Silicones & Silanes for sealant compounding
Chemistry of Silane Bonding to Inorganic Substrates

**Hydrolysis**

\[ \text{RO}_2	ext{Si} - \text{OR} \quad \xrightarrow{+3 \text{H}_2\text{O}} \quad \text{HO}_2	ext{Si} - \text{OH} \quad \xrightarrow{-3 \text{ROH}} \]

**Condensation**

\[ \text{HO}_2	ext{Si} - \text{OH} + \text{HO}_2	ext{Si} - \text{OH} \quad \xrightarrow{-2 \text{H}_2\text{O}} \]

\[ \text{HO}_2	ext{Si} - \text{O} - \text{Si} \quad \xrightarrow{-3 \text{H}_2\text{O}} \quad \text{HO}_2	ext{Si} - \text{O} - \text{Si} - \text{O} - \text{Si} - \text{OH} \]

**Hydrogen bonding**

**Bond formation**

OR = alkoxy, acetoxy, oxime, acetone

X = organofunctional group
  e.g. -vinyl, -phenyl, -glycidoxy, -methacryloxy, -alkyl, -amine
# Chemistry of Silanes in RTV-1 Crosslinkers

By-product: $X$ Si $\text{RO}_n$ $\text{OR} \to $ ROH

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<th>Disadvantages</th>
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<td>Methylethylketoxime</td>
<td>Good adhesion to plastics, Low corrosive</td>
<td>H&amp;S issues, Low exposure levels</td>
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<td>Acetic acid</td>
<td>Good adhesion, Stable up to 300 °C, Fast cure</td>
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<td>Slow cure, Only stable up to 220 °C</td>
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Chemistry of Silanes in RTV-1 Crosslinkers

\[
\text{RO-Si-R} + \text{HO-Si-OH} \rightarrow \text{RO-Si-O-Si-RO} - \text{ROH}
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BRB Products
for RTV-1 Sealant Production

1. Acetoxy sealants
2. Alkoxy Sealants
3. Oxime Sealants
4. MS-Polymer Sealants
1. Acetoxy sealants

A: 100% Silicone Sealant General purpose

- BRB OH Fluid 80,000 cSt ➔ 60-80%
- BRB Silicone Oil 1,000 cSt ➔ 10 - 20%
- BRB Silanil MTAS ➔ 5 - 10%
- BRB DBTDL ➔ 0.2 -1%
- Third party fumed Silica ➔ 10%

Optional adhesion Promoter: BRB Silanil BDAC
1. Acetoxy sealants

B: Extended Silicone Sealant General purpose

- BRB OH Fluid 80,000 cSt ➔ 40-60%
- Third party solvent plasticizer ➔ 20 - 40%
- BRB Silanil MTAS ➔ 5 - 10%
- BRB DBTDL ➔ 0.2 -1%
- Third party fumed Silica ➔ 10%

Optional adhesion Promoter: BRB Silanil BDAC
2. Alkoxy sealants

- BRB OH Fluid 20,000 cSt and 80,000 cSt
- BRB Silicone Oil 500 cSt
- Third party coated calcium carbonate
- BRB Silanil 118

Optional adhesion Promoter: BRB Silanil 919
3. Oxime Sealants

Neutral cure all Weather Purpose

- BRB OH Fluid 80,000 cSt ➔ 30 -40%
- BRB Silicone Oil 100 cSt ➔ 5-10%
- Third party coated calcium carbonate ➔ 40-50%
- BRB Silanil MOS and VOS ➔ 3-4%
- BRB DBTDL ➔ 0.2 - 1.0%

Optional adhesion Promoter: BRB Silanil 919
4. MS-Polymer

X-linker and adhesion promoter for MS-Polymer

- BRB Silanil 118

Optional adhesion Promoter: BRB Silanil 138
BRB Silanil 276
What BRB offers

1. Full range of siloxane and silane products
2. Formulation help
3. Only raw material supplier, not competing with sealants in the market
4. Flexible supply from regional warehouse
5. Competitive prices for continuous sustainable growth
Powerful like a major, flexible like a formulator