

NOXERIOR
Next Generation Gas Solutions



**Special packages for
dry air & gas generation**

SHAPING THE FUTURE



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NOXERIOR – Competence and Trust

NOXERIOR focuses on all aspects of the production of dry compressed air and its non-cryogenic separation for on-site generation of nitrogen and oxygen; we help our customers to reduce their costs by offering a customized solution based on either Pressure Swing Adsorption (PSA) or hollow-fibre membrane technology.

The unique and patented technology applied for our NITROSWING® and OXYSWING® modular PSA generators has set market standards in terms of flexibility, efficiency and reliability.

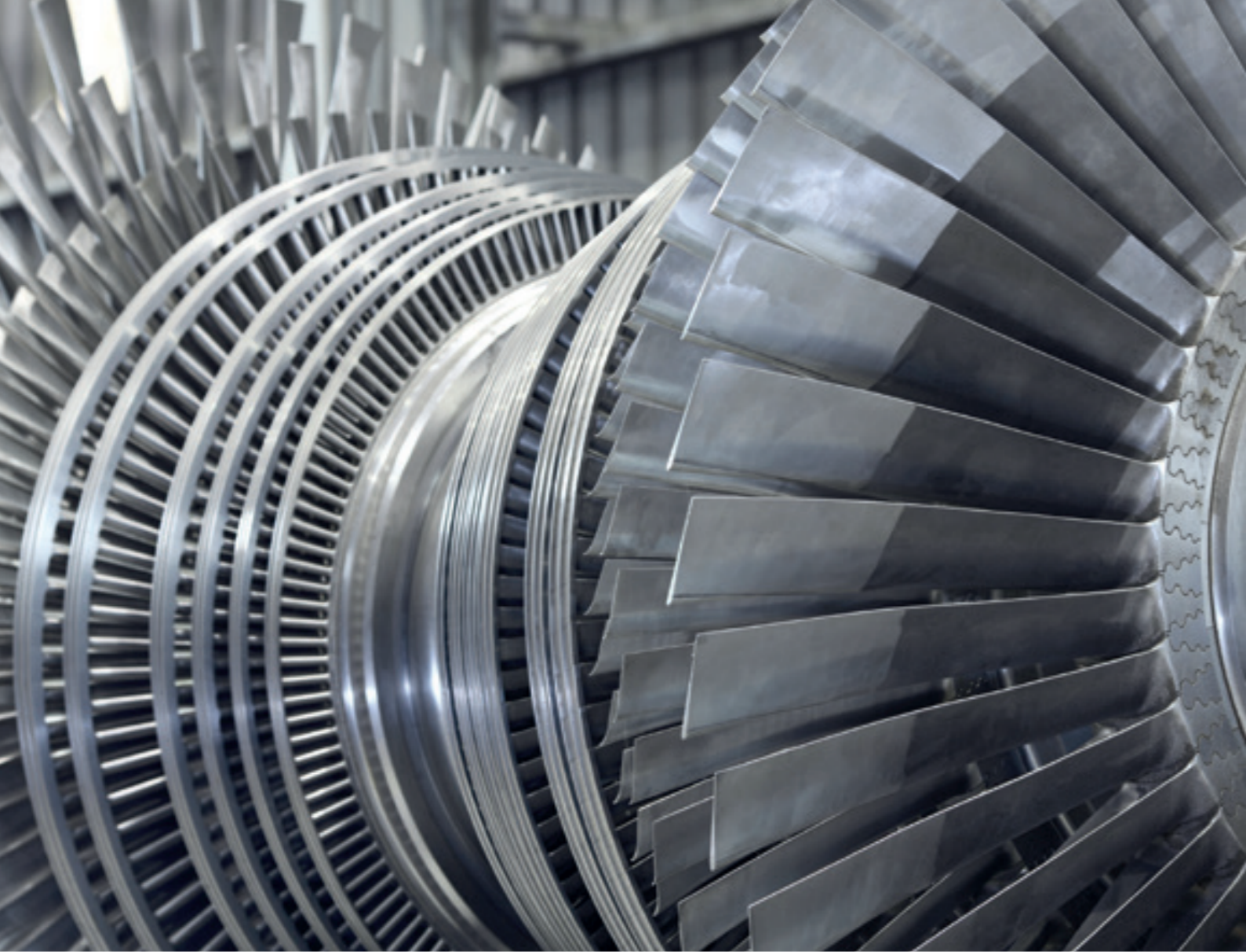
Our special packages for instrument air, nitrogen or oxygen generation, designed according to customer's specifications and suitable even for operation at extreme ambient conditions, are well known for their high level of engineering and outstanding quality.

Behind all our activities lies trust: the trust our customers have in our ability to meet their specific needs in terms of both quality standards and agreed delivery terms.

Our prime aim is to establish long-term professional relationship based on transparency and reliability. Our customers appreciate our capacity for smooth project execution and on-time delivery.

NOXERIOR has an export quote of almost 90% with customers located in all corners of the world.





APPLICATIONS



Our Field of Experience

Our custom-designed instrument air, oxygen and nitrogen generation packages are mainly supplied for applications in the oil & gas, mining and power generation industry.

Our experience covers onshore and offshore installations, installations at desert or arctic ambient conditions, mobile units as well as custom-designed systems for installation in classified areas

Nitrogen supply for applications in the Oil & Gas industry:

- APV's (Air Pressure Vessels) for floating offshore platforms
- BOP (Blowout Preventer) closure systems
- Dry bulk transfer
- Dry gas compressor or gas turbine sealing
- EOR (Enhanced Oil Recovery)
- Fracking
- Gas lift
- Heave compensation for offshore lifting/drilling operations
- Marine riser tensioner for offshore drilling
- Pipeline purging / pigging
- Purging-of instrument panels
- UBD (Underbalanced Drilling) / CPD (Controlled Pressure Drilling)
- Well clean outs

Nitrogen supply for applications in Power Plants:

- Dry gas compressor or gas turbine sealing
- Inerting of HRSG (heat recovery steam generator) and other wetted parts during lay-ups or outages
- Purging of gas turbine natural gas fuel lines during commissioning & start-up

Nitrogen supply for Mining applications:

- Extinguishing of coal mine fires
- Inerting of sulphuric acid plants for heap leaching
- Inerting of worked-out or abandoned mine areas
- Purging of LPG lines in copper / nickel / uranium mines

Oxygen supply for Mining applications:

- Gold leaching and silver leaching of ores
- Bottom-Blown Oxygen Converter or BBOC™
- Oxygen lancing

Membrane Systems

NOXERIOR uses the principles of air separation by means of hollow-fibre membranes, which is a continuous process driven by the selective permeation of gases across the membrane wall of hollow polymer fibres. The hollow polymer fibres are packed together in a functional unit, called membrane module, which consists of a bundle of several thousand hollow fibres inside a casing. Normally membrane modules are installed in a parallel configuration, so that each module output contributes proportionately to the capacity of the system.

The membrane technology is particularly suitable for the production of nitrogen or for dew point suppression of compressed air. Our membrane modules are the result of an extensive effort in R&D and set market standards in terms of productivity and efficiency. Besides, the productivity of a membrane module increases with the temperature of the incoming feed air, which makes the process particularly suitable for operation at high ambient temperatures. Our membrane modules are available in various sizes in order to offer the most suitable solution for each individual customer.

Membrane packages from NOXERIOR require very limited installation space and therefore are particularly suitable for mobile units, offshore platforms or shipboard installations. Our membrane plants can be supplied inside cabinets, on skids or turn-key installed inside ISO freight containers. All components will be selected based on the local ambient conditions and the area classification of the installation site.

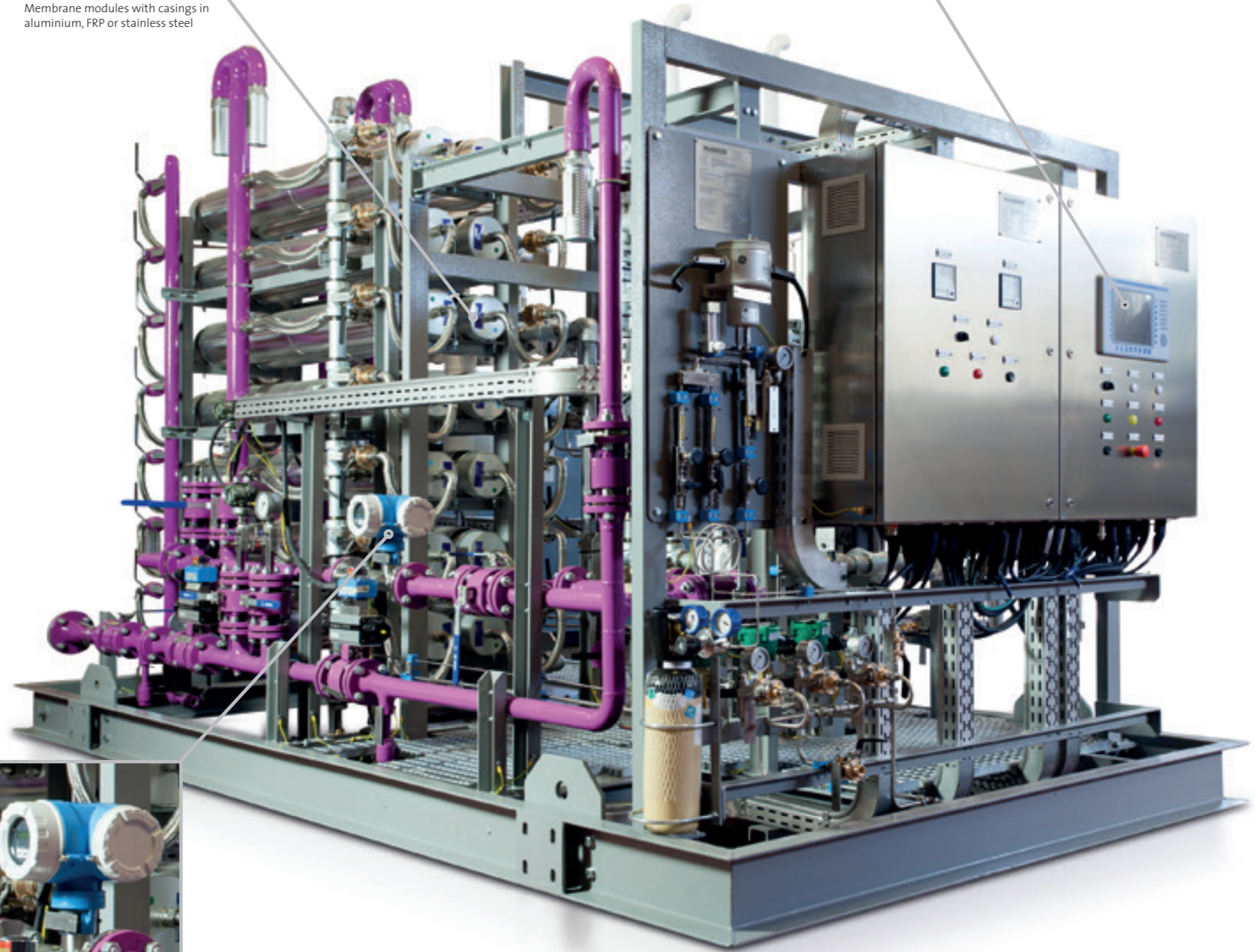
NOXERIOR is able to fulfil any specific requirement from the customer. Whether it concerns the inclusion of the feed air system in our scope of supply, or the application of specific technical specifications for materials of the various components, local instrumentation and plant control, we can make the membrane system exactly as you want it.



Membrane modules with casings in aluminium, FRP or stainless steel



Plant control by a Local Control Panel (LCP) or directly by customer's DCS/ESD



Local instrumentation with either the HART® or the Foundation™ Fieldbus communication protocol

Nitrogen		
Capacity Range	Residual Oxygen Content	Discharge Pressure
5 – 5.125 Nm ³ /h 3 – 3.290 scfm	0,5 – 10 vol.%	up to 12 bar(g) up to 175 psig
125 – 7.670 Nm ³ /h 80 – 4.925 scfm	0,5 – 10 vol%	up to 22 bar(g) up to 320 psig

Dry Air		
Capacity Range	Pressure Dew Point	Discharge Pressure
0,9 – 1.000 Nm ³ /h 0,5 – 590 scfm	-40 °C – +10 °C– -40 F – + 50 F	up to 12 bar(g) up to 175 psig

Adsorption Systems

NOXERIOR also applies the adsorption technology by means of molecular sieves as an alternative process for air separation or air drying. An adsorption system typically contains either two single adsorption vessels (twin-tower systems) or a series of modules of two adsorption vessels (modular systems), where each vessel is filled with an appropriate molecular sieve. These adsorption vessels are alternatively loaded with clean feed air in order to guarantee a continuous product flow. If one adsorption vessel is loaded, simultaneously the other one is regenerated (desorption). The entire process is generally known as Pressure Swing Adsorption (PSA) in case of air separation and as heatless air adsorption drying in case of compressed air drying.

The adsorption technology is particularly suitable for the production of high purity nitrogen, oxygen or instrument air. Our PSA process for nitrogen or oxygen production and our heatless adsorption process for air drying are the result of an extensive effort in R&D and set market standards in terms of productivity and efficiency. The volume of the adsorption towers will be defined specifically for each project in order to offer the best technical and economical solution.

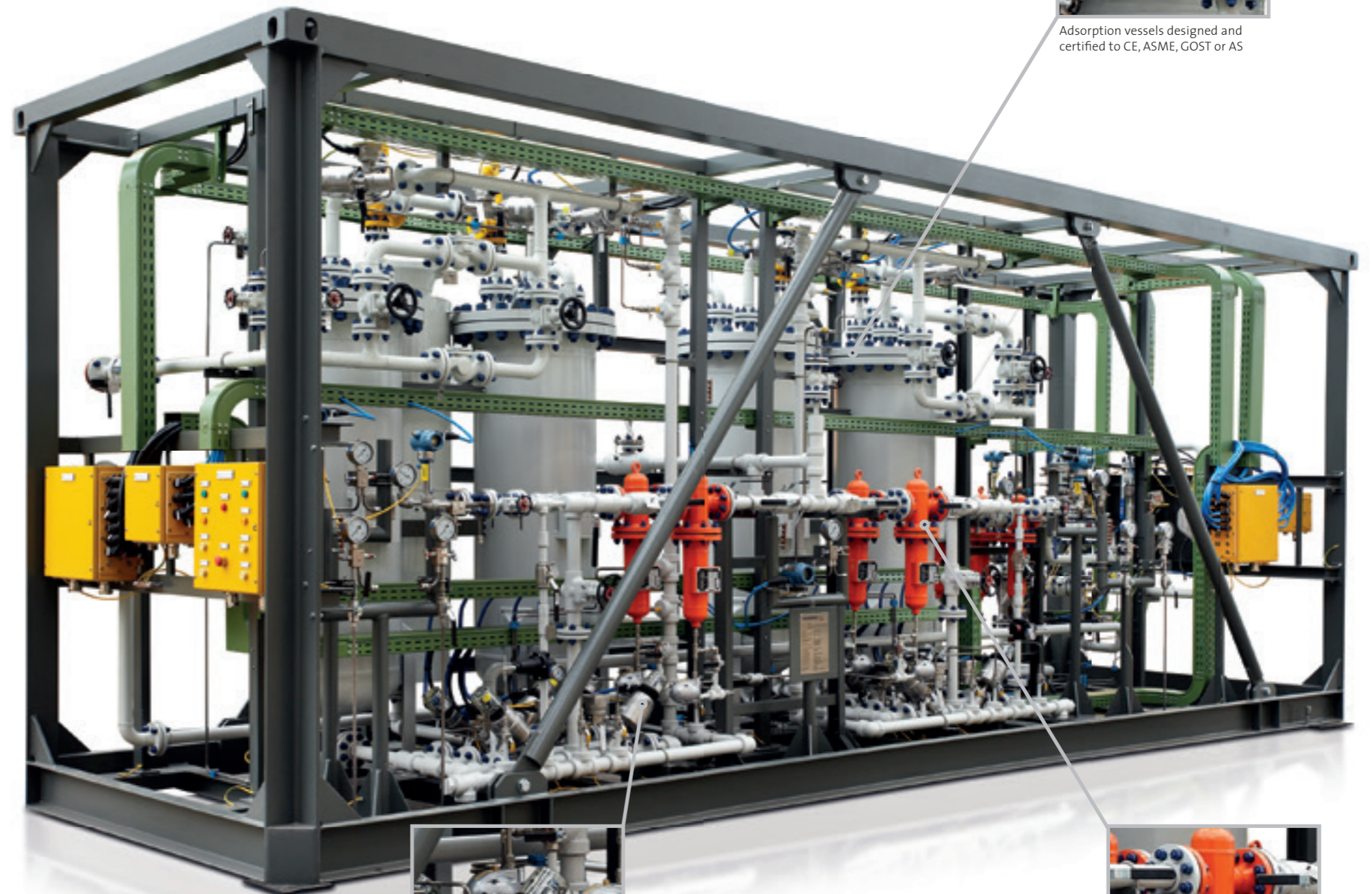
Our PSA and adsorption air drying plants can be supplied inside cabinets, on skids or turn-key installed inside ISO freight containers. All components will be selected based on the local ambient conditions and the area classification of the installation site.

NOXERIOR is able to fulfil any specific requirement from the customer. Whether it concerns the inclusion of the feed air system in our scope of supply, or the application of specific technical specifications for materials of the various components, local instrumentation and plant control, we can make the PSA or adsorption air drying plant exactly as you want it.

Nitrogen		
Capacity Range	Residual Oxygen Content	Discharge Pressure
1,4 – 3,360 Nm ³ /h 0,9 – 2,160 scfm	10 ppmV – 5 vol.%	up to 12 bar(g) up to 175 psig

Oxygen		
Capacity Range	Oxygen Content	Discharge Pressure
2,5 – 150 Nm ³ /h 1,7 – 93 scfm	90 – 95 vol.%	up to 6 bar(g) up to 87 psig

Instrument Air		
Capacity Range	Pressure Dew Point	Discharge Pressure
50 – 6,000 Nm ³ /h 30 – 3,725 scfm	-70 °C – -20 °C– -94 F – -4 F	up to 12 bar(g) up to 175 psig



Adsorption vessels designed and certified to CE, ASME, GOST or AS



Process valves with limit switches



Feed air conditioning for feed air from either oil-flooded or oil-free air compressors



Quality

All activities within our company strictly comply with the procedures of our certified quality management system, which are regularly updated and optimised.

Our welders are qualified according to the most stringent regulations and for different types of materials. Before packing and shipment all our plants will be thoroughly tested, eventually in presence of the customer if so required.

Project Documentation & Support

NOXERIOR's engineers are able to supply you all required project documentation, like data-sheets, drawings, procedures, test reports and certifications, during the execution of the project. Project documentation will be supplied either in NOXERIOR's own format or in customer's specific format. Final databooks will be supplied in English language as standard, but other languages can be applied on request. If required, our engineers can also participate to HAZOP and SIL assessments organized by the customer during the design phase of the plant.

Design Software

During the design of your plant NOXERIOR's engineers will work with the latest software for FEM mechanical stress & fatigue analysis, CFD fluid flow and heat transfer simulation, piping analysis, design of pressure vessels and heat exchangers as well as design and drawing software for 2D and 3D CAD for product simulation, tooling creation and design communication.

After-Sales Service

A reliable and responsive after-sales service is an integral part of NOXERIOR's business philosophy. Our technicians will travel to customers located all over the world to ensure a correct plant installation, commissioning and start-up and to train customer's personnel.

Critical spare parts are always available on stock and can be supplied immediately to any location in the world.

Health, Safety & Environment

It is NOXERIOR's company policy to minimize and to continuously improve the environmental impact of all its activities.

According to our environmental management system we constantly verify and correct our consumption of utilities and our waste disposal and we pay special attention to the material selected for our products and services. Our Health & Safety system is implemented and applied according to national Italian legislation with periodic external verification by local authorities.

References

NOXERIOR has supplied its special packages for instrument air, nitrogen or oxygen generation to many renown companies in the oil & gas, mining and power generation industry.

Please ask for the latest version of our reference list.





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