Testing of Paint Reformulation Guidelines and the Reformulation Results

CPU-Royal Scientific Society

30.04.2020
The Feedback on the Guidelines

• Guideline Mainly to
  • Ministry of Health
  • Ministry of Environment
  • Ministry of Industry and Trade
  • Jordan Standards and Metrology Organization
  • Jordan Chambers of Industry
  • Participants from paint industry (4 Companies)
The Feedback on the Guidelines

• Feedback from
  • Ministry of Health (comments on translation mainly the word dirty)
  • Jordan Standards and Metrology Organization (comments on translation and terminology to be in line with JSMO)
The Feedback on the Guidelines

• Their opinion
  • Terminology
  • Definitions

• What should be added or better explained?
  • Jordanian experience from the companies participated in the project.
## Reformulation Overview in Jordan

<table>
<thead>
<tr>
<th>Company</th>
<th>Target Paints</th>
<th>Stages</th>
<th>Type</th>
<th>Quantity of Lead Paints [ton]</th>
<th>Quantity of Raw Materials Containing Lead</th>
</tr>
</thead>
</table>
| Sipes Paints    | Road paints (yellow)                 | • New Reformulation  
• Test at RSS Labs  
• Regarding lead is OK  
• Luminance factor (58>45) | Alkyd base    | 84 (26.5 for road)          | 11            |
|                 |                                      |                                                                        |              |                              |                                          |
| Golden Paints   | Car paints (orange/yellow)            | • New Reformulation  
• Application on car metals  
• Sent to BASF R & D in Germany | Solvent based |                              |                                          |
# Reformulation Overview in Jordan

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</tr>
</thead>
<tbody>
<tr>
<td>Tameer Paints</td>
<td>Road paints (yellow)</td>
<td>S6 • New Reformulation • Test at RSS Labs • Should be reformulated</td>
<td>Oil based</td>
<td></td>
<td></td>
</tr>
<tr>
<td>UniChem</td>
<td>Withdraw from the project, because it closed. Technical paint is to replace and they are in the stage of reviewing contract</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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Testing of Paint Reformulation — 24/04/2021
www.rss.jo
Reformulation Results of Selected Products (Road Marking)

<table>
<thead>
<tr>
<th>Test</th>
<th>Alt.#1</th>
<th>Alt.#2</th>
<th>STD</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lead content</td>
<td>&lt; 1.0 [mg/kg]</td>
<td>&lt;1.0 [mg/kg]</td>
<td>Lead chromate</td>
<td>Requirement</td>
</tr>
<tr>
<td>Luminance factor</td>
<td>46.8</td>
<td>48.8</td>
<td>59.5</td>
<td>&gt; 58</td>
</tr>
<tr>
<td>Opacity CR [%]</td>
<td>99.4</td>
<td>96.6</td>
<td>97.5</td>
<td>&gt; 96</td>
</tr>
<tr>
<td>Abrasion resistance (sand: Liter)</td>
<td>&gt; 45</td>
<td>&gt; 45</td>
<td>&gt; 45</td>
<td>&gt; 45</td>
</tr>
<tr>
<td>Luminance factor/300 hrs accelerated weathering [QUV]</td>
<td>45.4</td>
<td>44.9</td>
<td>57.5</td>
<td>&gt; 55</td>
</tr>
<tr>
<td>Fineness of grind [Hegman]</td>
<td>4</td>
<td>4</td>
<td>4</td>
<td>&gt;3</td>
</tr>
</tbody>
</table>
Color Comparison
Drivers and Barriers to SMEs Reformulation

Drivers

- Environmental issue
- New Regulations
- Social responsibility.
Drivers and Barriers to SMEs Reformulation

- Pigment availability in local market
- Equipment availability (e.g. ball mill)
- Price
The Economic Evaluation of Reformulated Paints

Raw materials cost increase by about 90%

Production cost: will be higher by about (x), since the production time is higher by about 200%

Product cost increase by about 30-60%
Lessons Learned and Best Practices

- Pigment availability in the Jordan market and its price
- Availability of equipment to perform the reformulation is very important
- Matching the standard color, which is adopted by local parties
- Matching the opacity of lead chromate paint, so TiO\textsubscript{2} pigment is used to overcome this point
- Organic pigments need milling and more time
Influence of Lead Paint Laws on Reformulation

New lead concentration limit (90 ppm) will accelerate the reformulation activities, especially if this new limit comes into act.
Conclusions and the Way Forward: Views on the future of reformulation in Jordan

Plan to Continue Reformulation

- Continue with the other two companies.
- Continue to find new participants.
- Continue to work with the related authorities.
- Add the national experience to the Reformulation Guidelines
Conclusions and the Way Forward:
Views on the future of reformulation in Jordan

Way Forward

• Response with the feedback on the Reformulation Guidelines.
• Modify the Guidelines accordingly.
• Expand the awareness activities
Thank you

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