

DIN EN 13381-8:2013-08 (E)

Test methods for determining the contribution to the fire resistance of structural members - Part 8: Applied reactive protection to steel members

Contents		Page
Foreword		4
1	Scope	6
2	Normative references	6
3	Terms and definitions, symbols and units	7
3.1	Terms and definitions	7
3.2	Symbols and units	9
4	Test equipment	11
4.1	General	11
4.2	Furnace	11
4.3	Loading equipment	11
5	Test conditions	11
5.1	General	11
5.2	Support and loading conditions	11
5.3	Loading	12
6	Test specimens	12
6.1	General	12
6.2	Size of test specimens	13
6.3	Construction of steel test specimens	14
6.4	Composition of steel sections	15
6.5	Properties of fire protection materials	15
6.6	Selection of test specimens	16
7	Installation of the test specimens	21
7.1	Loaded beam	21
7.2	Unloaded beams	22
7.3	Loaded columns	22
7.4	Unloaded columns	22
7.5	Test specimen installation patterns	22
7.6	Furnace load	23
8	Conditioning of the test specimens	23
9	Application of instrumentation	23
9.1	General	23
9.2	Instrumentation for measurement and control of furnace temperature	23
9.3	Instrumentation for measurement of steel temperatures	24
9.4	Instrumentation for the measurement of pressure	25
9.5	Instrumentation for the measurement of deformation	25
9.6	Instrumentation for the measurement of load	25
10	Test procedure	26
10.1	General	26
10.2	Furnace temperature and pressure	26
10.3	Application and control of load	26
10.4	Temperature of steelwork	26

10.5	Deflection	27
10.6	Observations	27
10.7	Termination of test	27
11	Test results	27
11.1	Acceptability of test results	27
11.2	Presentation of test results	28
12	Test report	29
13	Assessment	29
13.1	General	29
13.2	Temperature data	30
13.3	Correction for discrepancy in stickability and insulation performance over the thickness range tested	30
13.4	Assessment procedures for thermal performance	30
13.5	Acceptability of the assessment method used and the resulting analysis - criteria for acceptability	30
14	Report of the assessment	31
15	Limits of the applicability of the results of the assessment	32
Annex A (normative) Test method to the smouldering fire (slow heating curve)		49
A.1	Introduction	49
A.2	Test equipment	49
A.3	Test specimens	49
A.4	Termination of test	50
A.5	Evaluation of the results	50
Annex B (normative) Measurement of properties of fire protection materials		51
B.1	Introduction	51
B.2	Thickness of fire protection materials	51
B.3	Identification	52
Annex C (normative) Fixing of thermocouples to steel work and routing of cables		53
C.1	Introduction	53
C.2	Types of thermocouples	53
C.3	Fixing of thermocouples	53
C.4	Routing of thermocouple wires	53
C.5	Connection of thermocouples	54
C.6	Thermocouple failures	54
Annex D (normative) Correction of data/Nominal thickness		55
D.1	Correction of data	55
D.2	Nominal thickness - Graphical method	58
Annex E (normative) Methods of assessment of fire protection system performance		59
E.1	General	59
E.2	Graphical Approach	59
E.3	Differential formula analysis (variable approach) methodology	65
E.4	Differential formula analysis (constant approach) methodology	70
E.5	Numerical regression analysis	71
Annex F (normative) Tables of section sizes		74
Bibliography		76