

## Foam Control in PVC Polymerization

### TEGO® Antifoam KS 53

- The standard antifoam for emulsion PVC
- Complies to EU regulation 10/2011 and FDA 175.300, 177.1210
- Dosage: approx. 300 ppm based on PVC

### TEGO® Antifoam KE 600/KE 600 EC

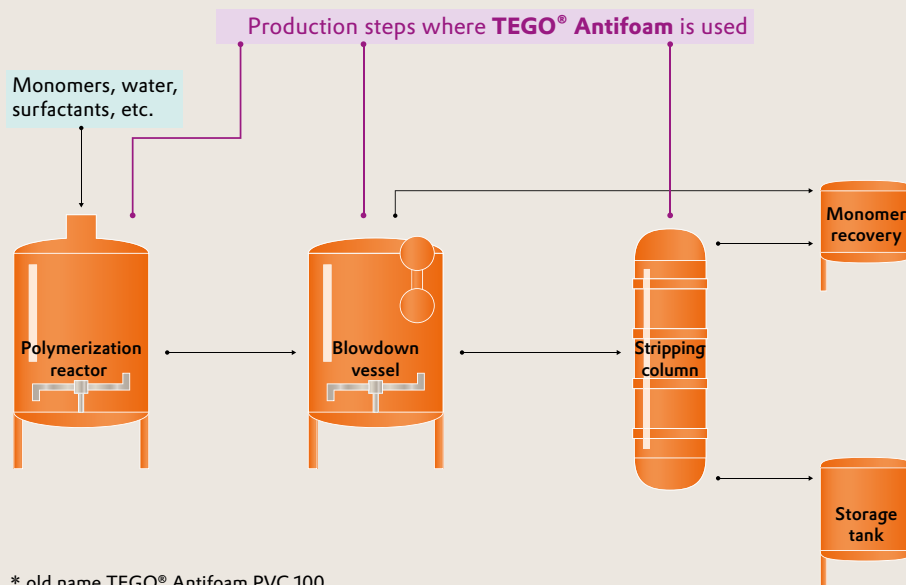
- Reliable foam control in suspension PVC
- Complies to FDA 175.300, 177.1210
- KE 600 EC complies to EU regulation 10/2011
- Dosage: approx. 100 ppm based on PVC

### TEGOPREN® 5890\*

- The solution to fight dry foam
- Complies to EU regulation 10/2011
- Dosage: approx. 100 ppm based on PVC

### TEGO® Antifoam 2285 XP

- For the production of cable PVC
- Complies to EU regulation 10/2011
- Dosage: approx. 100 ppm based on PVC



# Lab Test for PVC Antifoams

## Preparation

- One litre surfactant solution in a 2-litre cylinder
- Defined amount of prediluted antifoam is added

## Procedure

- Air is passed through the sintered glass (6 l/min)
- Foam is generated
- Time to reach 2 litre mark is noted
- Test is finished

## Interpretation

The measured time is used as parameter to evaluate the defoamer performance. The longer the time the better the defoamer.

PVC defoamers are tested at 60°C.



Lab equipment for sintered glass test

## PVC defoamer performance using suspending aids or emulsifiers

	0.1% PVOH solution for S-PVC	1% DBS solution for E-PVC
Without antifoam	12 s	12 s
TEGO® Antifoam KS 53	120 s	960 s
TEGO® Antifoam KE 600	600 s	300 s
TEGOPREN® 5890	640 s	100 s
TEGO® Antifoam 2285 XP	580 s	140 s
Competitor antifoam for suspension PVC	340 s	140 s
Competitor antifoam for emulsion PVC	80 s	360 s

The table shows that antifoams which are developed for the use as process additive in the production of PVC, like TEGO® Antifoam KE 600, TEGOPREN® 5890 and TEGO® Antifoam 2285 XP for S-PVC and TEGO® Antifoam KS 53 for E-PVC, are more effective than standard antifoams of the market.

# TEGOPREN® 5890 to fight Dry Foam in the Reactor

In the last hours of suspension PVC polymerization the so called “dry foam” may occur and may create problems with reflux condensers, cause it build up layers on the condensers cooling surface and reduces the cooling capacity.

Practical experience shows that the standard antifoams, that normally work very well in the production of PVC, fail to fight dry foam.

To solve this problem TEGOPREN® 5890 has been developed.



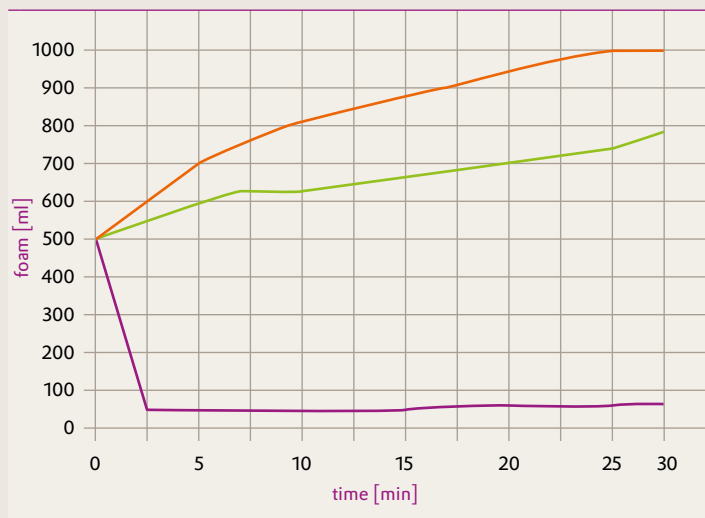
Dry foam



Wet foam + TEGOPREN® 5890

In the first step TEGOPREN® 5890 transfers the dry foam into wet foam and then destroys it like it is shown in the table below:

## TEGOPREN® / TEGO® Antifoam performance in a S-PVC slurry



■ TEGOPREN® 5890    ■ TEGO® Antifoam KE 600    ■ TEGO® Antifoam 2285 XP

# Influence of Antifoams in final PVC Applications

The standard antifoams are based on oils like silicone oil, mineral oil or even vegetable oil. These base oils may have negative side effects in the properties of the PVC goods.

**TEGO® Antifoams show less influence than standard antifoams**

## Antifoam performance and side effects

PVC property	TEGO® Antifoam KS 53	TEGO® Antifoam KE 600	TEGOPREN® 5890	TEGO® Antifoam 2285 XP	Silicone oil based	Mineral oil based	Vegetable oil based
Fogging behavior	+	+	+	+	+	-	+
Transparency of films	•	•	•	•	•	•	•
Electric resistance	•	•	•	+	•	•	•
Welding properties	+	+	+	+	-	+	+
Printability & foamability	+	+	+	+	-	+	+
Antifoam performance	+	+	+	+	+	•	-

- + no influence observed
- influence may occur (depending on defoamer dosage and the total PVC formulation)
- has a negative influence on the PVC

- **Automotive industry: no fogging required**
- **Production of films: no haziness of clear films liked**
- **Cable production: no increase of electrical conductivity allowed**
- **Production of window frames: welding properties needed**
- **Packaging, cable, tubes: no effect on printability & foamability liked**



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