Gericke

COMPETENCE IN MIXING

When it comes to mixing technology Gericke has every aspect covered: hygienic and easy to clean equipment, the highest homogeneity, fast and effective processing, energy efficient, space saving, and the ability to add fully integrated feeders to your entire process.

WHY MIXING SOLUTIONS FROM GERICKE?

- Complete range of batch and continuous solutions, including feeding and conveying, from one supplier
- Robust and hygienic designs
- Experience and references in all key industries and applications

GMS DOUBLE SHAFT MIXING

When mixing of fragile products, efficient distribution of micro ingredients, optimal dispersion of liquids onto particles or the highest hygienic requirements are the challenges, the GMS Multiflux® is the best choice.

GBM SINGLE SHAFT MIXING

Our single shaft mixer, GBM, also brings the quality of Gericke mixing to simpler mixing tasks.

GCM CONTINUOUS MIXING

Efficient, compact, easy to clean: Continuous mixers are the perfect fit for many demanding mixing tasks.

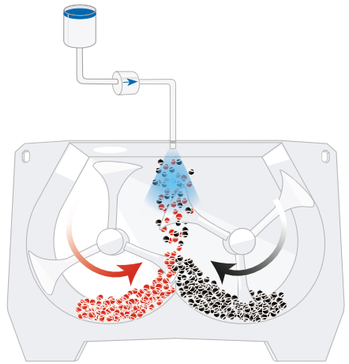
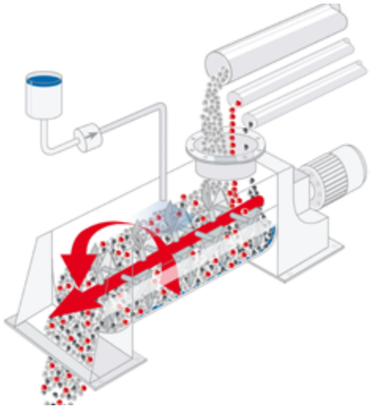
TCM TURBO COMPACT MIXING

With the TCM Turbo Compact Mixing it is possible to continuously feed gravimetrically, and mix up to three streams, with minimal space requirement, directly upstream of the filling line.

	GMS	GBM	GCM	TCM
Process	Batch	Batch	Continuous	Continuous, Late Product Differentiation
Type	Double shaft	Single shaft	Single shaft	Integrated feeding and mixing unit
Batch capacity	1 - 4,000 l	1 - 30,000 l		
Hourly capacity	up to 70,000 l	up to 250,000 l	10 l - 150,000 l	up to 20,000 l
Microingredients	●		●	●
Liquid injection	○	○	○	○
Gentle mixing	●		●	●
Disperser	○	○		
Extractable mixing tool	○	○	○	●
Hygienic Design				
FDA/EHEDG	○	○	○	○
EC 1935/2004	○	○	○	○
Regulatory Compliance				
ATEX/IECEx	○	○	○	○
GMP Design	○	○	○	

standard ● optional ○

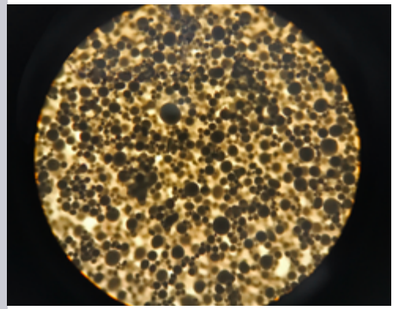
Expertise . Value . Trust

	Batch (example GMS Multiflux batch mixer)	**Continuous** (example GCM continuous mixer)
		
Number of ingredients:	Unrestricted	Limited by the number of gravimetric feeders required for each component or premix. Note: each component has to be continuously feedable
Frequency of recipe change	A recipe can be changed or adjusted for every batch allowing the production of small production volumes	Continuous mixing lines achieve their full potential when the recipe remains unchanged for hours
Frequency of cleaning	After each batch possible	Smaller volumes to be cleaned, but interrupts continuous process
Demixing	Potential risk of demixing, especially in the hoppers and transport installation downstream of the mixer	Low risk of demixing, mixer can be positioned directly in front of next reactor or packaging
Space requirements	Higher space requirements	Low space requirements
Dust explosion potential	The higher volumes of mixers and hoppers may demand additional measures against dust explosions	Low volumes, reduced risk of dust explosion
Automation	Various degrees of automation are possible, from fully manual to fully automated	Fully automated
Energy	Strongly dependent upon RPM and mixer size	Significantly reduced energy requirement due to continuous and short mixing time in smaller mixing chamber
		

FIT FOR ALL YOUR MIXING NEEDS

Highest homogeneity with short mixing times

Homogeneous mixing of microingredients (down to <0.001%) has never been easier or faster. The effectiveness of the mixing (RSD <1.0%) can easily be checked in one of Gericke's test centers around the globe.



Easy cleaning & hygienic design

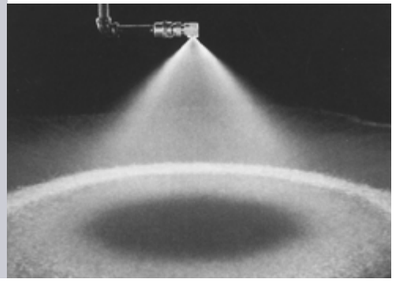
Many of our standard versions come with a large front door, giving access to all parts of the mixers for cleaning and inspection. Additionally, in the ECD versions (Extractable Cantilevered Drive), the whole drive unit, including mixing rotors, can easily be extracted from the body, facilitating full access to mixing tools and the interior of the mixer body. This means that inspection, disassembly, and cleaning of our mixers require far less time and effort than with other systems.

Efficient dispersion

The new optional GCU Dispersers (patent pending) can be mounted on the front door. This optimised location, together with the large disperser diameters, provides a highly efficient process enhancement - whilst still being easily accessible for cleaning. With this new feature the GMS becomes even more flexible to disperse viscous liquids and fat powders.

Liquid addition

The design of our mixers using advanced spray nozzles, integrated into the mixer lid, allows the addition of finely dispersed droplets directly into the fluidised zone for efficient liquid/solid mixing or coating.

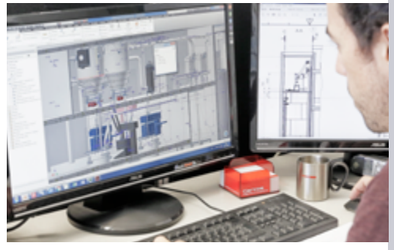


Heat transfer

Whenever you need accurate and reliable temperature control: Our mixers are designed for efficient heating and cooling using double jacketed or electrically heated executions.

Global Service and Support – We speak your language

With our global network of subsidiaries, test centres and partners, we support our customers in all parts of the world. Wherever you are, we will be with you.



Bespoke solutions

To satisfy even the most complex mixing requirements, Gericke can custom create complete mixing lines including product reception, storage, recipe preparation, mixing and conditioning. Gericke's world renowned mixing turnkey packages can also integrate every processing stage from feeding to mixing into a single line to guarantee maximum efficiency.

Industry 4.0 is here – Assess, Prevent, Predict

With Gericke's experience not only in powder processing processes but also in automation and sensor integration, our systems allow also for online access to sensors and analytics, direct diagnostics to assess the process and machine, or planning of maintenance.

GMS MULTIFLUX® BATCH MIXER
GENTLE MIXING MEETS EFFICIENCY

If minor ingredients, fragile products, liquid additions or highest hygienic requirements are part of your process, GMS Multiflux® is the answer.

Why GMS?

- Optimized design for easy cleaning and inspection
- No dead zones for maximum product safety
- Perfect for microingredients down to <0.001%

The GERICKE GMS Multiflux® batch mixer achieves a maximum degree of homogeneity and preserves high-quality ingredients during the mixing process.
Gericke Multiflux® GMS mixers form a mechanical fluidized zone with two horizontally arranged superimposed mixing tools. Consequently, the mixing process achieves high quality results and is both rapid and very gentle. Gericke Multiflux® mixers can produce up to 20 mixing cycles per hour. The GMS mixers are available in sizes of 1 to 4000 litres (useable volume). Designed with cantilevered and optionally extractable drives they allow for easy and quick cleaning. Compared to other mixing systems the GMS also stands out due to its low height.

Your benefits

- Highest and consistent mixing quality (even with the smallest components below 0.001 %)
- Very fast and gentle mixing with minimized product stress and energy input
- Meets stringent hygiene requirements following FDA, EHEDG and GMP guidelines
- Easy and quick to clean (full accessibility, extractable mixing tools etc) avoids cross-contamination
- Quick and complete discharge of the mixer
- Fast return of investment because of minimal downtime and high number of batches per hour
- Long life time and low maintenance
- Low energy costs (short mixing time)
- A safe investment, supported by references from satisfied customers and scientifically proven
- Optional heating/cooling jacket
- Can be fitted with high speed dispersers
- Can be fitted with load cells for process control

The GMS Compact Mixer brings the superb mixing quality and speed of the GMS family to laboratory, R&D and pilot plant batch sizes, with useable volumes from 1 to 20 l.

Your benefits

- Reduced R&D costs because of low minimal filling volume
- Easy dismantling of the mixing tools and the mixing chamber
- Interchangeable mixing chambers
- Operating at the optimal Froude number of 1.1, it preserves your high - quality ingredients

Applications

- Recipe development
- Pre-mixes
- For agile product development due to very short mixing times
- Scaling-up on an early development stage

GCM CONTINOUS MIXER

Why GCM?

- Saves time with optimised design for easy cleaning
- Compact and efficient
- Market leading with installations from 10 kg/h up to more than 100 t/h

Continuous inline mixing processes are a powerful alternative to traditional batch processes. They combine efficient mixing and high throughput with low space requirements.

The constant infeed rate is continuously controlled by GERICKE feeding systems in accordance with the recipe.

The axial dispersion compensates for variations in feed concentration and results in a defined residence time distribution.

The radial dispersion is defined as mixing by rotation. The forward motion causes intensive material transport and forms a fluidized zone. This allows also for the addition of liquids.

The optionally extractable GCM mixer is suitable for mixing a wide range of powders, flakes, granulates and viscous products also in combination with spraying of liquids.

Advantages

- Completely automated mixing lines by design
- Maximum mixing homogeneity even with very small component proportions
- Minimises demixing effects
- Options for heating, cooling and overpressure
- Low space requirements even with large throughputs
- Hygienic and pharmaceutical models (optional)
- Inertisation using a gas blanket (optional)

TCM TURBO COMPACT MIXER

Why TCM?

- Saves space and energy with highly integrated feeding and mixing
- Perfect for late product differentiation
- High process safety with easy to clean design

GERICKE's unique experience in continuous mixing and feeding has led to a new level of mixing solutions. With the TCM Turbo Compact Mixing it is possible to continuously feed gravimetrically and mix up to four streams with minimal space requirement and high feed precision.

Specifications and typical applications

- Continuous inline mixing of a principal component stream with up to 3 minor streams
- High capacity for up to 20,000 l/h
- End of line addition of critical products to upstream filling or extrusion line ; e.g. flavor, colorants
- Minimal height for the addition of minor ingredients with frequent changes, ideally suited for allergen handling
- Inline operation with downstream filling lines (bag, sachet, can, capsule) or compaction lines; recipe precision is proven even for frequent start- stop operation
- Fully automated with high precision gravimetric loss-in-weight feeders

Advantages

- Space (height) savings thanks to very compact integration of feeding and mixing
- Fast and gentle mixing
- Minimal equipment to clean, excellently suited to products which have to guarantee zero cross contamination allergene handling. Down time due to dry cleaning is reduced by 90 %
- Complete disassembly allows for easy and fast cleaning. Even the mixing chamber is removable

MIXING AND BLENDING FOR THE PHARMACEUTICAL INDUSTRY

Gericke continuous mixing process technologies are ideally suited to the new era of efficient solid dose pharmaceutical manufacturing. Our systems are fully developed, and in use at various sites and have been approved by customers and the FDA.

Blending for continuous manufacturing of solids
Gericke Continuous Mixers GCM offer the optimum combination of radial and axial mixing (dispersion), ensuring highest homogeneity with low RSD. The shape, layout and adjustment of the Gericke mixing tools have been developed based on upon 50 years of experience in continuous mixing and in collaboration with universities. The residence time and the energy input can be adjusted easily.

Advantages of our Continuous Blenders

- Maximal mixing homogeneity even with very low API concentrations
- Minimal start-up losses
- Easy adjustment of the mixer to various products, recipes and capacities
- Interchangeable housing and mixing tool
- Minimal product residue at the end of the process, with good residue dischargeders
- Low space (consider footprint) requirements even with large throughputs
- Removable mixing tool and housing for fast and hygienic cleaning

MINI BATCH BLENDER

The Gericke Mini Batch Blender is a semi-continuous inline approach to make continuous manufacturing suitable for low dosage, low volume, highly potent products. It combines advantages of the traditional batch and true continuous manufacturing processes to generate a simplified system. Choose between the integrated Gericke Formulation Skid GFS or standalone equipment for early phase development.

Advantages of our Continuous Blenders

- Maximal mixing homogeneity (even with very low API concentrations)
- Minimal Batch sizes < 1 – 3 kg
- No start-up losses
- Simple feeder start up
- Suitable for 0 – 20 kg/h without scale up
- Simple material tracking no RTD modelling
- Simple Integration of PAT, even Raman feasible
- Simple control strategy
- High Containment, Wash-in-Place WIP

LITERATURE:

You want to learn more about mixing of solids? You can find Gericke's detailed expertise also in several publications about mixing of solids with participation of Dr. Ralf Weinekötter

- Mischen von Feststoffen
- Mixing of solids
- Perry's Chemical Engineers, 8th edition, chapter 9
- Production, Handling and Characterization of Particulate Materials

Available from Springer Science or Amazon

GBM BATCH MIXER

GBM Single-Shaft Mixer

The GBM series offers impressive processing, flexibility and reliability. Optimum configuration of the mixer housing and paddle shape, as well as the favorable positioning of the infeed ducts for micro-components, mean the mixing process is three to four times shorter than in comparable devices.

The GBM mixer is available in sizes from 200 l to 40.000 l. Dispersing tools for liquids can be optionally integrated.

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