

Industry: Plastics
Customer: PVC producing company in Germany

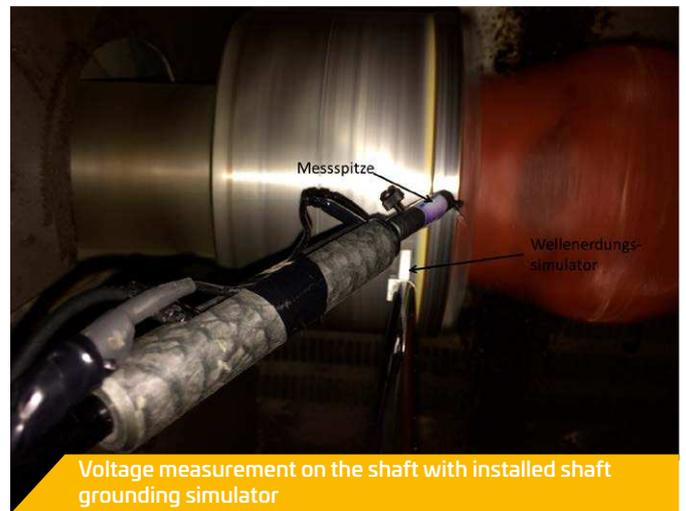
▶ Shaft-Voltage measurement in the plastics industry in Germany

▶ Case description:

The customer was complaining about failures of the crosslinks in a powertrain of a stirrer. Besides the possibility that through changing viscosities of the substrates, different and too high torques are applied to the cardan shaft, another hypothesis could not be ruled out: damages by electric currents caused by shaft voltages. Shaft voltages can build up on electric motors that are controlled by variable frequency drives. VFD's are widely used because of their energy saving potential.

In order to examine the problem in detail and to reduce the service costs, using the method of elimination, a shaft voltage measurement was carried out over a complete duty cycle of the stirrer powertrain.

Off-Highway Powertrain Services (OHP Services) uses specialized measurement equipment for this task. After the measurement and a careful analysis of the measurement data the hypothesis of high shaft voltages could be eliminated. The problem of the crosslink failures was further in-



Voltage measurement on the shaft with installed shaft grounding simulator

vestigated by a torque measurement. It was found that the type of cardan shaft used are not the most suitable for the specific operational conditions. The customer was advised to use another cardan shaft, specified by OHP Services, to prevent future outages.

▶ Technology snapshot:

For measuring the shaft voltages a digital oscilloscope with special probes and a grounding-ring-simulator is used. At first the voltage trend is measured on the shaft to check if there are voltages and how they build up during the use of the machine. In a second measurement the grounding ring-simulator is mounted on the shaft to check the effectiveness of the shaft grounding.



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► **Challenge:**

- Cost effective identification of the root cause of the customers problem
- Root-Cause analysis during running production
- Analysis and permanent solution of the problem by a structured process of elimination

► **Solution:**

- In this case problems due to electric currents could be ruled out by a shaft-voltage measurement
- After ruling out this cause, the problem was found with a torque measurement by OHP Services
- The customer could optimize the service life of his plant by following the advice given by OHP Services

► **Customer Value:**

- Due to the targeted analysis the investigation of the customers problems was extremely cost effective
- With OHP Services's experience in shaft voltage measurement the problem is analyzed precisely. In addition OHP Services provides a practical solution of the problem once the analysis is completed.
- The budget friendly shaft voltage measurement is the first logical step in the root cause analysis and can help to avoid more cost intensive torque or vibration measurements
- Due to the structured approach the cause of the failures could be precisely identified. With a redesigned cardan shaft the usual uptime of the production plant could again be achieved. By avoiding regular shaft replacements, that were previously required, the production costs could be lowered.

► **What is special?**

- By the trusted systematic approach of the OHP Services the root cause was found in a very cost effective way using a technical elimination process. In comparison to the economic benefits after the solution of the problem the cost for a preliminary shaft voltage measurement is negligible

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Off-Highway Powertrain Services collaborates with manufacturers and logistics partners worldwide: benefit from our extensive network. By means of our Service Parts Availability Module, you can define which part are to be available, and how quickly they can be delivered to your location – regardless of manufacturers. We also offer customized spare parts to our clients on stock.

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This case study is exemplary only. Any and all information, data, values, products, procedures etc. which are mentioned in this case study vary from case to case and can be different. For calculation pertaining to your business, please refer to a Off-Highway Powertrain Services employee.



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