### MENTHOL-I

**NATURAL VS SYNTHETIC**

<table>
<thead>
<tr>
<th>Criteria</th>
<th>Natural I-Menthol (mainly ex India)</th>
<th>Synthetic I-Menthol by Symrise</th>
</tr>
</thead>
<tbody>
<tr>
<td>appearance, odor and taste</td>
<td>needle like crystals (powder, small, medium, bold) typical Menthol incl. peppermint notes</td>
<td>pellets or solid mass typical Menthol, very fresh and clean</td>
</tr>
<tr>
<td>purity (GLC)</td>
<td>98.00 - 99.70%</td>
<td>mind. 99.70%</td>
</tr>
<tr>
<td>specification</td>
<td>on request</td>
<td>on request</td>
</tr>
<tr>
<td>other ingredients</td>
<td>components of peppermint oil</td>
<td>other Menthol isomers</td>
</tr>
<tr>
<td>raw material</td>
<td>Mentha Arvensis plant (mainly Indian)</td>
<td>m-Cresol (ex crude oil / petroleum)</td>
</tr>
<tr>
<td>manufacturing process</td>
<td>distillation and crystallisation</td>
<td>chem. reactions, distillation, crystallisation</td>
</tr>
<tr>
<td>handling</td>
<td>dissolve or melt prior to use</td>
<td>dissolve or melt prior to use</td>
</tr>
<tr>
<td>packaging</td>
<td>fibre drums and cardboard boxes</td>
<td>cardboard boxes, drums, tanktainers</td>
</tr>
<tr>
<td>availability</td>
<td>depending on crop (e.g. increase or decrease of plantation area due to market prices or climatic conditions)</td>
<td>2 manufacturing plants (Germany and USA)</td>
</tr>
<tr>
<td>pricing</td>
<td>short term and middle term, fluctuating, depending on Mentha Arvensis crop</td>
<td>short term, middle term and long term stable</td>
</tr>
<tr>
<td>pharma grade</td>
<td>depending on manufacturer</td>
<td>GMP, API, CEP, DMF</td>
</tr>
</tbody>
</table>
1973/74 Start of Menthol production in Germany (Bayer Uerdingen and Holzminden)

1978 Start of Menthol production in the USA (Bushy Park, S.C.)

1986 Capacity expansion Germany

2002 New crystallisation and filling area in Holzminden

2003 Symrise founded from the merger Harmann & Reimer and Dragoco

2012 Capacity expansion in Germany
MENTHOL
PRODUCT INFORMATION

• **CAS-No.:** 2216-51-5
• **appearance (20°C):** whitish to white fused-in crystals
• **odor:** typical-minty, fresh, cool
• **flavour:** cool, fresh, peppermint-like
• **application:** perfumery & flavour components, technical/other fields
• **stability min.:** 2 years from production date
• **original packaging:** drum 180 kg smaller quantities on request
MENTHOL
PRODUCT INFORMATION

• **CAS-No.:** 2216-51-5
• **appearance (20°C):** whitish to pelletized crystals, clear, colorless liquid
• **odor:** typical-minty, fresh, cool
• **flavour:** cool, fresh, peppermint-like
• **application:** perfumery & flavour components, technical/other fields
• **stability min.:** 2 years from production date
• **pallet size:** 16 x 20 kg cardboard boxes
  also available in smaller quantities

SY620009 Menthol-I pellets
MENTHOL
PRODUCT INFORMATION

- **CAS-No.:** 2216-51-5
- **appearance (20°C):** whitish to white pelletized crystals
- **odor:** typical-minty, fresh, cool
- **flavour:** cool, fresh, peppermint-like
- **application:** pharmaceutical
- **stability min.:** 2 years from production date
- **pallet size:** 16 x 20 kg cardboard boxes also available in smaller quantities
MENTHOL
PRODUCT INFORMATION

- **CAS-No.:** 2216-51-5
- **appearance (20°C):** whitish to white crystals
- **odor:** typical-minty, fresh, cool
- **flavour:** cool, fresh, peppermint-like
- **application:** special grade for chewing gum
- **stability min.:** 2 years from production date
- **pallet size:** 16 x 20 kg cardboard boxes
  also available in smaller quantities
MENTHOL
PRODUCT INFORMATION

- **CAS-No.:** 89-78-1
- **appearance (20°C):** colorless to white liquid to crystalline
- **odor:** minty-fresh
- **flavour:** minty-cooling
- **application:** perfumery & flavour components, technical/other fields
- **stability min.:** 2 years from production date
- **original packaging:** drum 180 kg

SY131136 Menthol racemic
MENTHOL
PRODUCT INFORMATION

- **CAS-No.**: 89-78-1
- **appearance (20°C)**: colorless to white liquid to crystalline
- **odor**: minty-fresh
- **flavour**: minty-cooling
- **application**: pharmaceutical, technical/other fields
- **tested against**: European and US Pharmacopoeia
- **stability min.**: 2 years from production date
- **original packaging**: drum 180 kg also available in smaller quantities
MENTHOL
PRODUCT INFORMATION

- **CAS-No.:** 15356-60-2
- **appearance (20°C):** whitish to white crystals
- **odor:** fresh-minty, cool, with light herbal and metallic undertones
- **application:** technical/other fields
- **stability min.:** 2 years from production date
- **original packaging:** drum 180 kg
  smaller quantities on request
MENTHOL

PRODUCT INFORMATION

- **CAS-No.:** 89-78-1
- **appearance (20°C):** colourless to white liquid to crystalline
- **odor:** minty-fresh
- **flavour:** minty-cooling
- **application:** perfumery & flavour components, technical/other fields
- **stability min.:** 2 years from production date
- **original packaging:** drum 180 kg smaller quantities on request
MENTHONE & COOLING AGENTS
INFORMATION

We also offer various Menthone products and Cooling agents.
For more information please contact us.

SY605501 Menthone rac. 9505
SY605494 Menthone-I 9505
SY614960 Menthone-I/Isomenthone-d 7030
SY620103 Menthone/Isomenthone rac.
SY633678 Isomenthone 8505
SY192924 Symcool® WS3
MENTHOL BY SYMRISE

BENEFITS

Security of Supply
- Safe raw material base (petroleum)
- Backwards integrated (Lanxess & Symrise)
- Two L-Menthol production plants (Germany & USA)
- 350 days/ a production and availability
- Contingency
- > 40 years experience in manufacturing Menthol
- Independent from nature’s unpredictability

Marketing & Distribution
- Longterm contracts and price stability
- No speculation on availability and market prices
- Global supply chain
- Global permissibility

Quality & Innovative Technology
- Consistent, standardized quality (synthetic production)
- Numerous grades for various applications available (pharma grades, GMP, etc.)
- Carbon footprint (e.g. water and energy consumption, waste, land use)
ANY QUESTIONS?

SIMPLY TALK TO US!

WE’RE LOOKING FORWARD TO YOUR REQUEST!

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