Social- og Boligstyrelsen
Danish Authority of Social Services and Housing

DS/EN 1993-1-3 DK NA:2019

National Annex to

Eurocode 3: Design of steel structures – Part 1-3: General rules – Supplementary rules for cold-formed members and sheeting

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Foreword

This National Annex (NA) is a revision of DS/EN 1993-1-3 DK NA:2013 and replaces the latter as from 2019-09-09. For a transition period until 2019-12-31, this National Annex as well as the previous National Annex will be applicable.

Text has been added under Clause 2(3)P Basis of design in relation to level of checking.

This NA lays down the conditions for the implementation in Denmark of EN 1993-1-3 for construction works in conformity with the Danish Building Regulations.

This NA applies to construction works covered by section 16(1) of the Danish Building Regulations as well as to construction works covered by sections 24 to 27 of the Danish Building Regulations.

This NA includes:

- an overview of possible national choices and clauses containing complementary information;
- national choices;
- (non-contradictory), complementary information which may assist the user of the Eurocode.

For structures covered by sections 24 to 27 of the Danish Building Regulations BR18, or not covered by the Danish Building Regulations, levels of checking may still be used for the calculation of structures in ultimate limit states. For structures covered by section 16(1) of the Danish Building Regulations, levels of checking cannot be applied.

Overview of possible national choices and clauses containing complementary information

The list below identifies the clauses where national choices are possible and the applicable/not applicable informative annexes. Furthermore, clauses giving complementary information are identified. Complementary information is given at the end of this document.

Clause	**Subject**	**National choice** [1)]	**Complementary information** [2)]
2(3)P	Basis of design	National choice	Complementary information
2(5)	Basis of design	Unchanged	
3.1(3), Note 1	Materials, General	Unchanged	
3.1(3), Note 2	Materials, General	Unchanged	
3.2.4(1)	Materials, Structural steel	Unchanged	
5.3(4)	Structural analysis, Structural modelling for analysis	Unchanged	
8.3(5)	Connections with mechanical fasteners	National choice	
8.3(13)	Connections with mechanical fasteners	Unchanged	
8.3(13) Table 8.1	Design resistances for blind rivets	National choice	
8.3(13) Table 8.2	Design resistances for self-tapping screws	National choice	
8.3(13) Table 8.3	Design resistances for cartridge fired pins	National choice	
8.3(13) Table 8.4	Design resistances for bolts	National choice	
8.4(5)	Spot welds	National choice	
8.5.1(4)	Lap welds	National choice	
9(2)	Design by testing	Unchanged	

Clause	Subject	National choice [1)]	Complementary information [2)]
10.1.1(1)	Special considerations for purlins, liner trays and sheeting – Beams restrained by sheeting	Unchanged	
10.1.4.2(1)	Special considerations for purlins, liner trays and sheeting – Beams restrained by sheeting	Unchanged	
A.1(1) Note 2	Testing procedures, General	Unchanged	
A.1(1) Note 3	Testing procedures, General		Complementary information
A.6.4(4)	Testing procedures, Assessment of test results	Unchanged	
E(1)	Simplified design for purlins	Unchanged	

[1)] Unchanged: No national choice is made, and recommendations in the standard are followed.

[2)] Complementary information: Non-contradictory, complementary information on how to use the Eurocode

National choices

2(3)P Basis of design

The below expressions for γ_{Mi} are used, including the factor (γ_0) on the partial factors for strength parameters and resistances, cf. National Annex to EN 1990, Table A1.2(B+C):

$$\gamma_{M0} = 1{,}1 \cdot \gamma_0 \cdot \gamma_3$$
$$\gamma_{M1} = 1{,}2 \cdot \gamma_0 \cdot \gamma_3$$
$$\gamma_{M2} = 1{,}35 \cdot \gamma_0 \cdot \gamma_3$$

The factor γ_0 takes into account the combination of actions, cf. National Annex to EN 1990, Table A1.2(B+C).

Limit state	**STR/GEO**				**STR**
Combination of actions	1	2	3	4	5
γ_0	1,0	1,0	K_{FI}	K_{FI}	$1{,}2 \cdot K_{FI}$

The factor γ_3 takes account of the level of checking of the product. The reduced level of checking is not used.
Extended level of checking: $\gamma_3 = 0{,}95$
Normal level of checking: $\gamma_3 = 1{,}00$

For structures covered by section 16(1) of the Danish Building Regulations, the extended level of checking cannot be applied, and γ_3 is taken as 1,00.

The partial factors are determined in accordance with the National Annex to EN 1990, Annex F, where $\gamma_M = \gamma_1 \gamma_2 \gamma_3 \gamma_4$.

γ_1 γ_1: takes into account the type of failure;
γ_2 $\gamma 2$: takes into account the uncertainty related to the design model;
γ_3 takes into account the extent of checking;
γ_4 takes into account the variation of the strength parameter or resistance.

When determining γ_1, the following types of failure have been assumed:

γ_{M0}: Warning of failure with residual resistance
γ_{M1}: Warning of failure without residual resistance
γ_{M2}: No warning of failure

For accidental and seismic design situations the following values are used:

$$\gamma_{M0} = 1{,}0$$
$$\gamma_{M1} = 1{,}0$$
$$\gamma_{M2} = 1{,}0$$

8.3(5) Connections with mechanical fasteners
The following value is used:

$$\gamma_{M2} = 1{,}35 \cdot \gamma_0 \cdot \gamma_3$$

8.3(13), Table 8.1, Design resistances for blind rivets
The resistance with respect to the forms of failure indicated should be determined by testing, or documented resistances provided by the supplier should be applied.

8.3(13), Table 8.2, Design resistances for self-tapping screws
The resistance with respect to the forms of failure indicated should be determined by testing, or documented resistances provided by the supplier should be applied.

8.3(13), Table 8.3, Design resistances for cartridge fired pins
The resistance with respect to the forms of failure indicated should be determined by testing, or documented resistances provided by the supplier should be applied.

8.3(13), Table 8.4, Design resistances for bolts
The resistance with respect to the forms of failure indicated should be determined by testing, or documented resistances provided by the supplier should be applied.

8.4(5) Spot welds
The following value is used:

$$\gamma_{M2} = 1{,}35 \cdot \gamma_0 \cdot \gamma_3$$

8.5.1(4) Lap welds
The following value is used:

$$\gamma_{M2} = 1{,}35 \cdot \gamma_0 \cdot \gamma_3$$

(Non-contradictory), complementary information

2(3)P Basis of design
For traditional cold-formed members and sheeting not used for resisting geotechnical actions, combinations of actions 3, 4 and 5 can be disregarded.

A.1(1), Note 3, Testing procedures, General
For each case an assessment should be made of how available test results are converted into values corresponding to results of tests carried out according to Annex A.