No trans, no compromise

with GRINDSTED® CRYSTALLIZER
Emulsifier Blends
No trans, no compromise

- Market drivers
- Key issues for the industry
- Danisco capabilities
- Application opportunities
- How can we help you?
- Conclusions
## Market drivers

- Growing health awareness among consumers
- Pressure from retail and the media
- Legislation
- Labelling
Key issues for the industry

The use of low trans fatty acid solutions can compromise

1. Capacity
2. Performance
Tap into our pool of knowledge on fats

1. Fat crystallisation’s dependency on
   - Raw materials
   - Process influences
2. Analytical and practical experience
Tap into our pool of knowledge on emulsifiers

1. Chemistry
2. Influence on fat crystallisation
3. Functionality in fat-based products and final applications
...and what are the benefits?

Being trans-free with Danisco, you overcome

1. Process issues
2. Performance issues
Support in faster identification of the right solutions

1. Co-development of low trans fatty acid solutions
2. Testing rate of crystallisation for specific fats
3. Pilot plant testing
## Application opportunities

<table>
<thead>
<tr>
<th>Fat based fillings based on liquid fat</th>
<th>Cakes (shortening)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cakes (cream and cake margarine)</td>
<td>Puff pastry</td>
</tr>
</tbody>
</table>
Application opportunities
- Fillings based on liquid fat

For confectionery and fine bakery
- Improved crystallisation
- Improved production capacity

GRINDSTED® CRYSTALLIZER 100 Emulsifier Blend
Improvement of crystallisation rate

Rate of crystallisation at 20°C (from 80°C to 20°C)

- Filling based on trans-free fat
- Filling based on trans-free fat + GRINDSTED® CRYSTALLIZER 100
Onset nucleation

Just 1% of GRINDSTED® CRYSTALLIZER 100 promotes earlier nucleation onset and consequently speeds up fat crystallisation.
Application opportunities - Cakes

For cake
- Improved crumb stability
- Improved appearance

GRINDSTED® CRYSTALLIZER 200 Emulsifier Blend
## Application opportunities - Cakes

<table>
<thead>
<tr>
<th>Cake produced with</th>
<th>Trans-containing shortening</th>
<th>Non-trans-containing shortening</th>
<th>Non-trans-containing shortening + GRINDSTED® CRYSTALLIZER 200 Emulsifier Blend</th>
</tr>
</thead>
<tbody>
<tr>
<td>Specific volume</td>
<td>2.6 ml/g</td>
<td>2.6 ml/g</td>
<td>2.6 ml/g</td>
</tr>
<tr>
<td>Structure</td>
<td>Stable</td>
<td>Unstable</td>
<td>Stable as 1</td>
</tr>
</tbody>
</table>
Cake shortening with same Solid Fat Content (SFC)

- Trans shortening (25% trans fatty acid)
- Non-trans shortening (<1% trans fatty acid)

SFC matches do NOT mean similar performance
Application opportunities
- Plastic cake shortening

For shortenings
- Faster crystallisation
- Optimised production capacity

For cake
- Improved crumb stability
- Improved appearance

GRINDSTED® CRYSTALLIZER 201
Emulsifier Blend
Summary

Market drivers
Health Media Legislation Labelling

Industry issues
Capacity Performance

Danisco capabilities
Fat & Emulsifier Chemistry

Benefits
Improved Capacity Performance

Solutions
GRINDSTED® CRYSTALLIZER Emulsifier Blends