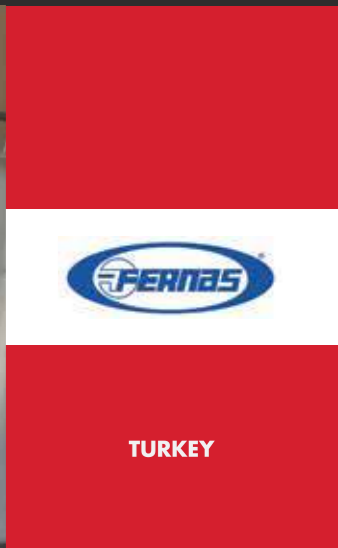
BOSCH

INDIA



بلدية الخمس
AL-KHUMS MUNICIPALITY

LIBYA



FERNAS

TURKEY

SAMPLES FROM OUR PROJECTS

SAMPLES FROM OUR PROJECTS



CHU NEDİR
MUHAMMED TZI

ALGERIA



GULAN GENERAL
HOSPITAL

IRAQ

SAMPLES FROM OUR PROJECTS



LIBYA



MILITARY HOSPITAL

TAJIKISTAN

SAMPLES FROM OUR PROJECT



وزارة الصحة العراقية
Iraq Ministry of Health
Established 1959

IRAQ



ASHGABAT
INTERNATIONAL
AIRPORT

TURKMENISTAN




مديرية الصحة السورية
Syrian Health Directorate
مديرية صحة حلب

SYRIA



giz Deutsche Gesellschaft
für Internationale
Zusammenarbeit (GIZ) GmbH

SYRIA

SAMPLES FROM OUR PROJECTS

SAMPLES FROM OUR PROJECTS



**assmann
construction**

KENYA




MALTA




ALGERIA

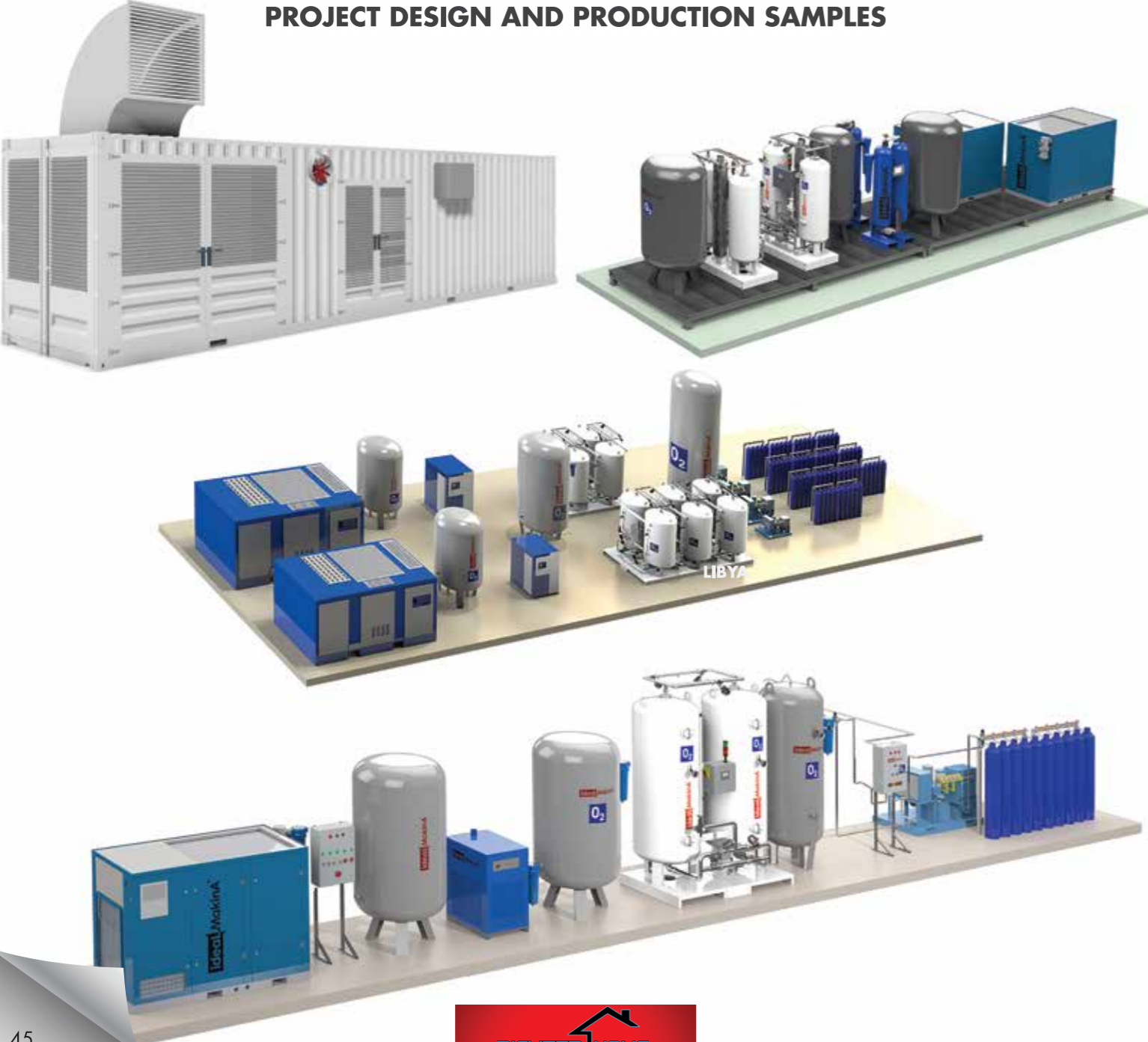


OTTOMAN COMPANY

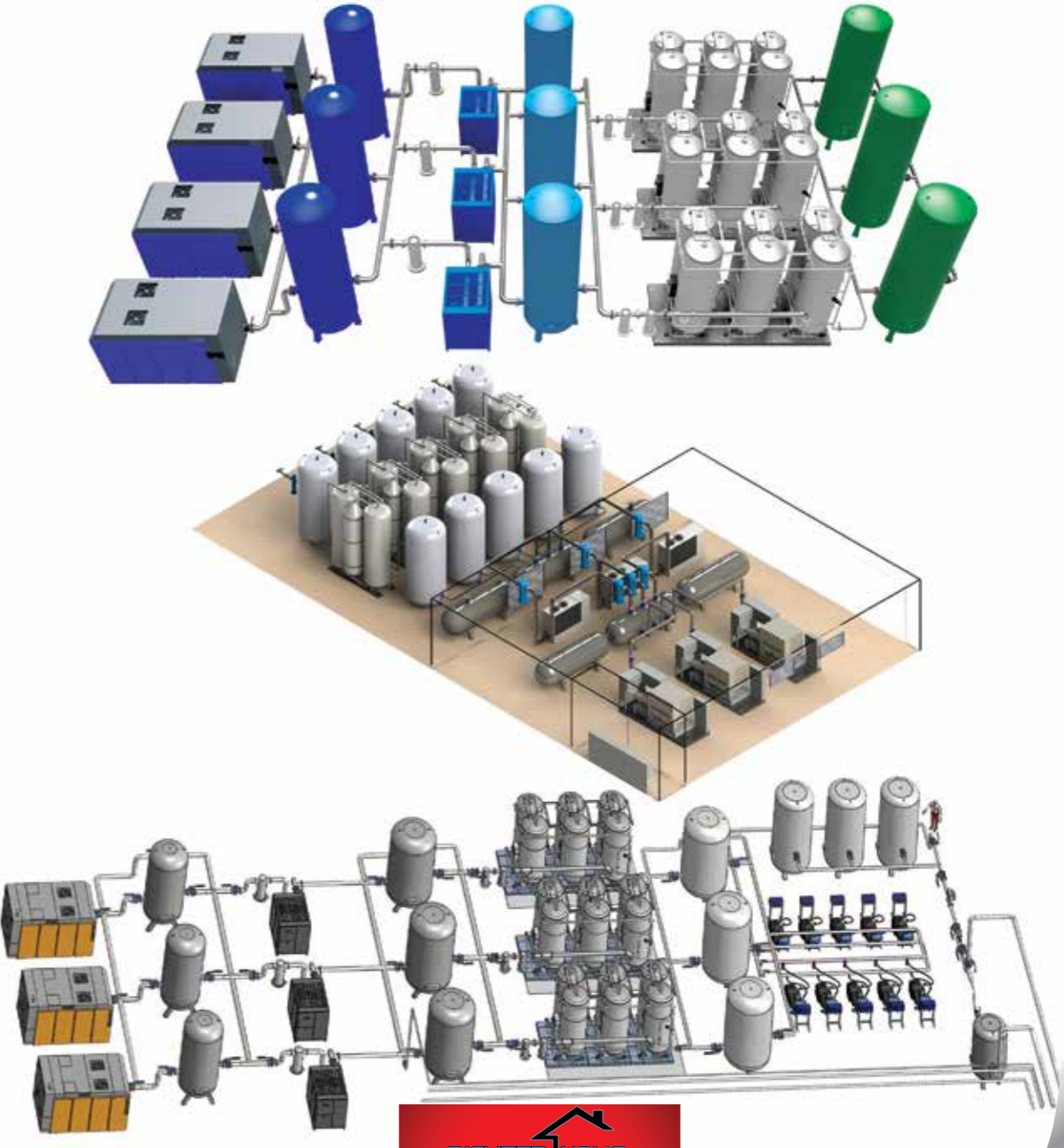
IRAQ

SAMPLES FROM OUR PROJECTS

PROJECT DESIGN AND PRODUCTION SAMPLES



PROJECT DESIGN AND PRODUCTION SAMPLES



HEAD OFFICE



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.

idealMakinA[®]

Acum in Romania in exclusivitate doar prin :

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