GRANULAR STARCHES FOR CREAMS AND LOTIONS
## PRODUCT OVERVIEW - GRANULAR STARCHES

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QUALITATIVE OPTIMIZATION OF COSMETIC EMULSIONS

For many years granular starches have been proven as outstanding rheology modifiers and as „green" alternative to mineral-oil based ingredients like silicones, various plastic beads etc.. Moreover, their addition to emulsion systems is a unique natural way to improve the quality of emulsions.

Emulsions can be optimized with granular starches:

- pleasant SKIN-FEEL
- MATTIFYING effect as the emulsion is quickly absorbed
- EASY SPREADING without whitening or shininess
- REDUCED STICKINESS and GREASINESS

Likely candidates for optimization with granular starches are:

- moisturisers
- face and body lotions
- oil-free facial serums
- sun-protection
- after-sun emulsions
- after-shave balms
- emulsion foundations
PROPERTIES OF GRANULAR STARCHES IN EMULSION SYSTEMS

Depending on the raw material source granular starches offer active surface and a natural range of particle size distribution.

Fig. 2 particle size distribution
HIGH SORPTIVE POWER

The high sorptive power facilitates the adsorption of both hydrophilic and hydrophobic liquids and the active substances dissolved in them. Consequently, substances like active ingredients, botanical extracts, vegetable oils, deodorant actives, sun filters and fragrances are also adsorbed and absorbed, providing a constant release and ensuring a long-lasting effect.

EXCELLENT MICROBIOLOGICAL AND CHEMICAL PURITY

Our cosmetic starches are non-GMO and in accordance with regulation (EC) No. 1223/2009 on cosmetic products. All our products are made of food-grade starches and optimized by chemical or physical treatment for cosmetic applications (see our data-sheets).

REDUCTION OF GREASINESS

Especially in natural formulations greasy and heavy textures can be a problem when natural oils and fats are used. Granular starches reduce greasiness and too heavy textures.

ADDITION OF STARCH

Practical experiences have shown that the use of these starches leads to a substantial increase in the stability of the emulsion.

Lipophilic starches AGENAFLO 9050 and AGENAFLO OS 9051 are hydrophobically modified and show best emulsion stabilization of granular starches. These products are predestined for use in oil rich creams and lotions.

The dispersed starch particles do not form sediments even on protracted storage. Whilst a certain viscosity increase will occur it does not mean that the raw formulation needs changing nor does the packing opening need to be altered. The spreading properties are improved significantly.

Undertaking stability-testing of the emulsions by centrifuge would result in no meaningful information and therefore serves no purpose. The emulsion should be stability tested without its starch content since the absorbed starch particles possess a high intrinsic weight and would in any case be separated out by centrifugal forces (erythrocytes, for example, also sediment out when centrifuged).
ADDITION BEFORE EMULSIFICATION (= „HOT PROCESS“)

For boiling-resistant starches optimum production technique is to disperse the starch in the aqueous phase and stir until emulsification occurs. These cross-linked starches absorb and adsorb their volume-wise specifically restricted amounts of the water phase. Temperatures beyond 90°C do not influence the properties of cross-linked starches as they are insoluble in water and resistant to boiling. The mixture should then be allowed to stand for about 15 minutes.

Due to the adaptive properties of these starches, also quantities of the oil phase dock-on to the water-starch-phase-depot during emulsification. The subsequent processing step is carried out using the standard procedure.

If active substances which are oily or dissolved in solvents have to be transferred to these phase depots they should be mixed with either a portion of or all the starch. After a detention time of 15 minutes, if necessary under additional stirring, this pre-mix should be transferred into the corresponding emulsion phase.

Fig. 3 possible dosage time for starches

ADDITION AFTER EMULSIFICATION (= „COLD PROCESS“)

Starches which are not boiling-resistant can be dispersed in pre-emulsified emulsions immediately after emulsification – e.g. at about 45°C – prior to commencing the cold stirring phase. This temperature should remain constant for at least 15 minutes and care should be taken that the dispersion is homogenously distributed. Optimization will depend on ensuring the temperature be maintained as long as possible.
SWELLING CAPACITY OF BOILING-RESISTANT STARCHES

Boiling-resistant starches possess a notable swelling capacity but are resistant to gelatinization and do not become a pudding. Furthermore they can even be autoclaved without losing their spreading powers. They are stable at acidic and weakly alkaline pH-values, chemically pure, inert and compatible with standard active substances.

Fig. 4 absorption capacity of CORN PO4 PH "B" in water at increasing temperatures

The picture shows the results of a sedimentation test. 10g of cross-linked starch are warmed in 100 ml water under stirring for 15 minutes at the indicated temperatures from 40°C - 90°C.

Then the suspension is filled in cylinders where the starch can sediment.

This procedure demonstrates the swelling and absorption capacity of the starches during an emulsification process.
AGRANA. THE NATURAL UPGRADE.

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This paper contains starch produced by AGRANA!