

# NorGeoSpec Product Certificate

## Quality Product Certification

This product has been found to be fit for use in accordance with the NorGeoSpec System for the function as stated below.

|                  |                        |
|------------------|------------------------|
| Certificate no.: | NGS-50472              |
| Manufacturer:    | HUESKER Synthetic GmbH |
| Product:         | Fortrac® 150 T         |
| Product Type:    | GGR                    |
| Raw material:    | PET                    |
| Function:        | Reinforcement          |

This certificate was issued on 05.03.2026 and will remain valid as long as the product fulfils the NorGeoSpec requirements, the product and the manufacturing conditions in the plant are not modified significantly. The validity of the certificate shall be checked on [www.norgeospec.org](http://www.norgeospec.org) or by using the QR code shown. Only certificates listed on [www.norgeospec.org](http://www.norgeospec.org) are valid.

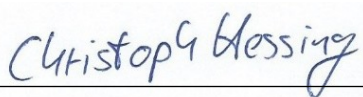
The hash value of this certificate is:  
84b53e8decc726b13d958a792c46c2ca35392115742217f5c60881343fd8c37



The products are regularly audited and tested to verify that the characteristics fulfil the NorGeoSpec, Rev. 02 / 01.09.2025 requirements.

Issued by

Approved by



Christoph Hessing, SINTEF Community



Christian Recker, SINTEF Community



Certificate no.: NGS-50472

## Quality Product Certification

| Quality Product Certification                  |     |                |                  | DoP <sup>1)</sup>       | NGS                                   |                                                                       |                                                                       |                                  |
|------------------------------------------------|-----|----------------|------------------|-------------------------|---------------------------------------|-----------------------------------------------------------------------|-----------------------------------------------------------------------|----------------------------------|
| Characteristic                                 |     | Standard       | Unit             | DoP declared mean value | NGS declared mean value <sup>2)</sup> | NGS max. tolerance <sup>3)</sup>                                      | NGS declared tolerance <sup>4)</sup>                                  | NGS control limits <sup>5)</sup> |
| Mass per unit area                             |     | EN ISO 9864    | g/m <sup>2</sup> | (-)                     | 440.0                                 | ± 44.0                                                                | ± 44.0                                                                | 396.0 - 484.0                    |
| <b>Dimensions</b>                              |     |                |                  |                         |                                       |                                                                       |                                                                       |                                  |
| Tensile elements                               | MD  | NGS, Annex F   | Elements/m       | (-)                     | 33.4                                  | ± 1.0                                                                 | ± 1.0                                                                 | 32.4 - 34.4                      |
|                                                | CMD | NGS, Annex F   | Elements/m       | (-)                     | 33.4                                  | ± 1.0                                                                 | ± 1.0                                                                 | 32.4 - 34.4                      |
| Grid apertures                                 | MD  | NGS, Annex F   | mm               | (-)                     | 25.0                                  | ± 3.8                                                                 | ± 3.8                                                                 | 21.2 - 28.8                      |
|                                                | CMD | NGS, Annex F   | mm               | (-)                     | 25.0                                  | ± 3.8                                                                 | ± 3.8                                                                 | 21.2 - 28.8                      |
| <b>Mechanical tests</b>                        |     |                |                  |                         |                                       |                                                                       |                                                                       |                                  |
| Tensile strength                               | MD  | EN ISO 10319   | kN/m             | 150.00                  | (-)                                   | (-)                                                                   | (-)                                                                   | (-)                              |
|                                                | CMD | EN ISO 10319   | kN/m             | 20.00                   | (-)                                   | (-)                                                                   | (-)                                                                   | (-)                              |
| Elongation at max. tensile strength            | MD  | EN ISO 10319   | %                | 9.5                     | (-)                                   | (-)                                                                   | (-)                                                                   | (-)                              |
|                                                | CMD | EN ISO 10319   | %                | 9.0                     | (-)                                   | (-)                                                                   | (-)                                                                   | (-)                              |
| Nominal tensile strength                       | MD  | EN ISO 10319   | kN/m             | (-)                     | 150.00                                | - 15.00                                                               | - 0.00                                                                | ≥ 150.00                         |
|                                                | CMD | EN ISO 10319   | kN/m             | (-)                     | 20.00                                 | - 2.00                                                                | - 0.00                                                                | ≥ 20.00                          |
| Tensile strain at nominal tensile strength     | MD  | EN ISO 10319   | %                | (-)                     | 8.5                                   | ± 1.7                                                                 | ± 1.5                                                                 | 6.0 - 10.0                       |
|                                                | CMD | EN ISO 10319   | %                | (-)                     | 8.5                                   | ± 1.7                                                                 | ± 1.5                                                                 | 6.0 - 10.0                       |
| Tensile stiffness at 2 % tensile strain        | MD  | EN ISO 10319   | %                | (-)                     | 1,500                                 | - 300                                                                 | - 0                                                                   | ≥ 1,500                          |
|                                                | CMD | EN ISO 10319   | %                | (-)                     | (-)                                   | (-)                                                                   | (-)                                                                   | (-)                              |
| Tensile stiffness at 5 % tensile strain        | MD  | EN ISO 10319   | %                | (-)                     | 1,440                                 | - 288                                                                 | - 0                                                                   | ≥ 1,440                          |
|                                                | CMD | EN ISO 10319   | %                | (-)                     | (-)                                   | (-)                                                                   | (-)                                                                   | (-)                              |
| Tensile stiffness at 10 % tensile strain       | MD  | EN ISO 10319   | %                | (-)                     | (-)                                   | (-)                                                                   | (-)                                                                   | (-)                              |
|                                                | CMD | EN ISO 10319   | %                | (-)                     | (-)                                   | (-)                                                                   | (-)                                                                   | (-)                              |
| <b>Durability</b>                              |     |                |                  |                         |                                       |                                                                       |                                                                       |                                  |
| Service life                                   |     |                | years            | 100                     | 100                                   |                                                                       |                                                                       |                                  |
| Proven for installation under low temperatures |     | NGS, Annex G.2 | (-)              | (-)                     | down to 0°C                           | <input checked="" type="checkbox"/> yes                               | <input checked="" type="checkbox"/> yes / <input type="checkbox"/> no |                                  |
|                                                |     |                |                  |                         | down to -10°C                         | <input checked="" type="checkbox"/> yes / <input type="checkbox"/> no |                                                                       |                                  |

<sup>1)</sup> Manufacturer's Declaration of Performance acc. hEN standards

<sup>2)</sup> Manufacturer's declared values

<sup>3)</sup> Max. possible NorGeoSpec tolerance according to NGS, Table 1

<sup>4)</sup> Manufacturer's declared tolerance; the tolerance for the NorGeoSpec certificate shall be equal or less than the "NGS max. tolerance" (see Table 1 Part 1 and Part 2 of the guideline)

<sup>5)</sup> NorGeoSpec control limit values regarding fitness for use; these "NGS control limits" are calculated based on the "NGS declared mean values" and the "NGS declared tolerances"; the product has to satisfy these "NGS control limits" during the NorGeoSpec certification process and random product testing

(-) = no performance declared; N/R = not required; N/A = not applicable

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## Declared values

### Reinforcement

| Declared values                            |                                                                      |                           |                                                                                                                               |
|--------------------------------------------|----------------------------------------------------------------------|---------------------------|-------------------------------------------------------------------------------------------------------------------------------|
| Reduction factor for creep rupture         | RF <sub>CR</sub>                                                     | 1.52                      | Design life: 120 years, design soil temperature: ≤ 20 °C; BBA assessment - HAPAS Certificate 13/H197, Product sheet 3         |
| Reduction factor for environmental effects | RF <sub>CH</sub>                                                     |                           | Remarks:                                                                                                                      |
| Chemical                                   |                                                                      | (-)                       | (-)                                                                                                                           |
| Oxidation                                  |                                                                      | N/A                       |                                                                                                                               |
| Hydrolysis                                 |                                                                      | 1.03                      | Design life: 120 years, design soil temperature: ≤ 20 °C, soil environment: 4 ≤ pH ≤ 9; Test report No. 160501 - ISO/TR 20432 |
| Reduction factor for environmental effects | RF <sub>W</sub>                                                      |                           |                                                                                                                               |
| or max. exposure time                      |                                                                      |                           |                                                                                                                               |
| 1 month                                    |                                                                      | X                         |                                                                                                                               |
| 2 weeks                                    |                                                                      |                           |                                                                                                                               |
| 1 day                                      |                                                                      |                           |                                                                                                                               |
| Reduction factor for installation damage   | RF <sub>ID, fine</sub>                                               | (-)                       |                                                                                                                               |
|                                            | RF <sub>ID, medium</sub>                                             | 1.10                      |                                                                                                                               |
|                                            | RF <sub>ID, coarse</sub>                                             | 1.10                      |                                                                                                                               |
| Used test method                           | BBA assessment                                                       |                           |                                                                                                                               |
| Compaction                                 | Compacted soil thickness: 200 mm, weight of vibrating roll: 4,550 kg |                           |                                                                                                                               |
| Particle size                              | RF <sub>ID, fine</sub>                                               | (-)                       |                                                                                                                               |
|                                            | RF <sub>ID, medium</sub>                                             | sandy gravel D90 ≤ 10 mm  |                                                                                                                               |
|                                            | RF <sub>ID, coarse</sub>                                             | coarse gravel D90 ≤ 35 mm |                                                                                                                               |