BRITISH STANDARD

BS 970-3:1991

Incorporating Amendment Nos. 1 and 2

Specification for

Wrought steel for mechanical and allied engineering purposes —

Part 3: Bright bars for general engineering purposes

Committees responsible for this British Standard

The preparation of this British Standard was entrusted by the Iron and Steel Standards Policy Committee (ISM/-) to Technical Committee ISM/31, upon which the following bodies were represented:

Associated Offices Technical Committee
British Chain Manufacturers' Association
British Coal Corporation
British Forging Industry Association
British Industrial Fasteners Federation
British Railways Board
British Steel Industry
Cold Rolled Sections Association
Department of Trade and Industry (National Physical Laboratory)
Engineering Industries Association
Federation of British Engineers' Tool Manufacturers
Lloyds Register of Shipping
Ministry of Defence
National Association of Steel Stockholders
Road Vehicle Spring Society
Society of Motor Manufacturers and Traders Limited
Stainless Steel Fabricators' Association of Great Britain

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The following BSI references relate to the work on this standard:
Committee reference ISM/31
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Amendments issued since publication

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Contents

Foreword

This Part of BS 970 has been prepared under the direction of the Iron and Steel Standards Policy Committee. It supersedes those clauses concerned with bright finished bars in BS 970-1:1983, which is withdrawn.

Technical Committee ISM/31 has decided that requirements for bars supplied in the bright cold finished condition should be withdrawn from BS 970-1:1983 to appear in a separate standard for the sake of clarity and as a preparatory step towards a European Standard for this product range.

This Part of BS 970 specifies the requirements for bright cold finished bars in carbon, carbon manganese, alloy, free-cutting and stainless steels supplied in straight lengths.

A British Standard does not purport to include all the necessary provisions of a contract. Users of British Standards are responsible for their correct application.

Compliance with a British Standard does not of itself confer immunity from legal obligations.

Summary of pages

This document comprises a front cover, an inside front cover, pages i to iv, pages 1 to 30, an inside back cover 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.

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1 Scope

This Part of BS 970 specifies requirements for carbon and carbon manganese, alloy, free-cutting and stainless steels normally supplied in the bright cold finished condition. It is only applicable to steels supplied in straight lengths.

In addition to the definitive requirements, this Part of BS 970 also requires the items detailed in clause **3** to be documented. For compliance with this Part of BS 970, both the definitive requirements and the documented items have to be satisfied.

Special ordering options to be called up as required by the purchaser are included in appendix A.

NOTE The titles of the publications referred to in this standard are listed on the inside back cover.

2 Definitions and symbols

2.1 Definitions

For the purposes of this Part of BS 970 the following definitions apply.

2.1.1
bright cold drawn bars

bars of various cross-sectional shapes obtained, after descaling, by drawing of hot rolled bars or rod, through a die (cold deformation without removing material)

NOTE This operation gives the product special features with respect to shape, dimensional accuracy and surface finish. In addition, the process causes cold working of the product, which can be eliminated by subsequent heat treatment. Products in lengths are delivered straightened regardless of size.

2.1.2
bright turned bars

bars of circular cross section having the special features of drawn product concerning shape, dimensional accuracy and bright surface finish with the additional benefit of metal removal on decarburization and surface defectiveness produced by turning

2.1.3
precision ground bars

drawn or turned bars of circular cross section given an improved surface finish and dimensional accuracy by grinding or grinding and polishing

2.1.4
annealing

heat treatment consisting of heating and soaking at a suitable temperature followed by cooling under conditions such that, after return to ambient temperature, the metal will be in a structural state closer to that of equilibrium

NOTE The heat treatments in **2.1.4** to **2.1.7** can be carried out either before or after cold conversion and can result in surface discolouration.

2.1.5
normalizing

heat treatment consisting of austenitizing followed by air cooling to refine the metallurgical structure (See note to **2.1.4**.)

2.1.6
stress relieving

heat treatment including heating and soaking at a suitable temperature followed by cooling at an appropriate rate in order to relieve internal stresses without substantially modifying the structure (See note to **2.1.4**.)

2.1.7
hardening and tempering

heat treatment including heating to a temperature above the upper critical temperature followed by rapid cooling by means of a suitable quenching medium and subsequent reheating to a temperature below the lower critical temperature (See note to **2.1.4**.)

2.1.8
ruling section

the equivalent diameter of that portion of the product at the time of heat treatment that is most important in relation to mechanical properties

2.1.9
limiting ruling section

the largest diameter in which certain specified mechanical properties are achieved after a specified heat treatment

2.1.10
equivalent diameter

the diameter of a hypothetical bar of infinite length of uniform circular cross section which, if subjected to the same cooling conditions as the product, i.e. same initial and final temperature and same cooling medium, would have a cooling rate at its axis equivalent to that at the slowest cooling position in the product or relevant part

2.1.11
test sample

a sufficient quantity of material taken from the sample product for the purpose of producing one or more test pieces

2.1.12
test piece

part of the test sample, with the specified dimensions, machined or unmachined, brought to the required condition for submission to a given test