Guideline Formula 13. External Varnish for Bodies

<table>
<thead>
<tr>
<th>PRODUCT</th>
<th>WEIGHT</th>
<th>PRODUCER</th>
<th>URL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acrylic resin (60% nvm, medium mole weight, Ohv 110)</td>
<td>370</td>
<td>JANA</td>
<td><a href="http://www.jana-ksa.net">www.jana-ksa.net</a></td>
</tr>
<tr>
<td>BE 659</td>
<td>45</td>
<td>DOW</td>
<td><a href="http://www.dow.com">www.dow.com</a></td>
</tr>
<tr>
<td>Razeen LR 1100</td>
<td>60</td>
<td>JANA</td>
<td><a href="http://www.jana-ksa.net">www.jana-ksa.net</a></td>
</tr>
<tr>
<td>PMA</td>
<td>285</td>
<td>DOW</td>
<td><a href="http://www.dow.com">www.dow.com</a></td>
</tr>
<tr>
<td>Phosphoric Acid</td>
<td>1</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

And all items in turn to item 1.

Formulating Details

- Film former type: Acrylic
- Crosslinker type: Benzoguanamine
- Solis ratio: 8.7/1 (acrylic + epoxy/amino)
- Typical Stoving Schedule: 15-45 secs @ 200-250˚C
- Solids: 0.31
- Viscosity: 45 seconds Ford Cup 4/25˚C

Testing

**Mechanical**
- Slip: Pasteurisation 80˚C/30 minutes in water
- Process 115˚C/30 minutes in water

**Mechanical**
- Wedge bend
- Box draw
- Adhesion (cross hatch to basecoat)
- Abrasion resistance
- Scratch
- Slip

External Coating for Ends
Guideline Formula 6 is suitable
Internal Coating for Ends
Guideline Formula 5 is suitable

**Guideline Formula 5 is suitable**
**Guideline Formula 12. External White Basecoat for bodies**

- Acrylic resin (60% nvm, medium mole weight, Ohv 110) 370
- Titanium dioxide 250
- Cymel 301 25
- Razeen LR 1100 70
- PMA 185
- PM 99
- Phosphoric Acid 1

Disperse item 2 in item 1 using HSD and keeping temperature below 50˚C. Continue until off. Scale using a Hegman gauge. Add remaining items in turn.

**Formulating Details**

- **Film former type**: Acrylic
- **Crosslinker type**: HMMM
- **Solids ratio**: 11.7/1 (acrylic +epoxy/amino)
- **Typical Stiving Schedule**: 15-45 secs @ 200-250˚C
- **Solids**: 56%
- **Viscosity**: 65 seconds Ford Cup 4/25˚C

**Testing**

**Mechanical**
- Wedge bend
- Box draw
- Adhesion (cross hatch)
- Abrasion resistance
- Scratch
- Slip

**2.3 Two Piece Aerosols**

**Guideline Formula 14. Internal Spray**

- Razeen SR 5099 140
- Xylene 273
- Butanol 205
- Ethyl glycol 282
Phenolic (butylated resole 60%
BE 659 20
Lanco wax TF1780 10

Dissolve epoxy in items 2-4 by heating to 80°C. Cool and add remaining items.

Formulating Details

<table>
<thead>
<tr>
<th>Film former type</th>
<th>Epoxy phenolic</th>
</tr>
</thead>
<tbody>
<tr>
<td>Crosslinker type</td>
<td>Benzoguanamine</td>
</tr>
<tr>
<td>Solids ratio</td>
<td>12.6/1 (epoxy +phenolic/amino)</td>
</tr>
<tr>
<td>Typical Stoving Schedule</td>
<td>6 - 7 minutes at 230°C</td>
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<tr>
<td>Solids</td>
<td>Solids</td>
</tr>
<tr>
<td>Viscosity</td>
<td>25 seconds Ford Cup 4/25°C</td>
</tr>
</tbody>
</table>

Testing

**Mechanical**
- Buckle test
- Box draw followed by wedge bend
- Cross hatch adhesion
- Necking test

**Chemical**
- Dichloromethane at 40°C/24 hours
- Diethy ether/water/ethanol 45/10/45 at 40°C/24 hrs.
- Cross hatch adhesion
- Enamel rating

External White for bodies
Guideline Formulation 12 is suitable
Typical stoving schedule is 1-2 minutes at 160 -190°C

External Varnish for bodies
Guideline Formulation 13 is suitable
Typical stoving schedule is 1-2 minutes at 160 -190°C

External White for end (Cones)
Guidelines Formulation 8 is suitable
Typical stoving schedule is 10-12 minutes at 160 -180°C

External Varnish for ends (Cones)
Guideline Formulation 6 is suitable and can be used without white basecoat if required
Typical stoving schedule is 10-12 minutes at 160 -180°C

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