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

GB/T 19879-2023

Steel plate for building structure

建筑结构用钢板

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Table of Contents

Foreword	3
1 Scope	5
2 Normative References	5
3 Terms and Definitions	7
4 Designation Expression Method	7
5 Ordering Contents	8
6 Size, Shape, and Weight	8
7 Technical Requirements	9
8 Test Methods	15
9 Inspection Rules	16
10 Packaging, Marking and Quality Certificate	17

Foreword

This document was issued on 7 September 2023 by the State Administration for Market Regulation; Standardization Administration of the PRC and takes effect on 1 April 2024.

It is a GB/T standard: recommended rather than compulsory, but it is the text a Chinese reviewer applies when assessing a submission.

1 Scope

GB/T 19879-2023 covers the high-performance steel plate used in building structures - the way a grade is written, built from the letter Q for yield strength, the specified minimum yield value, the letters GJ that mark it as steel for high-performance building structures, and the quality grade; the contents a contract or order has to carry; the size, shape and weight, with dimensional deviations taken from GB/T 709-2019 and delivery by theoretical weight; the technical requirements, beginning with the grades and their melt chemical composition and running through the mechanical properties; the test methods, with the inspection items, sampling quantity, specimen direction and sampling method tabulated for each batch; the inspection rules, under which the supplier's technical inspection department carries out acceptance and the purchaser keeps the right to verify; and the packaging, marking and quality certificate. Plate in a frame or a heavy connection is bought against a designation that ties grade to guaranteed minimum yield, because a joint is designed on the strength the member is assumed to have. A grade named without those controls tells a fabricator nothing. Written for steel mills, structural fabricators, designers and third-party inspection.

This Document specifies the designation expression method, ordering content, size, shape, weight, technical requirements, test methods, inspection rules, packaging, marking and quality

certificates of steel plate for building structure.

This Document is applicable to the manufacture of high-performance hot-rolled steel plate (hereinafter referred to as steel plate) with a thickness of 6mm~200mm for building structures,

long-span structures and other steel structures. Hot-rolled steel strips can also be implemented

with reference to this Document.

2 Normative References

The provisions in following documents become the essential provisions of this Document through reference in 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 Document.

GB/T 222 Permissible Tolerances for Chemical Composition of Steel Products

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

GB/T 223.9 Iron steel and alloy - Determination of aluminum content - Chrom azurol S photometric method

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

3 Terms and Definitions

For the purposes of this Document, there are no terms and definition apply.

4 Designation Expression Method

The designation of steel consists of four parts, namely, the first letter "Q" in Chinese Pinyin for

"Qu" of yield strength, the specified minimum yield strength value, the first letter "GJ" in Chinese Pinyin for "Gao Jian" of steel for high-performance building structures, and the quality

grade symbol (B, C, D, E).

5 Ordering Contents

Contracts or orders based on this Document include but are not limited to the following.

6 Size, Shape, and Weight

6.1 The size, shape and allowable deviation of the steel plate shall comply with the provisions

of GB/T 709-2019.

6.2 The steel plate is delivered according to the theoretical weight. The thickness used in the

theoretical weight calculation is the average of the maximum and minimum thickness allowed

for the steel plate. The density of the steel plate used for calculation is 7.85g/cm³.

7 Technical Requirements

7.1 Designation and chemical composition

7.1.1 The designation and chemical composition (smelting analysis) of steel shall comply with

the provisions of Table 1.

7.1.2 For thickness direction performance steel plates, the sulfur content shall comply with the

a When V, Nb, and Ti are added in combination, for Q235GJ and Q345GJ, $(V+Nb+Ti) \leq 0.15\%$; for Q390GJ, Q420GJ, and Q460GJ,

$(V+Nb+Ti) \leq 0.22\%$.

7.1.3 The carbon equivalent (CEV) and welding crack sensitivity index (Pcm) of all quality

levels of steel of each designation shall comply with the provisions of Table 2. Delivery shall be in carbon equivalents.

7.1.4 The allowable deviation of the chemical composition of the finished steel plate shall comply with the provisions of GB/T 222.

7.2 Smelting methods

Steel is smelted in electric furnaces or converters and refined outside the furnace.

7.3 Delivery status

The delivery status of each designation shall comply with the provisions of Table 2. The specific

delivery status shall be agreed upon by both parties and shall be specified in the contract.

7.4 Mechanical properties and process properties

7.4.1 Stretching

The tensile properties of the steel plate shall comply with the provisions of Tables 3 and 4.

7.4.2 Charpy (V-notch) impact test

7.4.2.1 The Charpy (V-notch) impact properties of steel plates of each quality level shall comply

with the provisions of Table 5.

7.4.3 Bending test

7.4.3.1 The bending test of steel plates shall comply with the provisions of Table 6.

7.4.3.2 If the supplier can ensure that the bending test is qualified, the bending test may not be performed.

7.5 Surface quality

7.5.1 There shall be no cracks, bubbles, scars, folds, inclusions and pressed-in iron oxide scale

on the surface of the steel plate. Steel plates shall not have visible delamination.

7.6 Ultrasonic testing

Steel plates with thickness direction performance shall be ultrasonic tested one by one in accordance with GB/T 2970, and the qualification level is Level-III.

7.7 Other requirements