

CYS National Annex to CYS EN 1993-1-6:2007

Eurocode 3: Design of steel structures

Part 1-6: Strength and Stability of Shell Structures

Prepared by
Eurocodes Committee, Scientific and Technical
Chamber of Cyprus under a Ministry of Interior's Programme



NATIONAL ANNEX

TO

**CYS EN 1993-1-6:2007 Eurocode 3: Design of steel
structures**

Part 1-6: Strength and Stability of Shell Structures

This National Annex has been approved by the Board of Governors of the Cyprus Organisation for Standardisation on 11/06/2010.

INTRODUCTION

This National Annex has been prepared by the Eurocodes Committee of the Technical Chamber of Cyprus which was commissioned by the Ministry of Interior of the Republic of Cyprus.

NA 1 SCOPE

This National Annex is to be used together with CYS EN 1993-1-6: 2007.

This National Annex gives:

(a) Nationally determined parameters for the following clauses of CYS EN 1993-1-6: 2007 where National choice is allowed (see Section NA 2):

- 3.1(4)
- 4.1.4(3)
- 5.2.4(1)
- 6.3(5)
- 7.3.1(1)
- 7.3.2(1)
- 8.4.2(3)
- 8.4.3(2)
- 8.4.3(4)
- 8.4.4(4)
- 8.4.5(1)
- 8.5.2(2)
- 8.5.2(4)
- 8.7.2(7)
- 8.7.2(16)
- 8.7.2(18) (2 times)
- 9.2.1(2)P

(b) References to non-contradictory complementary information to assist the user to apply CYS EN 1993-1-6: 2007 (see Section NA 3).

NA 2 NATIONALLY DETERMINED PARAMETERS

NA 2.1 Clause 3.1(4) Material properties

No information is given on material properties at temperatures exceeding 150°C.

NA 2.2 Clause 4.1.4(3) LS4: Fatigue

The recommended value of $N_f = 10\,000$ shall be used.

NA 2.3 Clause 5.2.4(1) Stress resultants and stresses

The recommended value of the radius to thickness ratio $(r/t)_{\min} = 25$ shall be used.

NA 2.4 Clause 6.3(5) Design by global numerical MNA or GMNA analysis

The recommended value of $n_{mps} = 50$ shall be used.

NA 2.5 Clause 7.3.1(1) Design values of total accumulated plastic strain

No recommendation is given for a more refined materially nonlinear global analysis.

NA 2.6 Clause 7.3.2(1) Total accumulated plastic strain limitation

The recommended value of $n_{p,eq} = 25$ for use in equation (7.5) of CYS EN 1993-1-6: 2007 shall be used.

NA 2.7 Clause 8.4.2(3) Out-of-roundness tolerance

Values for the out-of-roundness tolerance parameter $U_{r,max}$ as recommended in Table 8.1 of CYS EN 1993-1-6: 2007 are given in Table 8.1 (CYS).

Table 8.1 (CYS): Values for out-of-roundness tolerance parameter $U_{r,max}$

| | Diameter range | $d \leq 0,50m$ | $0,50m < d < 1,25m$ | $1,25m \leq d$ |
|-------------------------------------|----------------|----------------------------------|--------------------------|----------------|
| Fabrication tolerance quality class | Description | Recommended value of $U_{r,max}$ | | |
| Class A | Excellent | 0,014 | $0,007 + 0,0093(1,25-d)$ | 0,007 |
| Class B | High | 0,020 | $0,010 + 0,0133(1,25-d)$ | 0,010 |
| Class C | Normal | 0,030 | $0,015 + 0,0200(1,25-d)$ | 0,015 |

NA 2.8 Clause 8.4.3(2) Accidental eccentricity tolerance

Values for the maximum permitted accidental eccentricity $e_{a,max}$ as recommended in Table 8.2 of CYS EN 1993-1-6: 2007 are given in Table 8.2 (CYS).

Table 8.2 (CYS): Values for maximum permitted accidental eccentricities

| Fabrication tolerance quality class | Description | Recommended values for maximum permitted accidental eccentricity $e_{a,max}$ |
|-------------------------------------|-------------|--|
| Class A | Excellent | 2 mm |
| Class B | High | 3 mm |
| Class C | Normal | 4 mm |

NA 2.9 Clause 8.4.3(4) Accidental eccentricity tolerance

Values for the accidental eccentricity tolerance parameter $U_{e,max}$ as recommended in Table 8.2 of CYS EN 1993-1-6: 2007 are given in Table 8.3.

Table 8.3 (CYS): Values for accidental eccentricity tolerances

| Fabrication tolerance quality class | Description | Recommended value of $U_{e,max}$ |
|-------------------------------------|-------------|----------------------------------|
| Class A | Excellent | 0,14 |
| Class B | High | 0,20 |
| Class C | Normal | 0,30 |

NA 2.10 Clause 8.4.4(4) Dimple tolerances

Values for the dimple tolerance parameter $U_{0,max}$ as recommended in Table 8.2 of CYS EN 1993-1-6: 2007 are given in Table 8.4 (CYS).

Table 8.4 (CYS): Values for dimple tolerance parameter $U_{0,max}$

| Fabrication tolerance quality class | Description | Recommended value of $U_{0,max}$ |
|-------------------------------------|-------------|----------------------------------|
| Class A | Excellent | 0,006 |
| Class B | High | 0,010 |
| Class C | Normal | 0,016 |

NA 2.11 Clause 8.4.5(1) Interface flatness tolerance

The recommended value of $\beta_{\theta} = 0,1\% = 0,001$ radians shall be used.

NA 2.12 Clause 8.5.2(2) Design resistance (buckling strength)

Where no application standard exists for the form of construction involved, or the application standard does not define the relevant values of γ_{M1} , the value of γ_{M1} shall not be taken as smaller than the recommended value of $\gamma_{M1} = 1,1$.

NA 2.13 Clause 8.5.2(4) Design resistance (buckling strength)

The values of the following parameters shall be taken from Annex D of CYS EN 1993-1-6: 2007:

- α elastic imperfection reduction factor
- β plastic range factor
- η interaction exponent
- λ_0 squash limit relative slenderness

NA 2.14 Clause 8.7.2(7) Design value of resistance

The recommended value of $\beta = 0,1$ radians shall be used.

NA 2.15 Clause 8.7.2(16) Design value of resistance

No additional requirements are defined for the assessment of appropriate patterns of imperfections.

NA 2.16 Clause 8.7.2(18) (2 times) Design value of resistance

The recommended value of $n_i = 25$ shall be used.

Values for the dimple tolerance parameter U_{n1} and U_{n2} as recommended in Table 8.5 of CYS EN 1993-1-6: 2007 are given in Table 8.5 (CYS).

Table 8.5 (CYS): Values for dimple imperfection amplitude parameters U_{n1} and U_{n2}

| Fabrication tolerance quality class | Description | Recommended value of U_{n1} | Recommended value of U_{n2} |
|-------------------------------------|-------------|-------------------------------|-------------------------------|
| Class A | Excellent | 0,010 | 0,010 |
| Class B | High | 0,016 | 0,016 |
| Class C | Normal | 0,025 | 0,025 |

NA 2.17 Clause 9.2.1(2)P General

Where no application standard exists for the form of construction involved, or the application standard does not define the relevant values of the partial factor for resistance to fatigue γ_{Mf} , the value of γ_{Mf} should be taken from CYS EN 1993-1-9: 2005 but not smaller than $\gamma_{Mf} = 1,1$.

NA 3 REFERENCES TO NON-CONTRADICTORY COMPLEMENTARY INFORMATION

None

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