ISO/TS 16733-2:2021 (E)

Fire safety engineering — Selection of design fire scenarios and design fires — Part 2: Design fires

Contents

Foreword

Introduction

1 Scope

2 Normative references

3 Terms and definitions

4 Symbols

5 The role of design fires in fire safety design

6 Considerations based on methods of analysis

7 Elements of a design fire

- 7.1 General
- 7.2 Incipient stage
- 7.3 Growth stage
- 7.4 Flashover
- 7.5 Fully developed stage
- 7.6 Events that change a design fire
- 7.6.1 General
- 7.6.2 Suppression systems
- 7.6.3 Intervention by fire services
- 7.6.4 Changes in ventilation
- 7.6.5 Enclosure effects
- 7.6.6 Combustible construction materials
- 7.7 Extinction and decay stage

8 Constructing a design fire curve

- 8.1 Procedure
- 8.2 Step 1 — Parameters provided by the design fire scenario
- 8.3 Step 2 — Fires involving single or multiple fuels
- 8.3.1 General
- 8.3.2 Develop the design fire curve for first item
- 8.3.3 Ignition of other items
- 8.3.4 Power law design fire curves
- 8.3.5 Wall and ceiling linings
- 8.3.6 Smouldering fires
- 8.4 Step 3 — Flashover
- 8.4.1 General
- 8.4.2 Empirical correlations for critical heat release rate for onset of flashover
- 8.5 Step 4 — Maximum heat release rate
- 8.5.1 General
- 8.5.2 Fuel-controlled fires
- 8.5.3 Ventilation-controlled fires
- 8.5.4 Mechanical ventilation
- 8.6 Step 5 — Modifying the design fire curve
- 8.6.1 Suppression systems
- 8.6.2 Fire service intervention
- 8.6.3 Changes in ventilation

8.6.4 Enclosure effects on mass loss rate of fuel
8.7 Step 6 — Fire duration
8.7.1 Duration of the fire growth stage
8.7.2 Duration of the steady burning stage
8.8 Step 7 — Decay

9 Species production

9.1 Species yields

10 Design fires for structural fire engineering

10.1 General
10.2 Localized fires
10.2.1 Flames not impinging the ceiling
10.2.2 Flames impinging the ceiling
10.3 Parametric fires
10.3.1 Heating phase
10.3.2 Heating duration and maximum temperature
10.3.3 Cooling phase
10.4 Fires in large compartments (travelling fires)

11 External design fires

12 Fire tests

13 Probabilistic aspects of design fires

13.1 General
13.2 Inclusion of statistical representativeness/distribution characteristics
13.3 Simulations using distributed input and sampling techniques
13.4 Stochastic models
13.5 Results of probabilistic analysis and their evaluation

14 Documentation

Annex A (informative) Data for development of design fires

A.1 Introduction
A.2 Data for development of design fires

Page count: 52