BL Interface & Performance

TEGO® Antifoams for the Production of SBR-Latex & SBR-Rubber
Two Types of Styrene Butadiene Rubber (SBR)

1. SBR-Latex
   - Synonyms: SB-Latex, SBR liquid
   - Liquid material
   - Main applications: paper coating, carpet backside, foams, asphalt
   - 40% of globally produced SBR

2. SBR-Rubber
   - Synonyms: SBR, SBR-Elastomer, SB-Elastomer, SB-Rubber
   - Solid material, properties similar to natural rubber, crosslinkable
   - Main applications: tires, tubes, mechanical rubber goods, shoe sole
   - 60% of globally produced SBR
1. SBR-Latex and its Main Applications

- Paper coatings: 65%
- Carpet backings: 15%
- Foams & adhesives: 8%
- Asphalt modification: 2%

Total market: 3,2 Mio t

*9%*
TEGO® Antifoam in the Production of SBR-Latex

Water Monomer Additives

Emulsifier: Sulfonate Sulfate Ethersulfate

TEGO® Antifoam 2291

Monomer removal (Styrene)

SBR-Latex

Reactor

Stripper
**Test Method – Sintered Glass Test**

**Preparation**
One litre surfactant solution is poured into a 2-litre graduated cylinder. Defined amount of prediluted antifoam is added.

**Test**
Six litres of air per minute are bubbled through the sintered glass into the solution whereby foam is formed. When the foam reaches the 2 litre mark antifoam is added again and the time is noted. This is done for 30 minutes.

**Analysis**
The total number of dosages is used as measurement for the antifoam’s efficiency.

In case the antifoam efficiency is checked in emulsifiers or dispersants for the production of polymer dispersions this test is run at 60 °C.
Test Method – What the Sintered Glass Test looks like

The cylinder has to be filled with 1000 mL of surfactant solution.

When the foam reaches 2000 mL another amount of antifoam is added.
TEGO Antifoam 2291 is 2 to 3 Times More Efficient

Less dosages (=shorter bar) means higher efficiency of the antifoam
Defoamer based on paraffinic oil

100% active material, silicone free, dosage level: 0,01 - 0,1%

Can be used as delivered or from a predilution in water.

Compliant with Regulation (EU) 10/2011, BfR XIV, FDA 176.210, FDA 175.105, FDA 175.300, FDA 176.170, FDA 176.180 and 177.2600

Is listed in the following chemical inventories: EINECS, TSCA, ENCS, AICS, PICCS, CHINA, DSL, ECL, NZIOC
2. SBR-Rubber and its Main Applications

- Tires: 75%
- Nontire automotive: 15%
- Mechanical goods: 6%
- Miscellaneous: 4%

Total market: 4,5 Mio t
TEGO® Antifoams – Excellent Defoaming & no Fouling

Water Monomer Additives

Emulsifier: Soap

TEGO® Antifoam 2450 / 2460

Monomer removal (Styrene)

Acid

Reactors

Stripper

Coagulation

Rubber
TEGO® Antifoams are 1.5 to 6 Times More Efficient

Less dosages (=shorter bar) means higher efficiency of the antifoam
Conventional Antifoams can Create Undesired Fouling

Fouling = partial coagulation

Water Monomer Additives  Emulsifier: Soap  Conventional Antifoams  Acid  Coagulation  Rubber
Fouling/Coagulation test

- 100 g of the test dispersion including 0.1% defoamer as delivered is poured into a beaker and stirred for 30 minutes at 60°C.
- The dispersion is filtrated and the filter (with coagulate) is dried in an oven.
- After that the amount of the dry coagulate is weighted.
No Coagulation Observed with TEGO® Antifoams 2450/2460

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<tr>
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<th>Dispersion 1</th>
<th>Dispersion 2</th>
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<tr>
<td>controle</td>
<td>0,00g</td>
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<tr>
<td>Competitor 3</td>
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<td>Competitor 4</td>
<td>0,07g</td>
<td>0,05g</td>
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<tr>
<td>TEGO® Antifoam 2450</td>
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<td>TEGO® Antifoam 2460</td>
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<tr>
<td>Defoamer for SBR-Latex</td>
<td>0,22g</td>
<td>0,31g</td>
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<tr>
<td>Standard Defoamer</td>
<td>0,24g</td>
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Defoamer concentrate based on vegetable oil (2450) or mineral oil (2460), 100% active material, contains no silicone oil

We recommend to test both products in a specific formulation to identify the most suitable defoamer. Dosage level: 0.02 – 0.2%

Can be used as delivered or from a predilution in water. It is preferred to use the antifoam undiluted

Both compliant with FDA 176.210 and FDA 175.105, in addition 2450 compliant to Regulation (EU) 10/2011, BfR XIV

Listed in the following chemical inventories: EINECS, TSCA, ENCS, AICS, PICCS, CHINA, DSL, ECL
<table>
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<th>Emulsifiers for E-SBR Production</th>
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<tr>
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<td>TEGO® Antifoam 2450</td>
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<td>TEGO® Antifoam 2460</td>
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## Overview Food Contact Status and National Registrations

<table>
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<tr>
<th></th>
<th>Reg. 10/2011</th>
<th>FDA 176.210</th>
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TEGO® Antifoams for SBR – Your benefits & What You Can Expect

**TEGO Antifoam 2291 for SBR-Latex**
- Substantial cost savings due to 2 to 3 times higher efficiency
- Broad food contact status gives freedom for final applications, e.g. coated paperboard for food packaging

**TEGO Antifoams 2450 & 2460 for SBR-Rubber**
- Substantial cost savings due to 1.5 to 6 times higher efficiency
- Products do not cause fouling/precipitation in stripper

Support by our technical team in testing and identifying the optimal defoamer for your specific application!