

STRUCTURE[®] XL Starch

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INCI: Hydroxypropyl Starch Phosphate

Rheology/Aesthetics Modifier and Emulsion Stabilizer

INTRODUCTION

STRUCTURE[®] XL starch is a starch-based rheology modifier that provides excellent stabilization in emulsion products. This starch, delivered as a powder, is a new concept to simply create and process elegant and stable personal care emulsions. The ease of use and immediate dispersability in cold water make it ideal for use in continuous manufacturing processes.

In any type of emulsion for the Personal Care market, STRUCTURE XL starch can aid in emulsion stabilization, aesthetics enhancement and viscosity-build. An emulsion containing STRUCTURE XL starch will have outstanding stability over a broad temperature range (-30°C up to 50°C). It also brings body to the formulation and a conditioning after feel. STRUCTURE XL starch is readily cold water dispersible so that no pre-mixes are needed. STRUCTURE XL starch can be added to the oil phase or to adjust batch properties also at the end of a production.

Because of its nonionic character and broad compatibility, STRUCTURE XL starch provides the formulator with the flexibility to formulate over a wide pH range with high amounts of mono- and polyvalent salts (up to 20%) and a large variety of raw materials.

APPLICATION AREAS

AHA and DHA formulations, All natural creams, Antiperspirants, Cationic cleansing products, Cationic lotions and creams, Color cosmetics, Concealer, Conditioners, Cream rinses, Creams, Emulsions, Eye liner, Facial cleansers, Facial creams, Gels, High salt containing gels, Leave in conditioners, Liquid make-up, Liquid soaps, Liquid talc, Low surfactant or surfactant-free emulsions, Make-up, Ointments, Personal wash products, Protective creams, Shampoos, Shave creams, Skin lotions and creams, Sunscreens, Water resistant sunscreens

FEATURES / BENEFITS

| Feature | Benefit |
|----------------------|--|
| Cold water-swellable | Outstanding dispersability in cold water; improved efficiencies can be achieved in manufacturing and formulation development. |
| Nonionic | Compatibility with other ingredients offers formulation flexibility. Can be used with a wide range of other raw materials like oils, emollients, cationic as well as silicones, UV filters, vitamins, botanical extracts, alpha and beta hydroxy acids, dihydroxy acetone, mono- and polyvalent salts, fragrances and dyes |
| Shear Thinning | Extremely shear thinning, with rapid viscosity recovery, suitable for emulsion in spray or pump delivery. |
| Large particle size | Very low dusting compared to typical powder ingredients. |

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| Feature | Benefit |
|----------------------------|---|
| Salt tolerant | Stable in the presence of high electrolyte levels (20 %). |
| pH stability | Useful in emulsion systems from pH 3 - 9. |
| Modified waxy maize starch | Naturally-derived Biodegradable Emulsion stabilizer at any temperature. Simplifies the emulsion formulation procedure. Aesthetic enhancer bringing conditioning after-feel to emulsions. |

SUGGESTED USE LEVELS, AS SUPPLIED

The STRUCTURE XL starch is effective at improving emulsion stability and aesthetics and modifying rheology at concentrations of about 1% to 2%. Straight aqueous dispersions of STRUCTURE XL starch are stable at concentrations greater than 4%.

FORMULATION GUIDELINES

Because STRUCTURE XL starch is a specially processed pregelatinized starch, it will disperse in cold water instantly without requiring sifting or premixing. This allows for flexibility in manufacturing and formulation. Within 3 minutes at room temperature, 90 % of the viscosity of an aqueous STRUCTURE XL starch dispersion is built.

COMPATIBILITY WITH OTHER INGREDIENTS

STRUCTURE XL starch is compatible with salts (mono and divalent), cationic and anionic ingredients, and other ingredients common to personal care emulsions (oils, emollients, silicone, UV filters, AHA, DHA...). It can aid in the speed of dissolution of other powder ingredients, and will not contribute to dusting.

The STRUCTURE XL starch can be considered eco-friendly. It is naturally derived and biodegradable. It offers the potential for production by cold process, and thus can significantly reduce energy requirements as well as manufacturing costs. It should not be over extensively homogenized due to potential breakdown of the particles.

PERFORMANCE PROPERTIES

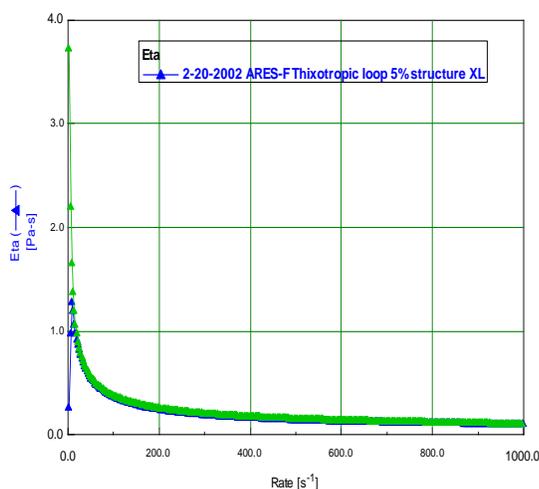
Rheology

STRUCTURE XL starch is extremely shear-thinning, with rapid viscosity recovery. This is an ideal property for personal care products where good workability is desired, yet the formulation must set up instantly when shear is removed.

Figure 1 shows a hysteresis loop of an aqueous dispersion of 5% STRUCTURE XL Starch.

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Figure 1



The close overlap of the increasing and decreasing shear sweeps demonstrates the pseudoplastic nature of this rheology modifier. A gap between the two curves would have indicated a longer viscosity recovery time, leaving a formulation prone to dripping when shear is removed.

In Creams in Lotions

STRUCTURE XL starch has demonstrated unique performance attributes in such emulsion products as skin creams and lotions (daily and treatment products, sun care and baby care products). Not only can STRUCTURE XL starch enhance an emulsion's aesthetics and viscosity, it can also improve the stability of emulsions in temperatures ranging from -30°C to 50°C .

In Rinse-off Applications

STRUCTURE XL starch has beneficial impact on foam and feel characteristics as denser, richer foam and conditioning after feel. In high surfactant systems it should be used in combination with stabilizers as STRUCTURE PLUS exhibiting yield point.

Aerosol foams

The stabilizing properties of STRUCTURE XL starch can also be applied to aerosol foams. Incorporation of the starch in aerosol shave foams or skin mousses results in enhanced foam richness and stability.

Color Cosmetics

STRUCTURE XL starch brings enhanced aesthetics, conditioning, and viscosity to color cosmetics, such as foundations, eye-liners, mascaras etc.

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STORAGE AND HANDLING

STRUCTURE XL starch should be stored in a cool, dry location away from heat, sparks or fire. Good industrial hygiene practices should be followed when working with this starch.

Please read the MSDS before working with this or any other chemical.

HEALTH AND SAFETY

A health and safety summary for STRUCTURE XL starch is available on request.

It is non animal tested and non GM (genetically modified).

The suitability of the final formulations should be confirmed in all respect by appropriate evaluation. The marketer is advised to evaluate the final formulation with regard to performance and health safety.

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