



Rough Environments don't impress Wipotec Weigh Cells!

Weighing kit as space-saving alternative to a checkweigher

Weight checks in industrial production lines are usually carried out by checkweighers. However, there is a space-saving and cost-efficient alternative, which is increasingly applied - the weighing kit. It comprises a Weigh Cell with an integrated weighing conveyor and can optionally be supplemented with an infeed and outfeed conveyor. Of course, the integration of a weighing kit depends on the customer's requirements and on the existing production environment.

For more than 15 years GKN Sinter Metals has applied checkweighers and more than a year ago the first Wipotec weighing kits were installed. Checkweighers and weighing kits both work effectively and successfully and handle the prevailing rough conditions of the production environment perfectly.

▶ **Wipotec GmbH**
Adam-Hoffmann-Str. 26 | 67657 Kaiserslautern | Germany
T +49.631.34146-0 | F +49.631.34146-8690
info@wipotec.com | www.wipotec.com

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W Ä G E T E C H N I K



Company GKN Sinter Metals



Weighing kit determining the weight of a sintered part



Communication with the S7 control system



A robot arm works hand in hand with the weighing kit

Application report sintered parts

GKN Sinter Metals is a wholly-owned subsidiary of GKN plc and is the world's leading supplier of sintered parts. With a staff of more than 7,000 at 30 sites on five continents the company provides its customers with cutting-edge sintering technology all over the world. GKN Sinter Metals manufactures sintered precision parts for applications in engines, transmissions, car bodies and chassis and supplies the automotive industry as well as the markets for machine parts and consumer goods.

Wipotec weighing systems play an important role in the manufacturing process of sintered parts and they are crucial for the quality control of the components, which are only released for the subsequent processing if they comply to the highest precision standards - and a weight check is, among other tests, a determining factor.

Precise sintered parts due to reliable weight checks

In the area of Radevormwald GKN manufactures a total of more than 4,500 different parts, in every car 80 to 100 of these parts can be found. Each individual sintered part is pressed from finest metal powder. This process takes only a few seconds but it creates a sophisticated, filigree product.

In the powder forge GKN Hückeswagen components with high tensile strength are manufactured in 24-hour shift work. These include synchronizing rings and connecting rods for customers such as Sapura, Volvo, ZF Friedrichshafen and Scania.

A production line for sinter-forged parts comprises a powder press, a sintering furnace and a forging press. Amidst these very large and robust machines the specially designed weighing kit with dustproof components is integrated and determines the precise weight of each manufactured part.

Manufacturing of quality components

After the pressing process a robot arm gently picks up the parts and places them on the weighing system. In this step, a precise transfer is crucial as the fragile parts can break easily. Piece by piece the weighing system - consisting of a Weigh Cell and a weighing conveyor - checks each individual pressed part, the so-called green body.

Determining the weight takes only fractions of a second and the throughput amounts to 6 to 8 pieces per minute. Vibrations in the production environment, caused by the press in close proximity, are suppressed by the electronic Active Vibration Compensation (AVC). In spite of the rough ambient conditions the weights are determined with a precision in the milligramme range.

The classification in good and rejected products is performed by a connected Siemens S7 control system. Parts with incorrect weight are separated safely by a customer-provided rejection mechanism.

Furthermore, the weighing system is connected to the filling quantity control system via interfaces and can influence it. In case the weighed sintered parts are to lightweight, the weighing system communicates with the powder press.

Consequently, the powder press adjusts the filling quantities for the individual sections accordingly to bring the total weight back into the tolerance range. „For us, this weighing system is an absolutely reliable and precise instrument, which has reached the break-even point after a very short time span. In our production line it has quickly become a part we cannot imagine to do without,“ says production manager Manfred Lerbs. „That's why we apply Wipotec weighing systems to weigh connecting rods at other sites, too.“

After the weight check the approved parts are brought to the sintering furnace where they are sintered at a temperature of 1120° Celsius.

In a conventional sintering process, the parts are cooled down to room temperature after sintering. However, the forge-sintering method uses the sintering heat. A robot arm picks up the hot part and feeds it into the forging press. The forging process increases the density and thus the strength compared to conventional sintered parts. At last, after a final quality check, the sintered parts are ready to be shipped to the end customers, the automotive industry.

The weighing kit is an obvious alternative to a checkweigher, as often the necessary space for the integration of a checkweigher into a production line is lacking. The weighing kit is a compact and cost-efficient unit comprising a Weigh Cell and a weighing conveyor which can be integrated easily and fast, mechanically as well as electronically. Depending on the type of control system verifiable applications as well as high-throughput applications can be implemented. Furthermore, a direct inter-connection to the machine control system via a range of interfaces is possible.

► Press relations

Wipotec GmbH

Sandra Hubach

T +49.631.34146-8266

F +49.631.34146-8694

sandra.hubach@wipotec.com