

***SENSE THE  
DIFFERENCE***



## ***Hydrocolloids***

*Brenntag Food & Nutrition  
North America*

# Hydrocolloids

A colloid is a type of mixture where one substance is dispersed evenly throughout another. A hydrocolloid is a colloid system where the colloidal particles are dispersed in water. Hydrocolloids may be reversible or irreversible, which means they can fluctuate between a gel-state and a solid-state and many are naturally derived. Hydrocolloids provide many functions in food products including texture modification, thickening, emulsification, stabilization, binding, and adhesion. While some hydrocolloids are used independently, many are used in combination with one another to provide the optimum result within the formulation.



HYDROCOLLOID	RAW MATERIAL	SOLUTION CLARITY	NATURAL STATUS	GRAS	SOLUBILITY	PH RANGE IN APPLICATION	ACID STABILITY	VISCOSITY	GELLING MECHANISM	EFFECT ON MILK AT PH <4.6	KEY FUNCTIONAL PROPERTIES	POTENTIAL APPLICATIONS
Carrageenan	Seaweed extracts	Good	Y	Y	Hot	4.0-10.0	Poor	N/A	K+ gels with Kappa and Ca++ gels Lambda, both gel with Iota	Precipitates	Provides cocoa suspension in chocolate milk, improves the quality of meats by enhancing texture, sliceability, and mouthfeel. Provides texture to dessert gels.	Frozen desserts, ice cream, chocolate milk, meats (ham, poultry), sauces and dressings, dessert gels, flan
Gellan gum	Produced via fermentation	HA - Good LA - Poor	Y	Y	Hot	2.0-10.0	Good	Low	Gels with K+, Ca++ and Na+ ions	None	Gellan gum is available in two forms, high and low acyl content. Low acyl gellan gum forms firm, non-elastic, brittle gels. High acyl gellan gum forms soft, very elastic gels. By varying the ratios of the two forms, gellan can produce a wide variety of textures. Gellan gum can be used to stabilize suspensions by forming a solution with a weak gel structure, known as a fluid gel.	Bakery fillings, beverages, confections, dairy products, jams
Guar gum	Seeds of Guar bean	Fair	Y	Y	Cold or hot	4.0-9.0	Fair	Medium	Non gelling	None	Provides body and texture in sauces and cheese products.	Dairy products, frozen desserts, sauces and dressings, processed cheese, dips
Gum arabic	Tree exudates	Excellent	Y	Y	Cold or hot	2.0-10.0	Good	Low	Non gelling	None	Stabilizes beverage emulsions, flavor encapsulation, prevents sucrose crystallization in confectionery applications, stabilizes toppings and icings.	Beverage emulsions, confectionery applications, baked goods, syrups, dietary fiber
Gum tragacanth	Tree exudates	Fair	Y	Y	Cold or hot	4.0-10.0	Good	High	Non gelling	None	Excellent emulsion stabilizer.	Sauces and dressings, crystallization inhibition
Locust bean gum	Seeds of Carob tree	Fair	Y	Y	Hot	4.0-10.0	Fair	High	Non gelling	None	Thickening, water-binding, gel strengthening.	Frozen desserts, cream cheese, dips, jams, jellies, pies, puddings, ice cream, cheese fillings
Pectin	Plant extracts and fruit skins	Excellent	Y	Y	Hot	2.0-7.0	Good	Varies	High Ester: none Low Ester: Ca++ forms gels	Stabilizes	Imparts gelled structure to many fruit-based products, stabilizes protein in acidified milk beverages.	Jams and jellies, confectionery applications, beverages, yogurt, fruit preps, bakery fillings
Propylene glycol alginate	Seaweed extracts	Fair	N	Y	Cold or hot	3.0-8.0	Good	Varies	Non gelling	Precipitates	Provides excellent low pH stability and temperature stability. Excellent secondary emulsification properties.	Salad dressings, beverages, frozen dairy, fresh citrus fruit coatings
Sodium alginate	Seaweed extracts	Good	Y	Y	Cold or hot	4.0-10.0	Good	Varies	Ca++ forms gels	Precipitates	Provides excellent pH, shear, temperature stability. Excellent freeze/thaw stability, syneresis control.	Cheese sauce, restructured foods, puddings, desserts, candy, frostings
Xanthan gum	Produced via fermentation	Fair	Y	Y	Cold or hot	2.0-10.0	Good	High	Non gelling	Precipitates	Provides excellent pH, shear, temperature stability. Pseudoplastic rheology unique. Excellent suspending polymer. Helps stabilize emulsions.	Sauces and dressings, dry mixes, beverages, bakery, frozen foods

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