NITROGEN
IN WINE-MAKING PROCESSES

pneumatech

Pure air . Pure gas

Stripping: The concentration of residual oxygen can still be corrected at the end of the production process by blowing nitrogen through special channels.

Filtration: A nitrogen-saturated environment maintains the integrity of the product in all the various wine filtering technologies.

Pumping under pressure: Nitrogen-based pneumatic systems are preferable to mechanical pumps because they reduce the mechanical stress placed on the product and limit potential contact with the surrounding air.

Bottling: Bottling and tank saturation are the two processes in which nitrogen is traditionally used the most. The various stages include:

- Blowing: Drying the bottles in nitrogen after washing also enables any residual impurities to be removed.
- Saturation of the bottling machine: Nitrogen stops the wine being contaminated with oxygen in the head of the machine during automatic filling.
- Filling: Modern-day bottling companies make extensive use of nitrogen to minimize the amount of residual oxygen in the bottles.
- Injection during corking/capping: Pressurized nitrogen preserves the characteristics of the finished product throughout the storage period.

Oxygen Is Your Wine's Greatest Enemy

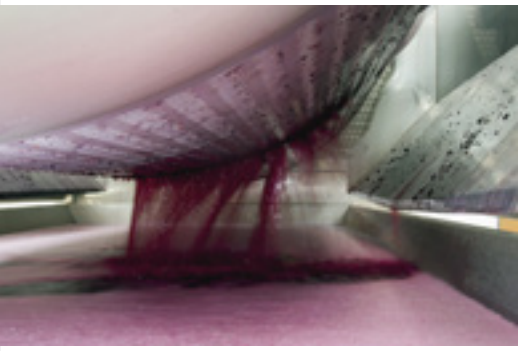
For some time now, nitrogen has been widely used by winemakers in processes that involve both the production cycle and wine preservation. The main aim of using nitrogen is to prevent oxidation, thus stopping the organoleptic properties of the wine from changing and inhibiting the growth of unwanted bacteria.
Throughout the winemaking process, from grape harvesting through to bottling, contact with oxygen should be avoided at all costs — except on the rare occasions when it is specifically desirable.

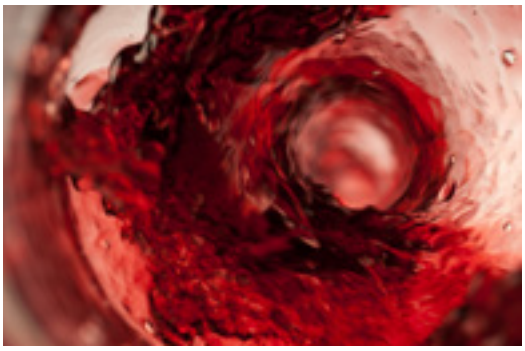
Conversely, oxygen encourages enzymatic oxidation and bacterial growth, and turns wines an undesirable color. This causes:

Color changes

Loss of aromas and flavors

Preservation issues





Nitrogen can be advantageously used at various stages of the production process

Pressing: Pneumatic presses are used to gently press the grapes in order to break the skins and bring about initial separation of the must. Having a nitrogen-saturated environment prevents oxidation and avoids uncontrolled fermentation.

Fermentation: Blowing nitrogen into the vat from the bottom encourages consistent mixing in order to separate the residual solid matter.

Racking: When making red wine, the pomace is kept immersed to prevent it from splitting; nitrogen flows from the bottom enable the cap to be mixed without using mechanical systems.

Sparging: Introducing nitrogen at low pressure helps to minimize dissolved oxygen and balance carbon dioxide levels, which prevents oxidation during the subsequent stages and consequently makes it possible to limit the use of preservatives such as sulfur dioxide.

Saturating the tanks: Nitrogen ensures there is no oxygen in the storage tanks and processing tanks.

Purification: Microbiological contamination of the pipes and equipment can be avoided by using nitrogen in combination with sterile filtration.

Generating Nitrogen On-Site

You can generate nitrogen in-house using compressed air.

Powered by a compressor, a nitrogen generator is capable of separating the main components of air, concentrating nitrogen to very high percentages of purity.

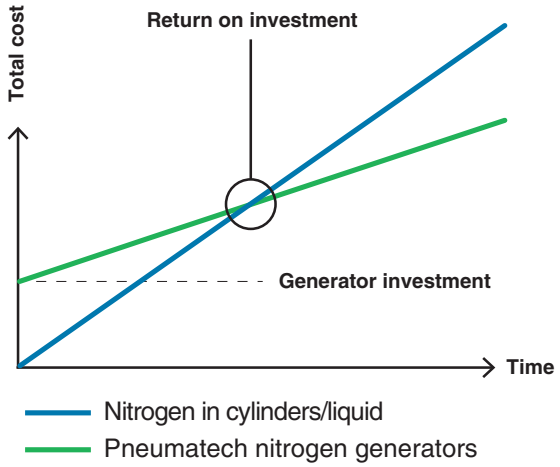
Pneumatech offers **two different technologies for on-site nitrogen generation** in order to satisfy different usage requirements.

Why buy nitrogen cylinders when nitrogen is already abundantly available in the air we breathe, and free of charge as well?
Pneumatech makes it possible for you to produce all the nitrogen you need for your production processes in-house. There are numerous benefits:

- Gas is always ready for your needs without the constraints of using monopolistic suppliers
- Maximum operational safety, without the risks associated with moving high-pressure cylinders or cryogenic gas bottles
- Complete control over the purity of the gas produced
- Minimal usage costs

versatile | safe | easy to use | economical | certified purity

These factors make the ability to generate gas on-site an attractive investment — with super-fast return on investment, often in under two years.



PNEUMATECH PPNG 6–68 HE

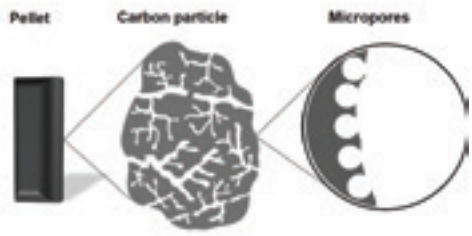
Complete control over purity with unrivaled efficiency. Nitrogen generator with PSA technology.

These generators are based on a gas separation technology called **PSA** (Pressure Swing Adsorption). The adsorbent bed is made of carbon molecular sieves. When subjected to a particular heat treatment, the surface of these sieves develops thousands of tiny cracks, increasing the porosity of the material.

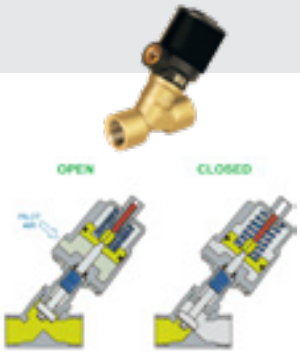
This characteristic makes the material act like a sponge for the oxygen molecules in the air. The cracks are similar in size to the oxygen molecules, which means that they are able to seize the oxygen molecules under certain conditions and separate them from the nitrogen.

PSA generators exploit this principle using columns filled with carbon molecular sieves. Once pressurized using compressed air, these columns capture the oxygen, thereby making nitrogen available at very high levels of purity.

The adsorption capacity of the columns is limited; once saturated with oxygen, they must be regenerated using a flow of air enriched with nitrogen. The columns work in pairs, alternating an adsorption phase with a regeneration phase in fully automated cycles that guarantee complete continuity of use.



Guaranteed reliability

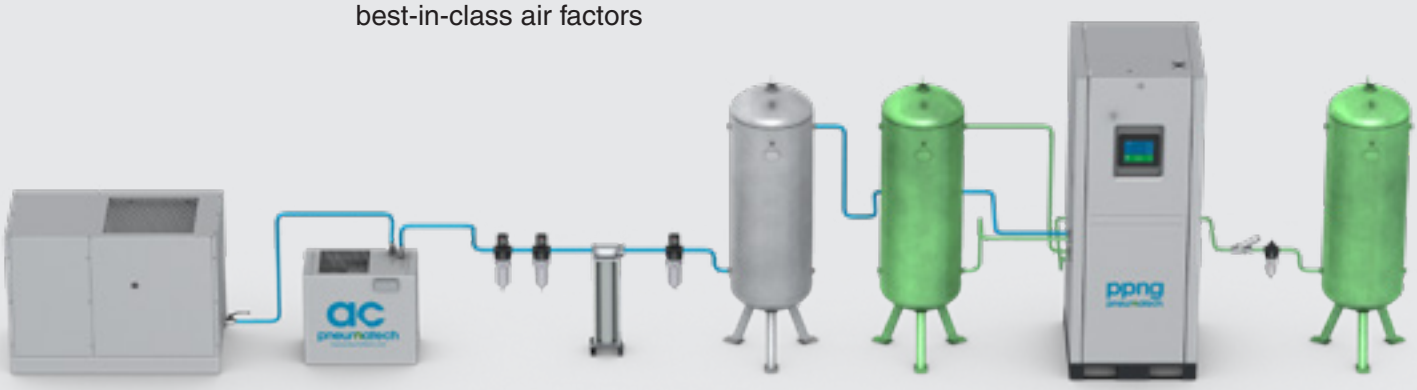


Fully automated system even during setup: The user-friendly interface on the graphic controller is intuitive to handle and enables maximum connectivity

Extremely efficient production: The carefully selected carbon molecular sieves, the exclusive back-flow pressurization technology and the energy-saving algorithm make the cost of gas production extremely competitive, thanks to the best-in-class air factors

Robust, long-lasting, and low-maintenance: Aside from the safe angular valves, the machine is designed to have a long service life while being easy and economical to maintain

Certified purity, always under control: The high precision of the zirconium sensors and their stability over time make it ideal for use in the food and pharmaceuticals industries, as guaranteed by purity certificates



General specifications

- Achievable nitrogen purity: 95%–99.9% (PCT model) and 99.95%–99.999% (PPM model)
- Inlet pressure range: 4–13 bar(g) / 60–189 psi(g)
- Inlet temperature range: 5–60°C / 41–140°F
- Required inlet air quality: 1:4:1 in accordance with the ISO standard 8573-1:2010
- Power supply: 115–230 V / 50–60 Hz

Technical specifications for PPNG 6 – PPNG 68 HE

Specifications	Unit	Product→ Purity ↓	PPNG 6 HE	PPNG 7 HE	PPNG 9 HE	PPNG 12 HE	PPNG 15 HE	PPNG 18 HE	PPNG 22 HE	PPNG 28 HE	PPNG 30 HE	PPNG 37 HE	PPNG 41 HE	PPNG 50 HE	PPNG 63 HE	PPNG 68 HE
Nominal flow rate N_2 [1]	m^3/h	95	18.4	23.4	28.8	36.4	46.8	57.2	70.2	86.0	93.6	114.8	128.9	157.7	N/A	N/A
		99.5	7.9	10.4	12.6	16.2	20.9	25.6	31.3	38.2	41.8	51.1	57.6	70.2	87.5	93.6
		99.999	1.9	2.5	2.9	4.0	5.0	6.1	7.9	9.7	10.4	13.0	15.8	19.4	22.7	25.9
Nominal air consumption	m^3/h	95	33.8	43.6	53.3	67.7	87.1	106.6	130.7	159.8	174.2	213.1	243.7	298.1	N/A	N/A
		99.5	20.9	27.0	33.1	42.1	54.0	66.2	81.0	99.0	108.0	132.1	152.6	186.8	227.5	249.1
		99.999	12.2	15.5	19.1	24.1	31.3	38.2	44.3	54.0	59.0	72.4	88.6	108.4	124.2	144.4
Air factor	-	95	1.86	1.86	1.86	1.86	1.86	1.86	1.86	1.86	1.86	1.86	1.89	2	N/A	N/A
		99.5	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.7	2.7	2.6	2.7
		99.999	6.3	6.3	6.3	6.3	6.3	6.3	5.6	5.6	5.6	5.6	5.6	5.6	5.5	5.6
PDP at outlet	°C / °F		–40	–40	–40	–40	–40	–40	–40	–40	–40	–40	–40	–40	–40	–40
Maximum pressure drop	bar	95	0.4	0.4	0.4	0.5	0.5	0.5	0.6	0.6	0.6	0.6	0.6	0.9	0.9	N/A
	bar	99.9	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.5	0.5	0.6	0.6
	bar	99.999	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.3
Length	mm		775	775	775	775	775	775	1400	1400	1400	1400	1400	1400	1400	1400
	inches		31	31	31	31	31	31	55	55	55	55	55	55	55	55
Width	mm		840	840	840	840	840	840	840	840	840	840	840	840	840	970
	inches		33	33	33	33	33	33	33	33	33	33	33	33	33	38
Height	mm		2015	2015	2015	2015	2015	2015	2015	2015	2015	2015	2015	2015	2015	2015
	inches		79	79	79	79	79	79	79	79	79	79	79	79	79	79
Weight	kg		264	277	290	326	359	380	619	647	683	736	865	1038	1211	1211
	lb		582	611	639	719	791	838	1365	1426	1506	1623	1907	2288	2670	2670
Inlet / outlet connections	G/NPT		1"	1"	1"	1"	1"	1"	1"	1"	1"	1"	1"	1"	1"	1"

1. Flow rate measured under reference conditions: 1 bar(a) and 20°C at an operating pressure of 7 bar(g), inlet temperature of 20°C and inlet air quality as per ISO standard 8573-1:2010, class 1-4-1

PNEUMATECH PMNG 1–3

The easy and immediate way to start producing nitrogen.

General specifications

- Achievable nitrogen purity: 90%–99.5%
- Inlet pressure range: 4–13 bar / 60–189 psi
- Inlet temperature range: 5–50°C / 41–122°F
- Use directly downstream of the compressor without the need for filters and tanks

These small generators use special semi-permeable membranes to separate nitrogen and oxygen at purities of up to 99.5%. Compressed air is blown through the filaments that make up the membrane. The oxygen molecules, which are smaller and more mobile, are able to escape via the surface of the filaments, while the nitrogen remains inside and becomes concentrated at the outlet of the membrane itself.

PMNG 1–3 generators are the perfect solution for applications in which small amounts of nitrogen are needed, such as saturating barrels or filling bag-in-box containers.
They are easy to use and can be put to work straight away: they have all the filtration required on the machine already, meaning they can be installed directly downstream of the compressor and dryer.

Technical specifications of the PMNG 1–3 units

Specifications	Unit	Product→ Purity ↓	PMNG 1	PMNG 2	PMNG 3
Nominal air consumption	Nm³/h	95%	9.72	19.44	29.16
		99%	6.12	12.24	18.36
		99.5%	5.76	11.52	17.28
Nominal nitrogen flow rate	Nm³/h	95%	4.68	9.36	14.04
		99%	1.8	3.6	5.4
		99.5%	1.44	2.88	4.32
Air factor	-	95%	2.1	2.1	2.1
		99%	3.4	3.4	3.4
		99.5%	4.0	4.0	4.0
Pressure dewpoint at outlet	°C / °F		–40	–40	–40
Length	mm		560.0	560.0	560.0
	inches		22.0	22.0	22.0
Width	mm		285.0	285.0	285.0
	inches		11.0	11.0	11.0
Height	mm		1150.0	1150.0	1150.0
	inches		45.0	45.0	45.0
Weight	kg		60.0	62.0	65.0
	lb		132.3	136.7	143.3
Inlet connections	G		G1/2"	G1/2"	G1/2"
Outlet connections	G		G1/2"	G1/2"	G1/2"

1. Flow measured under the reference conditions: 1 bar(a) and 20°C at an operating pressure of 8 bar(g), inlet temperature of 20°C and inlet air quality as per ISO standard 8573-1:2010, class 1-4-1.

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ISO 9001
ISO 14001
ISO 18001

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