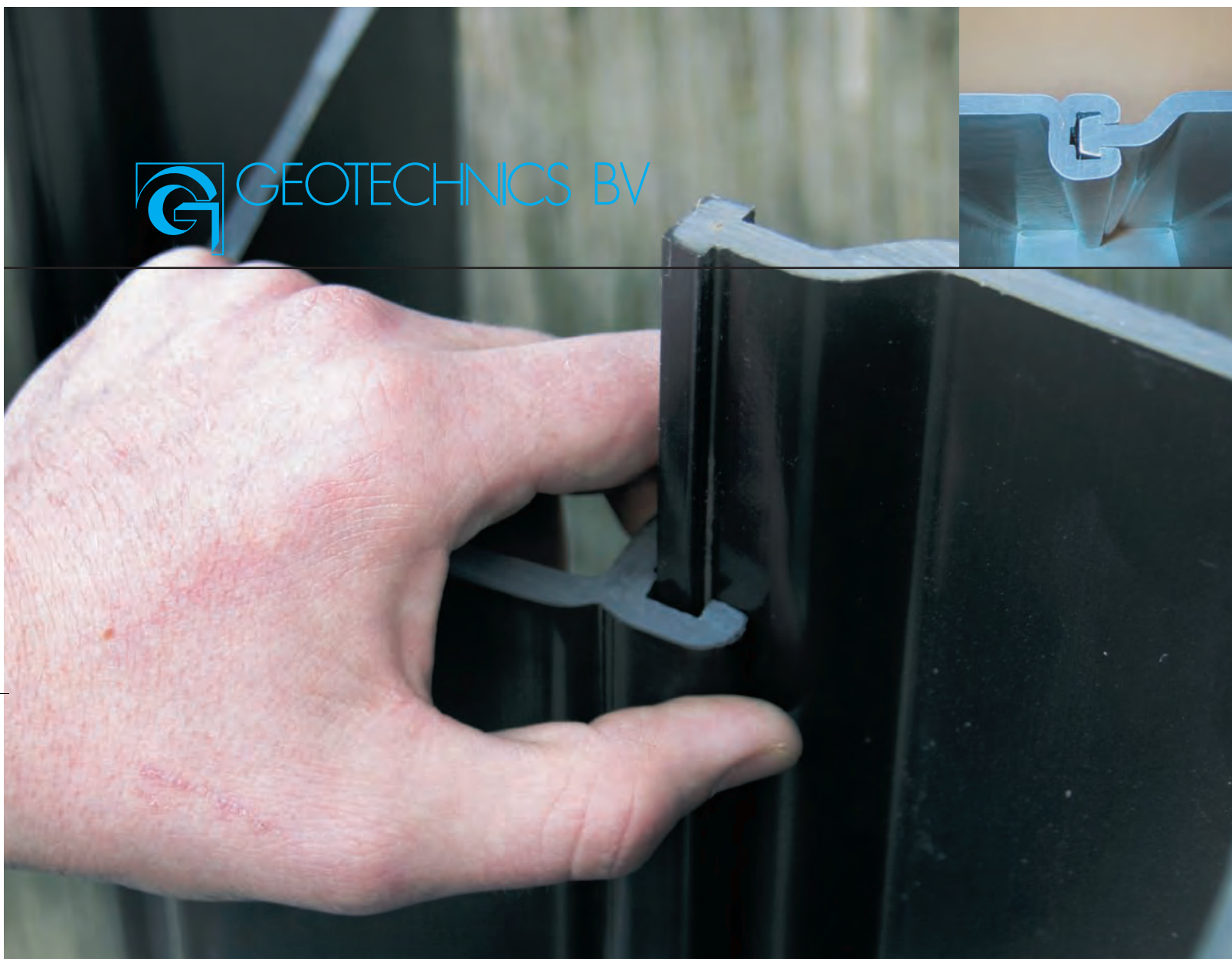


# Vinyl Sheet Pile System



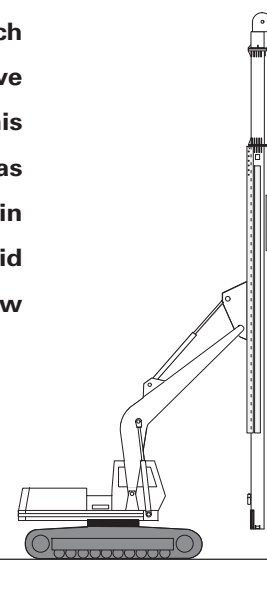
# Geoflex

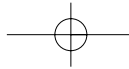
sheet pile system



## Introduction

The construction industry is an innovative field where developments succeed each other at a high rate. New technology and materials make it possible to achieve consistently better results. Geotechnics has been playing an important roll in this process for many years by manufacturing geosynthetics for use in civil as well as environmental projects. Geotechnic's products have been successfully applied in projects all over the world, and by continuing to focus on maintaining their solid know-how on products and techniques, Geotechnics will be a reliable partner for now and the future.





### Geoflex vinyl sheet pile system

Geoflex, developed by Geotechnics, is a vinyl sheet piling system used as an alternative to hardwood and steel sheet piling. Vinyl is a material with excellent resistance to weathering and has a long service life. Moreover, the material will not be affected by matters occurring naturally in the ground, rodents, or salt or fresh water. This gives us the possibility to design bank protection systems and retaining walls with a much longer service life.

#### The main properties of Geoflex are:

- Longer service life
- Weather resistance
- Resistance to rodents
- Friendly to the environment
- Easy to install
- Corrosion resistance
- Cost effectiveness

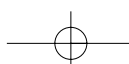
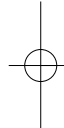
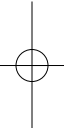
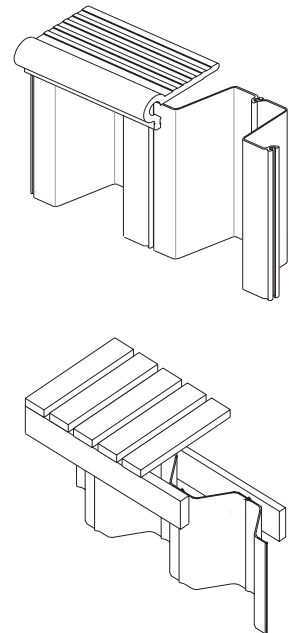
And because of its outstanding weather resistance Geotechnics Holland gives a 25-year guarantee on the material.

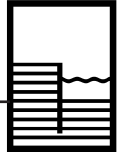
### Development

Geoflex has been developed in the Netherlands to replace tropical hardwood in applications such as soil retaining wall constructions and bank protections. The project has been developed out of the need to manufacture an economic sheet pile system with a long service life. With the help of computer aided design technology an optimal weight/strength proportion has been created, which has provided us with a new generation of sheet piling.

For the production of Geoflex the technique known as co-extrusion is used. With this technique it is possible to produce the sheet pile in almost any colour, for a relatively low price. Only the surface layer of the profile is coloured and has very high weather resistance.

In order to adapt the quality of the basic material to the demand that the final product has to meet – in particular UV resistance – stabilisers, flow improvers, colouring and other



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additives are added. By adding what are known as impact resistance improvers, the toughness of the vinyl is improved dramatically. It increases the resistance to mechanical damage and absorbs the impact pressure incurred during the driving of the sheets. Also at those places where, for instance, ships moor alongside the bank, a considerable local pressure on the wall may occur. Even during severe frost periods the Geoflex sheet piles will not be damaged.

The great advantage of vinyl sheet piling compared to alternative building materials is the long service life combined with a solution that is friendly to the environment. In addition, vinyl is an inert material, which means that it does not dissolve when it comes into contact with most commonly occurring chemicals, and no poisonous substances are released into the ground or the water.

More and more opposition has arisen to the application of hardwood in view of the threat to the tropical rain forests. With its harmful preservatives, wood impregnated with creosote or other chemical preservatives puts a burden on the environment, therefore, more and more often the switch is made to natural bank protections by means of gentle slopes with adapted planting.

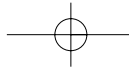
## Installation

A Geoflex profile only weighs 3 to 5 kg/m, thus the weight of the 210G corrugated sheet amounts to only 11 kg/m<sup>2</sup>. It is therefore very easy to handle, even in longer lengths. Sheets may be installed singly or en pairs.

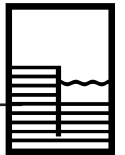
This gives the following advantages:

- Low transport costs
- High production
- No heavy equipment required for installation

Geoflex can be installed by means of using a water jet system, free fall hammering, pneumatic hammer, and vibrator, or by pushing in with an excavator. At greater depths or ground with a high resistance, a steel guiding sheet pile is used. Geoflex can easily be combined or connected with other building materials. The sheets can be sawn or bored. Wood, concrete, steel or plastic can be used as cap and wale system. The system may be designed and used with ties and anchors as with traditional sheet piling systems.



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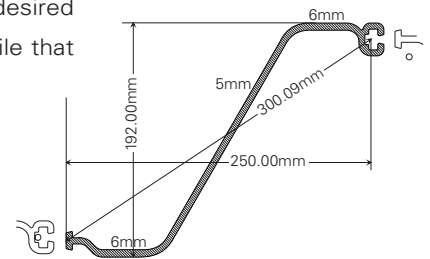
## Geoflex technical specifications

Geoflex is a 250 mm wide vinyl extrusion profile. This means that the basic material is re-melted and pressed through a mold. By doing so, a fixed profile is formed, which is cooled down and cut off to length. The process guarantees a consistent quality and dimensional stability. The sheet piling system can easily be shortened to the desired length. The sheets are provided with a lock, consisting of a male and female profile that fit perfectly together and guarantee a connection with great tensile strength.

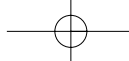
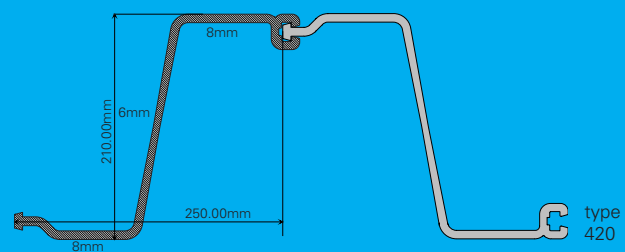
### The lock has been designed with the following philosophy:

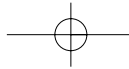
- Soil parts should not pass the lock.
- A certain rotation of the lock, making curved shapes possible.
- Possibility to make two configurations with the same profile.

The variety of configurations give the designer the possibility to choose between two different sheet piling configurations with a large difference in flexural strength.



	Unit	210G	210D	420
Weight	kg/m <sup>2</sup>	10,9	12,8	21
Profile height	mm	95	192	210
Section modulus	cm <sup>3</sup> /m	109	528	1041
Moment 50 year	kNm/m	2,4	11,7	23
Max. water depth	m	1	2	3
Max. soil retaining	m	0,7	1,5	2





sheet pile system

# Geoflex


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## Applications

Geoflex has been developed as a replacement for hardwood sheet piling. As for 50 year strength, the 210D sheet pile configuration can be compared to a new 40 mm thick tropical hardwood wall, while the 420 sheet piling configuration corresponds to a new 60 mm thick tropical hardwood wall.

For the design of Geoflex, the same calculation methods can be used as are used for steel and wooden sheet piling. Obviously the figures in the table above are only general values, which can be adhered to under normal circumstances. Strong waves, building up of the level of groundwater behind the sheet piling or bad foundations, however, can have an adverse influence on the stability of the sheet pile and, when in doubt, it is recommended to ask Geotechnics for advice about the final design in order to avoid incorrect application.

Besides the application as a retaining sheet pile there are numerous other possibilities for applications. Geoflex is highly suitable as a cut-off barrier, to retain ground-water in those places where there are no high concentrations of hydrocarbons to be found. The lock can be fitted with what is known as an expansion profile which is put into the lock. In contact with ground-water this profile can swell up to ten times its original volume and thus make the lock completely watertight. Geoflex can also be used as a temporary trench and other excavation support.

**On the Geotechnics website [www.geotechnics.nl](http://www.geotechnics.nl) you can download following information:**

- Design manual in PDF-format
- Technical specifications and AutoCAD drawings of the profiles.

09/05

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