The I-STIR CNC Series comprises an array of reliable and cost-effective solutions for medium and thin gauge friction stir welding (FSW) applications. Leveraging precision force and motion control expertise, these systems provide unparalleled load and position control accuracy for 2-D production welding, prototyping, and research and development.

I-STIR CNC Series systems combine advanced process controls and instrumentation with affordable, commercially available milling machine platforms available in a broad selection of standard work envelopes. The ability to integrate the advanced AdAPT™ weld head technology extends the utility of these systems across a wide span of functions, ranging from basic CNC machining to three modes of friction stir welding.

PROVEN, COST-EFFECTIVE PLATFORMS

Intelligent system design is what sets the I-STIR CNC Series apart from the other friction stir welding systems. I-STIR CNC Series machine frames are based upon a standard milling machine design that has been proven in hundreds of industrial applications and tens of thousands of hours of operation. Standard, low-force (22 kN) load capacities allow these systems to employ electric servomotors for positioning control in place of hydraulic drives—hydraulic pumps and water chillers are no longer required. Additionally, I-STIR CNC Series systems require no special foundation and can sit on any standard factory floor.
UPGRADEABLE WELD HEAD

I-STIR CNC Series systems feature a standard low-force (5 kip) spindle that can be easily upgraded to include the mid-range (MRH) weld head, the latest in a line of weld head technology advances. While optimized for material less than 10 mm (0.400 in) thick, the MRH leverages AdAPT™ weld head innovations such as the retractable pin tool, the self-reacting pin tool, and the independent forge actuator.

ADVANCED CONTROL SOFTWARE

Intelligent control software is the key to high-performance friction stir welding. I-STIR CNC Series systems feature proven controls and instrumentation, including advanced data acquisition capabilities, tool-tip programming via standard CAM software packages, and the ability to mode switch on-the-fly between position and load control.

UNRIVALED SERVICE & SUPPORT

I-STIR Technology is the FSW partner you can trust. A key component of our success is our global support organization. Regardless of your size or location, we are committed to helping you optimize the return on your I-STIR system investment through planned professional maintenance, responsive local service, expert training, and accredited calibration services. To resolve more complex engineering or process challenges, we field an experienced consulting team. Contact us today to learn more about I-STIR intelligent, cost-effective FSW solutions.
I-STIR BR SYSTEM

The three-axis I-STIR BR System is optimized for FSW applications on materials up to 6.4 mm (0.250 in) thick. It features a bridge gantry configuration with a large work envelope that is well-suited for friction stir welding in a wide X, Y plane.

SYSTEM FEATURES

- Precision I-STIR controls and instrumentation
- Cost-effective, low-force 22kN (5 kip) spindle
- Reliable milling machine platform design
- Large 2.5 by 1.3 meter (100 in by 50 in) work envelope
- 18/11 kw (24/15 HP) closed loop spindle drive and motor
- 4000 RPM 90 taper Spindle
- High torque AC digital servos

OPTIONS

- 35kN (8 kip) spindle (MRH weld head)
- Programmable tilt
- Y and Z roller ways
- 24/15 kw (35/25 HP) two speed
- 50, 60, 80 in between columns width
- 100 or 150 in table travel
- Surface sensor and clamp
- Cooling tool holder for steel FSW
- Inspection camera
- Further custom options available

I-STIR BR PERFORMANCE CHARACTERISTICS

<table>
<thead>
<tr>
<th>Axis</th>
<th>Travel Range</th>
<th>Max Speed (Uploaded)</th>
<th>Load Capacity</th>
</tr>
</thead>
<tbody>
<tr>
<td>X</td>
<td>2540 mm (100 in)</td>
<td>106 mm/s (250 ipm)</td>
<td>15 kN (3 kip)</td>
</tr>
<tr>
<td></td>
<td>3818 mm (150 in)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Y</td>
<td>1270 mm (50 in)</td>
<td>106 mm/s (250 ipm)</td>
<td>15 kN (3 kip)</td>
</tr>
<tr>
<td></td>
<td>2032 mm (80 in)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Z/Forge</td>
<td>0-713 mm (0-28 in)</td>
<td>72 mm/s (179 ipm)</td>
<td>22 kN (5 kip)</td>
</tr>
<tr>
<td>Spindle Option</td>
<td>NA</td>
<td>4000 RPM</td>
<td>136 N-m (1200 in-lb) @ 1000 RPM</td>
</tr>
</tbody>
</table>
I-STIR CNC VM

The I-STIR CNC VM is a robust weld system designed for high volume manufacturing applications. The system is based on proven I-STIR technology that has been used in demanding manufacturing environments for many applications. The system has an advanced control system with accurate sensing devices to allow the manufacturing engineer to perform a thorough and systematic analysis on FSW for a wide variety of materials and shapes.

SYSTEM FEATURES

- Precision I-STIR controls and instrumentation
- Cost-effective, low-force 22kN (5 kip) spindle
- Reliable milling machine platform design
- Open 0.51 by 0.76 meter (20 in by 30 in) work envelope
- 18/11 kw (24/15) closed loop spindle drive and motor
- 4000 RPM 90 taper spindle
- High torque AC digital servos

OPTIONS

- Extended table travel to 1542 mm (60 in)
- 24/15 kw (35/25 HP) two speed
- Extended Z travel to 609 mm (24 in)
- Spindle 8000 RPM
- Cooling tool holder
- Surface sensor clamp
- Further custom options available

I-STIR CNC VM30-3 PERFORMANCE CHARACTERISTICS

<table>
<thead>
<tr>
<th>Axis</th>
<th>Travel Range</th>
<th>Max Speed (Uploaded)</th>
<th>Load Capacity</th>
</tr>
</thead>
<tbody>
<tr>
<td>X (standard) Option</td>
<td>1270 mm (50 in)</td>
<td>106 mm/s (250 ipm)</td>
<td>10 kN (2.3 kip)</td>
</tr>
<tr>
<td>Y (standard) Option</td>
<td>762 mm (30 in)</td>
<td>106 mm/s (250 ipm)</td>
<td>10 kN (2.3 kip)</td>
</tr>
<tr>
<td>Z/Forge</td>
<td>508 mm (20 in)</td>
<td>179 mm/s (4550 ipm)</td>
<td>22 kN (5 kip)</td>
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<tr>
<td>Spindle Option</td>
<td>NA</td>
<td>4000 RPM</td>
<td>136 N·m (1200 in-lb) @ 1000 RPM</td>
</tr>
</tbody>
</table>