

***NATIONAL ANNEX
TO
CYS EN 1992-1-2:2004
(Including AC:2008)***

***Eurocode 2: Design of
concrete structures***

***Part 1-2: General rules
– Structural fire
design***



NATIONAL ANNEX

TO

CYS EN 1992-1-2:2004+AC:2008

**Eurocode 2: Design of concrete structures Part 1-2: General rules –
Structural fire design**

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INTRODUCTION

This National Annex has been prepared by the CYS TC 18 National Standardisation Technical Committee of Cyprus Organisation for Standardisation. (CYS)

NA 1 SCOPE

This National Annex is to be used together with CYS EN 1992-1-2:2004+AC:2008. Any reference in the rest of this text to CYS EN 1992-1-2:2004 means the above document.

This National Annex gives:

- (a) Nationally determined parameters for the following clauses of CYS EN 1992-1-2:2004+AC:2008 where National choice is allowed (see Section NA 2)
- 2.1.3 (2)
 - 2.3 (2)P
 - 3.2.3 (5)
 - 3.2.4 (2)
 - 3.3.3 (1)
 - 4.1 (1)P
 - 4.5.1 (2)
 - 5.2 (3)
 - 5.3.1(1)
 - 5.3.2 (2)
 - 5.6.1 (1)
 - 5.7.3 (2)
 - 6.1 (5)
 - 6.2 (2)
 - 6.3 (1)
 - 6.4.2.1 (3)
 - 6.4.2.2 (2)
- (b) Decisions on the use of the Informative Annexes A, B, C, D and E (see Section NA 3)
- (c) References to non-contradictory complementary information to assist the user to apply CYS EN 1992-1-2:2004. In this National Annex such information is provided for the following clauses in CYS EN 1992-1-2:2004 (see Section NA 4)

NA 2 NATIONALLY DETERMINED PARAMETERS

NA 2.1 Clause 2.1.3(2) Basis of Design – Parametric fire exposure

The values of $\Delta\theta_1$ and $\Delta\theta_2$ are specified as: $\Delta\theta_1 = 200$ K and $\Delta\theta_2 = 240$ K.

NA 2.2 Clause 2.3 (2)P Design values of material properties

The value of the partial safety factor for the relevant material property, $\gamma_{M,fi}$, for the fire situation is specified as follows:

- $\gamma_{M,fi} = 1,0$ for thermal properties of concrete and reinforcing and prestressing steel
- $\gamma_{M,fi} = 1,0$ for mechanical properties of concrete and reinforcing and prestressing steel.

NA 2.3 Clause 3.2.3 (5) Material Properties – Reinforcing steel

Class N (Table 3.2a (CYS EN 1992-1-2:2004)) is chosen to be used. Class X is recommended only when there is experimental evidence for these values.

NA 2.4 Clause 3.2.4 (2) Prestressing steel

Either, Class A and Class B can be used according to CYS EN 1992-1-2:2004.

NA 2.5 Clause 3.3.3(1) Thermal conductivity

The value of thermal conductivity λ_c of concrete shall be set within the range defined by lower and upper limit values, given in section 3.3.3 (2) of CYS EN 1992-1-2:2004.

NA 2.6 Clause 4.1 (1)P Design Procedures - General

The use of advanced calculation methods is permitted.

NA 2.7 Clause 4.5.1 (2) Spalling – Explosive spalling

The value of k is specified as 3,0.

NA 2.8 Clause 5.2 (3) Tabulated data – General design rules

Tabulated data in this section are based on a reference load level $\eta_{fi}=0,7$ unless otherwise stated in the relevant clauses.

NA 2.9 Clause 5.3.1 (1) Columns - General

Tabulated data is given for braced structures only. No tabulated data for unbraced structures is given in this national Annex.

NA 2.10 Clause 5.3.2(2) Columns – Method A

The value of e_{max} is equal to $0,15h$ (or b)

NA 2.11 Clause 5.6.1 (1) Beams - General

There is no restriction to the choice of Class WA, WB or WC.

NA 2.12 Clause 5.7.3(2) Continuous solid slabs

No additional rules on rotation capacity on supports are given in this National Annex.

NA 2.13 Clause 6.1 (5) High Strength Concrete (HSC) - General

There are no other values $f_{c,\theta} / f_{ck}$ for use than those given in Table 6.1(CYS). The class for concrete C55/67 and C60/75 is specified as Class 1, for concrete C70/85 and C80/95 as Class 2 and for concrete C90/105 as Class 3.

Table 6.1(CYS): Reduction of strength at elevated temperature

Concrete temperature θ °C	$f_{c,\theta}/f_{ck}$		
	Class 1	Class 2	Class 3
20	1,00	1,0	1,0
50	1,00	1,0	1,0
100	0,90	0,75	0,75
200			0,70
250	0,90		
300	0,85		0,65
400	0,75	0,75	0,45
500			0,30
600			0,25
700			
800	0,15	0,15	0,15
900	0,08		0,08
1000	0,04		0,04
1100	0,01		0,01
1200	0,00	0,00	0,00

NA 2.14 Clause 6.2 (2) Spalling

Any one of the methods (A, B, C and D) may be used.

NA 2.15 Clause 6.3 (1) Thermal properties

The value of thermal conductivity for high strength concrete is given within the range defined by lower and upper limit in clause 3.3.3 of CYS EN 1992-1-2:2004.

NA 2.16 Clause 6.4.2.1 (3) Structural design – Simplified calculation methods – Columns and walls.

The value of k is specified as follows:

$k = 1,1$ for Class 1

$k = 1,3$ for Class 2

For Class 3 more accurate methods are recommended.

NA 2.17 Clause 6.4.2.2 (2) Beams and slabs.

The value of k_m is specified in Table 6.2(CYS). For Class 3 more accurate methods are recommended.

Table 6.2(CYS): Moment capacity reduction factors for beams and slabs.

Item	k_m	
	Class 1	Class 2
Beams	0,98	0,95
Slabs exposed to fire in the compression zone	0,98	0,95
Slabs exposed to fire in the tension side, $h_1 \geq 120$ mm	0,98	0,95
Slabs exposed to fire in the tension side, $h_1 = 50$ mm	0,95	0,85

Where h_1 is the concrete slab thickness (see figure 5.7(CYS EN 1992-1-2:2004))

NA 3 DECISION ON USE OF THE ANNEXES

NA 3.1 Annex A

Annex A may be used

NA 3.2 Annex B

Annex B may be used

NA 3.3 Annex C

Annex may be used

NA 3.4 Annex D

Annex D may be used

NA 3.5 Annex E

Annex E may be used

NA 4 REFERENCES TO NON-CONTRADICTORY COMPLEMENTARY INFORMATION

None

**NA to
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1992-1-2:2004
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