Secumat®
3D Meshes

Naue

The modular, permanent erosion control geomats

naue.com

Building on sustainable ground.

Secumat® 401 G4 and ***Secumat® 601 G4*** *are extruded, three-dimensional erosion control mats consisting of a UV-stabilised, biologically and chemically resistant 3D mesh. Compared to Secumat® 601 G4, Secumat® 401 G4 has thinner more finely distributed filaments which makes it particularly suitable for use with fine-grained soils. Secumat 601 G4's thicker filaments make it an ideal solution for gravelly soils. The artificial root structure provides excellent erosion control due to soil and root stabilisation.*

Secumat® 401 G4 and Secumat® 601 G4 erosion control products can reduce consequential costs and provide permanent protection for soil and plant structures when filled in with soil. A rashel fabric is also laminated onto one side of these 3D meshes as a support structure.

Typical application examples for Secumat® 3D Mesh products with Rashel fabric

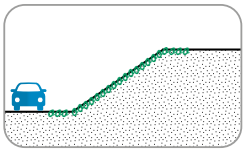

Figure 1:
Secumat® as a green infrastructure

1. Protect slopes in infrastructure projects such as road, highway and bridge construction
Secumat® 401 G4 offers particularly good soil retention for infrastructure projects with fine-grained, greenable soil. The coarser, more open structure of the Secumat® 601 G4 allows gravel fractions to settle perfectly and the robust three-dimensional structure provides good stabilisation for the granular content. In both instances, the monofilaments reduce the impact force of precipitation, create the basic framework for an open soil structure, and reduce surface run-off. (Fig. 1)

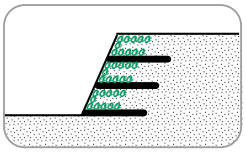

Figure 2:
Secumat® as trickle protection in facing systems

2. Vegetating, protecting and securing facing systems
Secumat® 401 G4 and Secumat® 601 G4 can be used in facing systems. The Secumat® 3D Mesh products in the front provide trickle protection and facilitate vegetation for quick integration of the facing surface into the landscape. This is the case when, for example, facing systems with an angle of up to 90° or a stepped structure need to be permanently secured against soil erosion in order to ensure secure footing during phases of low vegetative growth or when greening fails. (Fig. 2)

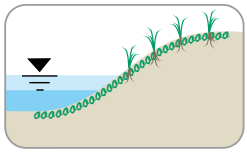

Figure 3:
Secumat® as soil retention

3. Vegetating trench/brook banks for rapid, long-term integration into the landscape
When used on trench/brook banks, the stronger and thicker Secumat® 601 G4 filament provides particularly good fixing for coarser soils. Permanent root stabilisation on natural banks with Secumat® 3D Mesh products can be reliably guaranteed, particularly in trenches and brooks with low flow velocities. (Fig. 3)

Benefits of using Secumat® 401 G4 and Secumat® 601 G4

Particularly quick and cost-effective installation due to easy handling and a low dead weight. No special tools or specific technical expertise are required to install. The 3D Mesh products with raschel fabric are installed as standard with an overlap. Alternatively, they can be fixed on slopes butted up to each without any cutting losses.

The system's integral support structure ensures quick installation and permanent, reliable functionality.

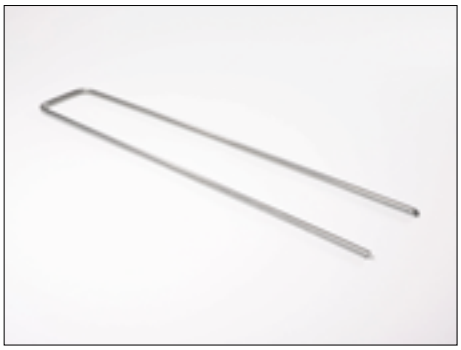

Figure 4: Secumat® PinU 23 steel pin

Figure 5: Secumat® 601 G4

Figure 6: Secumat® 401 G4 with initial vegetation

Secumat® 401 20/20 Q1 *and* ***Secumat® 601 40/40 Q6*** *are extruded, three-dimensional erosion control mats consisting of a UV-stabilised, biologically and chemically resistant 3D Mesh. A geogrid is integrated into the underside of the 3D Mesh as a reinforcement structure at the factory. The artificial root structure provides excellent erosion control due to soil and root stabilisation and is suitable for preventing clods of soil breaking away near the surface of larger areas. Secumat® 3D Mesh products are to be covered with soil after installation and provide an immediate, permanent effect.*

Secumat® 401 20/ 20 Q1 and Secumat® 601 40/ 40 Q6 erosion control products can reduce consequential costs, reinforcing and providing permanent protection for soil and plant structures.

Typical application examples for Secumat® 3D Mesh products with Geogrid

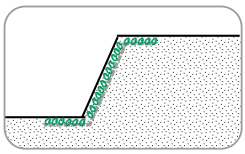

Figure 7:
Secumat® as a green infrastructure

1. Protect slopes in infrastructure projects such as road, highway and bridge construction
Secumat® 401 20/20 Q1 offers particularly good soil retention for infrastructure projects with fine-grained, greenable soil. The coarser, more open structure of the Secumat® 601 40/40 Q6 allows gravel fractions to settle perfectly and the robust three-dimensional structure provides perfect stabilisation for the granular content. In both instances, the monofilaments create the basic framework for an open soil structure and reduce surface run-off. When used with the correct fixing, the geogrid components reduce the risk of clods of soil near the surface breaking away in specific areas. (Fig. 7)

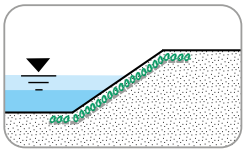

Figure 8:
3D mesh under water

2. Vegetating, protecting and securing trench/brook slopes
Secumat® 401 20/20 Q1 and Secumat® 601 40/40 Q6 can be used on trench/brook slopes. The Secumat® 3D Mesh product combinations integrated into the slope act to reduce the shear stresses and to aid vegetation for rapid integration. The geogrids support the tensile forces and secure the trench/brook slopes. The artificial root structure of the 3D Mesh supports plants in phases of low vegetative growth. (Fig. 8)

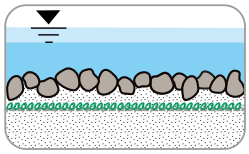

Figure 9:
Secumat® as permanent protection

3. Fixing the beds of bodies of water
When used on the beds of bodies of water, the stronger and thicker Secumat® 601 40/40 Q6 filament provides particularly good fixing for coarser soils. The geogrid has a long-term tensile strength which optimises the product combination for use in areas with a constant flow. This reduces erosion of the bed and the trench is secured against the effects of high peak discharges. (Fig. 9)

Benefits of using Secumat® 401 20/20 Q1 and Secumat® 601 40/40 Q6

Particularly quick and cost-effective installation due to easy handling and a low dead weight. No special tools or specific technical expertise are required to install. The 3D mesh products are installed as standard with an overlap. In trenches, they are installed in the direction of the flow like roofing tiles. Alternatively, they can be fixed on slopes butted up to each without any cutting losses or in the Naue m^3 system.

This system combines a three-dimensional mesh structure, reinforcing elements and a fixing system to provide reliable and permanent installation of a system for securing surfaces with an open pore structure which supports shear forces.

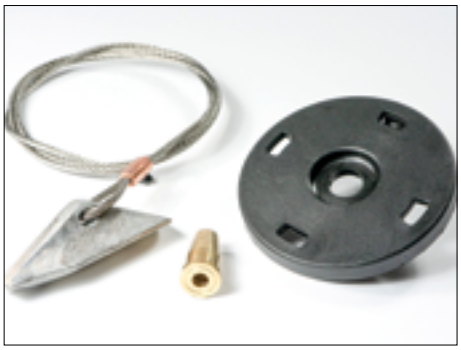

Figure 10: Secumat® Anchor 100 earth anchor

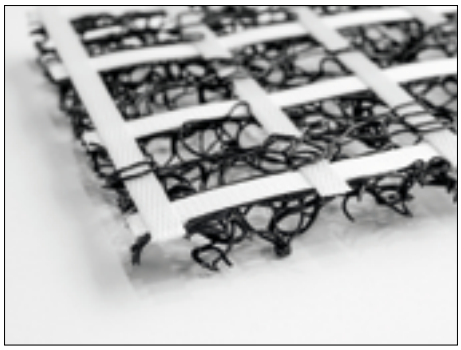

Figure 11: Secumat® 401 20/20 Q1

Figure 12: Secumat® 601 40/ 40 Q6 with initial vegetation

Secumat® 601 201 *and* ***Secumat® 401 20/20 Q1 131 C*** *are extruded, three-dimensional erosion control mats consisting of a UV-stabilised, biologically and chemically resistant 3D Mesh. The 3D Mesh in Secumat® 401 20/20 Q1 131 C has an integral geogrid/nonwoven combination which acts as a reinforcing structure and filter structure. The 3D Mesh structure of Secumat® 601 201 is supplemented by an open-pore separating and non-woven material. The artificial root structure provides excellent erosion control due to soil and root stabilisation. Secumat® 3D Mesh products are to be covered with soil after installation and are effective immediately.*

Secumat® 601 201 and Secumat® 401 20/20 Q1 131 C erosion control products can reduce consequential costs, filter and providing permanent protection for soil and plant structures.

Typical application examples for Secumat® 3D Mesh products with Nonwoven

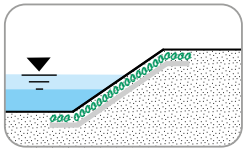

Figure 13:
Secumat® as a green trench structure

1. Protect slopes in hydraulic projects such as trench construction
Secumat® 401 20/20 Q1 131 C and Secumat® 601 201 are particularly advantageous for hydraulic projects where vegetation fails regularly and the introduced soil has to be separated from the sub-soil in a filtered and stable manner. Typical applications are thin layers of gravel above fine-grained soils, subsoils susceptible to erosion, ungreened surfaces, etc. When combined with the reinforcing structure of the Secumat® 401 20/20 Q1 131 C and fixing systems, it is possible to stabilise loose clods close to the surface. (Fig. 13)

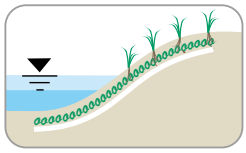

Figure 14:
Secumat® vegetating streams

2. Vegetating, protecting and securing brook banks
Secumat® 601 201 and Secumat® 401 20/20 Q1 131 C can also be used on brook banks. They act as protection against flushing out and support for vegetation for rapid integration of the surface into the landscape. Fine particles are retained behind the nonwoven filter material on the slope which secures the infrastructure above it. Furthermore, the roots of plants can easily work their way into the 3D Mesh product combination as it acts as an artificial root network. (Fig. 14)

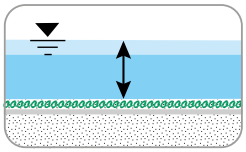

Figure 15:
Secumat® under water

3. Fixing trench/brook beds
Sedimentary erosion on trench/brook beds can be prevented by using Secumat® 401 20/20 Q1 131 C. The permanent structure of the Secumat® 3D Mesh product combination can provide re-liable and stable equilibrium on the bed, particularly where it is repeatedly attacked by running water. The integral geogrid structure supports the tensile forces and the nonwoven prevents the sediment from being flushed away. (Fig. 15)

Benefits of using Secumat® 601 201 and Secumat® 401 20/20 Q1 131 C

Particularly cost-effective installation due to easy handling and a low dead weight enables a par-ticularly cost effective installation. No special tools or specific technical expertise are required to install. The 3D Mesh products are installed with an overlap or in the same way as roofing tiles in the direction of the flow, or fixed butted up to each without any cutting losses.

The combinated system of the nonwoven filter material provides the system with many more op-tions. The combination of three products can also support tensile forces near the surface.

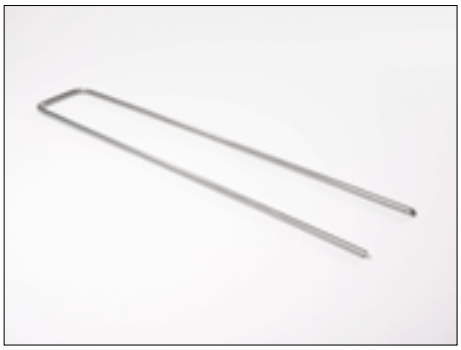

Figure 16: Secumat® PinU 23 steel pin

Figure 17: Secumat® 601 201

Figure 18: Secumat® 601 201 with initial vegetation

Figure 19: Storing e.g. Secumat® 601 G4

Figure 20: Secumat® 601 G4

Benefits of Secumat® 3D Mesh products

- Reliable and effective even under demanding conditions
- Can be used on slopes, in bodies of water, as part of the Naue m^3 and as a trickle protection system
- Temperature-resistant, very high UV stability and chemically and biologically resistant
- For permanent erosion control even in phases of low vegetative growth or when vegetation fails due to stresses from drought conditions
- Extremely stable and yet flexible, permanently adapts to the flat surface through positive fit

Modular Secumat® 3D Mesh product variants

The following Secumat® 3D Mesh product types are available in standard rolls of 2m x 30m (width x length) - other sizes available on request:

Product	Total weight per unit area [g/m²]	Roll weight [kg]
3D Mesh with Rashel fabric		
Secumat® 401 G4	430	26
Secumat® 601 G4	630	38
3D Mesh with Geogrid		
Secumat® 401 20/20 Q1	555	33
Secumat® 601 40/40 Q6	960	57.6
3D Mesh with Nonwoven		
Secumat® 601 201	800	48
Secumat® 401 20/20 Q1 131 C	685	41.1

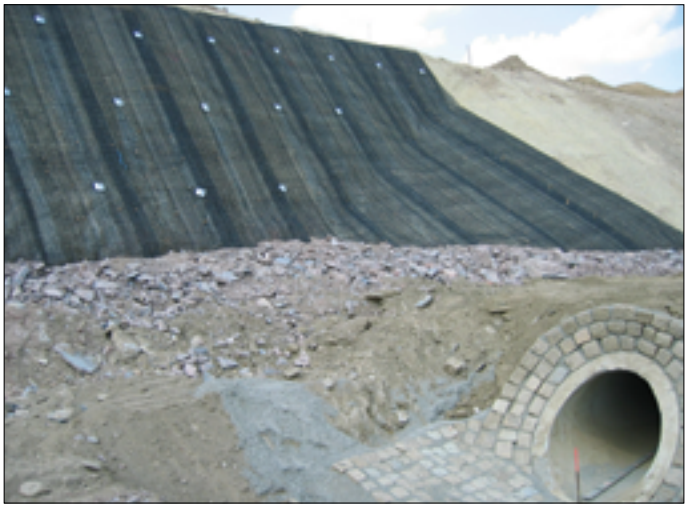

Figure 21: Steep slope with 3D Mesh

Figure 22: Rail slope with 3D Mesh

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