KINEMATICA

Homogenizing perfected.

MEGATRON®

PILOT PLANT LINE

MEGATRON® MT 5100 S²

The next generation: New Inline Homogenizing unit

MEGATRON® MT 5100 S²

Inline Dispersing System for pilot plant.

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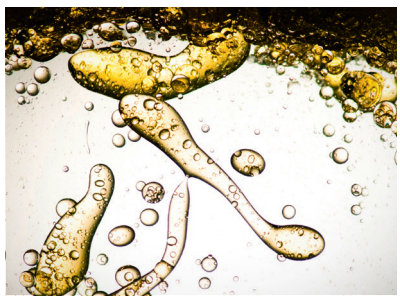
When testing and optimizing formulas, high process safety is paramount. This system enables processing of complex material systems with absolutely minimal loss of mass and minimal energy. This pilot plant format production system delivers efficent, replicable results like those of our inline machines used in large volume production.

YOUR PILOT PLANT EXPERT

This system was developed to help you realize your ideas under as realistic conditions as possible in small economic quantities. During subsequent scale-up, the results can be replicated with our large machines. Applications are mainly in recirculation mode.

Depending on the material's system, the components bind into the finest emulsions or suspensions with droplet or particle sizes down to a few microns. These results are achieved by the machines high speed and the resulting peripheral tip speeds as well as precise rotor / stator geometry. Depending on the material's system being process, the desired fineness is achieved after a certain period of recirculations and / or using other rotor / stator geometries.



INDUSTRY 4.0 BLUETOOTH™ USB 3.0

TECHNICAL INFORMATION

Volume flow	up to approx. 75 l/min
Generators	Eight different rotor / stator variants, single-stage
Product inlet	Single-phase (standard version) Multi-phase (with optional injector)
Processing system	Inline product processing Primarily used in recirculating operations
Working chamber	Horizontal, single-stage arrangement Working pressure up to 6 bar Working temperature up to 90 °C Quick coupling for easy disassembly Single-acting mechanical seal with pressure-less quench system Viton, EPDM or Kalrez seals Product connections G1 / 2"
Materials	High-quality 316L stainless steel Product contact parts electropolished, Standard Ra ≤ 1.6 µm
Accessories	Standard & customized selection of recircula-tion systems
Motor	1500 W wear-free high-frequency AC motor Gearless direct drive Continuous speed control Completely enclosed in stainless steel
Coupling / compatibility	Type F quick coupling for working chamber
Speed range	up to 21 000 rpm
Sound level	< 62 dB(A) at 21 000 rpm (w/o load)
Supply voltage	100 – 230 V ± 10 %, 50Hz / 60Hz
Maximum relative humidity	80 % in storage 80 % during operation
Operating temperature	0 – 40 °C
Protection class according to DIN	IP 20
Drive dimensions	324 x 255 x 322 mm
Weight (drive only)	21.2 kg
EMC standards	IEC / EN 61000-6-2 / EN 61000-6-3
Safety norm	IEC / EN 61010-2-51

USERS / APPLICATION RANGES

- Preparing emulsions
- Pharmaceutical or cosmetics products
- Suspending solids in liquids (such as liquid polymers)
- Dispersing fine solids in liquids or molten phases
- Suspending additives and solid polymers in mineral oils
- Extracting enzymes from biomass
- Extracting active ingredients and substances from plants, for example (when used with REACTRON®)
- Grinding and shredding of solids and fibers in liquids or polymers
- Cell disruption

This list provides a small selection of possible applications.

Technical principles of the MT 5100 S² Unit.

The Inline working chamber.

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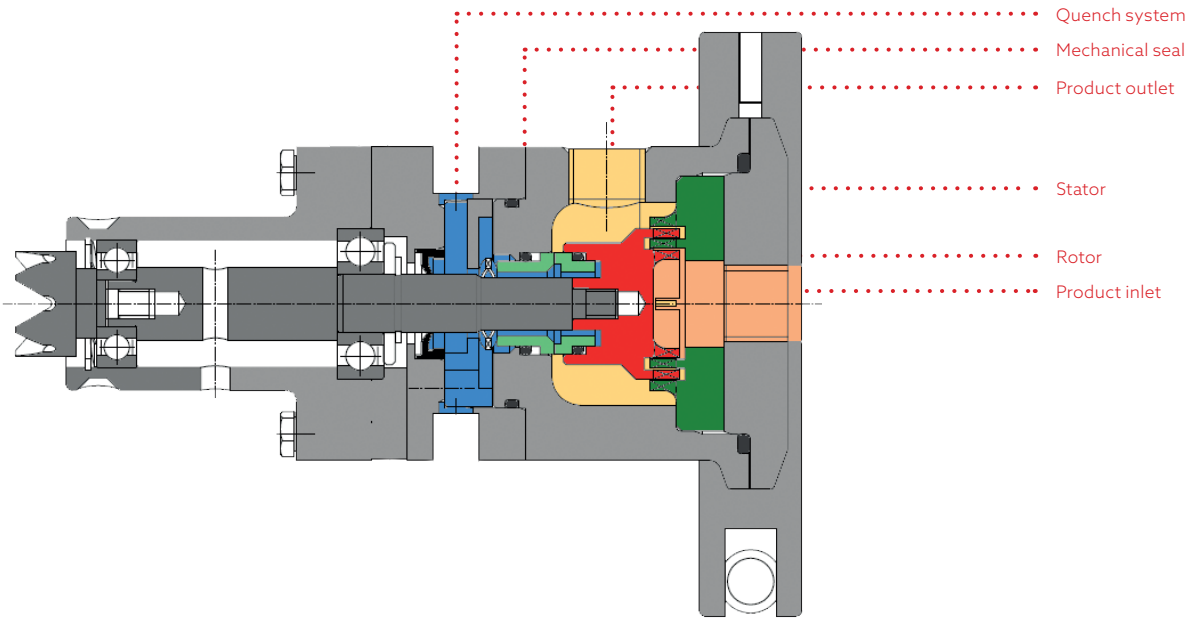
Mechanical rotor / stator system for homogenizing, dispersing, emulsifying and suspending. Depending on the dispersing generator, speed and product features, flow rates of up to 65 l/min are possible. Optional injectors can be used for additional phases of product into the working chamber. Integrating a thermostat to cool the system is recommended for temperature-sensitive products.



Motor speed (RPM)
Output frequency (Hz), Motor current (A)

Standard display functions

Power (kW)
Motor speed (RPM),
Output frequency (Hz)

Motor current (A)
Power (kW), Motor speed (RPM)

Complete solutions to meet your needs.

Your small Processing Plant.

Research needs modular, adaptable systems. We offer solutions that are easy to handle and flexible enough not to restrict your creativity. Our MEGATRON® is available to order as a ready-to-use mini-system with all of the devices you wish. Your own devices can be integrated into our systems depending on their design.

- Processing container (single or double-walled steel or borosilicate glass)
- System tubing (fixed or variable)
- Thermostat for double-walled processing container
- Vacuum pump for closed processing container
- Process sensors (e.g. temperature, pressure, pH and much more)
- Injector with feed pump
- REACTRON® laboratory reactor systems with double-walled processing container POLYMIX® anchor stirrer and integrated POLYTRON® batch disperser for pre-crushing
- Small volume recirculation systems available

DESIGN OF THE MT 5100 S²
INLINE DISPERSING MACHINE.

- OLED Display with foil keyboard for manual control
- Control over PC (USB 3.0) and Handheld (app for Adroid & iOS) integrated
- Bluetooth™ capable for use with app
- Inline working chamber (autoclavable version available)
- Standard product connections G1/2" for different standard fittings (hose nipple, clamp, milk thread)
- Working chamber removable through quick coupling
- Injector for additional phase (optional)
- Different standard R/S generator variants
- Parts coming in contact with the product in electro-polished, rust-free 316 L stainless steel
- Single mechanical seal with quench system
- Digital speed control with soft start
- Wear-free motor with direct drive
- Stable speeds as viscosity changes
- Complete recirculation systems upon request

Kinematic dispersion.

Using the rotor / stator system.

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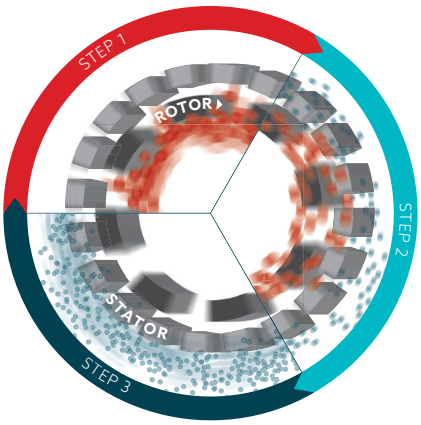
Who is the founder of it?
The roots of today's Kinematica began in the former chemical / physical research institute of Prof. P. Willems in Lucerne, Switzerland, the inventor of the modern rotor / stator dispersion technology.

THE PRINCIPLE:
The spinning rotor generates a vacuum. The sample is drawn in and discharged to the outside through the stator's slots. Between the rotor / stator (shear gap), the product is subject to high deceleration-tangential and radial acceleration forces.
The individual particles / droplets are torn apart and thus reduced in size; they are reduced to several micrometers in size through additional cutting and crashing effects.

THE RESULT:
Microscopic dispersions, emulsions, suspensions and foams are generated. Droplets, particles and gas bubbles are reduced to several micrometers or smaller. Small and large substances are dispersed more economically, faster and better than with any other system.



SCALE-UP FOR INLINE DISPERSING MACHINES.
The collected data and experiences can seamless be used for upscaling to larger processing volumes. Kinematica has solutions for all kind of throughputs from lab to pilot plant to production. For inline operation with throughputs up to 250 000 liters per hour we can always supply the most suitable and customer oriented process solution.

LABORATORY | LABORATORY & PILOT PLANT | PRODUCTION

Kinematica solution for industry 4.0.

Automation and data exchange in manufacturing technologies.

Industry 4.0 fosters what has been called a «smart factory». Within modular structured smart factories, cyber-physical systems monitor physical processes, create a virtual copy of the physical world and make decentralized decisions.

CONNECTED TO THE WORLD

- Industry 4.0 compliancy roadmap to fit industrial internet standards (controllable by web app)
- Ready to be integrated into Cloud-based services for data analytics
- Ready to be integrated into open platform architectures for smart production

SMART FACTORY / PRODUCTION

APP-CONTROL

CLOUD BASED SOLUTIONS

INTERNET CONNECTION (IOT)

Recirculating systems.

A complete process system.

Complete recirculation systems according to customer specifications can also be delivered. Process containers (single- or double-walled, steel or borosilicate glass), system tubing, valves, thermostat for double-walled process container, vacuum pump for closed process container, temperature sensor.

Order information and accessories.

Authorized extension of your system.

Our MT 5100 S^2 drive can be expanded with functional accessories according to your wishes and requirements. Our experts will gladly assist you if you have any application-related questions or other concerns.

DRIVES

Sales No.	Product	Description
23005060	MT 5100 S^2, 230 V	CH-power cable, ready for App control
23005061	MT 5100 S^2, 230 V	EU-power cable, ready for App control
23005062	MT 5100 S^2, 230 V	UK-power cable, ready for App control
23005063	MT 5100 S^2, 100 – 120 V	Incl. transformer, power cable, ready for App control

WORKING CHAMBERS

With single mechanical seal, material combinations: A: QBV (SiC-Carbon resin imprignated-Viton) / B: QBE (SiC-Carbon resin imprignated-EPDM) / C: QBE (SiC-Carbon resin imprignated-Kalrez6375) / D: QBE (SiC-Carbon resin imprignated-Kalrez6230), with quench connections, In- / Outlet connections: G1/2", product wetted O-ring made from A: Viton / B: EPDM / C: Kalrez6375 / D: Kalrez6230.

Sales No.	Product	Description
Standard (w / o heating / cooling jacket)		
23005017	MTO 5100 Q-V	A: QBV (SiC-Carbon resin imprignated-Viton)
23005034	MTO 5100 Q-E	B: QBE (SiC-Carbon resin imprignated-EPDM)
23005037	MTO 5100 Q-K6375	C: QBE (SiC-Carbon resin imprignated-Kalrez6375)
23005038	MTO 5100 Q-K6230	D: QBE (SiC-Carbon resin imprignated-Kalrez6230)
Standard (with heating / cooling jacket)		
23005010	MTK 5100 Q-V	A: QBV (SiC-Carbon resin imprignated-Viton)
23005039	MTK 5100 Q-E	B: QBE (SiC-Carbon resin imprignated-EPDM)
23005040	MTK 5100 Q-K6375	C: QBE (SiC-Carbon resin imprignated-Kalrez6375)
23005041	MTK 5100 Q-K6230	D: QBE (SiC-Carbon resin imprignated-Kalrez6230)

With single mechanical seal, material combinations: A: QBE (SiC-Carbon resin imprignated-EPDM) / B: QBE (SiC-Carbon resin imprignated-Kalrez6375) / C: QBE (SiC-Carbon resin imprignated-Kalrez6230), with quench connections, In- / Outlet connections: TC 3/4", product wetted O-ring made from A: EPDM / B: Kalrez6375 / C: Kalrez6230.

Autoclavable version (w / o heating / cooling jacket)		
23005042	MTO 5100 Q-E-A	A: QBE (SiC-Carbon resin imprignated-EPDM)
23005043	MTO 5100 Q-K6375-A	B: QBE (SiC-Carbon resin imprignated-Kalrez6375)
23005044	MTO 5100 Q-K6230-A	C: QBE (SiC-Carbon resin imprignated-Kalrez6230)
Autoclavable version (with heating / cooling jacket)		
23005045	MTK 5100 Q-E-A	A: QBE (SiC-Carbon resin imprignated-EPDM)
23005046	MTK 5100 Q-K6375-A	B: QBE (SiC-Carbon resin imprignated-Kalrez6375)
23005047	MTK 5100 Q-K6230-A	C: QBE (SiC-Carbon resin imprignated-Kalrez6230)

QUENCH SYSTEMS FOR MT 5100 S^2

- Pressureless lubricating and cooling of the mechanical seal
- Vessel and cover made from acrylic glass for easy supervising of operation
- Easy connection to the working chamber by means of «Steck-Fix» connections and flexible tubes
- Other types (e.g. made from stainless steel) available on request

Sales No.	Product	Description
23005020	TS 1 Standard	Made from Plexiglas, with tubings
23005021	TS 1 PTFE	Made from PTFE with tubings, for autoclaving

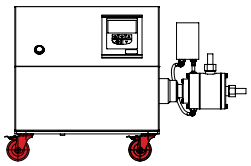
PRODUCT CONNECTIONS FOR MT 5100 S²

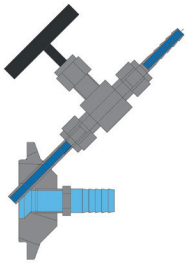
The following standard fittings are available:

Sales No.	Product	Description
23005022	S-DN15	Hose nipple connection
23005023	MR-DN15	Milk thread connections
23005024	TC-3/4"	Tri Clamp connections

OTHERS

Sales No.	Product	Description
23005019	Cooling jacket set	For MTO 5100 Q-V
23005026	Mobile kit	For MT 5100 S² with swivel castors





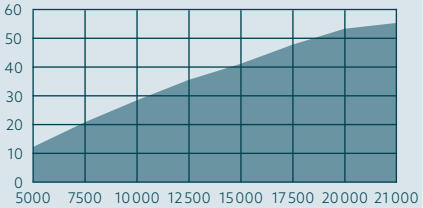
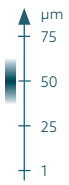
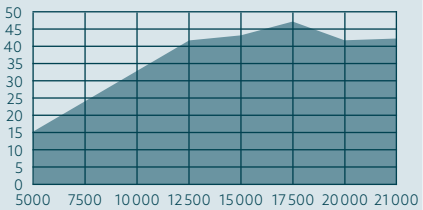
INJECTORS

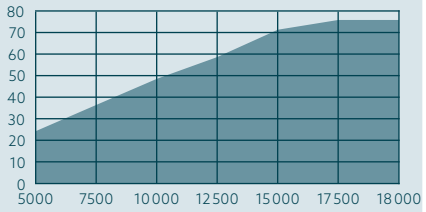
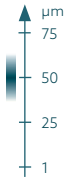
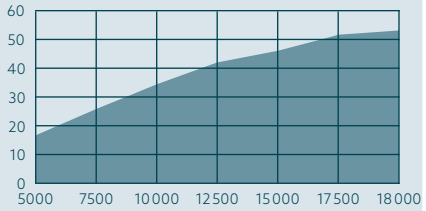
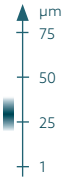
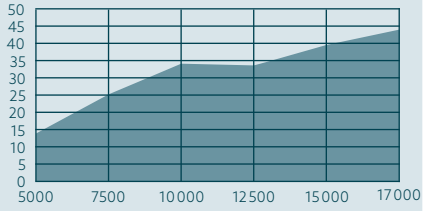
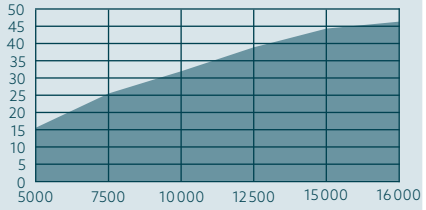
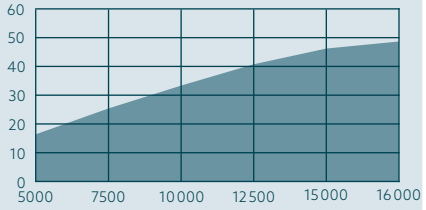
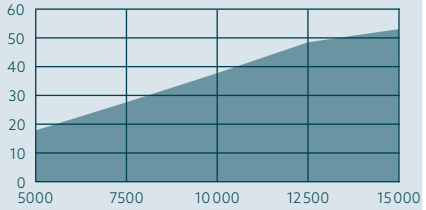
Certain applications, such as chemical reactions, first require a controlled mixing process in the generator chamber.

- controlled mixing
- gas, oil or other phase inputs
- prevents uncontrolled reactions

Sales No.	Product	Description
23005032	Inlet flange with injector & needle valve	For MTO/MTK 5100 Q, Product connection G1/2", Injector with tube ø 8/6 mm, with needle valve and hose nipple ø 10/6 mm

FOR DRIVE UNIT: MT 5100 S²

Sales No.	Product	ø Rotor/ Stator (mm)	max. shear rate 1/s	max. Tip speed m/s	Througput (Water) l/min x rpm	Particle/Droplet sizes
23005012	MTG 30/2M	29/30	63500	32		
23005011	MTG 30/4F	31/32	68000	34		

Sales No.	Product	ø Rotor / Stator (mm)	max. shear rate 1/s	max. Tip speed m/s	Througput (Water) l/min x rpm	Particle / Droplet sizes
23005013	MTG 40/2G	37/38	69500	35		
23005014	MTG 40/4M	39/40	73500	37		
23005015	MTG 40/6F	41/42	73000	37		
23005016	MTG 40/6FV	41/42	115500	35		
23005018	MTG 40/6FF	41/42	68500	34		
23005025	MTG 40/6FFV	41/42	115500	35		

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Our mission. Your solution.

Homogenizing perfected: for every industry.

Kinematica's broad portfolio of solutions can address almost every dispersing application for the pharmaceutical, cosmetic, chemical, food and life science industry. Innovative powder-induction systems, solutions for completely sterile environments, or fully-compliant ATEX architecture are just some examples of the broad portfolio that Kinematica can offer with true scalability from pilot-plant to large plant configurations.

Our state-of-the-art technology, in addition to a professional consulting and engineering suite of services, can address a variety of processes such as blending / mixing / stirring, emulsifying, deagglomerating, foaming, crushing and homogenizing with particle size reduction from a few micrometers down to nanometers in size: the proprietary design and innovative geometry of our aggregates / generators can downsize and provide perfect statistical particle distribution for the finest emulsions / suspensions and foam dispersions.

PHARMA

CHEMICAL

COSMETICS

FOOD

LIFE SCIENCE

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