Solvokane™ Solvent

Technical Information

Solvay
Fluor

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Introduction

Solvokane™, an azeotropic, non-flammable mixture of Solkane® 365mfc (1,1,1,3,3-pentafluorobutane) and t-DCE (1,2-dichloroethlylene), was developed and patented by Solvay Fluor GmbH to meet present and future demands of the precision cleaning industries.

The phase-out of conventional solutions (e.g., CFCs and HCFCs) has required alternative products. Solvokane™ offers product characteristics which are very close to HCFC 141b and CFC 113, with a Kauri Butanol (Kb) Index of 25. The solvency power versus common contaminants is stronger than the Kb value (25) would suggest.

EPA/SNAP approved, Solvokane™ 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 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™ 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
- Defluxing Electronics
- Cleaning of Optical Parts and Assemblies
- Degreasing
- Fluid Carrier

Environmental Aspects

SNAP approved, Solvokane™ 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 556, as well as other properties which make it a superior replacement for CFCs and HCFCs

Physical Properties – Solvokane™

Molecular weight MG	[kg/kmol]	127.85
Density	[kg/dm³] at 25 °C	1.225
Boiling point	[°C/1013 mbar]	36.0
Freezing point	[°C]	–42.6
Flashpoint		no
Heat of vaporisation ΔH	[kJ/kg] at 25 °C	209
Specific heatcapacity C_{pl}	[kJ/kgK] at 25 °C	1.309
Solubility of water	[%] at 20 °C	0.085
Solubility in water	[%] at 20 °C	S365mfc = 0.095 t-DCE = 0.239
Surface tension	[mN/m] at 20 °C	17.8
Viscosity liquid	[mPa*s] at 25 °C	0.53
Refractive index	[20 °C]	1.325
Autoignition temperature	[DIN EN 14522]	> 600 °C (T1)
Kauri Butanol index		25
Vapor pressure		
0 °C	[K Pa]	36.0
25 °C	[K Pa]	77.0
50 °C	[K Pa]	169.0
EX-limits		
LFL (Vol%) 20		5.4
UFL (Vol%) 70		9.4

Safety/Flammability

Solvokane™ shows no flash point according to DIN 13736 and ASTM D93. Despite the absence of flash-point, vapor from Solvokane™, 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

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

For complete toxicity information, refer to the Solvokane™ 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™ 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 azeotropic Solvokane™ 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 ($C_4H_5F_5$)	≥ 50 % wt.
t-DCE ($C_2H_2Cl_2$)	≤ 50 % wt.
Purity	≥ 99.7 % wt
Acidity	≤ 1 ppm
Water	≤ 100 ppm
Residue	≤ 10 ppm

Solvokane™ 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