DALEX
SCHWEISSTECHNIK

A ROUND THING: MANY VARIANTS, HIGH QUANTITIES, MINIMUM CYCLE TIMES - CABLE ASSEMBLY IN PERFECTION

Machines, vehicles, robots, pluggable power cords, microphone and speaker cables - flexible stranded wires are used wherever there is a higher risk of conductor breakage due to frequent movement. In order to be able to safely connect all individual wires, especially with higher cross-sections, it is better to weld them to the contacts instead of clamping them via a sleeve. FRÖTEK-Kunststofftechnik GmbH, one of the world's leading companies in connector technology, relies on first-class plant technology from DALEX Schweißmaschinen GmbH & Co. KG for the production of stranded cables with wire end contacts - and produces a wide range of variants in large quantities fully automatically within a very short time.

The competencies of FRÖTEK-Kunststofftechnik GmbH, founded in 1985 and headquartered in Osterode am Harz, range from injection molding of high-performance thermoplastics and multi-component injection molding to system developments such as Moldflow, resistance, ultrasonic and rotation welding, prototyping, the construction of small systems and molds, and the assembly of components. Another important pillar of the globally active company with seven production sites on three continents is battery technology. Whether flexible or rigid, sleeve or welding technology - in the production of a wide variety of connector cables, FRÖTEK occupies a leading position on the international market. One of the secrets of success lies in the production technology: the fully automatic assembly of the most diverse stranded cables with wire end contacts is carried out by a fully automatic welding system from DALEX.

One system for countless variants

„FRÖTEK wanted to optimize its production of stranded cables and combine several operations. Thus, the company was looking for a system solution that could handle all tasks from cable feeding to measuring, cutting and stripping processes, feeding of the wire end contacts to welding of the contacts on both sides and ejection of the finished products - all fully automatically, of course. The challenge lay above all in the high number of variants. Welded tube connectors with cross sections of 16, 25, 35, 50, 70 and 95 mm2 and lengths of 75 to 300 mm had to be manufactured reliably, repeatably and productively in the shortest possible time and in large quantities with a pitch of 1 mm.

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The result is a 16-station rotary assembly machine that is precisely tailored to the requirements," Marcel Groß (M. Eng., SFI), group manager mech. design at DALEX.
By means of dancer control, the stranded cable is fed to the line from the coil/coiler unit. For the conversion of the various diameters and lengths, the cable is measured, stripped and cut to length. Afterwards, the conveyor transports the corresponding cable section to the unloading station at the turntable. A sensor automatically detects the cable. The cable is then removed from the conveyor belt, inserted at the turntable and tensioned.

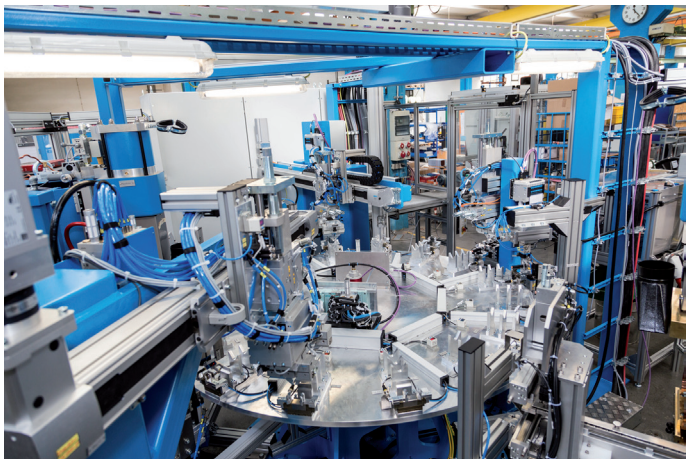
Double welding shortens times

„The system is equipped with two welding stations. They each fit one end of the cable with the end contacts. Since they work simultaneously, there are always two cables in the plant and the quantities can be fulfilled much faster," says Marcel Groß. The processes around the two welding machines are identical: a spring-mounted handling unit inspects the cable, balances the lengths and brushes the copper wires to remove oxidation residues for optimal welding. It is then inserted into the welding station. The copper end contact lugs also enter the station automatically. During the projection welding process, the system monitors the welding current, voltage and welding path to ensure optimum results. Between the two welding stations, a servo-motorized handling unit removes the cable, turns it, moves it into position and inserts it into the component fixture of the welding machine.

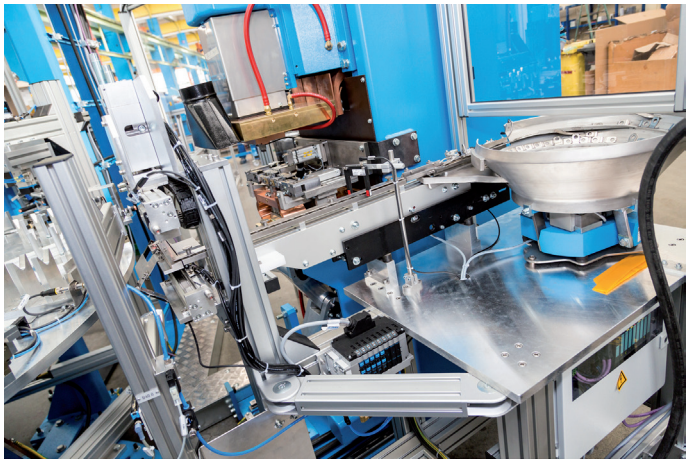
Automatic final inspection

Marcel Groß: „After welding, the system automatically inspects the welded cables. If the parts are in order, a needle embosser marks the contacts. Then they are discharged from the system by means of a conveyor belt. If the parts are defective, they are automatically separated before marking. In the final station, a light barrier still checks whether the component holder is empty after removal."
The advantages of the 16-station rotary assembly machine are impressive: Thanks to the combination of previously separate work steps, the production of stranded cables is more efficient and thus more productive. The many different variants can be covered by a single system. And the parallel welds significantly shorten production times. „Since acquiring the DALEX systems, we have already performed a remarkable 200 million welds - with outstanding quality.

The combination of our own stringent rope monitoring techniques and our cable extrusion lines with DALEX technology ensures that we have had very few weldment failures so far," enthuses Dipl.-Phys. Sebastian Mathes, Director Electrical Engineering / New Markets at FRÖTEK.
The fact that this complete package of high productivity and very good quality is completely convincing can come as no surprise to anyone: That is why FRÖTEK already has three such systems from DALEX in operation.



In order to produce the welding raw connectors in different cross-sections and lengths with repeatable accuracy in the shortest possible time and in high quantities, DALEX has designed a 16-station rotary assembly machine that is precisely tailored to the requirements.



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