

Focus on IFA's work

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Fire extinguishing control systems with integral safety functions

Problem

Mineral oil-based cooling lubricants are commonly used in the chip-forming machining of metals. Their function is to cool the workpiece by reducing the heat generated by friction. The flammability of these substances increases the risk of fire, which is usually averted by fire extinguishing systems integrated into the machine tools.

Gaseous fire extinguishing agents which displace the oxygen, such as carbon dioxide (CO₂) or argon, are used to extinguish fires. These gases may present an additional hazard to machine operators, particularly if the door to the machining zone is opened whilst a fire is being extinguished.

In order to avert this and other risks, the current version of EN ISO 19353 (Safety of machinery – Fire prevention and fire protection) defines safety functions which, for example, prevent the extinguishing process from being initiated when guard locking of the door to the machining zone is not activated, or maintain guard locking as long as extinguishing is in progress.

Stationary fire extinguishing systems which have the function not only of protecting machinery, but also of ensuring the safety of persons, must be treated as safety components. Like the machines on which they are used, they fall within the scope of the Machinery Directive 2006/42/EG. EN ISO 13849-1 should be applied for evaluation of the safety technology by which the safety functions are implemented, specifically:

1. Extinguishing system control
2. Manual initiation of extinguishing
3. Optical and acoustic alarms
4. Optical sensors (ultraviolet or infrared)
5. Temperature sensors
6. Extinguishing agent reservoirs with automatic initiation of extinguishing
- 7./8. CO₂ extinguishing jets
9. Pressure relief devices



Image: Kraft & Bauer

A product standard defining requirements for the controls of fire extinguishing systems on machine tools does not exist at the present time.

Activities

Together with the Machinery, robotics and production automation subcommittee of the Woodworking and metalworking expert committee and in consultation with manufacturers of fire extinguishing systems, the IFA prepared a DGUV information sheet provisionally setting out the requirements to be met by control systems for extinguishing systems used in metal machining (FB HM-087).

The DGUV information sheet also contains practical examples. These were produced by the IFA in cooperation with manufacturers with reference to real-case applications.

Results and use

In order to permit conformity assessment of fire extinguishing systems intended for the European market, the IFA has now also drawn up guidelines for the testing and certification of controls for fire extinguishing systems (GS-IFA-M22). The guidelines take account of various standards concerning protection against fire on machinery and observations made in the testing of safety switchgear.

The requirements set out in the guidelines enable manufacturers to develop fire extinguishing systems in compliance with the Machinery Directive. At the same time, they form the basis for current and future type examinations.

User group

Manufacturers of fire extinguishing systems and machine tools, OSH professionals, German Social Accident Insurance Institutions, labour inspectorates

Further information

- EN ISO 19353: Safety of machinery – Fire prevention and fire protection
- EN ISO 13849-1: Safety of machinery – Safety-related parts of control systems – Part 1: General principles for design

Technical enquiries

IFA, Division 5: Accident Prevention – Product Safety

Literature enquiries

IFA, Central Division