



**WACKER**

**SILICONES**

**SILFOAM®**

CUSTOM FOAM CONTROL  
THE INTELLIGENT RESPONSE

INTELLIGENT INDUSTRY SOLUTIONS





OUR PRODUCTS ENSURE THAT FOAM  
NEVER GETS OUT OF HAND



## Contents

Introduction	5
Product overview and requirements	8
Selection and application criteria	10
Textile industry	14
Detergent and cleaning-agent industry	20
Pulp and paper industry	28
Life sciences	32
Pharmacy	34
Food processing	36
Agrochemicals	38
Fermentation and biotechnology	40
Wastewater treatment	42
Petroleum industry	44
Dispersions	52
Glossary	58



# SILFOAM® FOAM CONTROL SYSTEMS MAKE FOAM DO WHAT YOU WANT

**Most end customers like foam. To them, it means a bubble bath, a hair-styling mousse, or a glass of beer. For engineers, it's a different matter. In industry, foam causes all kinds of difficulties. It affects product properties and disrupts manufacturing processes. All in all, it reduces quality and productivity.**

**WACKER SILICONES has the intelligent response: SILFOAM® foam control systems.**

As market leader in silicone antifoam agents, WACKER SILICONES offers you a comprehensive portfolio of highly efficient products that are available worldwide. Our foam control systems are general-purpose products that are economical and ready-to-use, and are individually tailored to your demands.

Choosing SILFOAM® foam control means choosing an innovative problem-solving system whose scope is continually being enlarged. The foam control systems from WACKER SILICONES already offer custom solutions for the most important industries: textiles, detergents and cleaning agents, pulp and paper, life sciences, petroleum and dispersions. And we are continually working on new applications.

For each of these areas, the SILFOAM® product portfolio has a foam control system that is ideal for you – regardless of whether in liquid or solid media, in the form of a powder, a compound, a self-dispersing solid or an emulsion. And if you still have any questions about our wealth of products, our experts are here to help with competent advice and practical tests.

Our expertise is demonstrated in our systematic development of the SILFOAM® product range, our ability to optimize your products and processes, and to implement innovative formulation ideas together with you. Take advantage of the opportunities that SILFOAM® offers you.

**SILFOAM®  
Custom Foam Control**







IF YOU VALUE HIGH-PERFORMANCE PRODUCTS  
AND PERSONAL ADVICE, YOU'VE COME TO THE  
RIGHT PEOPLE

# OUR ANTIFOAM AGENTS ARE EFFECTIVE

Do you have a particular foaming problem in your system? We will tailor an antifoam agent individually customized to your challenge. And that's not all: WACKER SILICONES foam control systems show their true strengths through their efficiency, versatility and ongoing technical development.

## **SILFOAM® SC**

### **Silicone Antifoam Compounds**

Oily, viscous, opaque or slightly cloudy liquids; they are preferably used in systems containing little or no water. Compounds can be used neat or mixed with suitable formulation components such as surfactants.

## **SILFOAM® SD**

### **Self-Dispersing Silicone Antifoam Agents**

Combination of antifoam agent compounds with organic active agents and auxiliaries; they disperse spontaneously in contact with foaming formulations and show particularly good distribution and compatibility.

## **SILFOAM® SE**

### **Silicone Antifoam Emulsions**

o/w emulsions of antifoam agent compounds with an active ingredient content of 5 to 50 %; this form of supply is preferred for water-based formulations and applications.

## **SILFOAM® SP**

### **Silicone Antifoam Powder**

Powder antifoam agents that are particularly suitable for use in powder products, e.g. laundry detergent powders.

## **PULPSIL®**

### **Silicone Antifoam Compounds and Emulsions**

Specially developed for use in the pulp and paper industry.

## **SILFAR®**

### **Product Range (Dimethicones, Simethicones, Defoamers, Active Substances and Auxiliaries)**

Specially developed for use in the pharmaceutical industry and related life sciences.

## **WACKER® AK**

### **Silicone Fluids**

Silicone fluids are characterized by good antifoam properties in water-free, non-polar systems; they are suitable for applications in which compatibility with other substances is not required.

With WACKER SILICONES' antifoam agents, you are not only purchasing a product. We supply a complete problem-solving system that enables you to find new solutions to specific problems – an advantage that can decide your market success.

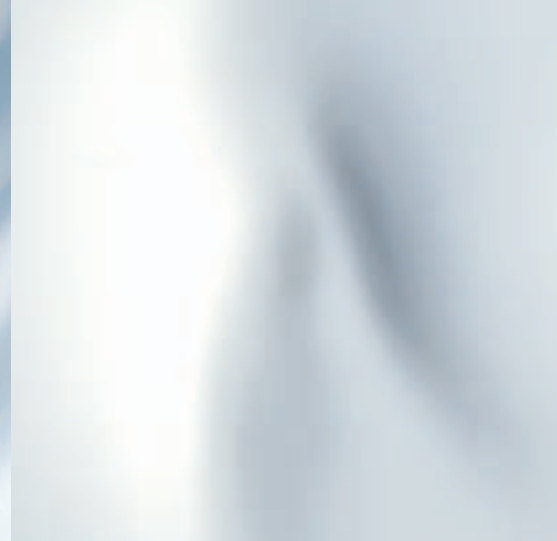




SILFOAM® SC



SILFOAM® SD



SILFOAM® SE



SILFOAM® SP

WACKER SILICONES foam control systems can be effectively used in a variety of applications. Depending on the particular application, our products must satisfy different demands.

They include:

- Long-term action in alkaline media
- Ionic character
- Filtrability
- Self-emulsifying
- Can be dispersed / diluted
- Compatibility
- Heat stability
- Physiological requirements / food-grade approval

Our expert team will be glad to assist you by making specific measurements under practical conditions. This allows us to ensure that you always receive the optimum product for your specific application. We are also available to you on request to make dosage recommendations and fine-tune our products.

**Note**

All the data listed in this product guide are guide values and are not intended for preparing specifications.

**> Link**

For a detailed explanation of the demands that SILFOAM® antifoam agents can satisfy, see the GLOSSARY.

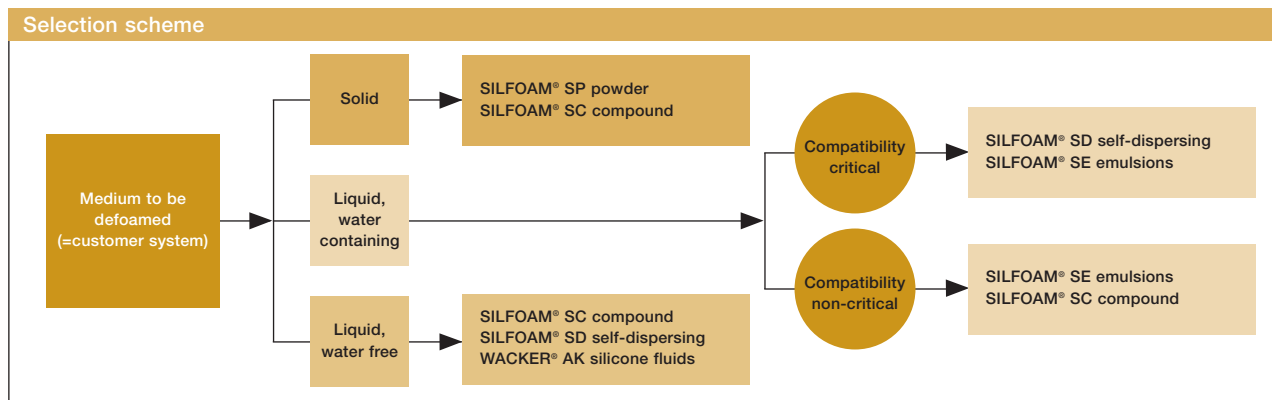
# AND WE OFFER CUSTOMIZED SERVICE SOLUTIONS

Individual problems require individual service solutions – these are provided by our expert teams.

To help you choose the antifoam agent that best suits your needs from our wide product range, we recommend you start by deciding whether you need a liquid or solid, water-free or water-based product. The main criterion is whether the SILFOAM® antifoam agent is compatible with your formulation.

Since the antifoam agent usually has a different solubility or dispersibility from the formulation components, it is necessary to choose a largely compatible antifoam product\*. On the other hand, relatively incompatible defoamers can be very efficient and a balance must be struck between efficiency and compatibility.

Our experts will be glad to assist you in solving this problem. You have the opportunity to perform detailed compatibility tests on your system with several products to determine the optimum SILFOAM® antifoam agent.



## Note

\* Foam-preventive substances are known as "antifoam agents," foam-destroying agents are called "defoamers." SILFOAM® foam control systems are multifunctional, i.e. they act as antifoam agents or defoamers, or perform both functions depending on the application.

### Some important aspects about using and handling SILFOAM® antifoam agents:

#### Efficiency Comparisons

- They are oriented to customer systems and their technical processes.
- Shaking tests and pump circulation tests, or generating foam profiles, for example in washing machines, provide practical data about the use of the antifoam agent in the final application.

#### Dosage

- The optimum dosage of SILFOAM® defoamers in customer systems is determined by preliminary tests.
- Good distribution of the highly active SILFOAM® products in the medium to be defoamed is essential for high efficiency.
- In calculating the optimum amount to use, remember that there should be enough antifoam agent present to compensate for any loss of effect on storage or dispersion.
- In metering SILFOAM® by pump, we recommend using low-shear equipment, which can meter small amounts precisely.

#### Dilution

- Antifoam compounds can be incorporated homogeneously by diluting them with suitable solvents, such as white spirit, ester or isopropanol.
- Viscous antifoam emulsions can be diluted by adding successive amounts of cold water in ratios of 1 : 1 - 1 : 10.
- To keep dilute emulsions stable for longer periods, we recommend adding thickeners, such as carboxymethylcellulose or polyacrylic acid solutions.

#### Shear Stability

- Shear forces can impair the effectiveness of SILFOAM® defoamers.
- With highly compatible defoamers, the shear force leads to rapid dispersion, often so finely divided that the defoamer is rapidly exhausted.
- With defoamers that are relatively incompatible, the shear forces can cause the defoamer to agglomerate and separate out.
- Pre-dispersed products such as emulsions offer advantages as long as the shear forces are not too high.

#### Storage Stability

- Silicone antifoams resist high and low temperatures. We recommend storage at room temperature.
- Self-dispersing silicone antifoam agents are best kept at room temperature.
- Silicone antifoam emulsions are ideally stored at between 5 and 25 °C. Temperatures above 30 °C or frost can affect the resistance and dilutability. Once opened, the drums should be carefully sealed to prevent microbial contamination.
- Silicone antifoam powders are best stored at room temperature.







OUR PRODUCTS ARE AT WORK IN MANY DIFFERENT INDUSTRIES BECAUSE WE LOOK AT THINGS FROM DIFFERENT PERSPECTIVES







# SILFOAM® IS THE MISSING LINK IN YOUR TEXTILE SUPPLY CHAIN

Antifoam agents from WACKER SILICONES guarantee quality and productivity in textile processes.

## Contents: Textile Industry

Introduction	15
Process defoaming	16
Product defoaming	18

## The Facts

The modern textile industry is faced with challenges such as globalization, short product lifecycles, increased quality demands, innovative materials such as high-tech fabrics, and increasing cost pressures. In this market, it is impossible to succeed without cost-effective production processes.

In textile processing, foam occurs at almost every processing stage. It affects the textile properties and disrupts the process. For example, in textile dyeing, foam causes undesirable color shadows that spoil the uniform color of the textile web. It is here that SILFOAM® antifoam agents start to work. They control undesirable foaming, ensure smooth and more efficient production processes and crucially improve product properties.

Our comprehensive SILFOAM® antifoam product line is suitable for optimizing almost any textile process, from fiber production and processing to dyeing, printing, design or textile pretreatment. SILFOAM® can be used in two different ways:

- Either as process defoamers that are added directly to your treatment liquor and regulate foam during the process
- Or as product defoamers that are incorporated into textile auxiliaries and are activated when the foamable product is used

## What Can SILFOAM® Antifoam Agents Do?

- They are extremely active in highly foaming textile auxiliaries.
- They can be combined with many non-silicone-containing defoamers.
- They show good compatibility with structured and non-structured wetting agents.
- Special SILFOAM® antifoam agents offer the desired process reliability in systems with high salt concentrations.
- Some grades show extremely good thermal stability and are suitable for reactive and dispersion dyeing, even with critical temperature profiles.
- For the most part, they are chemically stable and therefore do not have any negative effects in formulations.
- The effectiveness of wetting agents is not affected by the addition of the antifoam agent.

# WITH OUR ANTIFOAM AGENTS, YOUR PRODUCTION WILL RUN SMOOTHLY

As a process defoamer, SILFOAM® products optimize textile production processes from fiber manufacture to dyeing and design.

## The Facts

Foam can occur in many processes during textile production, where it leads to inefficient production. It is mainly caused by surfactant-containing auxiliaries, the use of alkali, and a wide variety of mechanical processes during production. SILFOAM® antifoam agents – used as process defoamers – allow effective control and regulation of foaming during the actual process.

The main applications of our antifoam agents are in

- Fiber production and processing
- Pretreatment
- Dyeing
- Design
- Finishing
- Wastewater treatment

The defoamer is added at regular intervals directly to your treatment liquor to regulate foaming.

Effective antifoam agents for textile processes must be resistant to the production conditions. SILFOAM® antifoam agents ideally meet these criteria.

Their properties include, in particular:

- High shear stability
- Excellent heat resistance
- Good alkali resistance

Our products' high dispersibility also ensures rapid and uniform distribution in your system. This allows effective foam control to be combined with good compatibility.

Application	Metering [%]	Solids content approx. [%]	Appearance	Viscosity approx. [mPa s], 25 °C	pH approx.	Ionicity	Product type	
<b>SILFOAM®</b>								
SE 39	Wetting agent formulations in bleaching processes	0.1 - 0.5	33	White	150	7.0	Nonionic/anionic	Emulsion
SE 40	Polyester (JET) dyeing	0.2 - 0.5	16	White	3 000	7.0	Nonionic	Emulsion
SD 771	Polyester (JET) dyeing	0.1 - 0.5	100	Yellowish	Pasty, in emulsion: 1 400	6.0	Nonionic/anionic	Self-dispersing
	Combined reactive and dispersion dyeing in polyester/cotton mixtures	0.1 - 0.5	100	Yellowish	Pasty, in emulsion: 1 400	6.0	Nonionic/anionic	Self-dispersing
SE 47	General purpose	0.2 - 0.5	17	White	50	7.0	Nonionic	Emulsion
SRE	General purpose	0.1 - 0.5	33	White	150	7.0	Nonionic	Emulsion

### Service

We offer you a wide range of antifoam agents that either meet all of the conditions mentioned above, or focus on particular aspects. Our experts choose SILFOAM® products that are optimized to your specific requirements for pH, shear or heat stability, and are individually tailored to your production conditions. For example, they will determine the most alkali-resistant defoamer for bleaching and kier-boiling processes. Our most stable SILFOAM® defoamer is particularly suitable for dyeing formulations containing large amounts of salt and dispersion agents. And for high-speed continuous pretreatment processes with large amounts of surfactant, we carry out preliminary shear tests to ensure the required process stability.

### Recommendations

- General-Purpose Applications**  
 Here, we recommend emulsions SILFOAM® SE 47 and SILFOAM® SRE.
- Wetting Agent Formulations**  
 For wetting agent formulations, the highly alkali-resistant SILFOAM® SE 39 is particularly preferred.
- Polyester Dyeing In JET Dyeing Machines**  
 For this special application, we recommend the heat-stable SILFOAM® SE 40 emulsion and self-emulsifying SILFOAM® SD 771 antifoam agent.



# WE IMPROVE YOUR TEXTILE PROPERTIES

As product defoamers, antifoam agents from WACKER SILICONES provide long-term effective foam control in your system.

## The Facts

With SILFOAM® antifoam agents, you can achieve a significant and lasting improvement in the quality of your products. The antifoam agent – acting as a product defoamer – is incorporated preemptively in a system or a component, such as a textile auxiliary formulation, to give your product lasting low-foaming properties. The defoamer only becomes active when the foamable product is used.

For the antifoam agent to develop maximum efficiency, its activity and compatibility are particularly important. In general, antifoam agents with good compatibility tend to have low activity, and vice versa. Our experts will help you to achieve the best balance between the required properties and possible side effects in order to find the best SILFOAM® antifoam agent for your individual product.

In addition to the stability of an antifoam agent at various pH, its ionic activity also plays an important role. Components with different ionicity often lead to precipitation. WACKER SILICONES has a large selection of nonionic antifoam agents showing excellent compatibility with such ionic emulsifiers.

	Application	Dosage [%]	Solids content approx. [%]	Appearance	Viscosity approx. [mPa s], 25 °C	pH approx.	Ionicity	Product type
<b>SILFOAM®</b>								
SE 36	Wetting agent in bleaching processes	0.5 - 3.0	28	White	8 000	7.0	Nonionic	Emulsion
SE 57	Wetting agent formulations	0.5 - 3.0	26	White	600	7.0	Anionic	Emulsion
SE 81	Wetting agent formulations	0.5 - 3.0	12	White	4 000	7.0	Nonionic	Emulsion
SLE	Wetting agent formulations	0.5 - 3.0	23	White	10 000	7.0	Nonionic	Emulsion
SC 132	Wetting agent formulations for bleaching processes	0.5	100	Colorless, opaque	20 000	-	-	Compound
SC 339	Wetting agent formulations	0.5 - 1.0	100	Colorless, opaque	80	-	-	Compound
SC 369	Wetting agent formulations	0.5 - 1.0	100	Colorless, opaque	2 000	-	-	Compound
SC 385	Wetting agent formulations	0.5 - 1.0	100	Yellowish, opaque	300	-	-	Compound
SD 670	Basic binder/deaeration	0.5 - 2.0	100	Yellowish, opaque	150	-	-	Self-dispersing
SD 850	Bleaching processes	0.5 - 2.0	100	Yellowish, opaque	200	-	-	Self-dispersing
SD 882	Textiles/deaeration	0.5 - 2.0	100	Yellowish, opaque	20	-	-	Self-dispersing

### Service

A standard procedure developed by us for choosing SILFOAM® antifoam agents forms the basis for choosing the ideal product solution.

The formulation can be adjusted if necessary to remove any incompatibilities with your surfactant system. The key to this is the CONTIFOAM® fully automatic foam level measuring device. It permits textile processes to be simulated under practical conditions and SILFOAM® antifoam agents to be optimized in advance. That saves expensive test runs and makes your production more reliable.

Now it is also possible to record foam profiles as a function of temperature and the instrument's range now extends to measurements at elevated pressures. This allows important process conditions, such as high-temperature, dispersion dyeing (polyester dyeing in JET dyeing machines) to be simulated under realistic conditions.

### Recommendations

- **Wetting Agent Formulations**

The alkali-resistant emulsions SLE and SILFOAM® SE 36, and SILFOAM® SE 57, which is particularly compatible in anionic systems, are especially suitable for use in wetting agent formulations. Particular advantages are also offered by the alkali-resistant compound SILFOAM® SC 132, the hydrophilic SILFOAM® SC 339, the highly surfactant-compatible SILFOAM® SC 369, and SILFOAM® SC 385, which is particularly compatible with systems having critical flow properties.

- **Deaeration and Applications with Critical Flow Properties**

For these special applications, we recommend antifoam agent SILFOAM® SD 882.

Bedienung  
- Taste am Türschloss drücken und Tür öffnen  
- Maschine anlegen  
- Tür schließen  
- Programm wählen  
- Abschleifte & Abschleifventil schließen  
- Taste Start drücken. Maschine anlaufen

Wahlmöglichkeiten:  
- Abschleifte  
- Abschleifte & Abschleifventil

73

- 1. Exchwasche mit Vorwäsche
- 2. Exchwasche mit Vorwäsche
- 3. Mischgewebe mit Vorwäsche
- 4. Mischgewebe mit Vorwäsche
- 5. Kaltwäsche mit Vorwäsche

Bedienung  
- Taste am Türschloss drücken und Tür öffnen  
- Maschine anlegen  
- Tür schließen  
- Programm wählen  
- Abschleifte & Abschleifventil schließen  
- Taste Start drücken. Maschine anlaufen

Wahlmöglichkeiten:  
- Abschleifte  
- Abschleifte & Abschleifventil

14

- 1. Exchwasche mit Vorwäsche
- 2. Exchwasche mit Vorwäsche
- 3. Mischgewebe mit Vorwäsche
- 4. Mischgewebe mit Vorwäsche
- 5. Kaltwäsche mit Vorwäsche

Bedienung  
- Taste am Türschloss drücken und Tür öffnen  
- Maschine anlegen  
- Tür schließen  
- Programm wählen  
- Abschleifte & Abschleifventil schließen  
- Taste Start drücken. Maschine anlaufen

Wahlmöglichkeiten:  
- Abschleifte  
- Abschleifte & Abschleifventil

15

73

- 1. Exchwasche mit Vorwäsche
- 2. Exchwasche mit Vorwäsche
- 3. Mischgewebe mit Vorwäsche
- 4. Mischgewebe mit Vorwäsche
- 5. Kaltwäsche mit Vorwäsche



# WITH SILFOAM® THINGS ALMOST WASH THEMSELVES

Whether laundry detergents, fabric softeners or cleaning agents – WACKER SILICONES antifoam agents will give your products the crucial quality edge they need to establish themselves on the market.

## Contents:

### The Detergents and Cleaning Agents Industry

Introduction	21
Powder detergents	22
Liquid detergent gel/fabric softeners	24
Cleaning agents	26

## The Facts

Modern laundry detergents and cleaning agents are complex, highly specialized products. For consumers, they should function efficiently and be easy to handle. Foam control plays an important role here. High quality detergents are only possible with effective foam control – since ultimately it is the foaming property that consumers use to judge the effectiveness of a detergent.

WACKER SILICONES offers the ideal antifoam agent for any detergent type. For powder detergents, we recommend SILFOAM® antifoam compounds and antifoam powders. And for liquid detergents, we offer self-dispersing SILFOAM® antifoam agents with excellent compatibility and activity. Foam control is particularly important in front loader machines with a horizontal axis. SILFOAM® is ideal for these machines.

SILFOAM® antifoam agents are also excellent for use in the cleaning agent industry. Here, too, foam control is an important condition for producing efficient end products.

To suit the many different cleaning agent formulations, WACKER SILICONES has a wide range of highly efficient SILFOAM® antifoam agents, which are customized to individual applications – ranging from universal cleaners or glass cleaners to special applications such as carpet cleaners or metal polishes.

## What Can SILFOAM® Antifoam Agents Do?

- They are effective in almost any type of surfactant system.
- They are effective at any wash temperature.
- They can be combined with other defoamers.
- They are effective independently of the water hardness.
- They are readily dispersible and do not separate.
- They are environmentally compatible with low BOD/COD and do not show bioaccumulation.

# WE SET THE LIMITS ON FOAM IN LAUNDRY DETERGENT POWDERS

Whether in the end product or in the production of powder detergents – SILFOAM® antifoam agents are effective anywhere.

## The Facts

Foam control of powder detergents requires antifoam agents specially tailored to the alkalinity of the particular system. SILFOAM® defoamers from WACKER SILICONES, as compound or powder, are remarkably effective in these specific systems.

In largely neutral powder detergent systems, we recommend spraying our silicone antifoam agents onto the powder detergent at the end of the process chain. They can also be combined with other components, such as surfactants.

## Spraying is superior to post-addition in many important respects:

- It is more economical.
- It always ensures homogeneous distribution of the antifoam agent in the detergent powder because the antifoam agent adheres to the individual detergent powder granules.
- It permits greater freedom of formulation, since the 100 % silicone-based compound is dosed in much smaller amounts than the powder antifoam agent (15 % silicone).

Our silicone antifoam powder has proven effective in strongly alkaline systems. A characteristic of SILFOAM® is that it is protected by its carrier system. This ensures the powder detergent continues to show reliable defoaming even after long storage. The antifoam agent is mixed with the detergent at the end of the production process.

For the production of the powder detergent itself, it is important that the material flows evenly without surges, and that the powder density is always uniform. Here we also offer SILFOAM® antifoam agent for slurry deaeration.



	Application	Dosage [%]	Active ingredient approx. [%]	Appearance	Viscosity approx. [mPa s], 25 °C	Density approx. [gm <sup>3</sup> ], 25 °C	Shelf life min. (months)	Product type
<b>SILFOAM®</b>								
SC 124	Spraying	0.1 - 0.5	100	Colorless, opaque	250	1.0	12	Compound
	Powder premix	5 - 20	100	Colorless, opaque	250	1.0	12	Compound
	Slurry deaeration	0.05 - 0.2	100	Colorless, opaque	250	1.0	12	Compound
SC 132	Spraying	0.1 - 0.5	100	Colorless, opaque	20 000	1.0	12	Compound
	Powder premix	5 - 20	100	Colorless, opaque	20 000	1.0	12	Compound
	Slurry deaeration	0.05 - 0.1	100	Colorless, opaque	20 000	1.0	12	Compound
SC 1132	Spraying	0.1 - 0.5	100	Colorless, opaque	30 000	1.0	12	Compound
	Powder premix	5 - 20	100	Colorless, opaque	30 000	1.0	12	Compound
SE 39	Slurry deaeration	0.05 - 0.2	20	White	150	1.0	6	Emulsion
SP 15	Post addition	1 - 3	15	Yellowish, white	-	0.6*	12	Powder

\* Bulk density

### Service

At WACKER SILICONES, we support you in choosing the ideal antifoam agent and fine-tuning it by means of trials conducted under realistic conditions at our application labs. We analyze foam profiles in washing machines at different water hardness and temperature programs, and carry out storage stability tests on SILFOAM® antifoam agents in the customer's system.

To ensure a consistent defoaming effect, we record foam profiles of our customers' detergent formulations with the antifoam agent before and after storage at elevated temperature and air humidity.

### Recommendations

- Spraying**  
 SILFOAM® SC 124, SC 132 and SC 1132:  
 The higher viscosity grades are to be preferred if possible, since they exhibit greater antifoam agent activity. Spraying of silicone antifoam agents is only recommended for largely neutral formulations. For better distribution, the antifoam agent can first be diluted with a nonionic surfactant.
- Post-Addition**  
 SILFOAM® SP 15:  
 It has 15 % active agent on neutral organic and inorganic carriers, which rapidly release the antifoam agent during washing, even at low temperatures. The lower dosage is advisable for normal detergents, and the higher for concentrated detergents.

- Powder Premix**

SILFOAM® SC 124, SC 132 and SC 1132:  
 They are mainly suitable for in-house premixing of antifoam powders or granules. Here, too, the higher-viscosity products should be preferred because of their higher activity. They can be combined with organic defoamers, e.g. paraffin-based products.

# OUR ANTIFOAM AGENTS ARE AS EFFECTIVE AS YOUR LIQUID DETERGENTS

Whether in all-purpose or mild detergents, or fabric softeners, SILFOAM® ensures effective foam control in the laundry.

## The Facts

The trend among consumers to prefer liquid detergents has been widespread in the USA for decades, and in recent years has spread to Europe. This is partly to do with the advantages that liquid detergents offer compared with powder detergents at low wash temperatures and for dark laundry, but is also partly a result of novel forms of dosage and applications, such as gels. SILFOAM® antifoam agents are ideal for use in this class of products. Their advantages of compatibility and high activity, compared with other systems, are particularly important here.

Our products can be used both in structured liquid detergents containing builders and in non-structured liquid detergents without builders. SILFOAM® is also very efficient in gel detergents, which differ from liquid detergents through their specific rheological properties.

SILFOAM® antifoam agents are also ideal for solving foam problems in textile softening applications, since our products offer excellent compatibility with quaternary ammonium compounds in fabric softener formulations.

Application	Dosage [%]	Active ingredient approx. [%]	Appearance	Viscosity approx. [mPa s], 25 °C	Density approx. [gm <sup>3</sup> ], 25 °C	Shelf life min. (months)	Product type	
<b>SILFOAM®</b>								
SC 132	Liquid detergents,	0.2 - 0.4	100	Colorless, opaque	20 000	1.0	12	Compound
	structured fabric softeners	0.05 - 0.2	100	Colorless, opaque	20 000	1.0	12	Compound
	Gel detergents	0.2 - 0.5	100	Colorless, opaque	20 000	1.0	12	Compound
SC 1132	Liquid detergent,	0.1 - 0.5	100	Colorless, opaque	30 000	1.0	12	Compound
	structured fabric softener	0.05 - 0.2	100	Colorless, opaque	30 000	1.0	12	Compound
	Gel detergents	0.2 - 0.5	100	Colorless, opaque	30 000	1.0	12	Compound
SD 167	Liquid detergent, non-structured	0.2 - 1	100*	Colorless, opaque	450	1.0	12	Self-dispersing
SD 850	Liquid detergent, non-structured	0.5 - 1	100*	Yellowish, opaque	200	1.0	6	Self-dispersing
SE 36	Liquid detergent, non-structured	0.1 - 0.4	20	White	8 000	1.0	6	Emulsion
	Gel detergents	0.2 - 1	20	White	8 000	1.0	6	Emulsion
SE 39	Liquid detergent,	0.2 - 0.5	20	White	8 000	1.0	6	Emulsion
	structured fabric softener	0.05 - 0.2	20	White	150	1.0	6	Emulsion

\* including organic active ingredients

### Service

The compatibility of the antifoam agent plays a decisive role in selecting the optimum SILFOAM® product for your detergent formulation. This is a particularly important criterion for modern liquid detergents. Our experts will carry out the necessary compatibility and functionality tests on customer samples. This allows us to give a qualified product recommendation individually tailored to your needs.

### Recommendations

#### • Structured Liquid Detergents

If the liquid detergent is structured or has a sufficiently high viscosity, SILFOAM® SC 132 or SC 1132 can usually be added directly. In this case, the surfactants and dispersion agents in the detergent formulation are responsible for its dispersion. The stronger the dispersing effect of the surfactant system or the greater the energy supplied by the mixer, the higher may be the viscosity of the compound. SILFOAM® SE 39 is also suitable for low-viscosity, structured liquid detergents.

#### • Non-Structured Liquid Detergent

If the liquid detergent is not structured, we recommend SILFOAM® SE 36 or the very readily dispersible and water-free SILFOAM® SD 167 and SD 850 antifoam agents.

#### • Gel Detergents

In gel-type products, high-viscosity antifoam agents such as SILFOAM® SC 132 or SC 1132 ensure improved foam control during washing. These products are also suitable as filling aids and allow containers to be filled correctly, without bubbles and at high speed. Antifoam agent SILFOAM® SE 36 is specially tailored for use in low-viscosity gel detergents.

#### • Fabric Softeners

For most modern fabric softeners, which are mostly based on ester quats, we recommend SILFOAM® SE 39.

# SILFOAM® LETS YOUR CLEANING AGENT DEVELOP ITS FULL POTENTIAL

Whether general purpose cleaners, carpet cleaners, sanitary or disinfectant cleaners, WACKER SILICONES antifoam agents achieve significant improvements in the properties that are important in cleaning agents.

## The Facts

Modern, efficient cleaning agents must provide cleanliness and hygiene in a wide variety of applications: in the household, at the workplace and in particularly demanding areas such as the sanitary and medical sectors. Undesirable foaming can significantly reduce the cleaning action. SILFOAM® antifoam agents help here. They effectively control foaming and improve product properties of cleaning agents.

WACKER SILICONES offers you a wide range of SILFOAM® products specially tailored to individual cleaning applications.

To effectively control foam in these special applications, our products fulfill a variety of specific demands depending on the application:

- In floor polishes, especially wax-based polishes, they provide good spread and deaeration. The polish then dries to form a bubble-free, smooth film.
- With carpet cleaners, an antifoam agent is necessary in the carpet shampooer's dirty-water tank to prevent foaming while dirty water is being sucked up.
- The main source of foam problems in the production of sanitary cleaners is the filling process.
- In disinfectant cleaners, there are often serious compatibility problems with the quaternary ammonium compounds (quats) often used here.

Since cleaning agents are usually used together with water, hydrophilic defoamer formulations are an important focus of our portfolio.

	Application	Dosage [%]	Active ingredient approx. [%]	Appearance	Viscosity approx. [mPa s], 25 °C	Density approx. [g/cm <sup>3</sup> ], 25 °C	Shelf life min. (months)	Product type
<b>SILFOAM®</b>								
SC 132	General-purpose cleaners	0.05 - 0.2	100	Colorless, opaque	20 000	1.0	12	Compound
SD 670	General-purpose cleaners	0.05 - 0.3	100*	Clear, yellowish	150	0.99	6	Self-dispersing
	Floor polishes	0.05 - 0.3	100*	Yellowish, opaque	150	0.99	6	Self-dispersing
	Disinfectant cleaners	0.05 - 0.3	100*	Yellowish, opaque	150	0.99	6	Self-dispersing
	Glass cleaners	0.05 - 0.3	100*	Yellowish, opaque	150	0.99	6	Self-dispersing
SRE	General-purpose cleaners	0.1 - 0.5	20	White	150	1.0	6	Emulsion
	Floor polishes	0.1 - 0.5	20	White	150	1.0	6	Emulsion
	Carpet cleaners	0.1 - 0.5	20	White	150	1.0	6	Emulsion
SE 47	Sanitary cleaners	0.01 - 0.5	10	White	50	1.0	6	Emulsion

\* including organic active ingredients

### Service

Our expert teams will be glad to support you in choosing the optimum SILFOAM® for your individual application. Shaking tests, pump circulation tests and the introduction of air in the CONTIFOAM® tester can be applied to determine the foaming behavior and long-term effect of our products in customers' systems. In the case of film-forming polishes, we also test the foam behavior on plastic sheet or glass plates.

Because of the different compatibility of SILFOAM® antifoam agents with your specific system, we recommend preliminary tests on customer samples. It is thus easier to make a preliminary selection and to test samples of our antifoam agents.

### Recommendation

- **General-Purpose Cleaners**

For solvent-containing products, we recommend the relatively high molecular weight and readily compatible SILFOAM® SC 132 defoamers. In aqueous systems we preferably recommend SILFOAM® SRE and SD 670. Our SILFOAM® SRE and SD 670 antifoam agents are preferred as filling aids in production processes.

- **Floor Polishes**

For this application, SILFOAM® SD 670 or alternatively our silicone antifoam emulsion SILFOAM® SRE is available.

- **Carpet Cleaners**

For this, we recommend our SILFOAM® SRE antifoam agent.

- **Sanitary Cleaners**

The nonionic, alkali-stable, low-viscosity antifoam emulsion SILFOAM® SE 47 is ideal for this purpose.

- **Disinfectant Cleaners**

Excellent results can usually be obtained with SILFOAM® SD 670.

- **Glass Cleaners**

For this application, we recommend relatively hydrophilic, polar products, such as SILFOAM® SD 670.





# PULPSIL® PUTS ZIP INTO THE PULP INDUSTRY'S PROCESSES

Antifoam agents from WACKER SILICONES ensure pulp and paper manufacturing processes run smoothly and efficiently.

## Contents: Pulp Industry

Introduction	29
Product recommendations	30

## The Facts

Over the last decade, the pulp and paper industry has undergone rapid concentration. Now, this market is dominated by multinationals. Pressure for cost-effective pulp and paper production is growing.

By far the most important process for producing chemical pulp is the kraft or sulfate process. Foaming problems often occur because of the high mechanical forces and the amount of air entrained in the liquor. To ensure pulp manufacturing processes run smoothly, therefore, it is essential to use defoamers with good dewatering properties.

The PULPSIL® line from WACKER SILICONES includes antifoam agents specially tailored to the pulp industry's needs, to ensure that processes run reliably and smoothly. Our silicone defoamers can be used in almost all production stages in which foaming occurs, such as pulp washing, sorting and screening, bleaching and wastewater treatment.

## What Characterizes PULPSIL® Antifoam Agents?

- Improved washing
- They reduce washing water consumption and therefore less energy is required for evaporation.
- Reduced soda loss
- Improved pulp quality
- Reduced pitch problems
- They reduce bleaching chemicals demand, ensuring production has a low environmental impact.

# AND WE RECOMMEND THESE PRODUCTS FOR SPEEDING UP YOUR PRODUCTION

**PULPSIL® – the product line from WACKER SILICONES specially tailored to the demands of the pulp industry – permits effective foam control in pulp production.**

## **Service**

At WACKER SILICONES, we support you in choosing the ideal PULPSIL® product and fine-tuning it by means of preliminary tests in our application labs under realistic conditions. We carry out pump circulation tests on different black liquors at different temperatures and with different dosage amounts. The CONTIFOAM® fully automatic foam recording instrument and a specially developed software program allow us to give our customers extensive data about foam collapse, the area beneath the foam curve or the long-term effect of PULPSIL® defoamers.

With our many years of experience in pulp defoaming, we can simulate pulp production under realistic conditions. The results from our labs can be directly applied to pulp mills. Our customers also have access to our sophisticated silicone analytical facilities, which can be used at any time for product development or product support.

Application	Dosage kg/t pulp	Solids content [%]	Appearance	Viscosity approx. [mPa s], 25 °C	pH approx.	Density approx. [g/cm <sup>3</sup> ], 25 °C	Shelf life min. (months)	Product type	
<b>PULPSIL®</b>									
160 C	Emulsion formulation	0.02 - 0.16	100	Colorless, opaque	17 000 - 25 000	n. a.	1.0	12	Compound
760 E	Pulp washing	0.1 - 0.8	32 - 35	White	50 - 500	7.0	1.0	6	Emulsion

n. a. = not applicable

### Recommendations

#### PULPSIL® 760 E

PULPSIL® 760 E silicone antifoam emulsion is based on tried-and-tested emulsifier technology. Low viscosity and optimum particle distribution together with high efficiency make PULPSIL® 760 E an optimized, ready-to-use emulsion in pulp mills.

PULPSIL® antifoam emulsions are preferably added to the washing water or fiber feed. When converting to PULPSIL®, we recommend choosing several metering locations. The dosage and the number of dosage locations are then reduced in an optimization process taking several months. This may require purchasing special pumps. The required concentration is of the order of 0.1 to 0.8 kg / metric ton of pulp. However, it is highly dependent on the medium to be defoamed and the process conditions.

#### PULPSIL® 160 C

Its good balance of handling, emulsification, fast knock-down and long-term effect make PULPSIL® 160 C the ideal antifoam compound for formulations in the pulp industry. The required amounts are of the order of 0.02 to 0.16 kg / metric ton of pulp. However, they are highly dependent on the medium to be defoamed and the process conditions.







# SILFOAM® AND SILFAR® TURN YOUR INNOVATIVE TECHNOLOGIES INTO MARKETABLE PRODUCTS

The latest developments in the life sciences require special customized systems for effective foam control.

## Contents: Life Sciences

Introduction	33
Pharmaceutical industry	34
Food processing	36
Agrochemicals	38
Fermentation and biotechnology	40
Wastewater treatment	42

## The Facts

Life-science products affect us in more ways than is obvious at first sight. Our lives would be greatly impoverished without recent developments in pharmaceuticals and food technology, biotechnology and fermentation, plant protection, agrochemicals or water treatment.

Many of the special processes used in the life sciences involve heavy foaming. WACKER SILICONES' SILFAR® and SILFOAM® antifoam agents offer a tailored problem-solving system for a wide variety of highly specialized life-science applications. Our products can be used as selected process auxiliaries or even as direct active ingredients.

As the market and users make rapidly changing demands on the life-science sector, WACKER SILICONES adapts by means of ongoing, systematic development of our SILFAR® and SILFOAM® product lines. Our antifoam agents meet the highest regulatory requirements and certification conditions. They are produced to very high quality standards and undergo strict quality controls.

See for yourself on the following pages how varied and effective our antifoam agents are in the most diverse life-science applications.

# OUR ANTIFOAM AGENTS ARE SPECIALISTS IN PHARMACEUTICALS

**SILFAR® products – efficient active ingredients and auxiliary substances for the pharmaceutical industry – ensure high pharmaceutical quality and meet the highest regulatory standards.**

## **The Facts**

Companies producing innovative high-quality products for the pharmaceutical industry must meet extremely high legal standards. The regulations describe the chemical composition of these products down to the last detail. WACKER SILICONES has created a benchmark and a synonym for pharmaceutical quality: the SILFAR® product line.

Our special products have been in successful use for years as active ingredients and auxiliary substances in human and veterinary medicine. Some pharmaceutical and medical products would not be possible at all, or could not be manufactured without SILFAR®. Our products meet regulations such as the European Pharmacopoeia (EP) or U.S. Pharmacopeia (USP/NF) monographs. The same also applies, of course, to the individual components contained within SILFAR® products.

Application	Regulations	Active ingredient approx. [%]	Appearance	Viscosity approx. [mPa s], 25 °C	pH	Density approx. [g/cm <sup>3</sup> ], 25 °C	Shelf life min. (months)	Product type	
<b>SILFAR®</b>									
100	Antiflatulence, antacid	EP, USP/NF-compliant	100	Colorless, clear	100	n. a.	0.97	12	Dimethicone
350	Antiflatulence, antacid Biotech processes	EP, USP/NF-compliant	100	Colorless, clear	350	n. a.	0.97	12	Dimethicone
500	Antiflatulence, antacid	EP, USP/NF-compliant	100	Colorless, clear	500	n. a.	0.97	12	Dimethicone
1000	Antiflatulence, antacid Biotech processes	EP, USP/NF-compliant	100	Colorless, clear	1 000	n. a.	0.97	12	Dimethicone
S 184	Antiflatulence, antacid Pharmaceutical liquid preparations, Biotech processes	EP, USP/NF-compliant	100	Colorless, opaque	3 000	n. a.	1.0	12	Simethicone
SE 4	Antiflatulence, antacid Pharmaceutical liquid preparations, Biotech processes	Ingredients EP, USP/NF-compliant	30	White	-	3.0 - 5.0	1.0	6	Simethicone emulsion

n. a. = not applicable

### Service

Special products for the pharmaceutical industry require selected manufacturing methods, which WACKER SILICONES provides as part of its GMP (Good Manufacturing Practices). We support these products with the required documentation, as laid down in the regulatory requirements, and issue approval test certificates confirming this.

Since our products can be used in many medical applications, we have compiled a guide – the WACKER Healthcare Guidelines. They give you detailed advice on using SILFAR® in the manufacture of pharmaceutical products.

Our expert teams will of course support you in modifying formulations and provide you with test procedures and analytical methods customized to your needs.

### Recommendations

- For applications requiring the GMP standard, we recommend our SILFAR® S 184 and the corresponding emulsion SILFAR® SE 4, which are produced according to GMP.

### Note

The applications mentioned in the table from the human sector also apply by analogy to related areas from veterinary medicine.

### > Link

Detailed information about the WACKER Healthcare Guidelines can be found under: [www.wacker.com](http://www.wacker.com)

# WE ENSURE FOOD PROCESSING RUNS SMOOTHLY

**SILFOAM® and SILFAR® are specialty foam control products customized to the demands of the food-processing industry.**

## **The Facts**

In the food-processing industry, foam can occur at various points in a production chain. This is usually caused by surface-active substances such as proteins, fatty acids and sugars. The resulting foam affects the product properties in various ways and greatly disrupts the process.

WACKER SILICONES has an answer to these problems: the SILFAR® and SILFOAM® lines of antifoam agents, which have been specially developed for the food-processing industry.

Our product range ensures processes run smoothly and product qualities are improved in specific application areas, such as washing of vegetables, the beverages industry, fruit conservation, alcohol distillation, deep-frying oils, deep-frozen foods and gelatine production. A distinction should be made between direct and indirect food contact. With direct contact, the antifoam agent remains in the food, while as an indirect process aid it is only temporarily in contact with the food.

SILFAR® and SILFOAM® are available to you as high-purity silicone fluids, highly efficient compounds or as antifoam emulsions that are specially tailored to water-based applications.

Special production and quality controls ensure a high standard for these special products for the food sector.

## **Service**

Antifoam agents used in the food-processing industry are subject to special regulations. The SILFAR® and SILFOAM® antifoam agents used here must conform to national legislation (such as EU guidelines and FDA regulations), as well as meet a wide range of requirements.

Our expert teams will be glad to discuss these questions with you on request.

## **Recommendations**

- We offer a wide range of SILFAR® and SILFOAM® antifoam agents as listed in the table for specific applications in the food industry.

	Application	Regulations	Dosage [ppm]	Active ingredient approx. [%]	Appearance	Viscosity approx. [mPa s], 25 °C	pH	Density approx. [g/cm <sup>3</sup> ], 25 °C	Shelf life min. (months)	Product type
<b>SILFAR®</b>										
350	Fat-based systems	FDA §173.340, E number BfR XV, kosher	10	100	Colorless, clear	350	n. a.	0.97	12	Silicone fluid
1000	Fat-based systems	FDA §173.340, E number BfR XV, kosher	10	100	Colorless, clear	1 000	n. a.	0.97	12	Silicone fluid
S 184	Fat or water-based systems	FDA §173.340, E number BfR XV, kosher	10	100	Colorless, opaque	3 000	n. a.	1.0	12	Compound
SE 4	Water-based systems	FDA §173.340, E number BfR XV, kosher	20	30	White	-	3.0 - 5.0	1.0	6	Emulsion
<b>SILFOAM®</b>										
SC 182	Fat or water-based systems	FDA §173.340, E number BfR XV, kosher	10	100	Colorless, opaque	1 500	n. a.	1.0	12	Compound
SE 2	Water-based systems	BfR XV, kosher	30	20	White	-	3.5 - 6.5	1.0	6	Emulsion
SE 6	Water-based systems	BfR XV, kosher	20	30	White	-	3.5 - 6.5	1.0	6	Emulsion
SE 9	Water-based systems	BfR XV, kosher	50	10	White	9 000	3.0 - 6.0	1.0	6	Emulsion
SE 10	Water-based systems	FDA §173.340, E number BfR XV, kosher	50	10	White	-	3.0 - 5.0	1.0	6	Emulsion

n. a. = not applicable



# YOU'LL REAP A GOOD HARVEST WITH OUR ANTIFOAM AGENTS

**SILFOAM® grades ensure effective foam control in production processes for the agrochemicals industry and plant protection agents.**

## **The Facts**

The world's population is growing steadily. Supplying enough agricultural products poses formidable challenges to the agrochemicals industry. The problem would be almost impossible to solve without efficient processing aids.

With SILFOAM® antifoam agents, WACKER SILICONES makes an important contribution to solving this problem. Our products provide effective and long-lasting foam control in production processes for various plant protection formulations. For manufacturers and users of plant protection agents, they offer smooth production processes and many different uses in a variety of applications.

SILFOAM® antifoam agents are available as powders, liquid concentrates (compounds) or emulsions.

## **Service**

Our expert teams will provide support with product pre-selection and give you processing tips and formulation recommendations for your specific application.

We will also provide the documentation to satisfy national regulatory requirements.

## **Recommendations**

- We offer you the wide variety of SILFOAM® antifoam agents listed in the table, customized to specific plant protection formulations.
- We recommend a range of antifoam agents that are specifically tailored to conform to the relevant EPA regulations (CFR 180.1001), e.g. SILFOAM® SC 120, SILFOAM® SE 2, SILFAR® S 184 and other special products.

Application	Dosage [%]	Active ingredient approx. [%]	Appearance	Viscosity approx. [mPa s], 25 °C	pH	Density approx. [g/cm <sup>3</sup> ], 25 °C	Shelf life min. (months)	Product type	
<b>SILFOAM®</b>									
SRE	SL, SC, SE, EW, SP, WP, WDG	0.5	20	White	150	5.0 - 8.0	1.0	6	Emulsion
SE 39	SL, SC, SE, EW, SP, WP, WDG	0.5	20	White	150	5.0 - 8.0	1.0	6	Emulsion
SC 120	SL, SC, SE, EW, SP, WP, WDG	0.1	100	Colorless, opaque	2 500	n. a.	1.0	12	Compound
SC 132	SL, SC, SE, EW, SP, WP, WDG	0.1	100	Colorless, opaque	20 000	n. a.	1.0	12	Compound
SC 369	SL, SC, SE, EW	0.1	100	Colorless, opaque	2 000	n. a.	1.0	12	Compound
SD 913	EC	0.1	60	Yellowish, clear	70	n. a.	1.0	12	Self-dispersing
SE 2	SL, SC, SE, EW	0.5	20	White	-	3.5 - 6.5	1.0	6	Emulsion
SE 9	SL, SC, SE, EW	1.0	10	White	9 000	3.0 - 6.0	1.0	6	Emulsion
SE 10	SL, SC, SE, EW	1.0	10	White	-	3.0 - 5.0	1.0	6	Emulsion
SE 47	SL, SC, SE, EW	1.0	10	White	50	5.0 - 8.0	1.0	6	Emulsion
SP 15	SP, WP, WDG	0.5	15	Yellowish, white	n. a.	n. a.	0.6*	12	Powder
<b>SILFAR®</b>									
S 184	SL, SC, SE, EW	0.1	100	Colorless, opaque	3 000	n. a.	1.0	12	Compound
<b>WACKER®</b>									
AK 1 000	EC	0.1	100	Colorless, clear	1 000	n. a.	1.0	12	Silicone fluid
AK 12 500	EC	0.1	100	Colorless, clear	12 500	n. a.	1.0	12	Silicone fluid

\* Bulk density  
n. a. = not applicable

EC = Emulsifiable concentrates  
SL = Water-miscible concentrates  
SC = Suspension concentrates  
SE = Suspoemulsions  
EW = Emulsions, water-based  
SP = Water-soluble powders  
WP = Water-dispersible powders  
WDG = Water-dispersible granules

# OUR PRODUCTS BRING ADVANCES TO FERMENTATION AND BIOTECHNOLOGY

**SILFOAM® and SILFAR® antifoam agents are ideal process auxiliaries for controlling complex fermentation and biotech processes.**

## **The Facts**

Many pharmaceutical and life-science products, and even foods, could not be produced without traditional fermentation and modern biotech processes. Of the many process auxiliaries required for controlling these complex processes, antifoam agents are very prominent.

SILFOAM® and SILFAR® antifoam agents efficiently control and regulate the foam occurring in numerous processes, and ensure the process runs smoothly.

Our antifoam agents' applications extend from fermentation processes for producing antibiotics, pharmaceutical raw materials, food products and enzymes – through to biotech processes such as media sterilization, foam control during the actual fermentation itself, and downstream processes.

The products we offer for the fermentation sector are characterized by optimum combinations of different product properties, such as high defoaming efficiency (knock-down and long-term effect), and compatibility with microbial cultures.

SILFOAM® and SILFAR® grades can be incorporated into these processes either as compound or emulsion.

	Application Fermentation/biotechnology	Dosage [%]	Active ingredient approx. [%]	Appearance	Viscosity approx. [mPa s], 25 °C	pH	Density approx. [gm <sup>3</sup> ], 25 °C	Shelf life min. (months)	Product type
<b>SILFAR®</b>									
S 184	Antibiotics	0.1	100	Colorless, opaque	3 000	n. a.	1.0	12	Compound
	Steroids	0.1	100	Colorless, opaque	3 000	n. a.	1.0	12	Compound
SE 4	Enzymes	0.1	30	White	-	3.0 - 5.0	1.0	6	Emulsion
	Foods	0.1	30	White	-	3.0 - 5.0	1.0	6	Emulsion
<b>SILFOAM®</b>									
SC 155	Antibiotics	0.1	100	Colorless, opaque	2 000	n. a.	1.0	12	Compound
SE 2	Enzymes	0.5	20	White	-	3.5 - 6.5	1.0	6	Emulsion
SE 9	Enzymes	0.5	10	White	9 000	3.0 - 6.0	1.0	6	Emulsion

n. a. = not applicable

#### Service

We will be glad to supply more detailed product information, product data or certificates on request.

#### Recommendations

- If, for specific applications, you require antifoam agents that meet particular monographs (e.g. USP or EP), or you require approved food-compliant grades, we recommend the SILFAR® product line.
- For applications requiring conformity to GMP standards, SILFAR® S 184 antifoam agent and the corresponding SILFAR® SE 4 emulsion are ideal.

# OUR ANTIFOAM AGENTS CLARIFY PROBLEMS IN WASTEWATER TREATMENT

**SILFOAM® products effectively control foam in industrial effluent or municipal sewage treatment plants.**

## **The Facts**

Effluent from municipal sewage treatment plants or industry almost always contains surface active agents that can cause foam. This foam can severely disrupt wastewater treatment processes.

WACKER SILICONES has an answer to these specific problems: SILFOAM® antifoam agents.

Our product range provides effective and long-term foam regulation and control in the different clarification stages of treatment plants. Our antifoam agents can also be effectively used in highly alkaline wastewater in the semiconductor sector, in cooling water or effluent from the textile industry or in fermentation processes in biogas systems.

SILFOAM® antifoam agents can be used either as emulsion or compound in wastewater treatment. With their high efficiency, they enhance process reliability in the plant, permitting economic wastewater treatment.



Application	Dosage [ppm]	Active ingredient approx. [%]	Appearance	Viscosity approx. [mPa s], 25 °C	pH	Density approx. [gm <sup>3</sup> ], 25 °C	Shelf life min. (months)	Product type	
<b>SILFOAM®</b>									
SD 670	Industrial wastewater treatment	20	100	Yellowish, opaque	150	n. a.	1.0	12	Self-dispersing
SD 771	Wastewater treatment	20	100	Colorless, opaque	50 000	n. a.	1.0	12	Self-dispersing
SE 39	Municipal and industrial wastewater treatment plants Evaporators	50	20	White	150	5.0 - 8.0	1.0	6	Emulsion
SE 47	Municipal and industrial wastewater treatment plants Textile industry	100	10	White	50	5.0 - 8.0	1.0	6	Emulsion
SE 57	Industrial wastewater treatment plants Evaporators	50	20	White	600	5.0 - 8.0	1.0	6	Emulsion
SE 73	Municipal wastewater treatment plants	100	8	White	3 000	5.0 - 8.0	1.0	6	Emulsion
SRE	Municipal and industrial wastewater treatment plants Solvent recovery	50	20	White	150	5.0 - 8.0	1.0	6	Emulsion
BG 100	Biogas plants	100	10	White	50	5.0 - 8.0	1.0	6	Emulsion

n. a. = not applicable

### Service

SILFOAM® antifoam agents sooner or later are discharged to the environment, either as part of the solid waste from wastewater treatment or as antifoam agents deliberately added to the wastewater.

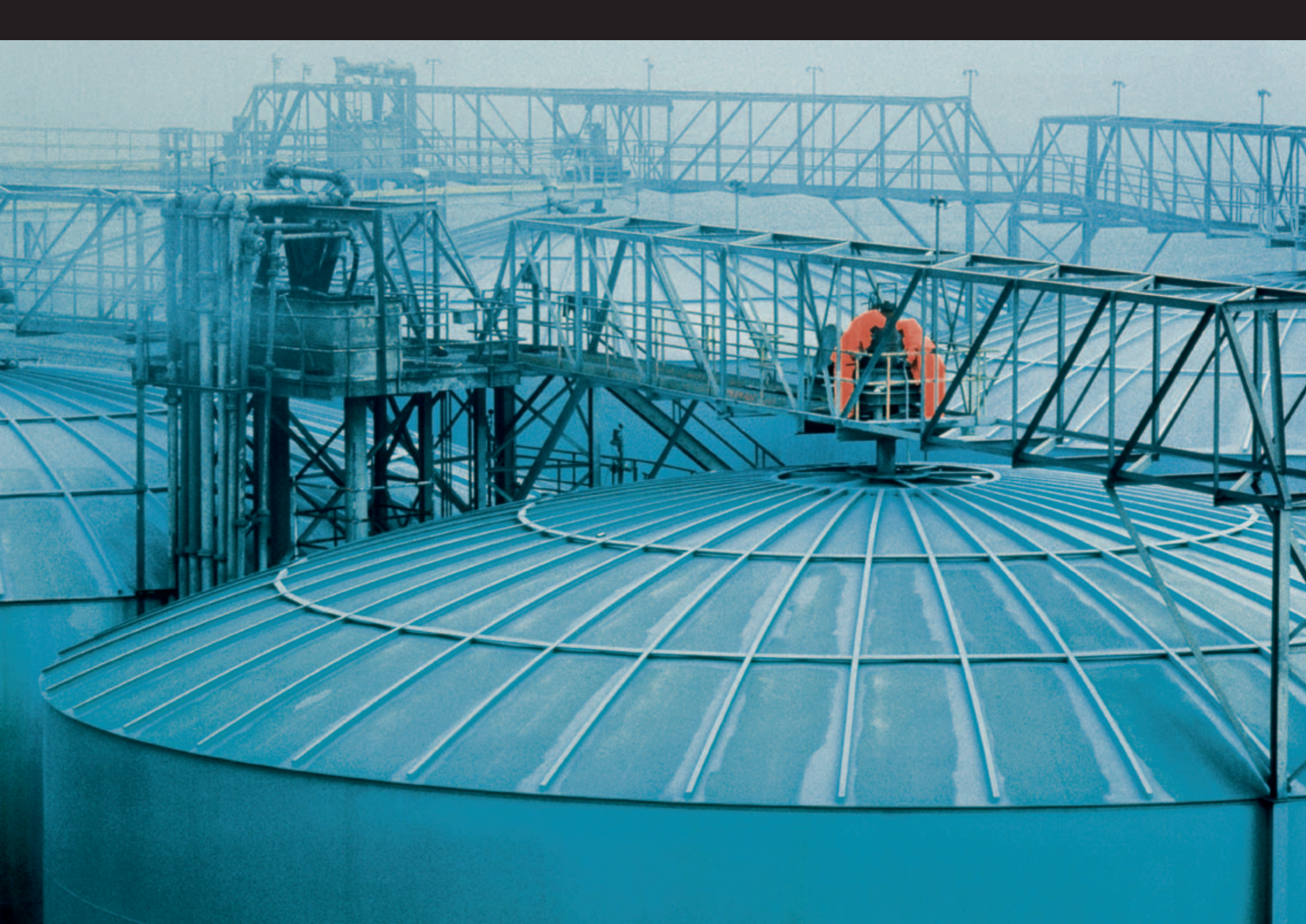
At WACKER SILICONES we have considered these ecological questions in detail.

Here is a short summary of the results:

- The emulsifier in antifoam emulsions is usually biodegradable.
- Silica (SiO<sub>2</sub>) is an inorganic substance that occurs as such in Nature.
- Polydimethylsiloxanes are initially bound in the sludge in wastewater treatment plants and subsequently, under appropriate conditions, undergo “abiotic” degradation, i.e. chemical degradation that is not initiated by microbes.

### Recommendations

- SILFOAM® SD 771 antifoam agent concentrate is suitable for the production of antifoam emulsions.
- We offer you a large range of SILFOAM® antifoam agents for specific wastewater applications, as listed in the table.





# SILFOAM® HELPS YOU PRODUCE, REFINE AND PROCESS CRUDE OIL

**WACKER SILICONES antifoam agents optimize petroleum and natural gas production, refining and processing.**

## **Contents: Petroleum Industry**

Introduction	45
Crude-oil and natural-gas production	46
Refining	48
Processing	50

## **The Facts**

The petroleum industry is among the most important branches of modern industry. Most processes in this industry are technically very sophisticated and oriented to optimum yields and high volumes. Petroleum and natural gas undergo a variety of treatment processes before they reach the end user.

Even at the drilling stage, it is important to produce the valuable raw materials as efficiently and in as pure a form as possible, and to prevent any intermediate reactions that would reduce quality.

In the fields of processing and enhancing petroleum products, too, the production conditions should be as smooth as possible. Undesirable foaming here leads to inefficient production processes and reduced product quality.

Innovative SILFOAM® antifoam agents from WACKER SILICONES offer you an individual, economic and efficient way of controlling and regulating undesirable foaming in the petroleum industry. Thanks to their superior properties

and diverse fields of application, our products can be used in all processing stages, from the drilling rig to consumer products.

## **What Can SILFOAM® Antifoam Agents Do?**

- In oil and gas production, they optimize drilling fluid additives, drilling mud, well cementation, oil and gas extraction, separation of crude oil and gas, and water separation.
- In refineries, they are also used in the areas of distillation, gas sweetening and drying, deasphalting and in cracking processes.
- In processing and enhancing, they permit smooth and more efficient production conditions.
- They are available worldwide in a variety of different packaging sizes.

# WITH OUR ANTIFOAM AGENTS, YOU WILL PRODUCE PURE OIL

**SILFOAM® antifoam agents permit the reliable and efficient extraction of petroleum and natural gas.**

## **The Facts**

### **Gas/Oil Separation**

In oil production, the gas dissolved in the crude oil is separated by pressure relief in gas/oil separators. Because of its many gaseous components, voluminous foam often forms on the crude oils. If the foam emerged through the gas discharge, it would seriously disrupt the subsequent processes. The use of SILFOAM® antifoam agents and WACKER® AK silicone fluids safely and reliably keeps the foam within low volumes. This ensures that the plant operates at full capacity.

### **Drilling Muds**

Density is an important criterion for drilling mud. Deaeration with SILFOAM® antifoam agents effectively reduces the gas content and decreases the compressibility.

### **Natural-Gas Production with Surfactants**

To prevent the gas flow failing, surfactants are used in low-pressure natural-gas fields to foam the produced water. The foam can be cost-effectively removed above ground by means of our silicone antifoam emulsions.

### **Well Cementation**

To achieve the necessary stability and impermeability, entrained air must be avoided at all costs during well cementation. Self-dispersing SILFOAM® products are added to concrete during processing to remove the contained gas.

### **Deaeration of Sea Water**

In areas near the sea, sea water is a suitable water source. Its permanent contact with air results in a relatively high oxygen content, which leads to corrosion and algal growth in the treatment processes. The sea water is therefore degassed in vacuum deaerators. The foam that occurs can be effectively reduced by means of SILFOAM® products.

Application	Dosage [ppm]	Active ingredient approx. [%]	Appearance	Viscosity approx. [mPa s], 25 °C	pH approx.	Density approx. [gm <sup>3</sup> ], 25 °C	Shelf life min. (months)	Product type	
<b>SILFOAM®</b>									
SD 670	Well cementation	20 - 500	100	Yellowish, opaque	150	n. a.	1.0	6	Self-dispersing
SD 860	Well cementation	20 - 500	100	Colorless, opaque	100	n. a.	0.9	12	Self-dispersing
SD 913	Gas/oil separation	5 - 50	60	Yellowish, clear	70	n. a.	1.0	12	Self-dispersing
SD 986	Gas/oil separation	20 - 200	6	Colorless, clear	5	n. a.	0.8	12	Self-dispersing
	Non-aqueous drilling mud	30 - 300	6	Colorless, clear	5	n. a.	0.8	12	Self-dispersing
SE 39	Deaeration of sea water	5 - 200	20	White	150	7.0	1.0	6	Emulsion
	Natural-gas production with surfactants	10 - 500	20	White	150	7.0	1.0	6	Emulsion
SE 47	Aqueous drilling mud	50 - 500	10	White	50	7.0	1.0	6	Emulsion
	Natural-gas production with surfactants	10 - 500	10	White	50	7.0	1.0	6	Emulsion
	Deaeration of sea water	10 - 500	10	White	50	7.0	1.0	6	Emulsion
SE 50	Aqueous drilling mud	100 - 500	5	White	1 000	6.0	1.0	6	Emulsion
SP 15	Gas/oil separation in cold climates	50 - 500	15	Yellowish, white	n.a.	n.a.	0.6*	12	Powder
<b>WACKER®</b>									
AK 12 500	Non-aqueous drilling mud	10 - 100	100	Colorless, clear	12 500	n. a.	1.0	12	Siliconefluid
	Gas/oil separation	10 - 100	100	Colorless, clear	12 500	n. a.	1.0	12	Siliconefluid
AK 60 000	Non-aqueous drilling mud	5 - 100	100	Colorless, clear	60 000	n. a.	1.0	12	Siliconefluid
	Gas/oil separation	5 - 100	100	Colorless, clear	60 000	n. a.	1.0	12	Siliconefluid

\* Bulk density  
n. a. = not applicable

## Service

WACKER SILICONES' experts are available at any time for support in the selection and fine-tuning of WACKER SILICONES antifoam agents. Our services include, not only laboratory tests and pre-sales tests, but also pilot plants and test apparatus specially tailored to requirements in oil production.

## Recommendations

### Non-Aqueous Applications

Ready-to-use SILFOAM® SD 986 is already optimized for gas/oil separation. It can also be used for non-aqueous drilling muds.

For very low temperature regions, WACKER SILICONES offers SILFOAM® SP 15, an antifoam agent powder that is always easy to handle, even at extremely low temperatures, and provides efficient defoaming.

WACKER® AK silicone fluids are available in a viscosity range from 0.65 to over 1 million mPa s for customers to make their own formulations.

### Aqueous Applications

The relatively low-viscosity and therefore easy-to-dose SILFOAM® SE 47 is particularly recommended for aqueous drilling muds in natural-gas production and for deaeration of seawater.

At high shearing rates and high surfactant concentrations, the highly active SILFOAM® SE 39 can be used as an alternative.

The highly stable and pre-diluted SILFOAM® SE 50 is specially suitable for drilling muds.

For use in well cementation, we recommend self-dispersing SILFOAM® SD 860 and SD 670.



# OUR PRODUCTS ENHANCE THE PROCESSES IN YOUR REFINERY

**SILFOAM® products control and regulate undesirable foaming in the principal petroleum refinery processes.**

## **The Facts**

### **Distillation**

In distillation, both at atmospheric pressure and under a vacuum, foams affect separation quality and therefore reduce the available capacity. SILFOAM® antifoam agents ensure that foam is prevented as necessary.

### **Delayed Cokers**

In the petroleum industry, delayed cokers are often subject to serious foaming under extreme conditions. Temperatures up to 500 °C require fast and effective foam control. High-molecular SILFOAM® antifoam agents ensure that as little silicone as possible is transferred to downstream process stages.

### **Gas Sweetening with Amines**

Corrosive components of gas streams, such as carbon dioxide and hydrogen sulfide, are removed by extraction. The various amines used for extraction have different foaming tendencies and require specifically tailored antifoam agents.

### **Gas Drying with Glycols**

The glycols used for gas drying show an increasing tendency to foam during use as a result of impurities. SILFOAM® products effectively prevent this foaming and prolong the lifetime of the extraction agent.

### **Extraction**

Like the above-mentioned extraction processes, foam also reduces capacity in the UDEX and sulfolane processes. SILFOAM® antifoam agents prevent this.

Application	Dosage [ppm]	Active ingredient approx. [%]	Appearance	Viscosity approx. [mPa s], 25 °C	pH approx.	Density approx. [gm <sup>3</sup> ], 25 °C	Shelf life min. (months)	Product type	
<b>SILFOAM®</b>									
SC 132	Gas sweetening with amines (H <sub>2</sub> S/CO <sub>2</sub> )	5 - 20	100	Colorless, opaque	20 000	n. a.	1.0	12	Compound
	UDEX/sulfolane process	1 - 50	100	Colorless, opaque	20 000	n. a.	1.0	12	Compound
SC 120	UDEX/sulfolane process	1 - 50	100	Colorless, opaque	2 500	n. a.	1.0	12	Compound
	Asphalt processing	1 - 20	100	Colorless, opaque	2 500	n. a.	1.0	12	Compound
SD 670	Gas drying with glycols	10 - 100	100	Yellowish, opaque	150	n. a.	1.0	6	Self-dispersing
SD 986	Vacuum distillation	50 - 200	6	Colorless, clear	5	n. a.	0.8	12	Self-dispersing
	Delayed coker/visbreaker	50 - 500	6	Colorless, clear	5	n. a.	0.8	12	Self-dispersing
	Deasphalting with propane	50 - 200	6	Colorless, clear	5	n. a.	0.8	12	Self-dispersing
SE 39	Gas sweetening with amines (H <sub>2</sub> S/CO <sub>2</sub> )	10 - 50	20	White	150	7.0	1.0	6	Emulsion
SE 47	Gas sweetening with amines (H <sub>2</sub> S/CO <sub>2</sub> )	20 - 100	10	White	50	7.0	1.0	6	Emulsion
	Gas drying with glycols	100 - 500	10	White	50	7.0	1.0	6	Emulsion
	Wastewater treatment	10 - 500	10	White	50	7.0	1.0	6	Emulsion
<b>WACKER®</b>									
AK 1 000	Asphalt processing	5 - 50	100	Colorless, clear	1 000	n. a.	1.0	12	Silicone fluid
AK 12 500	Vacuum distillation	5 - 50	100	Colorless, clear	12 500	n. a.	1.0	12	Silicone fluid
	Coker/visbreaker	10 - 100	100	Colorless, clear	12 500	n. a.	1.0	12	Silicone fluid
	Deasphalting with propane	5 - 50	100	Colorless, clear	12 500	n. a.	1.0	12	Silicone fluid
AK 60 000	Vacuum distillation	5 - 20	100	Colorless, clear	60 000	n. a.	1.0	12	Silicone fluid
	Coker/visbreaker	10 - 50	100	Colorless, clear	60 000	n. a.	1.0	12	Silicone fluid
	Deasphalting with propane	1 - 20	100	Colorless, clear	60 000	n. a.	1.0	12	Silicone fluid

n. a. = not applicable

## Service

Our experts are available at all times to provide comprehensive support in the selection and fine-tuning of WACKER SILICONES antifoam agents. Our services include laboratory tests and production trials, as well as realistic pilot plants and test equipment specially matched to requirements in the refinery sector.

## Recommendations

### Non-Aqueous Applications

In vacuum distillation, delayed cokers or visbreakers, we recommend a solution specially developed by us: SILFOAM® SD 986, a pre-diluted high-viscosity silicone fluid in a suitable solvent. On request, we can provide solutions of silicone fluids with viscosity up to over 1 million mPa s.

We recommend the use of low-viscosity silicone fluids for use in asphalt processing and transport.

### Aqueous Applications

In gas sweetening and gas drying, but also wastewater treatment, we recommend SILFOAM® SE 47.

It is added under low shear conditions. If that is not possible, the relatively high-viscosity, but alkali-resistant SILFOAM® SC 132 can be used for gas sweetening, and the self-dispersing SILFOAM® SD 670 for gas drying.

For various BTX extraction processes, we recommend SILFOAM® SC 120, which is ideal for this application, or the versatile SILFOAM® SC 132. They should be added under conditions of high shear.

# WE ENSURE FUELS AND LUBRICANTS ARE EFFECTIVE

**SILFOAM® products ensure that production runs smoothly and efficiently.**

## **The Facts**

### **Diesel Fuel**

Diesel fuels can foam strongly. Foam slows down filling of the tank at the gas station, or prevents filling to capacity. Foaming can be promoted by modern gas tank shapes, high filling rates and reduced sulfur content in fuels. Antifoam agents are among the fuel additives.

### **Engine Oils, Hydraulic Fluids, Transmission Oils, Cutting Fluids**

These fluids and lubricants require low-viscosity silicone fluids. Aqueous cutting fluids can use either SILFOAM® antifoam emulsions or SILFOAM® antifoam compounds, depending on the oil they contain.

### **Biological Wastewater Treatment**

Many companies that produce or process products for the petroleum industry operate their own industrial wastewater treatment plants. SILFOAM® antifoam emulsions are suitable for use in all aerobic and anaerobic process stages.

## **Service**

WACKER SILICONES tests all antifoam agents for diesel fuels according to the NFM 07-075 standard. The required compatibility with other diesel fuel additives can be further increased by customizing our antifoam agents to suit these additives. For example, we can also provide products that do not require a co-solvent.

## **Recommendations**

### **Diesel Fuel**

The addition of antifoam agents such as SILFOAM® SD 913 achieves complete defoaming of the diesel fuel in dosages of only 5 - 10 ppm.

### **Engine Oils, Hydraulic Fluids, Transmission Oils**

For these fluids, WACKER® AK silicone fluids provide the right degree of foam inhibition. In addition to the viscosity range mentioned here, we also offer products with a viscosity specially tailored to your needs.

### **Cutting Fluids**

For non-aqueous cutting fluids, a few ppm of WACKER® AK 60 000 is enough for effective foam control. Aqueous cutting fluids can either use antifoam emulsions or antifoam compounds, depending on the type of oil they contain.

### **Biological Wastewater Treatment**

The foam control necessary to allow wastewater treatment plants to operate at optimum capacity is provided by our antifoam emulsions SILFOAM® SE 47 and SILFOAM® SE 39.

Application	Dosage [ppm]	Active ingredient approx. [%]	Appearance	Viscosity approx. [mPa s], 25 °C	pH approx.	Density approx. [gm <sup>3</sup> ], 25 °C	Shelf life min. (months)	Product type	
<b>SILFOAM®</b>									
SD 670	Aqueous cutting fluids: • Based on synthetic fluid • Based on mineral oil	10 - 500	100	Yellowish, opaque	150	n. a.	1.0	6	Self-dispersing
SD 913	Diesel fuel antifoam agent	5 - 10	60	Yellowish, clear	70	n. a.	1.0	12	Self-dispersing
SE 39	Production of bitumen emulsions	5 - 200	20	White	150	7.0	1.0	6	Emulsion
	Aqueous cutting fluids: • Based on synthetic fluid	20 - 500	20	White	150	7.0	1.0	6	Emulsion
	Biological wastewater treatment	5 - 200	20	White	150	7.0	1.0	6	Emulsion
SE 47	Production of bitumen emulsions	10 - 500	10	White	50	7.0	1.0	6	Emulsion
	Aqueous cutting fluids: • Based on mineral oil	50 - 1 000	10	White	50	7.0	1.0	6	Emulsion
	Biological wastewater treatment	10 - 500	10	White	50	7.0	1.0	6	Emulsion
<b>WACKER®</b>									
AK 350	High-viscosity hydraulic fluids	5 - 100	100	Colorless, clear	350	n. a.	1.0	12	Silicone fluid
	Transmission oil: based on mineral oil	5 - 100	100	Colorless, clear	350	n. a.	1.0	12	Silicone fluid
	Engine oil	5 - 200	100	Colorless, clear	350	n. a.	1.0	12	Silicone fluid
AK 12 500	Non-aqueous cutting fluids	10 - 200	100	Colorless, clear	12 500	n. a.	1.0	12	Silicone fluid
	Low-viscosity hydraulic fluids	10 - 100	100	Colorless, clear	12 500	n. a.	1.0	12	Silicone fluid
	Transmission oil: based on synthetic oil	10 - 200	100	Colorless, clear	12 500	n. a.	1.0	12	Silicone fluid
AK 60 000	Non-aqueous cutting fluids	5 - 100	100	Colorless, clear	60 000	n. a.	1.0	12	Silicone fluid
	Low-viscosity hydraulic fluids	10 - 100	100	Colorless, clear	60 000	n. a.	1.0	12	Silicone fluid
	Transmission oil: based on synthetic oil	5 - 100	100	Colorless, clear	60 000	n. a.	1.0	12	Silicone fluid

n. a. = not applicable







# SILFOAM® SETS THE TONE IN DISPERSION DEFOAMING

Antifoam agents from WACKER SILICONES permit economic production of dispersions and improve important properties of dispersion-based products.

## Contents: Dispersions

Introduction	53
Product recommendations	54

## The facts

In times of stagnating markets, it may be crucial to your competitiveness to be able to produce dispersions economically, or to improve the properties of dispersion-based products. SILFOAM® antifoam agents can support you in achieving these aims.

Our products optimize space/time yields in dispersion production and facilitate the transport and filling of dispersions. They also simplify the use of dispersion-based products by suppressing unwanted foam or eliminating microfoam.

WACKER SILICONES has a SILFOAM® antifoam agent that is right for any type of dispersion. In the form of emulsions, organically modified compounds or organofunctional self-dispersing compounds. For dispersions, we offer a versatile range of antifoam agents with an ideal spread of efficiency and compatibility values.

## What Can SILFOAM® Antifoam Agents Do?

- They are active in almost all surfactant and protective colloid systems.
- They have good compatibility and can be used in sensitive applications such as paints and surface coatings.
- They are highly dispersible and shear stable.
- They do not cause loss of gloss in polymer films, and can therefore be used for formulating high-gloss lacquers.

# THESE ANTIFOAM AGENTS ENSURE THE BALANCE IS RIGHT

The highly specialized SILFOAM® product range offers the right antifoam agent for every type of dispersion.

## The Facts

To help optimize space/time yields, SILFOAM® products are specially tailored to the demands of dispersion producers for efficiently running processes. As process auxiliaries, our antifoam agents control and suppress the unwanted foam that occurs as a result of the shear forces applied during stirring of the dispersion, removing residual monomers from the dispersion, transferring the dispersion to downstream stirrers and filling the dispersion into sales containers.

For processing and using dispersion-based products, SILFOAM® grades also improve quality by optimizing the product functions. The properties of deaerating microfoams and good compatibility with organic systems make SILFOAM® products particularly valuable for use in processing dispersions and formulating products, such as paints, surface coatings, construction materials, paper coatings and adhesives.

In sensitive applications in the paints and surface coatings or paper sectors, too, SILFOAM® grades provide essential properties such as optimized flow and the formation of immaculate surfaces.

Application	Dosage recommendation* for trials [%]	Active ingredient approx. [%]	Appearance	Viscosity approx. [mPa s], 25 °C	Dispersibility in water**	Shelf life min. (months)	Product type	
<b>SILFOAM®</b>								
SE 47	s-PVC, interior paints, exterior paints	0.02 - 0.5	10	White	50	++	6	Emulsion
SE 9	s-PVC, interior paints	0.02 - 0.5	10	White	9 000	+	6	Emulsion
SD 670	Printing inks, paper coatings, adhesives, construction materials	0.05 - 0.3	100	Yellowish, opaque	150	++	6	Self-dispersing
SD 860	Printing inks, high-gloss lacquers, adhesives, construction materials	0.05 - 0.3	100	Colorless, opaque	100	(+)	12	Self-dispersing
SD 882	Exterior paints, paper coatings	0.1 - 0.5	100	Yellowish, opaque	20	++	12	Self-dispersing
SC 369	Printing inks, adhesives	0.02 - 0.5	100	Colorless, opaque	2 000	(+)	12	Compound
SC 370	Interior paints, high-gloss lacquers	0.02 - 0.5	100	Yellowish, opaque	650	(+)	12	Compound
SC 385	Interior paints, high-gloss lacquers, construction materials	0.02 - 0.5	100	Yellowish, opaque	300	(+)	12	Compound

\* Dosage recommendations are highly dependent on the system to be defoamed

\*\* ++ very good; + good; (+) good in the presence of surfactants

### Service

In our applications laboratories, we ensure that the optimum SILFOAM® product is chosen, and that it is fine-tuned to the customer's system. Here, we carry out tests on the compatibility and storage stability of our dispersion defoamers in the customer's systems, determine density levels to measure its efficiency at different temperatures and applied shear forces. We are also equipped to simulate dynamic processes, such as pump circulation by the CONTIFOAM® method.

### Legal Requirements

Our product range also includes antifoam agents for applications that must satisfy special food regulations. For guidelines BfR XIV and 2002/72/EC, we recommend SILFOAM® SC 370 and SILFOAM® SE 9 antifoams. The guidelines BfR XIV and FDA 21 CFR § 175.105, 175.300 and 176.200 are best satisfied using SILFOAM® SE 9 and SILFOAM® SC 385.

### Recommendations

#### • Dispersion Production

For this application, we recommend the medium-to-fine particle o/w emulsion SILFOAM® SE 47 or the self-dispersing compound SILFOAM® SD 670. SILFOAM® SD 670 is far superior to organic defoamers in systems subjected to high shear forces or with a high surfactant content.

If only a booster for organic defoamers is required, the organically modified compound SILFOAM® SC 369 is ideal.

#### • Dispersion-Based Products

We recommend the polyether-functional compound SILFOAM® SC 370 or self-dispersing compounds SILFOAM® SD 860 and SILFOAM® SD 882.

For high-solids systems, SILFOAM® SD 860 is ideal.

#### • Sensitive Applications

For this purpose, we have developed our organically modified defoamers SILFOAM® SD 670 and SILFOAM® SD 882.

In SILFOAM® SD 882, the typical silicone properties have been moderated by a high degree of organic modification.







WE HAVE ANSWERS FOR PEOPLE WHO KNOW A LOT  
BUT NOT YET EVERYTHING



# GLOSSARY

## A

- **ABIOTIC DEGRADATION**

Environmental degradation of substances by purely chemical or physical means, without the influence of living organisms (microbes)

- **ACTIVITY**

Effectiveness of an antifoam agent

- **ALKALI RESISTANCE**

Resistance of an antifoam agent in an alkaline medium

- **ANTIFOAM AGENT**

Foam-preventing substance:

SILFOAM® foam control systems are multifunctional, i.e. they act as antifoam agents, defoamers, or fulfill both functions, depending on the application.

## B

- **BfR**

German Federal Institute of Risk Assessment; replaces the former BgVV (Federal Institute for Health Protection of Consumers and Veterinary Medicine)

- **BLEACHING**

Chemical treatment of textiles to lighten their color

- **BOD/COD**

Biological/chemical oxygen demand

## C

- **COMPATIBILITY**

Property of an antifoam agent to mix with a given medium or other additives without separating

- **CONTIFOAM®**

Fully automatic test instrument for characterizing the foaming behavior of test media, e.g. by pump circulation

- **CONTINUOUS PROCESS**

Treatment of textiles in a continuous process

## D

- **DISPERSIBILITY**

Distribution of an antifoam agent in a given medium

## E

- **E NUMBERS**

Characterize substances that are approved as direct food additives according to EU legislation

- **EP**

Abbreviation for European Pharmacopoeia

- **EPA REGULATIONS**

Requirements made by the Environmental Protection Agency (USA)

## F

- **FDA REGULATIONS**

Requirements made by the Food and Drug Administration (USA)

- **FILTRABILITY**

Capability of antifoam agents to pass through filter materials

## G

- **GMP**

*Good Manufacturing Practices*

## H

- **HEALTHCARE GUIDELINES**

Guidelines defined by WACKER for describing the use of silicone products in the pharmaceutical sector ([www.wacker.com](http://www.wacker.com))

## I

- **IONICITY**

Description of a property of surfactants to either form ions or a property that is caused by ions; this term distinguishes between anionic, cationic and nonionic surfactants

## K

- **KNOCK-DOWN BEHAVIOR**  
Describes the initial foam collapse in a given foam system

## L

- **LONG-TERM EFFECT**  
Describes the long-term antifoam effect in a given system

## N

- **NF**  
National Formulary, a compendium of drug standards published by the American Pharmaceutical Association

## P

- **POST-ADDITION**  
Describes the addition of additives subsequent to the spray drying process during powder laundry detergent production
- **PRODUCT DEFOAMER**  
Antifoam agent that is incorporated into the formulation to prevent foam formation
- **PROCESS DEFOAMER**  
Antifoam agent that is added during the process to control foaming
- **PUMP CIRCULATION TEST**  
CONTIFOAM®

## S

- **SELF-DISPERSING ANTIFOAM AGENT**  
Antifoam agents that disperse spontaneously on contact with foaming systems, sometimes also known as "self-emulsifying antifoam agents"
- **SHEAR STABILITY**  
Resistance of an emulsion to the effect of shear forces (e.g. rotating rolls, stirrers, air entrainment, pumping)
- **SHELF LIFE**  
Stability of the product quality of an antifoam agent under defined storage conditions over a given period of time
- **SPRAYING**  
Method of applying antifoam agents to powders, e.g. in the laundry detergent industry

## T

- **TREATMENT LIQUOR**  
Liquid treatment medium for textiles

## U

- **USP**  
Abbreviation for United States Pharmacopeia

## W

- **WETTING AGENT**  
Has the effect that aqueous formulations can be applied uniformly to hydrophobic surfaces; wetting agents are mediators between incompatible phases

The data presented in this brochure are in accordance with the present state of our knowledge, but do not absolve the user from carefully checking all supplies immediately upon receipt. We reserve the right to alter product constants within the scope of technical progress or new developments. The information given in this brochure should be checked by preliminary trials because of conditions during processing over which we have no control, especially where other companies' raw materials are also being used. The information provided by us does not absolve the user from the obligation of investigating the possibility of infringement of third parties' rights and, if necessary, clarifying the position. Recommendations for use do not constitute a warranty, either express or implied, of the fitness or suitability of the product for a particular purpose.

**WACKER**

**SILICONES**

Wacker Chemie AG  
Hanns-Seidel-Platz 4  
81737 München, Germany

[silicones@wacker.com](mailto:silicones@wacker.com)  
[www.wacker.com](http://www.wacker.com)