

DIN EN 1991-1-5:2010-12 (E)

Eurocode 1: Actions on structures – Part 1-5: General actions – Thermal actions
(includes Corrigendum AC:2009) English translation of DIN EN 1991-1-5:2010-12

CONTENTS	Page
FOREWORD	4
BACKGROUND TO THE EUROCODE PROGRAMME	4
STATUS AND FIELD OF APPLICATION OF EUROCODES	5
NATIONAL STANDARDS IMPLEMENTING EUROCODES	6
LINKS BETWEEN EUROCODES AND PRODUCT HARMONIZED TECHNICAL SPECIFICATIONS (ENS AND ETAs)	6
ADDITIONAL INFORMATION SPECIFIC TO EN 1991-1-5	6
NATIONAL ANNEX FOR EN 1991-1-5	7
SECTION 1 GENERAL	8
1.1 SCOPE	8
1.2 NORMATIVE REFERENCES	8
1.3 ASSUMPTIONS.....	8
1.4 DISTINCTION BETWEEN PRINCIPLES AND APPLICATION RULES	9
1.5 DEFINITIONS	9
1.6 SYMBOLS	10
SECTION 2 CLASSIFICATION OF ACTIONS	13
SECTION 3 DESIGN SITUATIONS	14
SECTION 4 REPRESENTATION OF ACTIONS	15
SECTION 5 TEMPERATURE CHANGES IN BUILDINGS	16
5.1 GENERAL	16
5.2 DETERMINATION OF TEMPERATURES.....	16
5.3 DETERMINATION OF TEMPERATURE PROFILES	17
SECTION 6 TEMPERATURE CHANGES IN BRIDGES	19
6.1 BRIDGE DECKS.....	19
6.1.1 <i>Bridge deck types</i>	19
6.1.2 <i>Consideration of thermal actions</i>	19
6.1.3 <i>Uniform temperature component</i>	19
6.1.4 <i>Temperature difference components</i>	23
6.1.5 <i>Simultaneity of uniform and temperature difference components</i>	29
6.1.6 <i>Differences in the uniform temperature component between different structural elements</i>	30
6.2 BRIDGE PIERS	30
6.2.1 <i>Consideration of thermal actions</i>	30
6.2.2 <i>Temperature differences</i>	30
SECTION 7 TEMPERATURE CHANGES IN INDUSTRIAL CHIMNEYS, PIPELINES, SILOS, TANKS AND COOLING TOWERS	31
7.1 GENERAL	31
7.2 TEMPERATURE COMPONENTS.....	31
7.2.1 <i>Shade air temperature</i>	31
7.2.2 <i>Flue gas, heated liquids and heated materials temperature</i>	32

7.2.3	<i>Element temperature</i>	32
7.3	CONSIDERATION OF TEMPERATURE COMPONENTS.....	32
7.4	DETERMINATION OF TEMPERATURE COMPONENTS.....	32
7.5	VALUES OF TEMPERATURE COMPONENTS (INDICATIVE VALUES)	33
7.6	SIMULTANEITY OF TEMPERATURE COMPONENTS.....	33
ANNEX A (NORMATIVE) ISOTHERMS OF NATIONAL MINIMUM AND MAXIMUM SHADE AIR TEMPERATURES		36
A.1	GENERAL	36
A.2	MAXIMUM AND MINIMUM SHADE AIR TEMPERATURE VALUES WITH AN ANNUAL PROBABILITY OF BEING EXCEEDED <i>P</i> OTHER THAN 0,02.....	36
ANNEX B (NORMATIVE) TEMPERATURE DIFFERENCES FOR VARIOUS SURFACING DEPTHS.....		39
ANNEX C (INFORMATIVE) COEFFICIENTS OF LINEAR EXPANSION		42
ANNEX D (INFORMATIVE) TEMPERATURE PROFILES IN BUILDINGS AND OTHER CONSTRUCTION WORKS		44
BIBLIOGRAPHY		46