Vencorex chemicals

flo power!

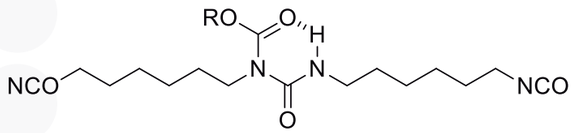
Tolonate™ X FLO 100

Bio-based & low viscosity aliphatic isocyanate polymer

Discover the flo power! of

Tolonate™ X FLO 100

Tolonate™ X FLO 100 is a new, partially bio-based, solvent-free and low viscosity aliphatic isocyanate polymer.



Designed for extreme low viscosity formulations

Thanks to its unique and innovative chemical structure based on Hexamethylene Diisocyanate, Tolonate™ X FLO 100 exhibits extremely low viscosity, enhancing flow and levelling properties of paint and coating systems.

Tolonate™ X FLO 100 is particularly designed to produce solvent-free polyurethane and polyurea materials and/or to reduce Volatile Organic Compounds (VOC) emissions of polyurethane solvent-based formulations.

Made from bio-based renewable materials

Tolonate™ X FLO 100 contains:

- 25% of renewable material, following ACDV's (Association Chimie Du Végétal) evaluation
- 32% of Green Carbon (^{14}C measurement, according to ASTM-D6866 standard: renewable carbon derived from non-fossil based inputs)

BIO-BASED CONTENT 25%

Ideal for polyurethane and polyurea materials

Tolonate™ X FLO 100 can be used in a large variety of polyurethane and polyurea materials as:

- **crosslinker**
- **reactive diluent in** two-pack (2K) systems
- **building block** for resins and polymers

A wide range of potential applications*

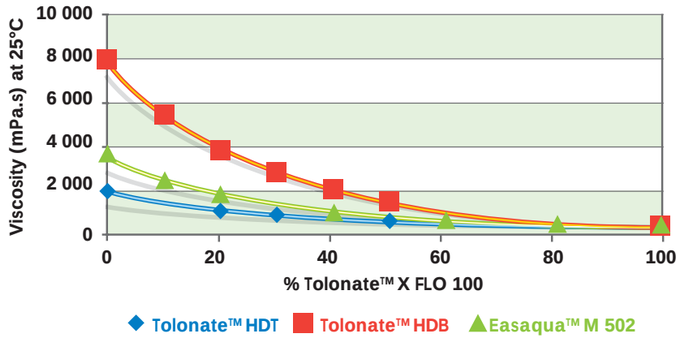
- 100% solids, solvent-free one-pack (1K) moisture-cured polyurethane coatings
- Adhesives or sealants
- Very high solids and/or solvent-free two components (2K) polyurethane and polyurea paints and coatings
- Solvent-free and waterborne polyurethane systems
- Synthesis of polyurethane-based resins and resin intermediates
- Thermosets (cast elastomers) and thermoplastics (TPU)

*non exhaustive list

Tolonate™ X FLO 100: THE solution to reduce viscosity…

…as reactive diluant

Tolonate™ X FLO 100 is miscible in all proportions with hydrophobic and hydrophilic polyisocyanates (See graph 1) while keeping their outstanding properties.



Graph 1: **Effect of Tolonate™ X FLO 100 on the viscosity**

…as building blocks

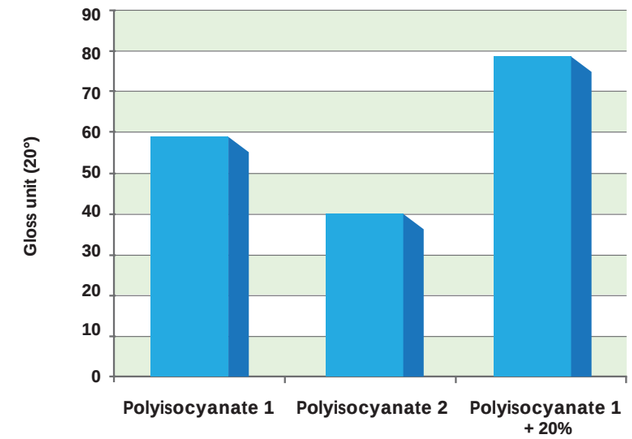
Thanks to its functionality (2 - 2.1) and its polymeric structure, Tolonate™ X FLO 100 is a suitable building block to design polyurethane acrylates (PUA) or polyurethane dispersions (PUD). Specific structure of Tolonate™ X FLO 100 will provide low viscosity PUA (see table 1)

	HDI Based PUA	Tolonate™ X FLO 100 based PUA
Viscosity (Pa.s at 25°C)	24.3	**17.1**
MEK resistance (double rubs)	> 250	> 250
Gloss (20°)	83	86

Table 1: Effect of Tolonate™ X FLO 100 on Hexafunctional PUA based on acrylated pentaerytrytol systems

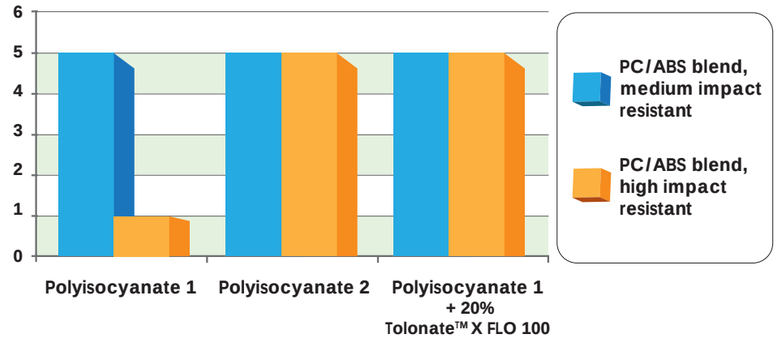
Coatings with improved appearance and end properties

Tolonate™ X FLO 100 is particularly suitable in coating formulations, including waterborne polyurethane systems, to improve appearance of coatings (see graph 2) and end properties like adhesion on plastic substrates (see graph 3). It can partly or totally replace the solvent needed for the formulation of the polyisocyanate while keeping good emulsification properties.



Graph 2 : Influence of Tolonate™ X FLO 100 on the gloss of coated plastic substrates

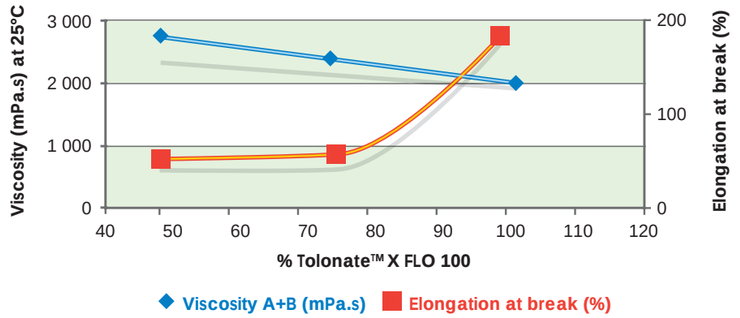
Polyisocyanate 1 : high hydrophilicity / Polyisocyanate 2 : low hydrophilicity



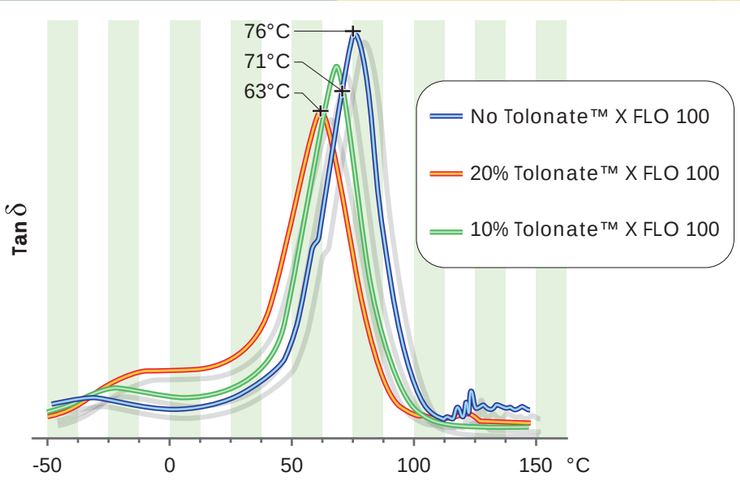
Graph 3 : Improvement of direct to plastic adhesion thanks to Tolonate™ X FLO 100 Crosshatch adhesion test after 3 days in hot water (40°C) / 5 = good / 0 = fail

Elastomers with enhanced mechanical properties

Tolonate™ X FLO 100 shows an excellent compatibility with hydrophobic resins like Hydroxyl Terminated PolyButadiene and enables to improve the mechanical properties (elongation at break) of elastomers (see graph 4). Among other characterictics, Tolonate™ X FLO 100 leads to increased flexibility of crosslinked materials. When used as a co-crosslinker in PU systems, Tolonate™ X FLO 100 can modify the glass transition temperature range (Tg) of the final product (see graph 5) and influence positively mechanical properties such as scratch healing.



Graph 4: Benefit of Tolonate™ X FLO 100 (blended with HDI trimer)



Graph 5: Effect of Tolonate™ X FLO 100 on Tg

Tolonate™ X FLO100 Physical properties

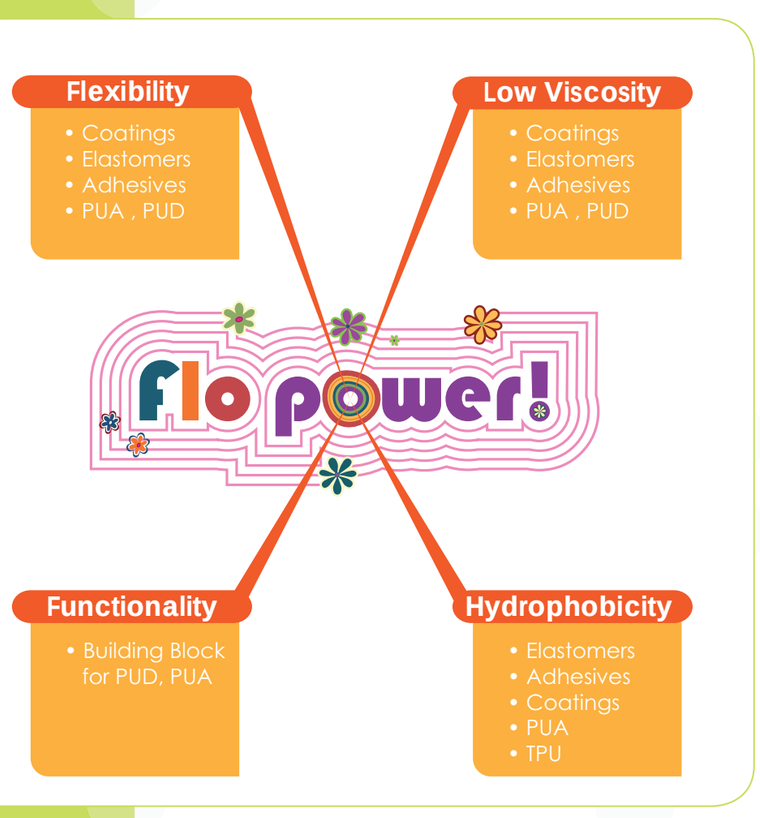
	Color (hazen)	Viscosity (mPa.s)	NCO (%)	Free monomer (%)	Solids content (%)	Bulk density at 25°C (Kg/m³)	Flash point [1](°C)	Equivalent weight [2] (g)	Green carbon content [3] (%)
Tolonate™ X FLO 100	Approx 80	140 ± 80	13.0 ± 1.0	< 0.5	100	Approx 1041	>120	325	Approx 32

Table 2: Tolonate™ X FLO 100 Physical properties

1: closed cup • **2**: on delivery form • **3**: ASTM D 6866

Tolonate™ X FLO 100 is a patented chemical structure registered in China, Taiwan, Korea, Japan, US and considered as a polymer in Europe.

Think of all you can do with Tolonate™ X FLO 100!



Vencorex
chemicals



Vencorex
your core partner
in polyurethane
chemistry

Vencorex is the owner of key technologies and a major manufacturer of aromatic (TDI) and aliphatic isocyanates, (HDI, IPDI) and their derivatives, for the polyurethane markets. Relying on a worldwide commercial representation, Vencorex has manufacturing and lab units in France and USA. Vencorex is supported by PTT Global Chemical, Asia's leading integrated petrochemical company and the Perstorp Group, a world leader in specialty chemicals market.

Let's build our future
together!

Responsible Care®

QUALITY SYSTEM CERTIFICATION ISO 9001 DNV

ENVIRONMENTAL SYSTEM CERTIFICATION ISO 14001 DNV

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