



TECHNICAL APPLICATION  
INFORMATION



**Pectin Amid CF 025-D**  
**for application in jellies and fruit spreads**  
**with reduced sugar content (TSS  $\leq$  30%)**

The production of sugar reduced fruit spreads and sugar reduced jellies such as dessert jelly gains more and more importance in the modern and calorie conscious nutrition.

For gelation of these products which usually have a soluble solids content of less than 30% different thickening agents are used in dependence from pH-value and desired texture of the product.

For products with fruit typically low pH-values (pH 2.9 – 3.7) and to enhance the fruit own flavour, the H&F Pectin Amid CF 025-D is especially suited.

Pectin Amid CF 025-D is a low methylester, amidated citrus pectin which is able to form both elastically firm gelled and viscous, slightly gelled products in a soluble solids range of 5 – 30% and relatively independent from pH-value.

The amount of calcium ions necessary for gelation is added via the water of the recipe (use of hard water of e.g. 19°dH) or separately by adding a calcium salt.

The following examples of model gels show the gelling properties of Pectin Amid CF 025-D at different soluble solids content in dependence from the pH-value of the product's.

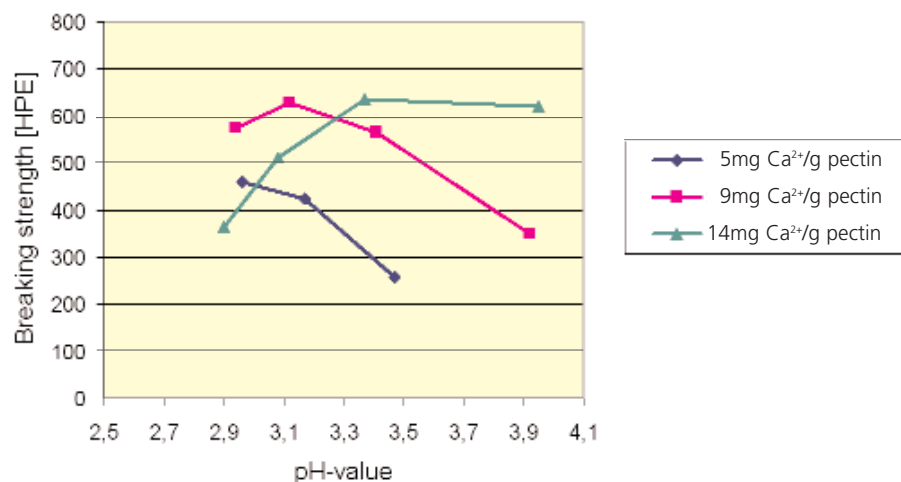


Fig. 1: Breaking strength of a gel preparation 30% TSS (sodium citrate / citric acid buffer) in dependence from pH-value of the product at different calcium dosages; 0.75% Pectin Amid CF 025-D

At a soluble solids content of 30% TSS elastically gelled products with constant breaking strength are obtained at already low calcium ion concentration in the recipe (5mg resp. 9mg Ca<sup>2+</sup>/g pectin appropriate to the use of water of 6°dH resp. 13°dH) using 0.75% Pectin Amid CF 025-D. At higher pH-values (pH > 3.3 – 3.7) spreadable up to viscous products are obtained.

If the calcium dosage is adjusted (14mg Ca<sup>2+</sup>/g pectin appropriate to the use of water of 19°dH) elastic gels with constant breaking strength can be produced relatively independent from pH-value in a range of pH 3.3 – 3.9.

At lower pH-values pre-gelation may already occur under the given conditions which can be seen in a decrease of breaking strength. Pre-gelation can be counteracted by adding complex forming salts such as citrates or phosphates. A typical application for 30% TSS are calorie reduced fruit spreads and fruit sauces. The texture and the desired properties of the product are exactly controlled by the dosage of Pectin Amid CF 025-D and by selecting the suitable calcium dosage.

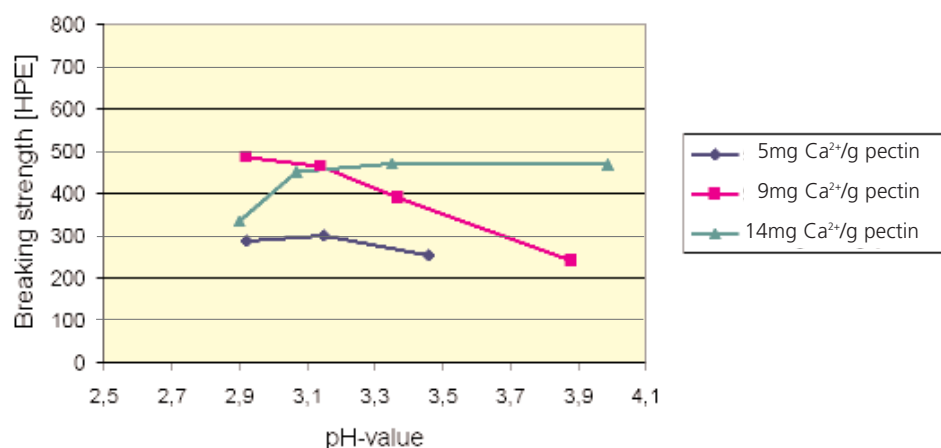


Fig. 2: Breaking strength of a gel preparation 20% TSS (sodium citrate / citric acid buffer) in dependence from pH-value of the product at different calcium dosages; 0.75% Pectin Amid CF 025-D

At a soluble solids content of 20% TSS spreadable, viscous gels are obtained with 0.75% Pectin Amid CF 025-D already with little addition of calcium ions (5mg Ca<sup>2+</sup>/g pectin) at pH-values < 3.3. An increase of calcium dosage (14mg Ca<sup>2+</sup>/g pectin) results in elastically gelled products relatively independent from pH-value in the range of pH 3.0 – 4.0.

At 20% soluble solids, Pectin Amid CF 025-D and a suitable calcium dosage result in calorie reduced fruit spreads and fruit sauces with elastically gelled up to viscous texture.

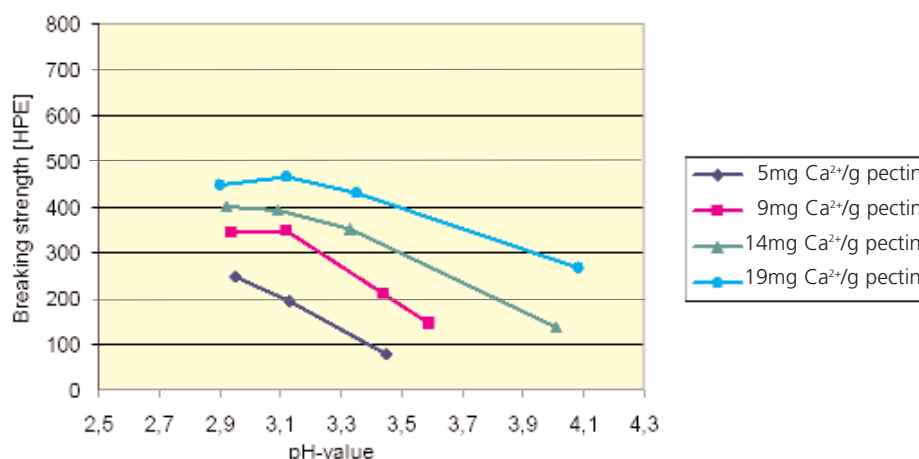


Fig. 3: Breaking strength of a gel preparation 10% TSS (sodium citrate / citric acid buffer) in dependence from pH-value of the product at different calcium dosages; 0.75% Pectin Amid CF 025-D

If the soluble solids content is reduced to 10% TSS, viscous to slightly gelled products will be obtained with 0.75% Pectin Amid CF 025-D in a range of pH 2.9 – 3.4. Elastically gelled products with a constant breaking strength are obtained with a further addition of calcium ions (19mg Ca<sup>2+</sup>/g pectin) in a range of pH 2.9 – 3.9.

With Pectin Amid CF 025-D calorie reduced fruit spreads and fruit sauces can be produced at 10% soluble solids content. The dosage of

Pectin Amid CF 025-D and selecting the suitable calcium dosage determine the texture of the final products.

With 0.75% Pectin Amid CF 025-D viscous, slightly gelled products can be produced at 5% soluble solids content in a range of pH 2.9 – 3.3 using 14mg resp. 19mg Ca<sup>2+</sup>/g pectin. A further increase of the calcium dosage leads to elastic-viscous up to elastic-brittle gels.

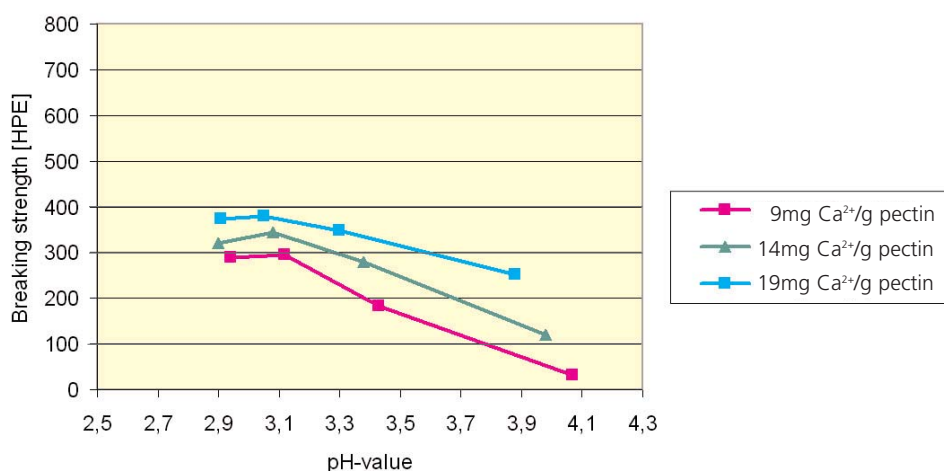


Fig. 4: Breaking strength of a gel preparation 5% TSS (sodium citrate / citric acid buffer) in dependence from pH-value of the product at different calcium dosages; 0.75% Pectin Amid CF 025-D

## TYPICAL APPLICATIONS for *Pectin Amid CF 025-D*

<b>Herbstreith &amp; Fox KG</b>	<b>Recipe</b>
<b><i>Calorie reduced fruit preparation 30% TSS</i></b>	
<b>Product <i>Pectin Amid CF 025-D</i></b>	
<p>6g Pectin (= 0.6%)            550g Fruit            277g Water, deionized            235g Sucrose            xml Citric acid solution 50%(m/m)                  to adjust the pH-value            yg tri calcium citrate tetrahydrate</p> <p>Net weight:       approx. 1075 g            Output weight:  approx. 1000 g            TSS:                approx. 30 %            pH-value:         approx. 3.2</p>	<p><b>Preparation:</b></p> <p><b>A</b> Mix the pectin with approx. 100g sugar (from total sugar amount).  <b>B</b> Stir in mixture „A“ into the fruit and water and boil under stirring until the pectin has completely dissolved.  <b>C</b> Add the remaining sugar and cook until output weight is reached.  <b>D</b> Add the citric acid solution to adjust the pH-value.  <b>E</b> Adjust the filling temperature to the container size.</p>

Strawberry fruit preparations 30% TSS which are produced with 0.6% Pectin Amid CF 025-D, pH 3.2 characterize themselves by their elastic texture.

<b>Herbstreith &amp; Fox KG</b>	<b>Recipe</b>
<b><i>Calorie reduced fruit preparation 20% TSS</i></b>	
<b>Product <i>Pectin Amid CF 025-D</i></b>	
<p>7.5g Pectin (= 0.75%)            550g Fruit            377g Water, deionized            135g Sucrose            xml Citric acid solution 50%(m/m)                  to adjust the pH-value            yg tri calcium citrate tetrahydrate</p> <p>Net weight:       approx. 1075 g            Output weight:  approx. 1000 g            TSS:                approx. 20 %            pH-value:         approx. 3.2</p>	<p><b>Preparation:</b></p> <p><b>A</b> Mix the pectin with approx. 100g sugar (from total sugar amount).  <b>B</b> Stir in mixture „A“ into the fruit and water and boil under stirring until the pectin has completely dissolved.  <b>C</b> Add the remaining sugar and cook until output weight is reached.  <b>D</b> Add the citric acid solution to adjust the pH-value.  <b>E</b> Adjust the filling temperature to the container size.</p>

Strawberry fruit preparations 20% TSS which are produced with 0.75% Pectin Amid CF 025-D at pH 3.2 show a spreadable, elastic-viscous texture.

Herbstreith & Fox KG		Recipe
<b><i>Apple juice jelly 20% TSS</i></b>		
Product <b>Pectin Amid CF 025-D</b>		
7.5g Pectin (= 0,75%)		<b>Preparation:</b> <b>A</b> Mix the pectin with approx. 100g sugar (from total sugar amount). <b>B</b> Stir in mixture „A“ into the apple juice and water and boil under stirring until the pectin has completely dissolved. <b>C</b> Add the remaining sugar and cook until output weight is reached. <b>D</b> Add the citric acid solution to adjust the pH-value. <b>E</b> Adjust the filling temperature to the container size.
450g Apple juice		
460g Water, deionized		
150g Sucrose		
xml Citric acid solution 50%(m/m) to adjust the pH-value		
yg tri calcium citrate tetrahydrate		
Net weight:	approx. 1070 g	
Output weight:	approx. 1000 g	
TSS:	approx. 20 %	
pH-value:	approx. 3.0	

The jelly produced with 0.75% Pectin Amid CF 025-D shows a smooth and very elastic texture.

Herbstreith & Fox KG		Recipe
<b><i>Dessert jelly</i></b>		
Product <b>Pectin Amid CF 025-D</b>		
9g Pectin (= 0.9%)		<b>Preparation:</b> <b>A</b> Mix the pectin with approx. 100g sugar (from total sugar amount). <b>B</b> Stir in mixture „A“ into the water and boil under stirring until the pectin has completely dissolved. <b>C</b> Add the remaining sugar, colour and flavour and cook until output weight is reached. <b>D</b> Add the citric acid solution to adjust the pH-value. <b>E</b> Adjust the filling temperature to the container size.
930g Water, deionized		
135g Sucrose		
xml Citric acid solution 50%(m/m) to adjust the pH-value		
yg tri calcium citrate tetrahydrate		
Colour, Flavour		
Net weight:	approx. 1075 g	
Output weight:	approx. 1000 g	
TSS:	approx. 15 %	
pH-value:	approx. 3.3	

When producing dessert jelly with 15% TSS and pH 3.3, with 0.9% pectin Amid CF 025-D transparent products with glossy, elastic texture are obtained.

Herbstreith & Fox KG		Recipe
<b>Calorie reduced fruit preparation 10% TSS</b>		
<b>Product Pectin Amid CF 025-D</b>		
<p>9g Pectin (= 0,9 %)            550g Fruit            470g Water, deionized            35g Sucrose            xml Citric acid solution 50%(m/m)                  to adjust the pH-value            yg tri calcium citrate tetrahydrate</p> <p>Net weight:       approx. 1070 g            Output weight:  approx. 1000 g            TSS:                approx. 10 %            pH-value:         approx. 3.2</p>	<p><b>Preparation:</b></p> <p><b>A</b> Mix the pectin with approx. 100g sugar (from total sugar amount).  <b>B</b> Stir in mixture „A“ into the fruit and water and boil under stirring until the pectin has completely dissolved.  <b>C</b> Add the remaining sugar and cook until output weight is reached.  <b>D</b> Add the citric acid solution to adjust the pH-value.  <b>E</b> Adjust the filling temperature to the container size.</p>	

The strawberry fruit preparation produced with Pectin Amid CF 025-D at pH 3.2 shows an elastically gelled texture.

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 30/11/2006