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

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**Railway ballast - Part 2: Test methods
(English Translation)**

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1 Scope

This Standard specifies test methods and calculations for Los Angeles abrasion ratio, standard collect stuff concussion temper, stones wear resistant rigidity coefficient, standard collect stuff crunch rate, ballast collect stuff crunch rate, filter coefficient, rock powder test model compressive strength, rock powder fluid limit, rock powder mold limit, combination of rock powder fluid limit and mold limit, vitriol natrium liquor marinate loss lead, stones density, stones specific gravity, ballast grading, acicular index and laminated index, air-slake grain and other incidental stones, the dust content of the grain below 0.1mm, surface cleanness of railway ballast.

This Part is applicable to railway ballast test. The tests of Los Angeles abrasion ratio, rock powder fluid limit, rock powder mold limit, vitriol natrium liquor marinate loss lead, ballast grading parameter for grading of gravel on the bottom of ballast and bed surface may refer to corresponding methods in this

Standard.

2 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

2.1 Los Angeles abrasion ratio

The parameter that uses the abrasion index of Los Angeles wear machine to indicate ballast (bottom ballast, grading gravel) resistance to impact, abrasion and edge shearing and other joint action capacity.

2.2 standard collect stuff concussion temper

The parameter that uses the impact index of standard collect stuff concussion testing

machine to indicate the ability of ballast material to resist instantaneous crash or impact.

3.1.2 Specimen

Sieving and specimen preparation steps are as follows.

3.2.1.1 Standard collect stuff concussion testing machine. the structure

dimensions are shown as Figure 2.

3.3.1 Equipment and machinery

3.3.1.1

The structure of the disc wear resistance rigidity testing machine is shown in Figure 3. Its rotation speed is 31r/min~33r/min.

3.3.1.2 Stone processing equipment such as diamond machine, stone saw and stone grinder.

3.3.1.3 Blast drying oven. the maximum control temperature of the equipment

is not less than 200°C, with a temperature adjustment device.

3.3.1.4 Balance. weighing is not less than 2000g, the division value / resolution is 0.01g.

3.3.1.5 Vernier caliper. the accuracy is 0.02mm.

3.3.1.6 Soft brush.

3.3.1.7 Small steel ball or plasticine.

3.3.1.8 No.100 emery.

Figure 3 -- Disc wear resistance rigidity testing machine

3.7.1 Equipment and machinery

3.7.1.1

Milling machine of which the output particle size is 120 mesh ~ 200 mesh (0.124mm ~ 0.074mm) and standard vibrating sieving machine.

3.7.2 Specimen

3.7.2.1

Clean the gravel specimen of which the particle size is less than 20mm, the mass is about 2kg. Dry at 105°C~110°C for at least 4h.

3.7.2.6

Pour the rock powder into the stirring pot. Turn on power. Slowly add the diluted hydrochloric acid solution. Stir 3min.

3.7.2.7 Clean and assemble the triple test model. Apply engine oil on the

surface and edges. Mix the specimen and respectively fill the triple test model.

3.7.2.8 Place the triple test model on the base frame of the standard vibrating sieving machine. Press with hands. Vibrate 30s. Regulate the triple test model.

Then vibrate another 30s. Add a small amount of specimen. Vibrate 3s to make the specimen top 5mm~10mm higher than the test model facet.

3.8.2 Specimen

From the rock powder after the Los Angeles abrasion ratio test, sieve 150g of rock powder of which the particle size is less than 0.5mm. Put into the blender.

Add pure water to make uniform thick paste. Cover to seal and place for not less than 24h.

3.8.4 Calculation

3.8.4.1

Calculate the rock powder fluid limit according to formula (14).

3.9.2 Specimen

From the rock powder after the Los Angeles abrasion ratio test, sieve 100g of rock powder of which the particle size is less than 0.5mm, Place into the blender.

Add pure water to mix and make uniform thick paste. Cover to seal. Place a day and night for use. It can also take 30g from the liquid limit test specimen for use.

3.10.2.1 From the rock powder after the Los Angeles abrasion ratio test, sieve

about 200g of rock powder of which the particle size is less than 0.5mm. Divide into 3 portions. Place in the blender.

3.10.2.2 Respectively according to the sinking depths of 3mm~5mm,

3.12.3.1 Weigh rock powder $G_{ds} = 10g$. Pour into the 100mL pycnometer. Inject

pure water to nearly half. And slightly shake to make it dissolved in water.

3.13.4 Calculation

3.13.4.1

Calculate the stones specific gravity according to formula (20).

3.14.1.1 Square hole inspection sieve

Super-class ballast. the hole side lengths are respectively 22.4mm, 31.5mm, 40mm, 50mm and 63mm;

3.14.1.3 Container, shovel.

3.14.2 Specimen

Take four sub-specimens at intervals on the finished product discharge port or conveyor belt of the ballast field. The mass of each sub-specimen is about

100kg. Fully mix and spread on a flat concrete floor. Use the method of quartering to take two specimens and mix for spare use. The mass is about

200kg.

3.14.4.4 When the drawn particle size grading curve falls into the standard

particle size grading range, it means that this ballast specimen is conforming, otherwise it shall be nonconforming.

3.14.4.5 Fill the record of ballast particle size grading test in Table 20 ~ Table

22.

3.16.1 Equipment and machinery

3.16.1.1

Platform scale. the weighing is not less than 100kg, the division value is 50g.

3.16.1.2

Container, shovel.

3.16.3.1 Rinse the specimen clean. Dry and weigh its mass Gf1. The mass unit

is kilogram (kg), to the nearest of 0.05kg.

3.16.3.2 Choose a clean concrete floor. Spread the specimens. Compare with

the specimen submitted for inspection (testing report). Pick the airslake grain and other incidental stones in specimens one by one. Weigh the mass Gf2. The mass unit is kilogram