

# Technical Application Information



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# **T**echniques for the Addition of Pectin into the Product Batch

## **Introduction**

One of the most important steps of the industrial processing of pectin is its addition into the respective product batch. As pectin is normally added in small doses an optimal solution process is essential.

The most common and best method for dissolving pectin is the production of pectin solutions with suitable equipment. Several methods of adding pectin are described below in more detail.

### **1. Producing a pectin solution with a disperser**

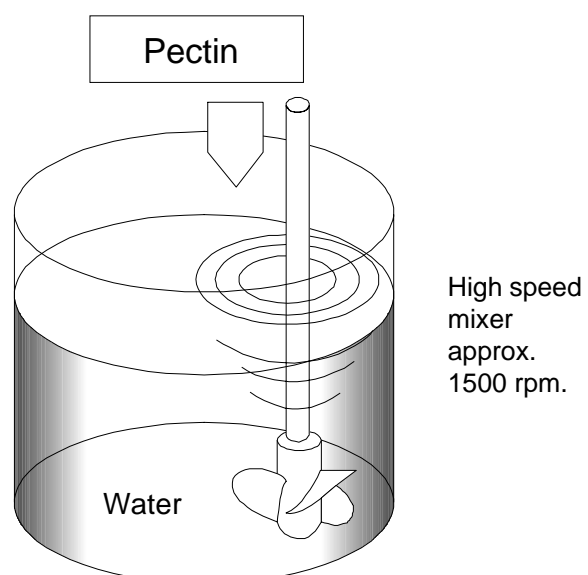
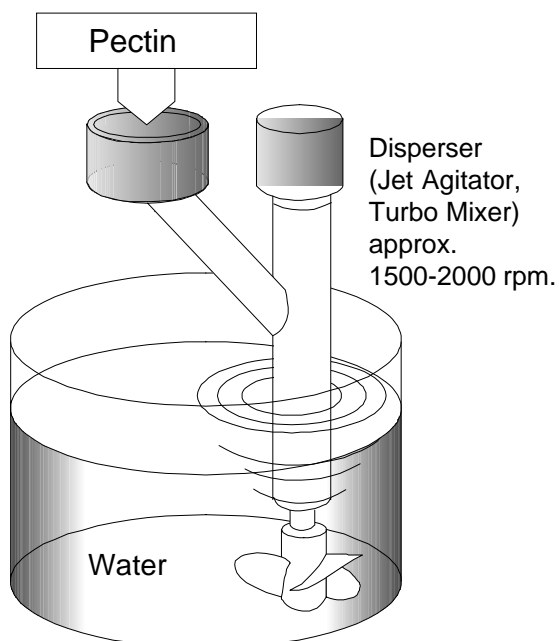
For producing a homogeneous pectin solution the use of a disperser (injection blender) allows a direct addition of the dried pectin to the

hot water. This pectin solution will then be mixed into the hot product batch. With a water temperature of 50-80 °C pectin solutions can be dissolved homogeneously with a concentration of 5 - 7.5%.

In some cases the concentration can be increased to 10% due to the high shear rate within the disperser.

### **2. Producing a pectin solution with a high speed mixer**

When producing a pectin solution with a high speed mixer, the pectin will slowly be added into the suction of the hot water (min. temperature 70-80 °C) and dissolved. Depending on the type of pectin and the speed of the mixer being used pectin solutions with a concentration of 5 - 7% can be produced.



### 3. Dry blending of pectin into the product batch

If the production of a pectin solution is not possible for technical reasons the dry pectin can also be homogeneously blended to a premix with five or ten times the amount of sugar (or other dry recipe components) and slowly stirred into the cold product batch (SS < 30%).

Please take care that no de-blending of the premix will occur as this may lead to lumping of the pectin.

These pectin lumps may not be completely dissolved due to lack of shear rates within the product batch which may cause an incomplete gelation of the final product.

After dissolving the pectin the remaining dry substances (as far as available, e.g. sugar, fruit powder etc.) will be added and the production may continue in the usual way.

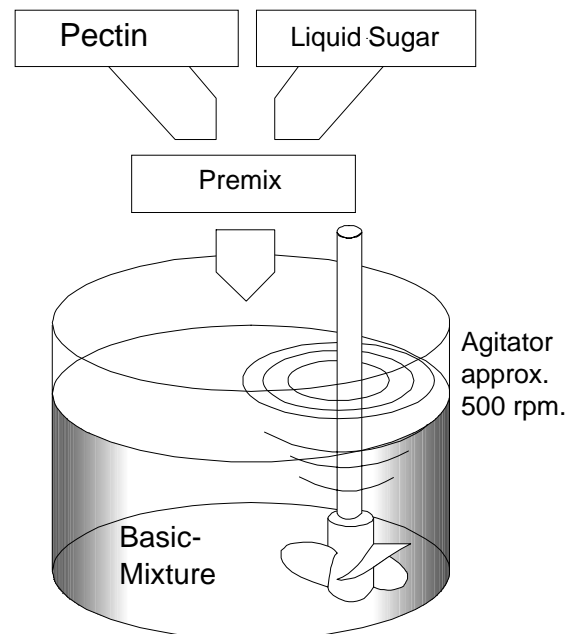
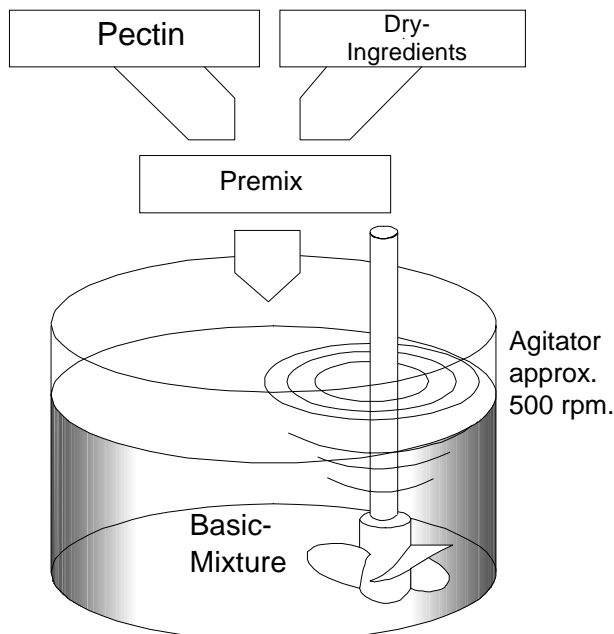
### 4. Blending of the pectin dispersion into the product batch

When working with liquid sugars, sugar syrup or fruit syrup it may be possible to disperse the pectin by slowly stirring it into ten times the amount of liquid sugar, sugar syrup or fruit syrup (min. 70% SS) by stirring slowly.

This dispersion will then be added to the cold product batch with a mixer.

To guarantee optimal solubility during the following heating process the soluble solids content in the product batch should not exceed 30%.

After dissolving the pectin the remaining soluble solids (as far as available) are added and the production continued in the usual way.



**Summary:**

The solubility of the pectin depends essentially on the following parameters:

**Temperature:**

The higher the temperature during the production of the pectin solution the better the solubility of the pectin.

The optimal temperature is > 80 °C. Should the dissolving temperature drop below 50 °C there is a danger of reaching the gelling range of the pectin, depending on the type of pectin. This will cause a so-called pre-gelation and thus may result in a loss of gelling strength.

As the temperature drops the viscosity of the pectin solution will increase. The dissolving temperature should therefore not drop below 50 °C.

When dissolving pectin at a lower temperature the power of the mixer should in any case be checked.

**Time:**

The longer the dissolving procedure takes the more completely the pectin can dissolve.

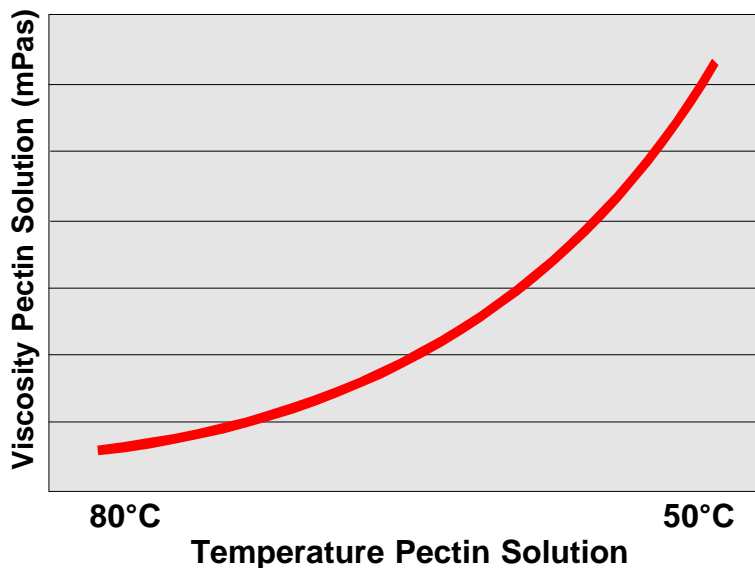
When using a dry blend (no. 3) lumping can be prevented by slowly adding the pectin / sugar premix and thus improving the solubility.

**Shearing:**

The higher the speed of the mixer used for making the pectin solution the better the solubility of the pectin.

A more powerful mixer is necessary to achieve the shear rate needed to dissolve the pectin, if the water temperature is lower and the resulting viscosity is high.

In comparison to other hydrocolloids pectin has a higher shear stability over a longer period of time independent of the speed of the mixer.



**Soluble solids content:**

To guarantee an optimal dissolving process the soluble solids content (SS) of the respective product batch should not exceed 30% when the pectin is added as the solubility of pectin decreases by increasing the soluble solids content (> 30%).