PERFECTAMYL GEL
PERFECTAMYL GEL NF
Thin boiling potato starches, applied as gelling and binding agents for Confectionery especially for the manufacture of winegums and jellies

Characteristics
PERFECTAMYL GEL and PERFECTAMYL GEL NF are thin boiling potato starch derivatives, used as binding and gelling agents for the manufacture of winegums and jellies. The products have the following attractive properties:
- can partly replace gelatin
- good water binding capacity
- form clear and stable solutions
- favourable gelling and texturing properties
- good flavour carrying properties
- neutral taste
- specific set-back properties
End-products have:
- gummy and gelatin-like texture
- good clarity
- neutral and fresh taste
- good shelf life.

Product description and properties
- Base
  - modified potato starches

Product as such
- Appearance
- Moisture content ISO 1666 205 mg/g maximum
- Solubility soluble after cooking
- Colour and taste AVEBE-stand. free from objectionable odours
- Fluidity (alkali) PERFECTAMYL GEL: approximately 90
  - PERFECTAMYL GEL NF: approximately 60

A 300 mg/g solution of PERFECTAMYL GEL and a 120 mg/g solution of PERFECTAMYL GEL NF in distilled water at 20 °C are measured
- pH 5.5 …7.0
- Appearance clear
- Texture gummy/gelatin-like neutral
- Taste PERFECTAMYL GEL: low viscous
  - PERFECTAMYL GEL NF: medium viscous
- Viscosity see figure 1 and 2.

Where no range is stated, these data should be taken as typical rather than absolute.

Application
Confectionery
PERFECTAMYL GEL and PERFECTAMYL GEL NF are applied, e.g. in combination with gelatin as binding, gelling and setting agents with good texturing properties in soft confectionery gums (winegums) and jellies, manufactured by the open-pan or batch process as well as by the continuous jetcooking process.
Figure 1: Viscosity of a typical sample of PERFECTAMYL GEL as function of time and temperature during gelatinization of a 300 mg/g concentration - dry solids - in distilled water

* BU = Brabender Units
Viscosity measured with a Brabender viscograph, type VS 5/250 cmg.

Figure 2: Viscosity of a typical sample of PERFECTAMYL GEL NF as function of time and temperature during gelatinization of a 120 mg/g concentration - dry solids - in distilled water

* BU = Brabender Units
Viscosity measured with a Brabender viscograph, type VS 5/250 cmg.
Basic recipes and processing procedures

Basic recipes for the manufacture of winegums and starch-gelatin jellies are given in the tables 1 and 2 respectively.

PERFECTAMYL GEL and PERFECTAMYL GEL NF regulate the texture such as elasticity of confectionery gums and jellies. The desired result depends on dosage, formulations and choice of the PERFECTAMYL GEL grade applied.

—Winegums—

Table 1: Basic recipes for the manufacture of winegums

<table>
<thead>
<tr>
<th>Ingredients</th>
<th>Quantities for a 100 kg batch</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1</td>
</tr>
<tr>
<td>PERFECTAMYL GEL</td>
<td>17.5</td>
</tr>
<tr>
<td>PERFECTAMYL GEL NF</td>
<td>-</td>
</tr>
<tr>
<td>Gelatin (180 Bloom)</td>
<td>2.5</td>
</tr>
<tr>
<td>Sugar</td>
<td>29</td>
</tr>
<tr>
<td>Glucose syrup (DE43)</td>
<td>29</td>
</tr>
<tr>
<td>Sorbitol</td>
<td>-</td>
</tr>
<tr>
<td>Water</td>
<td>21</td>
</tr>
<tr>
<td>Citric acid</td>
<td>1</td>
</tr>
<tr>
<td>Colour and flavour</td>
<td>a.d.</td>
</tr>
</tbody>
</table>

1. Good results are also obtained with recipes in which combinations of gelatin, PERFECTAMYL GEL NF and PERFECTAMYL GEL 45 are applied.
2. PERFECTAMYL GEL 45 is also a thin boiling potato starch derivative, manufactured by AVEBE.

—Preparation method for winegums according to the open-pan or batch process—

• Sugar, glucose syrup and sorbitol are dissolved in 20 litres water at 50 °C.
• Now - if applicable - PERFECTAMYL GEL is added to this mixture whilst stirring.
• The mixture is brought to the boil.
• Then - if applicable - PERFECTAMYL GEL NF, after being pre-suspended in cold or warm water (at a temperature below 40 °C) in a product-to-water ratio 1 : 1, is added slowly to the boiling mixture, so that the mixture is kept to the boil.
• To concentrate the mixture, boiling is continued until a dry solids content has been reached of respectively:
  720…730 mg/g for formulation 1,
  760…770 mg/g for formulation 2 and
  770…780 mg/g for formulation 3.
• The solution is deaerated and cooled to 85…90 °C.
• The pre-soaked gelatin is added.
• Citric acid, colour and flavour are added.
• After mixing the dry solids content should be 700…720 mg/g, then the solution is moulded at 70…80 °C.

1. The gelatin is pre-soaked in hot water in a product-to-water ratio 1 : 1.5 and stored at approximately 50 °C.

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—Preparation method for winegums according to the continuous jetcooking process (see also figure 3 and table 3)—

- Sugar, glucose syrup and sorbitol are dissolved in the preparation tank in the required quantity of water at a temperature below 60 °C.
- Then PERFECTAMYL GEL and/or PERFECTAMYL GEL NF is/are added, whilst stirring with a highspeed stirrer.
- The gelatin solution(1) is added and the whole is mixed thoroughly.
- This mix is pumped into a holding tank, where it is kept at 50…60 °C.
- Then the mix passes the jetcooker, where it is heated to 125…130 °C.
- By passing through a vacuum installation the solution is deaerated and cooled to 70…80 °C.
  The solids content should then be 700…720 mg/g
- Citric acid, colour and flavour are added.
- Finally the solution is moulded at 70…80 °C.

1. The gelatin is pre-soaked in hot water in a product-to-water ratio 1 : 1.5 and stored at approximately 50 °C.

—Starch-gelatin jellies—

Table 2: Basic recipes for the manufacture of starch-gelatin jellies

<table>
<thead>
<tr>
<th>Ingredients</th>
<th>Quantities for a 100 kg batch</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>A</td>
</tr>
<tr>
<td>PERFECTAMYL GEL</td>
<td>5</td>
</tr>
<tr>
<td>PERFECTAMYL GEL NF</td>
<td>-</td>
</tr>
<tr>
<td>PERFECTAMYL GEL 45(2)</td>
<td>-</td>
</tr>
<tr>
<td>Gelatin (180 Bloom)</td>
<td>7.5</td>
</tr>
<tr>
<td>Sugar</td>
<td>32</td>
</tr>
<tr>
<td>Glucose syrup (DE43)</td>
<td>38</td>
</tr>
<tr>
<td>Water</td>
<td>16.5</td>
</tr>
<tr>
<td>Citric acid</td>
<td>1</td>
</tr>
</tbody>
</table>

1. For sugar candied products formulation D is recommended especially.
2. PERFECTAMYL GEL 45 is also a thin boiling potato starch derivative, manufactured by AVEBE.
—Preparation method for starch-gelatin jellies according to the open-pan or batch process—

• Sugar and glucose syrup are dissolved in 15 litres water of 50°C.
• Now - if applicable - PERFECTAMYL GEL or PERFECTAMYL GEL 45 is added to this mix whilst stirring.
• The mix is brought to the boil.
• Then - if applicable - PERFECTAMYL GEL NF(2), after being pre-suspended in cold or warm water (below 40°C) in a product-to-water ratio 1 : 1, is added slowly to the boiling mixture, so that the mixture is kept to the boil.
• To concentrate the mixture, boiling is continued until a dry solids content has been reached of respectively:
  830…840 mg/g for formulations A, B and C,
  800…810 mg/g for formulation D and
  810…820 mg/g for formulation E.
• The suspension is deaerated and cooled to 85…90 °C.
• The pre-soaked gelatin(1) is added.
• Citric acid, colour and flavour are added.
• After mixing, the dry solids content should be 740…760 mg/g, then the solution is moulded at 75…85 °C.

1. The gelatin is pre-soaked in hot water in a product-to-water ratio 1 : 1,5 and kept at approximately 50 °C.
2. PERFECTAMYL GEL NF can also be added in the form of a solution instead of a suspension.
   To that end, PERFECTAMYL GEL NF is added to cold water in a product-to-water ratio 1 : 2,5 whilst stirring with a high-speed stirrer. Then steam is injected directly into this mixture, until a clear solution is obtained. This solution should not be stored too long in order to avoid retrogradation.

—Preparation method for starch-gelatin jellies according to the continuous jetcooking process—

• The sugar and glucose syrup are dissolved in the preparation tank in the required quantity of water at a temperature below 60°C.
• Then the chosen PERFECTAMYL GEL-grades are added, whilst stirring with a high-speed stirrer.
• The gelatin solution(1) is added and the whole is mixed thoroughly.
• This mix is pumped to a holding tank where it is kept at 50…60°C.
• Then the mix is pumped through the jetcooker, in which it is heated to 125…135 °C.
• Subsequently the mix passes through a vacuum installation where the solution is deaerated and cooled to 75…85 °C. The solids content should then be 740…760 mg/g.
• Citric acid, colour and flavour are added.
• Finally the solution is moulded at 75…85 °C(2).

1. The gelatin is pre-soaked in hot water in a product-to-water ratio 1 : 1,5 and kept at approximately 50 °C.
2. To achieve rapid and optimal drying of the jellies the moisture content of the moulding powder should be 80 mg/g when depositing takes place.
Table 3: Guiding lines for jetcooker processing

<table>
<thead>
<tr>
<th>Conditions (approximate values)</th>
<th>Winegums</th>
<th>Starch-gelatin jellies</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Jetcooker</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Course of temperature in °C</td>
<td>50…60 °C → 125…130 °C → 70…80 °C</td>
<td>50…60 °C → 125…135 °C → 70…80 °C</td>
</tr>
<tr>
<td>• Pump pressure:</td>
<td>inlet 0,5 MPa</td>
<td>0,5 MPa</td>
</tr>
<tr>
<td>• Vacuum pressure</td>
<td>47 kPa</td>
<td>47 kPa</td>
</tr>
<tr>
<td>• Steam pressure</td>
<td>&gt; 0,6 MPa</td>
<td>&gt; 0,6 MPa</td>
</tr>
<tr>
<td>• Capacity</td>
<td>1000 l/h</td>
<td>1000 l/h</td>
</tr>
</tbody>
</table>

| —Jetcooker processed solution— |          |                        |
| • Concentration of the mixture | 700…720 mg/g | 740…760 mg/g |
| • Moulding temperature | 70…80 °C | 75…85 °C |
| • Moulding viscosity of the solution | 1000…2000 mPa.s (Brookfield) | 1000…2000 mPa.s (Brookfield) |

1 MPa = 10 bar = 10 ato  
1 kPa = 7,5 mmHg  
1 mPa.s = 1 cP

Recommended drying conditions of winegums and starch-gelatin jellies

In order to achieve optimum quantity of the confectionery products, drying should be realized with due care and under mild and stable conditions. See table 4.
Table 4: Drying conditions for winegums and starch-gelatin jellies in relation to the basic formulations in tables 1 and 2

<table>
<thead>
<tr>
<th>Basic formulations</th>
<th>Drying conditions (approximate values)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Temperature</td>
</tr>
<tr>
<td>Winegums (table 1)</td>
<td>50 °C</td>
</tr>
<tr>
<td>Starch-gelatin jellies (table 2)</td>
<td>20 °C</td>
</tr>
</tbody>
</table>

If the ready end-products are dried as indicated and exposed for 14 days to a relative humidity of 75 % at 20 °C, their storage life will be excellent.

**Packing**

Multiply white paper bags of 25 kg net, available on one-way shrink-wrapped pallets.

**Storage**

Store inside, cool and dry, in sound and well closed bags. When stored under the required conditions PERFECTAMYL GEL and PERFECTAMYL GEL NF will not lose their excellent performance within 12 months.

**Technical service**

Complete details for every use are difficult to cover adequately in this brochure because of varying local conditions. The technical staff of the AVEBE Business Unit Ingredients for Food and Pharma will gladly supply any further particulars about recipes and preparation equipment to achieve optimum results in your specific application.