SIPERNAT®

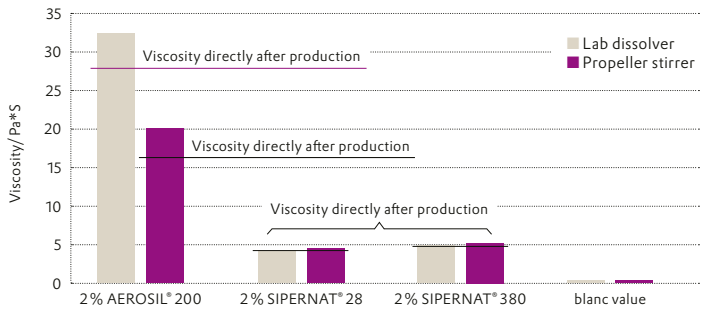
Rheology adjustment for agricultural formulations with easy to disperse SIPERNAT® 380

How can one stabilize an active in oil-based crop protection formulations without using high shear mixing equipment?

SIPERNAT® 380, the easy to disperse alternative for stabilizing highly loaded oil-based suspension, can be incorporated without high shear mixing equipment.

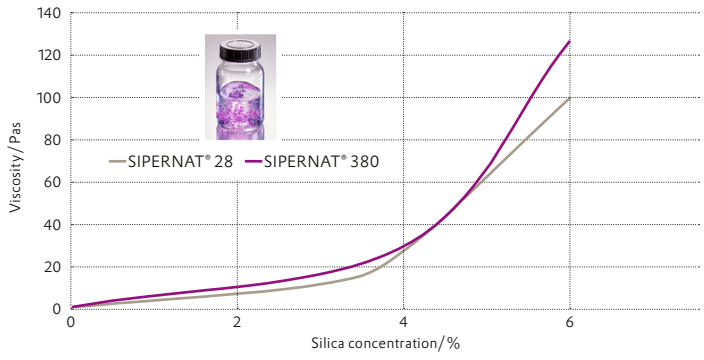
Using a common stirrer such as propeller stirrer provides sufficient viscosity to improve the storage stability of dispersed actives. SIPERNAT® 380 delivers consistent viscosity during processing and enhanced storage stability for high active formulations. These advantages combined with the easy handling, makes SIPERNAT® 380 an alternative to fumed silica grades when proper dispersion equipment is not readily available.

Diagram 1: Viscosity after 14 days storage



- Virtually no difference in viscosity immediately after processing with SIPERNAT® 380
- Propper dispersion can be achieved with a common propeller stirrer
- Maximum thickening effect is achieved with AEROSIL® fumed silica requires high-shear mixing

Diagram 2: Adequate thickening perfomance with less shear energy



Recommendations:

- Addition of 4 to 6 % SIPERNAT® 380
- Pre-wet precipitated silica and mix at 500 rpm for 5 min with typical propeller stirrer
- Increase mixing speed to 2000 rpm for 15 min

Manufactured using a special milling process, SIPERNAT® 380 has a unique particle size distribution which enables it to deliver medium thickening performance as seen in diagrams 1 and 2 on the previous page. SIPERNAT® 380 shows no post thickening effects after processing and in storage. This can be critical for high solids formulations that are prone to hard packing and thickening in storage. All these benefits are combined with an easy to disperse product requiring no activation with additional ingredients, special production conditions, or temperature requirements. All that is needed is the low shear energy of a common propeller stirrer!

	SIPERNAT® 380	SIPERNAT® 28	AEROSIL® 200
Silica structure	Precipitated silica	Precipitated silica	Fumed silica
Thickening performance	**good**	**good**	**excellent**
Post thickening	no	no	possible
Dispersion energy	**low**	**low**	**very high**
Dispersion equipment	Propeller stirrer	Propeller stirrer	Dissolver/Rotor-Stator
Silica concentration	4–6%	4–6%	2–3%

SIPERNAT® 380 is a precipitated, amorphous silica with fine particle size. Moreover, it is an alternative to micro-plastic. With its medium bulk density, it is easy to handle and creates less dust despite its fine particle size distribution.

It is produced in our production plants in Havre de Grace and Chester in the USA. The global availability of SIPERNAT® 380 will ensure the supply security in any of your production plants worldwide.

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