LEGIO™
A modular Friction Stir Welding system

ESAB’s LEGIO™ platform is developed to provide a standardized and modular approach to FSW utilization.

Technical Description
LEGIO™ is designed with a rigid framework for high performance during high-load conditions with a working range (welding head travel) from 1 and 5 meters. It comprises heavy-duty bearings and the welding head travel is actuated using a ball-screw system.

The welding head is hydraulically actuated, which allows the high FSW forces to be applied minimizing the space required. The contact force conditions is controlled by the PLC, which provides a dedicated close-loop controller for this vital process parameter.

The spindle is driven by an AC-motor, which provides the torque and spindle rotation needed for the intended applications. Liquid cooling is provided to minimize the wear on the spindle components and the pin tool.

Control System
All LEGIO™ machines are controlled using the latest of PLC technology and high accuracy drives. This allows the machine’s axes position and speed to be controlled delicately and precise.

The Z-axis control works in either on position or on set force control mode.

The menu driven 15" touch-screen HMI interface is designed specifically for FSW. It is the interface for setting up the process parameters, the welding path as well as the most common machine parameters. It also provides monitoring capabilities of the process parameters, alarms and system status.

Industry
- Aerospace
- Automotive
- Marine and Offshore
- Rail Cars
- Military Applications
- Energy

Features
- Reliable and uniform high weld quality
- Unbeatable strength
- Low distortion and shrinkage
- Minimum of post treatment
- Low energy consumption
- Environment friendly
- Easy to operate
The FSW system LEGIO™

The LEGIO™ platform is available in three models; ST, U, and UT. The ST-model is designed for linear welding. The U- and UT-models for 2-D welding Y-axis range 400 mm (15.7 in.). All models can be equipped with three different type of FSW Head sizes 3, 4 and 5. Other sizes and combinations can be quoted on request.

<table>
<thead>
<tr>
<th>Head Size</th>
<th>X-axis range [m]</th>
<th>Vertical down force [kN]</th>
<th>Welding depth, mm (in.)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>AA 6000</td>
</tr>
<tr>
<td>FSW 3</td>
<td>1 2 3 4 5</td>
<td>25</td>
<td>10 (0.39)</td>
</tr>
<tr>
<td>FSW 4</td>
<td>1 2 3 4 5</td>
<td>60</td>
<td>18 (0.71)</td>
</tr>
<tr>
<td>FSW 5</td>
<td>1 2 3 4 5</td>
<td>100</td>
<td>35 (1.38)</td>
</tr>
</tbody>
</table>

Note! Individual variations of the thickness range within the different alloy series can occur.

Welding speed
Standard welding speed for all models is up to 2 m/min (79 ipm).

Options
- High Speed Data logging
- Welding speed upgrade
- Spare part package
- Welding pin tools
- Hydraulic Pressure Roller system
- Installation
- Training

For more information see Technical description LEGIO™.