Transparent Fillers and their use in paint formulation
Fillers in the paint industry and their function

<table>
<thead>
<tr>
<th>Traditional Fillers</th>
<th>Value</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>Calciumcarbonate</td>
<td>low cost</td>
<td>body filler + brightness</td>
</tr>
<tr>
<td>Talc</td>
<td>medium value</td>
<td>opacity + brightness</td>
</tr>
<tr>
<td>Baryte</td>
<td>medium value</td>
<td>body filler + brightness</td>
</tr>
<tr>
<td>Mica</td>
<td>medium value</td>
<td>cracking control</td>
</tr>
</tbody>
</table>

**New Filler Type**

| Glass powders                | medium value | transparence + special functions |
Glass Powders Boruvit

Boruvit Glass powder acting as Functional Filler in Paints

- Transparency (neutral for pigmention)
- UV-absorption
- Scratch resistance
- Adhesion of coatings
- Mechanical properties
- Sanding
- Blocking
Research on use of Boruvit Glass powder in transparent wood coatings by Clariant Germany
Transparent Wood Coatings on Emulsion basis with UV - Protection
## Basic formulation of a Transparent Wood Coating

<table>
<thead>
<tr>
<th>Components</th>
<th>Parts by weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mowilith LDM 7416 approx. 50 %</td>
<td>740,0</td>
</tr>
<tr>
<td>Ammoniak 25 %</td>
<td>2,0</td>
</tr>
<tr>
<td>Water</td>
<td>93,5</td>
</tr>
<tr>
<td>Mergal KD 10 N</td>
<td>2,0</td>
</tr>
<tr>
<td>Syloid ED 30</td>
<td>15,0</td>
</tr>
<tr>
<td>Agitan 295</td>
<td>4,0</td>
</tr>
<tr>
<td>Lopon 890</td>
<td>3,0</td>
</tr>
<tr>
<td>Dowanol DPnB</td>
<td>20,0</td>
</tr>
<tr>
<td>Methoxybutanol</td>
<td>20,0</td>
</tr>
<tr>
<td>Rhoximat RH 50 MD</td>
<td>0,5</td>
</tr>
<tr>
<td>Primal RM-8</td>
<td></td>
</tr>
<tr>
<td>Water</td>
<td>15,0</td>
</tr>
<tr>
<td>Ultralube E 390 Cl</td>
<td>40,0</td>
</tr>
</tbody>
</table>

Total: 960,0
Traditional Formulations

- Insufficient UV-absorption
  → requires UV-absorber and HALS (hindered amine light stabilizer)

- High Thermoplasticity
  → leads to problems with Blocking and Sanding
New paint formulation
Including Boruvit B 140
Reducing UV-Transmission

1) 1,5% UV-Absorber
2) without addition
3) 10% Boruvit
4) 30% Boruvit
5) 4% Pigment preparation
The transparent wood coatings filled with Boruvit were tested on a weathering standing panel in Frankfurt area according to the normal conditions (45% inclination). This test showed the lasting UV-absorption of the Boruvit into the wood coatings. This field test result has been confirmed by laboratory measurements on UV-transmission.
a and c are without,
b and d with Boruvit 200

a and b = one coat
c and d = two coats
Conclusions

By adding Boruvit to transparent wood coatings made on emulsion basis,
it is possible to improve the following properties:

• UV – Protection
  • Blocking
  • Sanding

Without reducing noticeably the transparency of the wood coating
physical and chemical aspects of Boruvit

- mechanically strong
- transparent
- chemically resistant
- granular particle shape
- safe in handling
- particle sizes
  0-40 / 70 / 100 microns
Economic aspects of using of Boruvit

- Medium Value of Boruvit Glass Powder

- Important Cost savings on UV-absorbers / HALS

- Overall cost savings by filling up to 30 % Boruvit
Possible uses of Boruvit in paints

- Transparent Wood coatings
- Heavy duty coatings
- Transparent sealants