CODE OF PRACTICE

CP 118:1969

Incorporating Amendment No. 1

The structural use of aluminium

UDC 669.71:624.014.7

Code drafting committee BLCP/55
Structural aluminium
(Secretariat: Institution of Structural Engineers[a])
Mr. S. R. Banks (*Chairman*)

	Representing:
Mr. W. J. Meredith Mr. G. E. Norris	*Aluminium Federation*
Mr. G. Wood	*Association of Consulting Engineers*
Mr. P. Aldworth[b]	*British Standards Institution*
Mr. J. G. Young	*British Welding Research Association*[d]
Dr. J. B. Menzies	*Building Research Station*
Mr. L. W. Gold[c]	*Greater London Council*
Mr. A. L. Hale	*Institute of Welding*[d]
Mr. R. A. Foulkes (Vice Chairman)	*Institution of Civil Engineers*
Mr. S. R. Banks Mr. L. P. Bowen Mr. R. M. Davies Mr. J. B. Dwight Mr. J. W. Strong[e]	*Institution of Structural Engineers*
Mr. R. J. Hancock	*Ministry of Public Building and Works*
Mr. A. W. Torry	*Royal Aeronautical Society*
Mr. F. S. Alexander	*Royal Institute of British Architects*
Mr. I. J. Philip	*Royal Institution of Chartered Surveyors*
Mr. W. A. W. Lankshear Mr. R. McLester	*Co-opted*

[a] Transferred to the British Standards Institution in July, 1968.
[b] Resigned in November, 1967 and replaced by Mr. J. J. Rendell.
[c] Deceased August, 1967.
[d] Became part of the Welding Institute in March, 1968.
[e] Resigned in June, 1965 and replaced by Mr. J. H. Howlett.

The Committee is indebted to the following for valuable assistance in connection with certain sections of the Code: Mr. B.T.B. Baiden, Dr. P.S. Bulson, Mr. T.R. Gurney, Mr. J.R. Hall, Mr. W.L. Perry, Professor K.C. Rockey, Mr. R.E. Smith, Mr. G.H. Sowden, Dr. E.V. Tull and Dr. J.G. Whitman.

This Code of Practice has been prepared by a Committee convened by the Codes of Practice Committee for Building. It was published under the authority of the Executive Board on 18 June 1969

The following BSI references relate to the work on this Code of Practice:
Committee reference BLCP/55
Draft for comment 67/20192

ISBN 580 05520 5

Amendments issued since publication

Amd. No.	Date of issue	Comments
1129	March 1973	Indicated by a sideline in the margin

Contents

Foreword

This Code makes reference to the following British Standards:

BS 153, *Steel girder bridges — Part 3A: Loads.*

BS 275, *Dimensions of rivets (½ in to 1¾ in diameter).*

BS 350, *Conversion factors and tables.*

BS 466, *Electric overhead travelling cranes for general use in factories, workshops and warehouses.*

BS 499, *Welding terms and symbols — Part 1: Welding, brazing and thermal cutting glossary — Part 2: Symbols for welding.*

BS 641, *Dimensions for small rivets for general purposes.*

BS 648, *Schedule of weights of building materials.*

BS 729, *Zinc coatings on iron and steel articles.*

BS 916, *Black bolts, screws and nuts.*

BS 1083, *Precision hexagon bolts, screws and nuts (B.S.W. and B.S.F. threads).*

BS 1161, *Aluminium and aluminium alloy sections.*

BS 1470, *Wrought aluminium and aluminium alloys for general engineering purposes — Plate, sheet and strip.*

BS 1471, *Wrought aluminium and aluminium alloys for general engineering purposes — Drawn tube.*

BS 1472, *Wrought aluminium and aluminium alloys for general engineering purposes — Forging stock and forgings.*

BS 1473, *Wrought aluminium and aluminium alloys for general engineering purposes — Rivet, bolt and screw stock.*

BS 1474, *Wrought aluminium and aluminium alloys for general engineering purposes — Bars, extruded round tube and sections.*

BS 1475, *Wrought aluminium and aluminium alloys for general engineering purposes — Wire.*

BS 1490, *Aluminium and aluminium alloy ingots and castings for general engineering purposes.*

BS 1494, *Fixing accessories for building purposes — Part 1: Fixings for sheet, roof and wall coverings.*

BS 1500, *Fusion welded pressure vessels for general purposes — Part 3: Aluminium.*

BS 1615, *Anodic oxidation coatings on aluminium.*

BS 1768, *Unified precision hexagon bolts, screws and nuts (UNC and UNF threads). Normal series.*

BS 1769, *Unified black, hexagon bolts, screws and nuts (UNC and UNF threads). Heavy series.*

BS 1974, *Large aluminium alloy rivets: ½ in to 1 in nominal diameters.*

BS 2569, *Sprayed metal coatings — Part 1: Protection of iron and steel by aluminium and zinc against atmospheric corrosion.*

BS 2708, *Unified black square and hexagon bolts, screws and nuts (UNC and UNF threads). Normal series.*

BS 2901, *Filler rods and wires for gas-shielded arc welding — Part 4: Aluminium and aluminium alloys and magnesium alloys.*

BS 3019, *General recommendations for manual inert-gas tungsten-arc welding — Part 1: Wrought aluminium, aluminium alloys and magnesium alloys.*

BS 3416, *Black bitumen coating solutions for cold application.*

BS 3451, *Testing fusion welds in aluminium and aluminium alloys.*

BS 3571, *General recommendations for manual inert-gas metal-arc welding — Part 1: Aluminium and aluminium alloys.*

BS 3660, *Glossary of terms used in the wrought aluminium industry.*

BS 3692, *ISO metric precision hexagon bolts, screws and nuts.*

BS 3763, *International System (SI) units.*

BS 3987, *Anodized wrought aluminium for external architectural applications.*

BS 3989, *Aluminium street lighting columns.*

BS 4300-1, *Specification (supplementary series) for wrought aluminium and aluminium alloys. Aluminium alloy longitudinally welded tube.*

BS 4300-14, *HS17 plate, sheet and strip.*

BS 4300-15, *HE 17 bar, extruded round tube and sections.*

CP 3, *Code of basic data for the design of buildings — Chapter V: Loading.*

CP 143, *Sheet roof and wall coverings — Part 7: Aluminium.*

CP 231, *Painting of buildings.*

This Code of Practice was made on the recommendation of the Institution of Structural Engineers, whose report on the structural use of aluminium (1962) it supersedes.

It is assumed that the Code will be interpreted by chartered engineers competent in the fields to which they apply it, and that construction will be entrusted to capable contractors and carried out under competent supervision.

The range of alloys is wider than that of the above report and, although emphasis is laid on the more usual alloys H30, N8 and H9, provision is made for design with other alloys specified in British Standards and also with non-standard tempers and heat-treatment conditions.

The Code does not preclude the use of non-standard alloys, but warns that they should not be used without careful consideration of their relevant physical and chemical properties; consultation with the manufacturer is essential.

Permissible stresses are higher than those of the report, and are in good correspondence with those of foreign specifications; and the internationally accepted 0.2 % proof stress is adopted as a reference datum in place of the 0.1 % proof stress previously used. Useful expressions are given for dealing with torsional and local buckling of thin-walled open sections. Advantage is taken of the post-buckled strength of thin plates and webs. The general increase in static permissible stresses is supported by the inclusion of specific rules for the design of members subject to fluctuating loads.

The welding of aluminium by the inert-gas processes is dealt with comprehensively in regard to both design and fabrication.

Provision is made for the acceptance of a structure by testing should stress-analysis not be feasible; tests more realistic than those hitherto required are prescribed.

Detailed advice is given on the protection of aluminium structures in environments where it is needed.

Consideration was given to the possibility of drafting this Code on limit-state design principles, but to do so in the present state of knowledge was deemed impracticable.

With Amendment Slip No. 1, giving material properties and basic permissible stresses in SI units (for details of which see BS 3763[1)]), the Code becomes substantially a metric document, the conversions (based on BS 350[2)]) of those values still cited first in imperial units being sufficiently accurate for structural purposes.

[1)] BS 3763, *"International System (SI) units"*.
[2)] BS 350, *"Conversion factors and tables"*, Part 1, *"Basis of tables. Conversion factors"*, Part 2, *"Detailed conversion tables"*. Supplement No. 1 to Part 2, *"Additional tables for SI conversions"*.

This Code of Practice represents a standard of good practice and therefore takes the form of recommendations. Compliance with it does not confer immunity from relevant statutory and legal requirements.

Summary of pages

This document comprises a front cover, an inside front cover, pages i to viii, pages 1 to 133 and a back cover.

This standard has been updated (see copyright date) and may have had amendments incorporated. This will be indicated in the amendment table on the inside front cover.