# Installation and Safe Handling Procedures for Tensar Basetex® Knitted Geotextile

This Installation Guideline provides information for the safe and efficient installation of Tensar Basetex® high strength geotextile. The advice results from many years of worldwide experience of installing Tensar Basetex. Where applicable, the Contractor shall ensure that the installation fully complies with local Regulations and should refer to the Designer's Risk Assessment and COSHH statements.

## Safe Unloading & Storage Requirements

Tensar Basetex geotextile comes in standard rolls sizes (4.4m x 100m) and standard grades varying from 200kN/m to 1200kN/m longitudinal QC, tensile strength. Non-standard strength rolls are also available for specific large requirements. Please consult Tensar International for information on such project specific rolls. Rolls normally arrive on site, either in a container (see Figure 1) or on a truck. The standard roll weights range from 217kg to 950kg, so it is imperative that the roll weight is evenly distributed during lifting operations. The general lifting arrangement for loading/unloading adopts a suitable rigid core pole or 'carpet pole' which is inserted through the hollow core of the roll (Figure 2). Appropriate carpet pole dimensions are indicated in Table 1. This pole is not supplied with the Basetex rolls and should be obtained by the Contractor separately. For handling on site and during installation a Lifting Beam Set comprising of a 2 leg chain sling, spreader beam, lifting bar and end clamps should be used. Tensar in the UK can provide a Lifting Beam Set on request.

| Basetex grade | Standard Roll Size (m) | Typical roll weight (kg) | Interior Diameter of Core (mm) | Core length (mm) | Carpet Pole minimum length (mm) & maximum outside diameter (mm) |
|---|---|---|---|---|---|
| *200/50* | 4.4 x 100 | 217 | 98 | 4400 | 4500 x (85) |
| *300/50* | 4.4 x 100 | 290 | 98 | 4400 | 4500 x (85) |
| *400/50* | 4.4 x 100 | 357 | 98 | 4400 | 4500 x (85) |
| *600/50* | 4.4 x 100 | 505 | 98 | 4400 | 4500 x (85) |
| *600/100* | 4.4 x 100 | 534 | 150 | 4400 | 4500 x (140) |
| *800/50* | 4.4 x 100 | 677 | 150 | 4400 | 4500 x (140) |
| *800/100* | 4.4 x 100 | 711 | 150 | 4400 | 4500 x (140) |
| *1000/50* | 4.4 x 100 | 820 | 150 | 4400 | 4500 x (140) |
| *1000/100* | 4.4 x 100 | 860 | 150 | 4400 | 4500 x (140) |
| *1200/50* | 4.4 x 100 | 950 | 150 | 4400 | 4500 x (140) |

Notes
(1) Roll weight indicated is for standard roll length but Basetex may be supplied with bespoke roll lengths. Bespoke weight can be estimated based on actual vs bespoke length
(2) Although the max diameter carpet pole is mentioned as 140mm, normally an 85mm diameter carpet pole can be used across the whole product range, this is provided the carpet pole can take the load.

***Table 1 Tensar Basetex geotextile roll sizes and handling data***

***Figure 2 Extracting rolls from container with forklift fitted with a 4m carpet pole***

## Unloading

Rolls are normally unloaded from the container or truck using a steel carpet pole, fixed to a forklift truck, as shown on Figure 2. Due to the weight and flexibility of the rolls, it is not recommended to lift using straps around the end of the rolls or lift from the mid roll length (Figure 3). The use of straps is also a potential safety hazard and in addition, if the core is broken or distorted, proper installation and on-site handling of the Basetex rolls will be difficult.

***Figure 3 Incorrect method of lifting – must not be used***

## Storage

Basetex rolls should be temporarily stored either on a timber platform or prepared ground, to keep the roll cores straight to facilitate later lifting (Figure 4). They should be stacked no more than 4 rolls high.

***Figure 4 Tensar Basetex rolls stacked on site (Max 4 rolls high)***

## Handling & Installation on Site

When lifting and handling on site it is better to use a Lifting Beam Set. The complete lifting beam set includes a 2-leg chain sling, spreader beam, lifting bar and end clamps. The end clamps are used to centre the roll on the lifting bar and also to limit sideways movement of the roll during installation, they must be tightened onto the lifting bar before lifting. A typical Lifting Beam Set is shown in Figure 5.

The steel lifting bar which is inserted through the roll core must be used in conjunction with a suitable spreader beam. Both the lifting bar and spreader beam must be properly designed and fabricated to safely carry the loading. The beam supports the lifting chains at each end of the roll and spreads the load uniformly across the roll width. The spreader beam is usually slung from the bucket of an excavator which should be certified as suitable for lifting the appropriate grade and weight of Basetex roll. The lifting beam and any other lifting equipment should hold test certification of the maximum SWL (Safe working load). Tensar in the UK can provide a Lifting Beam Set on request.

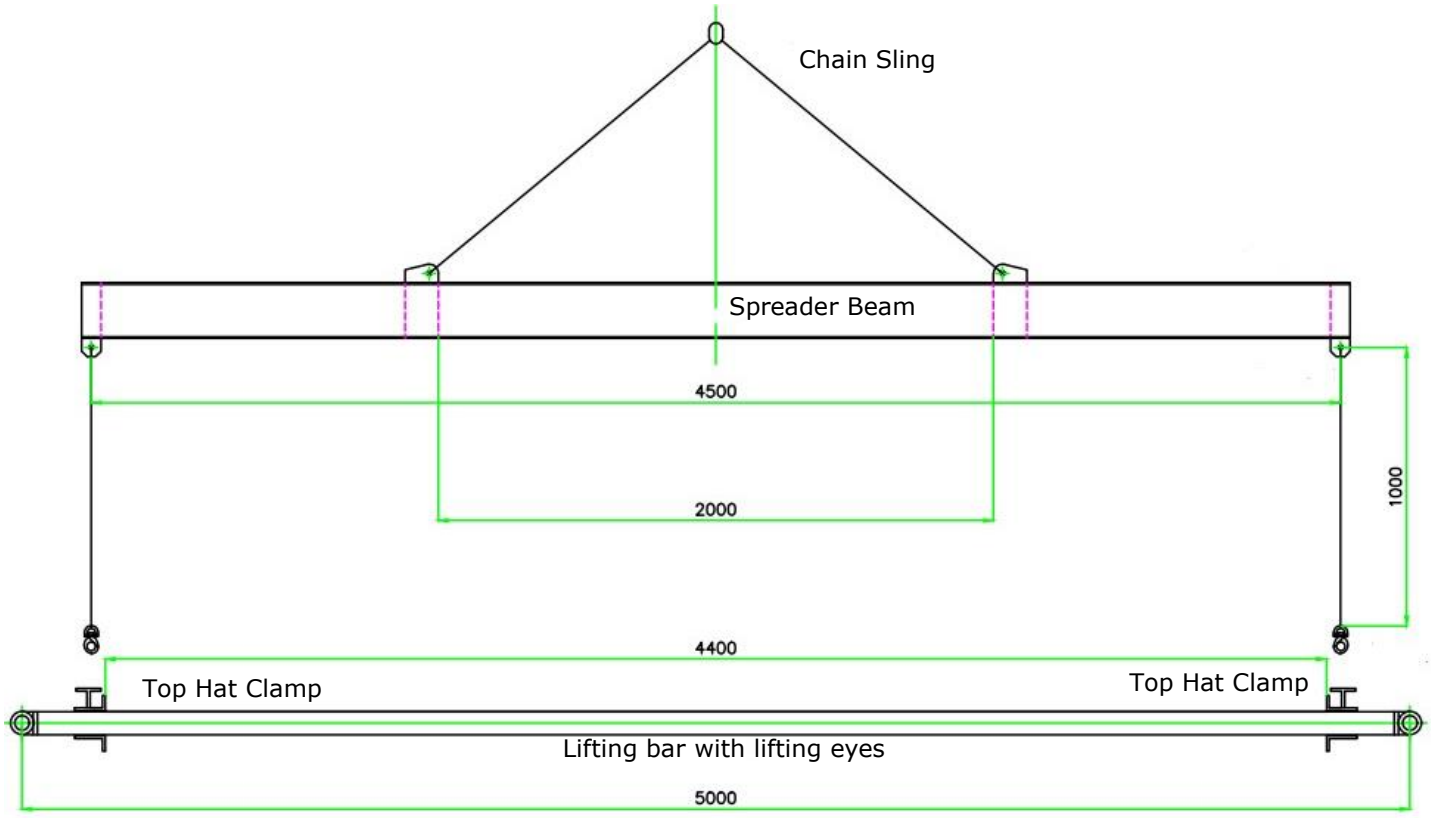


***Figure 5 Lifting Beam Set. Spreader Beam, Lifting Bar and Clamps***

***Figure 6 Lifting beam set for Basetex geotextile roll handling***

## Cutting Basetex

The product can be cut using a sharp blade; however, the most efficient method is to use an electric hot knife. This method seals the cut ends of the fabric to prevent fraying during subsequent handling. Cutting by this method should take place outdoors or in a well-ventilated area. Tensar does not provide cutting equipment.

## Subgrade Preparation

The existing subgrade surface must be free of major protrusions such as rocks, tree and bush stumps and construction debris. All local hollows and depressions should be filled with approved backfill and if conditions allow, the sub-grade should be levelled.

Tensar Basetex rolls should be taken to the installation area in the original roll wrapping. The wrapping should then be removed without damaging the Basetex. Most Basetex products are manufactured with greater strength in the longitudinal direction (i.e., at 90 degrees to the core). It is therefore critical that the rolls are oriented in the direction indicated by the contract drawings.

## Installation of Basetex

Operatives should wear appropriate personal protective equipment including heavy duty gloves and eye protection. In strong sunlight the glare from the surface of Basetex products can be very intense, and consideration should be given to wearing suitable eye protection. Due to the roll weights, it is recommended when lifting rolls, that a Lifting Beam Set be used in conjunction with an excavator. Operatives should not attempt to manually lift the rolls for health and safety reasons. The spreader beam and any other lifting equipment should be certified for the maximum safe working load.

If the subgrade can be trafficked without excessive rutting, it is recommended that Basetex can be unrolled in front of a backward moving excavator with the lifting beam attached to the front bucket (Figure 7). If the subgrade is soft, the excavator can stand at the end of the run and the Basetex unrolled manually by pulling from the suspended core. Construction equipment should not directly traffic the Basetex to minimise any damage to the material.

The rolls should be laid flat on the prepared formation and pulled hand taut to remove any slackness, wrinkles or folding. The ends and edges of the Basetex should have sand or fill (Figure 7 and 8 ) placed at regular intervals to hold the Basetex in place during placement of backfill, especially during windy conditions.

Note - all lifting operations should be carried in accordance with the safety requirements and safety standards associated with the country to which the lifting activity takes places.

## Jointing

Adjacent rolls should have a nominal side overlap of 500 mm (Figure 8). Strips should be continuous lengths or installed with the specified design overlap. A temporary **non-structural** longitudinal joint can be created by sewing. A full-strength structural connection through sewing is not possible. Advice on the most appropriate sewing methods should be obtained from suitably experienced suppliers of portable industrial sewing machines. This sewn joint is generally used as a construction expedient if the foundation is on swampy ground where laying the material may be difficult. The specified design overlap length should still be included within this sewn joint.

***Figure 8 Nominal 500 mm side overlap between adjacent rolls of Basetex geotextile)***

## Placing Fill

Approved fill should be placed onto the Basetex (Figures 10 and 11) as soon as practical after the Basetex has been laid down. Truck loads of fill should be tipped into piles on top of placed fill and not tipped directly onto the Basetex. The fill piles should be spread by mechanical plant which causes the material to cascade onto the Basetex, such as an excavator bucket or dozer with an open bucket.

Fill should be spread in layers of not less than 150mm finished thickness directly on top of the Basetex to protect it from damage. Care should be taken to avoid damage to the Basetex. No traffic or site plant shall be permitted to travel over the Basetex prior to placing fill on it.

***Figure 9 Laying Basetex geotextile using a Lifting Beam Set***

## General Manual Handling Information

As discussed above, all manual handling should be done in accordance with the safety requirements and safety standards associated with the country. More information specific to the handling of rolls can be found on the UK HSE (Health & Safety Executive) website in the "Manual handling in the textiles industry" manual.
https://www.hse.gov.uk/textiles/textiles-and-manual-handling.htm

**Contact Tensar International Limited if more specific advice is required.**

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