

Summary Grid of FMC BioPolymer Ingredients used in Fruit Preparations

Bake Stable Fruit Fillings for pH 3.6 - 4.0

Applications		Products	Ingredient Attributes	Recommended Use Level (%)	Bulletin Number	Finished Product Benefits and Attributes	
Process Type	% SS (Soluble Solid)						
COLD	Brix 40	Avicel® RC 591	<ul style="list-style-type: none"> • Thixotropic agent • Ease of processing, no heating required • Freeze-thaw stable 	1.0	CNF-38A	<ul style="list-style-type: none"> ■ Excellent bake stability and boil out reduction ■ Smooth and glossy texture ■ Easier processing, viscosity reforms after pumping ■ Easy and clean dosage due to short texture ■ Improved shelf life, reduced moisture migration 	
	Brix 55 to 65	Protanal® HEI/C	<ul style="list-style-type: none"> • Ease of processing <ul style="list-style-type: none"> - Easy to disperse (no stock solution required) - No need for hot processing • Ease of formulating <ul style="list-style-type: none"> - No need to adjust or add a calcium source 	2.5 - 4.5	CNF-38B	<ul style="list-style-type: none"> ■ Excellent baking stability ■ Pumpable and short texture ■ Smooth and glossy texture ■ Improved shelf life, reduced moisture migration 	
	Brix 65 to 75	Protanal GP 1155	<ul style="list-style-type: none"> • Ease of processing <ul style="list-style-type: none"> - Easy to disperse (no stock solution required) - No need for hot processing 	1.5 - 2.0	CNF-02	<ul style="list-style-type: none"> ■ Excellent bake stability and shelf stability ■ Wide range of texture, smooth to pulp-like and chunky texture ■ Excellent colour, clarity and gloss ■ Clean mouthfeel for excellent release of fruit flavour 	
HOT	U s i n g M C C	Brix 35 to 50	Avicel CL 611	<ul style="list-style-type: none"> • Thixotropic agent • Freeze-thaw stable • Opacifier • Avicel CL 611: cost effective, low process viscosity and good bake stability • Avicel RC 591: medium process viscosity, very good bake stability • Avicel-plus BK 4430: high process viscosity, excellent bake stability 	0.5 - 3.0	CNF-39B CNF-34	<ul style="list-style-type: none"> ■ Outstanding boil out reduction ■ Good bake stability ■ Opaque pulpy rich appearance in low fruit fillings ■ Easier processing, viscosity reforms after pumping ■ Easy and clean dosage due to short texture
		Brix 50 to 70	Avicel RC 591		CNF-24 CNF-34		
		Brix 70 to 80	Avicel-plus® BK 4430		CNF-03		
	U s i n g A l g i n a t e	Brix 35 to 50	Protanal GP 4650 Protanal FP 3744 Protanal GP 1155	<ul style="list-style-type: none"> • Protanal GP 4650: soft texture <ul style="list-style-type: none"> - Provides adequate viscosity to enable fruit suspension during and after the process • Protanal FP 3744: pulp-like to chunky texture <ul style="list-style-type: none"> - Easy to formulate, no addition of calcium, nor sequestrant needed • Protanal GP 1155: pulp-like to chunky texture <ul style="list-style-type: none"> - Ease of processing, easy to disperse (no stock solution required) • Protanal XP 3499: soft texture <ul style="list-style-type: none"> - Ease of processing, low process viscosity - Enables formulation at low water content 	0.5 - 0.7 0.5 - 0.7 1.5	CNF-39A CNF-34	<ul style="list-style-type: none"> ■ Excellent bake stability; shape maintained during and after cooking ■ Wide range of pumpable textures possible ■ Very good gloss, clarity and colour ■ Easy and clean dosage due to short texture ■ Clean mouthfeel for excellent release of fruit flavour
		Brix 50 to 70	Protanal XP 3499 Protanal FP 3744 Protanal GP 1155		0.65 - 1.0 0.8 - 1.0 1.5	CNF-42A CNF-34	
		Brix 70 to 80	Protanal XP 3499 Protanal FP 3744		1 - 1.5 1.5	CNF-42B	

Fruit Preparation for Dairy Desserts (pH 3.5 - 4.0)

Applications		Products	Ingredient Attributes	Recommended Use Level (%)	Bulletin Number	Finished Product Benefits and Attributes
Type of Yogurt	% SS (Soluble Solid)					
STIRRED YOGURT AND SPLIT PACK PRODUCT	<i>Brix 15 to 60</i>	Gelcarin® DG 5262	<ul style="list-style-type: none"> Premium product Low process viscosity Effective at a wide range of brix and pH levels Offers stability in a variety of salt ions, e.g., calcium 	0.3 - 0.5	CNF-37	<ul style="list-style-type: none"> Excellent fruit piece integrity due to low process viscosity Excellent fruit suspension throughout shelf-life Low milk reactivity Very smooth, clear and glossy texture Imparts clean mouthfeel properties with excellent flavor release Maximizes 'rich-in-fruit' appearance
		Gelcarin DG 5264 Gelcarin XP 3451	<ul style="list-style-type: none"> Standard product More acid resistant than other types of carrageenans Imparts low viscosity for ease of processing and pumping Effective at a wide range of brix and pH levels Offers stability in a variety of salt ions, e.g., calcium 	0.4 - 0.65 0.3 - 0.7	CNF-37 CNF-45	
FRUIT ON THE BOTTOM	<i>Brix 15 to 60</i>	Viscarin® SA 439 Gelcarin DG 5264 Protanal® GP 4650	<ul style="list-style-type: none"> Thixotropic rheology for easy in-plant processing and application to prepared foods The alginate when used together with carrageenan will create a barrier, reducing the osmotic exchange with the white mass 	0.3 - 0.5 0.3 - 0.5 0.1 - 0.2	CNF-46	<ul style="list-style-type: none"> Homogenous layer Thick, smooth and pseudo gelled texture Low milk reactivity Good flavour release

Jams and Spreads (pH 3.5 - 4.0)

Applications		Products	Ingredient Attributes	Recommended Use Level (%)	Bulletin Number	Finished Product Benefits and Attributes
Type of Jam	% SS (Soluble Solid)					
LOW SUGAR JAM AND SPREADS	Brix 25 to 50	Protanal® GP 1155	<ul style="list-style-type: none"> Excellent shelf stability Effective at a wide range of sugar levels and at pH 3.6 - 4.0 Easy to use Provide viscosity for fruit suspension during filling Cost effective 	0.2 - 0.8	CNF-36	<ul style="list-style-type: none"> Wide range of textures possible Excellent mouthfeel and flavour release Excellent fruity appearance and clarity Good fruit suspension
		Viscarin® SA 439	<ul style="list-style-type: none"> Controlled syneresis Easily dispersible 	0.75 - 1.3	CNF-47	<ul style="list-style-type: none"> Simulate the texture of high sugar jams and jellies Excellent flavour release
NO SUGAR JAMS (ARTIFICIALLY SWEETENED)	Brix 7 to 15	Protanal SF 120 RB	<ul style="list-style-type: none"> Excellent shelf stability Easy to use Provide viscosity for fruit suspension during filling 	0.6 - 0.8	CNF-40	<ul style="list-style-type: none"> Wide range of textures possible Excellent fruity appearance Excellent flavour release and mouthfeel
DRY MIX POWDER FOR HOUSEHOLD PREPARATION OF LOW SUGAR JAMS	Brix 25 to 60	Gelcarin® DG 4251	<ul style="list-style-type: none"> Controlled low syneresis Easily dispersible Refrigeration not required for gel setting Cooking time reduced 	16 - 24 in dry mix powder	CNF-41	<ul style="list-style-type: none"> Smooth, uniform mouthfeel Excellent for systems with a low and medium sugar content Excellent fruity flavour

Glazes and Toppings

Applications		Products	Ingredient Attributes	Recommended Use Level (%)	Bulletin Number	Finished Product Benefits and Attributes
Type of Glaze	% SS (Soluble Solid)					
HOUSEHOLD CAKE GLAZE DRY MIX	Brix 10 to 25	Gelcarin® DX 5253	<ul style="list-style-type: none"> Premium dry mix cake glaze Good compatibility with starch 	0.5 - 0.7	CNF-43A	<ul style="list-style-type: none"> Good gel clarity Non sticky with good sliceability Quick setting, refrigeration not required Good syneresis control Wide range of textures possible
		Gelcarin DX 5359	<ul style="list-style-type: none"> Standard dry mix cake glaze Cost effective Compatible with starch 			
INDUSTRIAL CAKE GLAZE RTU	Brix 10 to 25	Gelcarin DG 4257	<ul style="list-style-type: none"> Premium product with clarified LBG 	0.6 - 0.9	CNF-43B	
		Gelcarin DX 5253	<ul style="list-style-type: none"> Standard carrageenan, requires the addition of LBG 			
		Gelcarin XP 2278	<ul style="list-style-type: none"> Premium product with konjac Cost effective 			
INDUSTRIAL CAKE GLAZE CONCENTRATED	Brix 30 to 65	Protanal® LF 20/40	<ul style="list-style-type: none"> Used in combination with pectin to increase meltability and to soften the texture Cost saving 	0.4 - 0.6	CNF-43B	<ul style="list-style-type: none"> Good gel clarity Good syneresis control Possibility of creating thermo-reversible gels
TOPPING	Brix 30 to 40	Protanal SF 120 RB	<ul style="list-style-type: none"> Thickens at a wide range of sugar levels 	0.2 - 0.3	CNF-44	<ul style="list-style-type: none"> Wide range of textures, from slightly thickened to extremely viscous Very good cling to the fruit Excellent clarity and flavour release