NETZSCH

Proven Excellence.

Ψ-*Mix*® Inline-Disperser

Trial Guide for Ψ-*Mix*® 45

CHEMICAL INDUSTRY | a Business Field of NETZSCH Grinding & Dispersing

Ψ-*Mix*® Inline Disperser
Trial Guide

In order to ensure that tests in the NETZSCH-Feinmahltechnik laboratory run smoothly and successfully from planning to evaluation, we provide you with the Ψ-*Mix*® Trial Guide, which contains all of the key information at a glance. It is important to know that the Ψ-*Mix*® wetting process differs from conventional dispersion processes. For this reason, the production flow for a product can also differ from the conventional process. With the Ψ-*Mix*® Trial Guide you know from the very beginning of your test planning what it will take to carry out a successful test.

Ψ-*MIX*® System Laboratory Equipment | NETZSCH-Feinmahltechnik Selb

Machine

- Ψ-*MIX*® 45
- Pumps
  - geared pump
  - or
  - pneumatic diaphragm pump
- Tanks for liquid supply and product coolable in two zones – bottom and lower half of jacket + upper half of jacket
  - 325 liter effective volume
  - 400 liter total volume
- Pitched-blade agitator
- Sack chute for addition of powder
- Platform with pallet lock

Batch Preparation Aids

- Scale precision 0.5 kg (pallet lift truck)
- Scale capacity up to approx. 30 kg, 1 g precisionfor small quantities
- Barrel hoist for filling liquid from barrels into the batch tank
- Forklift
- Pallet truck

Product Evaluation

- Grindometer 15 µm, 25 µm, 50 µm, 100 µm, 250 µm
- Malvern Mastersizer 3000 for particle size measurement
- Malvern Kinexus for viscosity measurement

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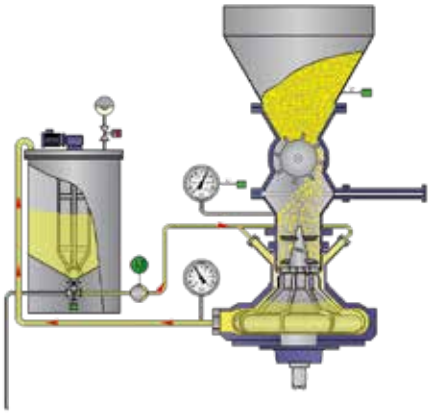
Fundamental Differences from other Dispersion Processes

High viscosities are not absolutely necessary as with dissolver batches; rather, an attempt should be made to have all of the liquid available for the wetting process if possible.

- Lower viscosity → lower power input → lower temperature increase
- More liquid → can result in better wetting
- Utilization of pressure differences and micro- cavitation for dispersion → may require fewer additives
- Gentle dispersion since there is no classic rotor-stator system



Test Preparation | Customer

- If possible, all dry and liquid components should be delivered pre-weighed and in individual containers. This simplifies test preparation and saves time
- Additives (defoamers, wetting agents, …) should be delivered individually and separate, not pre-mixed with the liquid or solid. It is entirely possible that less or more additive supply will be required than with other processes. The additives can be added to the product as needed during production, as long as no negative effects are expected
- The liquid can be delivered ready-mixed, as long as it has no negative effects on the manufacturing process or product quality
- Solids can be delivered pre-mixed, as long as it has no negative effects on the manufacturing process or product quality
- Basically: the fewer individual components that must be weighed on site, the quicker, cleaner and less prone to error is the test
- Liquid that is retained in the current production process for cleaning purposes should, to the extent possible, also be available for dispersion in the Ψ-*Mix*®. This means that this liquid could already be added to the process as needed, should the viscosity become very high
- Special cleaning agents should be supplied if required
- Empty containers should be supplied for returning the product

Batch Size

- Minimum fluid supply to start:
  approx. 80 liters for low-viscosity liquid
  approx. 100 liters for high-viscosity liquid (from approx. 500 mPas)
- Maximum product volume (finished product)
  325 liters
- Since air can be incorporated into the product with the addition of powder, the actual volume could be greater than the theoretically calculated volume. (The air is then usually removed from the product in the second dispersion sequence of the Ψ-*MIX*®).
- The liquid and solid volumes must be laid out such that the minimum liquid supply is achieved before the powder is added and the maximum product volume is not exceeded with the finished batch. In extreme cases, the batch tank can hold almost 400 liters, e.g. if the product tends to foam or absorb air.

In case of deviations from the above-stated volumes or further questions about the trial, please contact:

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Capacity

- If complete cleaning is not required between test batches, approx. three to four tests can be run per day.
- When cleaning between tests, for example if changing colors or to prevent product cross-contamination, a maximum of approx. two tests can be run per day.
- For tests that require very slow dosing of powder and thereby longer processing times, a maximum of approx. two tests can be run per day.
- For products that are extremely difficult to clean, it is possible that only one test can be run per day. However, this is seldom the case.
- Basically: anything that requires extra time reduces the number of possible tests per day. In particular, tasks that require extra time include:
  - complete cleaning
  - weighing and filling several components

Documentation

The test is documented with the aid of test protocols, which are tailored to the machine technology.
The protocol includes the formulation, the key parameters during production and additional comments if necessary.
The customer receives the test protocol as a PDF file.

Micro Ψ-*Mix*®

Ψ-*Mix*®

Technical Data

Technical Data	*Micro* Ψ-*Mix*®	Ψ-*Mix*®	*Mega* Ψ-*Mix*®
Production capacity at solid content of 50% approx. [t/h]	0.5	10	50
Solids flow (volumetric) max. [m^3/h]	0.3	5	35
Suspension flow [m^3/h]	1 - 2	10 - 25	120 - 200
Drive power [kW]	5.5	45 - 75	110 - 200
Speed range [min^{-1}]	1,000 - 3,000	500 - 1,800	250 - 1,000
Discharge pressure (max.) [bar]	2.0 (4)	3.5 (6)	3.5 (6)
Viscosity limit (approx. 210,000 mPas)		pumpable	
Control		PLC	
Total weight approx. [kg]	250	2,700	12,000
Recommended batch size [l]	5 - 700	500 - 15,000	5,000 - 100,000

Mega Ψ-*Mix*®

The NETZSCH Group is an owner-managed, international technology company with headquarters in Germany. The Business Units Analyzing & Testing, Grinding & Dispersing and Pumps & Systems represent customized solutions at the highest level. More than 3,700 employees in 36 countries and a worldwide sales and service network ensure customer proximity and competent service.

Our performance standards are high. We promise our customers Proven Excellence – exceptional performance in everything we do, proven time and again since 1873.

Proven Excellence.

Business Unit Grinding & Dispersing – The World's Leading Grinding Technology

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NETZSCH Vakumix – Germany
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