



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

GB/T 5224-2023

Steel strand for prestressed concrete

Issued on: August 6, 2023

Implemented on: March 1, 2024

Issued by: SAMR; SAC

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1 Scope

This document specifies the classification, code and labeling, order content, dimensions, cross-sectional shape, weight and allowable deviation, technical requirements, test methods, inspection rules, packaging, marking and quality certificate of steel strand for prestressed concrete.

This document is applicable to steel strand for prestressed concrete structures twisted from cold-drawn round steel wires, indented steel wires and helical rib steel wires (hereinafter referred to as the "steel strand").

2 Normative References

The contents of the following documents constitute indispensable clauses of this document through the normative references in the text. In terms of references with a specified date, only versions with a specified date are applicable to this document. In terms of references

without a specified date, the latest version (including all the modifications) is applicable to this document.

GB/T 5223 Steel Wire for Prestressing of Concrete

GB/T 21839 Test Methods of Steel for Prestressing Concrete 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 are applicable to this document.

3.1 standard strand

The steel strand twisted from cold-drawn round steel wires.

3.2 indented strand

The steel strand twisted from steel wires containing indentations.

3.3 helical rib strand

The steel strand twisted from steel wires containing helical ribs.

3.4 compact strand

The steel strand that is twisted, and then, cold-compacted.

3.5 nominal diameter

The nominal dimension of the diameter of the circumscribed circle of the steel strand.

3.6 stabilizing treatment

In order to reduce stress relaxation during application, the steel strand is subject to heat treatment under a certain tension for a short period of time.

4.1 Classification and Code

The general structure of the steel strand is classified into the following 9 categories, and the structure codes are.

4.2 Labeling

The labeling of products delivered in accordance with this document shall include the following content.

5 Order Content

The order content includes, but is not limited to the following.

- a) Serial No. of this document;
- b) Product name;
- c) Strength level;
- d) Structure code;
- e) Dimensions, length (or coil diameter) and weight (or quantity or coil weight) of the steel strands;
- f) Purpose.

6.1 The dimensions and allowable deviations, nominal cross-sectional area, and theoretical

weight per meter of the 1 ? 2 structured steel strands are shown in Table 1, and the schematic diagram of the cross-sectional shape is shown in Figure 1.

6.2 The dimensions and allowable deviations, nominal cross-sectional area, and theoretical

weight per meter of the 1 ? 3 structured steel strands are shown in Table 2, and the schematic diagram of the cross-sectional shape is shown in Figure 2.

6.9 The weight of each coil of the steel strands is not less than 1,000 kg. When there are no less

than 10 coils, 10% of the number of coils of the steel strands is allowed to be less than 1,000 kg, but not less than 300 kg.

7.1.1 The steel strands should be manufactured by wire rods of designations that comply with

the stipulations of GB/T 24238 or GB/T 24242.2 and GB/T 24242.4. Wire rods of other designations can also be adopted. The manufacturer does not provide the chemical composition.

7.1.2 The steel strands shall be manufactured with wire rods as the raw material, which are

subject to surface treatment and cold-drawing, and then, twisted into steel strands. After twisting, the steel strands shall undergo continuous stabilizing treatment.

7.1.7 The twist direction of the steel strands is generally left (S) twist, and right (Z) twist shall

be indicated in the contract.

7.2.5 The elastic modulus of the steel strands is (195 ± 10) GPa, which is not required as a

delivery condition. When required by the demand-side, this range shall be satisfied. If it exceeds this range, with reference to the stipulations of GB/T 21839, in the stress - strain curve, the slope value of the straight-line segment within the range of $0.2F_m \sim 0.7F_m$ can be re-corrected and select the best fit to obtain it.

7.2.6 In accordance with the agreement between the demand-side and the supply-side, steel

strands with strength levels other than Table 7 ~ Table 10 can be provided.

7.2.7 If there are no special requirements, only the relaxation test with an initial force of 70%

F_{ma} is performed, and the reckoning algorithm is allowed to be used to conduct a 120-h relaxation test to determine the 1,000-h relaxation rate. There is no requirement for the relaxation rate of the steel strands used for mine support.

7.3.1 Unless the user has special requirements, there shall be no oil, grease and other substances

on the surface of the steel strands.

7.3.2 There shall be no detrimental defects that may affect the performance on the surface of

the steel strands. Axial surface defects are allowed, but their depth shall be less than 4% of the diameter of a single steel wire.

7.4 Straightness of Steel Strands

The straightness of the steel strands shall not be greater than 25 mm.

7.5 Fatigue Properties, Deflection Tensile Properties and Stress Corrosion Properties

Through negotiation between the demand-side and the supply-side, and statement in the contract, axial fatigue test, deflection tensile test and stress corrosion test can be carried