



i-Flow Performance Data

Verified N₂ gas generation conforming with EIGA,
EC Food Grade, European Pharmacopoeia and USA
Food & Drugs Administration standards.

incorporating verified data from the National Physical Laboratory (NPL).

Peace of mind with i-Flow purity

i-Flow is a scalable on-demand nitrogen generation system capable of producing nitrogen gas at levels of purity and flow rates to suit a wide range of Gas Generation applications. Building on nearly two decades of experience as a global leader in gas generation for scientific applications, i-Flow is a culmination of Peak's innovation and technological expertise.

All i-Flow generators come with an oxygen analyzer as standard to provide real-time monitoring and display of nitrogen purity produced by the system. In order to assure our customers of this purity, we had our i-Flow generators independently tested by the National Physical Laboratory (NPL) in the United Kingdom.

Controlled Verification

The NPL collected gas samples from the Peak Gas Generation manufacturing facility under controlled conditions.

The gas was tested at four separate intervals: before entering the system, after being processed by a Peak PureAir dryer, after being processed by the i-Flow generator for 99% pure nitrogen and after being processed for 99.995% (50 ppm oxygen) pure nitrogen.

The gas samples were stringently tested using Gas Chromatography (GC) with a variety of different detectors including thermal conductivity detector, cavity ring-down spectroscopy, a pulse discharge helium ionization detector, a non-dispersive infrared and a methaniser and flame ionization detector. Further samples of gas were tested using the quartz crystal microbalance method.

The NPL uses this robust and detailed methodology to detect impurities down to trace detection levels, giving users assurance of the quality of nitrogen produced.



The results

The table below shows the findings of the NPL's gas analysis.

Component	NPL Results		EIGA	
	Post 1% O2 Peak i-Flow Feed / Result	Post 50ppm O2 Peak i-Flow Feed / Result	EC Food Grade (IGC Doc 126/04/E)	EU Pharmacopeia
Oxygen	20.89% / 0.774%	20.89% / 42.5ppm	1%	99.5% (O2 content <50ppm)
Carbon Monoxide	<1ppm / <1ppm	<1ppm / <1ppm	<10ppm	<5ppm
Carbon Dioxide	359.1ppm / 12.4ppm	359.1ppm / 11.7ppm	N/A	N/A
Hydrogen	2.58ppm / 1.47ppm	2.58ppm / 1.27ppm	N/A	N/A
Nitrogen Monoxide	<1ppm / <1ppm	<1ppm / <1ppm	<10ppm combined	N/A
Nitrogen Oxides	<1ppm / <1ppm	<1ppm / <1ppm		N/A
Methane	1.93ppm / 2.37ppm	1.93ppm / 4.32ppm	<100ppm	< 100ppm
Non-methane hydro-carbon compounds (NMHC)	<1ppm / <1ppm	<1ppm / <1ppm		
Water	>500ppm / <6.3ppm	>500ppm / <4ppm	<500ppm	<67ppm

NPL standards explained

The National Physical Laboratory (NPL) is the UK's national measurement institute and is a world-leading center of excellence developing and applying the most accurate measurement standards for science and technology markets. They perform gas analysis measurements against primary reference gas mixtures that are directly traceable to the SI unit.

Founded in 1900, the NPL was initially set up for standardizing and verifying instruments, testing materials, determination of physical constants and is one of the oldest standardizing laboratories in the world. Now they are a leading international measurement body, with measurement capabilities that are recognized across the European Union and worldwide.

The NPL provided the analysis and data used by Peak Gas Generation to independently verify that the quality of gas produced by the i-Flow system meets standard specifications set by global organizations such as European Gas Generation Gases Association (EIGA), European Pharmacopoeia, European Commission's Food Grade and JECFA (Joint Food & Agriculture Organization of the United Nations/World Health Organization Expert Committee on Food Additives) as well as numerous other industry standards in various fields. Furthermore, with Peak Gas Generation's IQ/OQ certification the i-Flow would also meet the specifications of USA Food & Drugs Administration (CFR Title 21).



EIGA

EIGA is an industry body representing the vast majority of European, as well as many non-European companies, producing and distributing Gas Generation, medical and food gases.

[ref: www.eiga.eu]



Based on the results of the extensive analysis by the National Physical Laboratory. Peak Gas Generation is satisfied that the nitrogen gas produced by the i-Flow gas generators meets and exceeds the standards laid down by both European Pharmacopoeia and the Joint Food & Agriculture Organization of the United Nations/World Health Organization (JECFA). EIGA fully co-operates with all National Gas Generation Gas Associations and regional Gas Generation gas associations around the world such as AIGA (Singapore), ANZIGA (Australia/New Zealand), CGA (USA), JIMGA (Japan), SACGA (South Africa), which are all associated members to EIGA.



European Pharmacopoeia

Peak's i-Flow generators are compliant with The European Pharmacopoeia's standards for gas applications. The European Pharmacopoeia is a legally binding quality standard applicable to all medicines sold in the European Union covering ingredients dosage, analysis methodology and production of medicines.

Peak Gas Generation's i-Flow generator has surpassed the requirements set out by this standard meaning that our generator is suitable for supplying nitrogen in pharmaceutical production and manufacturing.

EC Food Grade

Gases used in food processing, for example as a propellant or as a packaging gas are classified as food additives and are given E numbers (e.g. E941 for Nitrogen).

The NPL's test results show Peak's i-Flow generator comfortably meets the minimum EC Food Grade standards set for food gas applications and therefore, is suitable for food gas uses, such as modified atmosphere packaging, sparging and bottling of beverages.

USA Food & Drugs Administration Regulations

The Food & Drug Administration (FDA) is a federal agency of the US Department of Health & Human Services. It is the executive department responsible for protecting public health by assuring safety, efficacy and security of biological products, cosmetics, food supply, human/veterinary drugs, medical devices as well as products that emit radiation. For food or pharmaceutical companies, the minimum standards of Current Good Manufacturing Practices (cGMP's) are regulated via Title 21 of the Code of Federal Regulations (CFR title 21), under Part 110 for food and Part 210 for drugs.

With Peak Gas Generation's IQ/OQ certification, companies regulated by these standards can ensure they meet its specifications and this service can be provided at any point, whether requested at commissioning, servicing or at

any other stage.

ISO 8573-1: 2010

ISO 8573-1:2010 governs the acceptable levels of contamination per cubic metre of compressed air. In particular, the ISO document specifies purity classes of compressed air with respect to particles, water and oil, independent of the location in the compressed air system at which the air is specified or measured.

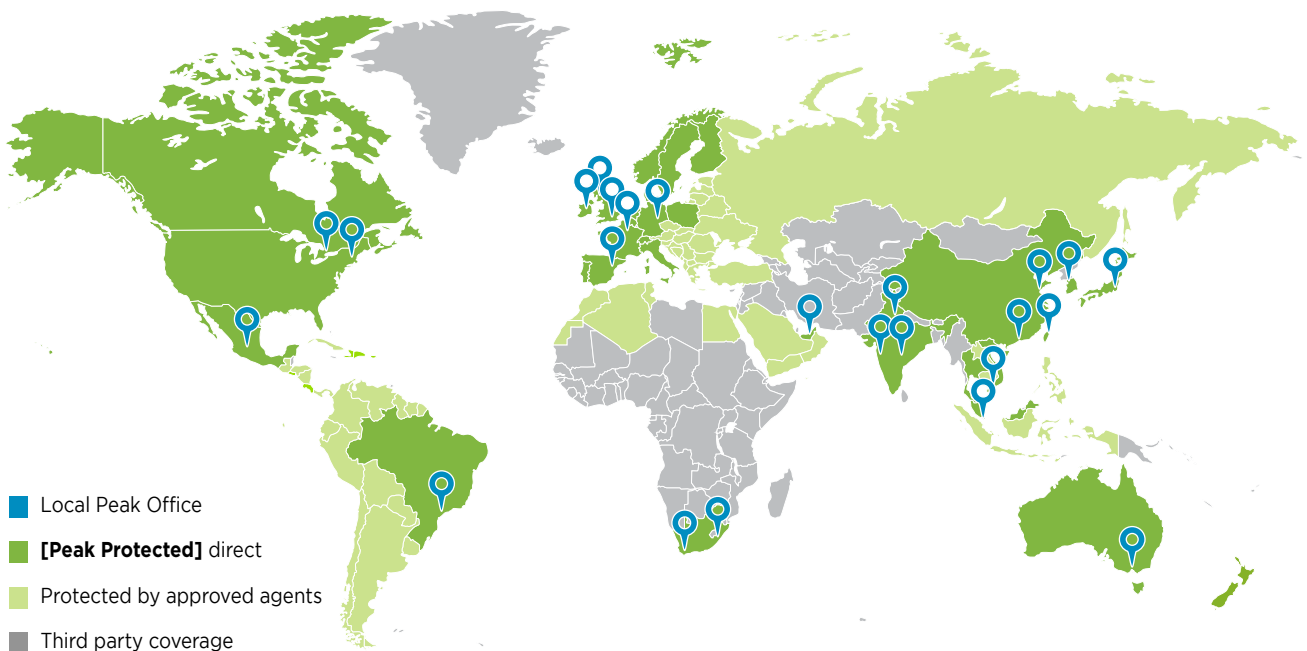
It is recommended that in order to achieve the purity specified by Peak's i-Flow generator that a Peak PureAir pre-filtration system is installed to ensure the quality of gas delivered to the i-Flow generator is compliant to ISO8573-1:2010 Class 1.2.1, see highlighted data below.

ISO8573-1:2010 Class	Solid Particulate			Mass Concentration mg/m ³	Water		Oil
	Maximum number of particles per m ³				0.1-0.5 micron	0.5-1 micron	Total Oil (aerosol liquid and vapour)
	0.1-0.5 micron	0.5-1 micron	1-5 micron				mg/m ³
0	As specified by the equipment user or supplier and more stringent than Class 1						
1	≤ 20,000	≤400	≤10	-	≤-70°C	-	0.01
2	≤400,000	≤6,000	≤100	-	≤-40°C	-	0.1
3	-	≤90,000	≤1,000	-	≤-20°C	-	1
4	-	-	≤10,000	-	≤+3°C	-	5
5	-	-	≤100,000	-	≤+7°C	-	-
6	-	-	-	≤5	≤+10°C	-	-
7	-	-	-	5-10	-	≤0.5	-
8	-	-	-	-	-	0.5-5	-
9	-	-	-	-	-	5-10	-
X	-	-	-	>10	-	>10	>10



Local service on a global scale

Peak Gas Generation has experienced & fully certified Field Service Engineers, located in over 20 countries in every continent across the globe. This further highlights our commitment to providing local sales & service support to customers worldwide. Coupled with industry-leading service response times, Peak Gas Generation can demonstrate that your company's productivity is our top priority.



Contact us today to discover more!

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