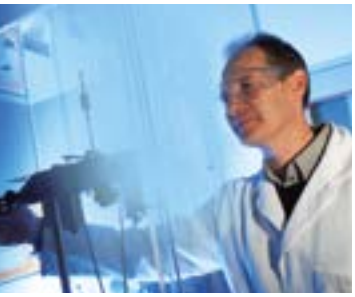
Vencorex chemicals

Aliphatic Isocyanates
for Polyurethane and
Polyurea solutions

Tolonate™ & Easaqua™

www.vencorex.com

Vencorex chemicals




A global player

> Leading manufacturer of **high specialty Isocyanates**

> **Worldwide player** with 3 manufacturing sites :
France (Pont de Claix), USA (Freeport, Tx), Thailand (Rayong)
- **1** R&D center in France (Saint Fons), **1** application lab in China (Shanghai)
- Warehouses to answer local customers needs
- **A worldwide sales footprint**

> Committed to Safety, Environment and Sustainable Development

> Shaped by a culture of **INNOVATION**

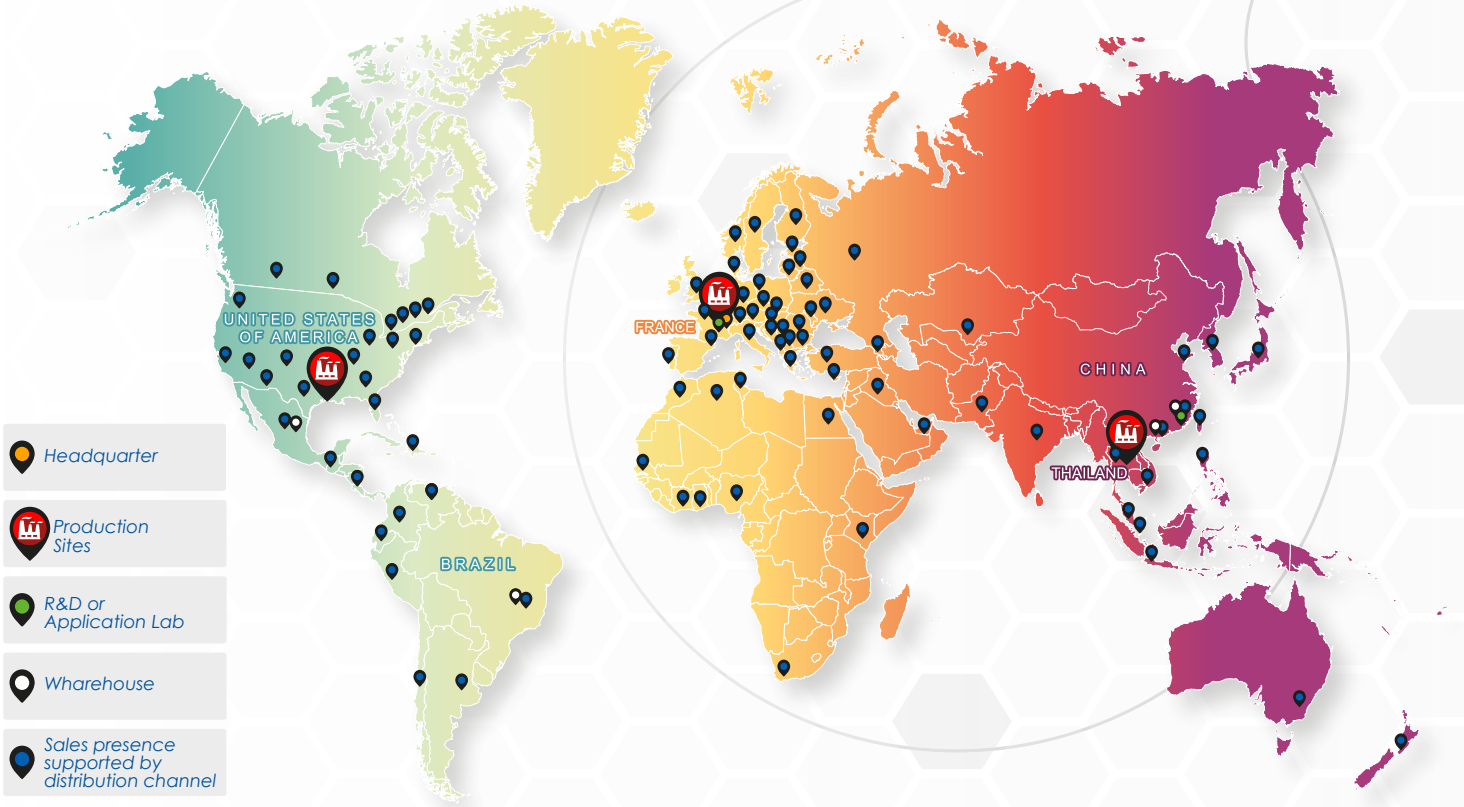
> Supported by **multicultural** and **international** teams

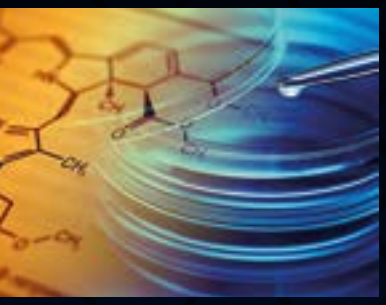
> Gold Medal at **Eco Vadis for Corporate Social Responsibility** Assessment since 2016

> Well-known brand name products
- **Tolonate™**
- **Easaqua™**

> Wide range of products that meet the needs of numerous markets including environmentally friendly CASE formulations

> Active member of ALIPA





Introducing Polyurethane technology

Polyurethane coating technology
Polyurethane coatings are formed by the reaction between a (poly)isocyanate (-NCO) and another polymer containing hydroxyl groups (-OH), commonly called polyol.

Vencorex produces aliphatic isocyanates for polyurethane with exceptional weathering resistance used in all demanding applications:

- Automotive coatings for OEM and refinish
- Transportation coatings: railway, truck and buses, aerospace
- Marine and protective coatings
- Coatings for industrial applications
- Plastic coatings
- Can and coil coatings
- Wood coatings
- Concrete coatings
- Leather finishing
- Adhesives and sealants
- Materials: elastomers and thermoplastic urethanes (TPU)

Our products are mainly used as crosslinkers of two component polyurethanes. They can also be used in other technologies:

- Polyureas based on secondary hindered aliphatic amines, such as polyaspartic ester and polycarbamide resins
- Polyurethane dispersions (PUD)
- Urethane acrylate for U.V. curing
- One component moisture cure polyurethane
- One component (1K) heat activated polyurethane with blocked isocyanate

Aliphatic Isocyanates HDI and IPDI Monomers

The choice of raw materials, both polyols and (poly) isocyanates is very large, enabling many combinations with a wide variety of properties. Polyurethanes based on aliphatic isocyanates are well-known for their outstanding properties, especially for their exceptional resistance to weathering. Vencorex is a major integrated manufacturer of aliphatic isocyanates (HDI and IPDI).

TOLONATE™

Vencorex's Tolonate™ Solvent-based and Solvent-free aliphatic polyisocyanates offer exceptional durability, very good flexibility and extensive possibilities to formulators. As crosslinkers of polyurethane coatings, they ensure:

- Outstanding appearance
- Exceptional gloss retention
- Non yellowing upon ageing
- High solids, low VOC options
- Fast drying possibilities

EASAQUA™

Vencorex's Easaqua™ hydrophilic self-emulsifiable polyisocyanates are based on a unique patented technology, providing exceptional benefits for manufacturers of waterborne polyurethane systems:

- Easy mixing
- Fast drying
- Environmentally friendly
- Worldwide registered
- Widely compatible

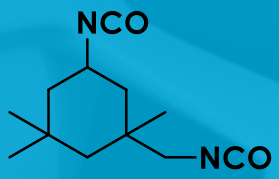
Aliphatic Isocyanates **Monomers**

HDI
(Hexamethylene Di-Isocyanate)

BENEFITS
Light fastness & **flexibility**

APPLICATIONS
used as raw material in the synthesis of:
Resins for coatings & Inks,
Polyurethane dispersion (PUD)
Elastomers & TPU,
Leather & Textile

IPDI
(IsoPhorone Dilsocyanate)



BENEFITS
Light fastness, selectivity & **hardness**

APPLICATIONS
used as raw material in the synthesis of :
Resins for coatings & Inks,
Polyurethane dispersion (PUD)
Elastomers & TPU,
Leather & Textile

Product data summary

	Molecular weight (g/mol)	Colour (Hazen or APHA)	Hydrolysable chlorine (ppm)	Total chlorine (ppm)	Assay (%)	Bulk density at 20°C (g/cm³)	Vapor pressure at 20°C (Pa)
HDI	168.2	≤ 15	< 350	< 1000	> 99.5	1.047	0.7
IPDI	222.3	≤ 30	< 200	< 400	> 99.5	1.060	0.06

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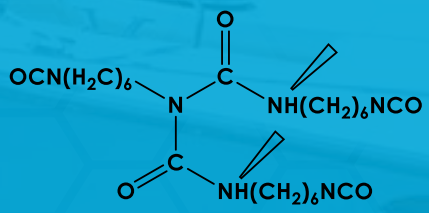
Tolonate™ HDI Biurets & Trimers

Tolonate™ HDB-series



Due to hydrogen bonds, Tolonate™ HDB series are more polar than the other HDI derivatives. As a result, they show:

> **good compatibility** with a wide range of resins (especially polyester polyols & alkyds)

> **very good adhesion** to a lot of substrates

Solvent free: Tolonate™ HDB

BENEFITS
Chemical and stain resistance

APPLICATIONS
Coatings for General Industry

Dilution: Tolonate™ HDB 75

BENEFITS
Adhesion, Flexibility

APPLICATIONS
Coatings for Construction, General Industry, Marine & Protective, Wood

Low viscosity: Tolonate™ HDB LV

BENEFITS
Chemical and stain resistance, VOC reduction, Flexibility

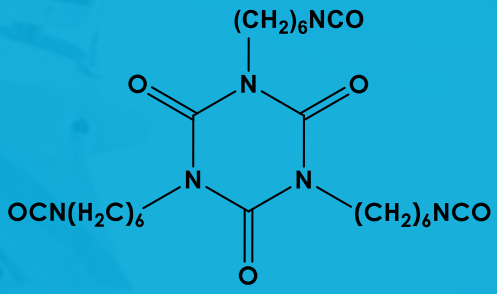
APPLICATIONS
Coatings for Construction, Marine & Protective, Wood
Adhesives & Sealants
Elastomers

Product data summary

Tolonate™	Colour (Hazen or APHA)	Viscosity at 25°C (Avg, mPa.s)	NCO on delivery form (Avg, %)	Free monomer %	Solid content (Avg, %)	Solvent type	Bulk density at 25°C (kg/m³)	Flash point in closed cup (°C)	Equivalent weight on delivery (g)	Refractive index at 25°C
HDB	≤ 40	9000	22	< 0.3	100	-	1120	> 120	191	1.5050
HDB 75 B	≤ 40	150	16.5	< 0.3	75	B	1150	35	255	1.4747
HDB 75 M	≤ 40	250	16.5	< 0.3	75	M	1083	55	255	1.4761
HDB 75 MX	≤ 40	250	16.5	< 0.3	75	MX	1067	38	255	1.4894
HDB 75 BX*	≤ 40	150	16.5	< 0.3	75	BX	1050	35	255	NM
HDB LV	≤ 40	2000	23.5	< 0.3	100	-	1120	> 120	179	1.5013

*Only available in North America / NM: not measured / B: Butyl acetate / M: Methoxy propyl acetate / X: Xylene

Tolonate™ HDT-series



Thanks to their aliphatic nature and to their isocyanurate ring structure, Tolonate™ HDT-series show:

> **exceptional UV and weathering resistance** (non yellowing and very high gloss retention)

> chemical and solvent resistance

> **ideal balance between high functionality and low viscosity**, which explains their increasing usage in low VOC systems (high solids and solvent free formulations)

Solvent free: Tolonate™ HDT

BENEFITS
Abrasion Resistance, Hardness, Weathering Resistance

APPLICATIONS
Coatings for Automotive OEM & Refinish, General Industry, Transportation
Adhesives & Sealants

Dilution: Tolonate™ HDT 90

BENEFITS
Weathering Resistance, Chemical and stain resistance, Abrasion Resistance

APPLICATIONS
Coatings for Automotive OEM & Refinish, General Industry, Marine & Protective, Transportation

Fast drying: Tolonate™ FD 90

BENEFITS
Chemical and stain resistance, Fast drying & Stackability, Weathering Resistance

APPLICATIONS
Coatings for Automotive OEM & refinish, Transportation

Low viscoity: Tolonate™ HDT-LV / LV2

BENEFITS
Adhesion, Weathering Resistance, Heat & humidity resistance, VOC reduction

APPLICATIONS
Coatings for Aerospace, Automotive Refinish, Construction, Plastic
Adhesives & elastomers

FOR 1K HEAT ACTIVATION

Blocked Tolonate™ D2

BENEFITS
Flexibility

APPLICATIONS
Coatings for Automotive OEM, Can & Coil, Textile

Product data summary

Tolonate™	Colour (Hazen or APHA)	Viscosity at 25°C (Avg, mPa.s)	NCO on delivery form (Avg, %)	Free monomer %	Solid content (Avg, %)	Solvent type	Bulk density at 25°C (kg/m³)	Flash point in closed cup (°C)	Equivalent weight on delivery (g)	Refractive index at 25°C
HDT	≤ 40	2400	22	< 0.2	100	-	1160	> 120	191	1.5039
HDT 90	≤ 40	500	19.8	< 0.2	90	SB	1120	53	212	1.4988
HDT 90 B	≤ 40	450	20	< 0.2	90	B	1132	48	210	1.4923
FD 90 B	≤ 40	2000	17.4	< 0.5	90	B	1130	48	241	1.4960
HDT-LV	≤ 40	1200	23	< 0.2	100	-	1160	> 120	183	1.5004
HDT-LV2	≤ 40	600	23	< 0.5	100	-	1131	> 120	183	1.4986
D2	≤ 40	3250	11.2*	-	75	S	1060	49	370	1.5103

*Blocked NCO / S: Aromatic hydrocarbon / B: butyl acetate

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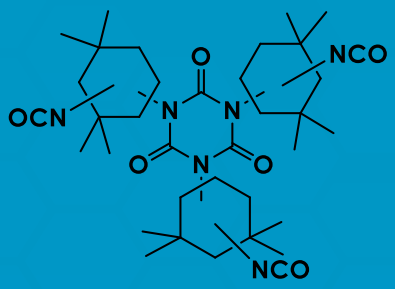
Tolonate™ IPDI Trimer

Tolonate™ IDT 70 B



Tolonate™ IDT 70 B is based on cycloaliphatic isocyanate, with a high glass transition temperature. It reduces physical drying time of polyurethane coatings.

Tolonate™ IDT 70 B

BENEFITS
Abrasion Resistance,
Hardness,
Fast drying
& Stackability,
Longer pot life

APPLICATIONS
Coatings for Automotive
OEM & refinish
General industry
wood

Exemple of Tolonate™ IDT 70 B influence in 2K PU formulation

Tolonate™ HDT 90 B Alone

Tack free time
2h15

Pot life
2h15

Persoz hardness after 7 days
161

Blend 80/20 Tolonate™ HDT 90 B / Tolonate™ IDT 70 B

Tack free time
1h15

Pot life
3h00

Persoz hardness after 7 days
204

Resin: acrylic polyol, 2.2 %OH on solids, 80% solids.
Application on glass panel, 100µm wet film thickness.

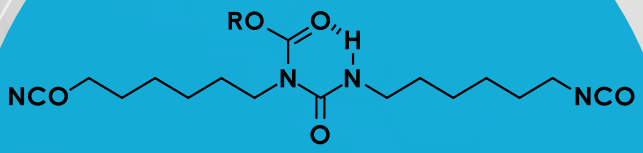
Product data summary

	Colour (Hazen or APHA)	Viscosity at 25°C (Avg, mPa.s)	NCO on delivery form (Avg, %)	Free monomer %	Solid content (Avg, %)	Solvent type	Bulk density at 25°C (kg/m³)	Flash point in closed cup (°C)	Equivalent weight on delivery (g)	Refractive index at 25°C
Tolonate™ IDT 70 B	≤ 60	600	12.3	< 0.5	70	Butyl acetate	1060	29	342	1.48

Tolonate™ X FLO 100

Partially bio-based

Tolonate™ X FLO 100



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

BENEFITS

Flexibility, Longer pot life, VOC reduction
32% green carbon

APPLICATIONS

Coatings for Construction
Resins for coatings & inks
Adhesives & sealants
Elatomers & TPU

Further detailed information are available in the Tolonate™ X FLO100 dedicated brochure.

Tolonate™ X FLO 100 could be used as building block in resin synthesis or as co-crosslinker in combination with another derivative from the Tolonate™ or Easaqua™ range:
A typical usage level is between 20% and 40% in the hardener formulation.

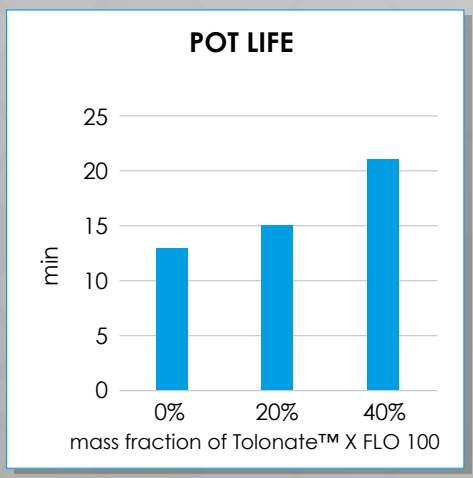


Fig 1. Pot life depending on mass fraction of Tolonate™ X FLO 100 in the hardener formulation. Part A: blend of polyaspartics resins

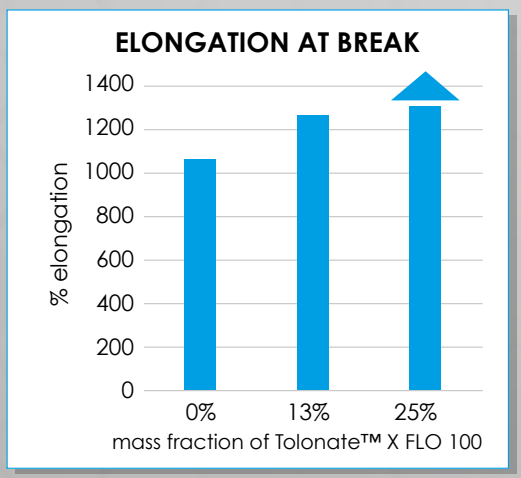


Fig 2. Elongation at break for a PUD with blend IPDI / Tolonate™ X FLO 100. At 25% the sample didn't break.

Product data summary

	Colour (Hazen or APHA)	Viscosity at 25°C (Avg, mPa.s)	NCO on delivery form (Avg, %)	Free monomer %	Solid content (Avg, %)	Bulk density at 25°C (kg/m³)	Flash point in closed cup (°C)	Equivalent weight on delivery (g)	Green carbon content* (%)
Tolonate™ X FLO 100	Approx. 80	140	12.3	< 0.5	100	Approx. 1041	> 120	341	Approx. 32

*ASTM D 6866

Tolonate™ X F 800

Tolonate™ X F 800

Tolonate™ X F 800 is a solvent free and low viscosity aliphatic polyisocyanate based on HDI. Tolonate™ X F 800 gives the perfect balance between hardness and flexibility. It provides excellent impact resistance, high scratch resistance and superior adhesion. It is compatible with solventborne, solventfree and waterborne systems.

BENEFITS

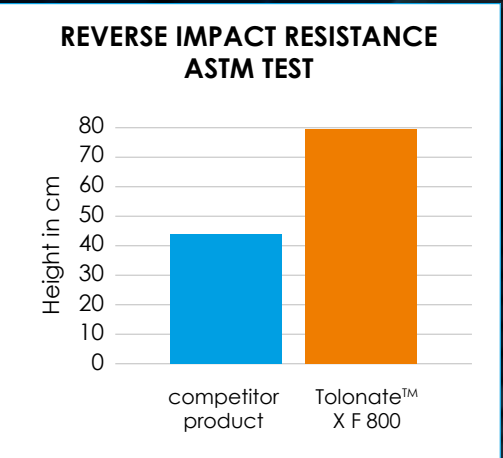
Adhesion, **Impact resistance**, **Flexibility**

APPLICATIONS

Coatings for Construction, General Industry, Marine & Protective

Polyureas formulation with Tolonate™ X F 800 showing high hardness and excellent reverse impact resistance.

	Competitor product	Tolonate™ X F 800
ASTM impact resistance reverse	46	80



polyaspartic resin with an amine value of 200 mg KOH/g, NCO/NH=1.

Product data summary

	Colour (Hazen or APHA)	Viscosity at 25°C (Avg, mPa.s)	NCO on delivery form (Avg, %)	Free monomer %	Solid content (Avg, %)	Bulk density at 25°C (kg/m³)	Flash point in closed cup (°C)	Equivalent weight on delivery (g)
Tolonate™ X F 800	≤ 80	800	20.1	< 0.3	100	1095	> 120	209

Tolonate™
Product Summary

IPDI
Monomer for Resin synthesis

- **IDT 70 B** — Fast drying

HDI
Monomer for Resin synthesis

- **X FLO 100** — Biobased, flexibility
- **X F 800** — Flexibility / hardness balance
- **HDB, HDB 75*** — Biurets (adhesion, compatibility)
  - **HDB-LV** — Low viscosity
- **HDT, HDT 90*** — Trimers (weathering resistance)
  - **HDT-LV, HDT-LV2** — Low viscosity
- **FD 90 B** — High functionality

Vencorex chemicals

Hydrophilic Isocyanates Easaqua™

Over the last twenty years, new regulations on VOC emissions have been implemented globally to reduce the impact of the industry on the environment. Coatings manufacturers had to adapt their formulations to switch from solvent based to water based polyurethane coatings. Our Easaqua™ product line has been developed to support this technology switch and provide safe and easy to use products for end users.

The Easaqua™ range, based on unique and patented technology specifically designed for waterborne polyurethane formulations, offers self emulsifiable isocyanates, very easy to use and providing high performances.

Our Easaqua™ aliphatic polyisocyanates

> Enable easy mixing and fast drying

> Meet demands for environmentally friendly performance

> Deliver innovative technology with broad compatibility

> Include ready-to-use grades

Self-emulsification of Easaqua™
Shows hand mixing of Easaqua™ (right) and standard hydrophobic isocyanate (left)

Easaqua™ grades are self emulsifiable so very easy to incorporate in waterborne formulations. High speed mixing is not needed, a manual hand mixing is sufficient.

Easaqua™ HDI based

Easaqua™ M & L series

Easaqua™ M & L series are versatile self-emulsifiable aliphatic polyisocyanates, used to prepare crosslinker for high performance **two-pack (2K) waterborne polyurethane** coatings & adhesives.

As they are **solvent-free**, it allows a large choice of organic solvents to optimize parameters of the formulation.

Easaqua™ M 501

BENEFITS
Chemical and stain resistance, VOC reduction
Mat finish

APPLICATIONS
Coatings for Construction, Marine & Protective

Easaqua™ M 502

BENEFITS
Easy dispersibility into water, VOC reduction, Weathering Resistance

APPLICATIONS
Coatings for General Industry, Transportation

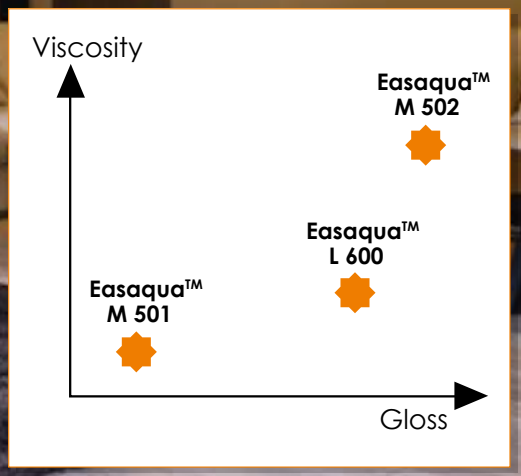
Easaqua™ L 600

BENEFITS
Easy dispersibility into water, Flexibility, Heat & humidity resistance, VOC reduction, Excellent DTM adhesion

APPLICATIONS
Coatings for Automotive OEM & Refinish, Construction, General Industry

Different level of gloss possible with our Easaqua™ grades

Left: Easaqua™ M501, Right: Easaqua™ L600



Product data summary

	Viscosity at 25°C (Avg, mPa.s)	NCO content (Avg, %)	Solid content (Avg, %)
Easaqua™ M 501	1100	21.6	100
Easaqua™ M 502	3600	18.3	100
Easaqua™ L 600	1800	20.5	100

Easaqua™ HDI and IPDI based

Easaqua™ D series

Easaqua™ X D grades are ready-to-use and self-emulsifiable aliphatic polyisocyanates.

They are based on a unique **combination of Easaqua™ technology and HDI/IPDI derivatives**.

They are used as **fast drying** hardeners of two-pack (2K) waterborne high performance polyurethane coatings.

Easaqua™ X D 401

BENEFITS
Easy dispersibility into water, Fast drying & Stackability, Hardness, Longer pot life

APPLICATIONS
Coatings for Automotive OEM & Refinish, Transportation, Wood

Easaqua™ X D 803

BENEFITS
Abrasion Resistance, Easy dispersibility into water, Fast drying & Stackability, Hardness, Longer pot life

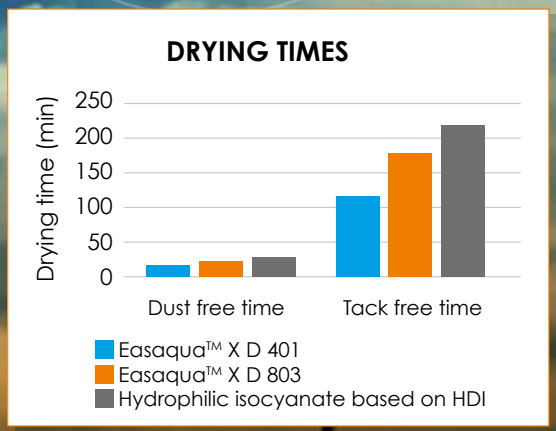
APPLICATIONS
Coatings for General Industry, Transportation, Wood

Easaqua™ X D 870

BENEFITS
Easy dispersibility into water, Hardness, Longer pot life, diluted in ecofriendly solvent

APPLICATIONS
Coatings for Construction, Wood

Fast drying obtained with the Easaqua™ X D series



2K WB PU formulation based on a solvent free PUD, 35% solids. 10% isocyanate on total formula.

Our Easaqua™ provides early stackability performance.

Curing time at 50°C	Easaqua™ X D 870	Easaqua™ X D 803	Hydrophilic isocyanate based on HDI
30 min	Pass	Pass	Fail
45 min	Pass	Pass	Pass

2K WB PU formulation based on 2 acrylic polyols with 2,4% and 3,5 %OH. NCO/OH=1,3. 100 µm wet on Leneta chart, curing at 50°C, contact black on white 1h, 50°C,150 g/cm².

Product data summary

	Viscosity at 25°C (Avg, mPa.s)	NCO content (Avg, %)	Solid content (Avg, %)	Solvent type
Easaqua™ X D 401	1050	15.8	85	Butyl acetate
Easaqua™ X D 803	200	12.2	69	Butoxyl
Easaqua™ X D 870	380	12.4	69	Propylene Glycol Diacetate

Easaqua™

Product Summary

Easaqua™ HDI based
Solvent free

- **M 501** — Mat finish
- **M 502** — High gloss
- **L 600** — Water resistance

Easaqua™ HDI /IPDI based
Ready to use

- **X D 803** — Easily dispersible
- **X D 870** — Environmentally friendly
- **X D 401** — High hardness

Processing recommendations with Tolonate™

NCO/OH ratio: calculation and impact on final properties

Polyurethane network is created by the reaction between the Tolonate™ – based hardener and the polyol. In theory a stoichiometrical ratio should be used (NCO/OH = 1), i.e. an equal number of NCO-groups of Tolonate™ will have to react with the OH-groups of the polyol*.

> But in practice the NCO/OH ratio varies, depending on the required end properties.

In the case of primer coats – NCO/OH is usually lower than 1 (0.7 to 0.9 for example), to obtain a better film flexibility and a better inter-coat adhesion with the topcoat.

In the case of topcoats – NCO/OH is usually higher than 1 (1.1 to 1.5 for example) in order to ensure a perfect crosslinking of the film, and thus durability and protection against UV light, humidity and chemicals.

> An easy way to calculate the quantities of each component (Tolonate™ and polyol) is obtained by using the so called "equivalent weights". They are either indicated on the product technical data sheets or can be calculated from the NCO content (%) and OH content (%), as explained here after:

Tolonate™

EW_{NCO} = equivalent weight of NCO in grams = 42x100/(% NCO)

Polyol

EW_{OH} = equivalent weight of OH in grams = 17x100/(% OH)

Technical data sheets of polyols sometimes only mention the OH index (I_{OH} in mg KOH per gram of dry resin). OH content (%) can be calculated from this using the following formula:

% OH = I_{OH} / 32.94

> The ratio between the two components can then be obtained by using:
- quantity of Tolonate™ (in grams) = NCO/OH x EW_{NCO} (as supplied)
- quantity of polyol (in grams) = EW_{OH} (as supplied) = EW_{OH} (on solids) / (solids content)

> Example:
For a polyol with an OH% = 4% (on solids) and a solids content of 60% by weight:

EW_{OH} (on solids) = 17x100/4 = 425g
EW_{OH} (on delivery form) = 425/(60/100) = 708g

Quantity of Tolonate™ HDB 75 MX to be used to have NCO/OH = 1.1:
As NCO% = 16.5% then EW_{NCO} (as supplied) = 42 x 100/16.5 = 255g

We therefore need 255 x 1.1 = 280g of Tolonate™ HDB 75 MX for 708g of polyol, which means 39.6g of Tolonate™HDB 75 MX for 100g of polyol.

Formulators have to make their own tests in order to define the best NCO/OH ratio depending on their formulation and final application.

Influence of temperature on viscosity

Viscosity							
Tolonate™	-20°C	-10°C	0°C	10°C	20°C	40°C	60°C
Biurets							
HDB	NM	NM	241470	66310	22730	3540	860
HDB 75 B	4440	1810	800	390	210	80	35
HDB 75 M	NM	NM	1450	600	310	110	45
HDB 75 MX	11000	3850	1820	700	340	110	50
HDB LV	NM	65680	19660	7190	2910	665	200
Trimers							
HDT	373000*	75400	26680	8530	3410	770	250
HDT 90	27430	9070	3420	1440	690	200	80
HDT 90 B	21230*	7390*	2700	1090	570	180	75
FD 90 B	NM	36700	12550	6470	2950	1470	NM
HDT LV	126240*	27400	9380	3810	1640	410	140
HDT LV2	41200*	15580	5170	2180	1000	280	105
D2	NM	NM	10100	24060	6370	960	250
IPDI Trimer							
IDT 70 B	NM	NM	NM	2320	820	160	76
Specialities							
X FLO 100	4660	1630	690	337	180	70	19
X F 800	68000	18940	6430	2550	1150	310	110

*calculated - NM: not measured

Dilutions of Tolonate™ with solvents in 2K formulations

In order to obtain a simple mixing ratio between part A and part B and to obtain the right application viscosity, formulators usually dilute Tolonate™ using one or several solvents.

Type of solvents

Most common solvents of the paint industry can be used to dilute Tolonate™ grades with the exception of hydroxylated solvents which can react with the isocyanate such as alcohol or glycols. Besides, Tolonate™ grade are not fully soluble in aliphatic hydrocarbons like White spirit which should not be used.

Recommended solvents are esters like butyl acetate and ketones like methyl isobutyl ketone (MIBK). Ether ester like MPA and aromatic hydrocarbon like xylene or naphta solvents are also commonly used.

Dilutions in hydrophilic solvents such as ketones are more sensitive to atmospheric humidity.

Water content of solvents and impurities reacting with isocyanate

Like all isocyanates, Tolonate™ grades react with water. So it is essential to use solvents with low water content such as urethane grade solvents containing less than 300 ppm of water.

We also recommend to carefully check the quantity of impurities of the solvent which might react with the isocyanate such as butanol in butyl acetate or acetic acid in methoxy propyl acetate.

Dilution level

In theory it is possible to dilute Tolonate™ grades at high degree. However, the higher the quantity of solvent the greater the risk that traces of water from the solvent may cause stability issue of the diluted isocyanate.

For this reason it is recommended to limit the dilution to 40% solid content. Below this level there is a risk of obtaining turbidity, precipitates or even gels.

It should be noted that trimers can generally withstand higher dilution levels than biurets.

Processing recommendations with Easaqua™

NCO/OH ratio in waterborne formulations

In most cases NCO/OH ratio for waterborne formulations with hydroxylated resins is between 1.0 and 1.5. At a high ratio pot life may be reduced and film defects like foam or haze could occur. If the ratio is below 1.0, this may lead to lower hardness and poorer chemical resistance. Generally a ratio above 1.0 is recommended for a full crosslinking considering that there is some side reactions between isocyanate and water.
In the case of waterborne formulations with non-hydroxylated resins such as PUDs, the quantity of Easaqua™ to be added is empirically determined. Generally it is between 5 to 10% by weight.
NCO/OH ratio calculation with Easaqua™ calculated as with Tolonate™: see page 16.

Dilutions of Easaqua™ with solvents

Diluting Easaqua™ is usually not necessary but it can help to incorporate the hardener in very low viscous formulations such as clearcoats.
The choice of solvent to dilute Easaqua™ is very important because when the right solvent is used then very small particles and very narrow particle size distribution are obtained after emulsification. This will influence film properties like gloss.

Type of solvents

Most common solvents of the paint industry can be used to dilute Easaqua™ grades with the exception of hydroxylated solvents which can react with the isocyanate such as alcohol or glycols.
Recommended solvents are esters like butyl glycol acetate, butyl acetate and ether ester like MPA, PGDA.

Water content of solvents and impurities reacting with isocyanate

Same recommendations as Tolonate™ apply for Easaqua™. See page 17.

Dilution level

Same recommendations as Tolonate™ apply for Easaqua™. See page 17.

Blending Easaqua™ with other polyisocyanates

Generally, one Easaqua™ grade is used as crosslinker of the formulation. Nevertheless, to adjust final film properties, it is possible to blend the Easaqua™ grades with Tolonate™ grades. Easaqua™ are compatible with the whole range of Tolonate™ but the most suitable ones are low viscosity grades: Tolonate™ HDT LV, Tolonate™ HDT LV2, Tolonate™ X F 800 and Tolonate™ X FLO 100.

Safety instructions & worldwide registration

Safety instructions

To formulate Tolonate™ and Easaqua™ several safety instructions are recommended:

- Never add water to the hardener as it will react with the isocyanate. In the case of waterborne 2K formulations, the Easaqua hardener has always to be added in the water-based resin part, which contains a large excess of water.

- Never keep the mixture of Part A containing the polyol with hardener containing isocyanate in a sealed collecting tank.

- Never put waste into a hermetically sealed collecting tank; use a tank equipped with a safety valve to enable gases to release.

- Before any modification of the hardener composition at industrial level, it is recommended to run lab or pilot test on small quantities.

- Before handling isocyanate refer to its safety data sheet.

Worldwide registration

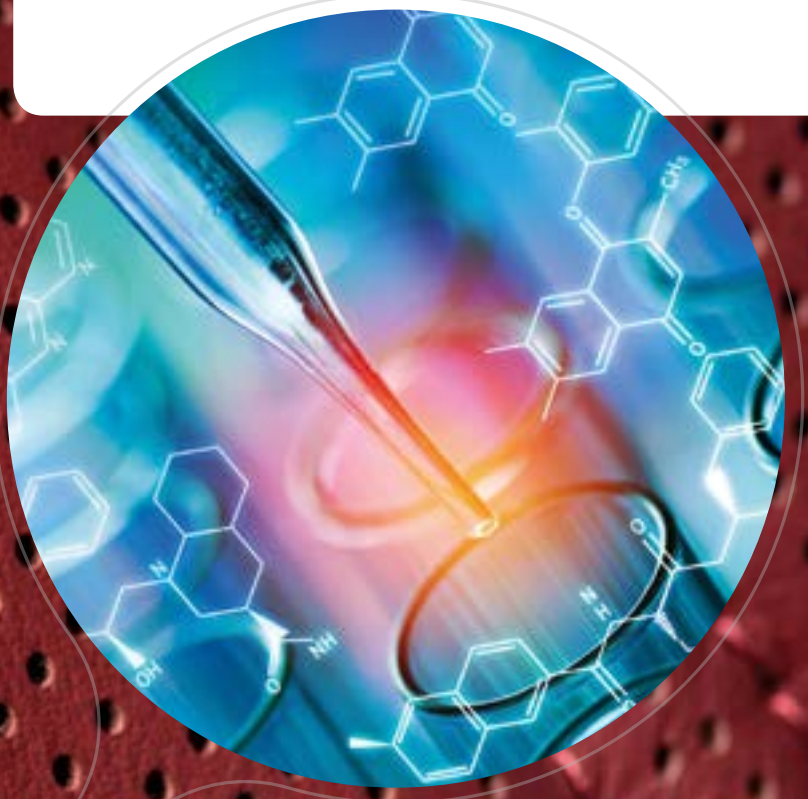
All substances in Tolonate™ and Easaqua™ products are registered in the following national inventories:

- EINECS (Europe)
- TSCA (USA)
- IECS (China)
- ENCS (Japan)
- ECL (South Korea)
- AICS (Australia)

Information on other countries upon request.

All substances in Vencorex products manufactured in Pont de Claix (France) have been registered according to EU REACH regulation requirements.

All products mentioned in the brochure are commercially available.



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