



## nPB Guidance Sheet

**Due to legislation around the safe use of nPB, the substance is banned from 4 July 2020.**

Any business still using this solvent in its cleaning and degreasing process must find a replacement as soon as possible. Here are the facts, what you should be looking for, and how you can make the change.



### What is nPB?

Short for normal Propyl Bromide, nPB (also known as solvent 1-bromopropane), is a solvent commonly used in the cleaning and degreasing process for the aerospace, precision engineering, medical, optical and electronic industries.

### Why do I need to stop using nPB?

nPB is a hazardous substance that can damage fertility and harm unborn children. It has been registered as a Substance of Very High Concern (SVHC) under REACH (Registration, Evaluation, Authorisation and Restriction of Chemicals), which regulates the supply and use of chemicals in Europe. As such, nPB has been placed on Annex XIV, and a 'sunset date' of 4 July 2020 has been set. After this date, its use is banned, unless an authorisation has been granted and the business has a permit for a specific use.

## How do I know if I'm using nPB?

Identifying products using nPB can sometimes be challenging, as it is known by a variety of different names, and some companies are continuing to promote and sell products using the substance without openly disclosing it.

To be absolutely certain that you are complying with the law and using safe products, the best thing to do is to check the chemical ingredients on the material specification data sheets (MSDS), and also to check the warning label on the drum. If the product contains nPB, it should be identified in the risk section of the MSDS and on the drum warning label.

Not all manufacturers are abiding by the most up to date legislation, so be extra vigilant. Names to look out for are **normal Propyl Bromide, nPB** and **solvent 1-bromopropane**.

If you are using cleaning solutions in surface finishing applications or in the aerospace or general engineering sectors, make sure you double check the chemical ingredients of your products. Alarming, some aerosols also still contain nPB, so check those too.

## I'm still using nPB. What should I do?

First of all, don't panic! There is still time to find an alternative, and there is a range of new generation solvents which are much safer, and also more environmentally friendly.

If you need help, we can undertake a full audit and survey of your existing equipment to make sure any switch of solvents will be viable and effective. nPB can turn acidic, which corrodes the machinery from the inside. This can make the machines irreparable, so rather than a simple chemistry change, you may need to also repair or replace your equipment.

Taking advice from cleaning industry specialists will help you understand the implications of nPB replacement. We offer a one stop solution to nPB replacement including free expert advice and pre-purchase trials of chemistries and equipment. Guidance through REACH and other regulations is also provided, ensuring that you understand how to remain compliant irrespective of your type of cleaning system.

## What can I use instead of nPB?

There are several replacement cleaning chemistries for nPB, but caution is advised. Some alternatives which may be suggested are also restricted solvents, such as **Perchloroethylene (PERC)** or **Methylene Chloride (MECL)**. These substances pose numerous health risks and usage restrictions are set to be put in place, so they are not safe alternatives, and they may also require replacement soon. Make sure you're not substituting one harmful substance for another.

The table below shows the common HFC and HFE's offered as replacement alternatives. As the table highlights, many of these fall under F-gas regulations and should be avoided.

The good news is, there are plenty of new generation cleaning agents which are worthy of consideration as a replacement. Opteon™ SF80® by Chemours™, for example, is a drop-in nPB alternative. SF80® is safe, extremely eco-friendly, and offers a superior cleaning performance to nPB and other restricted solvents.

It is a safe, non-flammable, and environmentally friendly solvent with no ozone depletion potential, an ultra-low global warming potential (GWP) of <2, and does not contain any products regulated under F-gas regulations. SF80® is an effective replacement for nPB, TCE, HCFCs, PFCs, HFCs and HFEs solvents, and is becoming known as the leader within a variety of cleaning applications such as vapour degreasing, oil and grease removal, precision cleaning, high solvency defluxing, and silicone removal, amongst many other uses.

Not only is SF80® safer than nPB, it also has an extremely low GWP and the highest KB (Kauri-butanol) value of any fluorinated solvent on the market by a significant margin. On average, competitors' new generation products have a GWP of around 40, while SF80® has a GWP of less than 2.

Other alternatives include SF79® the predecessor to SF80®, which has been widely approved within the aerospace and medical sectors. We can work with you to determine which chemistry is best for your equipment, machinery and individual needs.

| Common Name | Chemical Name                         | GWP  | Regulatory Issues |
|-------------|---------------------------------------|------|-------------------|
| nPb         | n-Propyl Bromide, 1-Bromopropane, 1BP | <1   | SVHC Sunset Date  |
| HFC 365     | 1,1,1,3,3-PENTAFLUOROBUTANE           | 890  | F-gas Annex I     |
| HFC 4310    | 1,1,1,2,2,3,4,5,5,5-decafluoropentane | 1640 | F-gas Annex I     |
| HFE7100     | Ethyl Nonafluoroisobutyl ether        | 320  | F-Gas AnnexII     |
| HFE 7200    | Ethyl nonafluorobutyl ether           | 55   | F-Gas AnnexII     |
| HFO         | Z)-1,1,1,4,4,4-Hexafluoro-2-butene    | <2   | None              |
| HFO         | Methoxytridecafluorohep-tene isomers  | <15  | None              |

## What is the problem with using F-gases as an alternative to nPB?

Regulations around the use of F-gases (also known as fluorinated gases) have become increasingly stringent over the last few years. F-gases can be present in solvents, and have a very high GWP. Global warming is a gradual increase in the overall temperature of the earth's atmosphere, generally attributed to the greenhouse effect, caused by increased levels of carbon dioxide, CFCs, and other pollutants. GWP is used to represent the equivalent of CO<sub>2</sub> being released into the atmosphere. So 1kg of CO<sub>2</sub> = a GWP of 1. In the case of F-gases, they have a GWP of up to 11,000.

Current Regulation limits how much F-gas can be sold in Europe and bans the use of F-gases in new equipment where alternatives with

a lower GWP are widely available. It also aims to prevent F-gases emitting from existing equipment by outlining mandatory checks and servicing, and controlling the safe recovery of the gases at the end of the equipment's life cycle.

Avoid F-gases where you can, and for more information, visit our website:

<https://frasertech.co.uk/2019/05/new-f-gas-regulations/>.

Again, any product containing fluorinated gases must clearly display it on the drum label and MSDS. You can find this in the supplementary information section on the drum, and in section 12.6 of the MSDS.

**SAFETY DATA SHEET**  
Inventory No. Reg. No. (EC) No. 146170008  
**Vertrel™ MCA specialty fluid**

Version: Revision Date: SDS Number: Date of last issue: 05.04.2019  
12.2 27.08.2019 1207-900-00000 Date of first issue: 07.02.2017

**12.2 Persistence and degradability**  
**Summary:**  
Reaction mass of (2R,4R)-1,1,1,2,2,3,3,3,3-octafluoropropane and (2S,4S)-1,1,1,2,2,3,3,3,3-octafluoropropane  
Biodegradability: Result: Not readily biodegradable  
Trans-Dichloroethylene: Result: Not readily degradable  
Biodegradability: Method: OECD Test Guideline 301C

**12.3 Bioaccumulative potential**  
**Summary:**  
Reaction mass of (2R,4R)-1,1,1,2,2,3,3,3,3-octafluoropropane and (2S,4S)-1,1,1,2,2,3,3,3,3-octafluoropropane  
Bioaccumulation: Remarks: Bioaccumulation is unlikely

**12.4 Mobility in soil**  
No data available

**12.5 Results of PBT and vPvB assessment**  
Not applicable

**12.6 Other adverse effects**  
**Global warming potential**  
Regulation (EU) No 517/2014 on fluorinated greenhouse gases  
**Product:**  
100-year global warming potential: 1.017

**12.3 Bioaccumulative potential**  
**Components:**  
Reaction mass of (2R,4R)-1,1,1,2,2,3,3,3,3-octafluoropropane and (2S,4S)-1,1,1,2,2,3,3,3,3-octafluoropropane  
Bioaccumulation: Remarks: Bioaccumulation is unlikely

**Trans-Dichloroethylene:**  
Partition coefficient: n-octanol/water: log Pow: 2.06

**12.4 Mobility in soil**  
No data available

**12.5 Results of PBT and vPvB assessment**  
Not applicable

**12.6 Other adverse effects**  
**Global warming potential**  
Regulation (EU) No 517/2014 on fluorinated greenhouse gases  
**Product:**  
100-year global warming potential: 1.017

ethylene 602-026-00-3 EC-No. 205-860-2 CAS-N

**Hazards:** Causes serious eye irritation. Harmful if inhaled. May cause drowsiness or dizziness. Harmful to aquatic life with long lasting effects.

**Prevention statements:** Wash skin thoroughly after handling. Do not breathe vapours or in a well-ventilated area. Avoid release to the environment. Wear eye protection/ face protection. IF INHALED: Move to fresh air and keep comfortable for breathing. Consult a physician/ doctor if you feel unwell. If eye irritation occurs, get immediate medical advice/ attention.

**Additional information:** Contains fluorinated greenhouse gas. Can become highly flammable in use.

## Will removing nPB cost me more?

While the price per litre of your nPB replacement may seem more expensive when taken at face value, this should not be the only factor to consider, as replacing nPB can result in cost-savings through efficiency.

Restricted solvents, including nPB, continue to be subject to special storage and handling requirements, as well as vapour extraction – all of which are 'hidden' costs. If you consider the annual compulsory occupational exposure monitoring for users of restricted solvents; as well as the energy-savings, boosted productivity and faster component drying times of the new generation solvents, the tally is even higher.

## Why should I come to Fraser Technologies?

We are experts in the component cleaning industry and are committed to finding the best option for our customers; helping you to achieve safe, sustainable, cost-effective and environmentally sound solutions. We constantly review performance to ensure we are providing the latest technology, best results and first-class customer service, as well as meeting increasingly stringent regulations.

We work with our customers to ensure that the correct chemistry is specified for individual needs. Before making any recommendations, we undertake a full audit and survey of existing

equipment to make sure any switch of solvents will be viable and effective, and we are on hand to make the switch as seamless as possible.

We work closely with Chemours™, which is one of the largest chemical manufacturers in the world and has been supplying the cleaning industry for over 40 years. Chemours™ shares many of our company values, championing honesty and integrity while providing the best service and products for our customers.

Chemours™ cleaning solvents are patented, so the chemistry cannot be replicated, and these products cannot be blended by other manufacturers. Be careful that the product that you are using is the correct one. Chemours use eco-friendly chemistries, which offer a superior cleaning performance. They are low in cost and provide a genuine alternative to these hazardous solvents which have been banned or restricted. The Chemours™ range of safe, environmentally friendly solvents have become widely accepted as best in class, next generation fluids and are approved for use in a large range of standard cleaning systems.

When you see our brand, you can be rest assured that you are getting a product you can trust – and we'll be with you for support at every stage of the process.

For more information or advice on nPB replacements or any of our products, please call us on 01506 443 058, email [sales@frasertech.co.uk](mailto:sales@frasertech.co.uk) or visit [www.frasertech.co.uk](http://www.frasertech.co.uk).

# Case Study



**BAE SYSTEMS**

## Making a simple switch to safer practices

BAE Systems approached us to assess its existing process to see how to use a safer alternative to nPB, at which point we also discussed additional benefits including efficiency and cost savings.

To assess their existing cleaning processes, we arranged a site visit to inspect the Solvac vapour degreasing systems at two of their facilities. We performed a full system inspection to ascertain suitability of the systems for conversion to Opteon™ SF79®, a cleaning fluid chosen for its performance, ultra-low global warming potential (GWP), recyclability, reusability, safety, and ease of use. At the time of the change, SF79® was the leading product for this application and while SF80® has since come on to the market as a refined replacement of SF79®, both products are safe and suitable alternatives to nPB.

Our objectives were to test the equipment for suitability and compatibility for use with SF79®, as well as the general condition of the equipment and any opportunities to reduce solvent usage. The customer found that their solvent usage was very high and they were aware that reductions would improve their environmental impact as well as save costs.

Before using nPB, both of BAE's systems used Trichloroethylene (Trike) to flush pipework using long narrow tanks suited to this application. They each had a flushing rig and filtration, and originally had carbon absorption/deabsorption systems fitted. The existing Solvac systems used more than 1 metric ton of solvent per year, meaning they both required a permit from the local authority for continued use, further increasing costs for the company.

## Results

The Opteon™ SF79® replacement has been fully implemented at two locations, while the third is currently transitioning to the new product.

Since switching solvents, BAE has achieved the cleaning performance expected while also significantly reducing its environmental footprint. As SF79® doesn't have the acidity issues of nPB, BAE's usage fell significantly because fewer cleanouts were required. And, it's safe and easy for operators to use.

Speaking about the results of the change to SF79®, BAE's Engineering & Governance Lead says, "The transition from nPB to SF79® was relatively straightforward and quick, and communication was good throughout. Fraser Technologies also had a much stronger relationship with the manufacturer than we did, which was especially helpful during the process.

"Emissions monitoring that we undertook following the introduction of SF79® showed a reduction in volatile organic compounds to the atmosphere compared with the previous solvent. The product's lower GWP will also contribute to reducing the environmental impact of our site operations.

"Overall, changing to SF79® has been a positive experience and it has helped us to achieve our safety, health, and environmental objectives."

**FRASER**  
TECHNOLOGIES

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