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British Engineering Standards Association

(Incorporated 1918.)

FORMED IN 1901 AS THE ENGINEERING STANDARDS COMMITTEE

BY

THE INSTITUTION OF CIVIL ENGINEERS.
THE INSTITUTION OF MECHANICAL ENGINEERS.
THE INSTITUTION OF NAVAL ARCHITECTS.
THE IRON AND STEEL INSTITUTE.
THE INSTITUTION OF ELECTRICAL ENGINEERS.

BRITISH STANDARD SPECIFICATIONS FOR RAILWAY ROLLING STOCK MATERIAL.

PART V.

COPPER PLATES, RODS AND TUBES, AND BRASS TUBES.

(REVISED DECEMBER 1911.)

LONDON:
PUBLISHED FOR THE ASSOCIATION BY CROSBY LOCKWOOD & SON,
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PART IV. Steel Forgings, Blooms and Castings.

PART VI. Steel Plates, Angles, etc., and Rivets for Locomotives, Carriages and Wagons.

BRITISH ENGINEERING STANDARDS ASSOCIATION.

MAIN COMMITTEE.

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MR. C. LE MAISTRE (*Secretary*).

MR. CHARLES DRESSER (*Assistant Secretary*).

† Succeeded the late SIR JOHN WOLFE BARRY, K.C.B., February, 1918.

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BRITISH ENGINEERING STANDARDS ASSOCIATION.

The following are lists of the Members of the Sectional Committee on Locomotives and its Sub-Committees, and of the Sectional Committee on Railway Rolling Stock Underframes.

SECTIONAL COMMITTEE ON LOCOMOTIVES.

December, 1911.

Chairman, SIR DOUGLAS FOX.

War Office,* Major A. G. Stevenson, D.S.O., R.E.

India Office, Mr. A. Brereton, C.S.I.

Crown Agents for the Colonies: Mr. G. L. Eyles, C.M.G.; Mr. Ashton M. Heath.

Locomotive Manufacturers' Parliamentary Association: Mr. W. Lorimer (*North British Locomotive Co., Ltd.*); †Mr. Hugh Reid (*North British Locomotive Co., Ltd.*); **Mr. T. P. Reay (*Kitson & Co., Ltd.*).

Railway Companies' Association: Mr. J. A. F. Aspinall (*Lancashire and Yorkshire Railway*); Mr. J. F. McIntosh, M.V.O. (*Caledonian Railway*).

Association of Railway Locomotive Engineers: Mr. G. J. Churchward (*Great Western Railway*); ‡ Mr. G. H. Hughes (*Lancashire and Yorkshire Railway*).

Steel Ingot Makers' Association: § Mr. Maxmilian Mannaberg (*Frodingham Iron and Steel Co., Ltd.*).

Steel Founders' Association of Great Britain: Sir Robert Hadfield (*Hadfield's Steel Foundry Co., Ltd.*).

Mr. F. Wolley-Dod (*Chairman of the Calcutta Conference, 1901*).

**Sir John Wolfe Barry, K.C.B.; Mr. G. Ainsworth (*Consett Iron Co., Ltd.*); **Mr. H. C. Arbuthnott (*Taylor Bros. & Co., Ltd.*); Mr. J. Hartley Bibby (*John Bibby, Sons & Co.*); Mr. D. Cassels (*Steel Company of Scotland, Ltd.*); Mr. W. Collingwood (*Vulcan Foundry, Ltd.*); Mr. J. M. Dobson (*Hawkshaw & Dobson*); ‖ Mr. J. Duncan Elliot (*Carruthers & Elliot*); Mr. F. C. Fairholme (*Thomas Firth & Sons, Ltd.*); Mr. C. N. Goodall (*Robert Stephenson & Co., Ltd.*); Mr. E. Greg, Jnr. (*Nasmyth, Wilson & Co., Ltd.*); Mr. Cyril Hitchcock (*Sir George Bruce & White*); ¶ Mr. A. F. Halstead (*Beyer, Peacock & Co., Ltd.*); Mr. Bradford Leslie (*A. J. Barry & Leslie*); Mr. Edward Mills (*Williams Foster & Co.*, and *Pascoe, Grenfell & Sons, Ltd.*); **Mr. F. E. Robertson, C.I.E. (*Rendel & Robertson*); Mr. Frederick Tomlinson (*Broughton Copper Co., Ltd.*); Mr. Seymour B. Tritton (*Rendel & Robertson*); Mr. J. N. Vickers (*Vickers, Ltd.*); Mr. Robert White (*Sir George Bruce & White*).

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* Succeeded Major T. H. Cochrane, M.V.O., R.E., October, 1909.

† Succeeded Mr. J. F. Robinson, January, 1910.

‡ Succeeded Mr. James Holden, June, 1908.

§ Succeeded Mr. F. W. Dick, July, 1909.

‖ Succeeded Mr. John Carruthers, July, 1910.

¶ Succeeded Mr. A. S. Jameson, June, 1911.

** Deceased.

SECTIONAL COMMITTEE ON RAILWAY ROLLING STOCK UNDERFRAMES.

December, 1911.

Chairman, SIR DOUGLAS FOX.

Crown Agents for the Colonies: Mr. G. L. Eyles, C.M.G.; Mr. Ashton M. Heath.

Mr. D. Bain (*Midland Railway*); Mr. Lincoln Chandler (*Metropolitan Amalgamated Railway Carriage and Wagon Co., Ltd.*); Mr. Thomas G. Clayton (*late Midland Railway*); Mr. Brodie Henderson (*Livesey, Son & Henderson*); †Mr. G. A. Hobson (*Sir Douglas Fox & Partners*); *Mr. H. D. Earl (*London & North Western Railway*); †Mr. F. E. Robertson, C.I.E. (*Rendel & Robertson*); Mr. H. J. Skelton (*H. J. Skelton & Co.*).

* Succeeded Mr. C. A. Park, June, 1910.

† Deceased.

LOCOMOTIVE SUB-COMMITTEES.

December, 1911.

SUB-COMMITTEE ON TYRES, AXLES AND SPRINGS.

Chairman, Mr. G. J. Churchward.

†Mr. H. C. Arbuthnott; Mr. W. J. Armitage; Mr. D. Bain; Mr. Lincoln Chandler; Mr. F. C. Fairholme; Mr. Albert Good; Mr. Richard Halstead; Mr. Ashton M. Heath; Mr. C. Hitchcock; Mr. Henry Steel, Jnr.; Dr. W. C. Unwin.

SUB-COMMITTEE ON LOCOMOTIVE STEEL PLATES.

Chairman, Mr. W. Lorimer.

Mr. G. Ainsworth; Mr. D. Cassels; Mr. Maxmilian Mannaberg; †Mr. T. P. Reay; Dr. W. C. Unwin.

SUB-COMMITTEE ON COPPER AND ITS ALLOYS.

Chairman, Mr. J. F. McIntosh, M.V.O.

Mr. J. Hartley Bibby; Mr. Edward Mills; Mr. Hugh Reid; Mr. Frederick Tomlinson.

† Deceased.

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PREFACE TO FIRST EDITION.

The subject of the Standardisation of Locomotives was first raised at a meeting of the Main Committee on January 14th, 1902, when Sir John Wolfe-Barry recorded interviews he had had with Lord George Hamilton and other officials of the India Office with regard to this subject, and it was agreed that evidence should be collected. On March 4th, 1902, the Main Committee sat to hear evidence on the subject, and this being in favour of proceeding, a Sectional Committee on Locomotives was formed under the Chairmanship of Sir Douglas Fox.

The Sectional Committee on Locomotives held their first meeting on May 30th, 1902, when the following Sub-Committees were formed :—

Name.	*Chairman.*
Locomotive Steel Plates .	Mr. W. LORIMER.
Tyres, Axles, and Springs	Mr. W. LORIMER.
Copper and its Alloys .	Mr. W. DEAN. (Succeeded by Mr. J. F. MCINTOSH.)

A number of meetings of the Sub-Committees have been held, and the Report in its present form was adopted by the Sectional Committee on Locomotives at their meeting held on March 23rd, 1906.

The Sectional Committee on Locomotives desire to place on record their appreciation of the services rendered by the Association of Railway Locomotive Engineers through their representatives on the Committee.

In many instances somewhat divergent opinions have had to be reconciled, and this has only been rendered possible by accepting the view that the Standard Specifications will be considered from time to time as occasion requires, and the Sectional Committee are desirous of making this point clear when submitting their Report.

To meet the various needs of the Home, Indian, and Colonial requirements, the Committee have in many cases included similar Specifications—one with, and the other without, a Chemical Analysis —in order that those who do not desire to specify a Chemical Analysis can still use a Standard Specification.

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