ISO 19353:2019 (E)

Safety of machinery — Fire prevention and fire protection

Contents

Foreword

Introduction

1 Scope

2 Normative references

3 Terms and definitions

4 Fire hazards

4.1 General
4.2 Combustible materials
4.3 Oxidizers
4.4 Ignition sources

5 Strategy for fire risk assessment and risk reduction

5.1 General
5.2 Determination of the limits of the machinery
5.3 Identification of fire hazards
5.4 Risk estimation
5.5 Risk evaluation
5.6 Risk reduction
5.6.1 General
5.6.2 Inherently safe design measures
5.6.3 Safeguarding
5.6.4 Complementary protective measures
5.6.4.1 General
5.6.4.2 Integrated fire detection and fire suppression systems
5.6.4.3 Further complementary protective measures

6 Procedure for the selection of complementary protective measures

6.1 General
6.1.1 Use of the procedure
6.1.2 Determination of the residual risk level
6.1.3 Specification of requirements for the choice of fire detection and fire suppression system
6.1.4 Specification of safety and performance requirements
6.1.5 Selection of system parts and suitable fire-extinguishing agent
6.1.6 Decision on the need for further complementary protective measures
6.1.7 Validation
6.2 Selection of the fire prevention and protection system in relation to the expected risk level
6.2.1 General
6.2.2 Injury to persons
6.2.3 Safety considerations
6.2.4 Selection of system parts
6.2.5 Selection of fire-extinguishing agent
6.2.6 Validation

7 Information for use

Annex A (informative) Examples of machines and their typical fire-related hazards

Annex B (informative) Example of a methodology for selecting and qualifying a fire detection and fire suppression system

B.1 General
B.2 Basic understanding of the fire event
B.3 Fire detection method
B.3.1 Pre-fire detection possibilities
B.3.2 Fire detection possibilities
B.4 Fire suppression method
B.4.1 Suppression possibilities
B.4.2 Isolation
B.5 System integration in conjunction with selection of fire detection and fire suppression method
B.6 Example for application of the methodology

Annex C (informative) Example for the design of a fire suppression system integrated in machinery

Annex D (informative) Examples of ignition sources

D.1 Heat energy
D.2 Electrical energy
D.3 Mechanical energy
D.4 Chemical energy

Annex E (informative) Example for the risk assessment and risk reduction of a machining centre for the machining of metallic materials

E.1 General
E.2 Operating conditions
E.3 Risk assessment and risk reduction
E.3.1 General
E.3.2 Selection of non-water-miscible metalworking fluids
E.3.3 Processed material
E.3.4 Ignition sources
E.3.5 Hazards
E.3.6 Risk estimation and risk evaluation
E.3.7 Inherently safe design measures
E.3.7.1 Hot surfaces and other ignition sources
E.3.7.1.1 Cooling by use of metalworking fluid
E.3.7.1.2 Monitoring of the metalworking fluid supply and tool wear
E.3.7.2 Chip removal
E.3.8 Safeguarding
E.3.8.1 Machining centre
E.3.8.1.1 Enclosure of the working area
E.3.8.1.2 Labyrinth sealings against flame ejection from the machine
E.3.8.2 Extraction system
E.3.8.2.1 General
E.3.8.2.2 Avoidance of flames entering the ducting / extraction system
E.3.8.3 Pressure relief devices
E.3.9 Complementary protective measures for fire prevention and protection
E.3.9.1 General
E.3.9.2 Determination of the residual risk level
E.3.9.3 Selection of fire detection and fire suppression system
E.3.9.4 Application of safety functions and performance requirements
E.3.9.5 Selection of system parts and suitable fire-extinguishing agents
E.3.9.5.1 Fire detection sensors
E.3.9.5.2 Extinguishing agent
E.3.9.5.3 Placement of extinguishing nozzles
E.3.9.5.4 Control system of the fire detection and fire suppression system
E.3.9.5.5 Additional system parts
E.3.9.6 Further complementary protective measures
E.3.9.7 Validation
E.3.10 Information for use

Page count: 49