Coriolis forces are generated in oscillating systems when a liquid or a gas moves away from or towards an axis of oscillation. A Coriolis measuring system is of symmetrical design and consists of one or two measuring tubes either straight or curved. A driver sets the measuring tube (AB) into a uniform fundamental oscillation mode. When the flow velocity $v=0$ m/s - 0 ft/s, the Coriolis force is also 0. At flowing conditions, i.e. flow velocity $v>0$ m/s - 0 ft/s, the fluid particles in the product are accelerated between points AC and decelerated between points CB. The Coriolis force is generated by the inertia of the fluid particles accelerated between points AC and those decelerated between points CB. This force causes an extremely slight distortion of the measuring tube that is superimposed on the fundamental component and is directly proportional to the mass flowrate. This distortion is picked up by special sensors. Since the oscillatory characteristics of the measuring continuously and the measured values corrected accordingly.

**APPLICATIONS:**
- Petroleum, petro-chemical, chemical industries.

**BENEFITS:**
- The direct calculation in mass and the permanent knowledge of the volumic mass gives the possibility to identify, at each moment, the product.
- The tube diameter correspond exactly to the flanges diameter. This allows to reduce the pressure drop, the risk of desgazification and the retention zones.
- The mass flowmeter gets constraint gauges giving the direct effects of the temperature (torsion, dilatation) and so, giving a more accurate correction.
- The flowmeter integrates a resonator, avoiding the compulsory lenght of pipe before and after the flowmeter.
- Thanks to the secondary containment rating (63 bar), the meter can be used for hazardous applications.
- Its design gives any constraint of installation.
- Due to the system, we have a low maintenance cost.

**MEASURING PRINCIPLE:**

Mass Flowmeter SATAM measures accurately and reliably the mass flow, density and temperature of liquids, suspensions, emulsions and gases. Thanks to there software, SATAM signal converters offer maximum flexibility in communication with the possibility to use three traditional output, a interface Profibus or Modbus under protocol Hart.

The straight single-tube system has been especially developed to deliver high flowrate of liquid and gas especially for shear-sensitive products lowest pressure drop.

The straight single-tube has been studied for high capacity in liquids and gases, and also by reducing its size and the head losses, especially for viscous products.
## Technical data

### Models

<table>
<thead>
<tr>
<th>Models</th>
<th>MFT20</th>
<th>MFT40</th>
<th>MFT200</th>
<th>MFT600</th>
<th>MFT1600</th>
<th>MFT3000</th>
<th>MFT7000</th>
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<tbody>
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<td></td>
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</tbody>
</table>

- **Mass flowrate (water at 20°C / 68°F and operating pressure at 2 bar / 29psig)**

<table>
<thead>
<tr>
<th>Nominal flowrate (kg /mn)</th>
<th>20</th>
<th>40</th>
<th>200</th>
<th>600</th>
<th>1600</th>
<th>3000</th>
<th>7100</th>
</tr>
</thead>
<tbody>
<tr>
<td>(kg/h)</td>
<td>12000</td>
<td>4400</td>
<td>12000</td>
<td>36000</td>
<td>96000</td>
<td>180000</td>
<td>430000</td>
</tr>
</tbody>
</table>

Maxi. flowrate 130% of the nominal flowrate

- **Pressure drop**: maximum 1 bar

- **Connections:**
  - Flanges DN/PN: 10/40, 15/40, 25/40, 40/40, 50/40, 80/40
  - ANSI B16.5: ½", 1/2", 1", 1½", 2", 3" / 4"

- **Signal convertors**: CT

- **Conception**: straight single-tube

- **Operation pressure**: 63 bar for titanium – 40 bar for stainless steel

- **Operation pressure**: -40 ...+150°C (titanium) - 0 ...+100°C (stainless steel)

- **Density**: 500 - 2000 kg/m³

- **Ambiante temperature**: -40 ...+60°C

- **Protection category (IEC 529/EN 60 529)**: IP 67, equivalent to NEMA 6

- **Material**:
  - Measuring tube: Ti or Stainless steel 318L
  - Secondary containment housing: Stainless steel 304 – AISI
  - Flanges: Stainless steel 304 – AISI

- **Measuring accuracy / errors limits** (reference values from pulse/frequency output)
  - Mass flowrate: Liquids ≤ ± 0.1% of measured value + 0 stability* / repeatability < +/- 0.04%
  - Mass flowrate: Gases ≤ ± 0.5% of measured value + 0 stability* / repeatability < +/- 0.2%
  - Density ≤ 0.001 g/cm³
  - Temperature ≤ 1°C

* 0 stability 0.01% of nominal flowrate of the primary head.

- **Ex. Approvals**
  - European Standard ATEX/CENELEC – OIMLR117
  - American Standard Factory Mutual

- **Dimensions (mm)**

<table>
<thead>
<tr>
<th></th>
<th>a</th>
<th>b</th>
<th>c</th>
<th>d</th>
<th>e</th>
</tr>
</thead>
<tbody>
<tr>
<td>(a)</td>
<td>335</td>
<td>413</td>
<td>450</td>
<td>598</td>
<td>796</td>
</tr>
<tr>
<td>(b)</td>
<td>425</td>
<td>510</td>
<td>548</td>
<td>700</td>
<td>925</td>
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<tr>
<td>(c)</td>
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<tr>
<td>(d)</td>
<td>312</td>
<td>312</td>
<td>312</td>
<td>319</td>
<td>346</td>
</tr>
<tr>
<td>(e)</td>
<td>160</td>
<td>160</td>
<td>160</td>
<td>166</td>
<td>193</td>
</tr>
</tbody>
</table>

- **Weight in (kg)**

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<td></td>
<td>16</td>
<td>20</td>
<td>23</td>
<td>35</td>
<td>80</td>
<td>145</td>
</tr>
</tbody>
</table>

All SATAM equipment comply with ATEX directive n°94/9/CE according to our notification LCIE ATEX Q8043

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