

## Introduction

Solvokane™ X is a near azeotropic mixture of Solvokane™, an azeotropic, non-flammable mixture of Solkane® 365mfc (1,1,1,3,3-pentafluorobutane) and t-DCE (1,2-dichloroethylene), with a higher portion of t-DCE. It was developed and patented by Solvay Fluor GmbH for increased solubility and heavy duty cleaning. It is suitable for the vapor degreasing environment

The phase-out of conventional solutions (e.g., CFCs and HCFCs) has required alternative products.

Solvokane™ X offers product characteristics which are very close to HCFC 141b and CFC 113, with a Kauri Butanol (Kb) Index of 76. The solvency power versus common contaminants is stronger than the Kb value would suggest.

EPA/SNAP approved, Solvokane™ X is a new generation, environmentally-compatible solvent. A volatile, colorless liquid without ozone depletion potential (ODP=0), it has a relatively low global warming potential (GWP), as well as other properties which make it a superior replacement for CFCs and HCFCs.

## Features and Benefits

- Fast drying with no-residue
- Low temperature with a boiling point 36°C
- Non-flammable near azeotrope
- Excellent toxicity characteristics

- Drop in replacement for high cost HFC/HFE solvents
- Cleaning similar to R 141b and R 113
- Can be used as a starting point or component for more complex/customized solvent formulations

## Typical Applications

Solvokane™ X was designed to serve numerous applications and it is applicable as formulated. It can, however, be used as a starting point or component for more complex or customized solvent formulations which can be adjusted for the needs of the industry.

- Precision Cleaning
- Vapor Degreasing
- Fluid Carrier

## Environmental Aspects

SNAP approved, Solvokane™ X is a new generation, environmentally-compatible solvent. A volatile, colorless liquid without ozone depletion potential (ODP=0), it has a relatively low global warming potential (GWP) of 278, as well as other properties which make it a superior replacement for CFCs and HCFCs.

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## Physical Properties – Solvokane™ X

<b>Molecular weight MG</b>	[kg/kmol]	114.84
<b>Density</b>	[kg/dm <sup>3</sup> ] at 25°C	1.22
<b>Boiling point</b>	[°C/1013 mbar]	36.2
<b>Freezing point</b>	[°C]	-42.6
<b>Flashpoint</b>		no
<b>Heat of vaporisation ΔH</b>	[kJ/kg] at 25°C	215
<b>Specific heatcapacity C<sub>pI</sub></b>	[kJ/kgK] at 25°C	1.247
<b>Solubility of water</b>	[%] at 20°C	0.077
<b>Solubility in water</b>	[%] at 20°C	S365mfc = 0.095 t-DCE = 0.239
<b>Surface tension</b>	[mN/m] at 20°C	20.59
<b>Viscosity liquid</b>	[mPa*s] at 25°C	0.44
<b>Refractive index</b>	[20°C]	1.386
<b>Autoignition temperature</b>	[DIN EN 14522]	—
<b>Kauri Butanol index</b>		76.0
<b>Vapor pressure</b>		
0°C	[K Pa]	26.3
25°C	[K Pa]	69.2
50°C	[K Pa]	156.7
<b>EX-limits</b>		
LFL (Vol%) 20		4.4
UFL (Vol%) 70		12.8

## Safety/Flammability

Solvokane™ X shows no flash point according to DIN 13736 and ASTM D93. Despite the absence of flash-point, vapor from Solvokane™ X, when diluted in air, can form explosive mixtures when an energy source is present. Lower and upper limits are noted in the table below. A number of conventional solvents such as HCFC 141b, Trichlorethylene (TCE) or Methylene chloride (MC) show identical flammability. But as seen in the chart below, the explosive range of Solvokane™ between lower and upper explosive limits is much narrower, further reducing the risk so handling with Solvokane™ is safer.

Prior to use, testing should be performed under conditions expected during normal operations. Standard precautions should be applied in form of good ventilation, grounding of equipment filling/refilling and pumping and avoiding contact with open fire or electrical sparks. For more information, please refer to the Solvay Solkane® Information Service: [www.solvay-fluor.com](http://www.solvay-fluor.com)

	Solvokane™	HCFC 141b	TCE	MC
<b>Flashpoint</b>	None	None	None	None
<b>Lower explosive limit (LEL, Vol%)</b>	5.4	5.6	8.0	13.0
<b>Upper explosive limit (UEL, Vol%)</b>	9.4	17.7	10.5	22.0
<b>Explosive range (Vol%)</b>	4.0	12.1	2.5	9.0

For complete toxicity information, refer to the Solvokane™ X MSDS.

## Disposal/Recovery Considerations

Consideration should be given to potential issues with flammability. Users should test for flammability in their particular application and test the spent Solvokane™ X to ensure proper classification for waste disposal. Please read the MSDS prior to disposal/recovery and contact your local Solvay representative for more information if needed.

## Product Description/Packaging/Sampling

The following table shows the typical composition of the near azeotropic Solvokane™ X mixture, which leads to the non-flammable properties. The stabilizer is an especially volatile substance, which is highly effective but will not affect cleaning properties or lead to residues.

Ingredients	Concentration
Solkane® 365mfc (C <sub>4</sub> H <sub>5</sub> F <sub>5</sub> )	≥ 50 % wt.
t-DCE (C <sub>2</sub> H <sub>2</sub> Cl <sub>2</sub> )	≤ 50 % wt.
Purity	≥ 99.7 % wt
Acidity	≤ 1 ppm
Water	≤ 100 ppm
Residue	≤ 10 ppm

### Solvokane™ X standard packaging

- 235 kg net metal returnable drums
- 22 kg net metal returnable drums

### Also possible in sampling dimensions or on special request:

- 12 kg net metal returnable drums
- 6 kg net metal returnable drums
- 1 kg net metal returnable drums