Application
Bakery filling creams are used in between various baked goods. Creams are important components in a variety of confectionery foods where they provide tailor-made taste experiences, texture and adhesion of the baked items. From a processing viewpoint, these creams fall into the categories heavy creams, light creams and creams with water. Often the creams are dispersions of sugar, other solids and occasionally gas, in fine crystallized fats. Some times creams also contain water. Classical examples are: chocolate based fillings for wafer or sandwich cookies, chocolate spreads and coatings and certain types of bakery improvers. Specific applications are caramel, toffee, nougat cream and praline filling.

Recipe

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>Typical Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>Particle size distribution is critical for the texture.</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>FAT PHASE IN %</th>
<th>TYPICALLY PALM KERNEL AND COCONUT OF OTHER VEGETABLE OILS</th>
<th>30.0</th>
</tr>
</thead>
<tbody>
<tr>
<td>SOLID COMPONENTS IN %</td>
<td>POWDER SUGAR</td>
<td>70.0</td>
</tr>
<tr>
<td></td>
<td>TYPICAL RANGE</td>
<td>65-80</td>
</tr>
<tr>
<td>AERATION</td>
<td>DENSITY (NITROGEN OR AIR INJECTION)</td>
<td>0.75-1.15</td>
</tr>
</tbody>
</table>

Processing of Heavy Filling Cream
• Melted fat blend is pumped into the mixer.
• Sugar, salt or other solids are weighed into the mixer. At this state the cream is very viscous due to the large amount of suspended material and it may have a tendency to exhibit sedimentation.
• Air or nitrogen can be injected after the lobe pump before the crystallizer.
• The homogeneous product mix is then crystallized in the scraped surface heat exchanger (SSHE) and the homogeneity and degree of post-crystallization is controlled in a pin rotor machine.
• The cream is then extruded and ready for use. Relatively smaller suspended particles give higher viscosities. Once the flow stops, extra force is required to make the product flow again.
• Granulated ingredients, e.g. chocolate, nuts or sugar granules, can be added by an in-line ingredient feeder prior to filling.
• A remelt flow back to the buffer tank is required in case of production stops.

Typical Challenges
• Filling creams are abrasive due to the content of solid hard particles. This requires special flushed seals for moving machine parts.
• It is recommended to plan production starting with light colored products moving to the dark colored products.
Continuous processes offer the following benefits compared to batch processes:

### Technology Benefits

- Uniform product quality and no batch variations
- High formulation flexibility
- Adjustable viscosity/plasticity
- Adjustable gas injection up to 30%
- Efficient mixing operation of solids and fat by high temperature

### Process Benefits

- Superior influence on texture properties and control of crystallization ($\beta'$ crystal promotion) including low trans fat blends
- Automatic production sequencing, change of formulations and full control of filling temperature
- High hygienic level based on closed system
- Labour savings by reduced handling of crystallized product
- Quality control savings due to accuracy
- Production on demand only
- Easy maintenance and service