

# BEST CHOICES GUIDELINES

## PERSONAL CARE PRODUCTS



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### Rheology As Nature Intended

CP Kelco's goal is to be the preferred partner for providing innovative products and solutions through the use of nature-based chemistry. CP Kelco is a creative and innovative leader in the production and manipulation of polysaccharides by microbial fermentation and extraction from plant, algal and cellulose base raw materials.

#### A Little About Our Chemistries

Our products are derived from natural, renewable raw materials, and CP Kelco strives to preserve nature's functionality through minimizing our chemical modification. These products serve many functions, including thickening, suspension, stabilization and gelation. Each is an aspect of rheology control.

Rheology control is vital. Yet selecting the most appropriate rheology modifier from the wide range commercially available is far from straightforward. Many factors must be taken into consideration, including the desired flow behavior or texture, the required shelf-life, the production equipment available, compatibility with other ingredients, and regulatory compliance.



#### **KELTROL® CG Xanthan Gum** INCI: Xanthan Gum

KELTROL® CG Xanthan Gum is produced by a fermentation process using the bacterium *Xanthomonas campestris*. Process control and rigorous quality standards throughout production guarantee consistent, reliable product performance.

**Pseudoplastic Rheology.** KELTROL has high viscosity at low shear rates, stabilizing suspensions and emulsions. Additionally, that KELTROL has low viscosity at high shear rates makes for solutions which are easily pumped. KELTROL is characterized by its very high viscosity at low concentrations.

**Emulsion Stabilization.** KELTROL is not an emulsifier. Because of its pseudoplastic nature, it imparts excellent stability to oil-in-water emulsions by preventing the oil droplets from coalescing by thickening the aqueous phase.



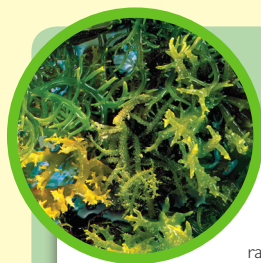
#### **GENU® Pectin** INCI: Pectin

GENU® Pectins are partially methyl esterified, anionic polysaccharides that are the gel-forming component in fruits and vegetables. Because of its traditional uses, pectin is well known by consumers and accepted as label friendly. The raw material source is citrus peel. CP Kelco has recently added sugar beet derived pectin to its extensive range.

There are two basic types of GENU pectin, differing in degree of methyl esterification (DE):

**HM (high DE)** citrus pectin forms gels and structured liquids under conditions of low pH and low water activity (for example, at high concentrations of sugar, sorbitol or glycerol).

**LM (low DE)** pectin forms gels in the presence of divalent cations, such as calcium and magnesium.



#### **GENUVISCO® Carrageenan** INCI: Chondus Crispus (Carrageenan)

GENUVISCO® Carrageenan products are a family of sulphated polysaccharides extracted from certain species of red seaweed. By using the appropriate carrageenan product, the formulator can create textures ranging from free-flowing liquids to solid gels.

In addition to offering standard GENUVISCO types, CP Kelco works in conjunction with customers to develop new products and formulations for specific applications.

- **Kappa carrageenan** forms firm gels in the presence of potassium ions.
- **Iota carrageenan** forms elastic gels and thixotropic fluids in the presence of calcium ions.
- **Lambda carrageenan** forms viscous, non-gelling solutions.



#### **KELCOGEL® CG Gellan Gum** INCI: Gellan Gum

KELCOGEL® CG Gellan Gum is a polysaccharide produced by fermentation of a pure culture of *Sphingomonas elodea* (previously known as *Pseudomonas elodea*). This multi-functional hydrocolloid can be used at low levels in a wide variety of products that require gelling, texturizing, stabilizing, suspending, film-forming and structuring.

KELCOGEL is extremely effective at low use levels in forming fluid gels with monovalent and divalent cations. **KELCOGEL is available in two grades: high and low acyl content, which form hard and soft gels.**

...you can



### CEKOL® Cellulose Gum INCI: Cellulose Gum

CEKOL® Cellulose Gum is a water-soluble polymer derived from wood and cotton cellulose by introducing carboxymethyl groups on the cellulose backbone. The formed anionic cellulose molecule hydrates and dissolves readily in water. CEKOL is refined to minimum 99.5% purity.

CEKOL has the ability to impart viscosity to aqueous solutions. CEKOL is pseudoplastic by nature and can have either thixotropic or non-thixotropic rheology.

By choosing the right CEKOL type, the formulator has the ability to achieve the desired rheology for any aqueous system, including **suspensions** and **emulsions**. Besides controlling the rheology, CEKOL is known for its **excellent water retaining** and **film forming capacity**.



### AxCel® CG PX Microfibrous Cellulose INCI: Cellulose, Xanthan Gum, Cellulose Gum

AxCel® CG PX is based on microfibrillar cellulose, produced using a patented microbial fermentation process. The fibers in AxCel are much finer than those found in other cellulose sources, and as such, on a weight-to-weight basis AxCel offers greater surface area and therefore produces a highly efficient structure-forming polymer.

Rather than relying on simply thickening the surfactant or liquid phases of a formula, AxCel CG PX forms an invisible, three-dimensional network in the liquid to provide suspension. This suspension happens independently of surfactant level and ionic strength. It also happens without adversely affecting the finished product's in-use viscosity.

**A formulator can now add suspension to a system without negatively impacting the in-use viscosity for greater formulating flexibility.**

## Application Opportunities...How to Get Started

Often, there is more than one way to achieve a given functionality...too much to contend with. Our field sales and technical service professionals are energized to work with customers to identify the optimum solution for specific and unique formulation needs. This guide is meant to provide some beginning guidelines on the best choices to achieve desired characterizes.

### Creams and Lotions

#### Viscosity needs:

- Stabilization of colloidal particles
- Skin feel
- Rubbing is an inherently high shear process (high velocity, narrow gap)
- Low viscosity can seem thin
- High viscosity can promote drag or stickiness

#### Best choices:

- **KELTROL CG** xanthan for stabilization
- **CEKOL** cellulose gum to promote a heavier skin feel
- **GENUVISCO** carrageenan (iota type) to promote skin feel and supports seaweed label claim
- **GENU pHresh** pectin to provide skin feel and help promote healthy skin
- **KELCOGEL CG** gellan gum for light skin feel

### Sun Care

#### Viscosity needs:

- Stabilization of colloidal particles
- Skin feel
- Water resistance
- Soothing

#### Best choices:

- **KELTROL CG** xanthan for stabilization
  - Good film formation to resist water
  - Film is slow to hydrate
- **CEKOL** cellulose gum to promote a heavier skin feel
  - Good film formation to resist water
  - Film is quick to hydrate
- **GENUVISCO** carrageenan (iota type) to promote skin feel and supports seaweed label claim
- **KELCOGEL CG** gellan gum for a sprayable sunscreen
  - Film is slow to hydrate
- **GENU pHresh** pectin for re-balancing skin pH post exposure

### Body Scrubs & Washes

#### Viscosity needs:

- Give a feeling of thickness when dispensed
- Pour without gel-like appearance
- Provide foam stability
- Suspend actives or aesthetic ingredients

#### Best choices:

- **KELTROL CG SFT** Xanthan gum that has a low degree of short term interactions
- **CEKOL** cellulose gum for more viscosity at higher shear rates
  - Improves thickness during pouring
  - Keeps product from seeming too gelled
- **GENU** pectin for similar properties to Celcol but supports pectin label claim
- **KELCOGEL CG** to add suspension or stabilization to a surfactant-thickened system
- **AxCel CG PX** to provide suspension power with no impact on in-use viscosity

### Mascara

#### Viscosity needs:

- High viscosity during application for good control
- Good film formation properties

#### Best choices:

- **CEKOL** cellulose gum for non-interacting viscosity
  - Higher polymer loading for good film formation (high solids)
  - Good solubility of the polymer for ease of removal
- **KELTROL CG SFT** xanthan gum with excellent film forming properties and a low degree of short term interactions

# Hydrocolloids at a Glance

HYDROCOLLOID	PRODUCT FAMILY	FUNCTIONALITY	TYPICAL APPLICATIONS	SOLUTION CHARACTERISTICS
Xanthan	<b>KELTROL® CG</b>	Thickening, Suspending, Stabilizing	Lotions, Sunscreens, Mascara, Body Washes	Pseudoplastic Fluid
Pectin	<b>GENU® pHresh</b>	Thickening, pH Buffering	Lotions, After Shower Balms, After Shave Creams and Gels	Newtonian Flow – Gel
Microfibrinous Cellulose	<b>AxCel® CG PX</b>	Suspending, Stabilizing	Sprayable Sunscreens, Foaming Hand Soaps, Body Washes	Thin, Pseudoplastic Fluid
Carrageenan	<b>GENUVISCO®</b>	Thickening, Stabilizing	Lotions, Shampoos, Lubricants, Shave Gels	Gel
Gellan	<b>KELCOGEL® CG</b>	Suspending, Stabilizing	Eye Drops, Sprayable Sunscreens, Body Washes	Thin, Pseudoplastic Fluid
Cellulose Gum (CMC)	<b>CEKOL®</b>	Thickening, Absorbing, Binding, Film Forming	Film Dosage Forms, Lotions, Shower Gels	Newtonian – Pseudoplastic Fluid
Cellulose Gum (CMC)	<b>NYMCEL®</b>	Tablet Disintegration	Tablets	Used in Dry Form Only

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