NON-METALLIC
CHAIN & FLIGHT
SLUDGE
COLLECTORS

MECANA
A Metawater Company
Mecana non-metallic chain and flight collector systems have proven themselves over the last 25 years. The systems are characterised by their long operating lifetime and high quality.

Operating Principle

The sludge collection takes place by means of sludge flights which run on guide rails perpendicular to the direction of travel. The flights are attached to a collector chain at each end and thus driven along the tank over the drive shaft and several idler positions.

Adaptability

MECANA Non-metallic chain collector systems can be installed in all rectangular settling tanks. They have been successfully applied both in new treatment works, and in the upgrading of existing plants. Our collector system is ideal for use in the following situations:

- Primary and Secondary Settlement Tanks
- Storm tanks, Intermediate settlement
- Fat separators
- Dissolved Air Flotation systems
- Grit collectors
Flexible Modes of Operation

According to need, the system can be constructed to permit collection of settled sludge and/or scum.

Scum collection; 2-shaft

Settled sludge collection; 3-shaft

Settled sludge and scum collection; 4-shaft
Through the use of our fully non-metallic collector systems, corrosion problems are a thing of the past.

**Tank Dimensions**

Scrapers for rectangular tanks with widths from 1 to 12 m and lengths up to around 90 m can be supplied without problem.

Depending on the tank width and design, flights, brackets and drive-shafts of various constructions are used.

**Various Flight Profiles**

<table>
<thead>
<tr>
<th>Typ</th>
<th>Material</th>
<th>Tank width m</th>
<th>Dimensions w × h mm</th>
<th>Weight kg/m</th>
<th>Modulus of Elasticity E N/mm²</th>
<th>Moment of Inertia lx cm⁴</th>
<th>ly cm⁴</th>
</tr>
</thead>
<tbody>
<tr>
<td>Standard</td>
<td>GFK</td>
<td>1.0–6.5</td>
<td>63.5 × 190</td>
<td>2.5</td>
<td>33 100</td>
<td>648</td>
<td>46</td>
</tr>
<tr>
<td>Ultra</td>
<td>GFK</td>
<td>6.0–8.0</td>
<td>76 × 190</td>
<td>3.0</td>
<td>27 600</td>
<td>857</td>
<td>116</td>
</tr>
<tr>
<td>Ultra Plus</td>
<td>GFK</td>
<td>8.0–9.5</td>
<td>89 × 190</td>
<td>4.2</td>
<td>33 000</td>
<td>1190</td>
<td>214</td>
</tr>
<tr>
<td>Box Flight</td>
<td>GFK</td>
<td>9.0–12.0</td>
<td>127 × 190</td>
<td>6.0</td>
<td>27 600</td>
<td>1721</td>
<td>431</td>
</tr>
</tbody>
</table>
Mechanical Construction

Mecana chain scrapers are constructed from non-metallic materials

No corrosion
The use of non-metallic materials eliminates the problem of corrosion that affects the conventional steel scrapers and mixed material systems.

Light construction
The required tensile force is very small, since the weight of the moving parts is low. This leads to a low drive motor power requirement (a 0.18 kW motor is sufficient in most cases) and a significantly reduced wear on the collector system components.

Simple installation
The use of GRP telescope headshafts and idler stations using stub shafts instead of full-width shafts allow simple and quick installation and maintenance.

Return rails mounted on wall brackets
Since the return rails are mounted on brackets away from the tank wall, sludge cannot build-up between the return rail and the wall. This system also enables a better distribution of the flight loading. The potential for damage to be caused by skewed running of the flights is thus also greatly reduced.

<table>
<thead>
<tr>
<th>Typ</th>
<th>Drive chain NH78</th>
<th>Collector chain NCS720S</th>
<th>Sprockets</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pitch</td>
<td>mm</td>
<td>66.3</td>
<td>152.4</td>
</tr>
<tr>
<td>Weight</td>
<td>kg/m</td>
<td>1.86</td>
<td>2.23</td>
</tr>
<tr>
<td>Manufacturer</td>
<td>Polychem</td>
<td>Polychem</td>
<td>Polychem</td>
</tr>
<tr>
<td>Material</td>
<td>Nylon 6/6</td>
<td>PBTP</td>
<td>Cast Nylon-6</td>
</tr>
<tr>
<td>Reinforcement</td>
<td>Glass fibre</td>
<td>Glass fibre</td>
<td>–</td>
</tr>
<tr>
<td>Tensile strength (DIN53455)</td>
<td>N/mm²</td>
<td>186</td>
<td>93</td>
</tr>
<tr>
<td>Tensile modulus of elasticity (DIN53457)</td>
<td>N/mm²</td>
<td>8610</td>
<td>5510</td>
</tr>
<tr>
<td>Elongation at breaking strength (DIN53455)</td>
<td>%</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>Breaking strength</td>
<td>N</td>
<td>17 800</td>
<td>30 500</td>
</tr>
<tr>
<td>Working Load</td>
<td>N</td>
<td>7700</td>
<td>13 800</td>
</tr>
</tbody>
</table>
Special Advantages

Minimal chain deformation
Plastic deformation of the glass-reinforced polyester collector chain under long term loading is very low in comparison to other systems.

Minimal flight deflection
The ability to select the optimal flight profile for each tank means that the flights exhibit a very limited degree of bending, even in wide tanks.

Long lifetime
The degree of wear is extremely low for all components.

Stability
The cast nylon sprockets are very dimensionally stable.

Drive
The drive unit consists of a geared motor, on the shaft of which is mounted a hub and sprocket. The connection between hub and sprocket is mechanically protected by means of a shear pin. Additionally, the motor is monitored by means of an electronic power control unit.
Power is transferred to the biaxially-wrapped fibreglass headshaft by means of a non-metallic drive chain.

Lubrication Properties
The non-metallic materials have self-lubricating properties. This therefore reduces maintenance and removes the necessity for any lubrication systems.
Mecana has been well known for over 25 years for its non-metallic collector systems and its professional customer advice.

**Accessories**

Systems can be supplied with accessories such as submerged outlet tubes for optimal outflow of the clarified water and manually- or electrically-actuated tipping troughs for scum removal.

**Customer specific design**

On the basis of our long experience, we are especially well suited to be able to develop and offer special, customer-orientated design solutions.
Experience
Mecana has much experience to offer in the field of non-metallic chain scrapers; especially with the construction of systems for wide tanks. We would be pleased to give details of appropriate reference plants on application, e.g.:

Partner
Mecana uses components from Polychem Systems, USA.

Mecana offers
• Engineering (Planning and System Layout)
• Customer specific designs
• Special components
• Installation
• Service, Repair, Maintenance

Mecana Umwelttechnik GmbH
Industriestrasse 39 • CH-8864 Reichenburg
Telephone: + 41 55 464 12 00 • Fax: + 41 55 464 12 01
E-Mail: info@mecana.ch • www.mecana.ch