

VIDOPECTINE®



Pastry Cook Jams and Bakery Fillings with HM Pectin

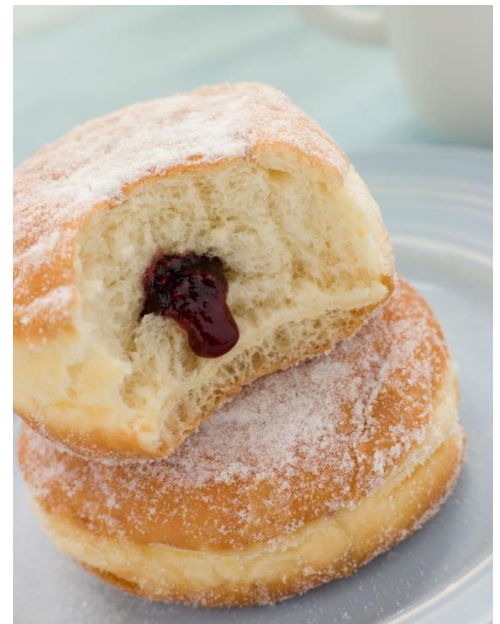
Improvement of Bake Stability, Texture and Pumpability with Citrus Fibre VIDOFIBRES CF 1525C

Objective:

To establish if VIDOFIBRES CF 1525 C Citrus Fibre is suitable in combination with HM pectin?

- Pastry cook jams and fillings (with total soluble solids contents being usually in the range of 65% – 72%) only need limited, if at all, bake stability. They are generally used after baking as injection jam or filling for sponge rolls etc. However, they mustn't be too firmly gelled and easy to pump. And their texture and viscosity should not change much during pumping.
- Only rarely they are baked together with the pastry
 - either by artisan bakeries where there is close supervision of the baking process possible or
 - industrially, in products baked at lower temperatures or only for a very short time, or where the filling is not directly exposed to the heat but insulated by the dough.
- Low methyl ester pectins are well known for being perfectly suited for these applications. They are used in top quality bakery fillings products due to their unique texture, shear- and pump stability and the possibility of lower filling temperatures that are important for filling into large containers. Their typical dosage would be in the range of 0.8% – 1.2%. They also have sufficient bake stability.
- However, their significantly lower cost-in-use (with typical dosages of 0.5% – 0.8%) often leads to the use of high methyl ester pectins instead. The users accept the limited shear- and pump stability of the jams, the higher filling temperatures necessary due to pre-gelling, and other disadvantages like e.g. tendency to firm gels and hence difficulties with pumping or stirring, and syneresis. These HM pectins are also critical in less acidic fillings cause at higher pH values of above 3.3, they would not correctly gel any more.
- Some apple pulp is often used in pastry cook jams and fillings made with HM pectin, where some bake stability is required. The fibrous apple paste helps with the texture, bake stability and shear stability, especially with raspberry or strawberry fillings.

- ⇒ To improve to firm and elastic texture caused by HM pectin at higher fill temperatures (85°C).
- ⇒ To improve the shear stability.
- ⇒ To improve the bake stability.
- ⇒ To reduce syneresis, especially at lower fill temperatures (70°C).
- ⇒ To reduce the amount of apple pulp or eliminate the need for it.



Recipe and Test description:

- Raspberry pastry cook jams without apple pulp.
- 65% and 72% TSS, pH 3.2 – 3.3.
- Fill temperatures: 85°C / 70°C.
- Baking test: 200°C for 20 minutes on a shortcrust dough piece (thickness 5 mm).
- Syneresis test: Jam placed on filter in a funnel, evaluation after 48 hrs.

Recipe:

x g **VIDOPECTINE MRSA 150 (Medium Rapid Set apple pectin) or MRS 150 (citrus pectin)**
x g **VIDOFIBRES CF 1525 C Citrus Fibre**
2,500 g Raspberry puree
4,500 g Sugar (520 g for the 72% TSS jams)
2,000 g Glucose syrup (C*Sweet 01127, Cerestar)
1,000 g Water
approx. 20 ml Citric acid solution 50%

Process:

- A: Mix pectin and citrus fibre with 100 g of sugar.
B: Add blend A to water and fruit puree.
C: Heat to the boil under stirring.
D: Boil for 1 minute to dissolve pectin.
E: Add remainder of sugar in 2 portions.
F: Add glucose syrup.
G: Cook to 65% respectively 72% TSS.
H: Cool to 85°C, fill half the jam in jars.
I: Cool further to 70°C and fill the remainder into jars.
J: Let stand for 48 hrs before performing tests.



Trials & Results:

65 % TSS				
Pectin Citrus Fibre	Dosage	Fill Temperature	Texture, after filling	Baking Test, 200°C, 20', on dough, after stirring
MRS 150	0.8%	85°C	Firmly gelled Difficult to pump	Limited bake stable (destroyed texture) Strong syneresis
MRSA 150	0.8%	85°C	Firm and pasty Better pumpable	Limited bake stability Some syneresis
MRS 150 VF CF 1525 C	0.5% 0.8%	85°C	Firm and pasty Better pumpable	Improved bake stability Significantly less syneresis
MRS 150	0.8%	70°C	Firmly gelled Difficult to pump	Limited bake stable (destroyed texture) Strong syneresis
MRSA 150	0.8%	70°C	Firm and pasty Better pumpable	Limited bake stability Some syneresis
MRS 150 VF CF 1525 C	0.5% 0.8%	70°C	Firm and pasty Better pumpable	Improved bake stability Significantly less syneresis
72% TSS				
Pectin Citrus Fibre	Dosage	Fill Temperature	Texture, after filling	Baking Test, 200°C, 20', on dough, after stirring
MRS 150	0.6%	85°C	Firmly gelled Difficult to pump	Limited bake stable (destroyed texture) Strong syneresis
MRSA 150	0.6%	85°C	Firm and pasty Pumpable	Limited bake stable Some Syneresis
MRS 150 VF CF 1525 C	0.5% 0.8%	85°C	Firm and pasty Better pumpable	Limited bake stable (somewhat destroyed texture). Less syneresis (than 0.6% MRSA 150)
MRS 150 VF CF 1525 C	0.4% 0.8%	85°C	Creamy	Bake stable Little syneresis
MRS 150 VF CF 1525 C	0.3% 0.8%	85°C	Creamy, soft	Quite bake stable Little syneresis
MRS 150	0.6%	70°C	Firmly gelled Difficult to pump	Limited bake stable (destroyed texture) Strong syneresis
MRSA 150	0.6%	70°C	Soft and pasty Pumpable	Limited bake stable Syneresis
MRS 150 VF CF 1525 C	0.5% 0.8%	70°C	Firm and pasty Better pumpable	Limited bake stable Less syneresis (than 0.6% MRSA 150)
MRS 150 VF CF 1525 C	0.4% 0.8%	70°C	Creamy	Bake stable Little syneresis
MRS 150 VF CF 1525 C	0.3% 0.8%	70°C	Creamy, soft	Quite bake stable Little syneresis

Conclusion:

- Pastry cook jams with HM citrus pectin VIDOPECTINE MRS 150 at 65% TSS and 72% TSS show the expected firm gel, making it difficult to stir and pump. Stirring and pumping results in destroyed gels with reduced bake stability and increased syneresis.

Fill temperatures of less than 75°C are not advisable due to strong pre-gelling.

Reducing the pectin dosage to achieve softer and better pumpable gels is not an option, as this leads to stronger syneresis and reduced pumping stability.

- Pastry cook jams with HM apple pectin VIDOPECTINE MRSA 150 have advantages in texture, pumpability and bake stability but cannot eliminate the problems completely.

- Pastry cook jams / baking stable jams made with dedicated bake stable LM pectins need quite a high pectin dosage of 0.8 – 1.0% and some fibrous fruit pulp (e.g. apple pulp) to help the bake stability. With raspberry pulp alone, they might be sufficiently pumpable and do not lose much viscosity due to their good reversibility, but they are only limited bake stable.

Here VIDOFIBRES CF 1525 C Fibre can replace the apple pulp or increase the bake stability.

- Adding 0.8% – 1.0% VIDOFIBRES CF 1525 C Citrus Fibre to pastry cook jams made with VIDOPECTINE MRS 150 HM citrus pectin has the following advantages/benefits:

1. VIDOFIBRES CF 1525 C (Citrus fibre) is rich in soluble fibre, mainly high methyl ester pectin. This pectin remains functional and gels at high solids (≥ 58 °Brix) and low pH (≤ 3.3)
2. The pectin dosage can be reduced (to 0.4% at 72% TSS or 0.5% at 65% TSS).
3. The apple pulp can be eliminated, as VIDOFIBRES CF 1525 C Citrus Fibre provides the fibrous structure instead.
4. The texture becomes less jelly and elastic, which makes the jams easier to pump.
5. The syneresis is significantly reduced.

6. Bake stability is increased.
7. Slightly lower filling temperatures are achievable as the Citrus Fibre helps to hold the texture together, even after the pectin starts to gel / pre-gel.
8. When using HM apple pectin VIDOPECTINE MRSA 150, which is slightly superior to HM citrus pectin VIDOPECTINE MRS 150 in pumpability and bake stability, the dosage of VIDOFIBRES CF 1525 C Citrus Fibre can be reduced by 10 - 20%.



Recipes:

Pastry Cook Jams 65% / 72% TSS

Pectin:
Citrus Fibre

VIDOPECTINE MRS 150
VIDOFIBRES CF 1525 C

Recipe:	100.0 g	80.0 g	Pectin solution 5%
	8.0 g	8.0 g	Citrus Fibre
	250.0 g	250.0 g	Raspberry pulp
	450.0 g	520.0 g	Sugar
	200.0 g	200.0 g	Glucose syrup (C*Sweet 01127, Cerestar)
	60.0 g	40.0 g	Water
	2 - 3 ml	2 - 3 ml	Citric acid soln. 50 %
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Input:	approx. 1,070 g	1,100 g	
Output:	approx. 1,000 g	1,000 g	
SS:	65 %	72 %	
pH-Value:	3.10 – 3.25	3.10 – 3.25	
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Manufacturing:

- A: Prepare a pectin solution using a high-speed mixer and hot water.
- B: Mix fruit, citrus fibre, water, sugar and heat to a boil.
- C: Add hot pectin solution and cook to 61 % (68 %) solids.
- D: Switch off heat, add glucose syrup slowly to help cool the batch.
- E: Check solids level, adjust pH by adding citric acid solution.
- F: Fill at 75 - 80°C.
- G: Cool larger containers to avoid centre burning.



Product Suitability

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Know-How and Experience



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