

# Oxygen & Nitrogen On-site Solutions



# About OXYMAT

*OXYMAT A/S is a Denmark based company and the leading global supplier of advanced PSA generator systems since 1978.*

OXYMAT has 40 years of experience in designing, engineering and manufacturing high quality oxygen and nitrogen gas generators to meet customers' specific needs and process specifications.

You can produce your own oxygen or nitrogen with Oxymat PSA gas generators creating high quality nitrogen or oxygen gases on-site. There will be no need to order in, store and stock check your liquid oxygen tanks or nitrogen gas cylinders when you can produce your own supply on site.

Our generators are based on the well-known PSA (Pressure Swing Adsorption) technology, which is an air separation technique which will enable you to produce your own nitrogen or oxygen, using only electricity and atmospheric air. PSA technology can be used in all types of industries.

OXYMAT has produced more than 3800 oxygen & nitrogen PSA generators for many types of applications including: aquaculture, gold mining, medical, ozone, marine, oil & gas, nuclear power plants, biogas, process industry, pharma, food and many more.

With our vast experience in the field of quality, innovation and excellence, we serve our customers to identify, design and provide the best possible solution.

We listen, we design, and we manufacture. Therefore, we have gained the worldwide reputation as the highest quality PSA system supplier.

## Quality Assurance:

OXYMAT holds all relevant approvals for serving the numerous applications we supply. Our systems are designed and manufactured according to:

- MDD (Medical Devices Directive)
- PED (Pressure Equipment Directive)
- Comply European/US/UK/Canada Pharmacopoeia
- ISO 13485 (Quality Management Systems – Medical Devices)
- ISO 14001 (Environmental Management Systems)
- ISO 9001 (Quality Management Systems)
- ISO 10083 (ISO 7396)
- CE
- OHSAS 18001
- Free Sales Certificate-Danish Health & Medicines Authority



## Service

Aiming to provide first class after sales service, our team of service technicians is ready to make sure that all OXYMAT generator systems are maintained in good condition. We understand that unforeseen problems can have an immediate and major impact on running a business, might it be a fish farm, gas and chemical carriers, or a medical facility. Our service team is available at all times and can travel to provide support at short notice.

In addition to our service hotline, we have a global network of skilled partners and distributors, who are always at your service, whether your demand is finding an answer to a simple question or helping you solve a complex issue. Our customers are always our top priority.

Our extensive spare parts program provides day-to-day delivery of high quality original parts throughout the lifetime of your plant.

## Product Range

### Oxygen:

The capacity ranges from 2 to 473 m<sup>3</sup>/h at purities up to 95 %

Low power consumption: • From 1.0 kW/m<sup>3</sup>

### Nitrogen:

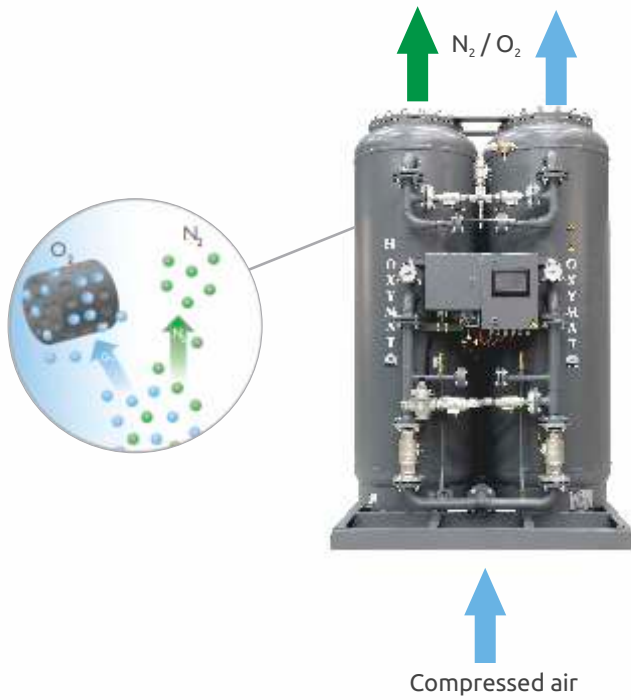
The capacity ranges from 1 to 5550 m<sup>3</sup>/h at purities up to 99.9999%

Low power consumption: • From 0.20 kW/m<sup>3</sup>

### OXYMAT generator design features:

- High performance top quality solutions
- Low CO<sub>2</sub> emission
- High quality touch screen control unit
- Remote control access
- Designed for durability in rough conditions and industrial environments
- 3D design
- Optional container or frame-built solution
- Optional skid mounted solutions
- Optional OEM supply

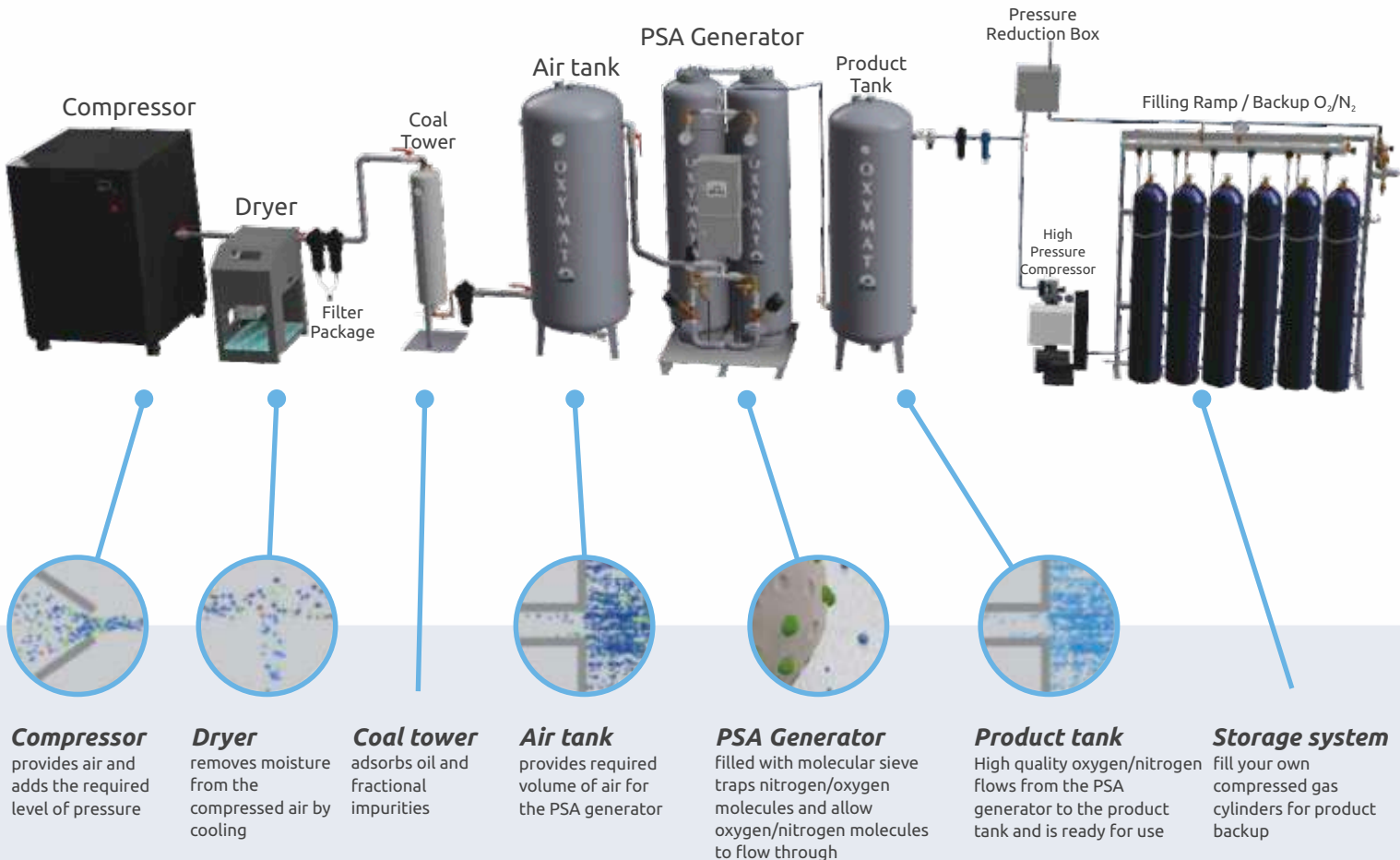
# PSA Technology



## PSA technology

Our generators are based on PSA technology, Pressure Swing Adsorption. This process evolves around the principle of an adsorbent media under pressure, trapping either oxygen or nitrogen molecules, allowing the target molecules to pass. The only raw material needed is the ambient atmospheric air, which makes the PSA process an extremely clean operation.

## PSA process description



*OXYMAT offers a wide range of on-site gas generator solutions and in a wide range of capacities and purities. Our on-site gas generators are suitable for all types of industries.*

*Each project is custom-built designed to meet your exact requirements to ensure that you receive the optimal system*

## PSA generator system



The OxyMAT PSA generator system is a cost-effective and maintenance friendly solution. The system is designed for continuous and autonomous operation. The PSA generator will automatically start and stop based on actual gas consumption. The PSA generator will switch to stand-by mode, when no gas is consumed.

### The entire system can be subdivided into:

- Compressed air system (Air compressor, Refrigeration dryer, Air receiver & Filters)
- PSA skid
- Nitrogen/oxygen receiver
- Nitrogen/oxygen boosting & Filling Station (optional)

### Optional supplies:

- Panel Display with electro galvanized sensor
- Touch Screen with zirconium sensor
- GSM modem for touch Screen
- Medical upgrade kit (Coalescing tower and bacterial filtration)

## X-series Frame Built Solutions



OXYMAT frame-built PSA oxygen generators covers large capacities in the range from 112.00 to 473.00 m<sup>3</sup>/hour (purity up to 95.0%). Whereas, OXYMAT frame-built PSA nitrogen generators are in the range from 74.00 to 5550.00 m<sup>3</sup>/hour (purity up to 99.9999%).

OXYMAT X-versions both for oxygen and nitrogen includes: buffer vessels, filters, advanced control, dew point, pressure, temperature, flow, purity and remote monitoring.

# Solutions

## Skid-mounted Generator 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 OXYMAT.



## Portable Container Solutions

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 at the Alpe d'Huez)
- special conditions prepared by the army such as street and off-road tests.

Oxymat containerized solution secures 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).



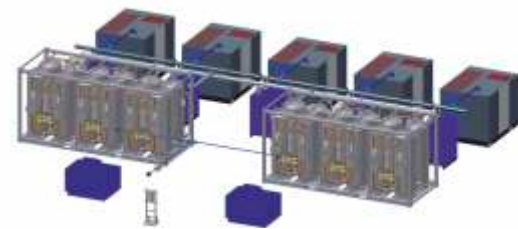




## Gold mines

### Gas company

Since 2010 we have installed several oxygen systems for gold mines worldwide. Heavy duty construction of PSA is designed for rough conditions of the mining environment. The system was delivered with a remote control in order to monitor all process parameters and alarms. The advanced control system makes the operation of PSA systems easier to handle, user-friendly and reliable. Onsite oxygen production made the mine independent of liquid oxygen deliveries from remote locations.



- model 2x O800x5, 20 tons per day, 93%, 12.0 bar



## Laser Cutting

### KGZ / Dobropolje / Slovenia

Laser cutting will normally require high flow rates combined with relatively high purity and pressure, to ensure a clean and smooth cut. Our tailor-made solutions with nitrogen booster just need to be connected to power supply and start filling cylinders. The cost of own produced nitrogen reduced costs by more than 50 % in comparison with inconvenient external gas supply.



- model N600, 7.2m<sup>3</sup>/h, 10 ppm, 200 bar



## Medical

### King Faisal Hospital / Kigali / Rwanda

Complete line including air package, filtration, PSA generator, O<sub>2</sub> receiver, HP booster, vacuum pump and filling line for 20 HP cylinders has been successfully installed and commissioned at King Faisal Hospital, Kigali, Rwanda. Such a solution makes the hospital fully independent from external gas supply and even provides O<sub>2</sub> delivery at the event of primary source failure thanks to special back up system.



- model O500 25Nm<sup>3</sup>/h, 95% purity incl. HP filling, vacuuming and back up supply



## Food & Beverage

### San Clemente / Santiago de Chile / Chile

The system is used for a Controlled Atmosphere (CA) storage systems applied for a long-term fruit and vegetable storage in a remote area in Chile. Since high-pressure technology was applied PSA technology was the best solution. The system has been delivered on the skids as a „plug & play“ solution.



- model 2 x N1000 ECO, 2 x 115m<sup>3</sup>/h, 99% purity

# we serve



- model X4000 Marine Nitrogen PSA, 4.000m<sup>3</sup>/h, 95% purity, 6.0 bar



- Container Nitrogen System I 300 m<sup>3</sup>/h, 95% purity, 120m<sup>3</sup>/h, 99.5% purity



- model O40, 2.3 Nm<sup>3</sup>/H, 93% purity



- model N600ECO, 7.96m<sup>3</sup>/h, 99.999% purity

## Marine & Off-shore

Oddfjell

During 2006-2009 OXYMAT developed our marine versions, and we have so far sold more than 35 units to Chemical Carriers, LNG Carriers & Supply Vessels. The unique design eliminates the need for air- and product vessels. Together with a very low power consumption of 0,2 kW per m<sup>3</sup>, we have launched the smallest foot print world wide. OXYMAT offers Marine Nitrogen PSA from 100 to 10.000 m<sup>3</sup>/h delivered with certificate by all major class associations like DNV, ABS, GL, Lloyds, BV etc.



## Petrochemical

VAOS / Austria

Two unique sets, both containerized, designed for outdoor placement and suitable for transport to different locations. Each of the lines were split into two containers, with an Air package in one, and in the second PSA with complete control. The PSA units were designed for the use in EX environment close to the point of use and capable of remote controlling of the air compressors and dryers located in a safe area. This solution enables the customer to cut down the costs for EX air treatment units to standard ones while keeping the PSA unit capable to perform in the EX environment.



## Aquaculture & Ozone

Damas Zivju Audzetava / Latvia

A customer was looking for a supplier of oxygen to their new fish farm in Latvia. Looking through different ways of supplying the oxygen to their fish farm, they choose a solution, thinking „Why buy it - when we can, make it on-site“. This will help the customer to obtain a fast return on their investment. Adding oxygen into the fish tank and enclosures by diffusers keeps the fish healthy and allow them to grow bigger. Protecting the environment Damas Zivju Audzetava also uses the OXYMAT oxygen generator to their ozone production for their water recirculating and water treatment program.

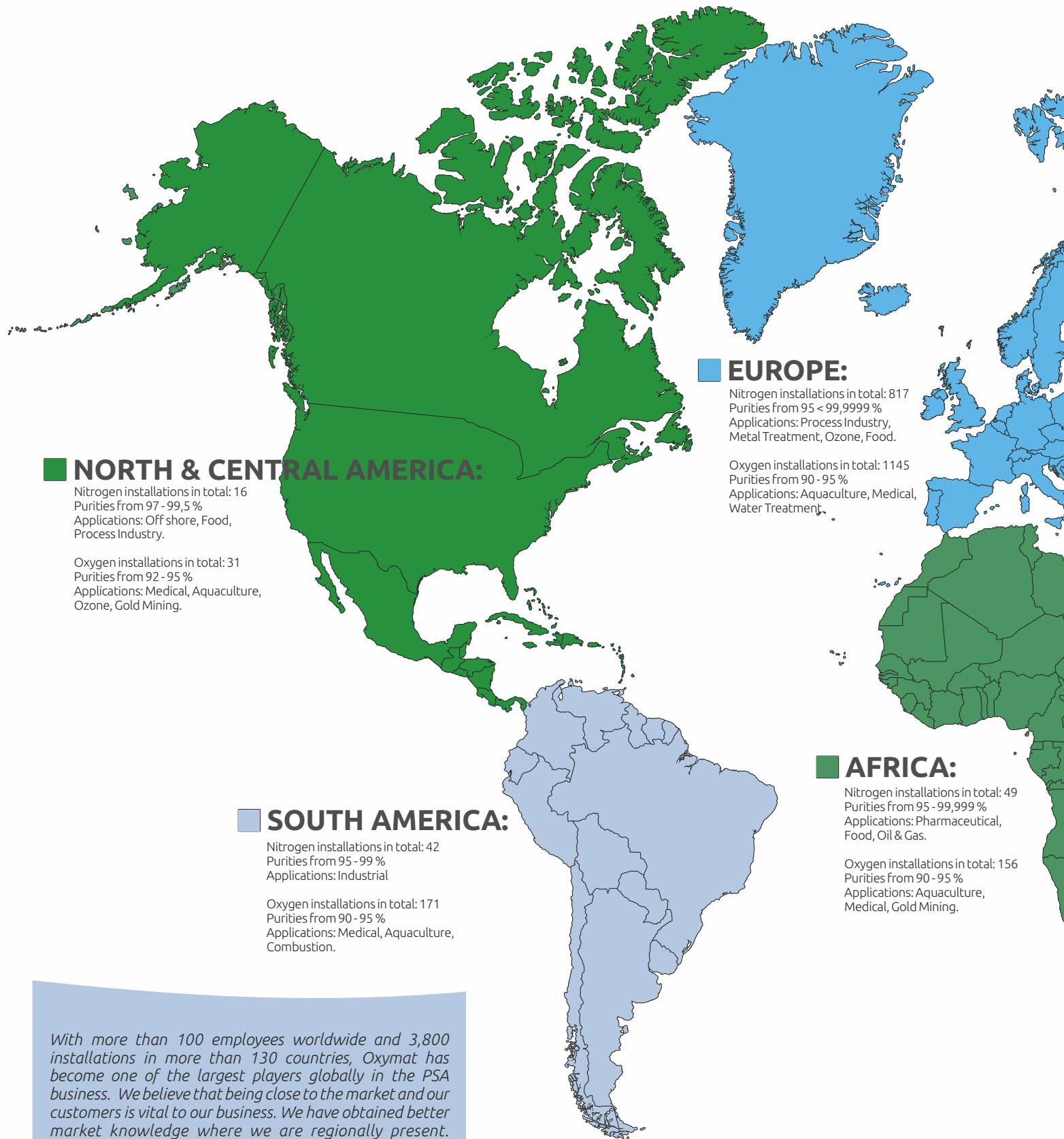


## Electronics

Note / Torsby / Sweden

The customer uses 10ppm Nitrogen in order to protect the soldering processes from oxidation and leaves a clean solder point resulting in increased products quality. After the comparison the end user found the OXYMAT nitrogen PSA solution to be the most economical and effective source of Nitrogen (constant delivery, competitive pricing and top performance in air/gas relation).



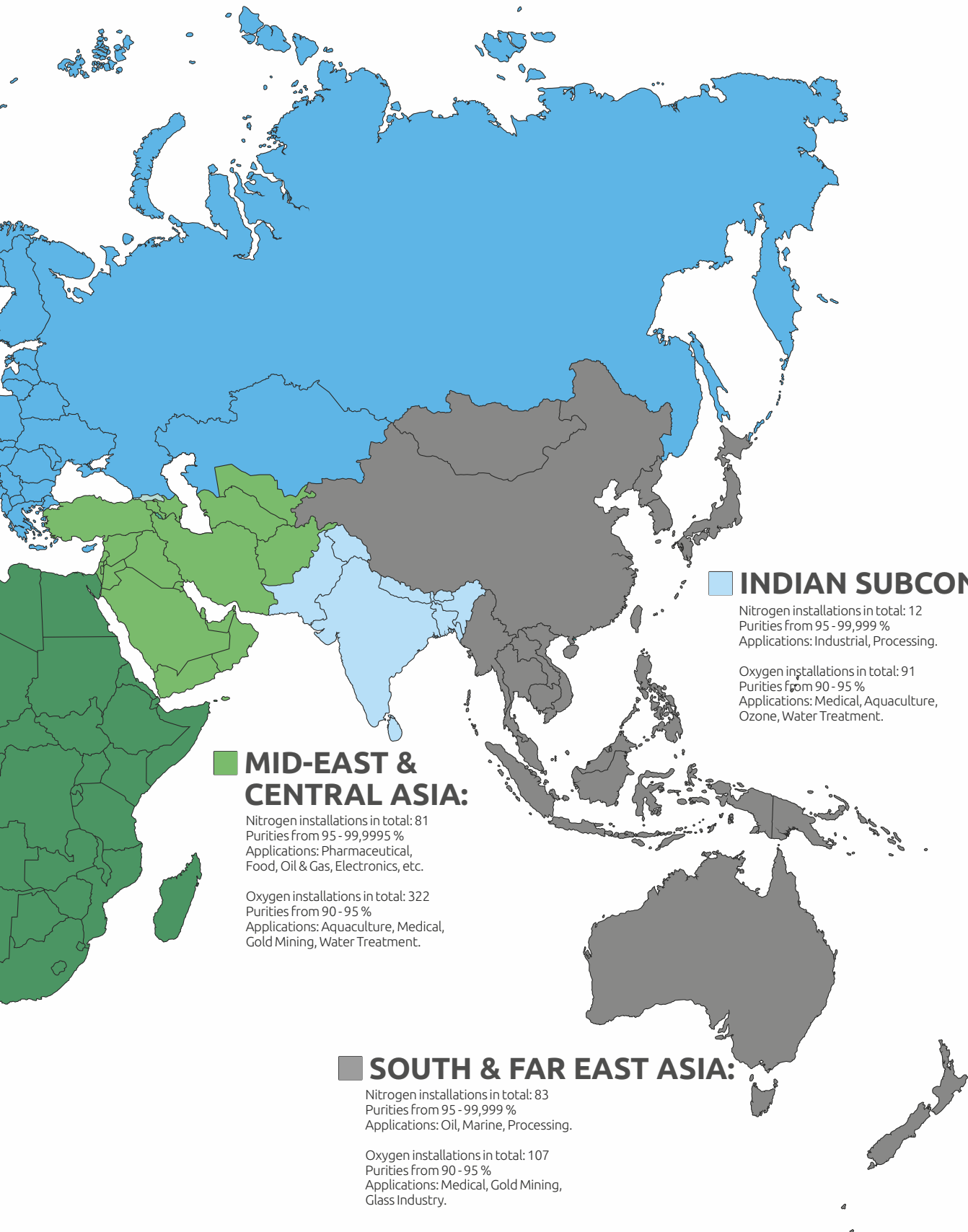


*With more than 100 employees worldwide and 3,800 installations in more than 130 countries, Oxymat has become one of the largest players globally in the PSA business. We believe that being close to the market and our customers is vital to our business. We have obtained better market knowledge where we are regionally present. Oxymat has 3 offices worldwide and a wide network of distributors and agents in more than 40 countries.*



# References

\*up to December 2017



## INDIAN SUBCONTINENT:

Nitrogen installations in total: 12  
Purities from 95 - 99,999 %  
Applications: Industrial, Processing.

Oxygen installations in total: 91  
Purities from 90 - 95 %  
Applications: Medical, Aquaculture, Ozone, Water Treatment.

## MID-EAST & CENTRAL ASIA:

Nitrogen installations in total: 81  
Purities from 95 - 99,9995 %  
Applications: Pharmaceutical, Food, Oil & Gas, Electronics, etc.

Oxygen installations in total: 322  
Purities from 90 - 95 %  
Applications: Aquaculture, Medical, Gold Mining, Water Treatment.

## SOUTH & FAR EAST ASIA:

Nitrogen installations in total: 83  
Purities from 95 - 99,999 %  
Applications: Oil, Marine, Processing.

Oxygen installations in total: 107  
Purities from 90 - 95 %  
Applications: Medical, Gold Mining, Glass Industry.

\*installations counted from 2005

# OXYMAT at a glance

- HQ in Denmark
- Turnover in 2017 was 22m €
- More than 100 employees worldwide
- Wide network of distributors and agents in more than 40 countries
- Manufacturer of custom designed oxygen and nitrogen systems
- Oxygen generator systems since 1978
- Nitrogen generator systems since 2001
- OXYMAT s.r.o. in Slovakia established in 2006
- OXYMAT China established in 2010
- More than 3800 generator systems installed in more than 130 countries in 2017

- Holds all relevant approvals for the great variety of applications which we serve:

- » ISO 9001
- » ISO 13485
- » ISO 14001
- » ISO 7396
- » ISO 18001 (OHSAS)
- » CE
- » PED 97/23/EC Module B+D
- » MDD 93/42/EEC (Medical Device Directive)
- » GOST
- » US Pharmacopoeia
- » European Pharmacopoeia

- Marine Class societies – we can deliver according to the rules of:

- » American Bureau of Shipping
- » Bureau Veritas
- » Det Norske Veritas
- » Germanischer Lloyd
- » Lloyd's Register
- » Nippon Laiji Kyokai
- » RINA

## • MADE IN DENMARK

Oxymat Denmark - headquarters



COMPLETE REFERENCE LIST IS AVAILABLE UPON REQUEST

# Our Customers say

## AQUACULTURE

*The Faroese salmon industry has not always been successful. Additionally, we have also been affected by diseases over the years. But for the past 6-8 years, the salmon industry has made great progress. The good and close cooperation between LEIF MOHR and OXYMAT has made it possible for our company today to look back with joy that we have supplied PSA SYSTEMS to all the new Smolt production facilities in the Faroe Islands. We have also replaced some of the old PSA systems with newer models. We look forward to the future and hope that the cooperation between LEIF MOHR and OXYMAT also can benefit to optimize our customers' needs.*

Andrias Joensen  
LEIF MOHR, Faroe Islands

## LASER CUTTING

*A customer in Galway has a high purity OXYMAT nitrogen generator, which is used for cutting stainless steel almost constantly, and the nitrogen supply has been highly reliable and economical. This addition to their engineering works allows them to reduce their production costs, while at the same time, reduce the ordering and handling burden of buying in nitrogen. The target specification was 10 parts per million (ppm) and the plant always exceeds that target. We can recommend OXYMAT nitrogen generators to any Laser Cutting operation.*

AirPro Gas Solutions, Ireland

## AQUACULTURE

*In intensive aquaculture, oxygen is an indispensable addition. HESY Aquaculture, worldwide supplier of turn key Recirculation Aquaculture Systems, and OXYMAT have a solid cooperation of more than 20 years.*

Julian Bondt, Sales Manager  
HESY Aquaculture, Netherlands

## MEDICAL

*Most healthcare providers in Kenya face challenges in ensuring reliable supply of medical oxygen in their facilities. Those who have bought OXYMAT on-site PSA oxygen generating plants, now do not have this difficulty. Their facilities now have consistent supply with the overall effect of lowering mortality associated with inefficient oxygen supply. Our partnership with OXYMAT is therefore of great benefit to the country.*

Philip Simiyu Wandibba, Managing Director  
Pulse Healthcare Limited, Kenya

## MINING

*The OXYMAT nitrogen generating system combined with our container solution have served non-stop in a number of coal mines in the Silesian region. This combination provides a high safety level in operation and at lower costs and minimal downtime.*

Mr. Lukasz Lasek  
Azis mining Service





## Highest level of international approval

OXYMAT Oxygen & Nitrogen systems are designed and manufactured according to European directives:

- » PED (97/23/EC)
- » MDD (93/42/EEC)

Oxymat has long experience in designing, engineering and delivering of hundreds of Oxygen and Nitrogen systems all over the world, in accordance with international and national authorities.



OXYMAT operates a QA system in accordance with international standards:

- » ISO 9001 (Quality Management Systems)
- » ISO 13485 (Quality Management Systems - Medical Devices)
- » ISO 14001 (Environmental Management Systems)
- » ISO 18001 (OHSAS)

Certified by Apragaz and DNV.

## Worldwide manufacturer of PSA generators



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