Innovations in Production Dispersing and Milling

Online Webinar  March 4th 2021
Andy Stummer
Agenda

- Introduction
- Dispersion process overview
- New production equipment
- Lab and pilot resources
VMA-Getzmann Overview

- Founded in 1972 in Germany
- Family-owned
- Over 100 employees
- Dissolvers, bead mills and basket mills for laboratory, pilot plant and production
VMA-Getzmann Overview

- Represented in 100 countries
- Flexible to customers requirements
- Complete solutions for lab, pilot plant and production
- State of the art dispersion and pilot plant in US and Germany

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The Dispersion Process

1. Wetting of solid particles
2. Mechanical breakdown of agglomerates and aggregates into primary particles
3. Small particle stabilization
The Dispersion Process

wetting → grinding → stabilisation
Dissolver and Bead Mill

Product viscosity

Medium

Paste like

Extrem

Low

(liquid)

10nm Nano

100nm Submicron

1µm Micron

100µm

1mm Coarse

Particle size

Extruder

Three roll mills

Bead mills

Dissolver
Dispersion Process

Predispersion (18-25 m/s)
- Dissolvers
  - DISPERMAT® SC

Fine dispersion / milling / grinding (10-16 m/s)
- Vertical bead mills
  - Milling system APS
- Basket mills
  - Milling system TORUSMILL SK, DISPERMAT® SC with QCS®
- Horizontal bead mills
  - DISPERMAT® RS5, RS10, RS20, RS30
DISPERMAT® and TORUSMILL®

Highly efficient dissolvers, bead mills and basket mills designed for the challenges of the production environment:

- Dyes and varnishes
- Pigments and additives
- Printing inks
- Chemistry
- Plastics
- Construction chemistry
- Electronics
- Adhesives
- Coatings
- Microbiology
- Pharma
- Cosmetics
- Agrochemicals
- 3D print media
- Lithium-ion batteries

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Dissolver DISPERMAT® SC

- Output 15Kw – 55Kw
- Product Volume 35L – 2000L
- Control via SPS/ SC
- New QCS quick change system
- Dissolver/Basket mill combination
- Vacuum upgrade
- Removable cover for cleaning
- Wall scraper for viscous or thixotropic products
- Explosion proof option

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Dissolver DISPERMAT® SC with QCS (patent pending)

- QCS – quick change system
- Basket Mill or Rotor Stator system
- Ceramic option
Dissolver DISPERMAT® SC with Vacuum

- Better wetting and dispersing effect
- Higher energy input
- Elimination of foam
- Faster product transfer
- Improved homogenization
- Cost savings
- Variable Vacuum pumps
- Nitrogen purge valve optional

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DISPERMAT® Vacuum cover example
DISPERMAT® SC technology control panels

- Rotational speed: 5,500 rpm
- Cross-radial speed: 25.4 m/s
- Power: 2,380 W
- Temperature: 42.0 °C
- Torque: 4.1 Nm
- Time: 00:26:58

- RPM: 2800
- A: 12
- °C: 34

Control buttons and indicators:
- POWER
- READY
- START
- ERROR
- START/STOP
- SPEED
DISPERMAT® SC technology control panels
Pilot Plant
DISPERMAT® TM 2:1 Dissolver/Basket Mill Combo

- Motor Power 15Kw – 55Kw
- Product Volume 35L – 1600L
- Control via SPS/ TM
- EX models
- Dissolver/Basket Mill in one
- Ceramic option
- Vacuum option
DISPERMAT® TM 2:1 Dissolver/Basket Mill Combo

• Predispersion and fine grinding in a closed system
• Excellent grinding results in a very short time with narrow particle size distribution
• Simple scale-up from the laboratory system TML to the production machine TM
• Double-walled, temperature-controlled grinding basket with forcibly guided cooling system
• Space savings: 2 processes - 1 machine
• Simple cleaning and particularly quick regrind changes
DISPERMAT® TORUSMILL® SK

- Motor Power 15Kw – 55Kw
- Product Volume 35L – 1600L
- Control via SPS/ SK
- EX models
- Basket Mill with optional QCS
- Ceramic option
- Nano kit
- Vacuum option
- Quick color changes
TORUSMILL® QCS (patent pending)
DISPERMAT® TORUSMILL® SK

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Basket Mill design TML
DISPERMAT® RS Horizontal Mill

- Motor Power 5.5 Kw – 30 Kw
- Product Volume 25L-1000L/hour
- Control via C/ C-EX/ M/ M-EX
- EX models
- Ceramic option
- Nano kit
- Vacuum option

<table>
<thead>
<tr>
<th>DISPERMAT RS</th>
<th>Milling chamber size in Liters</th>
<th>Motor Power in Kw</th>
<th>Volume in liters/hour</th>
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<tbody>
<tr>
<td>RS5</td>
<td>5</td>
<td>5.5</td>
<td>25-250</td>
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<td>RS10</td>
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<tr>
<td>RS30</td>
<td>30</td>
<td>30</td>
<td>150-1000</td>
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Vertical bead mill – APS system
VMA-LAB in Wallingford, CT
VMA-LAB Wallingford Equipment
VMA-LAB Wallingford overview

- The Wallingford site is a 1st class laboratory facility
- Ability to demonstrate the performance, flexibility and accessories to perform different milling techniques.
- Scale-up capability for customers interested in large equipment.
- Leveraging synergies between the instrument and additive business.
- Showroom with the latest milling/dispersing equipment.
- Milling/dispersing training and seminar location.
Thank you

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