ERHVERVS- OG BYGGESTYRELSEN

EN 1991-1-6 DK NA:2007

National Annex to
Eurocode 1: Actions on structures -
Part 1-6: General actions – Actions during execution

Foreword

In connection with the incorporation of Eurocodes into Danish building legislation to replace the Danish structural codes of practice, this National Annex was prepared in 2006-2007 to implement Eurocode 1 in Denmark.

Scope

This National Annex lays down the conditions for the implementation of the Eurocode.

Contents

This National Annex specifies the national choices prescribed in Denmark.

The national choices may be in the form of nationally applicable values, an option between methods given in the Eurocode, or the addition of supplementary guidance.

This National Annex addresses:

- Clauses where national choices have been made;
- All clauses where national choices have been possible;
- Bibliography: Overview of all National Annexes prepared.

Clauses where national choices have been made

Clause	Subject	Comment
2.2 (4) NOTE 1	Position of construction loads classified as free	The limits of any areas where free construction loads may not be positioned should be stated clearly in the project material.
3.1(1)P	Design situation corresponding to storm conditions	Where collapse during storm conditions involves the risk of loss of human life, *or* considerable economic, social or environmental consequences, the design situation should be assumed to be for persistent and transient design situations.
3.1(5) NOTE 1 / Table 3.1 NOTE 2	Return periods for the determination of the characteristic values of variable actions during execution Minimum wind speed during execution	Se Table 3.1 DK below. Is not applied, see NOTES a and b in Table 3.1 DK.

Table 3.1 - Recommended return periods for the determination of the characteristic values of climatic actions

Duration	Characteristic snow, wind and temperature loads
≤ 5 days ≤ 1 year > 1 year	see NOTE a see NOTE b none
NOTE a - The characteristic load should be determined on the basis of reliable meteorological predictions for the considered period. *Wind:* If execution is planned such that it is only begun if the weather forecast for the duration of the execution phase predicts a 10 minutes average wind speed for the location which is less than a specified value, the structure may be designed for this wind speed, however using a minimum value of 0,2 kN/m^2. *Snow:* If execution is planned such that it is only begun if the weather forecast for the duration of the execution phase does not predict snowfall, snow loads can be disregarded. NOTE b - For determination of the characteristic load account should be taken of seasonal variations of snow, wind and temperature, see EN 1991-1-3, EN 1991-1-4 and EN 1991-1-5, respectively. *Snow:* If it is ensured that snow is removed where more than 200 mm of snow has accumulated, the reduction factor for snow load may be set at 0,5 all year round.	

Clause	Subject	Comment
3.1(7)	Rules for the combination of snow loads and wind actions with construction loads	Construction loads acting no longer than one working day should usually not be combined with wind actions and snow loads. Simultaneous wind actions and snow loads combined with construction loads should be disregarded.
4.11.1(2) / Table 4.1	Recommended characteristic values of construction loads Q_{ca}, Q_{cb} and Q_{cc}	Buildings should as a minimum be designed for a free uniformly distributed load $q_{c,k} = q_{ca,k} + q_{cb,k} + q_{cc,k}$ = 1,5 kN/m^2 and for a concentrated load $F_{cb,k}$ corresponding to the maximum load of stored materials that may occur at the location in question. The magnitude and distribution of $F_{cb,k}$ should appear from the project

		material. It is assumed that $q_{c,k}$ and $F_{cb,k}$ do not act simultaneously.
4.12 (1)P NOTE 2	Dynamic effects due to accidental actions	Dynamic effects should be considered for the individual project. The recommended value of the dynamic amplification factor should be used.
4.12(2)	Dynamic effects due to falls of equipment (accidental actions)	Normally the structure should be designed for a static load of 2,5 kN applied over an area of 200 x 200 mm.
4.12 (3)	Design values of human impact loads (accidental actions)	Normally the structure should be designed for a static load of 2,5 kN applied over an area of 200 x 200 mm to account for stumbling effects and of 6,0 kN applied over an area of 300 x 300 mm to account for falling effects.
4.13(2)	Seismic actions	Structures susceptible to horizontal actions should be designed for the seismic design situation (horizontal mass load), see NA to EN 1990.
2.2 (1) NOTE 2	Representative values of the variable actions due to construction loads	For construction loads the following values should be used ψ_0 = 0,6 and ψ_2 = 0,2.

Clause	**Subject**	**Comment**
Annex B	Actions on structures during alteration, reconstruction or demolition	The annex should be applied with the following addition to B (8): NOTE – Structural members subject to only limited change of function and loads should be designed using the set of standards applicable at the time of construction.

Overview of possible national choices

The list below identifies the clauses where national choices are possible and the applicable/not applicable informative annexes.

Clause	Subject	Comment
1.1(3)	Design rules for auxiliary construction works	(no national guidance)
2.2 (4) NOTE 1	P	Any areas where free construction loads must not act are to be stated clearly in the project material.
3.1(1)P	Design situation corresponding to storm conditions	Where collapse during storm conditions involves the risk of loss of human life, *or* considerable economic, social or environmental consequences, design for persistent and transient design situations is selected.
3.1(5) NOTE 1 / Table 3.1 NOTE 2	Return periods for the determination of the characteristic values of variable actions during execution Minimum wind speed during execution	Se Table 3.1 DK below. Is not applied, see NOTES a and b in Table 3.1 DK.
3.1(7)	Rules for the combination of snow loads and wind actions with construction loads	Construction loads acting no longer than one working day are usually not combined with wind actions and snow loads. Simultaneous wind actions and snow loads combined with construction loads should be disregarded.
3.1 (8) NOTE 1	Rules concerning imperfections in the geometry of the structure	(no national guidance)
3.3(2)	Criteria associated with serviceability limit states during execution for permanent structural members	(no national guidance)
3.3(6)	Serviceability requirements for auxiliary construction works	(no national guidance)

4.9(6) NOTE 2	Loads and water levels for floating ice	(no national guidance)
4.10(1)P	Definition of actions due to atmospheric icing	(no national guidance)
4.11.1(2) / Table 4.1	Recommended characteristic values of construction loads Q_{ca}, Q_{cb} and Q_{cc}	Buildings should as a minimum be designed for a free uniformly distributed load $q_{c,k} = q_{ca,k} + q_{cb,k} + q_{cc,k} = 1,5$ kN/m^2 and for a concentrated load $F_{cb,k}$ corresponding to the maximum load of stored materials that may occur at the location in question. The magnitude and distribution of $F_{cb,k}$ should appear from the project material. It is assumed that $q_{c,k}$ and $F_{cb,k}$ do not act simultaneously.
4.11.2(1) NOTE 2	Construction loads during the casting of concrete	(no national guidance)
4.12(1)P NOTE 2	Dynamic effects due to accidental actions	Dynamic effects should be considered for the individual project. The recommended value of the dynamic amplification factor should be used.
4.12(2)	Dynamic effects due to falls of equipment (accidental actions)	Normally the structure should be designed for a static load of 2,5 kN applied over 200 x 200 mm.
4.12 (3)	Design values of human impact loads (accidental actions)	Normally the structure should be designed for a static load of 2,5 kN applied over 200 x 200 mm to account for stumbling effects and of 6,0 kN applied over 300 x 300 mm to account for falling effects.
4.13(2)	Seismic actions	Structures susceptible to horizontal actions should be analysed verified ? for the seismic design situation (horizontal mass load), see NA to EN 1990.
A1.1(1) NOTE 2	Representative values of the variable actions due to construction loads	For construction loads the following values should be used $\psi_0 = 0,6$ and $\psi_2 = 0,2$.
A1.3(2)	Characteristic values of equivalent horizontal forces	(no national guidance)
A2.3(1)	Design values of vertical deflections for the incremental launching of bridges	(not relevant for building structures)
A2.4(2)	Reduction of the	(not relevant for building structures)

	characteristic value of snow loads	
A2.4(3)	Reduced values of horizontal friction forces	(not relevant for building structures)
A2.5(2)	Design values of horizontal friction forces	(not relevant for building structures)
A2.5(3)	Determination of friction coefficients μ_{min} and μ_{max}	(not relevant for building structures)

Annex B	Actions on structures during alteration, reconstruction or demolition	The annex should be applied with the following addition to B (8): NOTE – Structural members subject to limited change of function and loads should be verified using the set of standards applicable at the time of construction.

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Bibliography

List of all National Annexes

EN 1990 DK NA:2007	National Annex to Eurocode 0 – Basis of structural design
EN 1991-1-1 DK NA:2007	National Annex to Eurocode 1: Actions on structures – Part 1-1: General actions – Densities, self-weight, imposed loads for buildings
EN 1991-1-2 DK NA:2007	National Annex to Eurocode 1: Actions on structures – Part 1-2: General actions – Actions on structures exposed to fire
EN 1991-1-3 DK NA:2007	National Annex to Eurocode 1: Actions on structures – Part 1-3: General actions – Snow loads
EN 1991-1-4 DK NA:2007	National Annex to Eurocode 1: Actions on structures – Part 1-4: General actions – Wind actions
EN 1991-1-5 DK NA:2007	National Annex to Eurocode 1: Actions on structures – Part 1-5: General actions – Thermal actions
EN 1991-1-6 DK NA:2007	National Annex to Eurocode 1: Actions on structures – Part 1-6: General actions – Actions during execution
EN 1991-1-7 DK NA:2007	National Annex to Eurocode 1: Actions on structures – Part 1-7: General actions – Accidental actions
EN 1992-1-1 DK NA:2007	National Annex to Eurocode 2: Design of concrete structures - Part 1-1: General rules and rules for buildings
EN 1992-1-2 DK NA:2007	National Annex to Eurocode 2: Design of concrete structures - Part 1-2: General rules – Structural fire design
EN 1993-1-1 DK NA:2007	National Annex to Eurocode 3: Design of steel structures - Part 1-1: General rules and rules for buildings
EN 1993-1-2 DK NA:2007	National Annex to Eurocode 3: Design of steel structures - Part 1-2: General rules – Structural fire design
EN 1993-1-3 DK NA:2007	National Annex to Eurocode 3: Design of steel structures - Part 1-3: General rules - Supplementary rules for cold-formed members and sheeting
EN 1993-1-4 DK NA:2007	National Annex to Eurocode 3: Design of steel structures - Part 1-4: General rules - Supplementary rules for stainless steels
EN 1993-1-5 DK NA:2007	National Annex to Eurocode 3: Design of steel structures - Part 1-5: Plated structural elements
EN 1993-1-6 DK NA:2007	National Annex to Eurocode 3: Design of steel structures - Part 1-6: Strength and stability of shell structures
EN 1993-1-7 DK NA:2007	National Annex to Eurocode 3: Design of steel structures - Part 1-7: Plated structures subject to out of plane loading
EN 1993-1-8 DK NA:2007	National Annex to Eurocode 3: Design of steel structures - Part 1-8: Joints
EN 1993-1-9 DK NA:2007	National Annex to Eurocode 3: Design of steel structures – Part 1-9: Fatigue
EN 1993-1-10 DK NA:2007	National Annex to Eurocode 3: Design of steel structures - Part 1-10: Material toughness and through-thickness properties
EN 1994-1-1 DK NA:2007	National Annex to Eurocode 4: Design of composite steel and concrete structures - Part 1-1: General rules and rules for buildings
EN 1994-1-2 DK NA:2007	National Annex to Eurocode 4: Design of composite steel and concrete structures - Part 1-2: General rules – Structural fire design
EN 1995-1-1 DK NA:2007	National Annex to Eurocode 5: Design of timber structures - Part 1-1: General - Common rules and rules for buildings
EN 1995-1-2 DK NA:2007	National Annex to Eurocode 5: Design of timber structures - Part 1-2: General – Structural fire design
EN 1996-1-1 DK NA:2007	National Annex to Eurocode 6: Design of masonry structures - Part 1-1: General rules for reinforced and unreinforced masonry structures
EN 1996-1-2 DK NA:2007	National Annex to Eurocode 6: Design of masonry structures - Part 1-2: General rules – Structural fire design
EN 1996-2 DK NA:2007	National Annex to Eurocode 6: Design of masonry structures - Part 2: Design considerations, selection of materials and execution of masonry
EN 1997-1 DK NA:2007	National Annex to Eurocode 7: Geotechnical design - Part 1: General rules
EN 1999-1-1 DK NA:2007	National Annex to Eurocode 9: Design of aluminium structures - Part 1-1: General rules
EN 1999-1-2 DK NA:2007	National Annex to Eurocode 9: Design of aluminium structures – Part 1-2: Structural fire design
EN 1999-1-3 DK NA:2007	National Annex to Eurocode 9: Design of aluminium structures – Part 1-3: Fatigue