

Automated machine for maximum throughput

Cleaning marathon

At an automobile supplier, small parts for car seats are cleaned and degreased in high quantities. In the process, the highest demands on the degree of cleanness have to be met. These goals were only able to be achieved with a cleaning machine optimised for throughput.

At the automobile supplier, steel parts for car seats, which arrive as loose parts in baskets with a high packing density, need to be cleaned and degreased. The crucial point is: there are very high demands as regards amount of residue, as the subsequent hardening process requires a certain level of cleanness of the parts. At the same time, the throughput has to be four baskets of 650 kilograms of parts to be cleaned each hour. In the hard practical reality, this quickly becomes up to three tonnes per hour.

"With standard solutions, there is no way that such user requirements can be fulfilled. Therefore, we recommended to the customer a special machine with automated loading to cope with this very demanding task and got the decision to build the machine" explains Wolfgang Müller managing partner of the cleaning machine manufacturer, Emo.



A portal with a special gripper places the basket on the feed conveyor for the machine, installed at a height of around 1.5 metres



The parts are cleaned in 850 x 600 x 750 millimetre baskets as tightly packed loose material



The parts are given an initial clean and degrease in the machine with liquid Perchloroethylen and then finally degreased with solvent vapour before drying under vacuum

Up to three tonnes of parts to be cleaned per hour

In the meantime, the machine is operational in a 3-shift operation for seven days a week, i.e. 24 hours a day. The special machine operates using the Vaiocs process (Vacuum Assisted Inorganic Organic Cleaning System) with Perchloroethylen as the cleaning medium, but it could also be operated with unchlorinated hydrocarbon cleaners or modified alcohol without any conversion costs.

"We move 850 x 600 x 750 millimetre baskets tightly packed with small parts as loose material into the machine. We can only support the cleaning process with light swivelling of the full baskets as they are open at the top and the parts would fall out if inclined too far. The fact that it manages to clean up to three tonnes of parts in an hour in the best quality under the particularly demanding conditions speaks for the performance of the machine technology" according to Karl Trautz, Project Manager at Emo.

In the first step in the machine there is a general cleaning and degreasing with liquid Perchloroethylen after which solvent vapour is used to remove the remaining grease and finally dried quickly and without residues under vacuum. The increased temperature level and the high solvent quality provided by the permanent distillation provide the best cleaning and degreasing results.

Highlight: the automatic loading

In order to be able to ensure the high throughput of the eleven metre long and five metre wide machine, the machine manufacturer relied on an automatic loading system designed in-house. In the process, the baskets are delivered on the "dirty side" of the machine and fetched on the "clean side" – in between a sophisticated logistics system ensures simple, smooth and fast loading and unloading processes.

In the first step, the machine operator moves a basket into the loading station of the loading system. As each basket has a so-called floor roller, this task can be achieved simply and conveniently. At this position, a portal lifts the basket from the floor roller using a special gripper and places the heavy load on the feed conveyor of the machine situated at a height of around 1.5 metres. From here, the basket automatically enters the treatment chamber.

While the cleaning steps are running in the machine, the portal moves back to the "dirty side" of the machine, grips the floor roller left there and places this on a chain conveyor, which transports the floor roller to the "clean side" of the machine, where it waits for the basket with the cleaned parts.

Once the cleaning process is complete, the steel basket moves automatically out of the treatment chamber and reaches the "clean side" of the machine via a roller conveyor. Here the portal accepts it and places it back on the waiting floor roller with special grippers.

"Only because of the well-thought-out overall concept for this machine with automatic loading has it been possible to fulfil the high demands concerning throughput and cleaning quality", sums up Karl Trautz.

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