

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

JT/T 1127-2017

**Technical requirements for continuous compaction control
system of fill engineering of subgrade for highway**

公路路基填筑工程连续压实控制系统技术条件 清晰版

(English Translation)

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Foreword

This standard is drafted in accordance with the rules given in GB/T 1.1 -.2009.

This standard is proposed by the National Traffic Engineering Facilities (Highway) Standardization Technical Committee (SAC/TC 223).

The main drafting unit of this standard. Dalian East Road Technology Co., Ltd., Ministry of Transportation Highway Science Research Institute.

This standard participates in the drafting unit. Shenyang East Road Technology Co., Ltd., Southwest Jiaotong University, Harbin Institute of Technology, China Construction Machinery Industry Association Road and Compaction Machinery Branch, Heilongjiang Provincial Highway Survey and Design Institute, Gansu Provincial Department of Transportation, Xugong Group Road Machinery Division, Hill Push Road Machinery Co., Ltd., Xinjiang Transportation Construction Group.

1 Scope

This standard specifies the system composition and function, technical requirements and test methods for the continuous compaction control system of highway subgrade filling works.

This standard is applicable to the continuous compaction control system in the process of roadbed filling and rolling.

2 Normative reference documents

The following documents are indispensable for the application of this document. For dated references, only the dated edition applies to this article Pieces. For undated references, the latest edition (including all modifications) applies to this document.

JJG 676 working vibrometer verification procedures Technical specification for JT G F10 highway subgrade construction Technical specification for continuous compaction control of railway subgrade filling works

3 Terms and definitions

TB 10108 and the following terms and definitions apply to this document.

Continuous compaction control Subgrade filling rolling process, according to the filling body and vibration roller interaction with each other principle, through continuous measurement vibration vibrator vibration Wheel vertical vibration response signal, the establishment of detection and evaluation and feedback control system to achieve the entire crushed surface compaction quality of real-time dynamic monitoring and control.

Compaction state compaction state the physical and mechanical properties of the subgrade structure under the action of the road roller are carried out during the rolling process.

Vibration compaction value Based on the vibratory roller in the process of rolling vibration signal generated by the vertical response to the compaction of the compaction state of the mechanical index.

Compaction degree

During the process of rolling, the compaction value of the vibration reaches the target vibration compaction value.

Compaction stability Subgrade filling rolling process, in the vibration of the vibratory compaction process parameters of a certain circumstances, the roadbed compaction state with the rolling times the nature of the.

Compaction uniformity the consistency of the distribution of physical and mechanical properties (compaction state) of each part of the rolling surface during the rolling process.

Correlation verify correlation verify the process of establishing the relationship between the vibration compaction value and the conventional quality detection index is established by comparing the test method.

4.1 System components

4.1.1

continuous compaction control system consists of loading equipment, measuring equipment, background compaction information management platform and remote compaction information management platform group Into, the system composition shown in Figure 1.

Description.

- 1 --- loading equipment;
- 2 --- measuring equipment;
- 3 --- background compaction information management platform;

4 - remote compaction information management platform.

Figure 1 continuous compaction control system composition diagram

4.1.2

Load the equipment as a vibratory roller.

4.1.3

measuring equipment by the vibration sensor, signal conditioning, data acquisition, analysis and processing, display devices and system control software and other components.

4.1.4

Background compaction information management platform consists of compaction data management software, computer and network.

4.1.5

Remote compaction information management platform consists of compaction information receiving software, database, computer and network.

4.2 System functions

4.2.1

Continuous compaction control system shall have the ability to verify the consistency of the monitoring results with the conventional test results.

4.2.2

Continuous compaction control system shall have the ability to monitor the rolling speed and vibration frequency of vibratory rollers in real time.

4.2.3

Continuous compaction control system should have the degree of compaction of the filling body, compaction uniformity, compaction stability and compaction state Cloth and other real-time analysis and graphical and digital display capabilities.

4.2.4

Continuous compaction control system should have the ability to transmit and manage compaction monitoring information.

5.1 Load the device

5.1.1

Vibratory compaction process of vibratory roller, vibration wheel distribution quality, exciting force, vibration frequency, amplitude and rolling speed the parameters should be clearly identified.

5.1.2

vibratory roller vibration frequency should be stable, the fluctuation range should not exceed the stability of $\pm 0.6\text{Hz}$.

5.1.3

Vibratory roller rolling speed should be kept uniform, rolling speed should be $(2.5 \sim 3.0)$ km/h, the maximum should not exceed 4.0km/h.

5.1.4

Vibratory roller machine should provide the vibration frequency and rolling speed of the corresponding signal interface, the corresponding location should be installed on the measurement equipment installation interface.

5.2 Measuring equipment

5.2.1

vibration measuring device vibration sensor should adopt the acceleration sensor, the sensitivity should not be less than $10\text{mV}/(\text{m/s}^2)$, the range should not be less than 10g, the frequency response should not be greater than 5kHz.

5.2.2

The number of analog-to-digital conversion bits of the data acquisition device of the measuring equipment shall be not less than 16, and the sampling frequency shall not be less than 400Hz.

5.2.3

The dynamic performance of the measuring equipment should be stable, the linear range of vibration amplitude in the $(5 \sim 100)$ m/s^2 when the relative error should not be greater than 0.5%, the vibration frequency in the $(5 \sim 120)$ Hz when the relative error should not be greater than 0.5%.

5.2.4

The correlation between the vibration compaction value of the output of the measuring device and the conventional inspection index shall be not less than 0.70.

5.2.5

System control software for measuring equipment should have the following functions.

- a) control the operation of the measurement equipment, real-time measurement of measurement information, processing, analysis, display and storage, record the construction-related parameters information;
- b) According to the obtained compaction information on compaction degree, compaction uniformity, compaction stability, compaction state distribution and related statistics, etc.