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**INDUSTRY STANDARD OF THE
PEOPLE'S REPUBLIC OF CHINA**

YB/T 4002-2013

**Standard diagrams for macrostructure and defects in
continuous casting billets
(English Translation)**

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1 Scope

This standard specifies the terms and definitions, order content, dimensions, shape, weight and allowable deviations, technical requirements, test methods, inspection rules, packaging, markings and quality certificates of hot-rolled wide flat steel for structural use.

This standard is applicable to strip-shaped wide flat steel which has a thickness of 4 mm ~ 40 mm, a width of 150 mm ~ 600 mm, in a rectangular cross-section for structural use, hot-rolled on all four sides.

2 Normative references

The following documents are essential to the application of this document. For the dated documents, only the versions with the dates indicated are applicable to this document; for the undated documents, only the latest version (including all the amendments) is applicable to this standard.

GB/T 222 Permissible tolerances for chemical composition of steel products

GB/T 223.3 Methods for chemical analysis of iron, steel and alloy - The diantipyryl methane phosphomolybdate gravimetric method for the determination of phosphorus content

GB/T 223.5 Steel and iron - Determination of acid-soluble silicon and total silicon content - Reduced molybdosilicate spectrophotometric method

GB/T 223.9 Methods for chemical analysis of iron, steel and alloy - The chrome azurol S photometric method for the determination of aluminum content

GB/T 223.11 Iron, steel and alloy - Determination of chromium content -

Visual titration or potentiometric titration method

GB/T 223.14 Methods for chemical analysis of iron, steel and alloy - The N-benzoyl-N-phenylhydroxylamine extraction photometric method for the determination of vanadium content

GB/T 223.17 Methods for chemical analysis of iron, steel and alloy - The diantipyryl methane photometric method for the determination of titanium content determination of carbon content

GB/T 223.72 Iron, steel and alloy - Determination of sulfur content -

Gravimetric method

GB/T 228 Metallic materials - Tensile testing at ambient temperature

GB/T 229 Metallic materials - Charpy pendulum impact test method

GB/T 232 Metallic materials - Bend test

GB/T 700 Carbon structural steels

GB/T 1591 High strength low alloy structural steels

GB/T 2101 General requirement of acceptance, packaging, marking and certificate for section steel

GB/T 2975 Steel and steel products - Location and preparation of samples and test pieces for mechanical testing

GB/T 4336 Carbon and low-alloy steel - Determination of multi-element contents - Spark discharge atomic emission spectrometric method (routine method)

GB/T 20066 Steel and iron - Sampling and preparation of samples for the determination of chemical composition

YB/T 081 Rule for rounding off of numerical values and judgement of testing values for technical standards of metallurgy

3 Terms and definitions

The following terms and definitions apply to this standard:

3.1

Wide flat

Wide flat steel refers to a steel with a width greater than or equal to 150 mm and a thickness usually greater than 4 mm, generally delivered in straight bars, not in coils, with

edges and corners on the sides. Wide flat steel is obtained by hot rolling on four sides (or by box-shaped hole).

4 Order content

a) This standard number

When the wide flat steel is delivered according to the theoretical weight, the nominal size shall be adopted for calculating the theoretical weight. The density of carbon steel is 7.85 g/cm³. Other steel types shall be as specified in accordance with the corresponding standards.

6.1 Designation and chemical composition

The designation and chemical composition of steel shall meet the requirements of GB/T 700 and GB/T 1591. The allowable deviation of the chemical composition of the finished wide flat steel shall meet the requirements of GB/T

222.

6.2 Smelting method

Steel is smelted by converter or electric furnace.

6.3 Delivery status

Wide flat steel is delivered straight in hot rolled status.

6.4 Mechanical properties and process properties

The mechanical properties and process properties of wide flat steel shall meet the requirements of GB/T 700 and GB/T 1591.

6.5 Surface quality

6.5.1

The surface of the wide flat steel shall not have defects such as scars, cracks, folds, inclusions, blisters, oxide scales that are harmful to use. There shall be no delamination of wide flat steel.

6.5.2

The surface of the wide flat steel is allowed to have local defects such as thin oxide scale, rust, slight pitting and scratches that do not affect the use. The unevenness shall not exceed half of the thickness tolerance of the wide flat steel; meanwhile it shall ensure the allowable minimum thickness of wide flat steel.

6.5.3

The surface defects of wide flat steel are allowed to be cleaned up. The cleaning place shall be smooth and without edges and corners, meanwhile the allowable minimum thickness of the wide flat steel shall be guaranteed.

However, welding repair or blockage is not allowed.

6.5.4

For edge cracks and other defects caused by rolling, the depth shall not exceed half of the width tolerance of the wide flat steel, meanwhile the wide flat steel shall not be made smaller than the nominal width.

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