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BRITISH STANDARD 2762: 1956

NOTCH DUCTILE
STEEL
FOR GENERAL STRUCTURAL PURPOSES
~~FOR BRIDGES AND GENERAL~~
~~BUILDING CONSTRUCTION~~

BRITISH STANDARDS INSTITUTION

BRITISH STANDARD SPECIFICATION

NOTCH DUCTILE STEEL

FOR BRIDGES AND
GENERAL BUILDING CONSTRUCTION
(SUITABLE FOR WELDING)

B.S. 2762 : 1956

Price 3/6^{net}

BRITISH STANDARDS INSTITUTION

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THIS BRITISH STANDARD, having been approved by the Iron and Steel Industry Standards Committee and endorsed by the Chairman of the Engineering Divisional Council, was published under the authority of the General Council as a British Standard on 24th July, 1956.

The Institution desires to call attention to the fact that this British Standard does not purport to include all the necessary provisions of a contract.

In order to keep abreast of progress in the industries concerned, British Standards are subject to periodical review. Suggestions for improvements will be recorded and in due course brought to the notice of the committees charged with the revision of the standards to which they refer.

A complete list of British Standards, numbering over 2500, indexed and cross-indexed for reference, together with an abstract of each standard, will be found in the Institution's Yearbook, price 12s. 6d.

This standard makes reference to the following British Standards :—

- B.S. 4. Dimensions and properties of channels and beams for structural purposes.
- B.S. 4A. Dimensions and properties of equal angles, unequal angles and T-bars for structural purposes.
- B.S. 18. Tensile testing of metals.
- B.S. 131. Forms of notched bar test pieces.
- B.S. 350. Conversion factors and tables.
- B.S. 2566. Broad flange beams, heavy flange T-bars and long-legged T-bars.

British Standards are revised, when necessary, by the issue either of amendment slips or of revised editions. It is important that users of British Standards should ascertain that they are in possession of the latest amendments or editions.

The following B.S.I. references relate to the work on this standard :—
Committee reference ISE/12 Draft for comment CV(ISE) 144

CO-OPERATING ORGANIZATIONS

The Iron and Steel Industry Standards Committee, under whose supervision this British Standard was prepared, consists of representatives from the following Government departments and scientific and industrial organizations :—

- *Admiralty
- Alloy Steels Association
- British Cast Iron Research Association
- *British Constructional Steelwork Association
- British Electrical and Allied Manufacturers' Association
- *British Engineers' Association
- *British Iron and Steel Federation
- British Ironfounders' Association
- *British Railways, The British Transport Commission
- British Steel Castings Research Association
- British Steel Founders' Association
- *British Steel Wire Industries Association
- Council of Iron Producers
- Council of Ironfoundry Associations
- *Crown Agents for Oversea Governments and Administrations
- Federation of Civil Engineering Contractors
- Institute of British Foundrymen
- Institute of Marine Engineers
- Institution of Civil Engineers
- Institution of Mechanical Engineers (Automobile Division)
- *Institution of Structural Engineers
- Iron and Steel Institute
- Joint Iron Council
- *Lloyd's Register of Shipping
- *Ministry of Labour and National Service (Factory Department).
- *Ministry of Supply
- National Association of Drop Forgers and Stampers
- National Ironfounding Employers' Federation
- *National Physical Laboratory
- *Oil Companies Materials Committee
- *Royal Institute of British Architects
- *Shipbuilding Employers' Federation
- Society of British Aircraft Constructors
- The Government departments and scientific and industrial organizations marked with an asterisk in the above list, together with the following, were directly represented on the committee entrusted with the preparation of this British Standard :—
- Air Ministry
- D.S.I.R.—Building Research Station
- High Commission of India
- Institute of Welding
- Institution of Engineers and Shipbuilders in Scotland
- Institution of Municipal Engineers
- Institution of Naval Architects
- London County Council
- Ministry of Transport and Civil Aviation
- Ministry of Works
- National Association of Iron and Steel Stockholders
- National Federation of Building Trades Employers
- North East Coast Institution of Engineers and Shipbuilders

BRITISH STANDARD SPECIFICATION FOR NOTCH DUCTILE STEEL FOR BRIDGES AND GENERAL BUILDING CONSTRUCTION

(SUITABLE FOR WELDED CONSTRUCTION)

FOREWORD

This specification has arisen from the growing need for mild steels whose 'notch ductility' or resistance to 'brittle fracture' is better than that of ordinary mild steel to B.S. 15, 'Structural steel for bridges, etc., and general building construction.' There is as yet no general agreement about the correct tests to be applied to a steel to measure these properties, but as far as our present knowledge goes, the Charpy V-notch impact test, particularly if carried out at sub-atmospheric temperatures, provides some guidance in this respect. In this connection B.S. 131, 'Forms of notched bar test pieces' is being revised and extended to cover the Charpy V-notch impact test in more detail.

The essential difference between this specification and B.S. 15 is that it provides for impact tests at temperatures down to -50°C as shown in Table 3.

The fact that low temperatures are used for these tests does not necessarily imply that the steels described are guaranteed as being completely satisfactory for use at these temperatures, though in general they can be regarded as progressive improvements over ordinary mild steel in the order shown in the table.

SPECIFICATION

*See Amendment 3
page 2*

SCOPE

NOTE. The figures in British units are to be regarded as standard. The metric conversions are approximate and more accurate conversions should be based on the tables in B.S. 350, 'Conversion factors and tables.'

1. This specification applies to notch ductile steel suitable for welding and in the following forms:—

Plates and flats having a thickness of 0.4 in. (10.2 mm) up to and including 2 in. (50.8 mm).

Rounds, squares and hexagons having a diameter or width across flats of 0.625 in. (15.9 mm) up to and including 2 in. (50.8 mm).

Sections having a thickness, as defined in B.S. 4, B.S. 4A and B.S. 2566, exceeding 0.4 in. (10.2 mm); but the supply of certain sections to Grades NDII and III and IV shall be a matter of agreement between the purchaser and the manufacturer.

It covers four grades of notch ductility (NDI, NDII, NDIII and NDIV) and each grade is covered in two tensile ranges viz., 26/31 tons/sq. in. (40.9/48.8 kg/sq. mm) and 28/33 tons/sq. in. (44.1/52.0 kg/sq. mm).

In the case of Grade NDIV the purchaser shall state in the order at which of the temperatures given in Table 3 the impact test is to be made.

STEELMAKING PROCESS

2. The steel shall be made by the open hearth or electric process, acid or basic, as may be agreed between the purchaser and the manufacturer. Steel of Grade NDIV shall be produced in accordance with fine grain practice.

CHEMICAL COMPOSITION

3. The steel shall contain:

Element	Grades NDI and II		Grades NDIII and IV	
	per cent		per cent	
	min.	max.	min.	max.
Carbon	—	0.20	—	0.17
Silicon	—	—	0.10	0.35
Manganese	—	1.50	—	1.50
Sulphur	—	0.060	—	0.050
Phosphorus	—	0.050	—	0.050

The analyses reported shall be ladle or cast analyses for the cast or casts of steel concerned in the order.

QUALITY OF FINISHED STEEL

4. All finished steel as sent from the mills shall, subject to the provisions of Clause 5, be well and cleanly rolled to the dimensions, sections and weights specified or required. It shall be sound and free from cracks, surface flaws, laminations and other defects. It shall be finished in a workmanlike manner and shall in all respects comply with the appropriate tests and requirements specified herein.

ROLLING MARGIN

5. a. 'Specified lengths.' When steel in the form of bars or sections is specified to be cut to certain lengths it shall be cut within a margin of 1 in. (25.4 mm) under and 1 in. (25.4 mm) over the specified length, but when minimum lengths are specified the margin shall be 2 in. (50.8 mm) over.