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**Geosynthetics —**  
**Part 2:**  
**Symbols and pictograms**

*Géosynthétiques —*  
*Partie 2: Symboles et pictogrammes*



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## Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see [www.iso.org/directives](http://www.iso.org/directives)).

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received (see [www.iso.org/patents](http://www.iso.org/patents)).

Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

For an explanation on the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the WTO principles in the Technical Barriers to Trade (TBT), see the following URL: [Foreword — Supplementary information](#).

The committee responsible for this document is ISO/TC 221, *Geosynthetics*.

This second edition cancels and replaces the first edition (ISO 10318:2005), which has been technically revised.

ISO 10318 consists of the following parts, under the general title *Geosynthetics*:

- *Part 1: Terms and definitions*
- *Part 2: Symbols and pictograms*

# Geosynthetics —

## Part 2: Symbols and pictograms

### 1 Scope

The intent of this part of ISO 10318 is to define property symbols, graphical symbols and pictograms used in EN and ISO geosynthetics standards. Definitions of particular or specific symbols and pictograms terms not included in this part of ISO 10318 can be found in the International Standards describing appropriate test methods.

### 2 Symbols

#### 2.1 Property symbols

##### 2.1.1 Physical properties

| Symbols  | Units            | References           | Properties         |
|----------|------------------|----------------------|--------------------|
| $d$      | mm               | ISO 10318-1, 2.3.2.1 | Thickness          |
| $b$      | m                | —                    | Width              |
| $l$      | m                | —                    | Length             |
| $\rho_A$ | g/m <sup>2</sup> | ISO 10318-1, 2.3.2.2 | Mass per unit area |

##### 2.1.2 Hydraulic properties of GTX and of GTP

| Symbols    | Units                  | References           | Properties                                      |
|------------|------------------------|----------------------|-------------------------------------------------|
| $k_n$      | m/s                    | ISO 10318-1, 2.3.3.3 | Coefficient of permeability normal to the plane |
| $\psi$     | s <sup>-1</sup>        | ISO 10318-1, 2.3.3.6 | Permittivity ( $\psi = k_n/d$ )                 |
| $\theta$   | l/(m · s)              | ISO 10318-1, 2.3.3.8 | Transmissivity ( $\theta = k_p \cdot d$ )       |
| $v$ -index | mm/s                   | ISO 10318-1, 2.3.3.5 | Velocity index                                  |
| $q_p$      | l/(m · s)              | ISO 10318-1, 2.3.3.7 | In-plane flow capacity                          |
| $q_n$      | l/(m <sup>2</sup> · s) | ISO 10318-1, 2.3.3.4 | Flux normal to the plane                        |
| $O_{90}$   | µm                     | ISO 10318-1, 2.3.3.1 | Characteristic opening size                     |

##### 2.1.3 Mechanical properties

###### 2.1.3.1 Tensile characteristics

| Symbols    | Units | References             | Properties                    |
|------------|-------|------------------------|-------------------------------|
| $\sigma_y$ | MPa   | ISO 10318-1, 2.3.4.1.2 | Tensile stress at yield point |

| Symbols           | Units       | References             | Properties                                                                                          |
|-------------------|-------------|------------------------|-----------------------------------------------------------------------------------------------------|
| $T_{\varepsilon}$ | kN/m        | ISO 10318-1, 2.3.4.2   | Tensile strength at a given strain $\varepsilon$ (e.g. $T_3$ is the tensile strength at 3 % strain) |
| $\sigma_f$        | MPa         | ISO 10318-1, 2.3.4.1.3 | Tensile stress at failure                                                                           |
| $T_f$             | kN/m        | ISO 10318-1, 2.3.4.2.1 | Tensile strength (related to the specimen width) at failure                                         |
| $\sigma_{\max}$   | MPa         | ISO 10318-1, 2.3.4.1.4 | Maximum tensile stress                                                                              |
| $T_{\max}$        | kN/m        | ISO 10318-1, 2.3.4.2.2 | Maximum tensile strength (related to the specimen width)                                            |
| $T_{j\max}$       | kN/m        | ISO 10318-1, 2.3.4.4.4 | Maximum seam or joint strength                                                                      |
| $\xi_s$           | %           | ISO 10318-1, 2.3.5.5   | Joint or seam efficiency                                                                            |
| J                 | kN/m or kPa | ISO 10318-1, 2.3.4.2.3 | Tensile modulus                                                                                     |

### 2.1.3.2 Frictional characteristics

| Symbols          | References           | Properties                                                         |
|------------------|----------------------|--------------------------------------------------------------------|
| $\phi_{s,GSY}$   | ISO 10318-1, 2.3.6.1 | Friction angle between soil and GSY                                |
| $\phi_{GSY,GSY}$ | ISO 10318-1, 2.3.6.1 | Friction angle between GSY and GSY                                 |
| $f_{s,GSY}$      | ISO 10318-1, 2.3.6.2 | Friction interaction (efficiency) coefficient between soil and GSY |

### 2.1.3.3 Loading characteristics

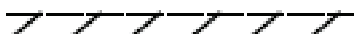
| Symbols    | Units | References | Properties                                 |
|------------|-------|------------|--------------------------------------------|
| $F_f$      | kN    | —          | Load recorded at failure in a tensile test |
| $F_{\max}$ | kN    | —          | Maximum load recorded in a tensile test    |
| $F_p$      | kN    | —          | Puncture force in a static puncture test   |
| $P_n$      | kN    | —          | Normal load in a compressive creep test    |
| $P_s$      | kN    | —          | Shear load in a direct shear test          |

### 2.1.3.4 Other characteristics

| Symbols | Units | Properties                                                                    |
|---------|-------|-------------------------------------------------------------------------------|
| $D_C$   | mm    | Diameter of the hole, if any, expressed in mm, obtained in the cone drop test |

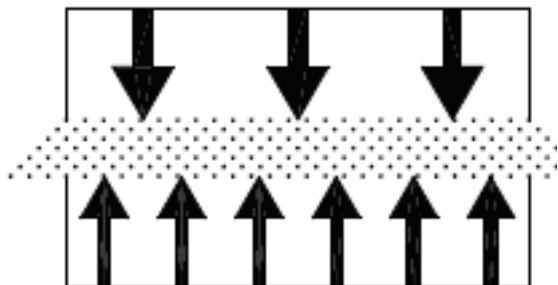
## 2.2 Graphical symbols and pictograms

### 2.2.1 Products

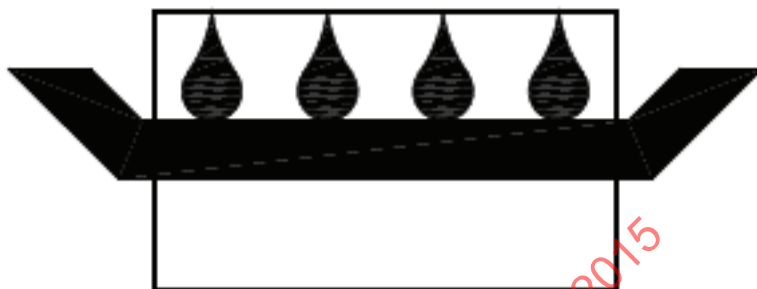
|       |                                                                                   |                           |
|-------|-----------------------------------------------------------------------------------|---------------------------|
| GTX   |  | Geotextile                |
| GBR   |  | Geosynthetic barrier      |
| GGR   |  | Geogrid                   |
| GCO   |  | Geocomposite              |
| GNT   |  | Geonet                    |
| GBR-C |  | Clay geosynthetic barrier |
| GCE   |  | Geocell                   |
| GMA   |  | Geomat                    |

## 2.2.2 Functions

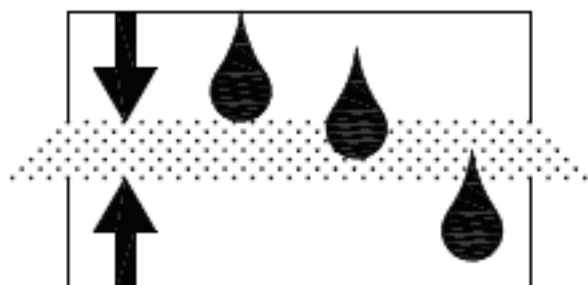
Separation



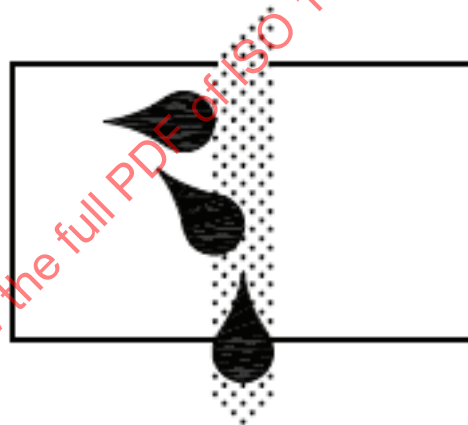
Barrier



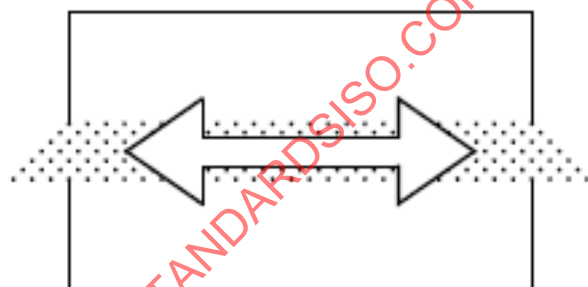
Filtration



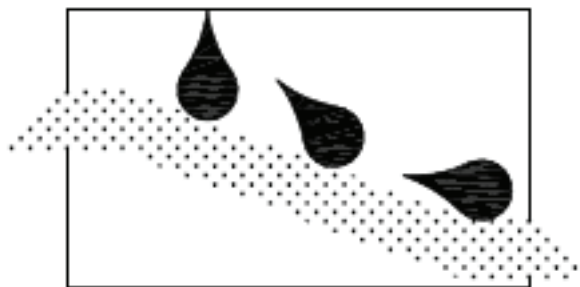
Drainage



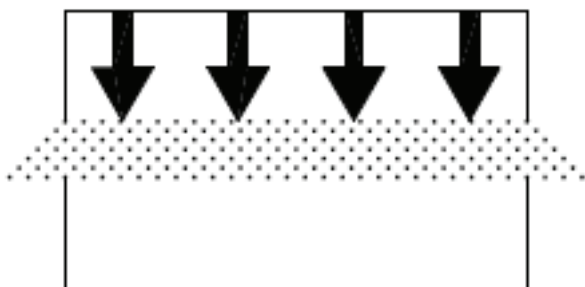
Reinforcement



Surface erosion control



Protection

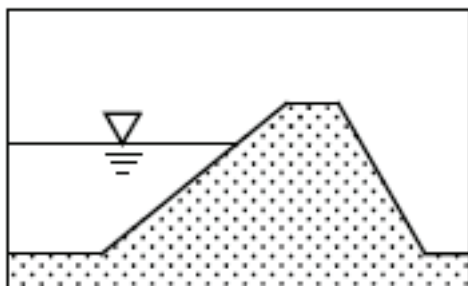


Stress Relief (for asphalt interlayer)

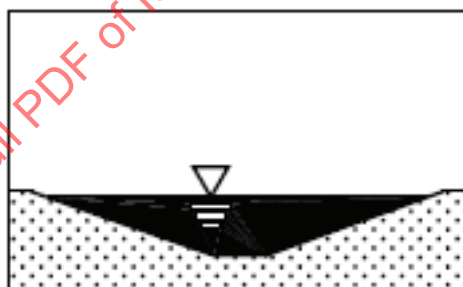


### 2.2.3 Applications

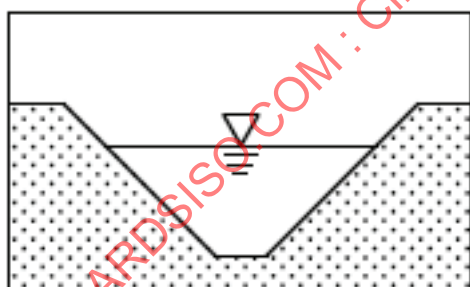
Reservoirs and dams



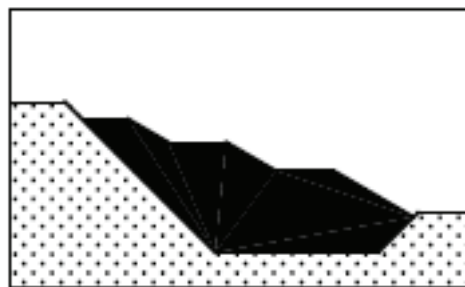
Liquid waste



Canals



Solid waste



Transportation infrastructure and roads



Foundations and retaining walls

