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

DZ/T 0276.16-2015

Replacing DY-94

**Regulation for testing the physical and mechanical properties
of rock. Part 10: Test for determining the volume resistivity and
surface resistivity of rock**

岩石物理力学性质试验规程 第16部分：岩石体积电阻率和表面电阻率试验 清晰
版

(English Translation)

Issued on: February 4, 2015

Implemented on: April 1, 2015

Issued by: Ministry of Land and Resources

Table of Contents

Foreword

1 Scope

2 Terms and definitions

3 Galvanometer direct deflection method

3.1 Principle

3.2 Instrumentation

Foreword

DZ/T 0276 "Testing Procedures for Physical and Mechanical Properties of Rocks" is divided into 31 parts.

- Part 1. General and general provisions;
- Part 2. Rock moisture test;
- Part 3. Rock particle density test;
- Part 4. Rock density test;
- Part 5. Rock water absorption test;
- Part 6. Rock hardness test;
- Part 7. Rock gloss test;
- Part 8. Rock antifreeze test;
- Part 9. Rock resistance to disintegration test;
- Part 10. Rock expansion test;
- Part 11. Rock erosion test;
- Part 12. Rock acid and alkali resistance test;
- Part 13. Rock specific heat test;
- Part 14. Rock thermal conductivity test;
- Part 15. Rock breakdown voltage and breakdown strength test;
- Part 16. Rock volume resistivity and surface resistivity test;
- Part 17. Rock radioactivity specific activity test;

- Part 18. Rock uniaxial compressive strength test;
- Part 19. Rock uniaxial compression deformation test;
- Part 20. Rock triaxial compression strength test;
- Part 21. Rock tensile strength test;
- Part 22. Rock flexural strength test;
- Part 23. Rock point load strength test;
- Part 24. Rock acoustic wave velocity test;
- Part 25. Rock shear strength test;
- Part 26. Rock mass deformation test (bearing plate method);
- Part 27. Rock mass deformation test (drilling deformation method);
- Part 28. Rock mass strength test (direct shear test);
- Part 29. Rock mass strength test (bearing plate method);
- Part 30. Rock mass bolt load test;
- Part 31. Rock sound wave velocity test.

This part is part 16 of DZ/T 0276.

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

This part replaces DY-94 "Testing procedures for physical and mechanical properties of rock 12. Volume resistivity and surface resistivity test". This part and Compared with DY-94, the main technical changes are as follows.

- Added two chapters "terms and definitions" and "principles";
- Increased the temperature control range of the drying oven;
- Increased the vernier caliper and its measurement range;
- Revised the indication of the galvanometer deflection number and the shunt split coefficient when measuring the galvanometer dynamic constant;
- Modified rock volume resistivity and surface resistivity test record table.

This part is proposed by the Ministry of Land and Resources of the People's Republic of China.

This part is under the jurisdiction of the National Land Resources Standardization Technical Committee (SAC/TC93).

This section drafted by. Hubei Institute of Geological Experiments.

1 Scope

This part of DZ/T 0276 specifies the galvanometer direct deflection method and high resistance meter method for determining rock volume resistivity and surface resistivity.

This section applies to rock volume resistivity and surface resistivity tests in rock physical and mechanical properties tests.

2 Terms and definitions

The following terms and definitions apply to this document.

Volume resistivity

The ratio of the DC electric field strength in the direction of the volume current of the rock sample to the current density at that point is expressed in ohm centimeters (ohm·cm).

Surface resistivity the ratio of the DC electric field strength in the direction of the surface current of the rock sample to the surface conduction current per unit length, expressed in ohms (ohm).

Electrode electrode A conductor having a shape, size, and structure that is in contact with the rock sample being tested.

Galvanometer dynamic constant galvanometer power constant when the mirror of the galvanometer is 1 m away from the measuring scale, the scale has a current value required for deflection of 1 mm.

3.1 Principle

The galvanometer direct deflection method is based on Ohm's law, using a sensitive galvanometer, first measuring the galvanometer dynamic constant, and then according to the electrode and sample Dimensions, galvanometer readings, and shunt coefficients were used to calculate the volume resistivity and surface resistivity of the rock sample.

3.2 Instrumentation

3.2.1

Galvanometer. Sensitivity is not less than 10-10A/min.

3.2.2

Electrode. The electrode material should be made of brass, stainless steel or other conductive metal materials and conductive rubber; the working surface of the metal electrode the finish is required to reach level 7 or higher; the contact pressure with the sample is 10 kPa, and the dimensions are as follows.

- a) measuring electrode. diameter 50mm;
- b) high voltage electrode. diameter greater than 150mm or area greater than 150mm x 150mm;
- c) Protective electrode. The inner diameter of the ring shape is $54\text{mm} \pm 0.1\text{mm}$, the outer diameter is 58mm, and the height is 10mm.