

Savings potential of powder coating through inline coating thickness measurement in the field test

Over 25% powder coating savings with a visible improvement in surface quality.

Application video: CoatMaster determines powder layer thickness before curing
[www.youtube.com/watch?v=0n"2plvKels](http://www.youtube.com/watch?v=0n)

Over the last year of production, Ernst Schweizer AG has been relying on non-contact coating thickness measurement from Winterthur. The main features of the modernised plant are, in particular, a visible improvement in surface quality, the prevention of rejects and a savings potential of more than 25%. Training hours for new employees were also significantly reduced.

Ernst Schweizer AG, based in Hedingen, Switzerland, is a metal construction company with products in the fields of façades, wood/metal systems, windows and mailboxes as well as solar energy systems. The independent family business employs over 500 people today, including 45 apprentices. It operates two powder coating plants of the Wagner company.

Powder coatings are becoming increasingly important from an ecological and economic perspective. In the long term, further growth in favour of powder coatings is to be expected. In the case of powder coatings, the freedom from solvents and the high degree of material utilisation, which results from the recyclability of powder coatings, are particularly advantageous. Powder coatings also have excellent mechanical properties, which are lost, however, due to a decreasing elasticity at higher layer thicknesses.

Rising costs for powder coatings are the result of a constant shortage of raw materials and a growing bureaucratic burden of proof in the paint manufacturing industry. The goal must therefore be an efficient use of powder coatings, which is synonymous with the lowest possible coating thickness. As a result, the economic efficiency of a plant as well as the sustainable use of raw materials can be taken into account.

For micrometer-precision application of powder coatings, the coating thickness measurement must be carried out immediately after the coating process. Conventional measuring methods, which determine the layer thickness after the curing process, are therefore out of the question. For coating thickness measurement in the current production, the measuring system must meet prerequisites such as a large measuring distance and a high tilt- and spacing tolerance. The measuring system must be simple and reliable in operation and may not pose any hazard to employees.

After extensive series of tests with ultrasound- and laser-based measuring devices, the decision was made to opt for a CoatMaster measuring system from Winterthur Instruments. For non-contact coating thickness measurement immediately after powder coating, the measuring system was installed 2 metres from the powder coating plant. It traverses via a vertical axis over a distance of 2 metres and maps the layer thickness distribution using the height of the product carrier. The results of the coating thickness measurement are graphically displayed on a monitor immediately next to the plant control system. The plant operator receives quantitative and immediate feedback on

changes in the process parameters and can therefore reduce layer thickness to the lower tolerance threshold selectively and without any risk.

To compare the savings, the powder consumption per square meter was determined without contact-free coating thickness measurement. From the beginning of 2014 to the end of 2015, 138 grams per square meter were used. From the installation of the CoatMaster measuring system in early May 2015 until the end of April 2016, a powder consumption of 99 grams per square meter was determined. This corresponds to a 28% reduction in powder material and a return of investment of just under 10 months. Thus, the expectations of the savings potential of powder coating were exceeded significantly. The savings achieved by avoiding faulty coatings and time-consuming reworking have not yet been included in this calculation. In addition, run-in times of the plants for changing colour or components and training times for new employees at the plant could be significantly reduced. End customers appreciate the optimal visual appearance as a result of a uniform coating application as well as the continuous quality control.

By modernising in a difficult market environment, Ernst Schweizer AG has created economic and ecological added value and thus positioned itself clearly against the competition and with respect to the environment. The second powder coating plant is also currently being equipped with a measuring system from Winterthur.



coatmaster: the non-contact inline coating thickness measuring instrument from Winterthur Instruments