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.

Benefits at a glance

- Light stable and weather resistant
- Full gloss control
- Excellent reusability
- Brilliant mechanical properties
- Non-hazardous
- Broad product range for multiple applications

Evonik played a major role in the development of powder coating technology from the very beginning and today produces a number of different raw materials which are used by powder coating manufacturers worldwide.

VESTAGON® products enable light-stable, weather-resistant powder coating systems – beyond your imagination.
Powder Coatings

Easy to use, environmentally friendly and cost effective: Powder coatings have become extremely popular. They find use in a wide range of applications, such as automotive, architectural, lawn and garden as well as for general metal applications. Powder coatings are the right choice, even for temperature-sensitive substrates.

**Powder applications are often the most cost effective application, due to**
- Low raw material costs
- A high transfer yield because of overspray recycling
- High coating thickness in one step
- No solvents needed
- Often no primer needed

Polyurethane Powder Coatings

PUR powder coatings show superior light stability and chemical resistance in comparison to non-PUR powder coating technologies. Another benefit is the formation of high crosslinking densities. Chemical as well as hydrogen bondings between urethane groups lead to high surface hardness while acting flexible in case of impacts from outside. Polyurethane powder coatings fulfill highest demands coming from the coatings industry like automotive and architecture.

**Polyurethane systems provide**
- Superior durability
- Good levelling
- High hardness
- Good flexibility
- Antigraffiti properties

Additional hydrogen bondings enable high hardness and good flexibility.
The majority of powder coatings are matte. The production of matte powder coatings takes long because typically 2 coatings have to be produced separately and blended afterwards (dry blend technology). VESTAGON® grades are appreciated worldwide for the formulation of matte polyurethane powder coatings just by using dissimilar resins (OH-No. ~280 blended with OH-No. ~40) in one coating (one shot matte technology).

Less steps – Lower costs

The gloss value strongly depends on the type of polyesters used, their specific mixing ratio and the stoichiometry towards the crosslinker. As a consequence, each combination of polyesters must be tested empirically on their matting effect with the crosslinker in use. It is highly recommended to precisely adjust the ratio of the polyesters and the crosslinker to make each formulation robust in terms of gloss readings during production.

VESTAGON® products are the ideal solution for light stable and weather resistant powder coating systems.

The Evonik portfolio contains e-caprolactam blocked (VESTAGON® B) as well as blocking agent free grades (VESTAGON® BF). Antigraffiti, optimized matting, low-temperature cure, food contact - VESTAGON® crosslinkers enable powder coating systems beyond your imagination.
Our VESTAGON® B grades are blocked by using an external blocking agent. During synthesis, the reactive group is rendered inert through the formation of a relatively weak urea bond. This bond can be cleaved upon heating starting at 170°C by forming ε-caprolactam.

From linear to highly branched, Evonik provides a full range of externally blocked crosslinkers to allow formulators to meet various demands of end customers.

**VESTAGON® B grades**

VESTAGON® B grades are ε-caprolactam-blocked, PUR crosslinkers providing high crosslinking density and good levelling.

**BENEFITS**

- High crosslink density
- High glass transition temperature
- Excellent antigraffiti properties
- Excellent durability
- Good levelling

**PUR Crosslinkers (blocked)**

<table>
<thead>
<tr>
<th>Supply Form</th>
<th>NCO content</th>
<th>Tg</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>VESTAGON® B 1065</td>
<td>Pellets</td>
<td>10.1-10.8 % bwt</td>
<td>~51 °C</td>
</tr>
<tr>
<td>VESTAGON® B 1400</td>
<td>Pellets/Flakes</td>
<td>12.5-14.0 % bwt</td>
<td>~52 °C</td>
</tr>
<tr>
<td>VESTAGON® B 1530</td>
<td>Pellets/Flakes</td>
<td>14.8-15.7 % bwt</td>
<td>~48 °C</td>
</tr>
</tbody>
</table>

= Crosslinker backbone

R = Polyester backbone
Our VESTAGON® BF grades are blocking agent free. During synthesis the reactive groups are rendered inert through the formation of a relatively weak uretdione ring. This bond can be cleaved upon heating starting from 160°C. Special low temperature curing grades starting from 120°C are available.

Although the total content of reactive groups is similar to ε-caprolactam blocked grades, their functionality is somewhat lower. The use of branched polyesters with a higher hydroxyl content can compensate for this.

VESTAGON® BF grades are internally blocked PUR crosslinkers enabling the formulation of coatings with low emission values.

**BENEFITS**
- Low emission
- Even flat matte is possible in one shot
- Good durability

**PUR Crosslinkers (blocking agent free)**

<table>
<thead>
<tr>
<th>Supply Form</th>
<th>NCO content</th>
<th>Tg</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>VESTAGON® BF 1320</td>
<td>Coarsely ground</td>
<td>13.5-13.0 % bwt</td>
<td>~75°C</td>
</tr>
<tr>
<td>VESTAGON® BF 1321</td>
<td>Coarsely ground</td>
<td>14.0-15.5% bwt</td>
<td>~77°C</td>
</tr>
<tr>
<td>VESTAGON® EP-BF 1350</td>
<td>Coarsely ground</td>
<td>12.5-14.0 % bwt</td>
<td>~61°C</td>
</tr>
<tr>
<td>VESTAGON® BF 1540</td>
<td>Granules</td>
<td>15.2-17.0 % bwt</td>
<td>~84°C</td>
</tr>
<tr>
<td>VESTAGON® EP-BF 9030</td>
<td>Granules</td>
<td>12.0-13.5 % bwt</td>
<td>~50°C</td>
</tr>
<tr>
<td>VESTAGON® EP-SC 5050</td>
<td>Powder</td>
<td>–</td>
<td>–</td>
</tr>
</tbody>
</table>
Automotive Coatings

Powder coated rims, assembly parts and automotive trim must withstand chemical attacks e.g. from acid rain and brake fluids. Furthermore, they have to be UV and stone chip resistant.

VESTAGON® B 1530
Is a PUR crosslinker imparting superior chemical resistance.

VESTAGON® EP-BF 1350
Is a blocking agent free crosslinker imparting superior levelling.

Coatings for Decorative Metal Surfaces

For sublimation technology to achieve good image sharpness, the coating must withstand high temperatures without changing its morphology or becoming soft. This is why high Tg polyurethanes are suited to this technology.

VESTAGON® BF 1320
Is an internally blocked PUR crosslinker for high production reliability.

VESTAGON® BF 1321
Is comparable to VESTAGON® BF 1320 but for lowest possible gloss readings.

APPLICATIONS

BENEFITS

VESTAGON® B 1530

• High crosslink density
• High glass transition temperature
• Excellent durability
• Good levelling

VESTAGON® EP-BF 1350

• One shot matte technology
• Excellent gloss control
• Good sharpness of images
• Production reliability
**Antigraffiti Coatings**

PUR powders are particularly useful in antigraffiti applications and whiteboards, where a high crosslinking density and coatings Tg enable resistance to antigraffiti, board markers and repeated cleaning.

**VESTAGON® B 1530**  
Is the preferred grade for highly crosslinked polyurethane powders providing a functionality of about 3.

**VESTAGON® BF 1540**  
Is a blocking agent free alternative to VESTAGON® B 1530, and requires higher OH-containing polyesters.

**Household Appliances**

PUR technology boost chemical resistance and appearance in coatings for household appliances. Hybrids can be reinforced by imparting PUR technology. It is possible to apply those systems even on surfaces able to withstand conditions being found at washers.

**VESTAGON® B 1400**  
Is a cost effective highly branched crosslinker with good overall properties.

**VESTAGON® BF 1540**  
Is a blocking agent free alternative to VESTAGON® B 1400, and requires higher OH-containing polyesters.

**Metal Rim Coatings**

Scratch resistance and impact resistance make polyurethane coatings as the material of choice to color metal parts like frames for bicycles, scooters and motorcycles.

**VESTAGON® B 1530**  
Enables the formulation of highly crosslinked coatings with a good levelling.

**VESTAGON® BF 1320**  
Enables the formulation of low emission powder coatings and matting.
Let’s get in contact.
Comprehensive supply chain & technical service around the world

Our VESTA experts look forward to serving you

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