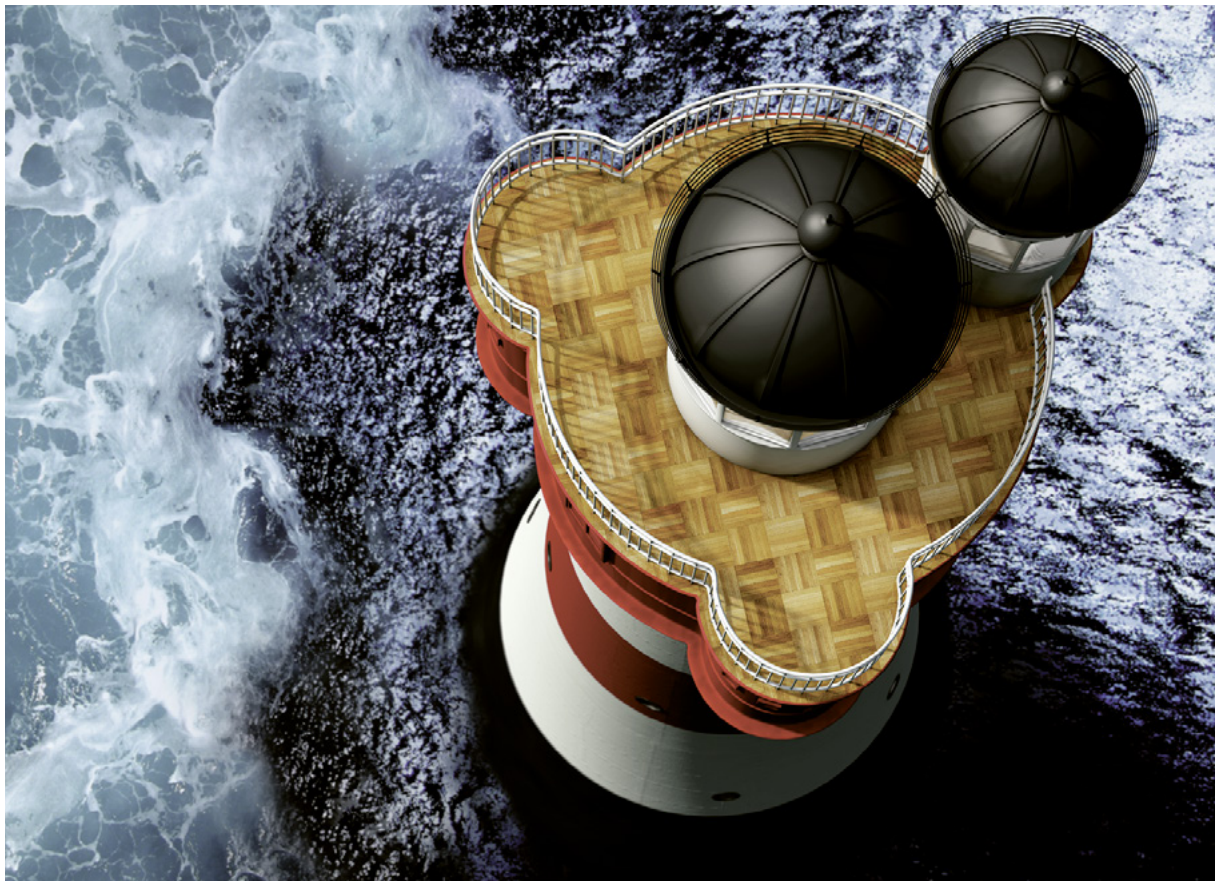


VESTANAT®

Polyurethane crosslinkers
for liquid coating applications

vesta[®]nat

VESTA – Developed in Germany.
Available globally.



About us

For more than 55 years Evonik's Business Line Crosslinkers has been the reliable partner and solution provider in the field of isophorone chemistry. With global production sites, we are uniquely placed to satisfy our customers' demands. Our portfolio of VESTA products showcases high performance materials that enhance the quality of our customers' applications.

VESTA – Developed in Germany. Available globally.



VESTANAT®
products are a natural fit
for high performance
PUR coatings.

Benefits at a glance

- Versatile product range
- Excellence in quality
- Securing reliability for coating formulations
- Global technical service and R&D

With its highly specialized product portfolio and broad expertise in crosslinker technology, Evonik is a major and essential provider of new solutions for liquid coating systems. Our strong competitive position is based on integrated technology platforms, innovation power and close cooperation with our customers.

vestanat
stands for **natural fit**

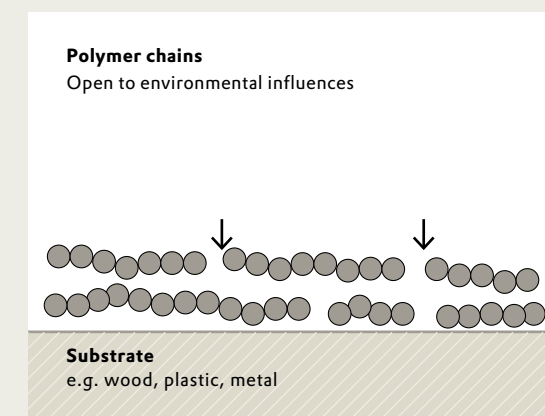
Crosslinking makes the difference ...

In a well-linked network, by connecting many individuals, a continuously stable performance can be assured and often even the positive extra can be achieved.

The idea of crosslinking can be applied in the field of coating systems. Single molecules have the potential to perform outstandingly, but crosslinked molecules surpass the level of superior performance.

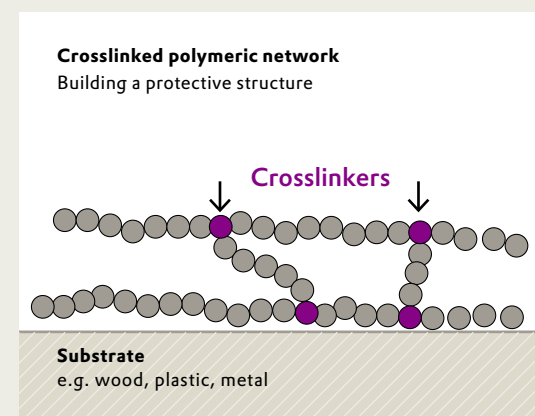
Non-crosslinked coatings

Without crosslinking, a coating will be easily influenced by environmental impacts and will consequently lead to the damaging of the substrate.



Crosslinked coatings

Crosslinkers increase the stability of the coating and improve the resistance towards environmental impacts.



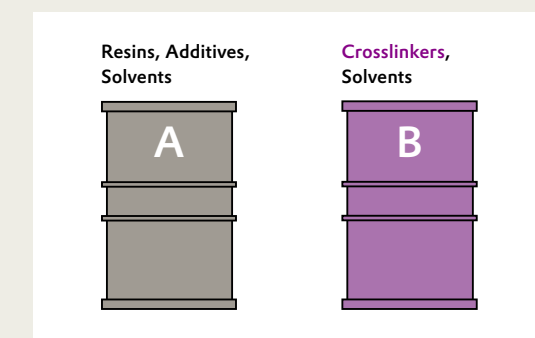
Based on a broad isophorone technology platform Evonik offers **VESTANAT®** crosslinking solutions that ensure the excellence of coatings.

VESTANAT® Crosslinkers for high-performance PUR coatings

VESTANAT® crosslinkers focus on aliphatic polyisocyanate crosslinkers that are light-stable. They are based on e.g. IPDI isocyanurate trimer, for the formulation of one- (1K) and two component (2K) polyurethane systems.

Polyisocyanate crosslinkers in 2K systems

- Combination with a resin component right before application
- Reaction starts immediately after mixing the polyisocyanate with the resin component
- Reaction leads to a 3D network with a high durability

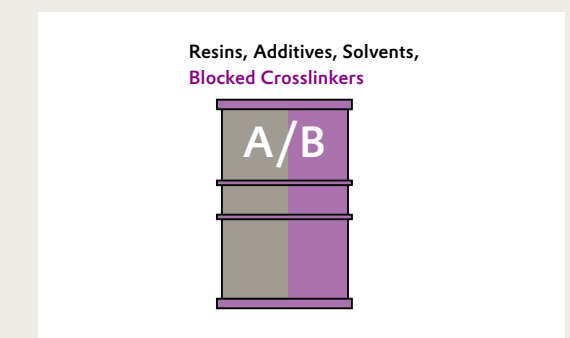


Evonik solutions for 2K systems

VESTANAT® T
Polyisocyanates; IPDI-trimer

Blocked polyurethane crosslinkers in thermosetting 1K systems

- Contains blocking agents e.g. ϵ -caprolactam
- At ambient temperature: blocked polyurethane crosslinkers cannot react with the resin component
- At elevated temperatures: the blocking agent will be released and the isocyanate group can react with the resin



Evonik solutions for 1K systems

VESTANAT® B
Blocked polyurethane crosslinker

VESTANAT® EP-DS
Waterborne blocked polyurethane crosslinker

These crosslinkers come along with ready-to-react isocyanate groups which can link with isocyanate reactive functionalities e.g. hydroxyl groups. To address the challenges of today and tomorrow we offer high performance crosslinkers for the use in high-end applications.

Agriculture & Maintenance Automotive OEM & Car Refinish

VESTANAT® polyisocyanate crosslinkers are used for the formulation of highly weather- and chemical resistant PUR coatings. VESTANAT® T 1890 imparts faster dry times, which result into remarkably short curing cycles even at ambient temperatures.



Selection of solutions

VESTANAT® T 1890 / E / L / SN

are cycloaliphatic polyisocyanate crosslinkers with a high compatibility. The crosslinkers are used for light-stable and weather-resistant 2K PUR systems with improved physical drying properties and chemical resistance. They are available as 70% solutions in different solvents.

VESTANAT® B 1358 A

Is a blocked cycloaliphatic polyurethane crosslinker for the use e.g. in 1K automotive OEM primers generating excellent intercoat adhesion. It is characterized by an excellent balance of reactivity and storage stability.

BENEFITS

- Durability against environmental impacts
- High reactivity even at ambient temperature
- First-class chemical resistance
- Short curing cycles
- Excellent compatibility & high reactivity

Can- & Coil Coating

Blocked VESTANAT® polyurethane crosslinkers offer solutions for interior as well as exterior coating applications within the can- & coil coating industry. Highly flexible coatings with superior durability are easy to obtain, ensuring prime protection.



Selection of solutions

VESTANAT® B 1186 A

Is a cycloaliphatic blocked polyurethane crosslinker for interior BPA-NI * can coatings. According to FCN No. 1268, VESTANAT® B 1186 A is eligible for food contact applications. Please refer to FCN. No. 1268 or get directly in touch with us for further details.

* BPA-NI = Bisphenol A – not intentionally added

VESTANAT® B 1358 A

Is a cycloaliphatic blocked polyurethane crosslinker to be used for exterior can coatings.

VESTANAT® B 1481 ND

Is a cycloaliphatic blocked polyurethane crosslinker to be used for coil coating formulations due to a low tendency to yellow during curing process.

BENEFITS

- All can- & coil coating applications can be served (food / non-food)
- 1K storage-stable approaches
- Improved sterilization resistance
- High flexibility

Decorative & Industrial

Unique VESTANAT® DS grades are sophisticated blocked waterborne crosslinkers. These products are available either for anionic or cationic 1K formulations for e.g. glass, metal or textile coatings.



Selection of solutions

VESTANAT® EP-DS 1205 E

Is a blocked polyurethane crosslinker based on cycloaliphatic VESTANAT® IPDI emulsified in water without any auxiliary solvents for combinations with anionic or nonionic waterborne OH-terminated resin dispersions.

BENEFITS

- Light stability
- Co-solvent-free
- Water-based

Specialties

Crosslinker specialties adjust your coating systems according to your individual needs and add a unique touch to your formulation.

Our versatile spectrum of specialty products complement your specific application requirements. Please contact us to elaborate on your tailor-made solution.

Extract of crosslinker specialties application fields:

- OEM applications
- Maintenance
- Industrial
- Wood
- Plastic coatings



Selection of solutions

VESTANAT® T 1890/100

Is a solvent-free cycloaliphatic polyisocyanate crosslinker which can be used in 2K PUR systems e.g. for the manufacture of PUR resins or blocked polyisocyanates.

Its broad solubility in all types of non-protic solvents gives our customers the chance to chose a solvent which fits best to the coating application.

VESTANAT® B 1358/100

Is a solvent-free blocked cycloaliphatic polyisocyanate crosslinker which can be used in 1K PUR stoving systems.

The solvent-free delivery form offers a great choice of possible solvents to be used with the benefit of the optimization of many paint formulations.

VESTANAT® EP-B 1358 DINP

Is a cycloaliphatic blocked polyurethane crosslinker component supplied as a solution in diisononylphthalate for the combination with plastisols and organosols.

It is specially developed e.g. for under-the-body coatings leading to a solid and resistant result.

VESTAMIN® A 139

Is a liquid blocked crosslinker for polyisocyanate resins based on a cycloaliphatic diamine. The product exhibits a very low reactivity towards isocyanate groups. The fast crosslinking with polyisocyanate resins occurs under the influence of moisture by releasing the original diamine.

OXYESTER® EP-HS 2272

Is a linear polyester diol, developed primarily for the use in aliphatic PUR technology, especially as a VOC-reducing co-polyol in 2K PUR high solid coatings.

OXYESTER® T 1136

Is a linear saturated polyester diol. It is mainly applied as a flexibilizing polyol in 2K PUR high solid paints or 1K stoving systems.



BENEFITS

- Plug-in tools for the enhancement of your coating formulation
- Faster curing cycles
- Lower VOC contents
- Higher flexibility momentum



Evonik's Business Line Crosslinkers is your perfect partner for innovative product developments and tailor-made solutions!

VESTANAT® Product range for liquid coating applications

Polyisocyanate crosslinkers for 2K systems

VESTANAT® T Polyisocyanates; IPDI-trimer

| | Physical form | NCO content | Viscosity at 23°C | Commercial availability |
|----------------------|-------------------------------------|-------------|-------------------|-------------------------|
| VESTANAT® T 1890 E | 70 % in butylacetate | 12.0 % | 900 mPas | Worldwide |
| VESTANAT® T 1890 L | 70 % in BuAc /solvent naphtha (1:2) | 12.0 % | 1.700 mPas | Worldwide |
| VESTANAT® T 1890 SN | 70% in solvent naphtha | 12.0 % | 2.000 mPas | Worldwide |
| VESTANAT® T 1890/100 | 100 % (pellets) | 17.3 % | - | Worldwide |

Others

| | Physical form | OH-value / Amine value | Viscosity at 23°C | Commercial availability |
|-----------------------|----------------|------------------------|-------------------|-------------------------|
| OXYESTER EP-HS 2272 * | 100 % (liquid) | 215 mg KOH/g | 1.300 mPas | Europe |
| OXYESTER T 1136 | 100 % (liquid) | 107 mg KOH/g | 4.000 mPas | Worldwide |
| VESTAMIN® A 139 | 100 % (liquid) | 400 mg KOH/g | 25 mPas | NAFTA, Europe |

* EP = Experimental Product

Blocked polyurethane crosslinkers for 1K systems

VESTANAT® B Blocked polyurethanes; Solvent borne

| | Physical form | NCO content | Viscosity at 23°C | Blocking agent | Commercial availability |
|----------------------------|-----------------------------|---------------------------------|-------------------|---------------------|-------------------------|
| VESTANAT® B 1042 E | 65 % in butylacetate | NCO equivalent approx. 630 g/eq | 1.500 mPas | Diethylmalonate | Worldwide |
| VESTANAT® B 1358 A | 63 % in solvent naphtha | 8.0 % | 5.000 mPas | Methylethylketoxime | Worldwide |
| VESTANAT® EP-B 1358 DINP * | 40 % in diisononylphthalate | 5.0 % | 20.000 mPas | Methylethylketoxime | Worldwide |
| VESTANAT® B 1358/100 | 100 % (flakes) | 12.5 % | - | Methylethylketoxime | Worldwide |
| VESTANAT® B 1370 | 60 % in BuAc/Xylene (3:5) | 8.0 % | 2.600 mPas | Acetoneoxime | Worldwide |
| VESTANAT® B 1186 A | 60 % in solvent naphtha | 7.1 % | 1.200 mPas | ε-caprolactam | Worldwide |
| VESTANAT® B 1481 ND | 65 % in solvent naphtha | 8.5 % | 2.400 mPas | ε-caprolactam | Worldwide |

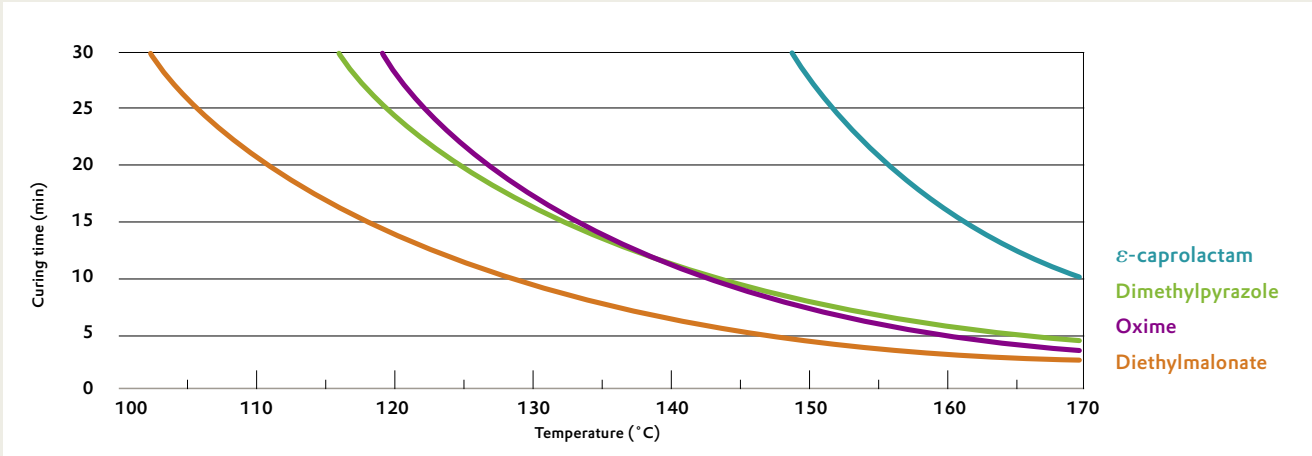
* EP = Experimental Product

VESTANAT® B Blocked polyurethanes; Water borne

| | Physical form | NCO content | Viscosity at 23°C | Blocking agent | Commercial availability |
|--------------------------|---------------|-------------|-------------------|---------------------|-------------------------|
| VESTANAT® EP-DS 1205 E * | 42 % in water | 11.0 % | 110 mPas | Methylethylketoxime | Europe |

* EP = Experimental Product

Blocking agent related curing settings



Depending on curing temperature and curing time different VESTANAT® crosslinkers are available.

EVONIK OPERATIONS GMBH

Business Line Crosslinkers
Paul-Baumann-Straße 1
45764 Marl
Germany
Phone +49 2365 49-9011

www.evonik.com/crosslinkers
www.evonik.com/crosslinkers-contact

**EVONIK CORPORATION**

Business Line Crosslinkers
7201 Hamilton Blvd.
Allentown, PA 18195
USA
Phone +1-610-573-5207

EVONIK SPECIALITY CHEMICALS CO. LTD.

Business Line Crosslinkers
55, Chundong Road
Xinzhuang Industry Park
Shanghai, 201108
China
Phone +86 21 6119 1000

® is a registered trademark of **EVONIK INDUSTRIES AG** or one of its subsidiaries.

This information and all further technical advice are based on our present knowledge and experience. However, it implies no liability or other legal responsibility on our part, including with regard to existing third party intellectual property rights, especially patent rights. In particular, no warranty, whether express or implied, or guarantee of product properties in the legal sense is intended or implied. We reserve the right to make any changes according to technological progress or further developments. The customer is not released from the obligation to conduct careful inspection and testing of incoming goods. Performance of the product described herein should be verified by testing, which should be carried out only by qualified experts in the sole responsibility of a customer. Reference to trade names used by other companies is neither a recommendation, nor does it imply that similar products could not be used.



For contacts in your country, please visit:
www.evonik.com/crosslinkers-contact

06.2020 /hg