MarMax Meter Mix Dispense Machines
for the composite industry

► User friendly operation
by the use of visualized user interface

► High metering accuracy
by the use of precision gear pumps

► Modular and flexible
by the use of application specific machine concepts

Precision has our word.
Metering experiences of more than 60 years have taught us a lot. Mahr Metering Systems headquartered in Göttingen has been developing and manufacturing precision gear pumps since 1948. For the most different applications.

Today we can say, the word ‘light’ accompanies Mahr Metering Systems from the very beginning. At first step gear pumps have metered nylon fibers for stocking initially with 40 denier. The fiber is light! On 9000 m length it weighs 40 gram.

Today, after many developments gear pumps meter various media such as PAN fibers, which is the precursor of carbon fibers. These fibers will be infiltrated with a matrix by MarMax Meter Mix Dispense Machines of Mahr Metering Systems. So transfers ‘light’ into ‘lightweight’. A challenge of the 21th century.

New demands are always being placed. Technologically, too. We feel at home in this world.

### Equipment for the composite industry

#### MarMax Meter Mix Dispense Systems

- for 1 up to 8 components
- further components on request
- for PUR, Elastomer, Thermoset and Thermoplastic
- for cold and warm material systems
- mobile and steady state machines
- mixing ratios 100:1 up to 100:1, others on request
- flow rate approx. 0,05 l/min up to 100 l/min, depending on mixing ratio and viscosity
- viscosity up to 85000 mPas
- production process automatic or manually
- recirculation, purge and sleep mode
- data exchange with host computer
- maintenance and remote diagnosis
- service hotline

#### Material Supply

- hobbock
- drum
- IBC
- mass storage tank

#### MarDrum Drum Pump Supply Systems

For automatic refilling of the Meter Mix Dispense Machine out of 200 l drums. Or optionally suitable as a 1-component dosing machine.

- controlled by MarMax Meter Mix Dispense Machine or stand-alone machine
- unheated, partially heated, fully heated
- for 100 – 1 500 000 mPas
- up to 16 l/min at 100 000 mPas
- admissible operating temperature max. 200 °C
- required compressed air supply 6-8 bar
- pump selection based on metering media

#### MarIBC 1000 Container Supply Systems

- various systems for 1000 liter container are available
MarMax Meter Mix Dispense Machines for the composite industry

MarMax Meter Mix Dispense Machines up to 4K

For example: 2-component meter mix dispense machines for thermoset, PU

Features

Machine concepts for low up to middle and high viscosity

- vessel in different sizes with level control
- pressure vessel
- vessel with screw lid (recommended for automatic tank refilling)
- vessel with flap lid (recommended for manual tank refilling)
- gear metering pumps with and without magnetic coupling
- other pumps on request
- partially heated: 1 component heated (vessel, pump, dosing hoses, dosing head)
- fully heated: all components heated
- temperature control from supply tank to dosing head
- flow measurement instruments and/or recirculation
- flow measurement optionally based on the coriolis or on gear-based working principle
- level control for adhesive puddle (e.g. filament winding applications)
- adhesive puddle level sensor: analog / digital

- agitator
- degassing
- potlife control
- pressure and flow control during injection
- pressure monitoring
- pressure sensor in pultrusion box
- remote maintenance via modem / ISDN / Ethernet
- optical signal
- acoustic signal
- in-line viscosity measuring
MarMax Meter Mix Dispense Machines for the composite industry

MarMax Meter Mix Dispense Machines up to 8K

Mixing Equipment

For each given application different kinds of mixing equipment are available

- static mixer, disposable or stainless steel
- static-dynamic mixer
- fluid-dynamic mixer
- low shear dynamic mixer
- high shear dynamic mixer

for example: 6-component meter mix dispense machines for thermoplastic

continuous mixing of fillers / short fibers with dynamic mixers
MarMax Meter Mix Dispense Machines for the composite industry

Advantages

MarMax is designed for use in the composite industry. The requirements in manufacturing fiber-reinforced composite parts increase constantly. Today mass production, short cycle times and fully automatic production of composites is the first priority. MarMax Meter Mix Dispense Machines support in reaching ever higher goals. Mahr-Quality gives certainty to the plant operator.

- MarMax is equipped for each given application.

- High-precision gear metering pumps are manufactured at the Mahr Metering Systems headquarters in Göttingen with the guarantee of high metering accuracy.

- If highest accuracies are required, MarMax will be additionally equipped with flow measurement instruments.

- Each system is equipped with only those high-quality components needed for the application-specific configuration - a budget-friendly solution.

- A user friendly operation is guaranteed by a visualized user interface.

- Password protected operations assure secure handling.

All these advantages enable the operator reliable use and gentle handling of financial resources.

MarMax maintenance agreements on request.

General Information

Applications
- aerospace
- aircraft
- automotive
- chemical
- construction
- electronics
- sport & leisure
- military
- oil and gas
- shipbuilding
- wind energy
- etc.

Manufacturing Processes
- Prepreg
- RTM
- T-RTM
- Pultrusion
- RIM
- Filament winding
- Rotational moulding
- BMC
- IMC
- SMC
- etc.
MarMax Meter Mix Dispense Machines for the composite industry

MarDrum Drum pump supply systems, optionally suited as 1-component dosing machine

MarDrum 200 for media from low up to medium viscosity

- partially heated (product hose and drum dolly heated)
- fully heated I (additional heating jacket)
- fully heated II (additionally pump outlet heated)
- pump selection according to discharge medium
- base plate
- air motor

MarDrum 200h for media with high viscosity

- temperature control
- electrical heated or liquid heated
- follow-up plate in different designs
- level monitoring

Features MarDrum

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<tr>
<th></th>
<th>MarDrum 200</th>
<th>MarDrum 200h</th>
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<tbody>
<tr>
<td>Flow rate</td>
<td>10 l (at 6 000 mPas) (other on request)</td>
<td>16 l (at 100 000 mPas) (other on request)</td>
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<tr>
<td>Viscosity range</td>
<td>1 ÷ 50 000 mPas</td>
<td>50 000 ÷ 1 500 000 mPas</td>
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<tr>
<td>Heating features</td>
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<td>fully heated II</td>
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<tr>
<td>Feeding device</td>
<td>Excentric screw pump</td>
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<td></td>
<td>gear metering pump</td>
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