

ISO/TR 24679-5:2023-07 (E)

Fire safety engineering - Performance of structures in fire - Part 5: Example of a timber building in Canada

Contents		Page
Foreword		iv
Introduction		v
1	Scope	1
2	Normative references	1
3	Terms and definitions	1
4	Design strategy for fire safety of structures	2
4.1	General design process for fire safety of structures	2
4.2	Practical design process for fire safety of structures	2
5	Quantification of the performance of structures in fire	2
5.1	Step 1: Scope of the project for fire safety of structures	2
5.1.1	Built-environment characteristics	2
5.1.2	Fuel loads	6
5.1.3	Mechanical actions	8
5.2	Step 2: Identifying objectives, functional requirements and performance criteria for fire safety of structures	8
5.2.1	Objectives and functional requirements for fire safety of structures	8
5.2.2	Performance criteria for fire safety of structures	9
5.3	Step 3: Trial design plan for fire safety of structures	10
5.4	Step 4: Design fire scenarios and design fires (thermal actions)	10
5.4.1	General	10
5.4.2	Design fire scenarios	11
5.4.3	Design fires (thermal actions)	12
5.5	Step 5: Thermal response of the structure	34
5.5.1	Charring of timber	34
5.5.2	Description of the thermal properties	37
5.5.3	Scenario 3	38
5.5.4	Temperature beyond the char layer	50
5.6	Step 6: Mechanical response of the structure	51
5.6.1	Description of the mechanical properties	52
5.6.2	Scenario 3 - Beam B1	52
5.6.3	Scenario 3 - Column C2	56
5.7	Step 7: Assessment against the fire safety objectives	60
5.7.1	Beam B1	60
5.7.2	Column C2	60
5.8	Documentation of the design for fire safety of structures	61
5.9	Factors and influences to be considered in the quantification process	61
5.9.1	Material properties	61
5.9.2	Effect of continuity and restraint (interaction between elements and materials)	62
5.9.3	Use of test results	62
5.9.4	Fire spread routes	62
6	Guidance on use of engineering methods	62
6.1	Using calculation methods	62
6.2	Using experimental methods	62
6.3	Using engineering judgment	62
Bibliography		64