

VIDOPECTINE®



Application Overview

FOOD APPLICATION

Jams, jellies, marmelades and preserves

HM-pectin requires a minimum of 55% sugar (or soluble solids) to 85 % sugar and pH 2.5 - 3.8 to gel. These requirements limit HM-pectin's possible uses as a gelling agent to such products like sweetened fruit products. A large part of HM-pectin's global production is traditionally used in the production of jams and jellies. The pectin being added is making up for the deficiency of naturally occurring pectin in the used fruit.

The pectin's role is to impart a texture to the jam or jelly that provides good fruit distribution in the jar, which allows transportation without changes, giving a good flavour release and minimising syneresis. During manufacture of a jam, the pectin must ensure a uniform distribution of fruit particles in the continuous jelly phase from the moment the mechanical stirring ceases, i.e. the pectin must set quickly after the filling operation. The use rates for pectin vary from 0.1 - 0.5 % in jams and jellies.



Pectin gelation can be achieved in a cold process by mixing a 'hydrated' pectin-sugar-syrup with soluble solids of 60 - 65 % and pH 3.8 - 4.2 with fruit acid solution to pH 3.0. This process is used in Germany and Scandinavia by cookie producers and bakers to make jaffa cakes, domino stones and jelly-covered fruit tarts. A variation of the technique is mixing a pectin solution with pH 2.9 and soluble solids 25 % with liquid sugar to obtain soluble solids of 55 %.

These two processes are possible because of the gelation of HM-pectin being time-, as well as temperature-dependent.

The traditional LM-pectin application is in jams with soluble solids below 55 %, which is the limit for HM-pectin use. The fruit's calcium content is usually sufficient to set amidated LM-pectin, whereas conventional or acid de-esterified LM-pectin usually requires calcium salt. The type of LM-pectin must be carefully selected according to the soluble solids/pH conditions in the application medium. For instance, in products with very low solids, like, e.g. sugar-free jams

for people with diabetes, LM-pectin hardly has sufficient water binding, and carrageenan is a valid option and better suited. In some instances combinations of LM-pectin and carrageenan offer advantages.

The heat reversibility of LM-pectin gels is used in bakery jams and jellies for glazing purposes (nappages). A jam or jelly base with soluble solids of approx. 65% has a relatively good microbiological sterility, but the LM-pectin only imparts a paste-like texture to the product, due to pre-gelation. Before application as nappage, the base is diluted with water to approx. 40% solids and heated to re-melt the LM-pectin gel. When poured, sprayed or brushed on top of cakes and tarts, the LM-pectin gels optimally at the reduced solids to form coherent and glossy glazing.

Confectionery, gums and jellies

High ester pectin is mainly used within the confectionery industry for making fruit jellies and jelly centres, flavoured with fruit paste or concentrate and/or synthetic flavours. In combination with whipping agents, it is further used as a texturiser for aerated fruit flavoured products.



Low ester pectin not requiring the addition of acid for gel formation is suitable for non-acidic jellies and centres in which the low pH-range necessary for HM-pectin gelation is not acceptable for flavour reasons (e.g. peppermint or cinnamon-flavoured jellies).

At low concentrations, LM-pectin may further impart a thixotropic texture to confectionery fillings. Cold gelation can be obtained at higher concentrations if calcium ions are allowed to diffuse into the filling.

Compared to other gelling agents commonly used for confectionery products, pectin requires strict observance of the recipe and production parameters. Still, it offers the advantage of an excellent texture and mouth-feel, excellent flavour release and compatibility with modern continuous processing due to fast and controllable gelation.

Bakery fruit preparation

Baked products combined with a fruit filling or topping are trendy due to their fresh fruity flavour.

The fruit preparations used in the production of such baked products are given onto the cold cakes or dough pieces, are injected after baking (e.g. fruit fillings for doughnuts) or are baked together with the cake or dough.

The fruit preparations added after the baking process need the right texture and flavour besides good processing properties (e.g. pumping, dispensing, injecting). Fruit preparations that are baked together with the dough also have to withstand the baking process's temperatures without significantly changing their shape and volume – they have to be bake-stable. Several different pectin types like HM, LM and LM amidated pectins are suitable to achieve the required sensory and technological properties in these different types of fruit preparations for baked products. Bakery fruit preparations are usually filled into and delivered to the bakery in buckets, drums or pallets depending on the process requirement.

Fruit preparations for yoghurt

Low ester pectins are often used in fruit preparations for yogurt to create a soft, partly thixotropic gel texture, sufficiently firm to ensure uniform fruit distribution but still allowing the fruit preparation to be easily stirred into the yogurt. The pectin may further reduce colour migration into the final product's yogurt phase, especially when combined with other gums or thickeners.

Fruit drink concentrates, flavour syrups

Gelation of pectin can stabilise a multi-phase system if gelling conditions are achieved at some stage in the process. Gelation provides the yield value (rheological term, meaning the force necessary to make a substance flow) required to obtain permanent stabilisation of emulsions, suspensions and foams. HM-pectin with a very high DE is often used in fruit drink concentrates, stabilising any oil emulsions and fruit particle suspensions. In this application, the gelation is apparent in the end product only as a

thickening effect, as the coherent gel has been destroyed mechanically to obtain a smooth flow. Extensive homogenisation must not be used, as sufficient yield value must still be present to ensure stabilisation.

Fruit Juice

The viscosity or mouth-feel creating properties of HM-pectin is used in recombined juice-drinks and low juice/near water drinks to restore the juice's mouth-feel to that of the fresh juice. Pectin is also useful to provide a natural mouth-feel in instant fruit drink powders.



Fruit / milk desserts

LM-pectin's calcium reaction is used to obtain the almost instant gelation when adding calcium ions via the milk to a syrup containing LM-pectin. A canned fruit preparation containing 2% LM-pectin in a fruit syrup with 25-30% soluble solids and pH 4.0 (achieved with buffer salts) is mixed with an equal amount of cold milk to make a fruit-flavoured semi-gelled milk dessert quickly.

LM-pectin has excellent stability at the conditions of fruit preparation recipe and process, i.e. pH 4.0 and suitable pasteurisation conditions. The LM-pectin solution remains fluid in the can and at room temperature, as the calcium content is insufficient to cause gelation. When the consumer mixes the fruit preparation with milk, sufficient calcium is available to gel the LM-pectin.

Fermented and directly acidified dairy products

HM-pectin's 'protective colloid' effect stabilises sour milk products, either cultured or produced by direct

acidification (fruit juice/milk combinations). The pectin reacts with the casein, prevents the aggregation of casein particles at pH below the isoelectric pH (4.6) and allows pasteurisation of the acid milk products to extend their shelf life.



Small amounts of LM-pectin may improve the texture of cup yogurt, added before the yogurt milk is heated. The LM-pectin does not prevent syneresis.

At low concentrations, LM-pectin may further impart a thixotropic texture to confectionery fillings. Cold gelation can be obtained at higher concentrations if calcium ions are allowed to diffuse into the filling. Compared to other gelling agents commonly used for confectionery products, pectin requires strict observance of the recipe and production parameters. Still, it offers the advantage of an excellent texture and mouth-feel, excellent flavour release and compatibility with modern continuous processing due to fast and controllable gelation.

PHARMACEUTICAL APPLICATIONS

Gelled milk products

LM-pectin is suitable as a gelling agent in milk desserts but less economical in use than carrageenan, which gels milk at much lower use concentrations. However, LM-pectin may be the preferred gelling agent for sour milk puddings or milk desserts combined with fruit. Unlike carrageenan, LM-pectin does not co-precipitate with casein at lower pH-values and thus ensures a good shelf life of the product.

The ability of pectin to add viscosity and stabilise emulsions and suspensions is utilised in a number of liquid pharmaceutical preparations. Pectin is further reported to possess some beneficial biological effects - the most well-known being anti-diarrhea and wound-healing. Anti-diarrhea suspensions, powders or tablets often contain a mixture of kaolin, pectin and an antibiotic.

Pectin is extensively used as a component in the adhesive part of ostomy rings. In this application, the water-binding effect and the ability to adhere to moist surfaces are utilised. Pectin is further non-irritating in contact with the skin, and certain bactericidal and wound healing effects have even been reported.

Confectionery products

High ester pectin is mainly used within the confectionery industry for making fruit jellies and jelly centres, flavoured with natural fruit constituents and/or synthetic flavours. In combination with whipping agents, it is further used as a texturiser for aerated fruit flavoured products.



Low ester pectin functioning at higher pH values and not requiring acid for gel formation is used for jellies and

centres. The low pH-value necessary for HM-pectin gelation is not acceptable for flavour reasons (like, e.g. in peppermint or cinnamon-flavoured jellies).

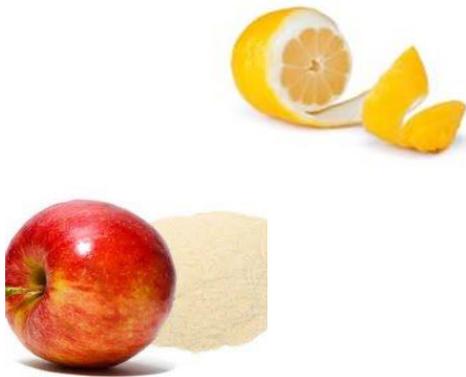


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Know-How and Experience



UNIPEKTIN Ingredients AG

Bahnhofstrasse 9
8264 Eschenz
Switzerland

Tel.: +41 52 742 3131

Fax: +41 52 742 3132

Email: info@unipektin.ch

Visit our website at
www.unipektin.ch

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