Inspiring innovation

Pyrostop™ Catalogue
SF₆ Gas
Equipment Services
INVENTEC Performance Chemicals subsidiary DEHON Group.

INVENTEC Performance Chemicals, a subsidiary of DEHON Group founded in 1874, formulates, packages and distributes solutions for the chemical industry.

The Group consists of 4 commercial companies, each with its own production facilities and R & D services:

**INVENTEC Performance Chemicals:** precision cleaning markets, electronics, fine chemicals and dielectric application to the electricity market.

**Climalife:** refrigeration and heating markets.

**SMB:** automotive with technical fluids.

**Soderec:** toxic, corrosive gases and acids for the industry.

The DEHON Group employs 500 people and achieved a turnover of 160 million euros in 2014.

INVENTEC Performance Chemicals 100 people, achieved a turnover of 65 million euros in 2014.

10% of turnover is invested in R & D and ensures technical and regulatory monitoring.

**SF$_6$**

One of the gas filled and distributed by INVENTEC is used in MV and HV power: The SF$_6$ (sulfur hexafluoride) sold under the trademark of Pyrostop™.

This gas has a very strong impact on the greenhouse effect and should be handled by qualified personnel with proper tools. INVENTEC offers a full range of equipment and services to prevent leakage to the atmosphere, to recycle the contaminated SF$_6$ and to help you in all steps handling SF$_6$. 
INVENTEC Performance Chemicals offers two qualities of **Pyrostop™ 6**: a product in compliance with IEC 60376 standard and a product with a purity exceeding the standard.

<table>
<thead>
<tr>
<th></th>
<th>Pyrostop 6 IEC 60376*</th>
<th>Pyrostop 6*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Purity</td>
<td>99.70 %</td>
<td>99.90 %</td>
</tr>
<tr>
<td>Acidity max.</td>
<td>1 ppmW</td>
<td>1 ppmW</td>
</tr>
<tr>
<td>Water content</td>
<td>25 ppmW</td>
<td>15 ppmW</td>
</tr>
<tr>
<td>Npn condensable content</td>
<td>2 000 ppmW</td>
<td>500 ppmW</td>
</tr>
<tr>
<td>CF4 max. content</td>
<td>2 400 ppmW</td>
<td>500 ppmW</td>
</tr>
<tr>
<td>Max. mineral oil</td>
<td>10 ppmW</td>
<td>10 ppmW</td>
</tr>
</tbody>
</table>

*Values guaranted on the liquid phase

**Adapted Packaging**

The **Pyrostop™ 6** is a liquefied gas which pressure depends on the temperature.

All our packaging for SF₆ have a test pressure of 70 bar. With their tap fitted with non return device on bottles, we guarantee that the product quality in the bottle will not be affected by returns of unwanted pollutants.

All packaging belonging to customers are accepted for filling provided if they are designed to contain SF₆ (mentioned on ID plate), if they have a test pressure of 70 bar, and correct testing date.

We have a large fleet of packages from 8 kg to 624 kg capacity and over 40 tons of fixed storage capacity.

**Clip’n Use**

**In a single step without tools**

- **Female coupling device**
  - 3rd sealing level
- **Male coupling device**
  - 1st sealing level

**Male quick coupling valve Teflon non-return device**

Preserving specification product inside the package against external pollution

**Sure Connection with no seals and no tools**

Male thread 25E conform to standard EN629-1

**Tapping ½ NPT**

**Clip’n Use**

Inventec designed and developed a quick connector, unique and patented. The Clip’n Use has three levels of tightness. Its handling is quick and safe, thanks to its **ease use without tools**.
Transfer and Recovering SF₆ Equipment

Designed and manufactured by our experts, the equipment allows to perform all your handling operations with SF₆.

The main functions are the recovery and the filling of SF₆, but also the vacuuming of air.

- Adapted equipment for all needs thanks to a flexible offer.
- Suitable for medium and large electric cells.
- Adapted for maintenance or recover the gas from cells at the end of their life.
- Recovery of SF₆ up to 1 mbar absolute.
- The particles and activated carbon filtration system ensures a long service life and low maintenance cost.
- Transfer of the remaining gas from several packaging to a single packaging.

<table>
<thead>
<tr>
<th>CORE FUNCTIONS</th>
<th>GR ECO SF₆ 80</th>
<th>GR ECO SF₆ 160</th>
<th>GR SF₆ 160</th>
</tr>
</thead>
<tbody>
<tr>
<td>Average transfer rate</td>
<td>10 - 80 kg/h</td>
<td>30 - 160 kg/h</td>
<td></td>
</tr>
<tr>
<td></td>
<td>3 compressors XLT in // and series (1,5 m³/h to 12 m³/h)</td>
<td>1 Compresseur Haug (5 m³/h à 15 m³/h)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Compressor lifetime 100 - 300 hours</td>
<td>Compressor lifetime ~300 hours</td>
<td></td>
</tr>
<tr>
<td>SF₆ recovery</td>
<td>up to 500 mbar abs</td>
<td>up to 900 mbar abs</td>
<td></td>
</tr>
<tr>
<td>Filters</td>
<td>Particle filter : Filter 12 µm</td>
<td>Active carbon filter with 2 cartridge HF, Adsorption of humidity, SO₂, etc.</td>
<td></td>
</tr>
<tr>
<td>Weighing recovery bottle</td>
<td>42 kg maximum</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Touch screen with controller</td>
<td>✗</td>
<td>✗</td>
<td>✗</td>
</tr>
</tbody>
</table>

**OPTIONAL FUNCTIONS**

- **Pushed recovering**
  - dry vacuum pump
  - up to 1 mbar abs
  - 10 m³/h
  - 17 m³/h
  - SF₆ Filling
    - up to 11 bar abs with pressure regulator
    - bottle of 42 kg emplacement for SF₆ new

- **Vacuuming of air**
  - palette vacuum pump
  - up to 1 mbar abs
  - 10 m³/h
  - 17 m³/h

- **SF₆ filling controlled**
  - up to 11 bar abs, precision +/- 20 mbar
  - bottle of 42 kg emplacement for SF₆ new

- **SF₆ filling controlled with compressor**
  - up to 16 bar abs, precision +/- 20 mbar
  - bottles emptying up to patm
  - bottle of 42 kg emplacement for SF₆ new

- **Lateral rollover**
  - aluminium ventilated sheet

Our equipment is compliant with the European Directive on Pressure Equipment 97/23 EC and the Machinery Directive 2006/42 EC.
Quality Analyser SF₆ GA11
Multifonctions Case.
On site analysis of the SF₆-quality, measures moisture, purity and SO₂ or SO₂/HF.

- Integrated pump-back-function allows measurement in a closed loop and three operations modes for zero SF₆ emissions.
- No internal pressure vessel, eliminates transportation regulations (dangerous goods regulation).
- Dual power source: rechargeable battery and AC power.
- Pump back / up to 5 measurements possible with one battery charge.
- Using external bag for recovery.
- Using external cylinder (up to 10 bar / 150 psig gaseous) for recovery.

SF₆ Analysis Equipments
INVENTEC is a WIKApriileged distributor, manufacturer of analysis and control equipment for SF₆.

<table>
<thead>
<tr>
<th>ANALYSYS EQUIPMENTS</th>
<th>FEATURES</th>
</tr>
</thead>
<tbody>
<tr>
<td>MV Pressure-Regulator GA05</td>
<td>Increase the inlet pressure for SF₆ analytic devices to measure at medium voltage switchgears.</td>
</tr>
<tr>
<td>Humiditor GA20</td>
<td>Automatic flow and pressure control module, uses an exclusive polymer-based sensor. All readings are temperature compensated and displayed real-time on the touch-screen display, in parts per million volume (ppmv), mass (ppmw), and dew point in °C.</td>
</tr>
<tr>
<td>Humiditor GA40</td>
<td>High accuracy of analysis by chilled mirror dewpoint sensor. It is an autonomous device which quickly and automatically measures the moisture in a gas sample SF₆.</td>
</tr>
<tr>
<td>Aciditor GA25 SO20</td>
<td>Specifically developed for arced or otherwise stressed SF₆ gas. Unlike conventional decomposition testers, which require disposable detector tubes, this unit uses an electrochemical sensor and is calibrated with certified test gas.</td>
</tr>
<tr>
<td>Purity-Meter GA50</td>
<td>is a cost effective way to determine if the SF₆ percentage in SF₆-filled equipment meets the requirements.</td>
</tr>
<tr>
<td>Accessoires pour GA20/GA25/GA40/GA50</td>
<td>Portable storage system designed to contain SF₆ gas. Light weight and easy to carry, compatible connections with SF₆ gas analysis instruments, the pocket is protected against bursting and is possible to store gas in liquid form.</td>
</tr>
</tbody>
</table>

Kit adapters M26×1.5 and F45×2 [DN8 and DN20]
Control Equipment

IR Leak Detector GIR-10
The portable gas detector, easy and quick to use
Helps to locate and identify leaks on equipment and determine the leak rate.

- Detects small SF₆ gas concentrations down to 0.6 ppmv.
- Detects SF₆ only, unaffected by moisture and by volatile organic compounds (VOC).
- Technology dual wavelength non-dispersive Infrared Spectrometer (NDIR), fast response time and reliable measured values even in the case of small leaks.
- Available for measures from 0 to 2000 ppmv with detection limit of 3 ppmv and detectable leakage rates (calculated) of 3.43 g/year (equivalent to 1.81 x 10⁻⁵ mbar x L/s). For measurements from 0 to 50 ppmv with detection limit of 0.6 ppmv and detectable leakage rates (calculated) of 0.34 g/year (equivalent to 1.81 x 10⁻⁶ mbar x L/s).
- Easy to use and good readability. Both the sensor and handheld portions of the unit have a digital display to show the actual SF₆ level.
- Factory calibration using certified calibration gases.

SF₆ Control Equipment

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<tr>
<td>GA35 SF₆-IR-Monitor 230V</td>
<td>Detect unsafe SF₆ gas levels in enclosed indoor environment</td>
</tr>
<tr>
<td>GA38 O2/SF₆-Monitor 230V</td>
<td>Detect unsafe O2 / SF₆ gas levels in enclosed indoor environments. Hygrostat option for the measurement of humidity and temperature.</td>
</tr>
<tr>
<td>Accessories for GA 35 and GA38</td>
<td>Multi sampler box to extend the monitor to 5 or 10 sample points and hose connection.</td>
</tr>
<tr>
<td>Leak detector XP1</td>
<td>Automatic electronic leak detector by high sensitivity ionization, capable of analyzing 2000 times per second. The operator can adjust 7 levels of sensitivity (allows an increase of signal up to 64 times).</td>
</tr>
<tr>
<td>Mini check pour détecteur XP1</td>
<td>Leak rate of about 20 ° C to 5g/an R134a. It controls the performance of portable electronic leak detectors and make sure they are not saturated or down before each use.</td>
</tr>
<tr>
<td>Electronic scale 50 kg</td>
<td>Operating time up to 25 hours continuous, supply by 9 volt battery, resolution 0.01 kg, precision +/- 0.030 kg or 1.1 % on reading.</td>
</tr>
<tr>
<td>Electronic scale 150 kg</td>
<td>Operating time up to 25 hours continuous, supply by 9 volt battery, resolution 0.01 kg, precision +/- 0.5 kg.</td>
</tr>
</tbody>
</table>
“Services tailored to your needs”

Inventec Performance Chemicals and its sister company Créalis* have an expertise and can offer you the best solution you need, related to SF₆.

* a Dehon Group Company.

Product Analysis
Inventec has a laboratory specializing in the analysis of liquefied gases. To help you better control the quality of SF₆ in your facilities or your storage areas, a complete analysis on a sample can be performed on request.

Recycling
Inventec is involved in the environment protection within the framework of sustainable development. Inventec recovers and recycles the polluted SF₆ and put it back to the specifications of IEC 60376 standard in order to allow his customers to use it again.

Control and maintenance of packaging
Control and regular maintenance of your packaging are necessary operations to ensure an optimal quality of SF₆ and maximum safety.

The following services are provided in the maintenance workshop of Inventec:
- re-testing of packaging
- care operations: inerting, painting, marking, destruction ...

Design, implementation and inspection of facilities
With our expertise and know how in the production facilities, we are able to design and to install an extended SF₆ installation in your plant, tailored to your needs. We can also handle the audit of your existing storage facilities and distribution network to check the compliance with the regulations in terms of safety and environment.

End of life equipment containing SF₆
We can ensure a complete recovery of your end of life HV cells still containing SF₆ gas, proceed to the emptying and the treatment of polluted SF₆, and manage the destruction of the cells.

Cleanup
To extend the life of your materials dedicated to recovery and transfer of SF₆, we propose you the depollution of your machines.

Ecoprogramme
France
- Saint-Priest Head Quarter and facilities
  Rue de Bourgogne – BP 211
  69802 Saint-Priest
  Tel : +33 (0)4 72 28 13 00
  Fax : +33 (0)4 72 28 13 41

- Vincennes offices
  26, avenue du Petit Parc
  94683 Vincennes cedex
  Tel : +33 (0)1 43 98 75 00
  Fax : +33 (0)1 43 98 76 20

- Bry-sur-Marne facilities
  Rue des Coulons – BP 27
  94363 Bry-sur-Marne cedex
  Tel : +33 (0)1 49 83 53 40
  Fax : +33 (0)1 49 83 92 17

Europe
- DKF GERMANY / INVENTEC
  Robert - Bosch - Strasse 14
  D-40668 MEERBUSCH
  Tel : +49 (0)21 50 70 73 00
  Fax : + 49 (0)21 50 70 73 17

- INVENTEC Performance Chemicals ESPAÑA
  Perez Pujol, 4 – 2º
  E - 46002 VALENCIA
  Tel : +34 96 353 51 93
  Fax : +34 96 353 51 92

- INVENTEC Performance Chemicals Netherlands BV
  Van Konijnenburgweg 84
  NL - 4612 PL - Bergen Op Zoom

- INVENTEC Performance Chemicals Switzerland
  15 Petits Champs
  CH - 1400 Yverdon les Bains
  Tel : +41 (0) 24 424 80 90
  Fax : +41 (0) 24 424 80 99

- CLIMALIFE Kft / INVENTEC
  Frigogaz Kft - H-2040
  Budaörs, Ret. u.2
  BUDAÖRS - HONGRIE
  Tel : +36 23 431 660
  Fax : +36 23 431 661

America and Asia
- INVENTEC Performance Chemicals USA LLC
  500 Main Street, Suite 18
  P.O. Box 989
  Deep River CT 06417
  Tel : +1 860 526 8300
  Fax : +1 860 526 8243

- INVENTEC Performance Chemicals MEXICO
  Rio Conchos 1757
  Fraccionamiento Industrial El Rosario
  Guadalajara, Jalisco C.P. 44890
  Tel : +52 33 3838 8866
  Fax : +52 33 3838 8867

- INVENTEC Performance Chemicals ASIA PACIFIC
  4, Jalan P/17 - Selaman Industrial Park Bandar Baru Bangi
  43650 SELANGOR
  Tel : +60 3 89 26 38 55/58
  Fax : +60 3 89 26 38 78

- INVENTEC Performance Chemicals China
  [Shanghai] Co., Ltd.
  No. 1258 Guanghua Road
  Xinzhuang Industrial Park 201108
  SHANGHAI
  Tel : +86 21 6442 3962/82
  Fax : +86 21 6442 3952

www.inventec.dehon.com