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ENTERPRISE STANDARD OF

BAOSHAN IRON AND STEEL CO., LTD.

**Q/BQB 312-2023**

Replacing Q/BQB 312-2018

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**Continuously hot-rolled advanced high strength steel sheet  
and strip for cold forming**

冷成形用先进高强度热连轧钢板及钢带

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## Foreword

This document was drafted in accordance with the rules provided in GB/T 1.1-2020 *Directives for standardization - Part 1: Rules for the structure and drafting of standardizing documents*.

This document is formulated with reference to EN 10338:2015 and in combination with Baosteel's actual situation.

This document replaces Q/BQB 312-2018 *Advanced high-strength continuously-hot-rolled steel sheets and strips for cold forming*. Compared with Q/BQB 312-2018, in addition to structural adjustments and editorial changes, the main technical changes are as follows:

- To normative references, add the year number of GB/T 228.1, and change the year number of GB/T 24524;
- Change terms and definitions;
- Add the designation BR780/980HE and corresponding technical requirements;
- In Table 2, change the lower limit of aluminum content for some designations, the upper limit of phosphorus for DP600 and the upper limit of manganese for FB590, and add footnote a for silicon and other element regulations for some designations;
- Change the diameter of bending indenter of DP600 in Table 5;
- Change the provisions of yield strength and elongation after break in Table 6;
- In Table 7, change the yield strength and tensile strength provisions for FB590, and change the tensile strength provisions for BR300/450HE and BR600/780HE;
- Change the default sampling direction of CP800 tensile test samples in Table 10;
- Change the elongation after break of SAPH780SF with thickness less than 3.15 mm in Table 11.

Appendix A of this document is an informative appendix.

This document is proposed by the Manufacturing Management Department of Baoshan Iron and Steel Co., Ltd.

This document is under the jurisdiction of the Manufacturing Management Department of Baoshan Iron & Steel Co., Ltd.

# Continuously hot-rolled advanced high strength steel sheet and strip for cold forming

## 1 Scope

This document specifies the dimensions, shape, technical requirements, inspection and testing, packaging, marking and inspection documents of continuously hot-rolled advanced high strength steel sheet and strip for cold forming.

This document is applicable to the continuously hot-rolled advanced high strength steel strip for cold forming produced by Baoshan Iron and Steel Co., Ltd., as well as the cross-cut steel sheet and longitudinally cut steel strip thereof, hereinafter referred to as steel sheet and strip.

**Note:** The advanced high strength steels referred to in this document include the following steel types: dual phase steel (ferrite + island martensite) (DP), high hole expansion steel (ferrite + bainite, ferrite or bainite) (HE, or FB, SF), transformation induced plasticity steel (ferrite + bainite + retained austenite) (TRIP, or TR), complex phase steel (ferrite + martensite + bainite + precipitation strengthening) (CP, or MP) and martensitic steel (martensite) (MS).

## 2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the version corresponding to that date is applicable to this document; for undated references, the latest version (including all amendments) is applicable to this document.

GB/T 222-2006, Permissible tolerances for chemical composition of steel products

GB/T 223, Methods for chemical analysis of iron steel and alloy (applicable parts)

GB/T 228.1-2021, Metallic materials - Tensile testing - Part 1: Method of test at room temperature

GB/T 232, Metallic materials - Bend test

GB/T 2975, Steel and steel products - Location and preparation of 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 5028-2008, Metallic materials - Sheet and strip - Determination of tensile strain hardening exponent

GB/T 8170, Rules of rounding off for numerical values & expression and judgment of limiting values

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

GB/T 20123, Steel and iron - Determination of total carbon and sulfur content - Infrared absorption method after combustion in an induction furnace (routine method)

GB/T 20125, Low-alloy steel - Determination of multi-element contents - Inductively coupled plasma atomic emission spectrometric method

GB/T 24524-2021, Metallic materials - Sheet and strip - Hole expanding test

Q/BQB 300, General rules of package, mark and inspection document for continuously hot rolled steel sheet and strip

Q/BQB 301, Hot-rolled steel sheets and strips - Dimensions, shape, weight and tolerances

### 3 Terms and definitions

The following terms and definitions are applicable to this Standard.

#### 3.1

##### **dual phase steel (DP)**

Steel whose microstructure is mainly ferrite and martensite, or a small amount of bainite and other structures.

**Note:** Dual phase steel is not only of higher tensile strength level, but also of lower yield ratio and higher work hardening rate.

#### 3.2

##### **high hole expansion steel (HE)**

Steel whose microstructure is mainly “ferrite + bainite” or ferrite (or strengthened ferrite) or bainite (or strengthened bainite), etc.

- e) marginal status;
- f) application;
- g) type of inspection document.

## **5.2 Omissions in the order contract**

5.2.1 When the surface treatment method is not specified, the steel shall be delivered with the rolled surface.

5.2.2 For hot-rolled steel sheet and steel strip, if the dimensional accuracy is not specified, they shall be delivered with ordinary accuracy; if the edge state is not specified, the steel strip shall be delivered with mill edge and the steel sheet shall be delivered with cut edge.

5.2.3 For hot-rolled pickled steel sheet and strip, if the dimensional accuracy is not specified, the thickness shall be delivered with higher thickness accuracy and other dimensions shall be delivered with ordinary accuracy; if the edge state, surface quality level and whether oiled are not specified, they shall be delivered with cut edge, higher quality surface and oiled; if the inner diameter of the steel coil is not specified, it shall be delivered with an inner diameter of 610 mm.

## **6 Dimensions, shape, weight and tolerances**

6.1 The dimensions, shape, weight and tolerances of steel sheets and strips shall comply with the provisions of Q/BQB 301. Where the buyer requires higher thickness accuracy, the advanced accuracy PT.C given in Table 4 of Q/BQB 301 can be selected when ordering.

6.2 Where there are special requirements for the tolerance of the unevenness of steel sheets and steel strips, they can be negotiated when ordering and indicated in the contract.

## **7 Technical requirements**

### **7.1 Designation and chemical composition**

7.1.1 The steel designation and chemical composition (melting analysis) shall comply with the requirements of Table 2 and Table 3.

7.1.2 The tolerances of chemical composition of finished steel sheets and strips shall comply with the provisions of GB/T 222.

### **7.2 Smelting method**

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Contact: Wayne Zheng, [Sales@ChineseStandard.net](mailto:Sales@ChineseStandard.net)

Linkin: <https://www.linkedin.com/in/waynezhengwenrui/>

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