

# DIN EN 1991-1-2:2010-12 (E)

## Eurocode 1: Actions on structures - Part 1-2: General actions - Actions on structures exposed to fire (includes Corrigendum AC :2009)

---

<b>Contents</b>		<b>Page</b>
<b>Section 1 General</b>	.....	<b>10</b>
1.1	Scope	10
1.2	Normative references	10
1.3	Assumptions	11
1.4	Distinction between Principles and Application Rules	11
1.5	Terms and definitions	11
1.5.1	Common terms used in Eurocode Fire parts	11
1.5.2	Special terms relating to design in general	13
1.5.3	Terms relating to thermal actions	13
1.5.4	Terms relating to heat transfer analysis	15
1.6	Symbols	15
<b>Section 2 Structural Fire design procedure</b>	.....	<b>21</b>
2.1	General	21
2.2	Design fire scenario	21
2.3	Design fire	21
2.4	Temperature Analysis	21
2.5	Mechanical Analysis	22
<b>Section 3 Thermal actions for temperature analysis</b>	.....	<b>23</b>
3.1	General rules	23
3.2	Nominal temperature-time curves	24
3.2.1	Standard temperature-time curve	24
3.2.2	External fire curve	24
3.2.3	Hydrocarbon curve	25
3.3	Natural fire models	25
3.3.1	Simplified fire models	25
3.3.1.1	General	25
3.3.1.2	Compartment fires	25
3.3.1.3	Localised fires	26
3.3.2	Advanced fire models	26
<b>Section 4 Mechanical actions for structural analysis</b>	.....	<b>27</b>
4.1	General	27
4.2	Simultaneity of actions	27
4.2.1	Actions from normal temperature design	27
4.2.2	Additional actions	28
4.3	Combination rules for actions	28
4.3.1	General rule	28
4.3.2	Simplified rules	28
4.3.3	Load level	29
<b>Annex A (informative) Parametric temperature-time curves</b>	.....	<b>30</b>
<b>Annex B (informative) Thermal actions for external members - Simplified calculation method</b>	.....	<b>33</b>
B.1	Scope	33

B.2	Conditions of use .....	33
B.3	Effects of wind .....	34
B.3.1	Mode of ventilation .....	34
B.3.2	Flame deflection by wind .....	34
B.4	Characteristics of fire and flames .....	35
B.4.1	No forced draught .....	35
B.4.2	Forced draught .....	37
B.5	Overall configuration factors .....	39
Annex C (informative) Localised fires .....		41
Annex D (informative) Advanced fire models .....		44
D.1	One-zone models .....	44
D.2	Two-zone models .....	45
D.3	Computational fluid dynamic models .....	45
Annex E (informative) Fire load densities .....		46
E.1	General .....	46
E.2	Determination of fire load densities .....	47
E.2.1	General .....	47
E.2.2	Definitions .....	47
E.2.3	Protected fire loads .....	48
E.2.4	Net calorific values .....	48
E.2.5	Fire load classification of occupancies .....	50
E.2.6	Individual assessment of fire load densities .....	50
E.3	Combustion behaviour .....	50
E.4	Rate of heat release Q .....	51
Annex F (informative) Equivalent time of fire exposure .....		53
Annex G (informative) Configuration factor .....		55
G.1	General .....	55
G.2	Shadow effects .....	56
G.3	External members .....	56
Bibliography .....		59