# Inspiring Innovation



# **INVENTEC** Aerospace & Defense Market

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An organisation with a dedicated approach, close to its customers.



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Greenway Environmental Approach

Regulations Inventec is part of the Dehon group. The group, a family company created in 1874, first specialized in the filling and distribution of refrigerants.

# Inventec a Dehon Group Company.

#### Today, the group with its 4 companies is dedicated to:

- Refrigeration, air conditioning and heating with Climalife;
- Car care with SMB auto;
- High Performance Chemistries with Inventec;
- High-risk chemicals with Soderec International.

Because of its products technical performance, its market responsiveness and its continuous research for sustainable solutions. The Dehon group is leader on these 4 markets in Europe, Asia and North-America.

**The Dehon group** generated a 190 million Euros revenue in 2015 and employs with more than 500 employees in 4 continents (*Africa, Americas, Asia, Europe*).











# **INVENTEC** Performance Chemicals

Inventec proposes products and services for: electronics assembly, precision cleaning, surface treatment, formulation of foams and aerosols, for chemical and pharmaceutical synthesis.

These applications are dedicated to a wide range of industries: aeronautics, automotive, electronics, food processing, energy, medical, pharmaceutical and optical industries.

Inventec is one of the leading companies in chemical innovation and in sustainable applications of these innovations protecting health and the environment. Over 2,500 substitutions of chemicals have been realised in highly technical processes in Europe, Asia and North America.

Substitution were done in areas as diverse as the cleaning of luxury watches, decontamination of liquid oxygen pipes in the aeronautics industry, lead-free soldering, foam expansion, aerosol formulation etc...

All these substitutions allowed to reduce considerably the risks linked to products and their use.

# INVENTEC's figures

100 employees 1/3 are engineers

40 years of experience in high tech markets

- 65 million Euros revenue in 2015
- 50% of the revenue generated outside France

+10% of the revenue is invested in research & development

## **Our positioning**

- Formulation: experts in the markets of Aerospace and Defense to meet your requirements.
- **Provider of solutions:** processes, products, applications, monitoring, diagnostics, analysis.



• Creating value: regulatory monitoring is crucial in our business; we attach daily attention to guide our clients towards sustainable solutions. Tests, pre-qualifications, training, integrated monitoring and Ecoprogram.

## Our skills and our business

- **Processes:** Vapour Phase, Spraying, Immersion, Flushing, Vacuum, Manual.
- **Products:** fluorinated solvents, modified alcohols, A3 hydrocarbons, detergents, strippers and coatings.
- **Applications:** degreasing, oil removal, decontamination, pollution control, stripping.

## **Our guidelines**

- **Proximity:** 3 R & D laboratories, 8 production sites, 11 subsidiaries + 12 distributors **across 4 continents**.
- **Performance:** specialized teams and effective technical solutions to serve our customers.
- **Protection:** friendly solutions for users and the environment.

# Our partners

For over 50 years, 3M<sup>™</sup> has been providing fluorinated fluids for applications, among other, of precision cleaning to sensitive markets such as aerospace, defense and electronics. In the early 90's 3M<sup>™</sup> developed the Hydrofluoroethers (HFE). Complying to environmental regulatory requirements, the range of fluids 3M<sup>™</sup> Novec<sup>™</sup> - with no impact on the ozone layer and with low Global Warming Potential benefit of qualifications in the aerospace market. These fluids are now a set of solutions which remains unequaled from the point of view of the performance, safety and the environment.

**E**BIROLIHIERITION

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HEMICAL INC. - CENTRAL

A range of detergents with more than 80 qualifications and homologations for Aeronautics,

mologations for Aeronautics,

The Blue Gold range from **Modern Chemical Inc.** offers a very versatile

solution and can be used in various applications.

Space and Military. Versatile products which may be used in various aqueous process and compatible with a wide range of materials and contaminants.

Blue Gold is currently used for cleaning in the context of maintenance of aircraft engines, oxygen-sensitive applications, in cleaning ferrous and nonferrous metals, plastics, rubbers, and many other applications.



Closer to its customers, an organization and a dedicated approach.

# The Electronics inside INVENTEC

Inventec Electronics is specialized in developing, manufacturing and commercializing **soldering**, **cleaning** and **coating** products for the assembly of printed circuit boards and semiconductors.

The main markets covered are automotive, aerospace, and energy - including solar and LED lighting markets. Our materials deliver a balanced added value involving **reliability**, **compatibility** and **sustainability**; key elements for high end electronics.

### **Our Core Brands**

PROMOCLEAN™ ECOREL™ TOPKLEAN™ ECOFREC™ AMTECH

# Solder pastes and Soldering fluxes

### Solder pastes ECOREL™

INVENTEC's solder pastes meet the increasing number of challenges in the electronics industry due to the evolution of technology, and of new legislation.

Halogen free, lead free, embedded technologies, hybrid assembly, miniaturization, and other requirements are covered :

- Chemical reliability of residues after reflow
- Thermal cycling performance
- Compatibility with Conformal Coating in No Clean processes
- Robust assembly process
- Performance improvement in production/ Minimization of defaults



### Soldering fluxes ECOFREC™

Inventec formulates and offers a wide range of flux for standard wave soldering or selective soldering. Inventec offers resin based flux, with or without cleaning, low residue no-clean fluxes, alcohol or water based.



# Soldering pastes ECOREL<sup>TM</sup>

INVENTEC'S solder paste references used in aerospace electronics.

| Product                | Description   | Alloy     |
|------------------------|---|-----------|
| Ecorel™ Free<br>387-6D | No clean solder paste with chemically inert residue after reflow,<br>Paste compatible with conformal coatings qualified in the military<br>industry, ie passes both the IPC SIR and BONO tests even after applying<br>a polyurethane conformal coating. | SAC387    |
| Ecorel™ Free<br>305-21 | Chemically inert residue, minimizing the risk of corrosion mechanisms<br>and leakage current. Good compatibility with a large range of conformal<br>coating in the market. BONO corrosion test compliant.   | SAC305    |
| Solderel™<br>DMH 0524  | Excellent residue cleanability.<br>Residue must be cleaned.<br>Recommended for military and aerospace applications.   | SnPb36Ag2 |
| AMTECH 4300            | Multi-process capabilities, a No Clean formula that is also water<br>washable. Compatible with high temperature alloys.<br>Suitable for fine pitch applications. Low solder voids. Halide free.   | Sn63Pb37  |



# Soldering fluxes ECOFRECTM

INVENTEC'S solder flux references used in aerospace electronics.

| Product  | Description  | Flux Type     |
|--|--|---------------|
| Ecofrec™ 200   | Reduced solder balling.<br>Low residue, excellent performance in ICT, no false failure.<br>High reliability, complies with BONO corrosion test.                  | Alcohol based |
| Ecofrec™ 202High SIR values.<br>Good cosmetic aspect residue.<br>Low residues. |  | Alcohol based |
| Ecofrec™ 303   | <b>Ecofrec™ 303</b> High reliability, complies with BONO corrosion test. Good soldering performance on any board finish.   |               |
| Ecofrec™ CMA 155   | Ecofrec™ CMA 155 Easy to clean flux.<br>Good balance of activation.  |               |
| Ecofrec™ TF48  | Tacky flux designed for soldering and rework of components.<br>For leaded and lead free ball attach and BGA repair processes.<br>Excellent printing performance. | Tacky flux    |





# Solvents\_\_\_\_\_ Vents\_\_\_\_\_ Vapour Phase Applications

**NOT flammable**, Elimination of a variety of pollutants, Compatibility with all metals, Quick Clean, Solution without ODP, **Replace halogenated and chlorinated solvents**.

| PURE and AZEOTROPIC solvents |  |   |                        |  |  |  |  |  |
|------------------------------|--|---|------------------------|--|--|--|--|--|
| Product                      | Characteristics  | Chemical<br>Nature                                  | Boiling<br>Temperature | Application<br>method  |  |  |  |  |
| 3M™ Novec™ 7100              | Non-flammable: cleans,<br>removes particles,<br>dust, fine oils, wax and<br>some silicones.  | Hydrofluoroether 61°C                               |                        | Vapour phase<br>machines   |  |  |  |  |
| 3M™ Novec™ 7200              | Non-flammable, cleaning<br>and rinsing fluid for vapour<br>phase degreasing of<br>particles, fine oils and<br>fluoropolymers.            | Ethoxy-nonafluorobutane                             | 76° C                  | Vapour phase<br>machines   |  |  |  |  |
| Promosolv™ 41M               | Non-flammable. degreases:<br>heavy oils, greases,<br>defluxing, waxes, varnishes,<br>particle and fluorinated<br>lubricants elimination. | 3M™ Novec™ 7100<br>+ 1,2 TDE<br>+ Pentafluorobutane | 38 - 39° C             | Vapour phase<br>machines, cleaning<br>contact by spraying<br>and heat transfer |  |  |  |  |





PERFORMANCE CHEMICALS . Aerospace & Defense Market

| PURE and AZEOTROPIC solvents |   |   |   |  |  |  |  |  |
|------------------------------|---|---|---|--|--|--|--|--|
| Product                      | Characteristics   | Chemical<br>Nature                                | Boiling<br>Temperature                                  | Application<br>method  |  |  |  |  |
| Promosolv™ 70                | Promosolv <sup>™</sup> 70 Non-flammable, degreases<br>heavy oils, greases, waxes,<br>varnishes, particle and<br>fluorinated lubricants.   |   | M™ Novec™ 7100 43° C<br>+ 1,2 TDE                       |  |  |  |  |  |
| Promosolv™ 90C               | Tomosolv™ 90C Non-flammable, degreases<br>heavy oils, greases, waxes,<br>varnishes, particle and<br>fluorinated lubricants. 3M™ Novec™ 7100<br>+ 1,2 TDE<br>+ Pentafluorobutane     |   | 43° C   | Vapour phase<br>machines, cleaning<br>contact by spraying<br>and heat transfer |  |  |  |  |
| Promosolv <sup>™</sup> NDE   | Non-flammable,<br>degreasing fluid and oil<br>removal of heavy oils,<br>dewaxing and defluxing,<br>eliminates fluorinated<br>lubricant particles, light<br>oils and fluoropolymers. | Pentafluorobutane<br>3M™ Novec™ 7100<br>+ 1,2 TDE | Pentafluorobutane<br>3M™ Novec™ 7100 40° C<br>+ 1,2 TDE |  |  |  |  |  |
| 3M™ Novec™ 71DE              | Non-flammable,<br>degreasing, stripping,<br>rinsing and drying fluid.   | 3M™ Novec™ 7100<br>+ 1,2 TDE                      | 41° C   | Vapour phase<br>machines   |  |  |  |  |
| 3M™ Novec™ 72DE              | Non-flammable,<br>degreasing, stripping,<br>rinsing and drying fluid.   | 3M™ Novec™ 7200<br>+ 1,2 TDE                      | 43° C   | Vapour phase<br>machines   |  |  |  |  |
| 3M™ Novec™ 71IPA             | Non-flammable, light<br>cleaning fluid, removes<br>dust, fine oils and<br>fingerprints.   | 3M™ Novec™ 7100<br>+ isopropyl alcohol            | 55° C   | Vapour phase<br>machines   |  |  |  |  |

# Solvents Vents Vapour Phase Applications

| Co-Solvents Mixed and Separated    |   |   |                          |           |             |           |   |  |
|------------------------------------|---|---|--------------------------|-----------|-------------|-----------|---|--|
| Product                            |   | Characteristics   | Operating<br>Temperature |           | Flash Point |           | Application<br>Method   |  |
|                                    |   |   | Mixed                    | Separated | Mixed       | Separated |   |  |
| Topklean™ MC 1153                  | 3M™   |   | 68° C                    | ≤ 49° C   |             | 64° C     |   |  |
| Topklean™ MC 20A                   |   |   | 66° C                    | ≤ 49° C   |             | 64° C     | Vapour phase  |  |
| Topklean <sup>™</sup> MC 1007 7100 |   | Degreasing fluids<br>and oil removal  | 68° C                    | ≤ 82°C    | INA         | 97° C     | machines<br>ccompatibility  |  |
| Topklean™ EL 20A                   |   | of heavy oils,<br>eliminate particles,<br>fluorinated<br>lubricants, light<br>oils and<br>fluoropolymers. | ≤ 66°C                   | ≤ 50° C   |             | 65° C     | with Co-Solvent<br>or Vapour phase<br>machines with<br>independent tank |  |
| Topklean™ MC 1153                  |   |   | 68° C                    | ≤ 49°C    | NA          | 64° C     |   |  |
| Topklean™ MC 20A                   | ™ MC 20A         3M™           Novec™         71IPA |   | 66° C                    | ≤ 49° C   |             | 64° C     | of the vapor phase<br>for the use of                                    |  |
| Topklean™ MC 1007                  |   |   | 68° C                    | ≤ 82°C    |             | 97° C     | Topklean™ only  |  |
| Topklean™ EL 20P                   |   |   | ≤ 70° C                  | ≤ 50° C   |             | 62.5° C   |   |  |



# Solvents\_\_\_\_\_ Vaccum Applications

**Energy savings and operating cost**, the vacuum leads to a reduction of the boiling point of the solvent. **Flammability is under control**, the vacuum eliminates oxygen so there is no combustion. **Low consumption** thanks to the separation of pollution and solvent.

| Product           | Characteristics  | Chemical<br>Nature | Concentration | Operating<br>Temperature | Flash Point |
|-------------------|--|--------------------|---------------|--------------------------|-------------|
| Topklean™ MC 20D  | Degreasing and   | Modified alcohol   | Pure          | ~ 70° C                  | ≥ 64° C     |
| Topklean™ MC 25   | and non-soluble<br>oils, greases and<br>fingerprints.            | Modified alcohol   | Pure          | ~ 70° C                  | ≥ 64°C      |
| Topklean™ MC 1153 | Degreasing fluid   | Hydrocarbon        | Pure          | ~ 70° C                  | 64° C       |
| Topklean™ Organic | eliminates whole oils.   | Agro Solvent       | Pure          | ~ 70° C                  | 65° C       |
| Topklean™ EL 20D  | Specially formulated<br>for applications of flux<br>elimination. | Modified alcohol   | Pure          | ~ 70° C                  | ≥ 64°C      |









#### Their low surface tension and rapid evaporation provide remarkable cleaning quality.

They are colourless, have a low viscosity and are almost odourless. They effectively replace solvents with potential for destruction of the ozone layer, highly toxic, high GWP or highly flammable.

| Product Characteristics |   | Chemical<br>Nature      | Application<br>method  | Flash<br>Point |
|-------------------------|---|-------------------------|--|----------------|
| Quicksolv™ 1            | Cold degreasing fluid.  | Hydrocarbon             | Pulverization<br>by spraying                                 | -              |
| Quicksolv™ 25           | Degreasing fluid for oils and greases.  | Hydrocarbon             | Manual or immersion  | > 29 °C        |
| Quicksolv™ DMC          | Cold degreasing fluid   | Hydrocarbon             | Manual or immersion  | -              |
| Quicksolv™ DEF 90       | Non-flammable, cold<br>degreasing and drying fluid<br>for oils heavy, greases, flux,<br>waxes, particles, fluorinated<br>lubricants light oils and<br>fluoropolymers. | Novec™7100<br>+ 1,2 TDE | Manual or immersion<br>without US                            | -              |
| Topklean™<br>MC 105     | Dewatering fluid, displaces<br>water from the surfaces of<br>parts, prevents oxidation<br>and corrosion and facilitates<br>subsequent final operations<br>of drying.  | Hydrocarbon             | Manual,<br>immersion or o spraying<br>Temperature<br>≤ 40 °C | 60 °C          |
| Topklean™<br>MC 1007    | Cleaning fluid for dried<br>or cracked grease and<br>polishing pastes, with<br>temporary protection<br>properties.  | Hydrocarbon             | Manual or by immersion<br>Temperature ≤ 70 °C                | 97 °C          |

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| Product Characteristics |   | Chemical<br>Nature   | Application<br>method  | Flash<br>Point |
|-------------------------|---|--|--|----------------|
| Topklean™<br>1107       | Effectively eliminates all<br>lubricant residues as well<br>unmolding sludge and<br>machining chips.                        | Hydrocarbon  | Manual or by immersion<br>Temperature ≤ 40 °C                | 60 °C          |
| Topklean™<br>MC 1153    | Degreasing fluid eliminates whole oils.   | Hydrocarbon A3   | Hydrocarbon A3 Manual or by immersion<br>Temperature ≤ 45 °C |                |
| Promosolv™ 70           | Non-flammable, degreases<br>heavy oils, greases, waxes,<br>varnishes, particle and<br>fluorinated lubricants.               | egreases<br>s, waxes, 3M™ Novec™ 7100<br>and + 1,2 TDE<br>nts. Manuel + US |  | -              |
| 3M™ Novec™ 7100         | Non-flammable, cleans,<br>removes particles, dust,<br>fine oils, wax and some<br>silicones.                                 | Methoxynonafluorobutane  | /nonafluorobutane Manual + US                                |                |
| 3M™ Novec™ 71DE         | ovec™ 71DE Non-flammable,<br>degreasing, stripping,<br>rinsing and drying fluid.<br>3M™ Novec™ 7100<br>+1,2 TDE Manual + US |  | -  |                |
| 3M™ Novec™ 72DE         | Non-flammable,<br>degreasing, stripping,<br>rinsing and drying fluid.   | Ethoxy-nonafluorobutane<br>+ 1,2 TDE                                       | Manual + US  | -              |
| 3M™ Novec™ 71IPA        | Non-flammable, light<br>cleaning fluid, removes<br>dust, fine oils and<br>fingerprints.                                     | 3M™ Novec™ 7100<br>+ isopropyl alcohol                                     | Manual   | -              |

# Solvents\_\_\_\_\_ Manual Applications

| Product                               | Characteristics  | Chemical<br>Nature  | Application<br>method | Flash<br>Point |
|---------------------------------------|--|---|-----------------------|----------------|
| 3M™ Novec™ 72FL                       | Non-flammable, degrease<br>and clean light oils,<br>greases and silicones,<br>fluoropolymers, petroleum<br>based solutions, hydraulic<br>fluids, fluorinated<br>lubricants, dust and<br>particles. | 3M™ Novec™ 7100<br>+ 3M™ Novec™ 7200<br>+ 1,2 TDE                       | Spray Manual          | -              |
| Electrofor 132CZ                      | Aerosol for fine cleaning<br>without dismantling.<br>Eliminates quickly<br>dirt, oxides, oils, greases,<br>adhesives and other<br>contaminants.  | Methoxynonafluorobutane<br>+ 1,2 TDE                                    | Spray Manual          | -              |
| 3M™ Novec™<br>Electronic<br>Degreaser | Non-flammable aerosol<br>for degreasing oils and<br>greases.   | Ethoxy-nonafluorobutane   | Spray                 | -              |
| 3M™ Novec™<br>Flux Remover            | Novec™ No flammable, no-corrosive,<br>aerosol for flux elimination during manufacturing,<br>maintenance. Fast drying. Methyl nonafluoroisobutyl Spray  |   | Spray                 | -              |
| 3M™ Novec™<br>Contact Cleaner         | Removes fluorinated oils<br>and greases, light oils<br>and silicones, dust and<br>particulates from sensitive<br>electrical and electronic<br>equipment.   | Methyl nonafluoroisobutyl<br>ether +<br>Methyl nonafluorobutyl<br>ether | Spray Manual          | -              |



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# Detergents\_\_\_\_\_\_ by Immersion or Spraying

Liquids and alkaline, for the most part they have been specifically formulated for use in ultrasonic baths or spray to clean all type of contaminants.

| Product                   | Characteristics   | Chemical<br>Nature | Standard<br>concentration<br>of use | Operating<br>Temperature | Application<br>method       | рН   |      |
|---------------------------|---|--------------------|-------------------------------------|--------------------------|-----------------------------|------|------|
|                           |   |                    |                                     |                          |                             | Pure | 1%   |
| Promoclean™<br>TP 1113    | Degreasing of polishes and oils.  | Alkaline           | 1 - 5%                              | 55 - 60 °C               |                             | 12   | 10.5 |
| Promoclean™<br>TP 1114    | Elimination of<br>polishes and<br>fingerprints.   | Alkaline           | 1 - 3%                              | 40 - 70 °C               |                             | 11   | 10.1 |
| Promoclean™<br>TP 1115    | Degreasing and<br>cleaning for finishing,<br>remove cutting oil,<br>swarf, dust and<br>fingerprints.    | Alkaline           | 2 - 5%                              | 50 - 55°C                | Immersion<br>or<br>Spraying | 11.5 | 10.3 |
| Promoclean™<br>TP 1128    | Used in preparation<br>before vacuum<br>treatment, for<br>degreasing and<br>removing lapping<br>pastes. | High<br>Alkaline   | 1 - 1.5%                            | 40 - 70 °C               |                             | > 13 | 12.5 |
| Promoclean™<br>Dewax Plus | Dewaxing and degreasing.  | Low<br>acidity     | 1 - 10%                             | 50 - 70 °C               |                             | 4,7  | < 7  |
| Promoclean™<br>Disper 2   | Mechanical<br>maintenance<br>degreasing with<br>temporary corrosion<br>protection properties.           | High<br>Alkaline   | 5 - 20%                             | 40 - 70°C                |                             | 13   | 11.9 |
| Promoclean™<br>Disper 6   | Inter-operational<br>degreasing with<br>temporary corrosion<br>protection properties.                   | Alkaline           | 1 - 5%                              | 40 - 50°C                | Spraying                    | 13   | 11.5 |
| Promoclean™<br>Disper 10  | Mechanical<br>degreasing with<br>temporary corrosion<br>protection properties.                          | Low<br>Alkaline    | 1 - 5%                              | 40 - 50°C                |                             | 9,8  | 9    |

# Detergents\_\_\_\_\_\_ by Immersion or Spraying

A very low surface tension gives them exceptional cleaning properties. Most products in the range contain particularly efficient corrosion inhibitors.

| Product                         | Characteristics   | Chemical Standard<br>Nature of use |          | Operating<br>Temperature   | Application<br>method       | pН   |      |
|---------------------------------|---|------------------------------------|----------|----------------------------|-----------------------------|------|------|
|                                 |   |                                    |          |                            |                             | Pure | 1%   |
| Promoclean™<br>Disper 15        | Detergent <b>BORATE</b><br><b>FREE</b> for degreasing<br>with protective<br>anticorrosion<br>properties.  | Low<br>Alkaline                    | 1 - 3%   | 40 °C<br>and<br>50 - 75 °C |                             | 9.9  | 9.2  |
| Promoclean™<br>DISPER 607       | Detergent for flux<br>elimination with low<br>VOC, no foaming.  | Alkaline                           | 25 %     | 50 - 60° C                 | Immersion<br>or<br>Spraying | 10.6 | -    |
| M-AERO                          | Degreasing of oils and greases.   | Alkaline                           | 5 - 20%  | until 60 °C                |                             | 11.7 | 10.8 |
| M-AERO NS                       | Degreasing of oils and greases.   | Low<br>Alkaline                    | 10 - 20% | 60 °C                      |                             | 9.1  | 7.1  |
| M-HP                            | Degreasing surfaces<br>with various origins<br>of impurities, ideal<br>for high pressure<br>applications. | Alkaline                           | 3 - 5%   | 40 - 70 °C                 | Spraying                    | 12   | -    |
| M-HP2                           | Degreasing of oils and greases.   | Alkaline                           | 3 - 10%  | > 70 °C                    | Spraying<br>> 100 bars      | 11.8 | 10.9 |
| M-GP                            | Degreasing and<br>cleaning lenses of<br>olymethylmethacrylate<br>not treated before<br>coating.           | Alkaline                           | 5 - 20%  | 60 °C<br>and more          | Immersion<br>or<br>Spraying | 11.4 | 11.3 |
| Blue Gold Spray<br>Wash Cleaner | Cleaning parts in<br>contact with oxygen.<br>No residue after<br>drying.                                  | Alkaline                           | 2 - 5%   | 40 - 60°C                  | Immersion<br>or<br>Spraying | 13   | 11   |



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# Strippers\_

#### Not Flammable.

Formulations replacing the solvents with high ODP (Ozone Depletion Potential) or high risk of flammability.

| Product                         | Characteristics  | Chemical<br>Nature                 | Concentration      | Operating<br>Temperature |      | erating<br>perature Application method |   | Flash<br>Point |  |
|---------------------------------|--|------------------------------------|--------------------|--------------------------|------|--|---|----------------|--|
|                                 |  |                                    |                    | Hot                      | Cold | Cleaning                               | Rinsing                                       |                |  |
| Promoclean™<br>TP 182           | Stripper<br>alternative NEP<br>or NMP.   | Micro<br>oxygenated<br>emulsion    | Pure<br>or diluted | < 54 °C                  | V    |  |   | 69 °C          |  |
| Promoclean™<br>TP 183<br>No VOC | Non-flammable<br>stripper for<br>organic pollutions<br>as lubricants and<br>resins, mineral<br>pollution such<br>as dust and<br>graphite.                                | Micro<br>oxygenated<br>emulsion    | Pure<br>or diluted | < 119 °C                 | v    | Immersion                              | Rinsing<br>with water<br>or with<br>a solvent | 134 °C         |  |
| Promoclean™<br>TP 184           | Non-flammable<br>cleaner for a wide<br>range of ink.   | Micro<br>oxygenated<br>emulsion    | Pure<br>or diluted | 50 °C                    | V    | manual<br>application                  | Rinsing<br>with<br>a solvent                  | >65 ℃          |  |
| Promoclean™<br>TP 186B          | Non-flammable<br>cleaner for<br>varnish, paint<br>resins and<br>lacquers.  | Micro<br>oxygenated<br>emulsion    | Pure               | < 80 °C                  | V    |  | Rinsing<br>with water<br>or with<br>a solvent | 95 °C          |  |
| Promoclean™<br>TP 188           | Cleaning and<br>stripping of<br>varnish, lacquers<br>and paints.   | Micro<br>oxygenated<br>emulsion    | Pure<br>or diluted | 69 °C                    | V    |  |   | >84 °C         |  |
| Quicksolv™<br>DEF 90            | Non-flammable,<br>stripping and<br>cold-drying<br>product for heavy<br>oil, grease, flux,<br>waxes, particles,<br>fluorinated oils,<br>light oils and<br>fluoropolymers. | 3M™<br>Novec™<br>7100<br>+ 1,2 TDE | Pure               | ×                        | v    | Spraying                               | Do not<br>require<br>rinsing                  | -              |  |

# Coatings

Their exceptional covering power, low surface tension, non-flammability and quick evaporation, make them products for film forming, adapted to high tech applications.

| Product               | Description<br>Characteristics   | Chemical<br>Nature            | Solids<br>Concentration | Drying<br>Time | Aspect                                | Thickness      | Type of polymerization              |
|-----------------------|--|-------------------------------|-------------------------|----------------|---------------------------------------|----------------|-------------------------------------|
| 3M™<br>Novec™<br>1700 | Low surface<br>tension<br>solutions, they<br>dry to form a<br>protective thin<br>film on a variety<br>of substrates. | Fluoroacrylate                | 2%                      | 5 - 60s        | Transparent                           | 0.1<br>to 1 µm | No curing                           |
| 3M™<br>Novec™<br>2702 |  | Fluoroacrylate                | 2%                      | 30 - 90s       |                                       | 0.1<br>to 1 µm | 30 to 90 min<br>from 70 - 150<br>°C |
| 3M™<br>Novec™<br>2704 |  | Fluoroacrylate<br>+ UV tracer | 4%                      | 5 - 60s        | Transparent,<br>to slightly<br>yellow | 0.2<br>to 1 μm | No curing                           |
| 3M™<br>Novec™<br>2708 |  | Fluoroacrylate<br>+ UV tracer | 8%                      | 5 - 60s        | depending<br>on the<br>thickness      | 0.5<br>to 1 μm | No curing                           |

| Product                        | Solid % | Curing | Removable | Permament | UV Trace |
|--------------------------------|---------|--------|-----------|-----------|----------|
| Promosolv™ Coat<br>FR 27100    | 2%      | No     | Yes       | No        | No       |
| Promosolv™ Coat<br>FR 27200    | 2%      | Yes    | No        | Yes       | No       |
| Promosolv™ Coat<br>FR 47200 UV | 4%      | No     | Yes       | No        | Yes      |
| Promosolv™ Coat<br>FR 87200 UV | 8%      | No     | Yes       | No        | Yes      |

## **Inventec Performance Chemicals member of**



Certification :

Adheres:





# Services

Inventec's laboratories perform all necessary test and define the product and processes most adapted to your needs.

# Process Monitoring and Management

# Background of the problem:

- Statement of the problem
- Management drift by Inventec technical team

#### Analysis of the drift:

- Diagnosis of the condition of the bathroom and the process
- Sample analyzes
- Recommendation of the technical solution

#### Treatment:

- Implementation of the technical solution with the customer
- Inventec on site intervention

# Laboratory testing and on-site starting

To better meet your specifications, a series of **tests of your pieces** may be needed. Once the stages of your process are defined, we support you in industrial testing for final validation and support you on the start of the process on sites.

# Qualitative analyzes of baths

#### Improve your production process throught analysis:

- → monitor the quality of a cleaning bath,
- → adjust the change intervals for process requirements,
- → **support** users in managing their processes in case of drift.





An analysis allows to monitor a cleaning bath, in a cost effective manner while protecting the environment.



\* List of non-exhaustive analysis

## Upon Request,

Examples of analyzes that can be performed\*

**Process Expertise** 

Particle counting

Distillation curve

for oils compatibility

Vapour pressure curve

Salin mist

Hot corrosion test

Metals researches by IPC

Thickness measuring

of deposits

Fluids analysis

Plastics compatibility

(ISO 175)

Flash Point

(open cup/closed cup)

Chlorine content

DCO

**Biodegradability** 

Halogen content

**Oil concentration** 

(according to internal method

of acid cracking)

Bacteriological analysis

a member from the technical team can intervene in case of malfunction of the cleaning process.

### **Equipment for process control**

Tools designed to achieve a real time fast evaluation for control of the process.

#### There are 2 types of analysis tools:

- → Detergent PCA Kit. recommended for monitoring the concentration of the Promoclean<sup>™</sup> range,
- → Solvent PCA Kit recommended for the monitoringof baths using TopkleanT™ Co-solvent Range.

## PCA KITS PROCESS CONTROL ANALYSIS BY INVENTEC



They allow to verify the correct concentration of the bath and to react quickly to readjust if necessary.

Regular analysis monitoring guarantees a constant cleaning quality, an easy Management of the production and a preventive maintenance of the bath.

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# Ecoprogram-Cleaning

# Ecoprogram is the downstream phase of controlling the life cycle of cleaning products, with the analysis, recovery and valorization or destruction of the used products.

INVENTEC has implemented a procedure to collect and treat fluorinated solvents. The products are recovered according to the legislation in force and are usually upgraded to increase their lifetime.



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# GREENWAY

## **Environmental Approach**

# Sustainable development requires a continuous effort

During the World Exposition in Shanghai, in October 2010, **INVENTEC**, performance chemical decided to go further and to implement a continuous sustainable development approach.

## Label given if 1/3 of **10 PARAMETERS** are improved

- Toxicity: level defined by GHS classification, but also including the newest aspects, for example the endocrine disruptors
- 2 Flammability: beyond the Flash Point measurement
- **3** Corrosivity
- Ecotoxicity
- **5** VOC content
- 🌜 GWP average value
- 7 Biodegradability
- **COD** (Chemical Oxygen Demand)
- **9** Bioaccumulation
- IU Content in non renewable raw material

While maintaining our solutions at a high level of technical and economical performance, we also define our products by their key impact parameters on health and environment.

If our engineers improve, significantly, 1/3 of parameters without degrading any of the others, we give the **GREENWAY™** "label" to a product.

f we do not further improve the product within the next 5 years, we take the label off.

The chemical reality does not imply black or white products where white products, supposedly, do not require any care when used-but more or less grey products that we "green up" progressively.

Up to now, in our high technology sectors, there are no standards de-



fining products or services that are more healthly or environmentally friendly, beyond regulations. Therefore the Greenway label is validated by **Bureau Veritas** as well as the products conformity to the new specifications.

GREENWAY™, is the 1<sup>st</sup> "label" of sustainable development created by a SME in the chemical industry.

# The way we think, the way we act

We think that this approach goes beyond Inventec products and services. This is a permanent evolution due to a "sustainable" mindset of the whole company.

It means thinking about sustainable development right from the design phase and also in all implementation details of production, logistics, customer service etc...

In the long run, 30% of our products and services should meet the **GREENWAY™** objectives. The extension to other activities of the Dehon group is expected.

This simple, focussed and honest approach corresponds to the state of mind of an international family owned SME in High Tech markets.

**GREENWAY™** will be a real "green growth" opportunity for our "High Tech" customers.

# Regulations

| The hole in Greenhouse<br>the ozone layer effect  |   | Lower<br>atmosphere   | Man and<br>environment  |   |  |
|---|---|---|---|---|--|
| Montreal Protocol<br>since 1995   | Kyoto Protocol  | Air quality   | Health – Environment<br>2007-2018   |   |  |
| EC Regulation<br>N°1005/2009<br>on ozone depleting<br>substances ODS  | FGAS II<br>EC Regulation<br>N° 517/2014/EC  | IED<br>Directive 2010/75/UE<br>Transposed into French law<br>in the Decree 2013-374<br>and its establishments   | <b>Reach</b><br>n°1907/2008/EC  | CLP<br>Regulation (EC)<br>1272/2008   |  |
| Protect the ozone<br>layer<br>Halons, CFC, HCFC   | Reduce greenhouse<br>gas emissions and their<br>impact on global warming<br>CO <sub>2</sub> , NO <sub>2</sub> , HFC,<br>PFC, SF <sub>6</sub>  | Improve air quality<br>in lower atmosphere<br>VOCs - any product having a vapor<br>pressure of 0.01 kPa or more at<br>293.15 K, or having a corresponding<br>volatility under the particular<br>conditions of use.  | Protect people and<br>the environment<br>from harmful<br>chemicals - Limiting<br>animal testing<br>Any exceptions<br><i>(see annex 4 &amp; 5)</i>   | To harmonize<br>existing systems<br>and have a unique<br>system in the<br>world concerning<br>the classification,<br>labeling and<br>packaging of<br>products   |  |
| ODP<br>Ozone Depletion<br>Potential   | <b>GWP</b><br>Global Warming<br>Potential   | <b>POCP</b><br>Photochemical Ozone<br>Creation Potential  | CMR<br>Carcinogens, mutagens<br>or toxic to reproduction<br>substances  | <b>CLP</b><br>Classification,<br>Lagelling and Packaging  |  |
| <ul> <li>Substances:<br/>ODP=0. If not,<br/>prohibition of the<br/>sale in Europe<br/>for aerosols<br/>and foam since<br/>1995. Regulated<br/>sales for export:<br/>purchase, sales<br/>and export<br/>declarations to<br/>the EU (CDS data<br/>base).</li> <li>duty of reporting<br/>for methyl<br/>chloride.</li> <li>training of<br/>personnel<br/>handling regulate<br/>substances.</li> <li>Reporting<br/>obligation to<br/>the commission<br/>for all purchases<br/>and sales.</li> </ul> | <ul> <li>Application by January<br/>the 1<sup>st</sup> 2015.</li> <li>Establishes rules on<br/>containment, use,<br/>recovery and destruction<br/>of fluorinated<br/>greenhouse gases.</li> <li>Imposes conditions<br/>on the placing on the<br/>market of specific<br/>products and equipment<br/>that contain, or whose<br/>functioning relies upon,<br/>fluorinated greenhouse<br/>gases.</li> <li>Certification for natural<br/>persons handling the<br/>products.</li> <li>Recovering and<br/>recycling of products.</li> <li>Reporting of<br/>importations and<br/>exportations of HFC's,<br/>HFO's, HFE's, PFC's.</li> <li>Reduction of HFC's<br/>between 2016 and 2030<br/>on the European market.</li> <li>By 2030, it will be only<br/>21% of HFC's in the<br/>market during the<br/>period 2009-2012.</li> </ul> | <ul> <li>Directive replacing and including the VOC regulation 1999/13/CE.</li> <li>The chapter 5 includes the VOC regulation under the title: "Special dispositions for installations and activities using organic solvents".</li> <li>MTD meilleures techniques disponibles (best techniques available) will be the base for the definition of limit values of emission: the conditions of authorization will be based on the MTD and include the reference documents development: the BREF, the one impacting the cleaning activity is the BREF SST.</li> <li>Compliance with emission limit values (ELVs) does not exceed the emission levels associated with MTD.</li> <li>Fields of application are the installations partly referred in Annex VII.</li> <li>Products with the hazard statements H340, H341, H350, H350i, H351, H360D, H360F, are controlled out under contained conditions, to the extent that it is technically and economically possible to do so in order to protect public health and the environment.</li> </ul> | <ul> <li>pre-registration:<br/>June/Nov 2008.</li> <li>2010 : Tonnage<br/>registration +1 000t<br/>per year CMR<br/>1 &amp; 2 &gt; 1t/year y<br/>R50/53 &gt; 100t/year.</li> <li>2010-2013 :<br/>Registration<br/>100-1 000t/year.</li> <li>2018 :<br/>Registration<br/>100-1 000t/year.</li> <li>Requirements<br/>of authorizations<br/>for substances<br/>in the annexe XIV.</li> </ul> | El GHS (Global<br>Harmonized System)<br>of the United Nations<br>undertakes to<br>classify:<br>• The chemical<br>substances and<br>mixtures according<br>to their hazardous<br>properties.<br>• Prescribes the<br>pictogram and<br>other entries to be<br>made on the label.<br>• On 01/12/2010,<br>pure substances<br>should be changed<br>of classification<br>and labelling.<br>• By June the 1 <sup>st</sup><br>2015 all mixtures<br>should be changed<br>and labelled. |  |



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