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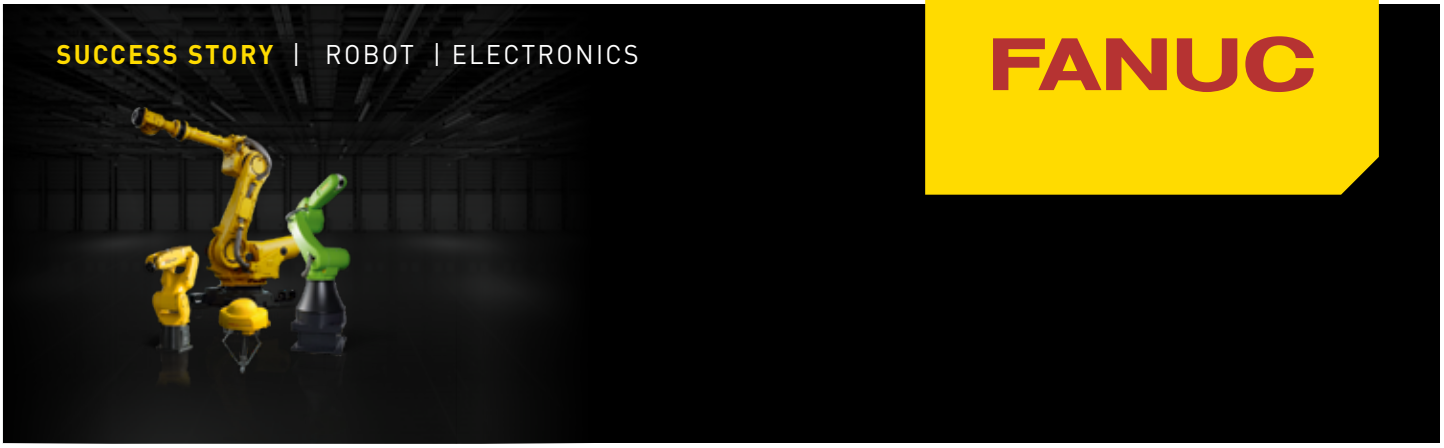
ELECTRONICS

FANUC Robots Deliver A Sound Solution For Speaker Cabinet Manufacture

Task Sanding and smoothing the surfaces of speaker cabinets

Solution FANUC provided three Robot Force Sensing Cabinet Sanding Cells, which are designed to sand the surfaces of cabinets using an orbital sander and utilising feedback from the FANUC robot force sensor to control applied pressure to the cabinets worked surface. All three identical cells carry out the same tasks. Each cell is equipped with one M20iA/M20 robot, incorporating FANUC Force Sensing Head and a rotary table. Each rotary table is driven and controlled by FANUC servo motor.

Result In order to deliver the highest levels of productivity, each cell is equipped with two-position turntable units, enabling the robot to work on one side, whilst on the other side, an operator removes a finished cabinet and re-loads the fixture with a new part to be processed. Light-Guards, together with the speed and repeatability of the robot, have delivered a significant reduction in processing time when compared to the original manual process.



FANUC M20*i*A/M20 Robots crucial to partially automate the manufacturing process of Bowers and Wilkins speaker cabinet

Since the company's formation in 1966, Bowers & Wilkins has grown to become recognised today as a world leader in acoustics. The comprehensive range of speaker products manufactured by the company are highly coveted for their ability to bring sounds to the listener, exactly as they were recorded in the studio.

Wilkins a significant amount of effort also goes into the manufacture of the speaker cabinet, which in some instances can represent the majority of the cost of the finished product. The company's reputation for innovation in product design and performance is now matched by the introduction of innovative automated manufacturing processes, including a number of FANUC Robot Cells.

The acoustic excellence of Bowers & Wilkins speakers is matched by the leading edge design of the company's products and the immaculate aesthetic finishes achieved. Maintaining these standards requires consistency in all areas of manufacture and especially in the operations used to finish the outer surfaces of the speaker. FANUC became the first choice for B&W due to its ability to match their quality standards by providing innovative automated manufacturing systems, which allowed B&W to reduce processing time.

Each of the three cells is used to sand and smooth the surface of the speaker cabinets using the combination of a FANUC model M20iA/M20 Robot and interchangeable sanding heads. The repeatability of the robot, coupled with feedback from the robot force sensor, ensures that consistent pressure is applied to the cabinet surface by the orbital sanding head at all stages of the process. The automated tool changer fitted to the robot makes it possible for the robot to

change the sanding heads as required, either during the process or at the end of the robot cycle. There is a total of six sanding heads within the cell, three on each side of the rotary table. The systems are also able to automatically change the sanding disks,

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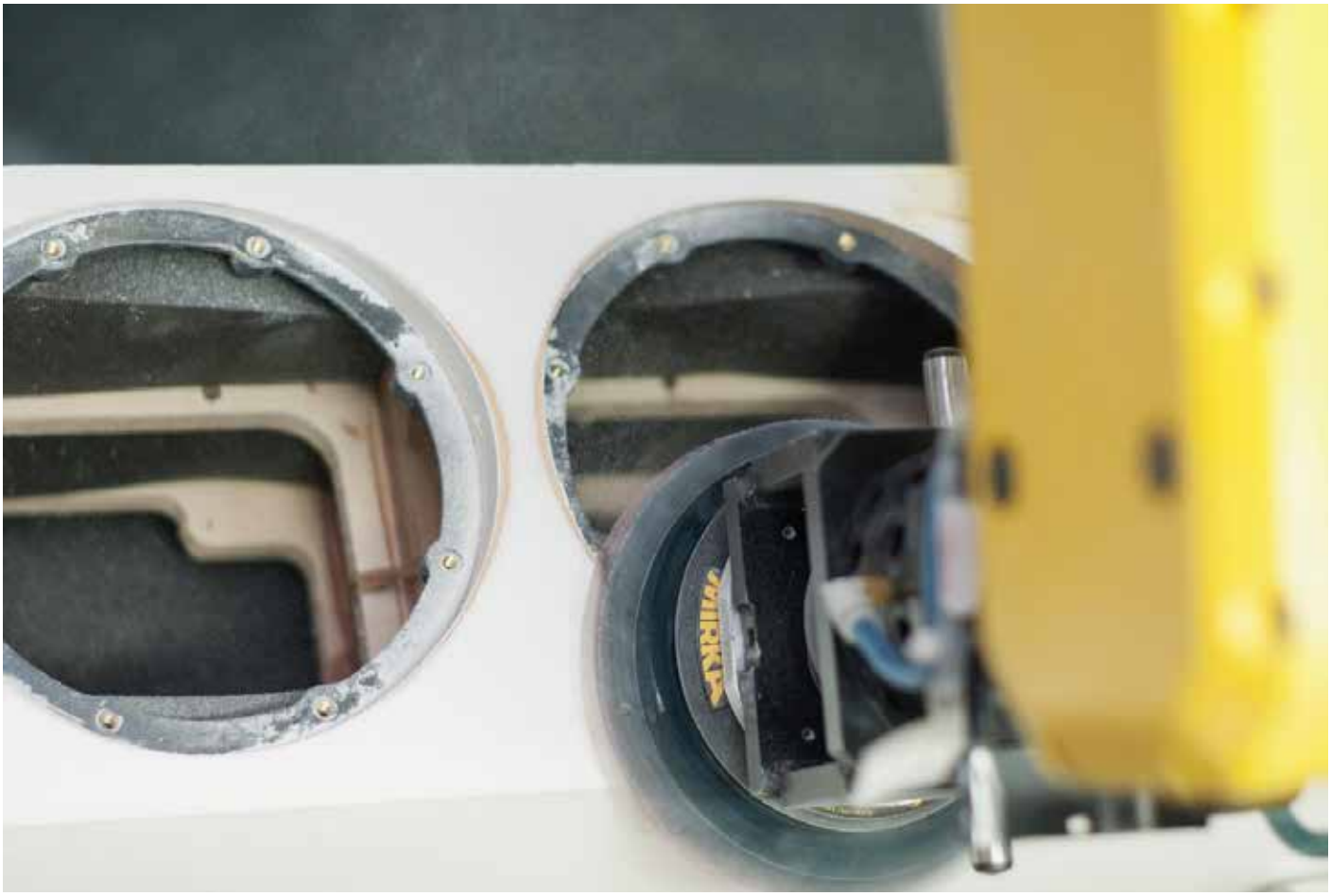
using the robot to strip off the used disk and, using the robot's force sensor, collect a new disk from a stack located within the cell.

Significant reduction in processing time

Designed to deliver the highest levels of productivity, each cell has a two-position turntable unit, enabling the robot to work on one side, whilst on the other side, an operator removes a finished cabinet and re-loads the fixture with a new part to be processed. Light-Guards are used to protect the operator during the loading and unloading operations. This concept, together with the speed and repeatability of the robot, has delivered a significant reduction in processing time when compared to the original manual process. Products that may have taken around one hour to finish by hand can be processed by the robot in under ten minutes.

An intuitive HMI Unit is used to allow the operators to select one of seven different speaker models of varying dimensions, which can be handled by the system. The operator is also able to choose the finish for the particular product eg. wood, paint, paper etc. from the HMI panel. Once the robot has completed its cycle, and following inspection by the operator, any surface that may require additional processing can be selected individually to allow the robot to re-visit that



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area for re-work.
Another key feature is the fact that the robot program paths are taught off-line using FANUC's Roboguide Software. This allows new programs to be developed for additional product types, or existing programs to be modified without interrupting production on the system. Bowers & Wilkins engineers can add their speaker CAD files (IGIS) to the Roboguide Cell and then use the "CAD to Path" utility to off-line program all of the robot paths. Once completed the programs can then be loaded to the robot. ■