

ISO/TR 15657:2013-06 (E)

Fire resistance tests - Guidelines for computational structural fire design

| Contents | | Page |
|--|--|-------------|
| Foreword | | iv |
| Introduction | | v |
| 1 | Scope | 1 |
| 2 | Basic principles | 1 |
| 2.1 | Primary objectives of fire safety design | 1 |
| 2.2 | Performance criteria | 2 |
| 3 | Design process | 4 |
| 3.1 | Fire model | 4 |
| 3.2 | Heat transfer model | 5 |
| 3.3 | Structural model | 6 |
| 3.4 | Combination models | 6 |
| 3.5 | Material properties | 8 |
| 4 | Fire models | 12 |
| 4.1 | Standard (nominal) fires | 12 |
| 4.2 | Natural fires | 14 |
| 4.3 | Numerical simulation of natural fires - Zone models | 16 |
| 4.4 | Heat flux to the structure | 18 |
| 5 | Heat transfer models for temperature calculations | 20 |
| 5.1 | Uniform temperature | 21 |
| 5.2 | Non uniform heating | 28 |
| 5.3 | Time equivalent | 32 |
| 6 | Structural design | 36 |
| 6.1 | Mechanical properties | 36 |
| 6.2 | Thermo physical properties | 51 |
| 6.3 | Thermal properties of structural fire protection | 68 |
| 6.4 | Structural fire design methods | 70 |
| Annex A (informative) National Fire Engineering Codes for Structural Design | | 76 |
| Bibliography | | 77 |