

ISO/TR 24679-4:2017-08 (E)

Fire safety engineering - Performance of structures in fire - Part 4: Example of a fifteen-storey steel-framed office building

Contents		Page
Foreword		iv
Introduction		v
1	Scope	1
2	Normative references	1
3	Terms and definitions	2
4	Symbols	2
5	Design strategy for fire safety of structures	3
6	Quantification of the performance of structures in fire	3
6.1	General	3
6.2	Step 1: Scope of the project for fire safety of structures	4
6.2.1	Built environment characteristics	4
6.2.2	Fuel load	5
6.2.3	Mechanical actions	6
6.3	Step 2: Identify objectives, functional requirements and performance criteria for fire safety of structures	7
6.4	Step 3: Trial design plan for fire safety of structures	7
6.5	Step 4: Design fire scenarios and design fires	8
6.5.1	Design fire scenarios	8
6.5.2	Design fires (thermal actions)	9
6.6	Step 5: Thermal response of the structure	10
6.6.1	Steel columns and beams	10
6.6.2	Other construction elements	12
6.7	Step 6: Mechanical response of the structure	12
6.7.1	Steel columns	12
6.7.2	Steel beams	13
6.8	Step 7: Assessment against the fire safety objectives	14
6.9	Step 8: Documentation of the design for fire safety of structures	14
6.10	Factors and influences to be considered in the quantification process	15
6.10.1	Thermal properties	15
6.10.2	Mechanical strength of steel material	15
6.10.3	Uncertainty of material properties	15
7	Guidance on use of engineering methods	15
Annex A (informative) Building and framing design		16
Annex B (informative) Fuel and structural load		26
Annex C (informative) Fire temperatures		31
Annex D (informative) Maximum temperature of insulated steel elements		36
Annex E (informative) Critical temperature of steel columns, girders and beams		42
Bibliography		49