

Focus on IFA's work

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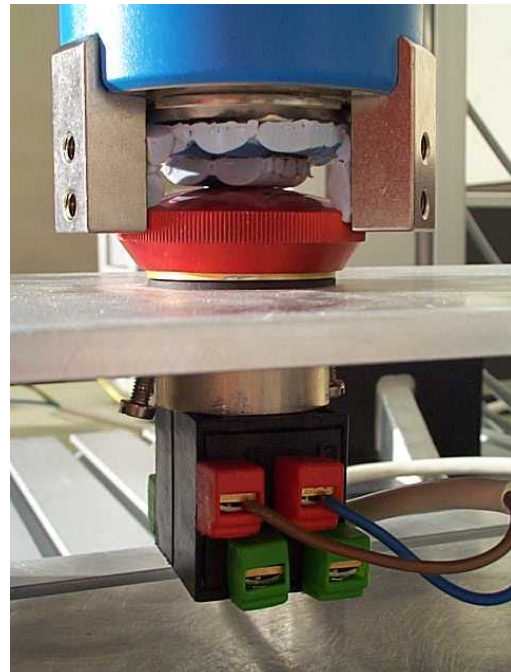
Durability tests of electromechanical safety components

Problem

Hazardous places on machinery are often protected with safety doors whose positions are detected by position switches. When the safety doors are opened, hazardous machine movements are prevented. Position switches are generally electromechanical safety components that produce electrical signals when activated. These also include emergency stop devices that are activated manually in case of an accident or hazard, sending a signal to shut down a machine movement.

The testing and technical safety evaluation of electromechanical safety components was done according to BG testing principles and to DIN standards or VDE guidelines. In the framework of these tests, the components were tested against electrical shock and special safety requirements, such as positive opening operation and the duration of the mechanical durability evaluated.

The aim of the mechanical durability test was to prove that the electromechanical safety component has sufficient resistance to wear and tear. Any wear that is exhibited within the durability given by the manufacturer must not have any negative impact on the safety functions. For position switches, this means no errors should arise during activation by at least 10^6 operation cycles and that the safety requirements must still be fulfilled after this load is successfully handled.



Equipment for testing the mechanical life cycle of an emergency stop device

Activities

The most modern equipment was set up at IFA for testing the mechanical durability of these components.

Results and Application

The automatic testing equipment was built so that it could model the activation of the tested devices

in the best possible practical manner and so that it could be quickly modified to fit the most common uses of the tested object. The use of this equipment allows the technical safety requirements for the mechanical durability to be tested in a way that is reproducible.

The test results form a reliable basis for the technical safety evaluation of electromechanical safety components.

Area of Application

Manufacturers of electromechanical safety components, testing bodies of the German Statutory Accident Insurance Institutions

Additional Information

- Zusatzanforderungen für die Prüfung und Zertifizierung von elektrischen Not-Aus-Geräten mit mechanischer Verrastfunktion (GS-ET-08, 03.13). Hrsg.: Fachbereich ETEM, Prüf- und Zertifizierungsstelle Elektrotechnik im DGUV Test, Köln 2013
- Principles of testing and certification for positively opening position switches (GS-ET-15, 02.11). Published by: Expert committee for electrical engineering, Testing and certification facility in DGUV Test, Cologne 2011
- Grundsätze für die Prüfung und Zertifizierung von Verriegelungseinrichtungen mit elektromagnetischen Zuhaltungen (GS-ET-19, 02.11). Hrsg.: Fachausschuss Elektrotechnik, Prüf- und Zertifizierungsstelle im DGUV Test, Köln 2011

- DIN EN 60947-5-5 (VDE 0660 Teil 210): Niederspannungsschaltgeräte. Teil 5-5: Steuergeräte und Schaltelemente, Elektrisches NOT-AUS-Gerät mit mechanischer Verrastfunktion (11.05). Beuth, Berlin 2005

Expert Assistance

IFA, Division 5: Accident prevention – Product safety

Literature Requests

IFA, Central Division