

Automated deburring of plastic parts with hot air

Precise, sensitive and efficient

Automation ensures consistent quality and saves personnel costs. For example, one plastics technician could be saved for each injection moulding machine thanks to automated hot air deburring of thermoplastic parts. The hot air components from Leister Process Technologies automatically regulate process parameters, such as temperatures and application time of the hot air jet – precisely and comprehensively. This shows a positive effect in the profitability calculation.

In injection moulding, burrs or sharp edges form at the joint between the two halves of the tool or also in the region of the core pullers. The burrs are kept as small as possible through the precision of the tool and optimisation of the processing parameters. But this is not always possible, especially on large parts. However, burrs are unacceptable, not only on parts designed to be highly visible, such as a vehicle dashboard. They are unsightly, they represent an injury hazard or they can impair the further processing of the part. Paint coatings subsequently applied adhere poorly to sharp edges. Broken off burr particles can also cause functional faults.

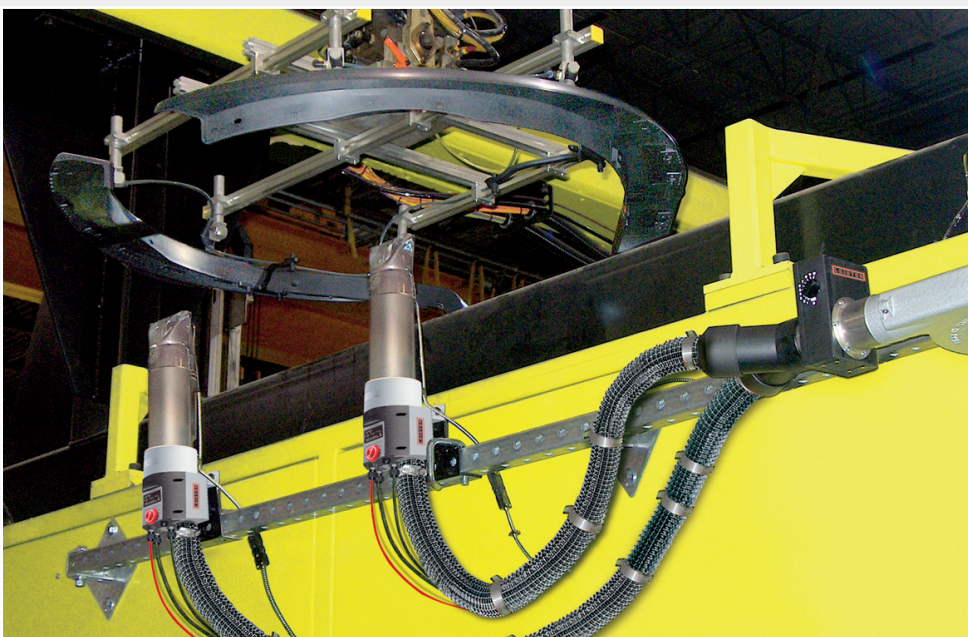
The quality achieved with manual deburring is very much dependent on the processor. A lower rejection rate can be maintained with mechanical and automated methods. If the geometry of the moulded part allows, the burrs can be abrasively removed in drum deburring machines. Devices

with open gas flames are also used to melt burrs on thermoplastic moulded parts. Besides the permanent danger of fire, there is also the risk here of damaging the moulded parts due to the effect of excessive heating. Automatic deburring with hot air represents a safe alternative, allowing ongoing control of all process parameters, protecting the surface of the moulded parts and avoiding distortion of moulded parts.

Consistent, reproducible results

Given optimal adherence to the process parameters, the burr melts when heated with hot air with the material of the moulded part so that the previous burr profile is almost invisible. The technique can be integrated in an automated production process. Directly after removing the hardened injection moulded part from the tool, a robot can pass it across a jet of hot air from the deburring device. The robot also passes complex moulded parts precisely along the burr profile across the jet of hot air, whose temperature and intensity is closely matched to the speed of robot motion. This allows consistent and reproducible quality to be attained. Controls are only required on a random sample basis. Hot air deburring takes place during the injection moulding cycle and therefore does not prolong the cycle time thus saving costly non-productive time.

Automated hot air deburring proves itself over a very wide range of magnitudes: The smallest configuration is a Leister LE MINI air heater with a 400 W power rating. The largest



In the automated production process, a robot can pass the injection moulded part across the jet of hot air immediately after removing it from the tool.

air heater from Leister works with 40 kW. Temperatures of up to 900 °C can be achieved. A plastic processor in Canada has installed two air heaters for each of his 30 injection welding machines and saves 30 persons as a result. The air heaters include patented heating element protection and an alarm output. They can be connected with a regulator or a PLC device via a galvanically isolated 4 – 20 mA interface.

The enormous diversity of the standard nozzles available from Leister allows extremely uncomplicated, customer-specific configuration of hot air plants. This makes it possible, for instance, to pass different parts across the same jet of hot air. The robot can also be programmed for point deburring of individual regions of injection moulded parts. The hot air system itself hardly requires any maintenance. Only for applications in dusty operating environments do the air filters need to be replaced from time to time.

Deburring with hot air has so far proven itself, particularly for injection moulded parts made of ABS (acrylonitrile butadiene styrene copolymer), PE (polyethylene) or PP (polypropylene). The excellent results in practical applications

indicate that the technique is destined to become established for moulded parts made of other thermoplastics. This opens up an array of further application areas for diverse types and forms of injection moulded parts in a wide range of industrial and consumer areas.

System partner for complete solutions

As a system partner, Leister Process Technologies offers its customers all the necessary components, such as nozzles, air heaters, temperature regulators and blowers, from a single source. The company operates a global network of more than 120 sales and service centres in over 60 countries. Based on years of experience in a broad spectrum of industries, it continually invests in the development of innovative products. Its hot air systems have been used for decades now on welding waterproof sheeting for roofs and tunnels, as well as in shrink-wrapping processes in the packaging sector or for curing adhesives. As diverse as the applications are also the demands placed on the plants. They provide dependable service in drying labels and burning in paints, but also in sterilizing test needles or smoothing pills, capsules or sweets.



Combination options with air heaters, blowers and temperature regulators.

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