**Application**

The Toftejorg TZ-89 rotary jet head provides 3D indexed low flow impact cleaning over a defined time period. It is suitable for processing, storage and transportation tanks and vessels between 0.5 and 10 m$^3$.

**Working principle**

The flow of the cleaning fluid makes the nozzles perform a geared rotation around the vertical and horizontal axes. In the first cycle, the nozzles lay out a coarse pattern on the tank surface. The subsequent cycles gradually make the pattern more dense, until a full pattern is reached after 8 cycles. The drive mechanism is located outside the tank or process equipment, leaving a minimum of parts to be submerged into the product.

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**TECHNICAL DATA**

<table>
<thead>
<tr>
<th>Lubricant:</th>
<th>Self-lubricating with the cleaning fluid</th>
</tr>
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</table>

<table>
<thead>
<tr>
<th>Standard Surface finish:</th>
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</thead>
<tbody>
<tr>
<td>Product contact parts:</td>
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</tbody>
</table>

| Max throw length:          | 4-7 m |
| Impact throw length:      | 2.5-4 m |

<table>
<thead>
<tr>
<th>Pressure</th>
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<tbody>
<tr>
<td>Working pressure:</td>
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<tr>
<td>Recommended pressure:</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Cleaning Pattern</th>
</tr>
</thead>
<tbody>
<tr>
<td>First cycle</td>
</tr>
</tbody>
</table>

The above drawings show the cleaning pattern achieved on a cylindrical horizontal vessel. The difference between the first cycle and the full pattern represents the number of additional cycles available to increase the density of the cleaning.

<table>
<thead>
<tr>
<th>Certificates</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.1 material certificate</td>
</tr>
</tbody>
</table>

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**PHYSICAL DATA**

**Materials**

316L (UNS S61603), Duplex steel (UNS N31803), PTFE, PEEK, FEP/Silicone

**Temperature**

Max. working temperature: 95°C
Max. ambient temperature: 140°C

| Weight: | 5.5 - 8.5 kg |

<table>
<thead>
<tr>
<th>Connections</th>
</tr>
</thead>
<tbody>
<tr>
<td>Inlet connections:</td>
</tr>
<tr>
<td>Tank connection:</td>
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</tbody>
</table>

**Caution**

Avoid hard and abrasive particles in the cleaning liquid, as this can cause increased wear and/or damage of internal mechanisms. In general, it is recommended to place a filter in the supply line.
**Flow Rate Impact Throw Length**

- **Flow rate (m³/h)**
  - 4.0
  - 3.0
  - 2.0
  - 1.0

- **l/min**
  - 70
  - 60
  - 50

- **4xø4**

- **bar**
  - 4106-0000
  - 30
  - 40
  - 20

- **2xø2.5**

- **432 765**

**Dimensions (mm)**

- **A**: Clamp 1" ISO
- **B**: Thread 3/4" Rp (BSP) / NPT
- **C**: Clamp 3" ISO
- **D**: Flange 50ND6, DIN2501 Do=140/PC=110/Db=4xø14 Flange 3" ANSI
  - 16.5 1991 Do=190.5/PC=152.4/Db=4xø19
- **E**: Adjustable

**Inlet pressure**

- **A**: Wetting
- **B**: Impact cleaning

**RPM**

- 3.0
- 3.5
- 4.0
- 4.5
- 5.0

**Cleaning Time, Complete Pattern**

- **PTM (Pattern time minutes)**
  - 16
  - 12
  - 14
  - 10
  - 4
  - 6
  - 2
  - 2.5
  - 6.0
  - 7.0
  - 9.0
  - 12.0
  - 20.0
<table>
<thead>
<tr>
<th>F</th>
<th>Q-DPL</th>
<th>H</th>
<th>J</th>
<th>K</th>
<th>L</th>
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<td>190</td>
<td>69</td>
<td>72</td>
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</tbody>
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**Standard Design**

Special versions include Tri-Clamp connections and ultra-low flow with fast rotation. As standard documentation, the Toftejorg TZ-89 can be supplied with a "Declaration of Conformity" for material specifications.

**TRAX simulation tool**

TRAX is a unique software that simulates how the Toftejorg TZ-89 performs in a specific tank or vessel. The simulation gives information on wetting intensity, pattern mesh width and cleaning jet velocity. This information is used to determine the best location of the tank cleaning machine and the correct combination of flow, time and pressure to implement.

A TRAX demo containing different cleaning simulations covering a variety of applications can be used as reference and documentation for tank cleaning applications. A TRAX simulation is free and available upon request.

**Wetting Intensity**
Alfa Laval reserves the right to change specifications without prior notification.

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