

Solkane[®] 365/227 Non Flammable Blends

Liquid Foaming Agent for Plastics



Solvay
Fluor



Product Description

- Colourless liquid
- Chemically stable
- Faintly ethereal odour
- Non flammable blends

Solkane® 365/227 are liquid hydrofluorocarbon blends of the third generation without ozone depletion potential. Solkane® 365mfc is currently under notification procedure within the European Authorities. The ELINCS No. is 430-250-1. A SNAP approval has been received.

Application

Solkane® 365/227 are binary blends of Solkane® 365mfc and Solkane® 227ea. The blends are designed for rigid PU foams for insulation purposes, where a non flammable liquid foaming agent with a low thermal conductivity is needed. Foams produced with Solkane® 365/227 have a fine cell structure with good insulation properties and a good compressive strength.

Environmental Benefit

Solkane® 365mfc has no ODP. It is the result of effort to follow the Montreal Protocol.

Two life cycle assessments performed according to ISO 14040 confirmed that Solkane® 365mfc product systems can be more eco-efficient than alternative solutions. For example, using Solkane® instead of water as an insulation and foaming agent for the polyurethane insulation of an industrial roof reduces energy consumption and consequently the contribution to global warming, to acid rain and the summer smog, seen over the entire life cycle.

Note: HFCs such as Solkane® 365mfc have no impact on the ozone layer.

Storage

Solkane® 365/227 should be stored in a cool and well ventilated area. The contact to heat sources, open flames or sparks should be avoided.

For more information see our SDS and our handling brochure.

Quality

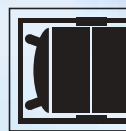
■ Purity of Solkane® 365mfc and Solkane® 227ea	99.5 % min.
■ Water	100 ppm max.
■ Acid	1 ppm max.
■ Non volatile residue	100 ppm max.

Packaging

Solkane® 365mfc is available in:



Non returnable drums (240kg)



ISO-tank container (20mt)



Roadtanker (20mt)

Other quantities on request

Physical Data

Chemical name	Blend of 1,1,1,3,3-Pentafluorobutane and 1,1,1,2,3,3,3-Heptafluoropropane	
Formula	CF ₃ -CH ₂ -CF ₂ -CH ₃ and CF ₃ -CHF-CF ₃	
Ratio Solkane® 365/227 [mass-%]	93/7	87/13
Molecular weight average [g/mol]	149.6	150.9
Bubble point [°C at 1.013 bar]	30	24
Flammable	no	no
Vapour pressure at 20 °C [kPa]	70	93
Density of liquid at 20 °C [kg/dm ³]	1.28	1.29
Density of vapour at 20 °C (Air = 1)	6.4	6.5
Thermal conductivity of vapour at 25 °C [mW/m.K]	10.7	10.9
Viscosity of liquid at 20 °C [μPa.s]	447	432
Log P o/w (pure Solkane® 365mfc)	1.6	
Solubility in water at 23 °C [g/kg]	0.84	

Flammability

Solkane® 365/227 blends have no flash point (ISO 1516/1523) and are not subject to flammable liquid regulation.

Being non azeotropic blends, the composition can change during handling. Below a concentration of 5 mass % of Solkane® 227ea the liquid becomes flammable.

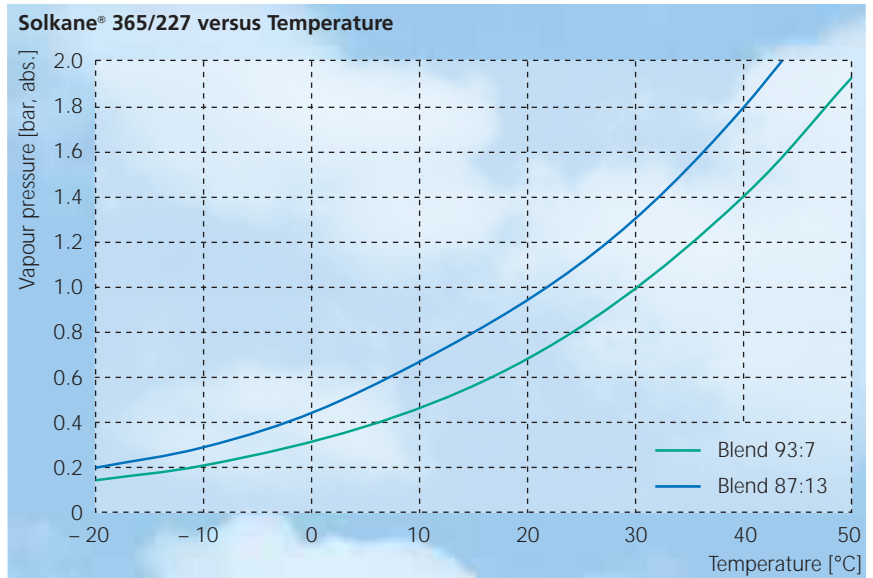
Straight Solkane® 365mfc has a flash point below -27 °C (DIN 51755, Teil 2) but is difficult to ignite. The minimum ignition energy is around 50 times higher than of n-pentane and is 10.4 mJ (25 °C, 8 Vol % in air at 1 bar).

The explosion limits at standard conditions in dry air are:

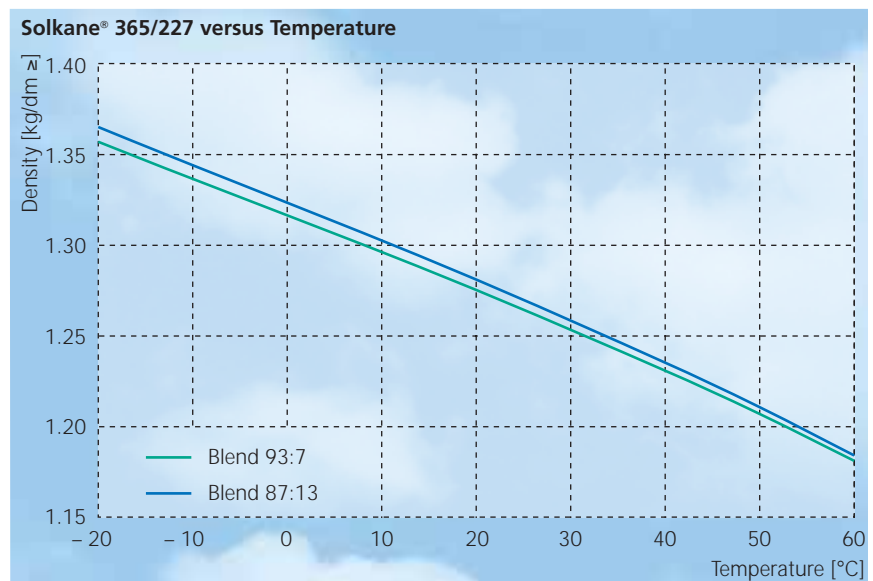
- Lower explosion limit (LEL) 3.6 % by volume in air
- Upper explosion limit (UEL) 13.3 % by volume in air

For more information please read our brochure about flammability characteristics and handling.

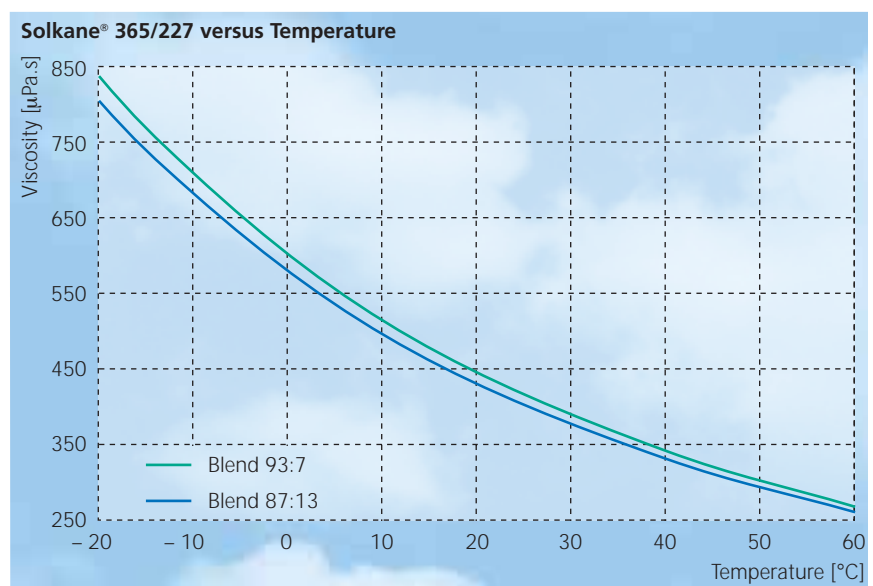
Vapour Pressure



Liquid Density



Viscosity



Materials Compatibility

Thermoplastics	Percent change of weight
PVC	-0.02
PE-HD	0.4
PMMA	57
Polycarbonate	0.3
PP	0.2
Nylon 66	-0.3
PS	0.2
Elastomers	
Neoprene	1.0
Viton A	90.5
EPDM	1.6
Natural rubber	7.2
Nitril rubber	2.5
Silicone	16.1

Change in % by weight after 7 days immersion.

Solubility in Polyols

The polyol solubility* is lower than known from Solkane® 141b and is higher than hydrocarbons in most cases.

Polyol	Solkane® 141b	Solkane® 365mfc	n-pentane	c-pentane
Caradol® 585	100	32	5	11
Castor Oil	100	18	47	100
Ethyleneglycol	4	3	1	1
IXOL® M125	37	5	2	5
Stepanpol® 3152	33	30	6	7
T CPP	100	100	10	100
Tercarol® A 350	100	100	36	100
Tercarol® RF 55	100	100	4	18
Voranol® RA 640	100	100	20	100

*Solubility in g per 100 g Polyol

Stability of Solkane® 365mfc

Solkane® 365/227 has a thermal and chemical stability even higher than Solkane® 141b. It should not be exposed to strong alkaline compounds or alkali metals. Under high temperatures or/and pressure hazardous reactions are possible with reactive metals e.g. Zinc, Aluminium and its alloys, Magnesium as well as with air. The user should give attention to our SDS for additional information.

In pre-formulated PU-foam systems Solkane® 365/227 blend has been observed to be stable, and no stabiliser is needed.

Miscibility

Solkane® 365/227 has a good miscibility with other solvents (e.g. Acetone, Ethanol, Pentane, etc.). It often forms azeotropes.

Toxicity

Toxicity testing (28 days, 90 days) shows no acute toxicity and the "no effect levels" are even higher than for Solkane® 141b.

For more information see our SDS.

Technical Service

For further information please contact our technical specialists:

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Warning

All statements, information, and data given herein are believed to be accurate and reliable but are presented without guarantee, warranty or responsibility of any kind, express or implied. The user should not assume that all safety measures are indicated, or that other measures may not be required. In any case, the user is not exempt from observing all legal, administrative and regulatory procedures relating to the product, personal hygiene, and protection of human welfare and the environment.

All statements or suggestions concerning the possible uses of HFCs and blends thereof are made without any representations and/or warranties whatsoever that any such use is free of legal constraints.

In particular, the use of Solkane® 365mfc and of blends containing Solkane® 365mfc might fall within the scope of European Patent 381 986 and its counterparts. Solvay has acquired certain rights from Bayer under these patents, according to which Bayer has agreed not to assert any of such patent rights against any purchaser of Solkane® 365mfc and blends containing Solkane® 365mfc from Solvay for use as foam blowing agent outside the USA and Canada. The following must be noted regarding the USA and Canada: (1) Solkane® 365mfc cannot be used in the USA or Canada, by itself or in a blend, as a blowing agent to foam a plastic based on an isocyanate to form plastic foam compositions; (2) Solkane® 365mfc and blends containing Solkane® 365mfc must not be made, used, offered for sale, or sold in the USA or Canada, or imported into the USA or Canada, for such blowing uses; and (3) closed cell plastic foam compositions prepared by foaming a plastic material based on isocyanate in the presence of a propellant comprising Solkane® 365mfc and/or a blend containing Solkane® 365mfc, cannot be made, used, offered for sale, or sold, within the USA or Canada, or imported into the USA or Canada. To do so can result in a claim of patent infringement under U.S. patent no. 5,496,866 and Canadian patent no. 2,009,169. Solvay will not sell Solkane® 365mfc or blends containing Solkane® 365mfc to any purchaser intending to use the product accordingly.

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