

# SIPERNAT<sup>®</sup> 350 – the low dust anti-caking aid

Technical Information TI 1359



Does **caking** or agglomeration of powdered ingredients have the potential to slow down your production?

Do you want to avoid a **dusty** atmosphere during processing?

Is dust of **free flowing** fat powders making your equipment difficult to work with?

Do you need **homogenous** powders?

SIPERNAT® 350 provides an excellent solution for these challenges. It is especially beneficial towards improving the flowability of fat-containing powders without increasing their dustiness.

### How caking of powders occurs

If particles of a soft, powdery substance such as fat powders or emulsifiers are deformed by applying pressure to them, they tend to agglomerate. Additionally, as the surface material starts melting when temperature increases the powder becomes sticky and the caking intensifies.

Ingredients and raw materials often are exposed to pressure or higher temperatures during storage and manufacturing, regularly leading to caking and agglomeration. As big lumps make handling, dosing and processing of such ingredients difficult and sometimes costly, a simple solution to preventing agglomeration is crucial to manufacturers.

### Examples of powders, that can benefit from addition of SIPERNAT® 350

#### Fat Powder

- Fractionated palm fat
- Hardened soybean oil or other hardened vegetable fats
- Cream powder
- Milk- or butter fat
- Cocoa butter

#### Emulsifiers

- Di-Acetyl Tartaric (Acid) Ester of Monoglyceride (DATEM)
- Stearates
- Lecithins

Particularly for soft, low-melting powders SIPERNAT® 350 is beneficial!

### How to avoid caking



Figure 1 Di-acetyl tartaric Ester of Monoglyceride without (above) and with SIPERNAT® (below) as flow aid

When SIPERNAT® 350 is added to soft and low melting powders, it prevents caking during storage very effectively. Even at elevated temperatures or applied pressure, agglomeration of individual particles is inhibited as SIPERNAT® 350 is absorbed at the surface of the powder and forms a separating layer in between. Due to this silica barrier, the particles of the host powder cannot stick together any more. (Figure 2. Model soft powder)

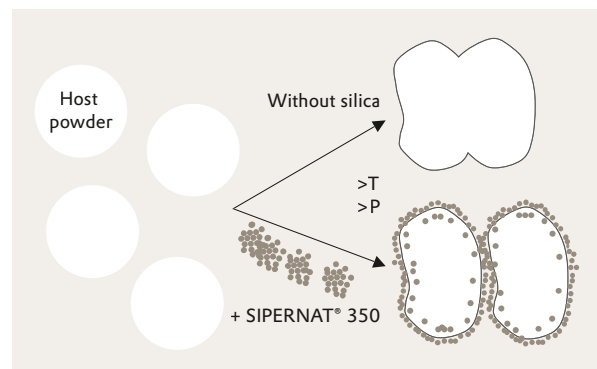


Figure 2 Model of SIPERNAT® 350 improving the caking stability of a soft powder

The Silica builds up a separating layer  
The Silica layer provides a zone which avoids direct particle to particle contact

### How to prevent dustiness when adding an anti-caking aid

When traditional anti-caking aids consisting of very fine particles are added to powders which normally are dust-free, an increase in dust may occur.

Increased dustiness has often been considered a trade-off for improving the flow characteristics of the materials.

Because of its unique properties, unlike other anti-caking aids, SIPERNAT® 350 does NOT add any dust to the material. Therefore, the powder can be handled conveniently in the manufacturing process. Fig 3 – 4 demonstrates this effect in a fat powder treated with conventional calcium silicate and with SIPERNAT® 350.



Figure 3 Ca-Silicate



Figure 4 SIPERNAT® 350

Fractionated palm fats with 3% of different anti-caking aids

### How to achieve a uniform powder

As SIPERNAT® 350 is easily dispersed onto a soft powder the resulting material is homogenous in its characteristics with uniform appearance.

After a few minutes of mixing, no visible particles of the anti-caking aid are left. The surface of the host powder is evenly coated by SIPERNAT®, ensuring effective anti-caking and giving a consistent appearance.



Figure 5 Ca-Silicate



Figure 6 SIPERNAT® 350

Fractionated palm fats with 3% anti-caking aid mixed for 10 min

### Advantages of SIPERNAT® 350 at a glance

- **Effective prevention of caking** of soft and low-melting powders
- **No dust** development – Cleaner work environment
- Easy dispersion, resulting in **uniform appearance** of the final mixture

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