Vinnolits' low emission grades:

®Vinnolit E 75 SK, ®Vinnolit E 74 CC and ®Vinnolit E 75 HV are fine-particle sized specialty emulsion homopolymers for plastisol processing, classified as low, medium and high viscosity resins.

®Vinnolit E 75 SK and ®Vinnolit E 74 CC are designed for the production of compact films and chemically blown foams.

®Vinnolit E 75 HV is designed for special artificial leather foam constructions.

®Vinnolit E 75 SK and ®Vinnolit E 75 HV furthermore exhibit excellent thermomechanical foam stabilities for modern processing in automotive applications.

All grades show lowest emissions.

Main application for all these grades is car interior.

Benefit from ®Vinnolit paste & extender PVC in your application.

Our Technical Service is ready to support you!

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Vinnolit is a Westlake Company

Paste & Extender PVC

Specialty low emission grades
Processing and Application

Plastisols based on these polymers can be applied by all commonly used coating technologies for artificial leather/foam foils production.

Noteworthy properties are:
- Adjustable viscosities for processing: low/medium/high with pseudoplastic base rheology
- Excellent foaming characteristics: high thermal stability and good mechanical properties of foams
- Good deaeration properties of the paste
- Good filler tolerance of the plastisol
- Wide processing range
- Excellent emission properties

Emission tests:

For materials in car interior applications all kinds of emissions are very critical. Therefore all ingredients of the plastisol formulation must reduce their contribution to the overall emission level.

The car producers specified test methods to characterize the emissions of materials. Methods in use for raw material tests (e.g. PVC) are:

- Fogging value DIN 75201 B, 10 g PVC heated 16 h at 100 °C, gravimetrical analysis of fogging condensate on aluminium foil. Limit for finished material: < 1 mg
- VDA 277 headspace gas chromatography purge and trap/thermo desorption GC-MS: 30 mg PVC, heated 30 min at 90°C for VOC value and 60 min at 120°C for Fog value, calibration with toluene (VOC) and hexadecane (Fog). Limit for end article: VOC < 250 ppm, Fog < 700 ppm

Typical results of Vinnolits' specialty grades:

<table>
<thead>
<tr>
<th>PVC</th>
<th>Fogging [mg]</th>
<th>VDA 277 [ppm]</th>
<th>VDA 278 [ppm]</th>
</tr>
</thead>
<tbody>
<tr>
<td>E 75 SK</td>
<td>&lt; 0.5</td>
<td>&lt; 15</td>
<td>VOC 41</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Fog 31</td>
</tr>
<tr>
<td>E 74 CC</td>
<td>&lt; 0.25</td>
<td>&lt; 15</td>
<td>VOC 42</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>Fog 12</td>
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<tr>
<td>E 75 HV</td>
<td>&lt; 0.5</td>
<td>&lt; 15</td>
<td>VOC 37</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Fog 29</td>
</tr>
<tr>
<td>Competitor</td>
<td>&lt; 0.5</td>
<td>&lt; 35</td>
<td>VOC 76</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Fog 31</td>
</tr>
</tbody>
</table>

Continuous improvement on emissions:

The graph shows the development of the gravimetric fogging values of e.g. Vinnolit E 75 SK over recent years.

A clear trend towards lower values can be observed.

The reason behind this is a continuous improvement of the quality (purity) of our processing additives and conditions.

Thus the average fogging values of E 75 SK decreased from $\bar{O} = 0.55$ mg/10 g PVC in 2012 to 0.20 mg/10 g PVC in 2015.

Conclusions:

- With premium-quality raw materials, like our low-emission paste grades (®Vinnolit E 74 CC, ®Vinnolit E 75 SK and ®Vinnolit E 75 HV), very low gravimetrical fogging levels are accessible.
- ®Vinnolit E 74 CC shows the lowest fogging value in the market.
- According to VDA 277, Vinnolit specialty resins show lower values for VOC compared to the best competitors’ resins.
- According to VDA 278, lower VOC values with Vinnolit specialty resins could be obtained.
- The Fog values determined with VDA 278 show low values.
- All specialty Vinnolit resins for car interior do not contain critical substances (e.g GADSL list).