BRITISH STANDARD

BS EN
790:2001

Inland navigation vessels — Stairs with inclination angles of 45° to 60° — Requirements, types

The European Standard EN 790:2001 has the status of a British Standard

ICS 47.020.10

National foreword

This British Standard is the official English language version of EN 790:2001. It supersedes BS EN 790:1995 which is withdrawn.

The UK participation in its preparation was entrusted by Technical Committee SME/32, Ships and marine technology — Steering committee, to Subcommittee SME/32/7, Inland navigation vessels, which has the responsibility to:

— aid enquirers to understand the text;

— present to the responsible European committee any enquiries on the interpretation, or proposals for change, and keep the UK interests informed;

— monitor related international and European developments and promulgate them in the UK.

A list of organizations represented on this subcommittee can be obtained on request to its secretary.

Cross-references

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This British Standard, having been prepared under the direction of the Engineering Sector Committee, was published under the authority of the Standards Committee and comes into effect on 15 September 2001

Summary of pages

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EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

EN 790

June 2001

ICS 47.020.10; 47.060

Supersedes EN 790:1994

English version

Inland navigation vessels - Stairs with inclination angles of 45° to 60° - Requirements, types

Bateaux de navigation intérieure - Escaliers à angles d'inclinaison entre 45° et 60° - Exigences, types

Fahrzeuge der Binnenschiffahrt - Treppen mit Steigungswinkeln von 45° bis 60° - Anforderungen, Bauarten

This European Standard was approved by CEN on 8 March 2001.

CEN members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration. Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the Management Centre or to any CEN member.

This European Standard exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CEN member into its own language and notified to the Management Centre has the same status as the official versions.

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EUROPEAN COMMITTEE FOR STANDARDIZATION
COMITÉ EUROPÉEN DE NORMALISATION
EUROPÄISCHES KOMITEE FÜR NORMUNG

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Contents

Foreword

This European Standard has been prepared by Technical Committee CEN/TC 15 "Inland navigation vessels" , the secretariat of which is held by DIN.

This European Standard supersedes EN 790:1994.

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by November 2001, and conflicting national standards shall be withdrawn by November 2001.

The standard specifies requirements for stairs within the meaning of Council Directive 82/714/EEC of 4 October 1982 laying down technical requirements for inland waterway vessels.

According to the CEN/CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and the United Kingdom.

1 Scope

This European Standard applies to stairs with inclination angles of 45° to 60°, having at least two steps, in working areas of inland navigation vessels.

It does not apply to stairs in passenger areas.

NOTE Whenever possible, stairs specified in EN 13056 should be preferred.

2 Normative references

This European Standard incorporates by dated or undated reference, provisions fronm other publications. These normative references are cited at the appropriate places in the text and the publications are listed hereafter. For dated references, subsequent amendments to or revisions of any of these publications apply to this European Standard only when incorporated in it by amendment or revision. For undated references the latest edition of the publication referred to applies (including amendments).

EN 711, *Inland navigation vesselst – Railings for decks – Requirements, types*

EN 22768-1, *General tolerances – Part 1: Tolerances for linear and angular dimensions without individual tolerance indications (Identical to ISO 2768-1:1989)*

EN 13056:2000, *Inland navigation vessels – Stairs with inclination angles of 30° to < 45° – Requirements, types*

3 Terms and definitions

For the purposes of this European Standard, the following terms and definitions apply.

3.1
stair
walkway with steps solidly fixed between two planes
[EN 13056:2000, 3.1]

3.2
inclination angle
angle between the pitch line connecting the front edge of the steps and the horizontal line

[EN 13056:2000, 3.2]

3.3
stair breadth
clear breadth of the stair measured between the strings

[EN 13056:2000, 3.3]

3.4
headroom
perpendicular distance between the pitch line connecting the front edges of the steps and the fixed components above them

3.5
step
tread of the stair

[EN 13056:2000, 3.5]

3.6
space between steps
vertical distance between the upper edges of successive steps

[EN 13056:2000, 3.6]

3.7
depth of steps
distance between the front and rear edges of the steps measured on the tread

[EN 13056:2000, 3.7]

3.8
string
lateral limitation of the stair supporting the steps

[EN 13056:2000, 3.8]

3.9
railing
construction of stanchions, hand rail and intermediate rails or network

[EN 13056:2000, 3.9]

3.10
height of railing
perpendicular distance between the pitch line connecting the front edges of the steps and the upper edge of the hand rail

3.11
hand rail

3.11.1
upper continuous part of a railing running in parallel to the string and serving as a handhold to persons using the stair and protecting them from falling outboard of the railing

[EN 13056:2000, 3.11.1]

3.11.2
round secton which is fixed at a bulkhead adjacent to the stair, running in parallel to the stairway and serving as a handhold

[EN 13056:2000, 3.11.2]

3.12
stanchion
part of the railing connecting hand rail and intermediate rail, if any, to the string

[EN 13056:2000, 3.12]

3.13
intermediate rail
continuous part fixed between hand rail and string serving as additional protection from falling outboard of the railing

4 Safety requirements

4.1 Design

For stairs, the dimensions and specifications given in 4.2 to 6 shall be met; the design style does not have to correspond to figure 1.

4.2 Dimensions

General tolerances: ISO 2768 - c conforming to EN 22768-1

Stairs, railings, platforms as well as free space in front of and above the stairs shall conform to to specifications given in tables 1 and 2.

Table 1 — Stair dimensions and their explanation

Dimensions in millimetres

Symbol	Explanation	Dimensions
α	Inclination angle of the stair	see table 2
A	Space between steps	see table 2, 4.3 and 4.4
B	Depth of steps	see table 2
C	Vertical distance between the upper edge of the lowest step and the floor	a^{+10}_{-30}
E	Vertical distance between the upper rear edge of the highest step and the front edge of the upper landing	≤ 30
f_1	Stair breadth between the strings	≥ 600
f_2	Clear width between railings or hand rails	≥ 600
G	Distance between hand rail and fixed components	≥ 60
h	Height of railing	900^{+50}_{0}
i	Vertical distance between the centre lines of hand rail and intermediate rail	≈ h/2
j	Distance between stanchions, measured at the hand rail	≤ 1 500
k	Headroom	≥ 2 100
n	Number of steps	–

Tabee 2 — Dimensions *α, a* und *b*

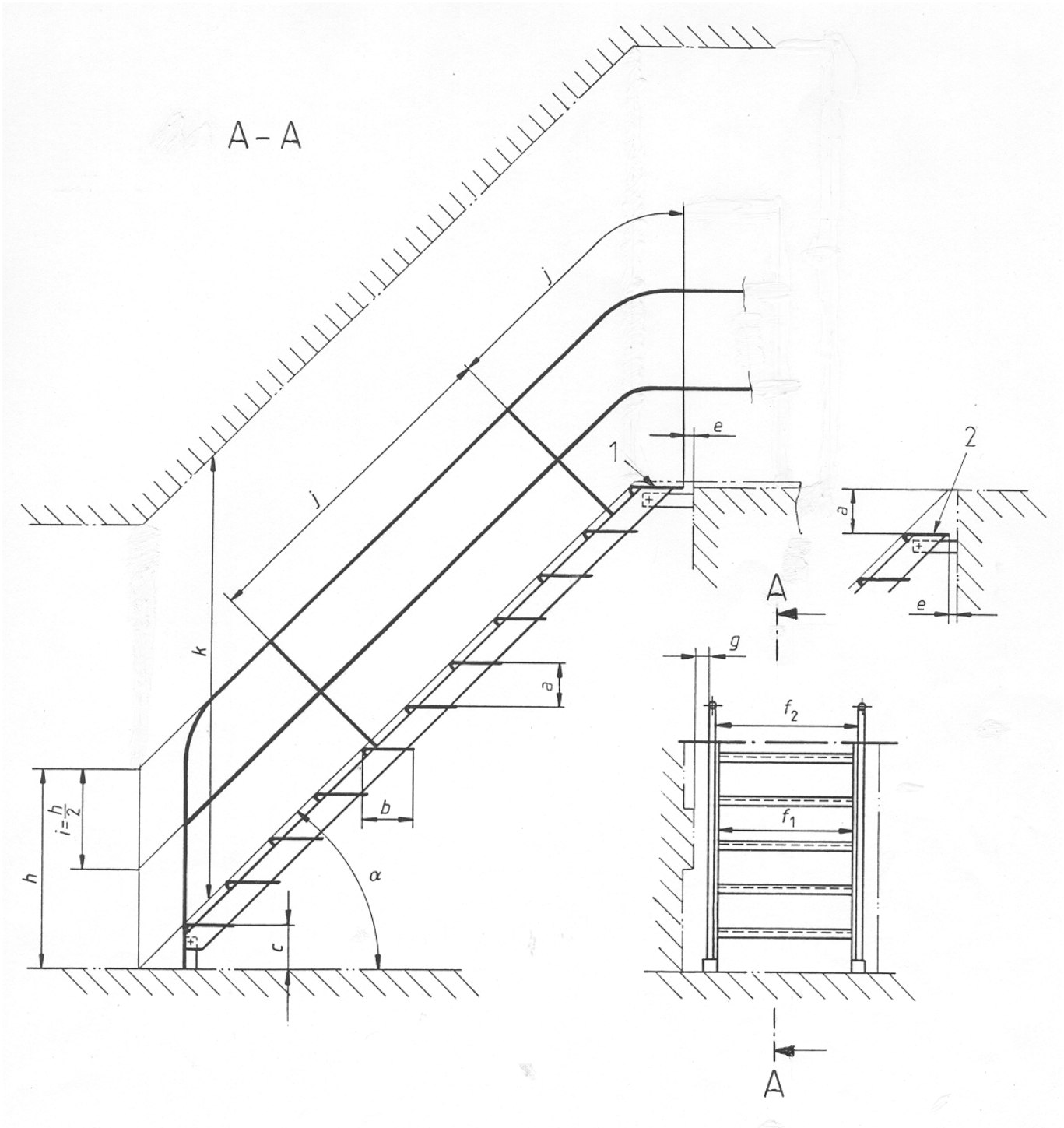
Dimensions in millimetres

Dimensions	Stairs for outside area and general use			Stairs for machine and boiler rooms
α [a])	45°	50°	55°	60°
a [b])	200^{+30}_{0}	200^{+20}_{-10}	200	200^{0}_{-30}
b	≥ 230	≥ 200	≥ 175	≥ 150

[a]) Intermediate values of α are permissible, the associated values of *a* and b are to be interpolated.
[b]) see 4.4

Stair with 45° inclination angle is illustrated

Dimensions in millimetres



Legend

1 Step on upper landing
2 Step one step spacing *a* lower than upper landing

Figure 1 — Illustration of stair with 45° inclination angle

4.3 Space between steps

The selected space between steps *a* shall be kept for all steps of a stair.

The value of *a* for two successive steps shall not differ by more than ± 2 mm.

The uppermost step of a stair shall be at the same horizontal level as the adjacent landing or shall end one normal step underneath, see figure 1, variation 2.

In compensation, the vertical distance between the upper edge of the lowest step and the floor, dimension *c*, may differ from the selected space between steps *a* by + 10 mm.

Steps shall be fixed in the horizontal plane.

4.4 Deviation for stairs for a height difference below 1,0 m

As a deviation from the information given in table 1, the space between steps can be $a = 230^{+40}_{-30}$ for stairs with a height difference below 1,0 m.

4.5 Landings/platforms adjacent to stairs

In front of stairs, there shall be a tread of at least 800 mm depth and at least the same width as the stair.

Platforms adjacent to stairs shall have railings as specified in EN 711 at the sides of the area used as a walkway.

Coamings shall be scalloped at platforms or adjacent landings in the walkway up to the height of the adjacent step.

4.6 Safety of treads

Steps and platforms shall have a non-slip surface. They shall be designed in such a way that they can be easily cleaned and that water cannot accumulate. The front edge of steps shall be designed so that slipping and stumbling will be prevented.

4.7 Hand rails/railings

Stairs with up to three steps shall have a handhold at one side instead of a railing.

Stairs with more than three steps shall be provided with railings or hand rails at both sides.

Railings of stairs with an inclination angle α up to 55° shall have an intermediate rail at half the railing height.

Hand rails or railings shall be continuous over the full length of the stairway At their upper ends they shall be suitably connected to structures or other continuous railings. At their lower ends hand rails and railings shall extend to the vertical above the outermost point of the string.

Hand rails shall be designed in such a way that their connectors do not hinder the continuous movement of the hands. Their distance *g* from adjacent structures shall be at least 60 mm; their ends shall be arranged to prevent injuries and to avoid damage to clothes.

4.8 Headroom

The headroom *k* shall be at least 2100 mm.

4.9 Strength

Stairs shall be permanently installed.

Steps shall be designed for a single load of at least 1,5 kN. If the expected load of 5 kN/m^2 leads to greater values, these shall be the basis for calculation.

The fixed stairs shall withstand a load which corresponds to 50 % of the total of the step loads without producing permanent deformation.

For treads and platforms adjacent to stairs, a load (imposed load) of 5 kN/m^2 shall be assumed.

Hand rails and intermediate rails shall be capable of withstanding a load of 500 N at any point without permanent deformation and shall not be deflected more than 20 mm.

4.10 Fire resistance

Stairs shall be made of non-combustible material, e.g. steel.

5 Manufacturer's declaration

The manufacturer has to declare that the stair is constructed conforming to this standard.

6 Designation

Stairs shall be designated in accordance with the following details:

a) Description "Stair"

b) Standard main number "EN 790"

c) Inclination angle α, in degrees

d) Stair breadth f_1, in millimetres

e) Number of steps n

f) Space between steps a, in millimetres

EXAMPLE: Stair EN 790 – 45 – 1 000 – 12 – 200

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