

ISO 21524:2021 (E)

Fire resistance tests — Elements of building construction — Requirements for active fire curtains

Contents

| | |
|-------|---|
| | Foreword |
| | Introduction |
| 1 | Scope |
| 2 | Normative references |
| 3 | Terms and definitions |
| 4 | Symbols |
| 5 | Requirements |
| 5.1 | General |
| 5.2 | Side retention |
| 5.3 | Additional requirements for multiple active fire curtains |
| 5.3.1 | Multiple active fire curtains |
| 5.3.2 | Required overlap |
| 5.3.3 | Larger than tested |
| 5.4 | Horizontal or angled |
| 5.5 | Pass door(s) |
| 5.6 | Vision panels |
| 6 | Sampling |
| 6.1 | Test samples, testing and conformance criteria |
| 7 | Test methods |
| 7.1 | General |
| 7.2 | Durability and force gauge |
| 7.3 | Reliability and durability |
| 7.4 | Deployment |
| 7.4.1 | Response time and velocity |
| 7.4.2 | Delayed and/or multi-positional deployment |
| 7.4.3 | Emergency egress control |
| 7.4.4 | Emergency access control |
| 7.5 | Smoke leakage |
| 7.5.1 | General |
| 7.5.2 | Total smoke leakage of active fire curtains with smoke-resistance |
| 7.6 | Fire resistance |
| 7.6.1 | General |
| 7.6.2 | Integrity |
| 7.6.3 | Insulation |
| 7.6.4 | Radiation (heat flux) |
| 7.6.5 | Deflection zone |
| 7.6.6 | Initial deployment |
| 7.6.7 | Operation following initial deployment — emergency egress |
| 7.6.8 | Operation following initial deployment — emergency access |
| 7.6.9 | Delayed and/or multi-positional deployment |
| 7.7 | Reaction to fire |
| 7.8 | Ancillary devices |
| 7.8.1 | General |
| 7.8.2 | Ancillary devices activation |
| 7.8.3 | Hold-open devices |

- 7.8.4 Fire detection and alarm systems
- 7.8.5 Sensory equipment for obstruction warning
- 7.8.6 Pressure-sensitive protective equipment (PSPE)
- 7.8.7 Self-test facility for dwellings

8 Marking, labelling and packaging

Annex A (normative) General requirements for testing

- A.1 General
- A.2 Test specimens
 - A.2.1 General
 - A.2.2 Specimen 1 and Specimen 2
 - A.2.3 Specimen 3
 - A.2.4 Specimen 4
 - A.2.5 Specimen 5
 - A.2.6 Specimen 6
 - A.2.7 Specimen 7
 - A.2.8 Specimen 8
 - A.2.9 Specimen 9
- A.3 Test report

Annex B (normative) Order of testing

Annex C (normative) Fire-resistance test method

- C.1 Test equipment — Test conditions
- C.2 Test specimen
 - C.2.1 Size
 - C.2.2 Number
 - C.2.3 Design
 - C.2.4 Installation of test specimen
 - C.2.5 Asymmetrical active fire curtains
 - C.2.6 Supporting construction
 - C.2.6.1 General
 - C.2.6.2 Standard supporting construction
 - C.2.6.3 Rigid standard supporting constructions (high or low density)
 - C.2.6.4 Flexible standard supporting constructions
 - C.2.6.5 Erection of standard-supporting and associated supporting constructions
 - C.2.6.6 Associated supporting constructions
- C.3 Integrity
 - C.3.1 General
 - C.3.1.1 Introduction
 - C.3.1.2 Cotton pad
 - C.3.1.3 Gap gauges
 - C.3.1.4 Flaming
 - C.3.1.5 Behaviour
 - C.3.1.6 Pressure
 - C.3.1.7 Deflection
 - C.3.2 Radiation
 - C.3.2.1 Introduction
 - C.3.2.2 General
 - C.3.2.3 Apparatus
- C.4 Test procedure
 - C.4.1 Pre-test examination and preparation
 - C.4.1.1 General
 - C.4.2 Gap measurements
 - C.4.3 Retention force measurements
 - C.4.4 Final setting
- C.5 Fire test
 - C.5.1 General
 - C.5.2 Integrity
 - C.5.3 Insulation
 - C.5.4 Radiation
- C.6 Field of direct application of test results
 - C.6.1 General

- C.6.2 Materials and construction
- C.6.3 General
- C.6.3.1 Introduction
- C.6.3.2 Specific restrictions on materials and construction
- C.6.4 Fixings
- C.6.5 Additional test requirements
- C.7 Acceptance

Annex D (normative) Overlapping multiple active fire curtains

- D.1 Introduction
- D.2 Symbols
- D.3 Calculation
- D.4 Example for increasing overlapping systems

Annex E (normative) Test method for active fire curtains reliability and response time and the durability of materials

- E.1 Principle
- E.2 Test specimen
- E.3 Apparatus
- E.3.1 Gap gauges
- E.3.2 C.3.1.2 applies.
- E.4 Method
- E.4.1 General
- E.4.2 Procedure for proving 'open' circuit gravity fail-safe (see Figure E.1)
- E.4.3 Procedure for proving 'short' circuit gravity fail-safe (see Figure E.2)
- E.5 Test results
- E.6 Test report

Annex F (normative) Test method for reliability of motor operation at elevated temperatures

- F.1 Principle
- F.2 Materials
- F.3 Apparatus
- F.4 Procedure
- F.4.1 Furnace testing of motor(s)

Annex G (normative) Calculation of ambient temperature smoke leakage

- G.1 Symbols
- G.2 Calculations
- G.3 Calculation of results
- G.3.1 General
- G.3.2 Calculation for other sizes of specimen, based on 2,3 m × 2,1 m test results

Annex H (normative) Test method for the durability and reliability of alternative or additional motors

- H.1 Test specimen
- H.2 Apparatus
- H.3 Procedure
- H.4 Test results

Annex I (normative) Test method for ancillary and optional equipment

- I.1 Introduction
- I.2 Test specimen
- I.3 Procedure
- I.4 Obstruction warning devices
- I.4.1 Single beam detectors
- I.4.2 Multi-beam detector
- I.5 Pressure-sensitive equipment
- I.6 Activation devices
- I.6.1 Fire alarm
- I.6.2 Smoke detector
- I.6.3 Heat detector
- I.6.4 Short circuit of smoke and heat detectors
- I.6.5 Secondary power supply
- I.6.6 Delayed and/or multi-positional deployment
- I.7 Emergency egress control

- I.7.1 General
- I.7.2 Emergency egress failure (short circuit)
- I.7.3 Emergency egress failure (fire damage)
- I.8 Emergency access control
- I.8.1 General
- I.8.2 Emergency access failure (short circuit)
- I.8.3 Emergency access failure (fire damage)
- I.8.4 Self-test device
- I.9 Test results
- I.10 Test report

Annex J (normative) Test method for durability and force gauge

- J.1 Introduction
- J.2 General
- J.3 Apparatus
- J.4 Procedure
- J.5 Performance criteria
- J.6 Test report

Annex K (informative) Typical product performance summary

Annex L (normative) System design

- L.1 Introduction
- L.2 Active fire curtains selection
- L.3 Selection of active fire curtains
 - L.3.1 Operational performance
 - L.3.2 Initiation of deployment
 - L.3.3 Method of deployment
 - L.3.4 Active fire curtains crossing access/egress routes
 - L.3.4.1 Introduction
 - L.3.4.2 General
 - L.3.4.3 Emergency egress controls
 - L.3.4.4 Emergency access controls
 - L.3.4.5 Overlapped active fire curtains
 - L.3.4.6 Overlapped active fire curtains on the side of a protected route
 - L.3.5 Warning systems
 - L.3.5.1 Deployment warning
 - L.3.5.2 Obstruction warning
- L.4 Fire resistance
 - L.4.1 General
 - L.4.2 Radiation and tenability
 - L.4.2.1 General
 - L.4.2.2 Simplified approach for horizontal routes in dwellings
- L.5 Power supplies
 - L.5.1 General
 - L.5.2 Electrical
 - L.5.3 Secondary power supplies

Annex M (informative) Installation

- M.1 General
- M.2 Side retention
- M.3 Support systems for active fire curtains
- M.4 Ancillary devices

Annex N (informative) Commissioning

- N.1 General
- N.2 Commissioning of ancillary devices
 - N.2.1 Initiating equipment
 - N.2.2 Operational equipment
 - N.2.3 Obstruction warning
 - N.2.4 Self-test facility

Annex O (informative) Inspection, testing and maintenance

- O.1 General

- O.2 Inspection and testing
- O.3 Maintenance
- O.3.1 General
- O.3.2 Replacement of smoke seals

Annex P (informative) Typical approving authority pre-installation checklist

Annex Q (informative) An engineered approach to using radiative heat flux for tenable conditions for single-level horizontal routes

- Q.1 Symbols
- Q.2 Guidance on the determination of the acceptability of active fire curtains in terms of radiative heat flux received by escaping occupants
- Q.3 Notes on the background to the development of Table Q.1 and Table Q.2
- Q.4 How to use Table Q.1 and Table Q.2
- Q.5 Assumptions and limitations of Table Q.1 and Table Q.2
- Q.6 Working example of the methodology
- Q.6.1 General
- Q.6.2 Site geometry
- Q.6.3 Human factors
- Q.6.4 Product data
- Q.6.5 Evaluating the radiative heat flux using the tables provided
- Q.7 Mathematical background
- Q.7.1 General
- Q.7.2 Radiative heat flux
- Q.7.3 Configuration factor
- Q.7.4 Thermal dose unit (TDU)

Annex R (informative) Yarns and fabric materials

Annex S (informative) Typical installation checklist

Annex T (informative) Model installation certificate

Annex U (informative) Typical inspection checklist

Annex V (informative) Model commissioning certificate

Annex W (informative) Model completion certificate

Annex X (informative) Model servicing certificate

Page count: 114