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

GB/T 14164-2026

Replacing GB/T 14164-2013

Hot rolled wide strip for oil and natural gas line pipe

石油天然气输送管用热轧宽钢带

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7.1 Chemical composition

7.1.1 The chemical composition (smelting and finished product analysis) of conventional PSL1 steel shall conform to the provisions of Table 2.

7.1.2 The chemical composition (smelting and finished product analysis) of conventional PSL2 steel shall conform to the provisions of Table 3.

7.1.3 The chemical composition (smelting and product analysis) of acid-resistant steel plates and strips shall comply with the provisions of B.1 in Appendix B.

7.1.4 The supplier only provides smelting analysis, but guarantees that it meets the product analysis requirements. If the user requires product analysis results, the two parties shall discuss this separately. Sure.

7.1.5 As required by the buyer, and determined through negotiation between the supplier and the buyer, and specified in the contract, the following can be supplied. two consecutive plates specified in this document. Intermediate grades between [number] and [number]. Their chemical composition shall be in accordance with the agreement and harmonized with the provisions of this document.

7.1.6 For steel plates and strips of grade L290/X42 and above, the following items may be added as specified in Table 2 or Table 3, subject to negotiation between the supplier and the buyer. Elements other than niobium, vanadium, and titanium can be added, but the

amount of these alloying elements should be carefully determined as their addition may affect the alloy's properties. The weldability of steel.

7.2 Carbon Equivalent

7.2.1 The carbon equivalent shall be calculated as follows:

7.2.3 The carbon equivalent of acid-resistant steel plates and strips shall comply with the provisions of B.1.

7.3.1 Tensile and Bending Properties

7.3.1.1 For intermediate grades that fall between two consecutive grades specified in Table 2 or Table 3 and have a specified total elongation strength higher than L290/X42. The tensile and bending test performance of the product shall be determined through negotiation between the supplier and the buyer.

7.3.1.2 The tensile and bending properties of conventional steel plates and strips shall conform to the provisions of Tables 5 and 6, respectively.

7.3.1.3 The tensile and bending properties of acid-resistant steel plates and strips shall comply with the provisions of B.2.

7.3.1.4 In Tables 5 and 6, the elongation after fracture A50mm is calculated according to formula (3).

7.3.1.5 For steel plates and strips of L450/X65 and below, tensile tests shall use full-thickness rectangular specimens. For L485/X70... For steel strips of grades 1 and above, tensile testing can be performed using full-thickness rectangular or round bar specimens. When using round bar specimens, the tensile test should be conducted within the gauge length. The diameter can be 12.7mm, 8.9mm, or 6.4mm. The largest possible sample size should be selected for testing based on the thickness of the steel strip or plate.

7.3.1.6 After the bending test, no cracks should appear on the outer surface of the specimen.

7.3.2 Charpy (V-notch) impact

7.3.2.1 The impact test results for steel plates and strips (typically PSL2) used in oil pipelines are shown in Table

7. For steel used in natural gas pipelines... For plates and steel strips, the impact absorption energy is 20J higher than the impact absorption energy specified in Table

7. For L360/X52 and higher grade natural gas... The impact shear cross-sectional area ratio of steel plates and strips (usually PSL2) used for gas transmission pipelines shall not be less than 80% for a single value and not less than 90% for an average value.

7.3.2.2 The Charpy (V-notch) impact performance of acid-resistant steel plates and strips shall comply with the requirements of B.3.

7.3.2.3 The impact test is applicable to PSL2 steel strips and steel strips with a thickness of not less than 6 mm. When using a 10 mm x 10 mm x 55 mm standard... When performing impact tests on quasi-samples, the impact absorbed energy value should conform to the specifications in Table

6. Steel plates and strips with a thickness of not less than 6 mm should be subjected to impact tests. For impact testing, standard specimens with dimensions of 10mm x 10mm x 55mm should be used; when steel is insufficient to prepare standard specimens, other methods should be employed. For small-sized specimens of 7.5mmx10mmx55mm or 5mmx10mmx55mm, the impact absorption energy should be no less than the values shown in the table below. 75% or 50% of the specified value, with preference given to larger-sized specimens. The shear cross-sectional area should conform to the specifications in Table 7.

7.3.2.4 The impact absorbed energy value and shear cross-sectional area ratio are the average values of a set of three specimens, with one specimen allowed to have a single value less than the specified value. The value should be, but not less than 75% of the specified minimum value.

7.3.3 Drop hammer tear

7.3.3.1 For conventional PSL2 steel plates and strips of grade L360/X52 and above, the shear area requirements and test procedures for the drop hammer tear test are as follows: The temperature specifications are shown in Table

7. For steel plates and strips used in natural gas transmission pipelines, the single-value drop weight shear area shall not be less than 70%, and the average value shall not be less than 85%.

7.3.3.2 The drop hammer tear test performance of acid-resistant steel plates and strips shall comply with the provisions of B.3.

7.3.4 Hardness

7.3.4.1 Table 8 provides reference values for the maximum permissible hardness (HV10) on the transverse cross section of conventional PSL2 steel plates and strips.

7.3.4.2 The hardness properties of acid-resistant steel plates and strips shall comply with the provisions of B.4.

7.3.4.3 For the hardness test of steel plates and strips, samples shall be taken at one-quarter of the width, and after polishing, the hardness shall be determined according to GB/T 4340.1. HV10, the certificate specifies the average value, but individual values should

not exceed the allowable value specified in the standard. The Vickers hardness test point locations are shown in Figure 1 and should conform to... The following regulations apply.

a) When t (steel plate thickness) $\geq$

6.0 mm, the hardness test points should be at least 9 as shown in the figure;

6.0 mm, three points should be taken on the upper and lower surfaces of the specimen cross-section (a total of six points) for testing;

4.0 mm, only 3 points need to be taken transversely at the center of the sample thickness for testing.

7.4 Grain size The grain size requirements for conventional PSL2 steel plates and strips, and acid-resistant steel plates and strips, should conform to the specifications in Table

9.If the supplier can guarantee this, after... With the buyer's consent, grain size testing may be waived. Grain size may be specified separately upon negotiation between the supplier and the buyer.

7.5 Non-metallic inclusions The grades of non-metallic inclusions (A, B, C, and D) in conventional PSL2, acid-resistant steel plates, and strips should conform to the specifications in Table 10.(This is based on supply and demand information.) Both parties agreed that the level of non-metallic inclusions could be specified separately.

7.6 Band-like tissue

7.6.1 The banded structure of steel plates and strips should not exceed grade

3.If the supplier can guarantee this, and with the buyer's consent, inspection may be waived. This is subject to the agreement of both the supplier and the buyer. The agreement shall be reached through negotiation and specified in the contract, and other requirements may be made for the strip tissue.

7.6.2 For acicular ferrite structures, the method specified in Appendix C may be used. For other structures, the method specified in GB/T 34474 shall apply. conduct.

7.7 Surface Quality

7.7.1 The surface of steel plates and strips shall be free from defects that are detrimental to their use, such as cracks, bubbles, scabs, folds, inclusions, and delamination visible to the naked eye. The above-mentioned defects are permissible to be removed, but the depth of removal should not exceed half the thickness tolerance of the steel strip or plate. The removed area should be smooth and without sharp edges.

7.7.2 Other local defects that do not affect the use of the steel plate and steel strip may exist on the surface, but the minimum thickness of the steel strip shall be guaranteed.