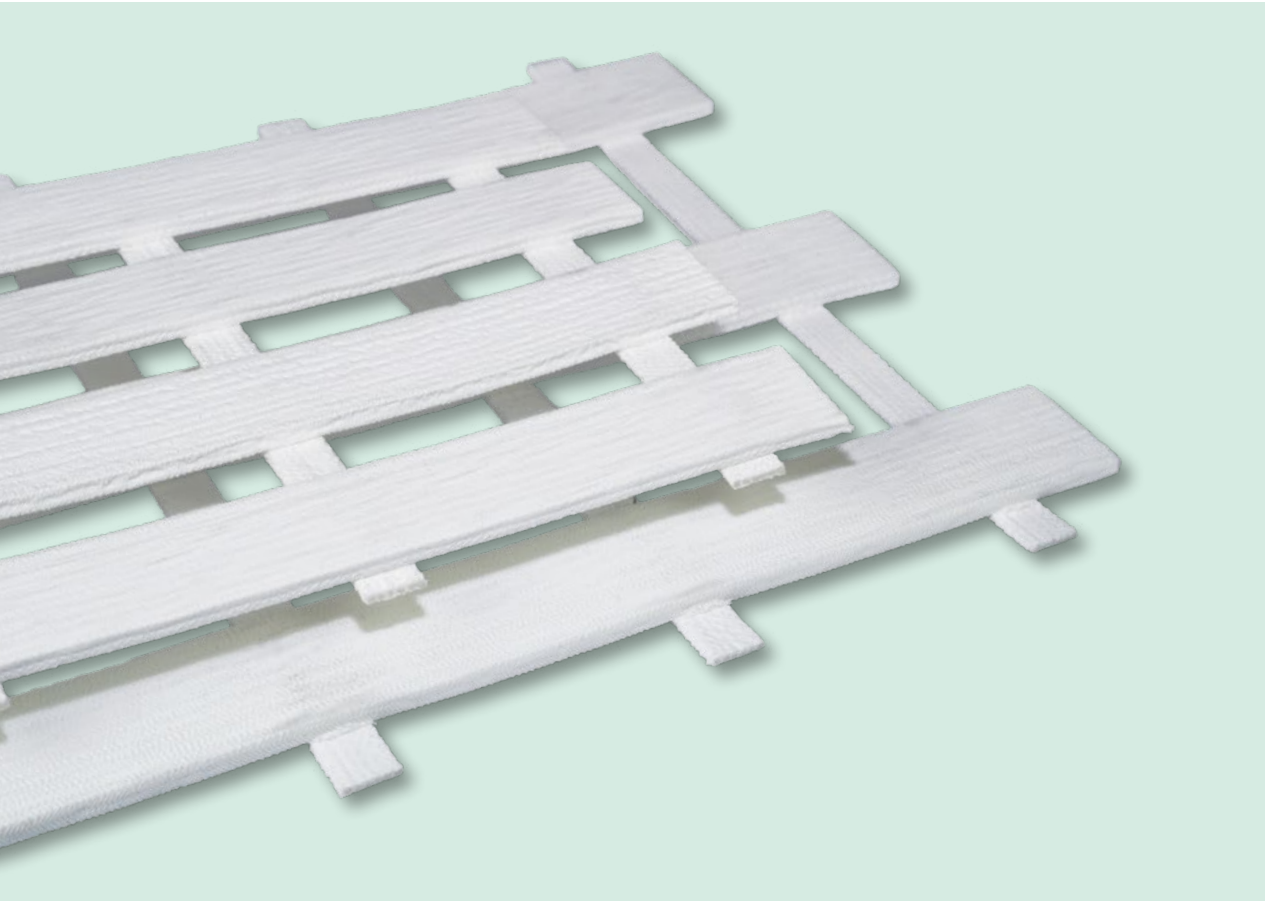
Secugrid® HS

Naue

High Strength Geogrid



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Building on sustainable ground.

Secugrid® HS geogrids are laid geogrids made of high tenacity polyester filaments with an extruded polyethylene protective coating and welded junctions. Secugrid® HS combines high tensile strengths and low creep tendency with extreme robustness and resistance.

Secugrid® HS was developed specifically for geotechnical applications in earthworks where tensile strengths of more than 400 kN/m are required.

TYPICAL APPLICATIONS FOR SECUGRID® HS

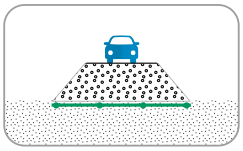


Figure 1:
Embankments
on soft soils

Embankment on soft soil

The high-strength Secugrid® HS basal reinforcement increases the stability of embankment structures on soft soils - during construction phases and in the final state.

Application advantages of Secugrid® HS

- Increased stability of embankments due to high tensile strengths of up to 1200 kN/m
- Faster construction progress due to shorter consolidation periods
- Mitigation of differential settlements in case of a heterogeneous subsoil
- Long-term stability (low creep tendency/high long-term resistance)

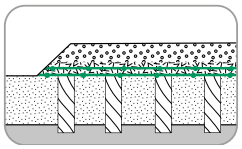


Figure 2:
Load transfer platforms
over piles

Load transfer platforms over piles

The design of reinforced load transfer platforms over piles is used to control embankment stability and settlements. The piles are transferring the load of the embankment through the soft compressible soil layer to a deeper, firm foundation. The relief of stresses onto the soft soil is achieved by load distribution within the reinforced base course towards the piles.

Application advantages of Secugrid® HS

- Larger pile spacings (due to high tensile strength)
- Absorption of lateral thrust forces eliminates the need for raking piles
- Mitigation of differential settlements
- No waiting time for consolidation processes

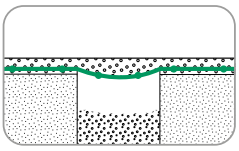


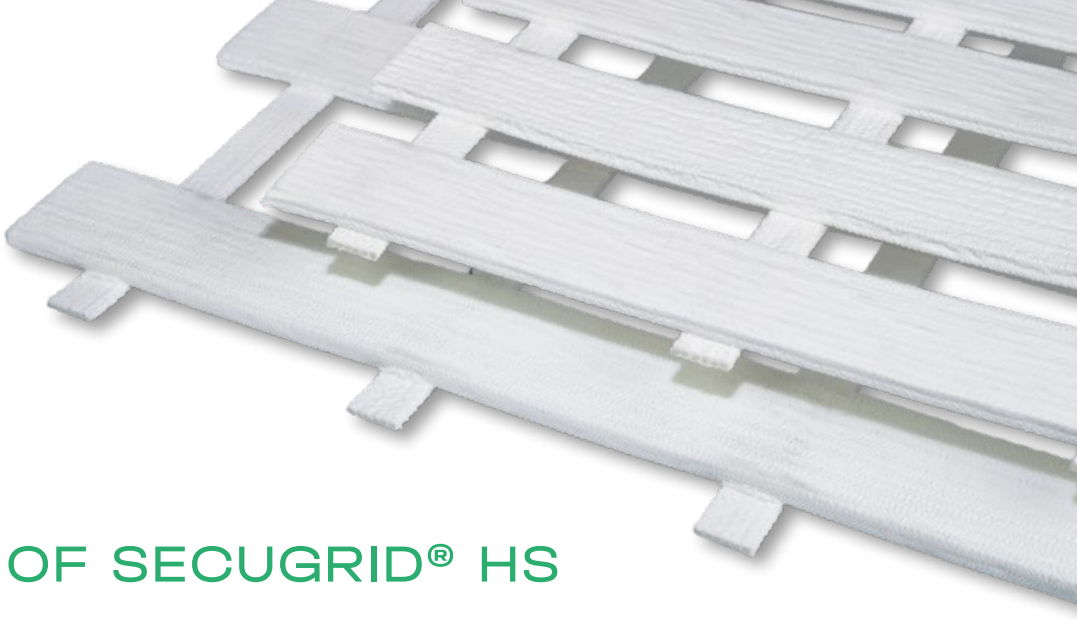
Figure 3:
Bridging of sinkholes
and mining voids

Bridging of sinkholes and mining voids

Secugrid® HS is installed below embankments or fill layers in order to limit the amount of surface deformation caused by subsidence. These voids can be the result of natural processes (e.g. subrosion in karstic areas) or artificial processes (e.g. groundwater extraction or underground mining).

Application advantages of Secugrid® HS

- Reduced risk of accidents in the event of occurring sinkholes/mining voids
- Increased safety due to high ductility of the system
- Economic and ecologic alternative to rigid raft foundations



ADVANTAGES OF SECUGRID® HS

Secugrid® HS is the choice for all applications where high tensile strengths over a long service life is required. The selection of the polymers used in combination with the applied product technology guarantees a robust and durable reinforcement product.

Low creep tendency

All geosynthetics that are exposed to permanent loads experience loss of tensile strength over time as a result of creep effects. The degree of tensile strength reduction depends on the stress level, time, temperature and molecular composition of the polymer used. Table 1 shows a comparison between the usual reduction factors for polymer-specific geosynthetics (see EBGEO 2010) and the result for Secugrid® HS. The comparison documents the high quality of Secugrid® HS with regard to its very low creep tendency.

Robust against damage during installation

Installation of soil and the subsequent compaction mean high stresses for geogrids during the installation phase. Robust reinforcement products largely retain their strength during installation. The very high robustness of Secugrid® HS was documented in field trials. For Secugrid® HS 1200/100 R6, for example, a reduction factor of only 1.03 can be expected when installed below crushed stone (d_{85} < 35 mm).

Raw materials	Usual values for RF_{CR}	
	from	to
Aramid (AR)	1,5[1)]	2[1)]
Polyester (PET)	1,5[1)]	2,5[1)]
Polyvinyl alcohol (PVA)	1,5[1)]	2,5[1)]
Polypropylene (PP)	2,5[1)]	4[1)]
Secugrid® HS (PET)	1,47[2)]	

[1)] EBGEO; 2nd Edition, Deutsche Gesellschaft für Geotechnik e. V. (2010)
[2)] Reduction factor RF_{CR} for Secugrid® HS, Expert Opinion, Dr.-Ing. J. Retzlaff (12/2015)

Table 1:
Usual reduction factors (EBGEO 2010) vs. Secugrid® HS

Figure 4:
Field trial with Secugrid® HS to determine the installation damage (RF_{CR}) reduction factor

Figure 5:
Uncovering of Secugrid® HS to determine the installation damage (RF_{CR}) reduction factor

Approvals for the Naue Group

Secugrid® Q6 and R6

Secugrid® HS R6

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