

Tools and solutions from the DEPRAG specialist

End-of-Arm Tooling for Grinding & Polishing in the Automotive Industry

The handheld air tool is replaced by a stationary robot

DEPRAG is a traditional manufacturer of professional air tools, sold worldwide under the brand DEPRAG INDUSTRIAL. The tools are used in operations in every significant field of industry, including the automotive industry, machine building and in potentially explosive environments. DEPRAG offers a wide range of pneumatic grinders, polishers, files, drills, tappers, impact wrenches, hammers, scalers, saws, pliers and ATEX-certified tools.



DEPRAG Robotic Grinder

Nowadays, individual solutions, customized to specific customer requirements, are in demand more and more frequently. DEPRAG was one of the manufacturers asked to come up with such a customized solution for one of their longstanding, respected clients that is active in the automobile industry. The customer had previously been using the handheld pistol-grip polishers from the PLU-series of the DEPRAG INDUSTRIAL standard product line on welding seams of vehicle bodies. This fabrication task was done by two employees per production line in three-shift operations, therefore six workers were needed per line. The definition of the client's project was: the traditional handheld air tool should be replaced by a stationary robot (End-of-Arm Tooling for grinding and polishing). The goal was: two robots replacing six operators (two workers per shift), optimization of the surface finish, the elimination of human error, prevention of any potentially health hazards, and an increased productivity with equal or reduced production costs.

At first, the project seemed to be simple; it is the norm today for robots to carry out activities such as welding, painting and transportation. Pavel Šilhán, Sales Manager for DEPRAG INDUSTRIAL Tools, emphasized: "The project definition was to replace grinding using handheld air tools with End-of-Arm Tooling whilst also taking into consideration the irregularities of the surface in relation to the contact force. This contact pressure is not consistent for every component".

There are new technologies currently on the market, which enable the contact force to react sensitively to varying surface profiles. They have their own electronic controller that is independent from the robot's controller. One particular stipulation by the client was, however, to manage without this additional controller. Malfunctions or breakdowns of electronically controlled processes can cause extensive production expenses. Interruptions are especially undesirable in series-production as they can lead to considerable financial losses.

The task therefore proved to be a greater challenge than expected for the technical development team at DEPRAG. The developer selected a stationary spindle with the necessary technical parameters for the required quality standards based on the grinding material and framework data provided by the client. The spindle was set up in such a way to prevent any limitation on the robot's freedom of movement. The adjustable spindle positioned in the clamping chuck is connected to a pneumatic cylinder which exerts a defined axial force on the grinding tool. Spindle overload can be adjusted in an external range of 1.0 to 6.3 bar. Using this method, the required contact pressure can be implemented delicately without using a regulation circuit.



DEPRAG End-of-Arm Tooling

The technical 3D documentation of the grinding head was developed next as a robot simulation. At the same time, in the DEPRAG laboratory, the optimal contact pressure in relation to the grinding material was determined in order to implement the required quality criteria for the surface. Only then was a prototype of the stationary grinding-head produced and successfully tested under real conditions in a mass-production environment at the customer's facilities.

After inspection of the functioning capabilities of the new technology, the quality parameters and repetition factor; the "return on investment (ROI)" of the whole robot was calculated. From an economic standpoint the investment is amortized within three months. Additional benefits include the environmentally friendly aspect, prevention of injury to humans and the elimination of any human errors during polishing.

DEPRAG has developed a new and innovative method for the successful automation of previously manual tasks such as grinding and polishing.

DEPRAG is represented in more than 50 countries with around 600 employees. The renowned medium-sized business operates in the sectors of screwdriving technology, automation, air motors and air tools. DEPRAG combines the expertise over many decades of experience with customized engineering solutions – perfect for versatile projects.

Please read more about this products:

End of Arm Tooling - [Catalog](#)

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