

NA to BS EN 1991-4:2006



BSI Standards Publication

UK National Annex to Eurocode 1: Actions on structures –

Part 4: Silos and tanks

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Summary of pages

This document comprises a front cover, an inside front cover, pages 1 to 10, an inside back cover and a back cover.

National Annex (informative) to BS EN 1991-4:2006, Eurocode 1: Actions on structures – Part 4: Silos and tanks

Introduction

This National Annex has been prepared by BSI Subcommittee B/525/1, *Actions (loadings) and basis of design*. In the UK it is to be used in conjunction with BS EN 1991-4:2006.

NOTE The UK committee has submitted amendments to BS EN 1991-4:2006, Expression 6.8 and Expression C.16.

NA.1 Scope

This National Annex gives:

- a) the UK decisions for the Nationally Determined Parameters described in the following subclauses of BS EN 1991-4:2006:
 - 2.5(5)
 - 3.6(2)
 - 5.2.4.3.1(3)
 - 5.4.1(3)
 - 5.4.1(4)
 - A.4(3)
 - B.2.14(1)
- b) the UK decisions on the status of BS EN 1991-4:2006 informative annexes; and
- c) references to non-contradictory complementary information.

NA.2 Nationally Determined Parameters

NA.2.1 General

UK decisions for the Nationally Determined Parameters described in BS EN 1991-4:2006 are given in **NA.2.2** to **NA.2.8**.

NA.2.2 Action assessment classes for a silo [BS EN 1991-4:2006, 2.5(5)]

UK decisions for action assessment classes for a silo are shown in Table NA.1.

Table NA.1 Recommended classification of silos for action assessments

Action Assessment Class	Description
Action Assessment Class 3	<p>Silos with capacity in excess of 5 000 tonnes</p> <p>Silos with capacity in excess of 200 tonnes in which any of the following design situations occur:</p> <ul style="list-style-type: none"> a) eccentric discharge with $e_o/d_c > 0,25$ (see BS EN 1991-4:2006, Figure 1.1b) b) squat silos with top surface eccentricity with $e_t/d_c > 0,25$ c) all silos not supported fully all around the circumference d) silos used for homogenising and blending, and silos containing internal structures
Action Assessment Class 2	All silos covered by this standard and not placed in another class
Action Assessment Class 1	Silos with capacity below 100 tonnes

NOTE The values are to be defined for the individual project, using the values in this table as a minimum.

NA.2.3 Guidance on the pressure exerted on structures near the silo as a result of an explosion within it [BS EN 1991-4:2006, 3.6(2)]

The appropriate pressures acting on adjacent structures as a result of an explosion within a silo should be determined by any rational method, and defined for the individual project as appropriate in consultation with the client.

NA.2.4 Values of k_1 , k_2 and k_3 [BS EN 1991-4:2006, 5.2.4.3.1(3)]

The following values should be used:

- $k_1 = 0,35$;
- $k_2 = 0,50$;
- $k_3 = 0,65$.

Further large values of k should be explored for more slender silos.

NA.2.5 Method to be used for determining the horizontal pressure p_h [BS EN 1991-4:2006, 5.4.1(3)]

The recommended expression should be used.

NA.2.6 Method to be used for determining the resulting vertical forces n_{zsk} [BS EN 1991-4:2006, 5.4.1(4)]

The recommended expression should be used.

**NA.2.7 Values of combination factor ψ
[BS EN 1991-4:2006, A.4(3)]**

Table NA.A.1, Table NA.A.2, Table NA.A.3, Table NA.A.4 and Table NA.A.5 of Annex NA.A of this National Annex should be used.

**NA.2.8 Loads resulting from accidental actions on tanks
[BS EN 1991-4:2006, B.2.14(1)]**

The loads should be agreed for an individual project with the client.

**NA.3 Decisions on the status of BS EN 1991-4:2006
informative annexes**

**NA.3.1 Basis of design – supplementary paragraphs to
EN 1990 for silos and tanks
[BS EN 1991-4:2006, Annex A]**

BS EN 1991-4:2006, Annex A, should not be used. Annex NA.A of this National Annex should be used instead.

**NA.3.2 Actions, partial factors and combinations of
actions on tanks
[BS EN 1991-4:2006, Annex B]**

BS EN 1991-4:2006, Annex B, should not be used. Annex NA.A of this National Annex should be used instead.

**NA.3.3 Flow pattern determination
[BS EN 1991-4:2006, Annex F]**

BS EN 1991-4:2006, Annex F, may be used.

**NA.3.4 Actions due to dust explosions
[BS EN 1991-4:2006, Annex H]**

BS EN 1991-4:2006, Annex H, may be used.

**NA.4 References to non-contradictory
complementary information**

The following is a list of references that contain non-contradictory complementary information for use with BS EN 1991-4:2006.

BS 5975, *Code of practice for temporary works procedures and the permissible stress design of falsework*

BS 6187, *Code of practice for demolition*

BRITISH CONSTRUCTIONAL STEELWORK ASSOCIATION. BCSA
Publication No 39/05, *Guide to steel erection in windy conditions*.
London: BCSA, 2005.