Drum Coating – Efficient and Cost-Effective

The German contract coating company APO started small and now owns the largest number of Rotamat coaters of any business in the world. The company currently operates ten machines of this kind and coats around one billion parts per year.

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When APO, a contract coating company based in Germany, was founded in 2002, the purchase of the first machine for coating small parts in bulk was a key decision. At that time, drum coating was only available in the form of a hot process for coating metal parts. For example, it would have been inconceivable then to coat plastic components with water-based paints. But because the process had a great deal of potential, APO decided to invest in drum coating. Shortly after the company was set up, a Rotamat (R 90) from Walther Trowal was installed and soon became an essential part of its coating operation.

As the use of water-based paints became more common, Walther Trowal and APO worked closely together to develop the Rotamat so that it could coat plastic parts as well as metal ones. Drum coating has now become widely recognised as a standard process for coating non-metallic substrates. APO currently processes a wide range of small parts made from metal, plastic, rubber and wood. These include components for the automotive and cosmetics industries and for pens, toys and haberdashery, together with seals and damping assemblies. As its order book grew, APO gradually invested in another nine Rotamats. It currently has the largest number of Rotamats in one plant of any company in the world and coats around one billion parts per year, around half of them with water-based paints. One of its specialities is coating parts such as seals and gaskets with dry film lubricant which reduces their tendency to adhere to surfaces, eliminates friction and simplifies the assembly process.
Of the company's ten Rotamats, eight have a volume of up to 50 litres (R 90) and two a volume of up to 75 litres (R 90C). The machines are operated via a touch panel where the entire process is clearly displayed. APO uses a new low-pressure plasma machine for pre-treating the parts which has led to a significant reduction in process times and in the cost of processing components, in particular seals.

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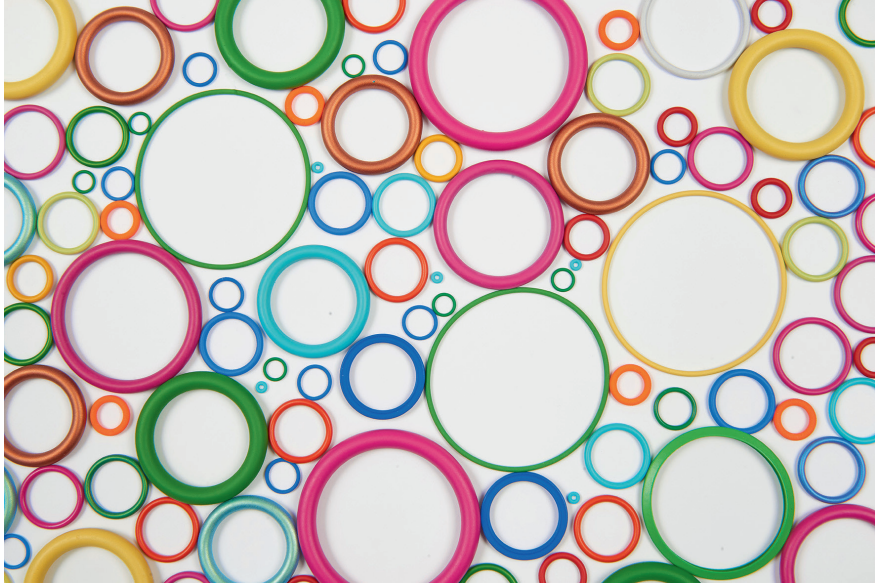
The contract coating company processes around one billion small parts per year.

Part of an integrated production process

The machines are connected to the plant's central computer and fully integrated into the production control system. The formulations and other process parameters, such as the flow rate of the coating material and the spray pattern of the automated guns, can be stored and automatically assigned to individual orders. This results in a high level of reproducibility from batch to batch. All the information about the current status of production is available throughout the plant and can be accessed from any location on a tablet or smartphone. The shift managers monitor the machines, but only



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Because of the growing use of water-based paints, the drum coating machine has been developed to enable it to coat parts made from plastic as well as those made from metal.

have to intervene if something unexpected happens, such as a spray gun becoming blocked.

Fast drying during the coating process

When new parts arrive, APO initially holds test runs to identify the process parameters, such as the air volume and temperature, the quantity of paint, the ideal number of parts per batch and the drum rotation speed and angle. During the coating process, filtered, pre-heated air is fed into the spray drum. It heats the small parts to the right temperature for the material, the shape and type of parts and the paint. The temperature of the components is constantly measured by an infrared sensor and the heating of the intake air is adjusted accordingly. As a result, the coating material bonds closely with the substrate and dries during the process.

The HVLP spray systems used in the Rotamats produce very little spray mist or overspray. A sensor and an electropneumatic valve on the spray gun regulate the

Ten drum coating machines are in use in the new factory building.

flow rate of the coating precisely. This ensures that the required amount of coating material always reaches the parts within the specified time period. The result is an evenly coated surface, a consistent coating thickness and a durable coating with a long service life.

If required, the machines can be equipped with two spray systems. This is useful, for example, if one type of part needs to be coated with two different paints, such as primer and top coat, in the same drum.

Intense cooling increases output

Some paints and coatings require the parts to be cooled quickly or even instantly after the application process. For this reason, the new machines are equipped with a bypass system for the intake air

Inspecting the parts after the coating process.

which circumvents the heating unit immediately after spraying and feeds ambient air into the drum. This allows the parts to cool quickly. As a result, they do not stick together and leave the machine separately. This leads to a higher output of very good quality parts.
In the enclosed drum of the Rotamat, the parts are coated at a slight, adjustable negative pressure, which prevents hazardous gases that could cause harm to health from escaping into the atmosphere. Every Rotamat is supplied with a four-stage exhaust air cleaning system consisting of a cardboard labyrinth filter, a filter mat and two bag filters. This means that the machines produce minimal emissions.

Robust and low-maintenance

The Rotamats process APO's entire range of products, produce a high-quality surface finish, need very little maintenance even in three-shift operation and are highly robust. The company's first machine, which is now 18 years old, is still functioning reliably and will remain in operation.
The replaceable drums of the Rotamats have also proved their worth. They have the flexibility to accommodate different batch sizes and also allow very small quantities to be processed, for example if samples are needed, under conditions that are identical to standard production.
As well as the high quality and reliability of the Rotamats, their cost also plays a decisive role. Because of their low total cost of ownership, applying coatings with the Rotamats is so cost-effective that APO can remain competitive on the international market. //

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