



TECHNICAL APPLICATION
INFORMATION



Jams 55°Brix

JAMS 55°BRIX

According to legal requirements, products such as jams, extra jams, jellies, extra jellies and marmalade have to have a soluble solids content of at least 60%.

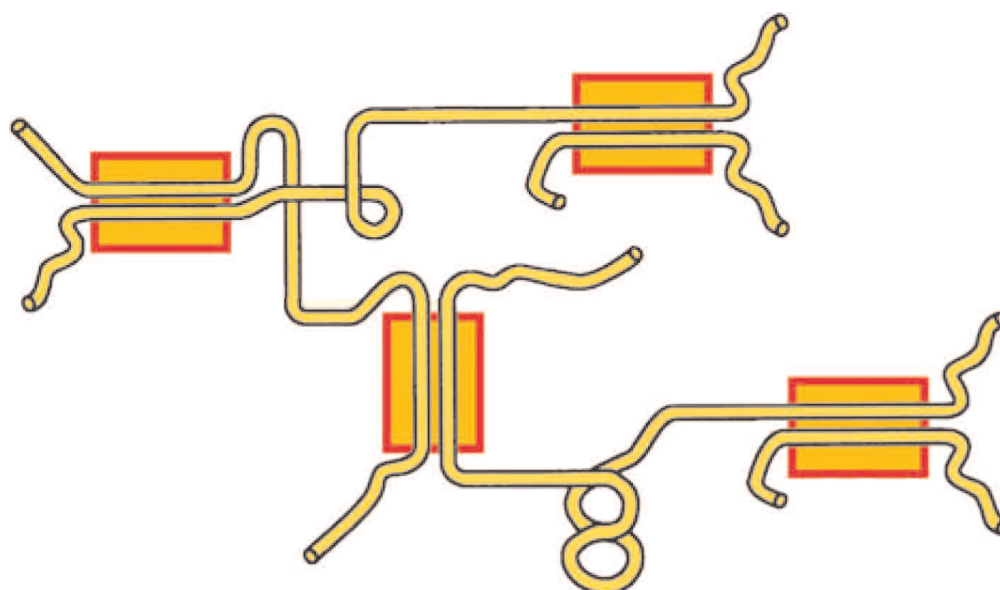
However, from EU legislation national exceptions are allowed in order to consider different traditions of the single member states. Also the consumers' demands show a tendency to more fruity and less sweet which means less sugar containing products.

For most of the EU member states these exceptions are already regulated, that means the products as mentioned above may also be distributed with a soluble solids content of less than 60%.

In Germany, too, the regulation on jams will be altered so that a soluble solids content of just 55% has to be complied with.

For jams with a soluble solids content of $\geq 60\%$ and pH-values between 2.8 and 3.3 all times high methylester pectins are excellently fitting. This is mainly based on their gelling mechanism.

High methylester pectins gel according to the so called sugar-acid gelling mechanism: The high sugar concentration reduces the water activity of the system whereby the pectin chains get dehydrated and are more able to approach. Secondary, the addition of food acids causes the repelling of free carboxyl groups dissociation thus preventing the mutual repulsion of negatively charged pectin chains. In certain limits sugar and acid may replace each other regarding their contribution to gel strength in this process.

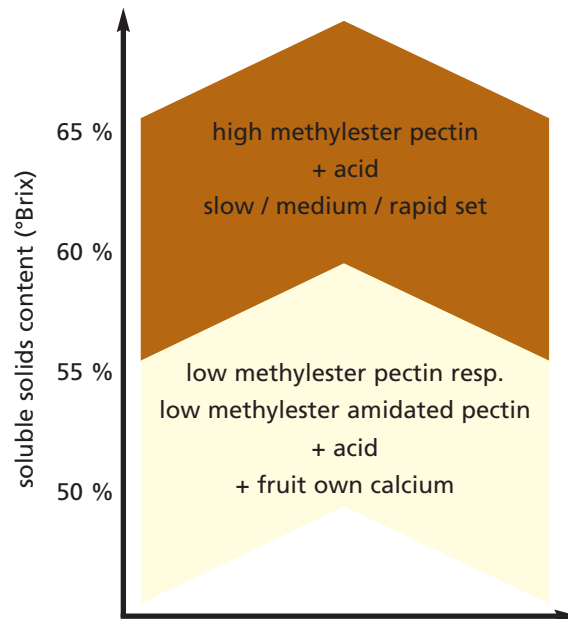


Very high methylester, rapid set pectins form highly elastic gels with high setting temperatures whereas high methylester, slow set pectins lead to elastic gels with higher viscous shares and lower setting temperatures.

However, for gelation in the range of $\geq 55-60\%$ soluble solids content especially low methylester pectins resp. low methylester amidated pectins are suitable.

In addition to sugar-acid gelation these pectins additionally are able to form gels with bivalent cations such as calcium ions. The calcium ions required for gelation come from the natural calcium content of the fruits, from the mineral content of added water in the formulation or they are added separately in the form of calcium salts (e.g. calcium citrate).

Especially for application in fruit preparations with 55-60% soluble solids content H&F offers Pectin Classic AF 703 and Pectin Amid AF 005 which both gel within the pH-range typical for



jams without a separate addition of calcium ions thus guaranteeing an assured production process. The products are characterized by their spreadable elastic-viscous texture typical for jams and their low tendency to syneresis.



For fruit preparations which are produced with fruits tending to floating H&F offers Pectin Classic AF 711 which is able to prevent floating surely. Already at high temperatures Pectin Classic AF 711 forms a weak, elastic gel structure in the gel preparation, in which the fruits or fruit pieces are embedded and remain distributed homogeneously also at high filling temperatures.



H&F pectins for jams $\geq 55^{\circ}\text{B}$ (without separate addition of calcium):

Pectin	VE°	A°	Standardization with neutral sugars + composition	Characteristics + properties
Classic AF 703	38-44%	-	constant calcium reactivity constant breaking strength E 440	apple pectin medium calcium reactivity smooth gel structure
Amid AF 005	32-40%	10-16%	constant calcium reactivity constant breaking strength E 440	amidated apple pectin low calcium reactivity
Classic AF 711	38-44%	-	constant calcium reactivity constant breaking strength E 440	apple pectin medium calcium reactivity optimum fruit distribution also at high filling temperatures smooth gel structure

Pectin Classic AF 703 is a low methylester apple pectin providing a spreadable texture typical for jams in products with a soluble solids

content > 55%. The apple pectin additionally emphasizes the natural fruit flavour.

Herbstreith & Fox KG		Recipe
<i>Fruit spread</i>		
Product Pectin Classic AF 703		
60-100g Pectin solution 5% (= 0.3-0.5%)	Manufacturing	
450g Fruit	A Preparation of pectin solution see „Technical Application Information“.	
340g Sucrose	B Mix fruit, glucose syrup and sucrose and heat to approx. 90°C.	
200g Glucose syrup	C Add hot pectin solution and boil until final soluble solids content is reached.	
xml Citric acid solution 50% to adjust the pH-value	D Add citric acid solution to adjust the pH-value.	
Input: approx. 1055g	E Filling temperature approx. 85°C.	
Output: approx. 1000g		
TSS: approx. 56%		
pH-value: approx. 2.9-3.2		

Pectin Amid AF 005 is a low methylester amidated pectin forming spreadable gels with body

and low tendency to syneresis in products with a soluble solids content of approx. 55%.

Herbstreith & Fox KG		Recipe
<i>Fruit juice jelly</i>		
Product Pectin Amid AF 005		
80-120g Pectin solution 5% (= 0.4-0.6%)	Manufacturing	
450g Fruit	A Preparation of pectin solution see „Technical Application Information“.	
340g Sucrose	B Mix fruit, glucose syrup and sucrose and heat to approx. 90°C.	
200g Glucose syrup	C Add hot pectin solution and boil until final soluble solids content is reached.	
xml Citric acid solution 50% to adjust the pH-value	D Add citric acid solution to adjust the pH-value.	
Input: approx. 1055g	E Filling temperature approx. 85°C.	
Output: approx. 1000g		
TSS: approx. 56%		
pH-value: approx. 2.9-3.2		

For application in fruit spreads with 55-60% soluble solids content H&F developed the low methylester, non amidated Pectin Classic AF 711.

Within this soluble solids content Pectin Classic AF 711 prevents floating of the fruits over a wide pH-range and leads to spreadable products with smooth and full-bodied texture.

Herbstreith & Fox KG		Recipe
Fruit spread		
Product Pectin Classic AF 711		
100-120g Pectin solution 5% (= 0.5-0.6%) 450g Fruit 340g Sucrose 200g Glucose syrup xml Citric acid solution 50% to adjust the pH-value Input: approx. 1110g Output: approx. 1000g TSS: approx. 56% pH-value: approx. 2.9-3.2	Manufacturing A Preparation of pectin solution see „Technical Application Information“. B Mix fruit, glucose syrup and sucrose and heat to approx. 90°C. C Add hot pectin solution and boil until final soluble solids content is reached. D Add citric acid solution to adjust the pH-value. E Filling temperature approx. 80°C.	

For bio fruits preads with a soluble solids content > 55% e.g. Pectin Classic AF 703 may be used. The products have a spreadable texture

typical for jams. The apple pectin additionally emphasizes the natural fruit flavour.

Herbstreith & Fox KG		Recipe
Bio fruit spread		
Product Pectin Classic AF 703		
5-7g Pectin (= 0.5-0.7%) 500g Fruit 660g Bio apple juice concentrate 75°Brix or bio agaven concentrate 75°Brix xml Citric Acid solution 50% to adjust the pH-value Input: approx. 1165g Output: approx. 1000g TSS: approx. 56% pH-value: approx. 2.9-3.2	Manufacturing A Disperse pectin in approx. 85g apple juice concentrate resp. agave concentrate. B Add fruit and heat to approx. 90°C. C Add remaining amount of apple juice concentrate resp. agave concentrate and boil until final soluble solids content is reached. D Add lemon juice concentrate to adjust the pH-value. E Filling temperature approx. 85°C.	