SET OF EQUIPMENT FOR MECHANIZED ASSEMBLY AND ROBOTIZED WELDING OF MICROPANELS

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SHIPBUILDING & SHIPREPAIR
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The system is purposed for mechanized assembly and robotized welding of flat section assemblies (micropanels), including the following operations:

- Mechanized installation and tacking of framing;
- Laser scanning and photogrammetry of working area;
- Automatic processing of results and robot control program generation;
- Robotized welding of micropanels.

Innovative solutions:

- Application of special laser scanning technology with photogrammetry of working area;
- Automatic generation of welding program for all horizontal and vertical welding seams of parts located in scanning zone.

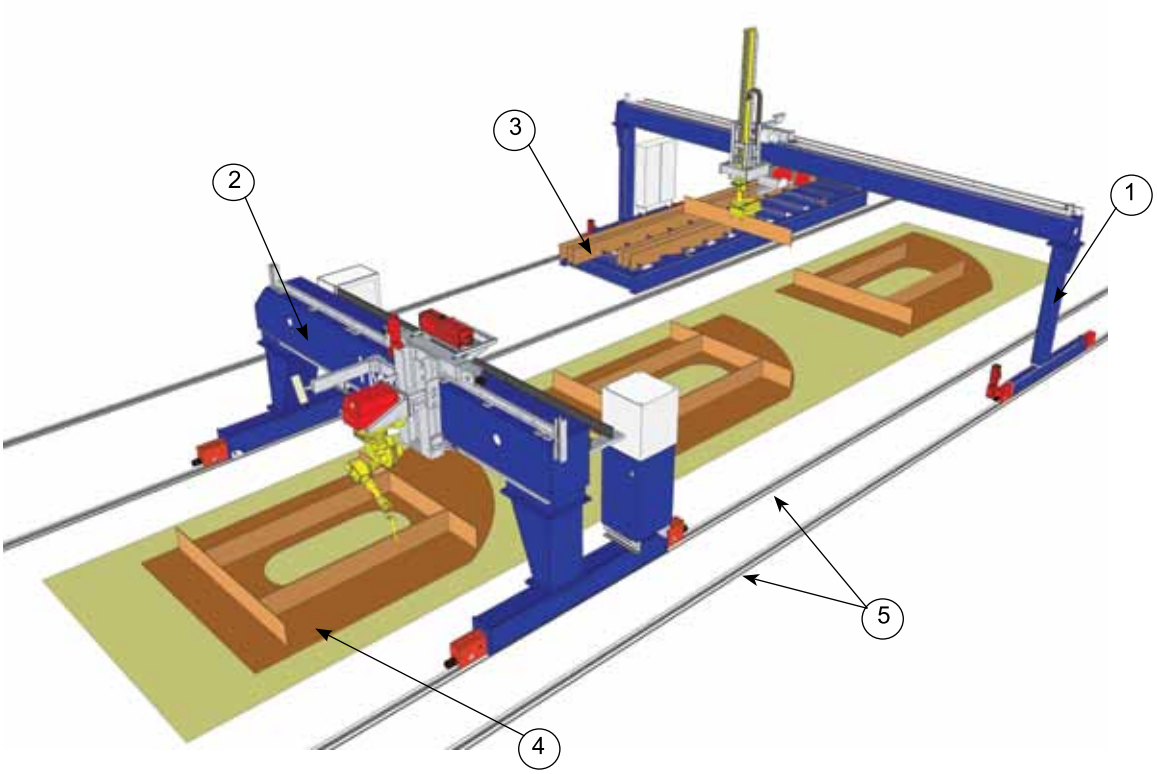
Application of robotic system will lead to:

- Implementation of unmanned technology for manufacturing wide range of hull panels up to 3.2×12 m;
- Guaranteed quality of weld joints;
- Increase of manufacturing performance of welded metal structures in 1.5—2 times due to reduction of welding preparation/finishing time;
- Decrease of weld materials consumption rate in 1.2—1.3 times due to their metering flow;
- Reduction of power consumption for straightening.

Set of equipment is composed of:

1. Portal for mechanized installation and tacking of stiffeners up to 0.5 m high on micropanels along marking line;
2. Portal for laser scanning, photogrammetry and robotized welding of micropanel stiffeners;
3. Pallet with set of stiffeners;
4. Assembly platform for installation of stiffeners and welding of micropanels;
5. Rail tracks.

Depending on required annual output of micropanels and available production premises, several (2-3) operating platforms can be installed one after another. While robot welds micropanels, the operator can set stiffeners on other operating platforms. In this case, it is required to provide long rail tracks and several removable pallets should be applied.



Portal for mechanized installation and tacking of stiffeners on micropanels

Portal for laser scanning, photogrammetry and robotized welding of stiffeners to micropanels

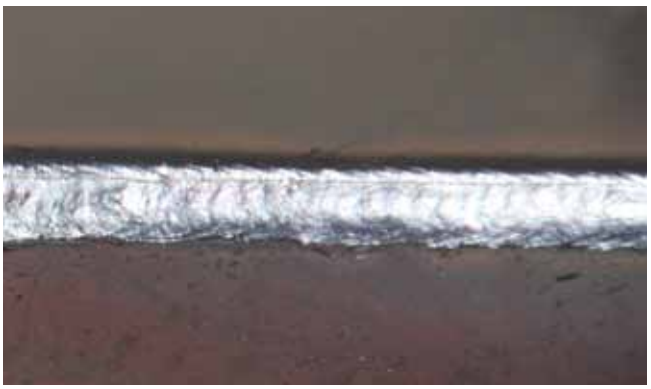
Clamping stiffener with manipulator

Laser scanning and photogrammetry

Installing stiffener on micropanel

Vertical and horizontal welding of stiffeners to micropanels performed by welding robot

Tacking stiffener to micropanel



Weld seam

Based on results of competition “Best innovative project and best research-scientific development of the year” held as a part of “Saint Petersburg technical exhibition” (March 15-17, 2011) the development has been awarded with 2nd degree diploma in category “New high-tech developments in equipment and science-intensive technology”.

The system has been designed jointly with “Ingenieurtechnik und Maschinenbau GmbH“ company (Germany).

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