3M™ NOVEC™ HFE and PROMOSOLV™ products have been specially developed as specific solvents for High Tech cleaning, degreasing, rinsing, decontaminating and drying a large range of materials used in a vapour phase cleaning process.

3M™ NOVEC™ HFE and PROMOSOLV™ products are basically made of methoxy-nonafluorobutane (C4F9OCH3), transparent liquid, colourless and with a very low odour to replace chlorinated and brominated products. Their boiling point and their very low surface tension, confer to these products, outstanding cleaning properties when implemented in vapour phase process using neat azeotropic products or with an Inventec co-solvent (Topklean™ range).

These exclusive fluids have no ozone depleting potential, they are chemically and thermally stable, they are not flammable or toxic, and thus become the most sustainable cleaning fluids.

As an illustration, hereunder parameters comparison between chlorinated and non-chlorinated vapour phase processes:

<table>
<thead>
<tr>
<th>PROCESS PARAMETERS</th>
<th>TRICHLOROETHYLENE * VAPOUR PHASE</th>
<th>CO-SOLVENT VAPOUR PHASE</th>
</tr>
</thead>
<tbody>
<tr>
<td>TOXICITY</td>
<td><img src="image" alt="H350" /> <img src="image" alt="H412" /></td>
<td><img src="image" alt="R 65" /> <img src="image" alt="R 66" /></td>
</tr>
<tr>
<td>CORROSIVITY</td>
<td>CHLORINATED</td>
<td>NON-CHLORINATED</td>
</tr>
<tr>
<td>BIODEGRADABILITY</td>
<td>FORMATION OF VINYL CHLORIDE (NON BIODEGRADABLE)</td>
<td>NO FORMATION OF VINYL CHLORIDE</td>
</tr>
</tbody>
</table>

* TRICHLOROETHYLENE (CAS 79-01-6) has been definitely classified as SVHC substance by European Chemicals Agency

All components inside formulation are complaint with new regulations concerning chemical substances (REACH*, RoHS*, FGas*, not CMR*…) and are implemented by INVENTEC and our recommended list of cleaning plant manufacturers.

* REACH a new normative document to be implemented in next years concerning chemicals substances for Registration Evaluation and Authorisation of Chemicals.
* FGas European Directive from 2006 concerning in prevent and thereby reduce emissions of fluorinated greenhouse gases covered by Kyoto protocol.
* CMR Carcinogenic, Mutagenic Reprotoxic substances.

Security: Workers exposition limit = 750 ppmv
**CLEANING CYCLE STEPS**

**MONO-SOLVENT PROCESS (AZEOTROPIC PROCESS)**
- Parts are immersed in tank 1 of co-solvent to be cleaned
- Immersion in tank 2 to be rinsed off
- Put in the vapour phase for the final rinsing
- The drying is finally made in the cold area.

**CO-SOLVENT PROCESS (MIXED PROCESS)**
- Parts are immersed in tank 1 of co-solvent to be cleaned
- Immersed in tank 2 to be rinsed off
- Put in the vapour phase for the final rinsing.

**SEPARATED CO-SOLVENT PROCESS**
- Parts are immersed in tank 1 of Topklean to be cleaned
- Immersion in tank 2 to be rinsed off
- Immersed again in tank 3 for a second rinsing
- Put in the vapor phase for the final rinsing
- The drying is finally made in the cold area.

*Specially dedicated for complex designs of parts OR heavy pollution*