JTG

PROFESSIONAL STANDARD

OF PEOPLE'S REPUBLIC OF CHINA

中华人民共和国行业标准

JTG E50-2006

Test Methods of Geosynthetics for Highway Engineering

公路工程土工合成材料试验规程

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Notice on publishing the professional standard of Test Methods of Geosynthetics for Highway Engineering

(JTG E50-2006)

"Test Methods of Geosynthetics for Highway Engineering"(JTG E50-2006) is issued on October 1, 2006. " Test Methods of Geosynthetics for Highway Engineering"(JTJ/T 060-98) shall be abolished simultaneously.

This standard is managed and explained by Ministry of Communications. chief development organization, highway scientific research institute of Ministry of Communications is in charge of routine interpretation and management. All relevant organizations are kindly requested to sum up and accumulate your experiences in actual practices during the process of implementing this code. The relevant opinions and advice, whenever necessary, can be posted or passed on to highway scientific research institute of Ministry of Communications(Xitucheng Rd. No. 8, Hai Dian district, Beijing; postal code:100088; telephone number:010- 62079598).

Ministry of Communications of the People's Republic of China
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Foreword

As informative professional standard, Test Methods of Geosynthetics for Highway Engineering(JTJ/T 060-98) was issued on December 30, 1998 and implemented on February 1, 1999. The implementation of this standard had played an important role in unifying highway engineering geosynthetics test methods, guiding and regulating geosynthetic experimentation.

Over the past few years, geosynthetics has developed a lot. application area thereof is extending; applied technology is perfecting day by day; new materials are rolling out. since 1999, the State Administration of Technical Supervision has approved and issued 14 national standards concerning geosynthetic products and test methods. In order to be in line with international standards and national standards and meet highway engineering's requirements for geosynthetic testing, it is necessary to revise the previous edition. At the end of 2001, Ministry of Communications gave the order (Gonglu Fa[2001]No.620) to highway scientific research institute which will be in charge of the revision of " Test Methods of Geosynthetics for Highway Engineering"(JTJ/T 060- 98).

The following principles are complied with in revising the regulations:

(1) The revision is carried out, on the basis of existing highway engineering professional standards, to integrate revision of relevant standards and industry special requirements. The test method is selected to compromise different materials, to cover dominant categories and to avoid complicity.

(2) Efforts are made as much as possible to adopt advanced standards. in view of China's condition and industry characteristics, efforts are made to be in line with international standards; base test methods are made to meet the requirement of national standard.

(3) For the convenience of understanding test method and applying parameter, information content in citation explanation is added.

Major contents revised in " Test Methods of Geosynthetics for Highway Engineering" are as follows:

(1) Terminology and signs: by reserving the original terminologies, product name terminologies are supplemented.

(2) Specimen preparation and data-processing: "specimen preparation and data classification" is divided into two sections; the first section is sampling and specimen preparation; the second section is test data arrangement and calculation.

(3) Physical property test: thickness measuring method is modified; breadth measuring method is added.

(4) Mechanical testing: strip tensile test, tensile creep and tensile creep fracture performance test, straight snips frictional characteristic experimentation, ladder type tearing test, CBR bursting test, pierce strength experimentation and lift hammer penetration experimentation are modified; wide strip tensile test, joint/ seaming wide strip tensile test and stuck bonding point limit decoherence force experimentation are added.

(5) Hydraulic performance test: effective aperture experimentation(dry-sieve method), perpendicular penetrating quality experimentation are modified; hydrostatic test, plastics discharge zone core belt buckling strength and plastic drain board core buckling strength and

1. General provisions

1.0.1 This regulation is formulated to boost geosynthetic application in highway engineering, regulate and unify material test method.

1.0.2 This regulation is applicable to all kinds of geosynthetic performance test in highway engineering.

1.0.3 Instrument and equipments used in this regulation shall be verified by measurement service or feeler mechanism. regular correction is also necessary.

1.0.4 Government statutory unit of measurement shall be used.

1.0.5 Standards contain provisions which, through reference in this text, constitute provisions of this standard.

1.0.6 Highway engineering geosynthetic performance test, not only meeting this regulation, shall also conform to current relevant standard of the nation; as for test items not stipulated in this regulation, domestic and foreign standards can be referred to, but it shall be indicated in the test report.

2. Terminology and symbol

2.1 Terminology

2.1.1 Geosynthetics

Collection of geotextile, geomembrane, geocomposite and earth work special type material used in geotechnical engineering and civil engineering.

2.1.2 Geotextile

Penetrable polymeric material used in geotechnical engineering, civil weaving, knitting or non-weaving.

2.1.3 Geogrid

Regular reticulation tensile strip formed geosynthetics used for reinforcement. Open pore thereof can be penetrated by around soil, stone or other geomaterials.

2.1.4 Geonet

Geosynthetics formed by parallel ribs bonding of different angle with same ribs to be used in plane drainage and venting.

2.1.5 Geomembrane

Relative waterproof film made of polymeric compound or asphalt.

2.1.6 Geocomposite

Geosynthetics made of two or more than two materials.

2.1.7 Tensile strength

Per unit width maximum pull when the sample is stretched to fracture in the test.

2.1.8 Elongation

Strain capacity corresponding to the maximum pull; percentage is the unit.

2.1.9 Tearing strength

Sample between two clampers are in the ladder-type; maximum force that tear the ladder-type sample.

2.1.10 Puncturing strength

Rigid knockout pin of 8mm diameter thrusts vertically at the sample with the stipulated velocity. the maximum force measured until crack.

2.1.11 CBR burst strength

Cylindrical top pressure perch vertical press the sample; the maximum pressure measured until crack.

2.1.12 Compressive strength

Under an applied force, plastic drain board core board's capability to resist fracture and tilting.

2.1.13 Equivalent opening size

Indicator to demonstrate grid type(like geonet and geogrid) geosynthetics pore size. it is to convert mesh into homalographic diameter.

2.1.14 Amount of cone penetration

When given-size lift hammer falls 500mm freely above the geosynthetics, the hole diameter penetrated on geosynthetics.

2.1.15 Apparent opening size

Approximate the largest particles diameter that can pass geotextile, for example O_{90} demonstrates 90%pore diameters of geotextile below this value.

2.1.16 Coefficient of vertical permeability

Current is perpendicular to geotextile plane; hydraulic gradient is equivalent to 1 hour osmotic flow velocity.

2.1.17 Permittivity

Water-head equals osmotic flow velocity perpendicular to geotextile plane during one hour.

2.1.18 Velocity index

Head difference velocity of flow 50mm on two sides of the sample.

2.1.19 Gradient ratio

In the silting experimentation, ratio between hydraulic gradient of geotextile sample and soil sample 25mm above it and hydraulic gradient of soil sample 25mm to 75mm above the texture.

2.1.20 The discharge capacity of prefabricated ban-shaped drains

Under side pressure, vertical passage capability of prefabricated ban-shaped drains and filter membrane complex along the prefabricated ban-shaped drains section.

2.2 Symbols

α_f--Tensile strength;

ε--Elongation;

S_f--Joint/ seaming strength;

E--Joint/ seaming efficiency;

G--Mass area ratio;

δ--Thickness;

w--Breadth;

D_e--Equivalent opening size;

$f_{g(\delta)}$--Friction ratio;

f--Friction factor;

τ--Shear stress;

k--Coefficient of vertical permeability;

v--Velocity of flow;

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