

POLYTRON®
DISPERSING AND MIXING TECHNOLOGY BY KINEMATICA

BIOTRONA®
DISPERSING AND MIXING TECHNOLOGY BY KINEMATICA

MEGATRON®
DISPERSING AND MIXING TECHNOLOGY BY KINEMATICA

REACTRON®
DISPERSING AND MIXING TECHNOLOGY BY KINEMATICA

Homogenizing and Dispersing Technology

Inline and Batch Processing for Pilot Plant and Production



KINEMATICA AG

Dispersing- and Mixing Technology

Rotor/Stator Dispersing Systems

Since Professor Willems - the founder of **KINEMATICA** - patented his pioneering invention of rotor/stator dispersing machines over 40 years ago, members of **KINEMATICA** work together with scientists from Switzerland, Austria, Germany, China, Japan and USA in order to make continuous improvements in the dispersing technology for specific applications.

Therefore **KINEMATICA** is in the position to offer excellent solutions in **certified quality** for dispersing applications in the chemical, biochemical, pharmaceutical, cosmetic and food industry.

Surplus customer value by professional advice and lead quality - ISO 9001 certified

POLYTRON® batch and **MEGATRON®** inline dispersing machines from **KINEMATICA** are manufactured with a wide choice of dispersing generators (rotor/stator) for the use in laboratories, pilot plant and production with volumes between 0.1 ml and 130 000 l/h.



But there are more features than a great choice of special generators which set **KINEMATICA** dispersing machines and solutions apart from all others. They convince also with the variety of throughputs, constructive advantages like longer teeth, multi-stage machines and the possibility to scale-up laboratory and pilot plant results into industrial conditions.

KINEMATICA offers also complete processing systems to customer and product specifications including premix vessels, piping, pumps, stirrers, processing tanks and electronic regulators.

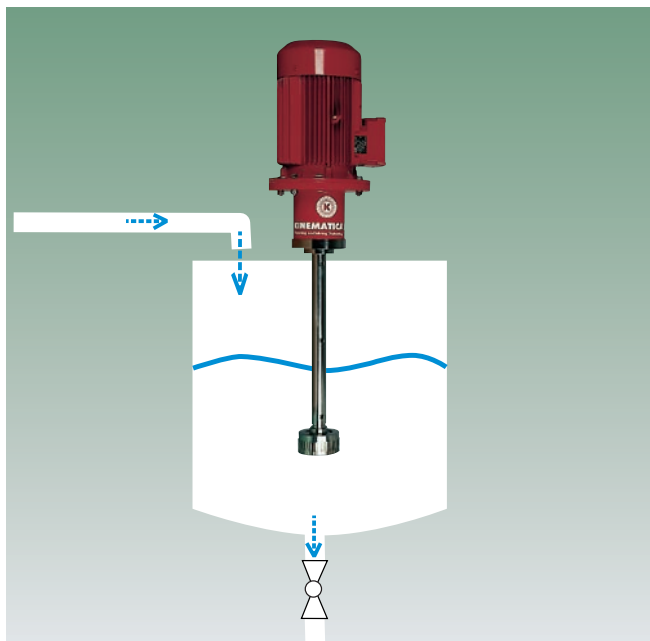
The advantage is to get a whole plant out of one hand and ready-to-plug-in. The different parts will be well suited to customer wishes.

The solution for your homogenizing, dispersing, emulsifying, suspending, size reduction and wet milling application is offered by **KINEMATICA**.

! To get further information, a quotation or a personal demonstration just fill-in the enclosed applications questionnaire and send it back to us.

Our staff will be glad to assist you.

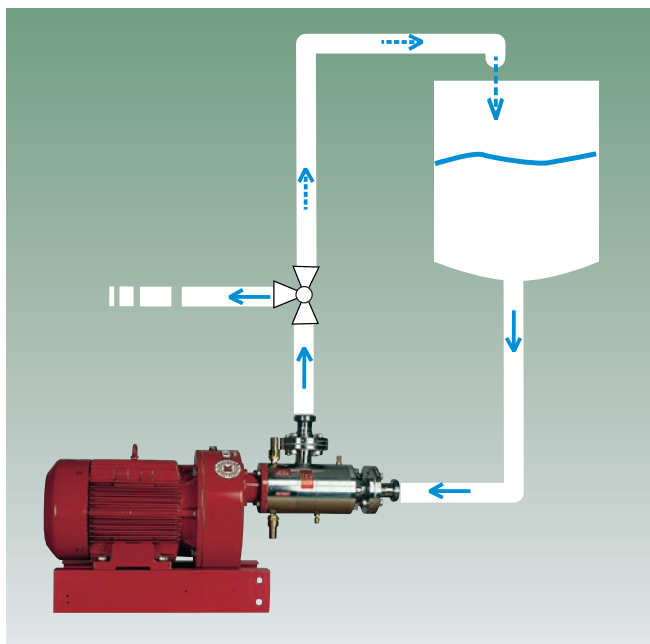
Batch Processing



POLYTRON® and **BIOTRONA®** batch processors are immersed directly into the medium. They can easily be mounted to a premix or processing tank by using a vessel clamp or a stand or can be connected to the cover by a flange



Inline Processing



MEGATRON® inline processors are in line with the product stream, so the product has to flow through the working chamber where it will be treated by the generator(s). They can easily be built into an existing production line or a recirculating system using all common inlet/outlet connections.



System POLYTRON® PT 36-60



System POLYTRON® PT 7000



System POLYTRON® PT-D 36-60

Pilot plants are used already in many places as scale-up unit for big processing plants.

KINEMATICA offers for both - batch and inline - complete dispersing pilot plants. Results figured out with KINEMATICA pilot plants are easily scaled up to processing conditions.

Therefore those pilot plants can be equipped with everything what is used only for processing equipment e.g.

- 3-phase-, ex-proof-, high frequency motors
- mechanical seals, with quench fluid or counterpressure systems
- working chambers with cooling jacket
- telescopic stands, pumps, piping
- processing tanks

From less than a liter (batch) up to approx. 4000 l/h (inline) - KINEMATICA offer the most suitable solutions.

The advantage of a KINEMATICA Pilot Plant is to have a complete dispersing factory but for a much less expensive price.

In an experimental stage it is no more necessary to handle with big unhandy industrial processors. With KINEMATICA Pilot Plants it's easy to figure out data like

- time to process
- necessary fineness and geometry of the generator(s)
- possible end result
- processing conditions (temperature, vacuum, pressure, viscosity,...)
- kind of processing (batch and inline)
- kind of processing tank (single or multi-walled, pressure / vacuum design)

Pilot Plant and Small Production

Model (selection) PT-DA 7036/2W PTA 36/2W	PT-DA 7040/2 PTA 40/2	PT-DA 7045/6 PTA 45/6	PT-BIA 7045 BAA 45	PT-DA 7050/2TM PTA 50/2TM	PT-DA 7050/6G PTA 50/6G	PT-DI 7058 BAA 58 DI	PT-DA 7060/2 PTA 60/2
special W-generator rotor/stator with one tooth row each	standard generator rotor/stator with one tooth row each	standard generator rotor/stator with three teeth rows each	BIOTRONA® generator blade rotor and stator with inclined slots	standard generator rotor with knives rotor/stator with one tooth row each	special G-generator with mechanical seal rotor/stator with three teeth rows each	special dissolver disk	standard generator rotor/stator with one tooth row each
Maximum tip speed 34 m/s	36 m/s	40 m/s	40 m/s	44 m/s	44 m/s	47 m/s	50 m/s
Useful capacity 200 - 4000 ml	200 - 5000 ml	200 - 4000 ml	1000 - 15 000 ml	300 - 10 000 ml	300 - 4000 ml	1000 - 40 000 ml	1000 - 30 000 ml
Applications • Dispersing of fibrous, stringy and brittle samples	• Dispersing and mixing of particles up to 20 mm in size • Preparing of samples for extraction and decomposition of organic material • Intensive mixing	• Making finest emulsions and suspensions • Mixes and reduces highly intensive solids into fluids • Gasses solutions • Separates fibers and cellular material into very small particles • Extractions	• High turbulent mixing with low shear forces • Fast dissolving and suspending of solids also at higher viscosity	• Dispersing and mixing of particles up to 25 mm in size • Sample preparation for extraction and solution of organic material • Intensive mixing • Prevents additional mixing of air into the medium (T-version) • Rotor with knives facilitate the processing of larger cell tissue samples or particles	• Working under pressure and vacuum • Making finest emulsions and suspensions • Mixes and reduces highly intensive solids into fluids • Gasses solutions • Separates fibers and cellular material into very small particles • Extractions • Prevents foam buildup	• Fast mixing and homogenizing of solid materials into fluids by means of a dissolving disk • Preparing highly viscose products	• Dispersing and mixing of particles up to 30 mm in size • Preparing of samples for extraction and decomposition of organic material • Intensive mixing
36 mm	40 mm	45 mm	45 mm	50 mm	50 mm	58 mm	60 mm



System MEGATRON® MT 36-48



System MEGATRON® MT 5000



System MEGATRON® MT-FM 50

Only newest technology can be found in KINEMATICA Pilot Plants including all mechanical and electrical regulations and quality certifications like ISO, CE, GMP, EMV, VDE,...

Together with universities all over the world KINEMATICA works out constantly new pilot plant dispersing systems to assist customers on their way to small or even large scale production.

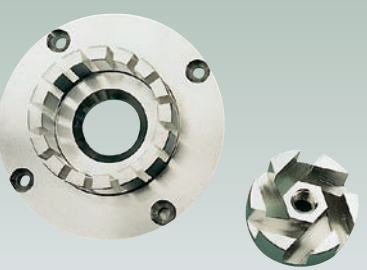
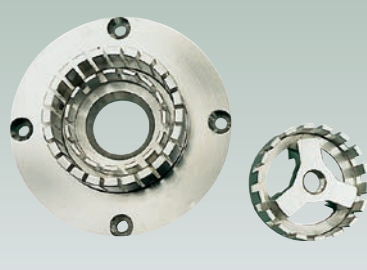

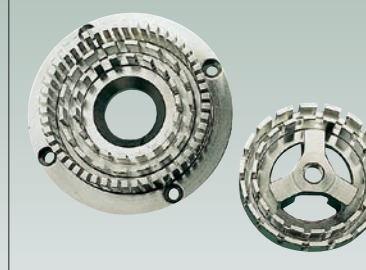
Therefore a good example is the new MEGATRON® FM 50 family for continuous foam processing. This revolutionary development was created in cooperation with the ETH, Zurich. New designed foam generators, integrated cooling system, gas volume regulator, dosing pump and stirrer allow to achieve an optimum of the foam quality and stability for volumes between 10 l/h and several 1000 l/h (processing versions).

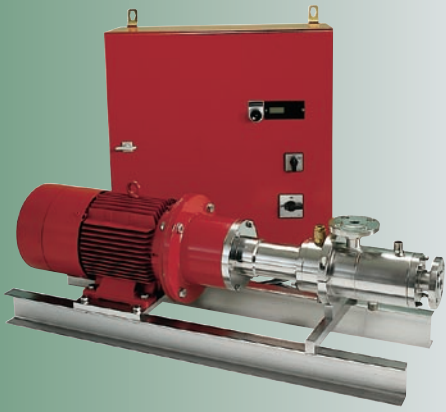
Complete customer and product specific manufacturing on request including all connections, piping, processing tanks and regulations ready-to-plug-in



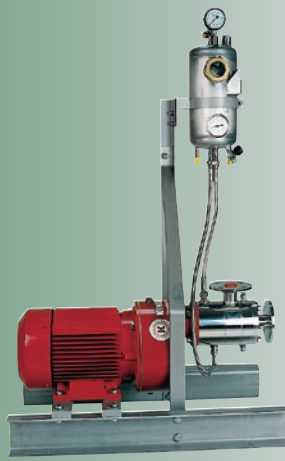
System MEGATRON® MT-D 36-48

Please, ask for extensive information about our wide range of dispersing and mixing machines. **Get the solution to your application now.**

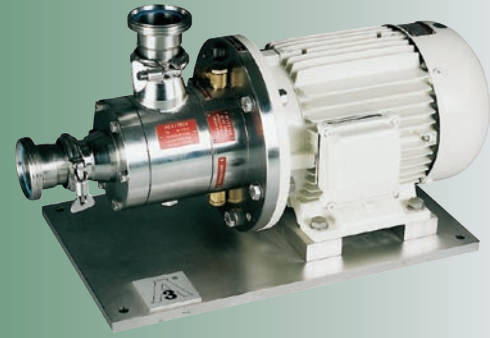
Type MTG 36/2 generator	Type MTG 36/4 generator	Type MTG 48/2 generator	Type MTG 48/6 generator
<ul style="list-style-type: none"> standard model, available for the systems MT 36-48, MT 5000, MT-D 36-48 rotor/stator with one tooth row each 	<ul style="list-style-type: none"> standard model, available for the systems MT 36-48, MT 5000, MT-D 36-48 rotor/stator with two teeth rows each 	<ul style="list-style-type: none"> standard model, available for the systems MT 36-48, MT 5000, MT-D 36-48 rotor/stator with one tooth row each 	<ul style="list-style-type: none"> standard model, available for the systems MT 36-48, MT 5000, MT-D 36-48 rotor/stator with three teeth rows each
29.0 m/s	26.0 m/s	32.0 m/s	36.0 m/s
up to 3500 l/h (referring to water)	up to 2000 l/h (referring to water)	up to 4000 l/h (referring to water)	up to 3500 l/h (referring to water)
<ul style="list-style-type: none"> Dispersing and mixing of particles in liquid Suspending, crushing, wet milling, extracting Preparing of samples for extraction and decomposition of organic material Intensive mixing 	<ul style="list-style-type: none"> Producing of fine emulsions and suspensions Dissolving of solids Making fluid mixtures Gassing Extractions Intensive mixing Wet milling 	<ul style="list-style-type: none"> Dispersing and mixing of particles in liquid Suspending, crushing, wet milling, extracting Preparing of samples for extraction and decomposition of organic material Intensive mixing 	<ul style="list-style-type: none"> Producing of finest emulsions and suspensions Mixes and reduces highly intensive solids into fluids Gasses solutions Separates fibers and cellular material into very small particles Extractions Wet milling of solids
			



System MEGATRON® MT 57



System MEGATRON® MT 61



System MEGATRON® MT 75 D

The principle of MEGATRON® inline processors is that the product has to flow through the machine treated by the generator(s) inside the working chamber - the processor is in line with the product stream.

The advantage is the possibility to increase the results regarding e.g. the reduction of droplet or particle sizes by recirculating the product some times.

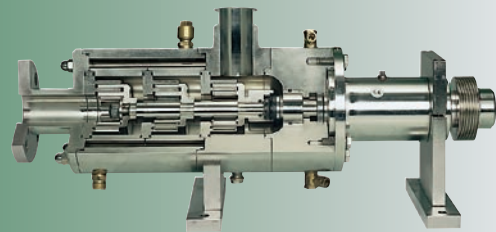
KINEMATICA inline dispersing machines offer large throughput volumes and quality improvements of your material up to about 130 000 l/h.

All MEGATRON® dispersing processors can be equipped with up to a three stage working chamber with 3 interchangeable rotor/stator generators of different fineness. This gives you the possibility to increase the efficiency and to process more material in less time.

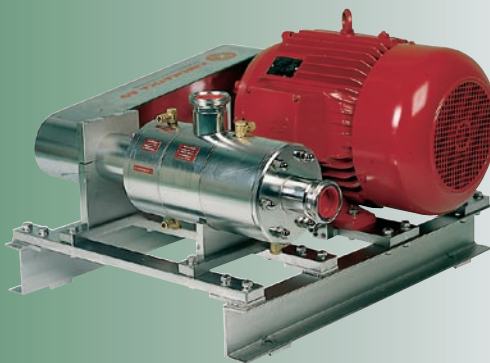
Some features of the MEGATRON® family:

- **powerful** three phase motor (ex-proof versions are available)
- speeds infinitely variable with a frequency inverter
- gear drives (optional) enable **higher speeds and high tip speeds**
- **multi-stage working chambers** (also with cooling jacket)
- great **variety of generators** for e.g. the reduction of coarse media down to about 1 µm
- special generators for applications like mayonnaise production
- **Single and double mechanical seals** in different material combinations
- quench and counterpressure systems
- processing tanks inclusive piping on customer specifications
- all parts wetted by the product are made of high quality stainless steel (**V4A/316L**)

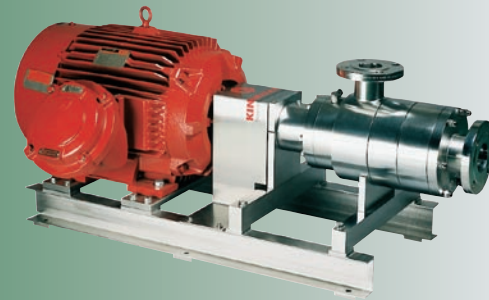
Model Type G generator	Type M generator	Type F generator	Type FF generator
<ul style="list-style-type: none"> • standard model, available for all systems • rotor/stator with one tooth row each 	<ul style="list-style-type: none"> • standard model, available for all systems • rotor/stator with two teeth rows each 	<ul style="list-style-type: none"> • standard model, available for all systems • rotor/stator with three teeth rows each 	<ul style="list-style-type: none"> • standard model, available for all systems • rotor/stator with four teeth rows each
<p>Tip speed 10.0 - 31.0 m/s</p>	10.0 - 31.0 m/s	10.0 - 31.0 m/s	10.0 - 31.0 m/s
<p>Throughput 2400 - 130000 l/h (referring to water)</p>	2400 - 130000 l/h (referring to water)	2400 - 130000 l/h (referring to water)	2400 - 130000 l/h (referring to water)
<p>Applications</p> <ul style="list-style-type: none"> • Dispersing and mixing of coarse solids into liquid • Size reduction of coarse solids in liquid • Extractions • Mixing of fluids • Crushing of lumps • Intensive mixing 	<ul style="list-style-type: none"> • Producing of emulsions and suspensions with medium droplet and particle sizes • Wet milling of solids up to medium particle sizes • Extractions • Accelerating of reactions • Crushing of lumps • Intensive mixing 	<ul style="list-style-type: none"> • Producing of emulsions and suspensions with fine droplet and particle sizes • Wet milling of fine solids • Extractions • Accelerating of reactions • Gassing of fluids • Cell pulping • Desagglomerations 	<ul style="list-style-type: none"> • Producing of finest emulsions and suspensions with finest droplet and particle sizes • Wet milling of fine solids • Gassing of fluids • Cell pulping • Desagglomerations



cut-away model (working chamber)



System MEGATRON® MT 90



System MEGATRON® MT 160

➔ The right model for each application

MEGATRON® processors should be selected according to the desired result, the initial state of the product, the volume of the material to be treated, the time available to do the job, the physical and chemical properties of the product - to name a few parameters.

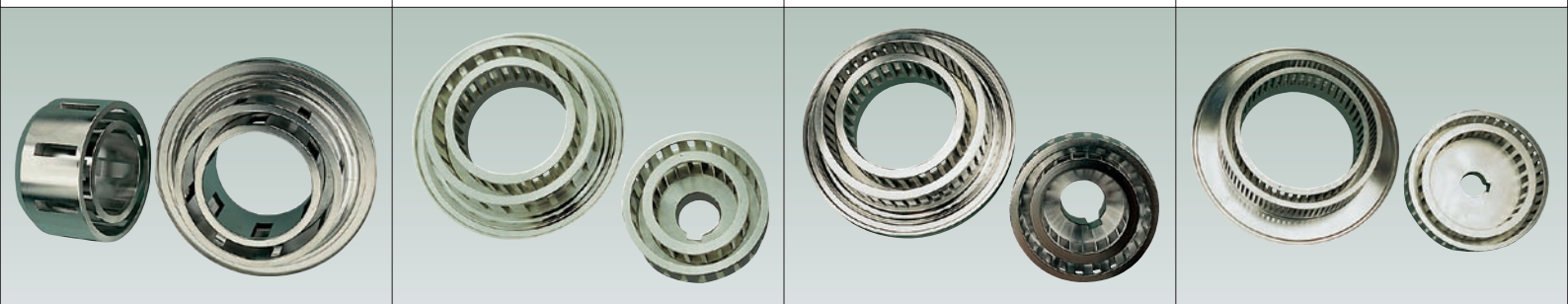
As the table shows, each model covers a very wide range of throughput. Selection of the shear rate will be based on the user's experience or on test results obtained on trial runs performed in our applications laboratory.

Model	max. throughput	tip speed max.	rotor speed max.	Ø generator(s)
MT ...57	2400 l/h	40 m/s	15000 rpm	57 mm
MT ...61	3000 l/h	26 m/s	8000 rpm	61 mm
MT ...75 D	4500 l/h	10 m/s	3000 rpm	75 mm
MT ...90	12000 l/h	25 m/s	6200 rpm	90 mm
MT ...120	18000 l/h	17 m/s	3000 rpm	120 mm
MT ...160	35000 l/h	21 m/s	3000 rpm	160 mm
MT ...220	60000 l/h	31 m/s	3000 rpm	220 mm
MT ...250	80000 l/h	17 m/s	1500 rpm	250 mm
MT ...330	130000 l/h	17 m/s	1000 rpm	330 mm



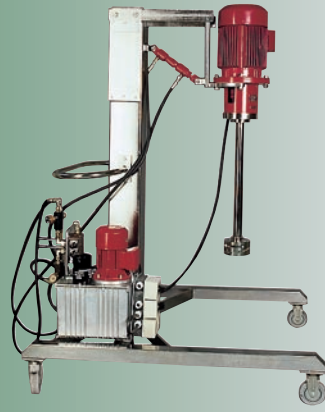
System MEGATRON® MT 220

Type HG generator	Type HM generator	Type HF generator	Type HS generator
<ul style="list-style-type: none"> • high-speed model with safety ring • available for the systems MT 57, MT 90, MT 160, MT 220 • rotor/stator with two teeth rows each 	<ul style="list-style-type: none"> • high-speed model with safety ring • available for the systems MT 57, MT 90, MT 160, MT 220 • rotor/stator with two teeth rows each 	<ul style="list-style-type: none"> • high-speed model with safety ring • available for the systems MT 57, MT 90, MT 160, MT 220 • rotor/stator with two teeth rows each 	<ul style="list-style-type: none"> • high-speed model with safety ring • available for the systems MT 57, MT 90, MT 160, MT 220 • rotor/stator with two teeth rows each
21.0 - 40.0 m/s	21.0 - 40.0 m/s	21.0 - 40.0 m/s	21.0 - 40.0 m/s
2400 - 60000 l/h (referring to water)	2400 - 60000 l/h (referring to water)	2400 - 60000 l/h (referring to water)	2400 - 60000 l/h (referring to water)
<ul style="list-style-type: none"> • Dispersing and mixing of coarse solids into liquid • Size reduction of coarse solids in liquid • Extractions • Mixing of fluids • Crushing of lumps • Intensive mixing 	<ul style="list-style-type: none"> • Producing of emulsions and suspensions with medium droplet and particle sizes • Wet milling of solids up to medium particle sizes • Extractions • Accelerating of reactions • Crushing of lumps • Intensive mixing 	<ul style="list-style-type: none"> • Producing of emulsions and suspensions with fine droplet and particle sizes • Wet milling of fine solids • Extractions • Accelerating of reactions • Gassing of fluids • Cell pulping • Desagglomerations 	<ul style="list-style-type: none"> • Producing of finest emulsions and suspensions with finest droplet and particle sizes • Wet milling of fine solids • Gassing of fluids • Cell pulping • Desagglomerations





System POLYTRON® TB 160



System BIOTRONA® BA 120 with stand



System POLYTRON® PT 250

POLYTRON® Batch Processors

POLYTRON® and BIOTRONA® Batch Processors are immersed directly into the medium. Thanks to a 3-phase motor the batch processors are designed to work continuously.

The advantage is they can easily be mounted to a premix or processing tank by using a vessel clamp or a stand or can be connected to the cover by a flange. With movable stands it is no more necessary to bring the tank to the machine - just bring the machine to the processing area(s) and put it in by using an oil drive/electric or feet pump.

KINEMATICA offers complete processing systems to customer and product specifications including the vessel(s), piping, stirrers, pumps (also vacuum pumps) and electronic regulators.

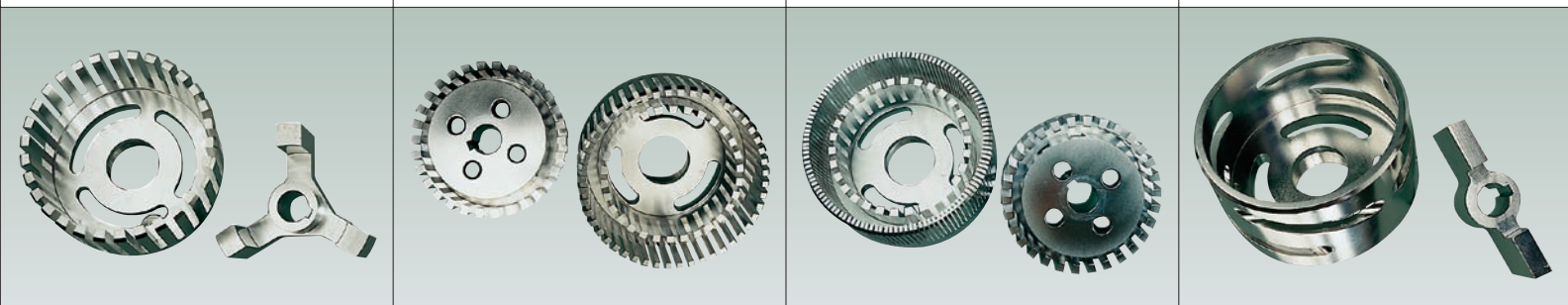
In the case of an existing processing tank POLYTRON® and BIOTRONA® batch processors can be fitted and designed especially to the vessel and the application. KINEMATICA batch processors handle volumes between a few liters up to approx. 10 000 liters.

Some features of the POLYTRON® family:

- **powerful 3-phase motor** (also ex-proof versions) regulation of the velocity by a frequency inverter
- **different interchangeable generators** (as well as BIOTRONA® flash blender and dissolver)
- **different standard shaft lengths** and special lengths
- **double bearing of the rotor shaft**
- equipable with mechanical seals
- special designs for pressure/vacuum conditions
- all parts wetted by the product are made of high quality stainless steel (**V4A/316L**)

Model	for volumes up to	tip speed max.	rotor speed max.	Ø generator(s)
PT 55	50 l	8 m/s	3000 rpm	55 mm
PT 80	100 l	12 m/s	3000 rpm	80 mm
PT 120	400 l	17 m/s	3000 rpm	120 mm
PT 160	1000 l	21 m/s	3000 rpm	160 mm
PT 250	2000 l	17 m/s	1500 rpm	250 mm
PT 330	8000 l	15 m/s	1000 rpm	330 mm

Model Type G generator	Type M generator	Type F generator	Type BIOTRONA generator
<ul style="list-style-type: none"> • standard model, available for all systems • rotor/stator with one tooth row each 	<ul style="list-style-type: none"> • standard model, available for all systems • rotor/stator with two teeth rows each 	<ul style="list-style-type: none"> • standard model, available for all systems • rotor/stator with two teeth rows each 	<ul style="list-style-type: none"> • flash blender model, available for all systems • blade rotor / stator with inclined slots
Tip speed 8.0 - 21.0 m/s	8.0 - 21.0 m/s	8.0 - 21.0 m/s	8.0 - 21.0 m/s
Working Volume 50 - 8000 l (referring to water)	50 - 8000 l (referring to water)	50 - 8000 l (referring to water)	50 - 8000 l (referring to water)
Applications <ul style="list-style-type: none"> • Dispersing and mixing of coarse solids into liquid • Size reduction of coarse solids in liquid • Extractions • Mixing of fluids • Crushing of lumps • Intensive mixing 	<ul style="list-style-type: none"> • Producing of emulsions and suspensions with medium droplet and particle sizes • Wet milling of solids up to medium particle sizes • Extractions • Accelerating of reactions • Crushing of lumps • Intensive mixing 	<ul style="list-style-type: none"> • Producing of emulsions and suspensions with fine droplet and particle sizes • Wet milling of fine solids • Extractions • Accelerating of reactions • Gassing of fluids • Cell pulping • Desagglomerations 	<ul style="list-style-type: none"> • High turbulent mixing with low shear forces • Fast dissolving and suspending of solids also at higher viscosity





System REACTRON® RT 10



System REACTRON® RT 50



System REACTRON® RT 100

REACTRON® systems are complete processing plants including all necessary processing tanks, stirrers, pumps, piping, connections and electric regulations (manual, half automatic, automatic control) for applications in laboratory, pilot plant and production with volumes between a few liters and several thousand liters.

The heart of a REACTRON® system is either a MEGATRON® inline dispersing processor or a POLYTRON® batch dispersing processor - a combination with both processors is also possible and can increase the results in some special applications. They can be equipped of course with all the above described dispersing generators.

! The advantage is to get a complete production unit ready-to-plug-in out of one hand and KINEMATICA offers for complete systems an overall after-sales-service.

REACTRON® plants are completely manufactured and designed on customer and product specifications, so the REACTRON® system is the most suitable system configuration for your application.

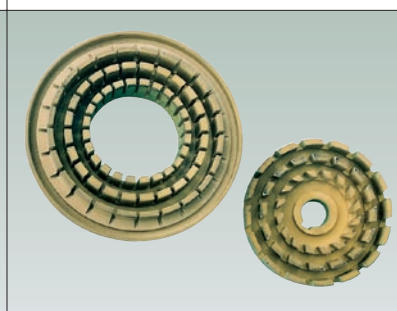
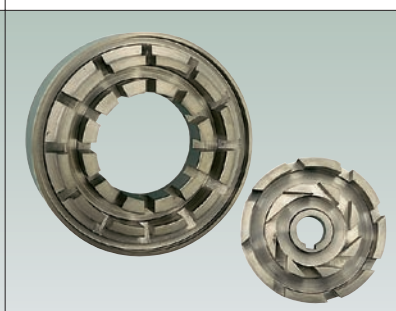
Don't get just a solution **get the solution** from KINEMATICA for your dispersing, homogenizing, emulsifying, suspending, size reduction and wet milling application.



System REACTRON® RT 150

REACTRON® Processing Systems

Special Designs	Type K generator	Type K600 generator	Type TIN generator	Type TB generator
	<ul style="list-style-type: none"> designed for optimal and smooth energy input available for the systems MT 5000, MT 57, MT 61, MT 90 rotor/stator with one tooth row each 	<ul style="list-style-type: none"> hardened generator available for all batch and inline systems rotor/stator with up to three teeth rows each 	<ul style="list-style-type: none"> titan-nitrated generator available for all batch and inline systems rotor/stator with up to three teeth rows each 	<ul style="list-style-type: none"> high speed mixing device available for all batch systems
	<p>Tip speed see above</p>	see above	see above	see above
	<p>Throughput see above</p>	see above	see above	see above
	<p>Applications • Producing of sauces, dressings, mayonnaises,...</p>	<ul style="list-style-type: none"> applications with abrasive components Material of the generator: tool steel K600 	<ul style="list-style-type: none"> applications with abrasive components Material of the generator: 316L, coated 	<ul style="list-style-type: none"> mixing and blending applications with smooth treatment also for higher viscosity



Finest Solutions ... worldwide !

A wide range of products with the finest solution for every application, matched by the superior quality of all components make KINEMATICA a world leader for Dispersing and Mixing technology.

With Keen Eyes ...

Development knows no rest at KINEMATICA. Our systems are constantly upgraded to reflect the state-of-the-art technology and the needs of the market. KINEMATICA has always had a keen eye for major advances, as proved by various patents. The rotor/stator principle for dispersing technology was conceived and developed at KINEMATICA and has become the world standard.

... For Your Needs

Applications for Dispersing/Homogenizing Technology are always on the increase. KINEMATICA continually creates new areas of processing applications based on innovations. We do not neglect the human factor as it is exemplified by the noise reduction of our high-speed systems.

Please, get in touch with us, our local appointed agent or your preferred dealer. We will be pleased to supply more details or arrange for a personal demonstration of our POLYTRON® and MEGATRON® systems.

Feinste Lösungen ... weltweit !

Eine breite Produktpalette mit der optimalen Lösung für jede Applikation, sowie der hohe Qualitätsstandard aller Systemteile machen KINEMATICA zum weltweit führenden Unternehmen im Bereich der Rotor/Stator-Dispergier- und Mischtechnik.

Mit offenen Ohren...

KINEMATICA entwickelt die Systeme laufend weiter und bringt sie konzeptionell und konstruktiv auf den neuesten Stand der Technik. Denn KINEMATICA hat die Ohren noch nie vor dem verschlossen, was unerhörte Fortschritte bringt - davon zeugen auch verschiedene Patente.

So hat sich das von KINEMATICA entwickelte Rotor/Stator-Dispergierprinzip weltweit durchgesetzt und bewährt.

... für Ihre Bedürfnisse

Die Einsatzbereiche der Rotor/Stator-Dispergiertechnik erweitern sich ständig. Das nicht zuletzt deshalb, weil KINEMATICA durch Innovationen, wie erhöhte Umfangsgeschwindigkeiten, neue Arbeitsgebiete und neue Applikationen erschliesst - ohne dabei menschliche Aspekte zu vernachlässigen. Erinnert sei an das Bemühen um die Geräuschkürzung am Arbeitsplatz.

Wenden Sie sich an uns. Gerne senden wir Ihnen weitere Unterlagen oder führen Ihnen unsere POLYTRON®- und MEGATRON®-Systeme vor.

Represented by / Vertreten durch:



KINEMATICA AG
Dispersing- and Mixing Technology

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