Robotic grinding and polishing system for Tech Academy

Testing polish finishing processes with robot support

SHL Automatisierungstechnik AG is equipping the new Tech Academy of the Menzerna company in Ötigheim – a specialist in polishing agents – with a robot-supported grinding and polishing system. The robots’ reproducible process precision makes it possible to systematically optimize grinding and polishing agents and processes.

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With over 1,000 robotic grinding and polishing units installed worldwide, the mid-size technology company SHL Automatisierungstechnik is a global market leader in the field of mechanical surface finishing. The fact that SHL supplies a robotic grinding and polishing system to another market leader in the field – the Menzerna company of Ötigheim, a specialist developing and producing industrial polishing agents – underscores SHL’s claim of being the competent partner of choice for all needs related to robot-supported grinding and polishing. The robotic grinding and polishing system developed for Menzerna complements the equipment at the company’s new Tech Academy. The role of this facility is to support the development of formulations for grinding and polishing agents and to enable practical tests to optimize these formulations. In addition, the facility supports process development and serves as the site for customer training events and expert workshops. Due to the need for conclusive, reproducible findings on polishing agents and their applications in daily practice, not only under laboratory conditions but also under real conditions, Menzerna has invested in a broad range of devices and equipment for industrial grinding and polishing work. For the most part, these devices and equipment match systems found in the customer’s production facilities, so they share the same technical basis. The engineers and process technology specialists at Menzerna formulated their requirements in an extensive specifications document for the robotic grinding and polishing system. The core requirement was that the system be able to perform polishing tests for typical production parts made of brass, aluminum, or stainless steel, as well as lacquered workpieces of wide-ranging complexity, in a highly flexible manner.

Robots guarantee reproducible processes and flexibility of uses. Based on this principle, SHL application specialists planned a project for building the system according to the customer’s specifications. To achieve an economical implementation, real-world proven standard industrial components were used, such as industrial robots, grinding and polishing machines, turning units, basic clamping devices and material flow equipment. The result was a robotic grinding and polishing system installed at the Menzerna Tech Academy that consists primarily of an industrial robot with a carrying load of 140 kg. Additional features include: a controller with hand-held programming unit and protective case sets, a swiveling double contact roll grinding machine DPE-G (swivel unit)-DKS-250/450, a swiveling double polishing machine DPE-G (swivel unit)-DP 1000, a basic clamping device for receiving pneumatic and vacuum gripper tools, a pneumatic clamping fixture for a standardized test workpiece, a double shuttle table for automatically feeding the system with workpieces from a pallet, two workpiece pallets for receiving the same test workpieces, another table for receiving workpieces and manually feeding 700(L)x500(W) mm parts for polishing, a noise protection booth, and, finally, a remote diagnostics maintenance package. SHL also supplied startup and operator training courses as well as system documentation.

To meet the customer’s scheduling expectations for implementing the system, custom fabrications were limited to the workpiece grippers, the part-specific design of the workpiece receivers and, of course, the noise protection booth.

Greater efficiency through perfected polishing processes.

To attain the desired high flexibility in utilization, the system was equipped with two grinding units and two polishing units (double contact roll grinding machine and double polishing machine). In addition, other grinding or polishing tools, such as brushes or Scotch-Brite, can be used. The robot is responsible for handling the test parts and it executes its operations with either modified parameters or reproducible process precision. The individual or multiple machining and speed/dynamic parameters are as easy to modify in tests as are the polishing tools, polishing agents and the contact pressure of the workpiece on the grinding/polishing disk. Testing and durability testing practices make it possible to perfect polishing results and process flows to achieve an optimal and efficient polishing process.

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