Purpose and main functions
The Trelleborg Sealing Solutions fully automated Skirted Piston Machine is designed for medium to high volume production. Incorporating two separate stations, mounting and calibration, the machine is able to mount the disc and calibrate the skirted piston to its final dimensions. The Skirted Piston Machine runs as an unmanned stand-alone unit, fitting perfectly into an automated manufacturing line. Both blank pistons and Turcon® discs can be refilled during running operation. In addition, the machine also has a double zone calibration unit controlled by the Programmable Logic Controller (PLC).

Construction
All primary movements are handled by state-of-the-art electro-servo actuators controlled by a PLC. All configurations are done via the large color touch panel. The standard supplied recipe system stores individual process settings for up to 99 different piston/skirt configurations and allows the operator to set and change parameters like:

- Calibration mode, speed and time
- Heating temperature
- Calibration temperature
- Numbers of mounting strokes
- Mounting time, speed and positions
- Mounting depth
- Automatic piston centering according to piston diameter
- Automatic Calibration of disc measurement controller
- Settings for disc dimension and tolerance
- All cylinders with adjustable service warnings

- Graphic overview of sequences in PLC for quick error detection
- Error type description
- English user interface (other languages optional)
- Passwords for different user levels

*The Skirted Piston Machine is CE-marked

### Standard Skirted Piston Machine

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Output</td>
<td>Up to 700 pistons/hour</td>
</tr>
<tr>
<td>Piston Range</td>
<td>Ø25 to Ø50 mm and 24 mm height</td>
</tr>
<tr>
<td>Manning</td>
<td>0.5 operators (recommended)</td>
</tr>
<tr>
<td>Tool Change Over</td>
<td>15 minutes</td>
</tr>
<tr>
<td>Disc Magazine Capacity</td>
<td>400 pieces</td>
</tr>
<tr>
<td>Inlet Conveyor Capacity</td>
<td>Approx. 400 ø32 pistons</td>
</tr>
<tr>
<td>Outlet Conveyor Capacity</td>
<td>Approx. 400 ø32 pistons</td>
</tr>
<tr>
<td>Stand-alone time</td>
<td>Approx. 30 min.</td>
</tr>
<tr>
<td>Thickness Check of Discs</td>
<td>Yes</td>
</tr>
<tr>
<td>Doors</td>
<td>Magnet switch on 5 doors for safety locking</td>
</tr>
<tr>
<td>PLC –controller</td>
<td>Siemens Simatic</td>
</tr>
<tr>
<td>Operator Panel</td>
<td>SIMATIC 10,4” TFT-display</td>
</tr>
<tr>
<td>Air Supply</td>
<td>6 BAR</td>
</tr>
<tr>
<td>Power Supply</td>
<td>3x400V 50Hz</td>
</tr>
<tr>
<td>Power Consumption</td>
<td>Max 3 Kwh/h at full load</td>
</tr>
<tr>
<td>Noise Level</td>
<td>78 dBa</td>
</tr>
<tr>
<td>Size (L, W, H) and Weight</td>
<td>3510, 1000, 2260 mm, 950 kg</td>
</tr>
</tbody>
</table>
Our Goals
Trelleborg Sealing Solutions wants to be your top supplier for the design and manufacturing of Turcon® discs for skirted pistons!

Top Reasons to Choose Trelleborg Sealing Solutions

Design
The single- and double-lip solution offers a positive rebound sealing, giving an improved ride control and efficient noise suppression.

Material
The unique material composition and processing provides strength and toughness, enabling our skirted piston solutions to have high wear resistance and load ability.

Not just a disc
Trelleborg Sealing Solutions offers a complete integrated skirted piston solution including the initial groove and disc design, material selection, tooling, assembly processes and equipment design. Trelleborg Sealing Solutions takes ownership of the entire process.

Optimal flow support of parts
We place the equipment at the end of the sinter metal production line or at the beginning of the shock assembly line.

Services/Capabilities

Design
Within a week, Trelleborg Sealing Solutions provides skirted piston solutions (groove and disc design, material selection, etc.) customized to the piston design and tube diameter of the customer.

Prototype service
Trelleborg Sealing Solutions offers to skirt prototypes with a lead-time of 3-4 weeks once customer piston samples (50-100 pcs) have been received.

For larger tests or production run-in
Trelleborg Sealing Solutions has the capabilities of skirting larger series (500-100,000 pistons p.a.)

Local Presence, Global Reach
With a design center located in Helsingoer, Denmark and a global network of manufacturing facilities, customers can take advantage of our global network while having contact to our local customer support centers. Choose Trelleborg Sealing Solutions to meet your local and global needs for Turcon® discs for skirted pistons!

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Years of Experience
1987  Trelleborg Sealing Solutions designs the skirted piston as an alternative to the Combi Slydring®
2005  16 Skirted Piston Machines delivered with over 50 million discs produced
2013  More than 36 machines placed on the market and more than 450 million discs produced

The Concept

TRELLEBORG SEALING SOLUTIONS
- Designs and manufactures Turcon® discs (PTFE based)
- Designs recommend skirting process
- Designs and sells required Skirted Piston Machines
- Trouble-shooting, service and support

Benefits
- Specialists in PTFE discs/seals
- Strong knowledge of various factors influencing the end-product (in the shock absorber)
- Capable of entering into joint developments

TIER 1 // Shock Absorber Manufacturer
Integrates Skirted Pistons into shock absorbers
Benefits
- Assembly/purchasing savings
- Increased product reliability

TIER 2 // Sintered Metal Part Manufacturer
Assembles Skirted Pistons using Trelleborg Sealing Solutions machines and PTFE discs
Benefits
- Focus on sinter metal part
- Drastic reduction of assembly cost
- Solutions to mounting issues and assembly risks

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