

HANSA[®] XFOAM

SILICONE ANTIFOAM & DEFOAMER SOLUTIONS FOR
SMOOTH APPLICATION AND PRODUCTION PROCESSES

GENERAL INFORMATION

The key difference between an antifoam and a defoamer is that antifoam agents can prevent foam from forming, whereas defoamers can control the amount of existing foam, and are generally applied as needed.

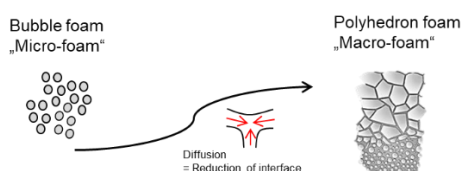
Industrial producers use these kind of additives in their formulations if they anticipate the tendency for the formation of foam during its use. Antifoams are generally slightly soluble in foaming solutions and can serve to decrease the surface tension. The most common class of antifoams include high boiling alcohols, polydimethylsiloxanes, and various silicone compounds with silica.

Defoamers are useful in similar industries by controlling the existing foam in liquids. These kind of additives eliminate any existing foam in liquid systems, but they generally do not prevent the future formation of new foam. The most common class of defoamers include insoluble oils, polyethersiloxane concentrates and compounds, stearates as well as EO/PO glycol copolymers.

CHT's highly concentrated HANSA® XFOAM solutions based on tailor-made polysiloxanes combine high process safety with long-term performance.

FOAM STABILIZATION MECHANISM

Building of foam lamellae with surfactant double layers by interfacial tension reduction:



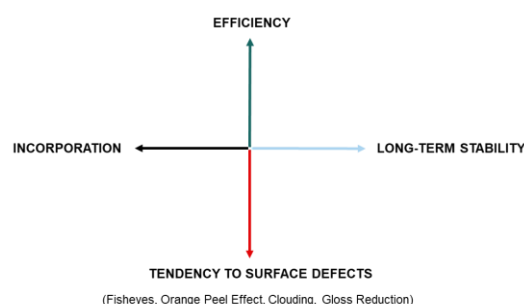
In addition, both the so-called drainage-effect (filling the vesicles with new liquid) and electrostatic repulsion support foam stabilization.

CHARACTERISTICS

General properties of silicone-based antifoams & defoamers:

- High efficiency, low dosage
- Excellent persistence
- Effective on macro & micro foam
- Stable at pH 2 to pH 11
- Active in hot & cold systems
- Free of BTX, SVHC, and VOC

The final performance will be affected by the level of material incompatibility in the application.



APPLICATION FIELDS

- Chemical Production additives
- Water-based dispersions
- Coating materials
- Distillation & Extraction processes
- Pulp & Paper
- Wastewater treatment
- Metalworking fluids & lubricants
- Agriculture formulations
- Cleaning agents
- Food & Beverage processing

CHT PORTFOLIO OF ANTIFOAMS

POLYDIMETHYLSILOXANES (FORMULATED COMPOUNDS)

| Product | Active [%] | CAS no. | Polarity | Viscosity [mPas] |
|--------------------|------------|------------|----------|------------------|
| ICM AF 100 | ~ 100 | 63148-62-9 | - - | 3000 |
| ICM XAF 101 | ~ 100 | 63148-62-9 | - | 10000 |
| ICM XAF 102 | ~ 100 | 63148-62-9 | + | 10000 |
| HANSA XFOAM I 6015 | ~ 100 | 63148-62-9 | - - - | 550 |

POLYDIMETHYLSILOXANES (EMULSIONS)

| Product | Active [%] | Recommended for | pH | Viscosity [mPas] |
|------------|------------|--------------------|-------|------------------|
| TA 10 | ~ 10 | Macro foam | 3 - 4 | 3000 |
| TA 20 | ~ 20 | Macro foam | 3 - 4 | 2000 |
| TA 30 | ~ 30 | Macro foam | 3 - 4 | 2000 |
| ICM XAF 40 | ~ 40 | Macro & Micro foam | 4 - 5 | 2000 |

FOOD GRADE ANTIFOAMS

| Product | Active [%] | Regulations | pH | Viscosity [mPas] |
|--------------------|------------|---|------------|------------------|
| HANSA XFOAM F 6105 | ~ 5 | US FDA CFR 21 173.340 | 3 - 4 | 3000 |
| HANSA XFOAM F 6110 | ~ 10 | | 3 - 4 | 2000 |
| HANSA XFOAM F 6120 | ~ 20 | European Union EU 1129/2011 & 231/2012 | 3 - 4 | 2000 |
| HANSA XFOAM F 6130 | ~ 30 | | German BfR | 3 - 4 |
| HANSA XFOAM F 6195 | ~ 25 | Kosher & Halal | 3 - 6 | 1000 - 2000 |

CHT PORTFOLIO OF DEFOAMERS

POLYETHERSILOXANES (CONCENTRATES)

| Product | Silicone [%] | End-Group | CAS no. | Polarity | Viscosity [mPas] |
|--------------------|--------------|-----------|------------|----------|------------------|
| HANSA XFOAM I 1070 | ~ 28 | OH | 68937-55-3 | 0 | 500 - 1000 |
| HANSA XFOAM I 1075 | ~ 40 | OH | 68937-55-3 | + | 650 - 1000 |
| HANSA XFOAM I 1080 | ~ 20 | OH | 68937-55-3 | ++ | 500 - 800 |
| HANSA XFOAM I 1085 | ~ 20 | OH | 68937-55-3 | +++ | 500 - 800 |
| HANSA XFOAM I 1090 | ~ 23 | O-Bu | 68440-66-4 | - | 300 - 600 |
| HANSA XFOAM I 1095 | ~ 44 | O-Bu | 68440-66-4 | -- | 300 - 600 |

POLYETHERSILOXANES (COMPOUNDS)

| Product | Silica [%] | Concentrate | Defoaming properties | Viscosity [mPas] |
|--------------------|------------|--------------------|----------------------|------------------|
| HANSA XFOAM I 5080 | ~ 6 | HANSA XFOAM I 1080 | ++ | 2000 - 5000 |
| HANSA XFOAM I 5085 | ~ 6 | HANSA XFOAM I 1085 | + | 2000 - 5000 |
| HANSA XFOAM I 5090 | ~ 6 | HANSA XFOAM I 1090 | +++ | 1000 - 2500 |
| HANSA XFOAM I 5095 | ~ 4 | HANSA XFOAM I 1095 | ++++ | 500 - 3500 |

POLYETHERSILOXANES (EMULSIONS)

| Product | Active [%] | Recommended for | pH | Viscosity [mPas] |
|--------------------|------------|-----------------|-------|------------------|
| HANSA XFOAM I 1175 | ~ 20 | Deaeration | 7 - 8 | 100 - 300 |
| HANSA XFOAM I 1183 | ~ 20 | Micro foam | 7 - 8 | < 100 |
| HANSA XFOAM I 1117 | ~ 17 | Micro foam | 7 - 8 | 500 - 1000 |
| HANSA XFOAM I 1110 | ~ 10 | Macro foam | 7 - 8 | 1000 - 2500 |
| HANSA XFOAM I 1115 | ~ 15 | Macro foam | 7 - 8 | 1000 - 2500 |
| HANSA XFOAM I 1135 | ~ 20 | Foam knock-down | 7 - 9 | 1500 - 3000 |
| HANSA XFOAM I 5160 | ~ 70 | Foam knock-down | 6 - 8 | 1900 - 3100 |