

Approval & Reception Procedure

DMC – Departamento de Materiais de Construção

Hot Rolled and Hot Rolled and Processed High Tensile Alloy Steel Bars for the Prestressing of Concrete

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1 Reference Standards

BS 4486 - Hot rolled and hot rolled and processed high tensile alloy steel bars for the prestressing of concrete,

2 Approval Procedures

Manufacturer's information, such as production catalogue, accredited quality system certificates, and mill certificate of each type and size of steel bar, should be submitted for compliance verification before any delivery.

Compliance verification includes the following:

- Cast Analysis
- Geometrical properties: Diameter, Cross-sectional Area and Unit Mass.
- Mechanical properties: Tensile strength, Characteristic breaking load, Characteristic 0.1% proof load, Elongation at fracture, Relaxation test, Modulus of elasticity
- Evidence of production control implementation

A material sample should be submitted at the same time as the above mentioned information is submitted.

3 Reception Procedure

3.1 Batch

A batch of steel bars is any quantity of steel bars of the same type, size and grade, manufactured by the same manufacturer, covered by the same certificates and delivered to the Site at any one time.

3.2 Stocking on the site

Steel bars shall be tagged with a number to identify the bundle number of the prestressing bar used. Steel bars shall be stored in a dry and weatherproof store and in a manner that will not result in damage or deformation to the materials or in contamination of the materials.

Different types and sizes of steel bars shall be stored separately. Steel bars shall not be stored on or adjacent to concrete surfaces that form part of the permanent work.

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Steel bars shall be protected from exposure to conditions that may affect the material.

3.3 Information to be submitted

Manufacturer's Mill Certificate and Quality Certificate of each delivery should be submitted for reception. Quality Certificate shall indicate the name of manufacturer, date and place of manufacture, grade of strength, diameter, cross sectional area, unit mass, the name of purchaser, the number of contract, product label, the number of bars, reference standards, test reports for mechanical properties (including breaking load, 0.1% proof load, elongation at break, relaxation and modulus of elasticity), seal of quality and technology supervision.

Quantity of each delivery shall be submitted for reception sampling.

3.4 Sampling for Test

Samples of steel bars shall be provided from each batch of steel bars delivered to the Site and at least 28 days before installation of the steel strands starts.

The number of specimens from each batch shall be 1 for each 100 tonnes or part thereof.

The number of specimens in each sample shall be 15. Each specimen shall be 1.0 metres long and straight. Each specimen shall be taken from different bars in the batch.

3.5 Testing

Each specimen of steel bars shall be tested to determine the breaking load, 0.1% proof load, elongation at break, diameter, cross-sectional area, unit mass and modulus of elasticity.

The method of testing shall be in accordance with BS4486.

The Relaxation test for hot rolled and hot rolled and processed high tensile alloy steel bars should be done if requested by the designer or the Quality Control.

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4 Acceptance Criteria

The standard deviations of the results of tests for breaking load and 0.1% proof load, expressed as equivalent stress values, of steel bars shall not exceed the following:

- Tensile strength: 55 MPa
- 0.1% proof stress: 60 MPa

The statistical interpretation of the test results shall be in accordance with BS 2846: Part 3, Table 3 and BS 2846: Part 4, Table E, both for a one-sided tolerance interval of 0.95 and for a confidence level of 0.95.

If the result of any test for elongation at break, diameter, cross-sectional area, unit mass or modulus of elasticity does not comply with the specified requirements for the property, one additional sample shall be provided from the same batch and additional tests for the property shall be carried out. The number of samples in the additional sample shall be 15.

The batch shall be considered as not complying with the specified requirements for the property if the result of any additional test does not comply with the specified requirements for the property.