NorGeoSpec 2012

Nordic system for certification and specification of geosynthetics

- Finland
- Norway
- Sweden
- Estonia
CE marking: Geosynthetics and geosynthetic related products

CE = Communauté Européenne
CE marking: a passport for the products in Europe

- a legal obligation:
  Without CE Marking, a product can’t be placed on the market in the countries members of the European Union and in Norway, Island and Liechtenstein.
CE marking: Geosynthetics and geosynthetic related products

Construction Product Regulation (CPR)

since 01.07.2013

Harmonized Standards

EN 13249 Roads and other trafficked areas
EN 13250 Railways
.....
.....
.....
EN 13265 Liquid waste containment
EN 15381 Pavements and asphalt overlays

CE Marking + Declaration of Performance (DoP)*

* The product is conform with the declared values"
CE marking: Geosynthetics and geosynthetic related products

- Producer declaration of conformity (DoP)
- The producer defines the tolerances for the different tests required in the harmonized standards
- Procedure based on
  - Product testing
  - Certification of the factory and factory production control (Notified body)

It is not a product certification

It is not a quality mark !!
Producer

CE marking system 2+

optionally:

Voluntary surveillance (vs)

contract

Contractor

Type test

Self-monitoring check

1. Attestation of product identity
2. Attestation of product properties
3. Material type test

contract

Contracting authority

Check tests

with vs

without vs

Mtt not applicable

Number of samples depending on safety requirements

4. Abidance of installation conditions

Acc. : U. Blume, BAST
NorGeoSpec 2012:

Nordic system for certification and specification of geosynthetics

Service life: 25, 50 and 100 years (acc. Annex B hEN)
NorGeoSpec 2012:

Function: Reinforcement

Reinforced Slope / Wall
Reinforcement with Pile Foundations
Reinforced Footing
Reinforced Road Bases
Sinkhole Bridging
Reinforced Abutment

Source: Axel Nernheim; Web.: 19.05.2014

New wearing course
Binder course
Bearing course

Source: Huesker
NorGeoSpec 2012: Certification and specification

A two-stage product-certification procedure is used when deciding whether geotextiles and geotextile-related products comply with the requirements of NorGeoSpec

Stage 1 Certification

Function

• Separation + Filtration
• Reinforcement

NGS 2012: Part 1, Table 1
Table 1: Certified values with tolerance (in % of values) depending on the function fulfilled by the product

<table>
<thead>
<tr>
<th>CHARACTERISTIC</th>
<th>STANDARD</th>
<th>UNIT</th>
<th>FUNCTION</th>
<th>Separation</th>
<th>Reinforcement</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>Filtration</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mass per unit area (^1)</td>
<td>EN ISO 9864</td>
<td>g/m²</td>
<td>± 10 %</td>
<td>± 10 %</td>
<td>± 10 %</td>
</tr>
<tr>
<td>Dimensions</td>
<td>&quot;</td>
<td>mm</td>
<td>n.r.</td>
<td>n.r.</td>
<td>± 10 %</td>
</tr>
<tr>
<td>MECHANICAL TESTS</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tensile strength</td>
<td>EN ISO 10319 (^3)</td>
<td>kN/m</td>
<td>-10 %</td>
<td>-10 %</td>
<td>-5 %</td>
</tr>
<tr>
<td>Elongation at max. load</td>
<td>EN ISO 10319</td>
<td>%</td>
<td>-20 %</td>
<td>-20 %</td>
<td>± 20 %</td>
</tr>
<tr>
<td>Strength at 2, 5, 10% strain</td>
<td>EN ISO 10319</td>
<td>kN/m</td>
<td>---</td>
<td>---</td>
<td>-20 %</td>
</tr>
<tr>
<td>Static puncture test</td>
<td>EN ISO 12236</td>
<td>kN</td>
<td>-10 %</td>
<td>-10 %</td>
<td>n.r.</td>
</tr>
<tr>
<td>Dynamic perforation resistance</td>
<td>EN ISO 13433</td>
<td>mm</td>
<td>+25 %</td>
<td>+25 %</td>
<td>n.r.</td>
</tr>
<tr>
<td>HYDRAULIC TESTS</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Permeability normal to the plane</td>
<td>EN ISO 11058</td>
<td>mm/s</td>
<td>-30 %</td>
<td>-30 %</td>
<td>-30 % (^4)</td>
</tr>
<tr>
<td>without load</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Characteristic opening size</td>
<td>EN 12956</td>
<td>µm</td>
<td>±30 %</td>
<td>±30 %</td>
<td>n.r.</td>
</tr>
</tbody>
</table>

NorGeoSpec 2012: Part 1 Quality Product Certification
NorGeoSpec 2012: Certification and specification

A two-stage product-certification procedure is used when deciding whether geotextiles and geotextile-related products comply with the requirements of NorGeoSpec.

Stage 1 Certification

Function

- Separation + Filtration
- Reinforcement

Stage I procedure is obligatory and must in all cases precede any stage II procedure.

Stage 2 Specification

Function

- Separation + Filtration

NGS 2012:
- Part 1, Table 1
- Part 2, Table 1
### Table 1: Required values – Quality Product Specification

<table>
<thead>
<tr>
<th>CHARACTERISTIC</th>
<th>UNIT</th>
<th>MAXIMUM TOLERANCE</th>
<th>REQUIRED VALUES CORRESPONDING TO 95% CONFIDENCE LIMIT</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>SPECIFICATION PROFILES</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>1</td>
</tr>
<tr>
<td>Min. tensile strength</td>
<td>kN/m</td>
<td>-10 %</td>
<td>6</td>
</tr>
<tr>
<td>Min. tensile strain at max. load</td>
<td>%</td>
<td>-20 %</td>
<td>15</td>
</tr>
<tr>
<td>Max. cone drop diameter</td>
<td>mm</td>
<td>+25 %</td>
<td>42</td>
</tr>
<tr>
<td>Min. energy index</td>
<td>kN/m</td>
<td></td>
<td>1.2</td>
</tr>
<tr>
<td>Min. velocity index</td>
<td>$10^{-3}$ m/s</td>
<td>-30 %</td>
<td>3</td>
</tr>
<tr>
<td>Max. char. Opening size, O90</td>
<td>mm</td>
<td>±30 %</td>
<td>0.2</td>
</tr>
<tr>
<td>Max. tolerance for mass per unit area</td>
<td></td>
<td>±12 %</td>
<td>±12%</td>
</tr>
<tr>
<td>Max. tolerance for static puncture strength</td>
<td></td>
<td>-10 %</td>
<td></td>
</tr>
</tbody>
</table>

NorGeoSpec 2012: Part 2 Quality Product Specification
A two-stage product-certification procedure is used when deciding whether geotextiles and geotextile-related products comply with the requirements of NorGeoSpec.

**Stage I procedure** is obligatory and must in all cases precede any stage II procedure.

**Stage II procedure** is obligatory for function separation and filtration.
NorGeoSpec 2012: Components

- NorGeoSpec System
  - Technical Committee
  - Advisory Board
- Certification body
  - SINTEF
- Laboratory
  - BTTG
  - IFTH
  - KIWA
  - SKZ
Responsibilities: Technical Committee (TC)

- examining files, inspection reports and laboratory test, reports which are presented by the NCB
- recommending decisions for the certification of single products
Responsibilities: Advisory Board (AB)

- contribution to drawing up and revising the NorGeoSpec document
- proposing the strategic evolution and supporting the promotion of the system
- ensuring that the NorGeoSpec document is harmonized to European and national regulations
- helping to solve any conflicts out of court between involved parties by setting up Working Groups if necessary.
Certification body

NorGeoSpec 2012: Components

The NCB is responsible for the following:

- the application of the rules set out in NorGeoSpec doc.
- the implementation of decisions recommended by the Technical Committee / Advisory Board
- organizing and running the administrative and technical secretariat
- organization and management of all inspections and verifications
- continual improvement in the quality of the test results of participating laboratories
NorGeoSpec 2012: Composition TC and AB

**Technical Committee:** Representatives from
- Transport administration: Estonia, Finland, Norway and Sweden (Blue)
- NorGeoSpec Certification Body (Yellow)

**Advisory Board:** Members
- Technical Committee
- Representatives from the manufacturers\(^1\) (Green)
- Representatives from the Laboratories (Red)

\(^1\) Nominated by the EAGM
NorGeoSpec 2012: Persons

Technical Committee

Christian Recker
Plippe Delmas

Arnstein Watn (Chairman)
Taivo-Ahti Adamson (Estonia)
Minna Leppänen (Finland)
Veli-Matti Uotinen
Aina Anthi (Norway)
Lovisa Moritz (Sweden)
NorGeoSpec 2012: Components

Advisory Board

Christian Recker
Plippe Delmas

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Taivo-Ahti Adamson (Estonia)
Minna Leppänen
Veli-Matti Uotinen (Finland)
Aina Anthi (Norway)
Lovisa Moritz (Sweden)
Romain Diederich (DuPont de Nemour)
Henning Ehrenberg (NAUE)
Anders Kroer (Fibertex)
Alain Nancey (TenCate)
Clarissa Austin (BTTG)
Ernö Németh (KIWA)

Technical Committee

Producer

Laboratories
NorGeoSpec 2012: Certification procedure (Part 1)

Certification request

- Products
- Function
- Profile

Offer Contract

- DoP
- Life time assessment

Document check

Responsibility

- Producer
- Certification Body

- Certification Body
NorGeoSpec 2012: Certification procedure (Part 2)

- Factory and Factory Production Control
- Product sampling
- Evaluation
- Product testing
- Certification decision

No direct contact is permitted between testing laboratory and producer.

Certificate
First certificates
Function: Reinforcements
NorGeoSpec 2012: Quality assurance

The certification body shall:

- take responsibility for all activities outsourced to another body
  (ISO 17065: Requirements for bodies certifying products)

  Evaluation of suppliers (Laboratories)

  Program of continuous improvement of testing quality
  (Organized by Certification Body)

Content of the program:

- continuously round robin tests (evaluation of test results)
- harmonization of test procedures (technical notes)
- regular visit to the laboratories (each 2 years)
- Regular meetings (once per year) of the involved laboratories
Nordic system for certification and specification of geosynthetics

NorGeoSpec 2012

Producer

Advisory Board

Certification body

Technical committee

Laboratories
NorGeoSpec 2012 was the result of a Nordisk Industrifond project with financial support from the road authorities in Finland, Sweden and Norway and a group of geotextile producers and distributors. The project has resulted in a common Nordic system for specification and control of geotextiles which is likely to have a strong beneficial effect both economically and technically.

On the initiative and with the financial support of the traffic agencies in Finland, Sweden and Norway, the existing guideline dealing with the separation and filtration functions have been extended to include the reinforcement function.

The new guidelines are valid for products covered by the following European standards.