

ADHESIVES

Hydrocarbon solvents
and plasticizers
for all formulation needs

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Adhesives

The right solutions whatever your application

Adhesive techniques are now well-known and are increasingly used in a great variety of applications including the automotive industry, construction and building. These techniques are also of particular interest to the wood/timber, furnishing, leather goods, shoes, packaging and electronic industries.

Addressing all formulation needs

Hydrocarbon solvents are used to dissolve various types of binders and polymers and can also help to control the drying properties of adhesive solvents.

- **Contact adhesives** (used for footwear and construction assembly).
- **Pressure-sensitive adhesives PSA** (used mainly for tapes and labels)
- **Hot melt PSA**

A wide set of product ranges

- **SOLANE range:** aliphatic and cycloaliphatic solvents and naphthenic fluids
 - Consistent and predictable process performance
 - Meet increasingly stringent regulations while maintaining the benefits of solvent-based formulations
 - Reduced worker exposure to hazardous chemicals
- **TOLUENE, XYLENE and SOLVAREX:** aromatic solvents ranges for a variety of glue & adhesive formulations
- **PLAXENE WO range:** white oils used as plasticizers in certain PSA and hot melt formulations
- **PLAXOLENE range:** heavy aromatic, naphthenic and paraffinic viscous oils used as plasticizers

Large solvent range for contact and rubber adhesives

	EVAPORATION RATE	DISTILLATION RANGE (C°)										
		IBP	FBP	40	60	80	100	120	140	160	TC	
SOLANE	DIN 53170 (Ether)											
Cyclopentane	2.0	48.5	49.5									
IsoHexane	1.0	51	61									
Hexane	2.0	65	69									
60-95	2.0	61	94									
CycloHexane	2.0	80.6	80.8									
70-95	2.0	71	93									
80-110	3.0	83	108									
Heptane	3.0	90	94									
Methylcyclohexane (MCH)	5.0	100.5	101.6									
100-120	6.0	102	123									
100-140	6.0	102	137									
100-155	9.0	103	156									

Meeting regulations without compromising performance

The REACH regulation (EC 1907/2006) and its amendments introduced in annex XVII some restrictions on use of toluene and cyclohexane in adhesives intended for sale to the general public.

Total offers alternative solutions using methylcyclohexane (SOLANE MCH offers a similar evaporation rate to Toluene). Formulations can be adjusted by optimizing methylethylketone (MEK) content and/or acetate esters to obtain the required performances.

Examples of replacement of Toluene by Methylcyclohexane are given here below. Solvent ratios have been adjusted to maintain the same Hansen solubility parameters

	LOW TOLUENE CONTENT	REFERENCE	BLEND 1
COMPOUND % MASS	Solane 60/95	60	55
	Solane MCH	-	15
	Methyl Ethyl Keltone	30	30
	Toluene	10	-
HANSEN SOLUBILITY PARAMETERS (sqrt/J/cm³)	δp	2.54	2.42
	δH	1.54	1.39
	δD	15.58	15.47
	δ total	15.86	15.71

	HIGH TOLUENE CONTENT	REFERENCE	BLEND 1
COMPOUND % MASS	Ethyl Acetate	30	50
	Solane MCH	-	40
	Methyl Ethyl Keltone	10	10
	Toluene	60	-
HANSEN SOLUBILITY PARAMETERS (sqrt/J/cm³)	δp	3.35	3.40
	δH	3.84	3.92
	δD	17.15	15.91
	δ total	17.89	16.73

	DISTILLATION RANGE (C°)	EVAPORATION RATE (ETHER=1)	ANILINE POINT (C°)	FLASH POINT (C°)
TOLUENE	109.6 to 111.6 (ASTM D850)	6 (DIN 53170)	9 (ASTM D611)	4 (ISO 13736)
SOLANE MCH	100 to 103 (ASTM D86)	5 (DIN 53170)	41 (ASTM D611)	-13 (ISO 13736)

Health hazard and Environmental hazard comparison between Methylcyclohexane (MCH) and Toluene demonstrates the clear benefit of MCH.

HAZARDS	TOLUENE	MCH
HEALTH	<p>H304 - May be fatal if swallowed and enters airways</p> <p>H315 - Causes skin irritation</p> <p>H336 - May cause drowsiness or dizziness</p> <p>H373 - May cause damage to organs through prolonged or repeated exposure if inhaled</p> <p>H361d - Suspected of damaging the unborn child</p>	<p>H304 - May be fatal if swallowed and enters airways</p> <p>H315 - Causes skin irritation</p> <p>H336 - May cause drowsiness or dizziness</p>
ENVIRONMENT	H412 - Harmful to aquatic life with long lasting effects	H411 - Toxic to aquatic life with long lasting effects