Silicones for textile processing
Silicones in textile
Main advantages

- Excellent softness and slickness
- Very nice gloss
- Hydrophobic or hydrophilic
- Darkening/ deepening color
- High weatherability
Mechanism of silicone softening

Affinity to textiles

- Silicone backbone distribution on fabric surface and inside fabric
- Flexible or pliable hand-feel vs. only surface slickness

Multifunctional softeners: Extremely high affinity with textiles
Treatment process

Main parameters influencing textile treatment and thus choice of product

• pH
• Temperature
• Shear
• Sensitivity to oxidization

These parameters are determined by the treatment process
Treatment process

Exhaust bath

- Rather low temperatures
- No shear applied
- Large liquor to goods ratio
- Open bath more susceptible to oxidization
Treatment process

Padding

- Higher temperatures
- Solution subjected to shear
- Easier to apply chemicals with low affinity for the fiber
Treatment process

Jet dyeing

- Higher temperatures
- Solution subjected to high shear
- Less water and time consuming
- Easier to apply chemicals with low affinity for the fiber
BRB product range

- Amino silicone oils
- Amino silicone emulsions
- Hydrophilic silicones
- Antifoams
Standard amino silicone softeners

- Good slickness: silky and bouncy hand-feel
- Not hydrophilic
- Fabric yellowing (amine content) can be overcome:
  - Application in acidic conditions
  - Amino groups are quaternized to cationic species (stronger attraction for the negatively charged fabric)
  - Especially for cotton-based fabrics (anionic charges on surface)
  - Improves deposition, performance and durability of the softener coating
Amino silicone oils

<table>
<thead>
<tr>
<th>Product</th>
<th>Type</th>
<th>End Cap</th>
<th>N % w/w</th>
<th>Viscosity cP</th>
</tr>
</thead>
<tbody>
<tr>
<td>BRB 8373</td>
<td>Pendant</td>
<td>Reactive</td>
<td>0.37</td>
<td>1,000</td>
</tr>
<tr>
<td>BRB3163</td>
<td>Pendant</td>
<td>Reactive</td>
<td>0.33</td>
<td>1,500</td>
</tr>
<tr>
<td>BRB 4031</td>
<td>Pendant</td>
<td>Reactive</td>
<td>0.37</td>
<td>900</td>
</tr>
<tr>
<td>BRB 4234</td>
<td>Pendant</td>
<td>Reactive</td>
<td>0.52</td>
<td>1,100</td>
</tr>
<tr>
<td>BRB 4036</td>
<td>Pendant</td>
<td>Reactive</td>
<td>0.78</td>
<td>1,300</td>
</tr>
<tr>
<td>BRB 4535</td>
<td>Pendant</td>
<td>Reactive</td>
<td>0.16</td>
<td>3,000</td>
</tr>
</tbody>
</table>

- Standard primary / secondary amino silicone oils
- Easy to emulsify to micro and macro emulsions
- Higher viscosity gives good greasy hand
## Amino silicone oils

<table>
<thead>
<tr>
<th>Product</th>
<th>Softness</th>
<th>Whiteness</th>
<th>Absorbency</th>
<th>Repellency</th>
</tr>
</thead>
<tbody>
<tr>
<td>BRB 8373</td>
<td>+</td>
<td>++</td>
<td>++</td>
<td>+++</td>
</tr>
<tr>
<td>BRB 3163</td>
<td>++</td>
<td>++</td>
<td>++</td>
<td>+++</td>
</tr>
<tr>
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<td>++</td>
<td>++</td>
<td>++</td>
<td>+++</td>
</tr>
<tr>
<td>BRB 4234</td>
<td>++</td>
<td>++</td>
<td>++</td>
<td>+++</td>
</tr>
<tr>
<td>BRB 4036</td>
<td>++</td>
<td>+</td>
<td>++</td>
<td>+++</td>
</tr>
<tr>
<td>BRB 4535</td>
<td>+++</td>
<td>+++</td>
<td>++</td>
<td>+++</td>
</tr>
</tbody>
</table>

- Standard to low yellowing
- Increase physical adsorption thus providing softening effect
# Amino silicone emulsions

<table>
<thead>
<tr>
<th>Product</th>
<th>Type</th>
<th>Active content</th>
<th>N % w/w</th>
<th>Viscosity cP</th>
</tr>
</thead>
<tbody>
<tr>
<td>BRB AFE 674</td>
<td>Macro</td>
<td>52%</td>
<td>0.07</td>
<td>400</td>
</tr>
<tr>
<td>BRB AFE 675</td>
<td>Micro</td>
<td>43%</td>
<td>0.04</td>
<td>500</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Product</th>
<th>Softness</th>
<th>Whiteness</th>
<th>Absorbency</th>
<th>Repellency</th>
</tr>
</thead>
<tbody>
<tr>
<td>BRB AFE 674</td>
<td>+++</td>
<td>+++</td>
<td>++</td>
<td>+++</td>
</tr>
<tr>
<td>BRB AFE 675</td>
<td>+++</td>
<td>+++</td>
<td>++</td>
<td>++</td>
</tr>
</tbody>
</table>

- Based on reactive pendant amino silicone oil
- Macro-emulsions deliver the silicone to the surface (topcoat)
- Macro-emulsions provide a more slick hand and higher hydrophobicity
- Micro-emulsions provide better fiber penetration
- Micro-emulsions give better softness to the fabric
Hydrophilic silicones

- Superior softness
- No fabric yellowing
- Bulky, full and rich hand-feel
- Resistant to laundry washing
- Develops hydrophilicity
Hydrophilic silicones

<table>
<thead>
<tr>
<th>Product</th>
<th>Fabric</th>
<th>Type</th>
<th>Active content</th>
<th>Viscosity cP</th>
</tr>
</thead>
<tbody>
<tr>
<td>BRB SQO 100</td>
<td>Natural</td>
<td>Fluid</td>
<td>92 %</td>
<td>3,000</td>
</tr>
<tr>
<td>BRB SQE 60</td>
<td>Natural</td>
<td>Micro emulsion</td>
<td>70 %</td>
<td>2,000</td>
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<tr>
<td>BRB SQO 80</td>
<td>Natural</td>
<td>Concentrate</td>
<td>77 %</td>
<td>2,000</td>
</tr>
</tbody>
</table>

- Current range mostly suited for natural fabrics
- BRB SQO 100 easy to emulsify into micro or macro-emulsions
- SQO 80 readily dispersible in water
- BRB SQE 60 is ready to use
- Compatible with organic softeners
- Suitable for all application methods (exhaust, padding or spray)
Hydrophilic silicones

<table>
<thead>
<tr>
<th>Product</th>
<th>Softness</th>
<th>Hydrophilicity</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Cotton knit</td>
<td>Cotton towel</td>
</tr>
<tr>
<td>BRB SQO 100</td>
<td>+++</td>
<td>++++</td>
</tr>
<tr>
<td>BRB SQE 60</td>
<td>+++</td>
<td>++++</td>
</tr>
<tr>
<td>BRB SQO 80</td>
<td>++++</td>
<td>++++</td>
</tr>
</tbody>
</table>

- Superior hydrophilicity
- Excellent softness to all cellulosic fabrics and blends
- SQO 100/ SQE 60 best suited for cotton knit
- SQO 80 best suited for towels
- Universal softener to various fabrics
- Durable to several laundry home washes, especially on cotton, linen and rayon
- Quickly absorbs water and perspiration
Antifoam

<table>
<thead>
<tr>
<th>New Product</th>
<th>Type</th>
<th>Active content</th>
<th>Viscosity cP</th>
</tr>
</thead>
<tbody>
<tr>
<td>BRB Snapsil SP 20</td>
<td>Macro emulsion</td>
<td>30%</td>
<td>1,500</td>
</tr>
</tbody>
</table>

- High efficiency in surfactant-rich systems
- Excellent foam control at temperatures up to 95°C
- Long durability in acid and alkaline conditions
- Rapid foam knockdown
- Easy dispersion in all foam systems & hard water
- No oily spots or lumps when diluted with water
- Compatibility with a variety of surfactant concentrates
Powerful like a major, flexible like a formulator