

# Your expert partner

## New generation specialty fluids



- lowest GWP
- exceptional performance
- low cost in use

Industry wide  
solutions.

[www.frasertech.co.uk](http://www.frasertech.co.uk)

# Fraser Technologies + Chemours™ = first choice in cleaning and specialty fluids

## Fraser Technologies

With over 50 years experience in component cleaning and specialty fluids across all sectors of manufacturing, Fraser Technologies is uniquely qualified to:

- offer independent evaluations and make recommendations
- supply a wide range of standard and bespoke cleaning and specialty fluid processes
- offer a range of great value after sales support packages to optimise the performance and efficiency of your process long term
- ensure fast turnaround
- provide one point of contact for all products and services

Fraser Technologies is the authorised distributor of Chemours™ cleaning and specialty fluids.

## Chemours™

Chemours™ is a world leader in fluorochemicals, titanium technologies and chemical solutions and is part of the DuPont™ portfolio, created to develop high performance chemicals that provide safer cleaning solutions.

Chemours™ has a rich history in the specialty fluids market – from Freon™ (DuPont) in the 1930's to Vertrel™ in the early 2000's. Now, we bring you Opteon™ – a line of zero ODP, ultra low GWP specialty fluids products developed with HFO technology.

Together, the Opteon™ specialty fluids provide a broad and versatile mix of product options that are better for both business performance and the environment. The Opteon™ specialty fluids prove to be ideal replacements for solvents with high GWP potential. They are used to replace products such as PFCs, HFES, HFCs, nPB-based solvents, perchloroethylene, trichloroethylene and hydrofluoroethers.

## Fraser Technologies - Your One Stop Solution

We provide a unique one-stop service, to ensure continuity of service and in depth knowledge of your process throughout.

**EVALUATE** your existing chemistry and process, look at your current and future requirements, conducting trials where necessary.

**SUPPLY** best in class chemistries and equipment, as you need them with all appropriate certification and warranties in place.

**SUPPORT** is available with our range of service plans to ensure your cleaning process is maintained at a level that ensures a high ROI, while staying abreast of health and safety and environmental legislation.

# Choosing the Chemours™ range

## Innovative Fluids That Deliver Superior Performance



### What are specialty fluids by Chemours™?

The specialty fluids portfolio by Chemours™ is made up of Opteon™ products. Opteon™ specialty fluids are HFO (hydrofluoroolefin) - based products with zero ODP and ultra low GWP. The Opteon™ range portfolios provide a range of solvency power, compatibility with a variety of materials and high performance. The unique properties of Opteon™ specialty fluids include low heat of evaporation, excellent solvent retention, low surface tension, low viscosity, nonflammability, chemical and thermal stability, low toxicity and ease of recovery by distillation. Opteon™ products are compatible with a broad range of materials, metals, plastics and elastomers.

Opteon™ specialty fluids are used in a wide array of applications such as:

- Aerosols
- Carrier fluids
- Precision cleaning
- Brine/coolant
- Drying fluids
- Heat transfer
- High voltage applications (dielectric)
- Testing or analytical fluids

### Used Industry Wide

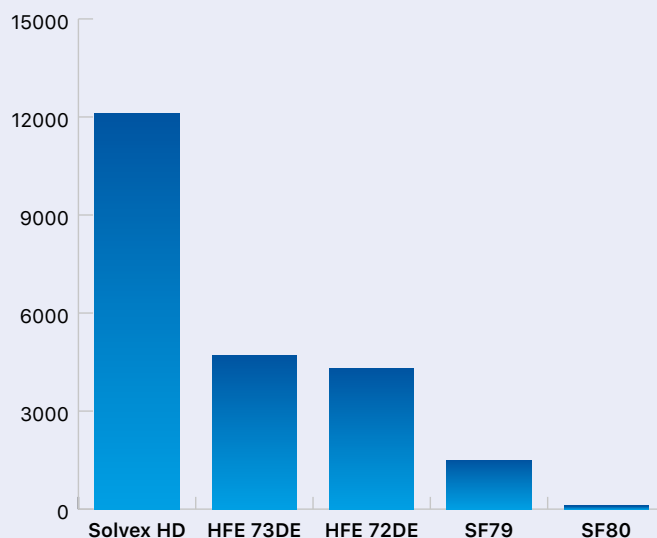
Because of their versatility and exceptional performance, Opteon™ specialty fluids are commonly used in a multitude of industries including: Aerospace, Automotive, Medical, Optical, Electrical and Manufacturing.

### What is GWP?

GWP (Global Warming Potential) Global warming potential is a measure of how much heat a greenhouse gas traps in the atmosphere up to a specific time horizon, relative to carbon dioxide. It compares the amount of heat trapped by a certain mass of the gas in question to the amount of heat trapped by a similar mass of carbon dioxide and is expressed as a factor of carbon dioxide.

GWP is used to represent the equivalent of CO<sub>2</sub> being released into the atmosphere. E.g. 1kg CO<sub>2</sub> = GWP of 1

### CO<sub>2</sub> Equivalent for 100kg Emissions



### The Chemours™ Advantage

- Ultra low environmental impact - because of their zero ozone depletion and ultra low global warming potential, Opteon™ specialty fluids are accepted by key governmental and environmental regulatory agencies globally
- Extremely safe - Opteon™ specialty fluids are considered some of the safest fluids in the market. Safety Data Sheets (SDS) ensure users are well informed regarding product properties, safe handling and use
- Non flammable - Opteon™ specialty fluids do not exhibit a closed-cup flash point and are not classified as flammable liquids.
- Safe in use - Opteon™ specialty fluids have low inhalation toxicity and pose little risk of adverse health effects when airborne exposure is maintained below established limits. All Opteon™ blends have an acceptable exposure limit (AEL) of > 200ppm.
- Replacement solution - effective and sustainable replacement for nPB, TCE, HCFCs, PFCs, HFCs and HFEs.



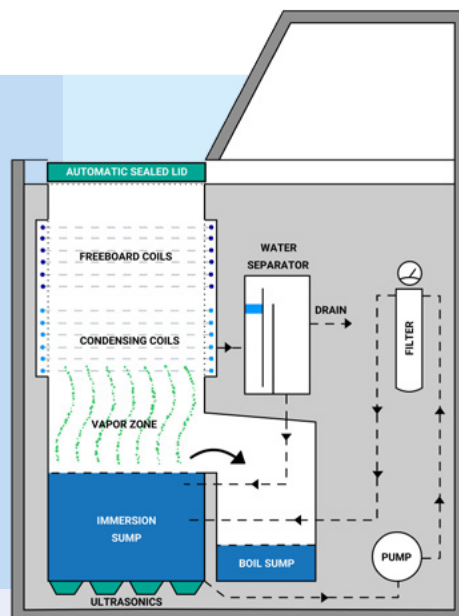
# Precision Cleaning

## Cleaner than clean



**In today's fast-changing, demanding and regulatory landscape, it can be challenging to find a cleaning solvent which is compatible, strong enough and safe enough for your application's needs.**

Fraser Technologies offers a solution with powerful cleaning performance that is also environmentally friendly, and extremely safe. Due to their low viscosity, low surface tension and high liquid density, Opteon™ specialty fluids enable effective wetting giving you excellent performance you can depend on from a company you can trust.



## Precision Cleaning

Today's demanding manufacturing processes require extremely tight and vigorous cleaning specifications, which is why solvents have been the chosen chemistry to meet this requirement. Chemours™ SF30, SF79 and SF80 meet this requirement due to their stability and highly effective results when cleaning silicones, lubricants and fluorinated greases such as Krytox™. Quality standards today are at their highest which is why these solvents are used to confirm exceptional cleanliness levels even with back light inspections, water breaks of particulate counts.

**Recommended Products:** **SF30** **SF79** **SF80**



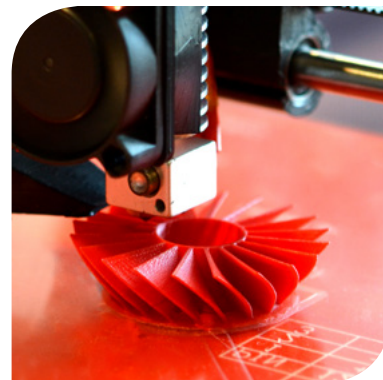
## 3D Printing

The recent technological advances within 3D printing has begun a boom within this industry not only for medical advancements, such as artificial joints and prosthetic limbs but also within the automotive and aerospace industries to create prototypes of new products. It can be used for industrial design and even small-scale manufacturing operations.

For inventors and small business manufacturers, developing product prototypes can be a laborious and expensive process, resulting in 3D printing becoming one of the fastest growing markets in the world. Due to the complexity and intricacy of not only the 3D printer itself but also the small, delegate components it prints, cleaning requirements have yet again become the product in demand.

Chemours™ recognised this spike in innovation and produced new generation fluids which not only meet this demand but also surpass the environmental regulations by far.

**Recommended Products:** **SF79** **SF80**



## Oxygen Cleaning

Cleaning demands have heightened more recently for systems that are designed to carry and transport pure liquid oxygen, since the slightest contamination or residue can cause large explosions. Hospital tubing and aeroplane components are examples of parts that require cleaning with extra care, and critical attention is essential. All oxygen systems must be cleaned using a non-flammable, fast drying, residue-free cleaner. Chemours™ have produced a chemical that is just that - SF30.

**Recommended Products:** **SF30**

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## Drying

Due to their unique combination of properties, Opteon™ specialty fluids are excellent drying solutions after aqueous cleaning, eliminating the problems that commonly occur with oven, hot air knife or tumble drying. For example, due to their lower surface tension, Opteon™ eliminate the problem of water getting trapped in a complex part because they can get into small gaps and blind holes and push the water out. The low boiling point of our products enables them to evaporate quickly— allowing parts to be processed faster, resulting in lower energy costs.

Opteon™ specialty fluids are used extensively for drying in a wide variety of industries, such as jewellery and watchmaking, optical and automotive tool manufacturing.

**Recommended Products:** **SF01** **SF05** **S-DF**

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## Vapor Degreasing

This is one of the largest cleaning applications in the market as it required to clean components to an exceptionally high standard. This is a very diverse market made up of manufacturers of aerospace and optical components, metal framing, household fixtures, automotive parts and costume jewellery. The most common need is to remove soils, greases, fingerprints or waxes – without compromising the component in anyway. Chemours™ SF80 performs extremely well in this arena, with its ultra low surface tension, it ability to penetrate small holes and crevices, which may even be blind to the eye.

**Recommended Products:** **SF30** **SF79** **SF80**

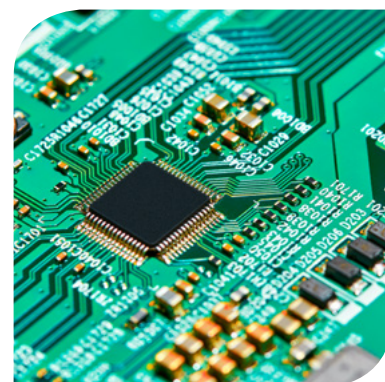
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## PCB Cleaning & Defluxing

In electronics manufacturing, the trend toward tighter clearances has made defluxing circuit boards more critical and more challenging than ever before. Opteon™ specialty fluids have proven to be the ideal solutions due to their low surface tension and ability to quickly and effectively wash away contaminants such as flux residues. If additional requirements such as total immersion or ultrasonics are needed we are able to add this into the cleaning process for you.

**Recommended Products:** **SF79** **SF80**



# Specialty Fluids

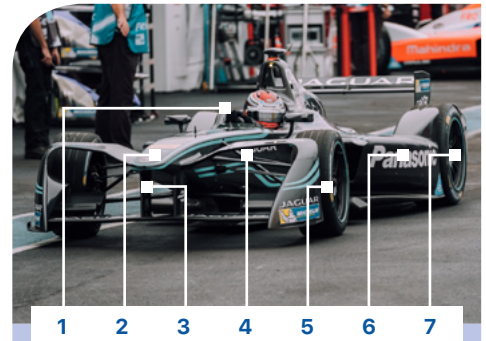
## Changing our Future



### Specialty Products are in extremely high demand in today's market due to the growth in innovation, especially over the latest decade.

One of the biggest growth areas has been in electric transport – in cars, trains and even aeroplanes. All of these electric items rely on battery power – increasing demand for output, size, capability, and charge capacity. In order for manufacturers to meet these commercial and consumer demands they must find compatible specialty fluids that match their requirements, no matter how exacting.

Opteon™ specialty fluids provide the high performance, consistent quality and high levels of safety that are synonymous with the Chemours brand.



#### Key

- 1 Cleaning and carrier fluids for fluorinated lubricants and grease
- 2 Cleaning engine and gearbox components
- 3 Bonding & cleaning of composites
- 4 Cleaning & cooling of EV battery
- 5 Cleaning & lubrication of bearings
- 6 Carrier fluid for adhesives
- 7 Hydraulic system cleaning



### Brine/Coolant

Opteon™ are very effective brine/coolants that prevent a part or device from overheating. In a brine/coolant application, Opteon™ is enclosed in a heat exchanger system. When Opteon™ come in contact with parts at high temperatures, they evaporate – cooling the parts. As Opteon™ moves to the cooler side of the heat exchanger system, it condenses back into liquid state. These products are used to continuously cool down parts that could become damaged due to excessive heat.

**Recommended Products:** **SF10** **SF33**



### Aerosols

Opteon™ specialty fluids are an ideal choice for replacing flammable or high GWP products in aerosol formulations due to their excellent environmental properties and ability to meet the diverse requirements of formulators. Specifically, Opteon™ specialty fluids provide outstanding cleaning performance; are non-flammable; feature reduced volatile organic compound (VOC) content and low toxicity; are quick drying; leave no residue; and offer good materials compatibility.

**Recommended Products:** **SF01** **SF05** **SF10**  
**SF30** **SF80**







## Carrier/Fluids

Opteon™ specialty fluids are ideal replacements for Methylene Chlorise, PFCs, HFCs and HFEs in carrier fluid/lubricant deposition applications, especially in adhesive hard disk drives and medical device industries. In these applications, Opteon™ is used as the carrier fluid. Because Opteon™ products are fast drying, they evaporate – leaving behind an even controllable coating.

**Recommended Products:** **SF10** **SF33** **SF80**

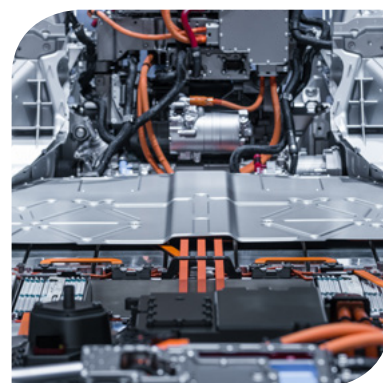


## Heat Transfer

Opteon™ specialty fluids, particularly Opteon™ SF10, offer a convenient and affordable solution to meet the complex challenges of heat transfer applications. Their operating temperature range and thermal stability guarantee continued effectiveness over several boiling cycles.

Opteon™ specialty fluids are typically used as heat transfer fluids for semiconductor tools, battery cooling and pharmaceutical manufacturing.

**Recommended Products:** **SF10** **SF33**



## High Voltage

Opteon™ specialty fluids are widely used as dielectric or testing fluids in many high voltage applications. The dielectric properties and breakdown voltage of Opteon™ make them ideal choices for this application. Typical uses include electrical testing of insulation sleeves, commercial glove testing, sleeve testing equipment and high voltage electronic cooling.

**Recommended Products:** **SF10** **SF33**



## Testing

As testing fluids, Opteon™ specialty fluids are used for a wide range of applications, including fingerprint extraction, wastewater analysis and virus extraction. The properties that make our products ideal for these kinds of applications are their materials compatibility, nonflammability, fast evaporation and good solubility of deposition fluids.

**Recommended Products:** **SF10** **SF33**



# General Chemical Properties

	Opteon™ SF01	Opteon™ SF05	Opteon™ SF10	Opteon™ SF30	Opteon™ SF33	Opteon™ SF79	Opteon™ SF80	Opteon™ S-DF
GWP	<10	<10	<2.5	<2.5	<2.5	<15	<2.5	<15
KB Value	11	11	6	20	11	103	99	103
Boiling Point °C	32	39	110	30	33	47	47	47
Specific Gravity SG	1.34	1.27	1.58	1.33	1.36	1.29	1.29	1.29
Surface Tension mN/m	13.8	15.7	18	16.4	13	21	21	21
OEL	526 ppm	636 ppm	500 ppm	425 ppm	500 ppm	200 ppm	200 ppm	200ppm
Flashpoint CC, ASTM D56 OC, ASTM D1310	None	None	None	None	None	None	None	None
Vapor Flammability ASTM E681 %vol	None	None	None	None	None	7.5 - 15.25	7.5 - 15.25	7.5 - 15.25

# Heat Transfer & Dielectric Properties



	Opteon™ SF10	Opteon™ SF33
Specific Heat kJ/kg-k	1.00	1.20
Thermal Conductivity W/m-K	0.065	0.077
Vapor Pressure kPa	2.9	0.07
Liquid Viscosity cSt	0.71	0.38
Heat of Vaporisation kJ/kg	115	166
Dielectric Constant at 1 kHz	5.48	32
Resistivity ohm-cm	10 <sup>9-11</sup>	10 <sup>8</sup>
Freezing Point °C	<-90	-107

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