High shear mixers
Agitators

HCM High shear colloidal mixers
The HCM line of high-shear (colloidal) mixers is recognized worldwide for its excellent mixing performance, efficiency and wear resistance. The units will effectively mix water with cement, micro-fine cement, bentonite, filler, sand and other admixtures commonly used in grouting.
Mixing Principle

The choice of material and the mixing quality become more important with the increasing demand for quality in the heavy construction industry. The key to a successful mixing of water with cement, ultra-fine cement, bentonite etc, is the creation of high shear forces in the mixer to separate the particles. These high shear forces can either be produced mechanically or hydraulically. State of the art high shear colloidal mixers usually consist of a mixing tank and a special mixing pump. Dry components are pre-wetted in the tank while the actual mixing process takes place in the mixing pump.

The Häny range of high shear colloidal mixers use high speed mixing pumps and the unique Häny vortex impeller. For the mixing process, water is dosed first, then the dry admixtures. The high capacity mixing pumps circulate the entire tank content 2 to 4 times per minute, depending on the size of the mixer. The vortex impeller creates an extremely high turbulence in the pump housing. This turbulence with its high hydraulic shear forces separates the individual particles from one another and thus is responsible for a thorough hydration of the mix. The result is a stable suspension of excellent workability.

Difficult-to-mix admixtures such as ultra-fine cement or bentonite can be mixed superbly in a very short time. Using the HCM high shear colloidal mixer eliminates the need for pre-soaking bentonite or providing storage tanks. For the mixing of grout with extremely low water/cement ratios or mortar with high sand content, auxiliary turbo-mixers (option) can be installed in the tanks. These mixers are responsible for a quick pre-wetting of the dry components, to prevent successfully the development of lumps.

Mixing pump

Due to the hydraulic creation of the necessary shear forces there are no close tolerances in the pump housing. As a result, disadvantages such as high wear and clogging by larger particles are virtually nonexistent. Depending on the size of the Häny vortex impeller pump, the free passage through the pump can range from 15 to 80 mm.

The extremely tough material of the Häny vortex impeller guarantees long life. This special material and the large passage allow the models HCM 300 and HCM 600 to mix sanded grouts of up to 8 mm particle size. The maintenance free shaft seal is grease lubricated, and will withstand a dry running period of the pump of several minutes without damage.

Mixing tank

The eccentrically shaped bottom cone of the tank breaks the vortex created by the intensive circulation of the mix. This eliminates any difficult-to-clean baffles. For models to HCM 600, the tank covers are equipped with a grid and bag breaker for manual feeding. A grease lubricated 3-way valve, specially designed for cement applications, allows either mixing (circulation) or transfer of the mix to a holding tank (agitator). The smaller units (up to HCM 600) can be equipped either with manual operation or automatic water meters for exact dosing. The water inlet allows backwashing when accidentally ‘dry bagged’ to ensure continuation of the mixing process.

The tank covers of larger mixers are equipped for connection to screw conveyors and replacement of the manual 3-way valve with pneumatic pinch valves.
Automatic batching

For automated operation, the mixers can be equipped with load cells that will weigh all components directly in the mixer. The distinct advantages of this system are the space saving and easy transportation of the unit without having to detach the weighing scale.

Intensive mixing action provided by the high capacity mixing pump.

<table>
<thead>
<tr>
<th>Model</th>
<th>HCM 100</th>
<th>HCM 300</th>
<th>HCM 300</th>
<th>HCM 600</th>
<th>HCM 800</th>
<th>HCM 2500</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mixing pump type</td>
<td>TMP 9</td>
<td>TMP 18</td>
<td>TMP 22</td>
<td>TMP 22</td>
<td>TMP 40</td>
<td>TMP 60</td>
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<tr>
<td>Production approx. (W/C ratio = 1) m³/h</td>
<td>2</td>
<td>5</td>
<td>5</td>
<td>8</td>
<td>20</td>
<td>40</td>
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<tr>
<td>Circulation capacity l/min</td>
<td>540</td>
<td>1100</td>
<td>1400</td>
<td>1400</td>
<td>2400</td>
<td>4800</td>
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<tr>
<td>Usable content l</td>
<td>100</td>
<td>260</td>
<td>260</td>
<td>550</td>
<td>800</td>
<td>2500</td>
</tr>
<tr>
<td>Max. particle size mm</td>
<td>5</td>
<td>8</td>
<td>8</td>
<td>8</td>
<td>3</td>
<td>–</td>
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<tr>
<td>Electric motor 50 Hz kW</td>
<td>3</td>
<td>5.5</td>
<td>9</td>
<td>9</td>
<td>22</td>
<td>45</td>
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<tr>
<td>Electric motor 60 Hz kW</td>
<td>3.6</td>
<td>–</td>
<td>11</td>
<td>11</td>
<td>25</td>
<td>52</td>
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</table>

HCM 2500 high-shear colloidal mixer installed as part of an MCM 5500 container plant with automatic weigh batching.

HCM 800 high-shear colloidal mixer and HRW 1200 agitator installed in an MCM 2000 container plant with automatic weigh batching.

Easy maintenance through vertical arrangement of the mixing pump.
HRW Agitators

The Häny HRW agitators are used as holding tanks between a batch mixer and the grout pump. This guarantees continuous operation. In the agitator the mix is homogenized and air bubbles are removed by a slowly revolving agitator. The agitator paddle is mounted at an angle to ensure circulation of the entire tank content. This mounting arrangement prevents the mix from revolving in the tank so that there is no need for static baffles which are difficult to clean. A strainer at the inlet to the agitator retains any large particles or paper from bags. Solid bearings located on top of the tank eliminate troublesome bottom bearings. The agitators can be equipped with level probes to control automatic mixing cycles in response to consumption.

<table>
<thead>
<tr>
<th>Model</th>
<th>HRW 350</th>
<th>HRW 800</th>
<th>HRW 800M</th>
<th>HRW 1200</th>
<th>HRW 2000</th>
<th>HRW 3000</th>
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<tr>
<td>Usable content l</td>
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<td>800</td>
<td>800</td>
<td>1050</td>
<td>2000</td>
<td>3000</td>
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<tr>
<td>Electric motor 50 Hz kW</td>
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<td>0.55/1.1</td>
<td>1.5</td>
<td>1.5</td>
<td>3</td>
<td>3</td>
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<tr>
<td></td>
<td>60 Hz kW</td>
<td>0.66/1.3</td>
<td>0.66/1.3</td>
<td>1.8</td>
<td>1.8</td>
<td>3.6</td>
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<tr>
<td>Agitator speed 50 Hz min⁻¹</td>
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<td>47</td>
<td>26</td>
<td>26</td>
<td>26</td>
<td>26</td>
</tr>
<tr>
<td></td>
<td>60 Hz min⁻¹</td>
<td>56</td>
<td>56</td>
<td>31</td>
<td>31</td>
<td>31</td>
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</table>

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