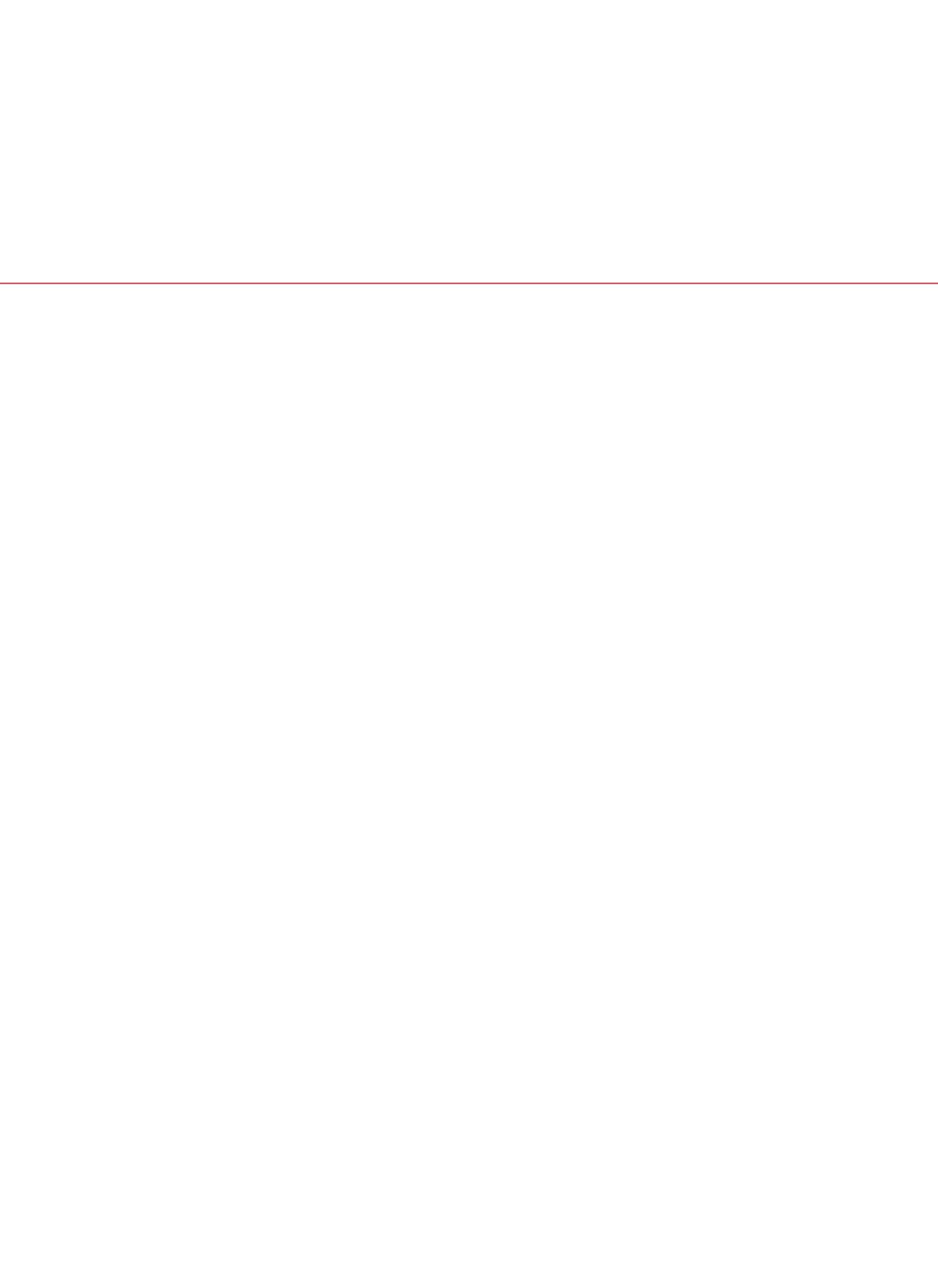




STARCHES FOR COSMETIC INDUSTRIES CORN PO₄ PH^B AND RICE NS



AGRANA STARCH





QUALITATIVE OPTIMIZATION OF COSMETIC EMULSIONS WITH CORN PO₄ PH "B" OR RICE NS

For many years CORN PO₄ PH "B" and RICE NS (cross-linked starches produced from renewable natural sources) have been proven as outstanding additives for decorative cosmetics. However, their addition to emulsion systems is a unique way to improve the quality of oil-in-water emulsions.

Emulsions can be optimized with CORN PO₄ PH "B" or RICE NS:

- quickly losing stickiness when applied to the skin
- spreading easily without whitening or shininess
- mattifying effect as the emulsion is quickly absorbed
- long-lasting, pleasant skin feel

Likely candidates for optimization with CORN PO₄ PH "B" and RICE NS are:

- moisturisers
- face and body lotions
- oil-free facial serums
- sun-protection
- after-sun emulsions
- after-shave balms
- emulsion foundations

PROPERTIES OF CORN PO₄ PH “B” AND RICE NS IN EMULSION SYSTEMS

LARGE SURFACE AREA

CORN PO₄ PH “B” has an active surface area of about 3350 cm²/g – determined by the Blaine Method (or BET) at an average particle size of 11.7 microns. The surface area of RICE NS is 3 to 4 times larger. This implies that a minimal 4% content of CORN PO₄ PH “B” in cosmetic preparations provides a theoretical surface of about 1.3 m²/100 g which is available as a carrier.

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, deodorants, sun filters, and fragrances are also adsorbed and absorbed, providing continuous release and ensuring a long-lasting effect.

The active substances that are absorbed and adsorbed are retained in the form of microscopic ‘encapsulates’ and distributed throughout the emulsion system. When this emulsion is applied to the skin these ‘encapsulates’ release their contents onto the skin over an extended period. Additionally, oil-in-water emulsions containing CORN PO₄ PH “B” or RICE NS slowly release water, providing long-lasting moisturization.

When an emulsion manufactured using these starches is applied to the skin, up to ten CORN PO₄ PH “B” ‘encapsulates’ (about 20 microns in size) are found per mm² of skin. This ensures that the active substances contained remain active and continue to be released for an extended period. Moreover occlusion by the emulsion is prevented, potentiating dermal respiration.

EXCELLENT MICROBIOLOGICAL AND CHEMICAL PURITY

(see our data-sheets)

SWELLING CAPACITY AND BOILING RESISTANCE

They possess a notable swelling capacity but are resistant to boiling 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. 1: absorption capacity of CORN PO₄ PH “B”

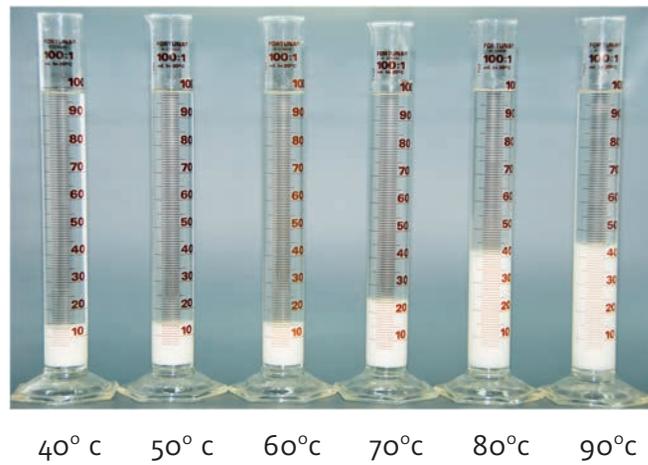
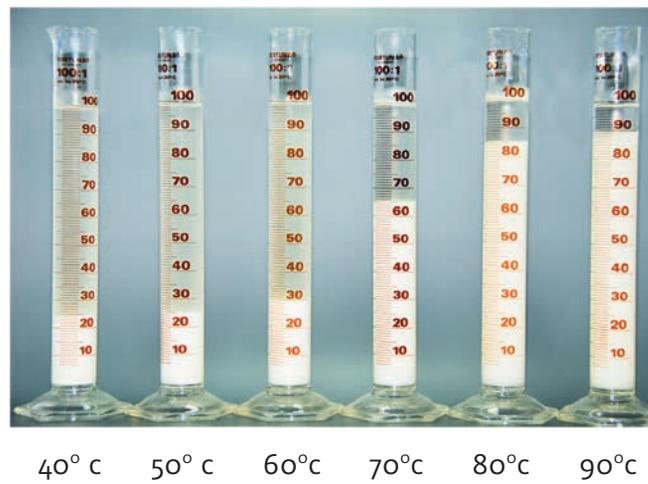


Fig. 2: absorption capacity of RICE NS

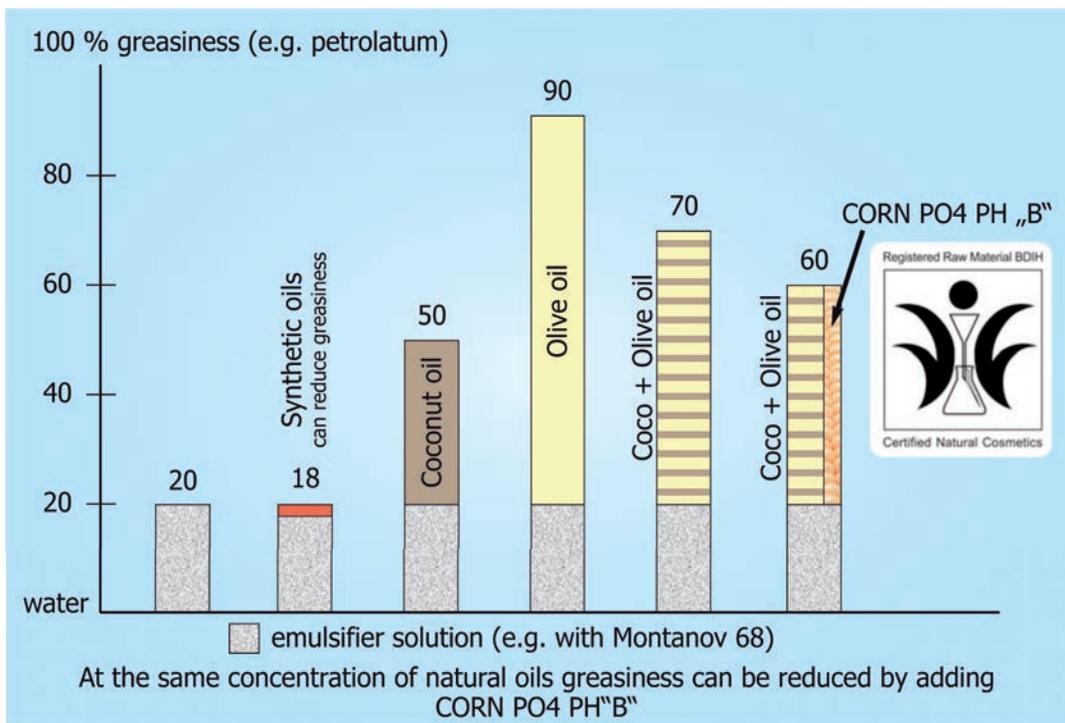


Both pictures show the results of a sedimentation test. 10 g of cross-linked starch are warmed in 100 ml water under stirring for 15 minutes at the indicated temperatures from 40°C - 90 °C.

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.

REDUCTION OF GREASINESS

Especially in natural formulations greasy and heavy textures can be a problem when natural oils and fats are used. CORN PO₄ PH[®]B[™] reduces greasiness and too heavy textures. CORN PO₄ PH[®]B[™] is a natural ingredient corresponding to BDIH and NaTrue standards.





APPLICATION SUGGESTIONS

CORN PO₄ PH “B” is a free-flowing powder, easily wetted and dispersible.

RICE NS is less easily wetted due to the exceptional fineness of its particles (7 µm) and a certain tendency for them to stick. Consequently **RICE NS** must be stirred into the aqueous phase using a high-speed stirrer until it is evenly dispersed.

We recommend using 4 to max. 10 % **CORN PO₄ PH “B”** or 3 to max. 8 % **RICE NS** (both based as a percentage of the formulation). No additional water needs to be added if the formulation has a high aqueous content.

GENERAL

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

HOT PROCESS:

The 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 waterstarch-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.

COLD PROCESS:

Both cross-linked starches can be dispersed with similar optimizing ease 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 homogeneously distributed. Optimization will depend on ensuring the temperature be maintained as long as possible.

The information and technical notes on applications are based on the present state of knowledge and are not binding in any way, nor are they binding where any rights of third parties are concerned. It is incumbent on the buyer of our products to satisfy himself as to their usability and suitability for the intended purpose

AGRANA. THE NATURAL UPGRADE.

AGRANA Starch / AGRANA Stärke GmbH

Mr. Anton Amon

A-3950 Gmünd, Conrathstrasse 7, Austria

Tel.: +43/2852/503-0

Fax: +43/2852/503-19360

e-mail: anton.amon@agrana.com

www.agrana.com

This paper contains starch produced by AGRANA!