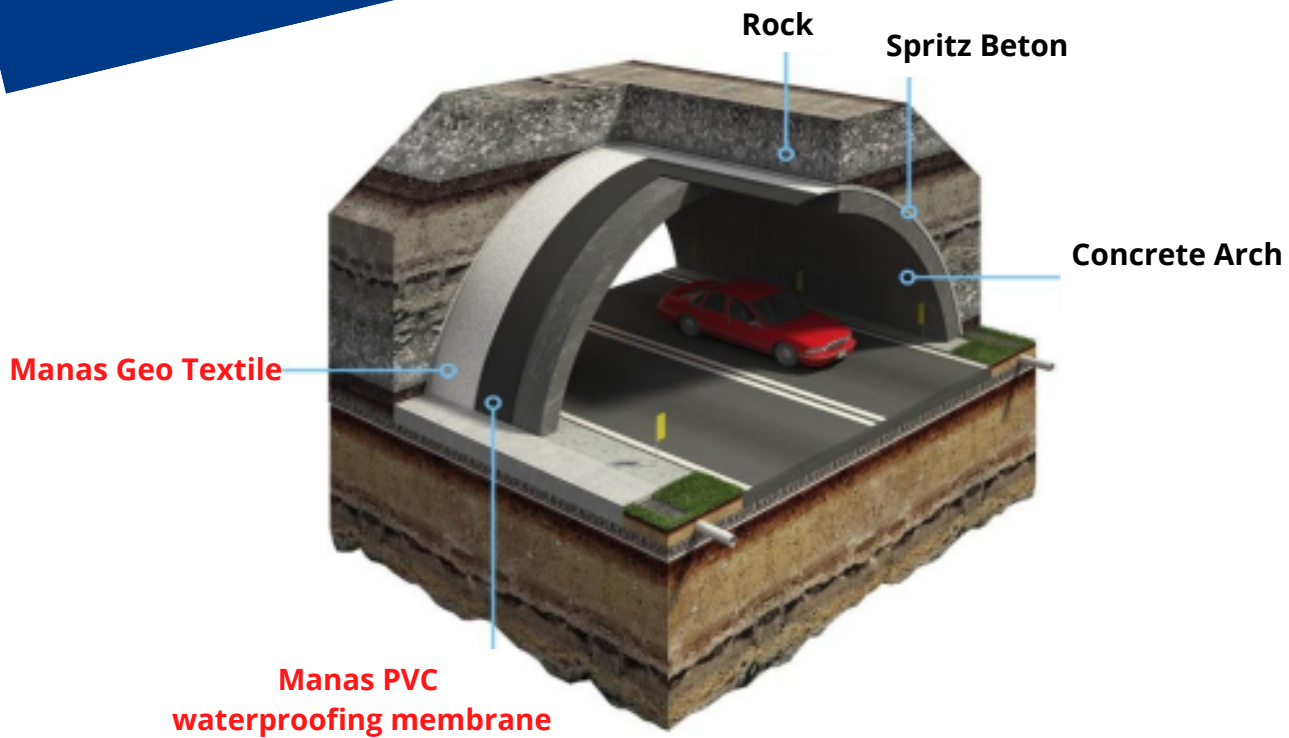


MANAS GEO TECH INDIA PVT LTD
FOR TUNNEL WATERPROOFING

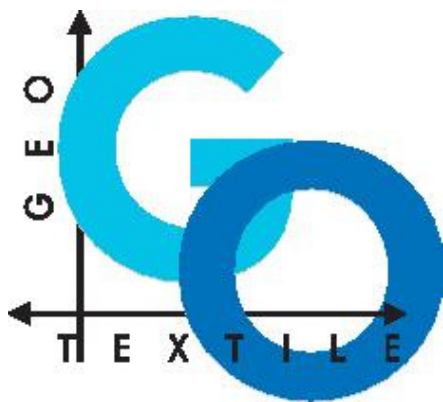
TUNNELING



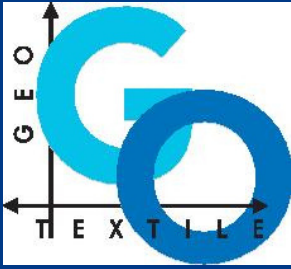
Modern tunnel design and construction involve engineered lining systems that provide effective drainage and a long-term moisture barrier for the tunnel walls. After the excavation of the tunnel, the rock is sprayed with concrete (shotcrete) to smooth out the unevenness of the rock face. Manas Non-Woven Needle Punched Geo Textile is then placed on the sprayed concrete and anchored using steel bolts coupled with polymer fastening discs. The Manas PVC Geo Membrane is then welded to the discs. After the weld testing a final concrete layer (ring concrete) is put in place.

The geotextile performs two primary functions:

1. Protection of the Geo Membrane from abrasion and puncture by protrusions from the base surface of the tunnel well.
2. Drainage of water seeping through the rock and sprayed concrete layer. The in-plane permeability of the geotextile enables the water to flow to a subsurface drainage collection system. Where it is directed away from the tunnel



MANAS NON WOVEN GEOTEXTILE



Manas Geotextile is made with high tenacity polypropylene staple fibers, needle-punched, Thermo Calendered & UV Stabilised. It is not toxic and does not pollute the environment. It is resistant to alkalis, acids, and organic substances.

Molds, rodents, and microorganisms cannot attack Geotextile. Its qualities and properties are not substantially modified by climatic factors like frost, heat, humidity, etc.

Geotextile non-woven made by PP high tenacity, UV stabilized, contributes to improving the useful life of tunnels.

Use :

As a protective layer of a geomembrane, and as a drainage layer of seepage water in the underground structures

Installation :

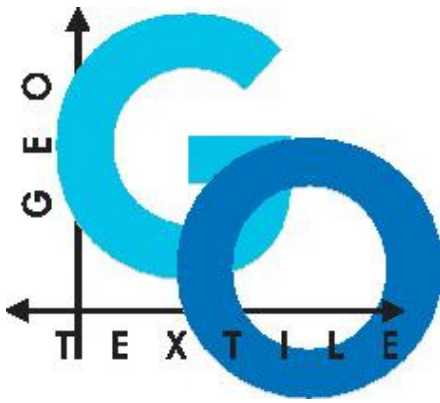
Inter-layer between the waterproofing geomembrane and a surface of shot concrete reference standard: EN 13256 (Geotextiles and geotextile related products. characteristics required for use in the construction of tunnels and underground structures)

Relevant characteristics :

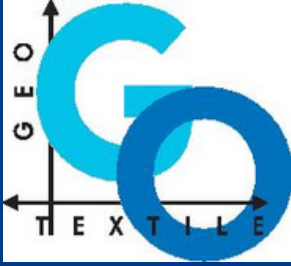
Protection efficiency, water flow capacity in the **plane**, durability.

Recommended products :

To be chosen according to the level of protection efficiency required, for example, MGT-50 to MGT-70, 500 to 700 GSM



PVC SHEET WATERPROOFING MEMBRANES



Manas PVC (Polyvinyl Chloride) Geo Membrane is a single-layer membrane consisting of two different colours of layers. It is light coloured on one side & black on the other. The light colour helps in identifying the damages that may occur during application. PVC membranes have a wide range of benefits for tunnels, the most important is cost-saving in remediation, repairs, maintenance, or replacement over the expected lifespan of the project.

Advantages of Manas Geo Membrane :

- Good Resistance to Punching
- Resistance to roof penetration
- Fast Application
- Welded joints for maximum water-tightness

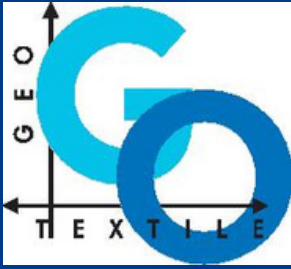


MANAS PVC GEO MEMBRANE

We have set up a new PVC Geo Membrane plant after working in the tunnel industry for closely 6 years. Our PVC sheet membranes are manufactured using superior raw materials chosen for strength and durability, providing PVC waterproofing membranes a long sustainable life. The Manas Membrane has an elongation of over 300% allowing a structure to move without tearing/splitting the membrane while maintaining the waterproofing integrity.

PVC Membrane has been found to form part in many Tunnels Waterproofing Specifications while also being the most preferred Membrane to Waterproof Tunnels as PVC Membranes are:

- Economical
- Sustainable
- Resistance to the Water-borne Chemicals
- Having relatively low Elastic Modulus so that they can withstand deformation more easily.
- Available in Fire Class E
- Higher static puncturing resistance
- High cold bending properties
- High tensile strength and high joint strength at welds
- Available with signal layer, so as to easily locate the onsite damages if any.
- Good Pliability to enable installation on undulated surfaces
- Ample Track Record

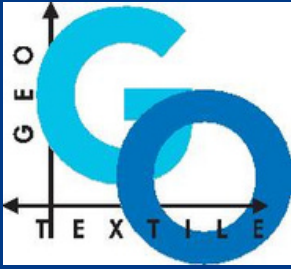


Plant Pictures for your reference :

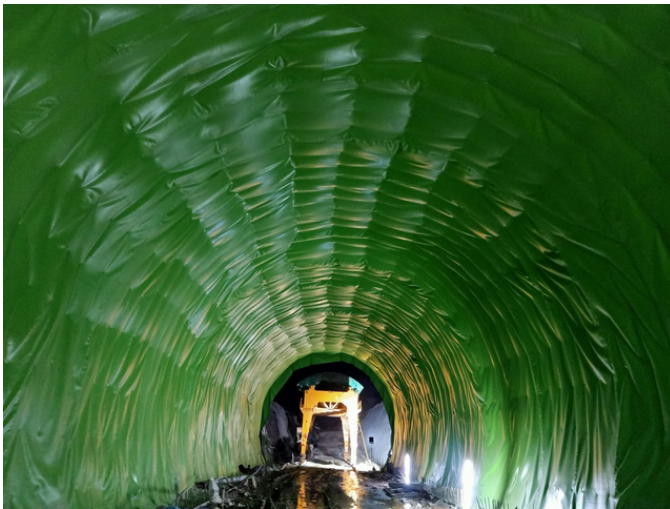


CERTIFICATIONS:





Pictures for your reference :



APPRECIATION LETTER



ESTEEMED CLIENTS



ZERO CARBON FOOTPRINT

Manas Geo Tech India Pvt Ltd has partnered with One Tree Planted to aim to plant 50,000 Trees for Landscape Restoration in 2022.

For Every Purchase Order, Manas Geo Tech India Pvt Ltd will plant a tree. The objectives of this new partnership include:

- Supporting global reforestation efforts
- Empowering consumers with sustainable actions
- Raising awareness about the importance of ecosystem restoration

Planting trees is one of the best ways to combat the damaging effects of climate change. Trees help clean the air we breathe, filter the water we drink, and provide habitat to over 80 percent of the world's terrestrial biodiversity.

Trees also provide tremendous social impacts by providing jobs to over 1.6 billion people, empowering women in underdeveloped nations, and supporting communities devastated by environmental damage.



Manas Geo Tech India Pvt. Ltd.

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