

# Robot Vision System — more power to production

MOTOMAN is achieving exceptional success with a vision-based system capable of automatically capturing all the data required to program welding robots. European shipyards are already adopting the technology. This article describes the system and its benefits.

**M**OTOMAN, with its systems partner, Pemamek Oy, is a world leading supplier of heavy welding automation, mechanisation and workpiece handling equipment. The company is acknowledged for its superior product quality, high capacity and its short pay-back times on investments. Activities include: heavy robotics and engineering; automation for the energy sector; production machines for the earthmoving, railroad and shipbuilding sectors; workpiece handling equipment; and customer support.

The Vision Robot System, which uses MOTOMAN-SSA2000 robots, represents the cutting edge in welding automation solutions. This vision system allows the job of welders to move toward that of machine operators, a change that enhances production efficiency. The advantages of the Vision Robot System are especially obvious at shipyards, where as many as tens of thousands of similar but individual products might be made for ship hulls every year. This is exactly the kind of production application where Vision really shines.

The patented Vision Robot System offers an effective means to enhance productivity in processes where the form, type and number of a given workpiece require easy and flexible pro-

gramming. Its key characteristics are user-friendliness and fast workpiece programming. The programming required for an entire 8-hour welding shift can be done in 30 minutes. During a single shift, one MOTOMAN robot equipped with a Vision system can complete approximately 160 metres of welds, and, based on testimonials from shipyards, it can even be programmed to continue welding during the night shift. In addition to this, the quality of welds is consistent.

Special emphasis has been placed on the ease of system programming. Professional welders trained as operators can use the system independently after just a few days of training.

The Vision system uses a camera to scan the workpiece and capture all the necessary data required to write a program for a welding robot. This is an especially significant advantage over an offline system, which requires an in-house engineer-level programmer to do labour-intensive CAD modelling. The Vision system welder-operator can independently handle the entire programming process, which results in exceptional production flexibility and efficiency.

Vision's other advantages over an offline system include: ease of workpiece calibration; the absolute position of the panel is ascertained during scanning; and changes to the welding order or the addition of new seams can easily be done. Furthermore, Vision produces an image of the actual workpiece that also shows the various support structures used by welders that do not appear in CAD images.

The Vision system also improves worker motivation, as the welder



*The VRWP-8000/1 Vision Robot System with a MOTOMAN-SSA2000 welding robot at the STX Turku shipyard – best suited to welding panels that are largely similar but not identical.*

who assembled and tack-welded the workpiece is its operator. The system's high arc-time ratio frees the operator to take care of other production-related tasks, which has a major impact on productivity.

This has proved an effective solution for the needs of shipyards and numerous Vision Robot System solutions have been implemented. Shipyard customers typically build highly demanding and complex cruise liners or warships. Italian shipbuilder Fincantieri Riva Trigoso and Spanish builder Navantia el Ferrol have both purchased systems. Fincantieri has also ordered a second system to strengthen the fleet of Vision robot systems it already has.

STX Finland Cruise Turku and Rauma shipyard has also improved its production efficiency with Vision Robot Systems. Along with several Vision Robot portals in use, a bulkhead line with two twin-robot welding stations equipped with a total of four MOTOMAN-UP6 robots has been installed. Tommi Reponen, head of robots at the STX Turku Shipyard, was involved in the development of the Vision system's usability. "The ease of robot programming that the Vision system provides saves on resources and enhances productivity in panel welding," he explains.

MOTOMAN continues to develop numerous new applications for the already exceptionally advanced Vision Robot System.

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*The robot operator can easily program the welding path based on the image of the scanned workpiece.*