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

TB/T 1878-2002

**Prestressed concrete sleeper fatigue test methods
(English Translation)**

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1 Scope

This standard specifies the fatigue test method for standard gauge railway prestressed concrete sleepers (including switch sleepers, wide sleepers, bridge sleepers).

This standard is applicable to fatigue tests for scientific research, new product development, product quality inspection of standard gauge railway prestressed concrete sleepers (including switch sleepers, wide sleepers, bridge sleepers).

2.1 The fatigue test of prestressed concrete sleepers (hereinafter referred to as sleepers)

shall use a fatigue testing machine, which has an accuracy level 1 and a loading vibration frequency between 4 Hz ~ 8 Hz.

2.2 Use a 20X reading magnifying glass, to observe the crack width. The reading accuracy is 0.01 mm; there is lighting equipment.

3 Test pattern

3.1

The test pattern of the section under the rail is as shown in Figure 1.

4 Test steps and methods

4.1

The sleepers for fatigue test shall be selected from the batches whose static load, appearance and demolding strength are all qualified in the exit-factory inspection; 6 sleepers shall be selected each time.

4.2

The fatigue test shall be carried out after the age of the sleeper is 28d. The 28d compressive strength of the concrete in the test batch shall meet the design strength requirements.

4.3

Fatigue test shall be carried out on 3 under-rail sections and 3 middle sections; only one section shall be made for each sleeper.

4.4 Characteristic value rho of fatigue load cycle

4.6 During the fatigue test, attention shall be paid to observe whether the loading meets the requirements of the test pattern; correct it if necessary.

4.7 The fatigue test shall be carried out continuously. If the test is stopped due to irresistible factors in the middle, it shall be subject to the 2 million accumulated fatigues;

it shall be indicated in the report.

4.8 Test results

4.8.1

After the sleeper is unloaded after 2×10^6 fatigue cycles, use a scale magnifying glass, to observe both sides of the test section, within 5 minutes after returning to zero.

The observed position is the position of the outer row of steel wires in the tension area, where the maximum residual crack width shall not exceed 0.05 mm.

4.8.2

After the sleeper has undergone 2×10^6 fatigue cycles, the failure test shall be carried out; its failure strength shall not be lower than 80% of the design failure strength;

the design failure strength shall be given by the design drawing. The sign of the failure state is that the crack width reaches 1.5 mm, OR where there are two or more cracks

AND the maximum crack width reaches 1.0 mm.

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