

CRYOGEN SERIES

LIQUID NITROGEN GENERATORS ON-SITE



MAKE YOUR OWN LIQUID NITROGEN,
ANYWHERE, ANYTIME!

WWW.F-DGS.COM

WHO WE ARE

Established in 2006, F-DGSI is a **French family-owned** company, dynamic and innovative in the field of gas generators, as we have proven experience in design, manufacturing and technical assistance in gas generators for many years.

Our commitment is to provide your laboratory with a complete gas and liquid nitrogen production solution that is reliable and durable for years. We achieve this through our expertise and **100% French design**. Our credo is: *«always one step ahead of the competition»*.

Service is at the heart of our business. With an in-depth knowledge of laboratories and their applications, our mission is to satisfy our customers by offering them **high quality products** and a **unique customer service**. Efficiency and reactivity is always our priority. **Customer satisfaction** is our top priority which we promise to achieve through our technical expertise and by sustaining plus enhancing the quality of our products time to time. We always tend to offer our customers the best possible solution as per their current requirements, we ensure this by having our technical engineering team readily available to support you from our HQ plus we have a large network of regional distributors trained by F-DGSI. Hence you are in safe hands.

The values of F-DGSI



Know-how

The passion we share



Customer satisfaction

Is our top priority



Innovation

Is part of our DNA



Quality

A commitment that continues



Design

Because performance is not enough



Security

More intelligent.
More Secure.

WHAT WE DO

At F-DGSI, we innovate, design and manufacture high performance gas and liquid nitrogen generators for nearly 20 years. Our Headquarters is located near Paris (France), where all our products are **designed and manufactured 100% in-house** by our own Research & Development center. This ensures reliability on our products as we totally control our manufacturing protocols.

With the know-how of our French engineering teams, we provide laboratories around the world with a **unique and efficient gas production solution (Hydrogen, Zero Air, Nitrogen)** offering a safer, more convenient and cost effective alternative to cylinders. F-DGSI has a wide range of gas generators products and also related to your gas needs, to meet your complete needs of all your analytical instruments. Our high quality products, combined with French technology and design, provides you with absolute peace of mind and helps to reduce your operating costs, environmental impact and eliminates inconvenience of cylinder supply.

We also **manufacture liquid N2 generators** for various applications providing safety and security for the labs and customers. As our gas generators, this range is a **sustainable and cost-effective solution** compared to conventional cylinder and bulk liquid supplies. Quality and minimum operating costs are targeted, so you can be even more focused on your analysis.

F-DGSI criteria is to provide the customer with the best advanced gas generator solution, which will meet the customer's expectations and quality is not compromised.

We ensure the availability of our services throughout the life time of the gas generator, where optimal maintenance of the gas generator is the utmost importance, that we provide through maintenance contracts [**F-DGSI Care**].

Discover more
on our website
www.f-dgs.com



LIQUID NITROGEN GENERATORS

Liquid Nitrogen for laboratories and medical

The CRYOGEN system allows you to produce on demand your own liquid nitrogen gas. It is a refrigerated liquefied gas with a boiling point of -196°C (-321°F).

It is used for many applications where very low temperatures or large temperature reduction is required. CRYOGEN eliminates the cost of buying liquid nitrogen and the hassle of waiting for deliveries.



8 good reasons to choose F-DGSi Liquid Nitrogen Generator

- **High Purity Liquid Nitrogen**

Routinely, CryoGen units supply LN2 at 99% purity ($\text{O}_2 < 1\%$) checked automatically by an O_2 sensor with alarm detection.

- **Remote PC monitoring and diagnostic analysis via USB or internet connection**

CryoGen units are remotely controllable via USB using a laptop connected to the internet. It allows us and users to check all the parameters and store the data events.

- **External Liquid Nitrogen hose to fill into the canisters**

As soon as the internal tank is full, the user just has to use a valve connected to a hose to fill external dewars. The valve and hose could be inside the cabinet or outside (option).

- **Intelligent Color Touch Screen**

All the parameters are accessible using an intelligent and intuitive touch screen. Start/stop the unit, check LN2 level in the internal tank, check running hours and service hours, schedule the production during the week... And a log book is available to check all the events.

- **Liquid Nitrogen on demand**

Having such units on board allow users to get access to LN2 when they want and use what they really need for their applications.

Flow rate: 10 to 240 L/day

- **No need to monitor LN2 level**

Low and high LN2 levels in the internal tank are set up by the user and automatically controlled.

- **Energy Saving Technology (EST)**

When the system is not producing, we use our Energy Saving Mode technology to put the system in economy mode to save consumption, save running hours and extend preventive maintenance.

- **Eliminates inconveniences, improves safety and being eco-friendly**

Getting a CryoGen unit allows you to be independent from gas suppliers, from truck deliveries and be more secure as you can install the unit much closer to your needs.

How it works?

The system is based on the Gifford-McMahon technique of a cold-head design with the compression and expansion of helium to obtain low temperature cooling.

Using PSA Technology for Nitrogen production, our gas generators can deliver a much drier and higher purity Nitrogen than produced using hollow fiber membranes, which are susceptible to humidity and can deplete over time resulting in costly replacement. The Cryo-Refregirator, mounted on the top of the Liquid Nitrogen Tank, converts gaseous Nitrogen into Liquid Nitrogen at -196°C (-321°F).

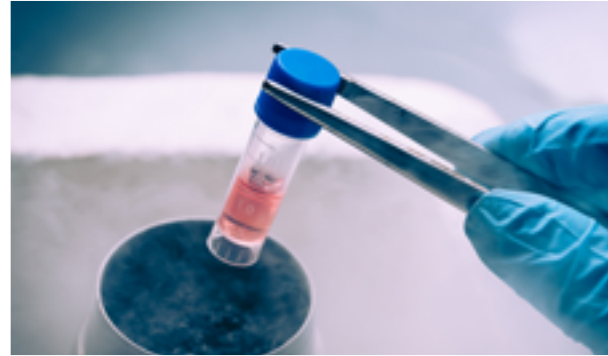
The liquefied Nitrogen drops down into the bottom of the Dewar. The liquid Nitrogen can be dispensed with a Insulated Cryogenic Hoses. The cooling of the CRYOGEN can be done by Air or Water depending on your needs.

DIFFERENTS APPLICATIONS

Cryopreservation

Process that preserves organs, tissues, human and animal semen, fertilized or any other biological constructs by cooling the samples to the boiling point of liquid nitrogen. With very low temperature, biological activity is stopped.

www.f-dgs.com/applications/cryopreservation



Cryotherapy

Known as cold therapy, is used in medical therapy to treat a variety of tissue lesions or skin abnormalities (cryosurgery). It is also an effort to relieve muscle pain, sprains and swelling after soft tissue damage (especially athletes).

www.f-dgs.com/applications/cryotherapy



Gastronomy

Liquid nitrogen is often used in modern cuisine to produce frozen foams and ice cream. After freezing food, nitrogen boils away creating a thick fog. LN2 is also appreciated by chefs for molecular gastronomy and food preservation.

www.f-dgs.com/applications/gastronomy



NMR

NMR Spectroscopy is used to analyse the physical and chemical composition of materials. Liquid helium is required to cool down the magnet of NMR and liquid nitrogen is used to absorb heat from outside the magnet.

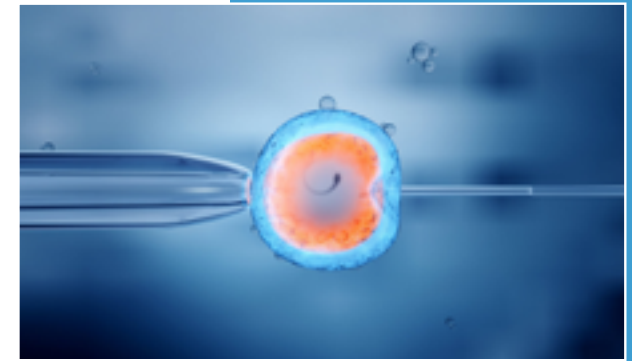
www.f-dgs.com/applications/nmr



In-Vitro Fertilization

IVF is an assisted reproduction technique. The use of liquid nitrogen allows for medical hibernation of embryos, sperm and oocytes (eggs). This biological sleep in liquid nitrogen can last for years.

www.f-dgs.com/applications/ivf



GC-2D

Two-Dimensional Gas Chromatography is a technique for analyzing complex samples which involves the use several columns used in series. LN2 traps molecules of the first dimension.

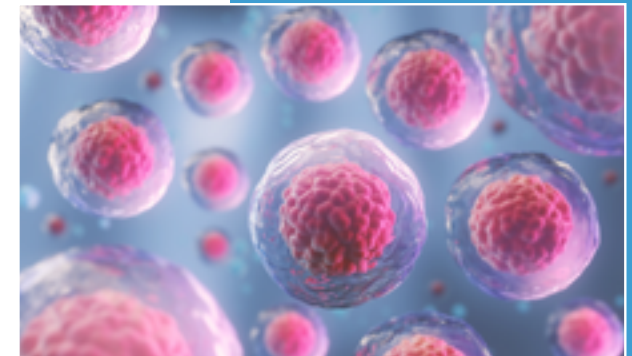
www.f-dgs.com/applications/gc-2d



Cells

LN2 preserves cells but also apply a source of cold to tumor lesions (cryosurgery). LN2 can freeze several types of cells: graft while waiting for transplant, hematopoietic stem cells while awaiting reinjection.

www.f-dgs.com/applications/cells



Metal Treatment

Metals like steel, iron, copper and aluminum are often heat treated to improve their physical properties. The metal is exposed to heat and then to cooling. This cryogenic hardening is characterized using LN2 to freeze metal.

www.f-dgs.com/applications/metal-treatment



Dermatology

LN2 in dermatology destroys certain skin lesions. Heat shock causes crystallization of the water contained in the cells. The freezing and heating phases constitute a freeze-thaw cycle. Many lesions can be treated: acne, scars, warts, skin cancer.

www.f-dgs.com/applications/dermatology



	Max L/Day	Liquid N2 Purity	Liquid N2 Dewar Capacity	Liquid N2 Pressure	Dimensions (W x H x D)
Water cooled					
CRYOGEN.10	10	> 99% (< 1% O2)	35 L	Up to 4.0 bar	120 x 180 x 60 cm (47" x 71" x 24")
CRYOGEN.20	20		100 L		
CRYOGEN.30	30		100 L		
CRYOGEN.40	40		160 L		
CRYOGEN.65	65		210 L		180 x 180 x 80 cm (71" x 71" x 31")
CRYOGEN.80	80		210 L		
CRYOGEN.130	130		300 L		
CRYOGEN.240	240		500 L		
Air cooled					
CRYOGEN.10-RA	10	> 99% (< 1% O2)	35 L	Up to 4.0 bar	80 x 180 x 80 cm (31" x 71" x 31")
CRYOGEN.20-RA	20		100 L		120 x 180 x 60 cm (47" x 71" x 24")
CRYOGEN.30-RA	30		100 L		
CRYOGEN.40-RA	40		160 L		
CRYOGEN.65-RA	65		210 L		180 x 180 x 80 cm (71" x 71" x 31")
CRYOGEN.80-RA	80		210 L		

Optionnal Accessories

■ Cryogenic Safety Equipment

Personal safety is paramount when handling cryogenic liquids. F-DGSi supplies a range of personal protective equipment as cryogenic gloves, visors, apron.



■ Insulated Cryogenic Hoses

They are the perfect solution for applications requiring the safe and efficient transfer of liquid nitrogen or other cryogenes.



■ Range of dewars

To suit individual laboratory storage and liquid nitrogen handling requirements.



■ Cryogenic isolation valves

Withstand and operate effectively at extremely cold temperatures.

■ Oxygen depletion alarm

Used as an oxygen sensor that constantly monitors a defined space. It can control third party systems and can audibly/visually indicate an incident. The sensor continually monitors the oxygen level in the enclosed area. If the oxygen level in the air drops below a preset value, the alarm warns occupants.

■ Water chiller

Recirculating water chillers ensure accurate and constant cooling conditions of instruments.

“ We are using a CRYOGEN (40L/day) from F-DGSi France since now 3 years for Cryotherapy. We are really happy of the performance of the unit, the remote connectivity of the system and the support of F-DGSi.

We recommend strongly to work with F-DGSi for all cryogenic applications. ”

Oliver Sommer
Art Physio Dresden, Germany










ALL BENEFITS

WORLD-CLASS BENEFITS IN ORDER TO MAINTAIN YOUR GAS SUPPLY

With F-DGSi generators, it is a new partnership that begins. Whether it is for an installation, an unforeseen breakdown or any other service, our teams of engineers and technical assistants are at your disposal to answer your questions related to our generators, wherever you are in the world.

F-DGSi expertise: What do we cover?

In order to be as close as possible to our customers, we have a wide range of services and benefits to meet your expectations. Installation, maintenance and qualification of your products, we strive to help and advise you in the implementation of your F-DGSi products. For special requests other than the one below, please contact us, we will be happy to find solutions.

 Installation Installing the products to meet your needs	 Re-location Relocation service for your products
 Rent or lease sale Rental of a wide range of equipment	 Advice Your expert in gas supply by your side
 Parts Service / Consumables A hotline to guarantee you a 48h deadline	 Maintenance Service plans and maintenance contracts
 Repairs Repair on customer site or F-DGSi office	 4Q Qualifications CQ / IQ / OQ / PQ Qualifications
 Customized training Training by our technical experts F-DGSi	

Learn more on www.f-dgs.com/benefits

[F-DGSi Care]

GET PEACE OF MIND WITH OUR WORLD-CLASS GAS GENERATOR SERVICE PLANS

When you invest in an F-DGSi gas generator, you're buying more than just a generator, you're starting a longterm partnership. The after sales service department not only keeps your generators in good working conditions, but also guarantees outstanding performance throughout their life cycle.

5 types of service plans for your gas generator

With on-site repairs and regularly scheduled maintenance, our various contracts will help you to reduce disruptions to your laboratory operations and to improve efficiency and productivity, with no hidden or unexpected costs.

Hotline Contract Do the maintenance yourself	Day Ticket Contract Peace of mind for your maintenance budget	Basic Preventive Contract Includes travel and labor without parts
Silver Preventive Contract Includes preventative maintenance parts	Gold Contract Contract Premium: Total peace of mind	

The benefits to take one of our FrenchCare Contracts

Cost Control

Preventive maintenance by experienced professionals of F-DGSi will reveal any wear and tear at an early stage. This avoids unexpected expenses and allows you to better control the costs of using the device.

Reduced downtime

Reduce your risk of breakdowns and unscheduled downtime! Remote access to your equipment allows to analyze critical equipment parameters and identify pending failures before they affect your lab operations.

Priority

With a Service Contract, you are our priority. We guarantee a quick maintenance response in case of emergency.

Flexibility

At the point of equipment sale, different payment options are available (Annual, Bi-annual, Quarterly, ...)

Get more details for contracts on www.f-dgs.com/service-plans



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