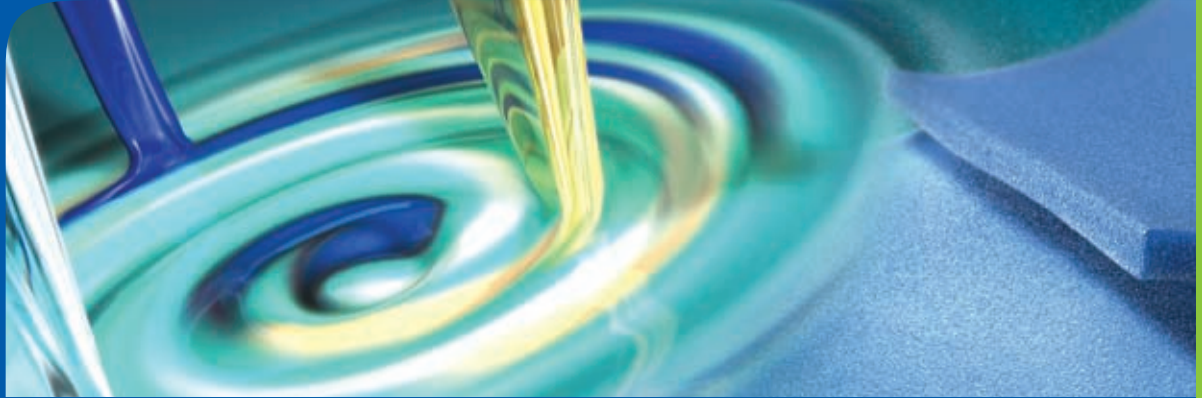


Substance for Success.



Technical Information PVC-TI 6

# Foam Stabilizers for Mechanical Foam

PVC Plastisol Applications

## Why Use Mechanical Foams?

- Lower gelling temperatures in comparison to chemically-blown PVC foams.
- Good sound insulation and rebound elasticity (thick coatings).
- When used as an impregnation coat, a mechanically frothed PVC plastisol can offer economic advantages: e.g. less paste at same impregnation, and less chances for moisture blistering.

### Mechanism of Mechanical Foams


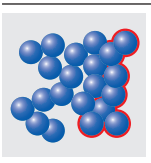

	Air entrapment	With the use of special mixing equipment, air is entrapped into the PVC plastisol.
	Separation and stabilization of air by a foam stabilizer	After air entrapment, the air is separated and stabilized by a foam stabilizer (e.g. BYK-8020 or BYK-8070).
	Fusing at 150 °C-175 °C (300 °F-350 °F)	After achieving the desired foam density, the plastisol is fused.

figure 1

## Key Factors

One of the factors in determining whether to use a silicone or silicone-free surfactant is the choice of plasticizers. If a silicone-free stabilizer is desired, a combination of BBP with other plasticizers is necessary. The silicone-free surfactant produces a foam with smaller cells than those produced by a silicone stabilizer. In comparison to silicone surfactants, a silicone-free surfactant needs a heat stabilizer to achieve the same foam whiteness (figure 2).

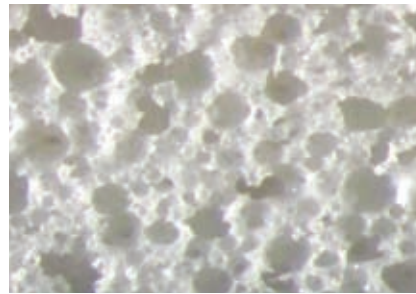
Both the silicone and silicone-free mechanical foam stabilizers produce a uniform cell structure. During processing, the BYK-410 at 0.1-0.4phr can enhance the froth stability of the mechanical foam without affecting the foam's froth density (figure 3).

### Differences between BYK-8020 and BYK-8070

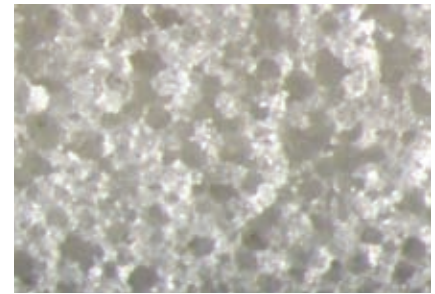
	Silicone stabilizer BYK-8020	Silicone-free stabilizer BYK-8070
<b>Plasticizer</b>	e.g. DOP (with < 15 phr BBP)	BBP is necessary, in combination with e.g. DOP
<b>Foam stability</b>	Large, uniform stable cells	Small, uniform stable cells
<b>Foam color</b>	Snow white	White, heat stabilizer required
<b>Water absorption</b>	Hydrophobic	Hydrophilic

figure 2

### Cross Section of Mechanical Foams



Mechanical foam with silicone stabilizer BYK-8020



Mechanical foam with silicone-free stabilizer BYK-8070

figure 3

### Water Absorption Test

Because the BYK-8020 is silicone based, it is hydrophobic in nature. Thus, a mechanical foam made with this additive will repel water. Likewise, a foam produced with the hydrophilic BYK-8070 will absorb water (figure 4).



2 ml water after 1 hour  
BYK-8020 silicone stabilizer  
(hydrophobic)



2 ml water after 1 minute  
BYK-8070 silicone-free stabilizer  
(hydrophilic)

figure 4

## Products and Applications

### BYK Additives

Additives are used during the production of coatings, printing inks and plastics to optimize the production process and to improve the quality of the final product.

#### Product Range Additives

- Additives to improve surface slip, leveling and substrate wetting
- Adhesion promoters
- Defoamers and air release agents
- Foam stabilizers
- Processing additives
- Rheological additives
- UV-absorbers
- Viscosity depressants
- Waxes
- Wetting and dispersing additives for pigments and extenders

#### Application Areas

- Ambient curing resins (FRP)
- Architectural coatings
- Automotive OEM
- Automotive refinishes
- Can coatings
- Coil coatings
- Color masterbatches
- Industrial coatings
- Leather coatings
- Marine paints
- Molding compounds
- Paper coatings
- Pigment concentrates
- Polyurethane foams
- Powder coatings
- Printing inks
- Protective coatings
- PVC plastisols
- Thermoplastics
- Wood and furniture coatings

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