

## Biotex Flax/PLA 4x4 Plain Weave 500g/m<sup>2</sup> Fabric

### Technical Data Sheet

August 2013

#### Introduction

Biotex Flax/PLA fabrics are commingled textiles made from natural flax fibre and polylactic acid (PLA) biopolymer and are suitable for producing fibre-reinforced thermoplastic composite parts. The fabrics are moulded into rigid components by simply applying heat and pressure to melt the thermoplastic, wet-out the flax and consolidate. Suitable processes include press moulding, vacuum bagging and autoclave. The intimate blend of flax and thermoplastic ensures fast wet-out and low porosity, even with relatively low pressure processes.

Biotex natural reinforcements and intermediates provide the high performance and easy processing normally associated with glass fibre composites but with lower weight and environmental impact. They are suitable for semi-structural and decorative applications in sectors such as automotive, construction, marine, sports and consumer goods. Biotex uses a unique Twistless Technology to ensure a high degree of fibre alignment, impregnation and performance.

#### Specification

Specification for standard fabric (other constructions available on request):

| Fabric specifications |                            |
|-----------------------|----------------------------|
| Weave style           | 4x4 plain weave (hopsack)  |
| Warp yarn             | Biotex 40% Flax/PLA 250tex |
| Weft yarn             | Biotex 40% Flax/PLA 250tex |
| Warp count            | 7 ends/cm                  |
| Weft count            | 11 picks/cm                |
| Weight                | 500g/m <sup>2</sup>        |
| Tolerance on weight   | +/-5%                      |
| Width                 | 1250mm                     |
| Tolerance on width    | +/-2%                      |

#### Fibre Properties

Typical average properties for flax fibres:

| Flax fibre properties* |                      |
|------------------------|----------------------|
| Density                | 1.5g/cm <sup>3</sup> |
| Diameter**             | 20 μm                |
| Tensile modulus        | 50GPa                |
| Tensile strength       | 500MPa               |
| Elongation to failure  | 2%                   |

\*Flax fibre is a natural product and a certain amount of variation should be expected.

\*\*Flax fibre has a non-circular cross-section.



## Composite Properties

| Property             | Biotex 40% Flax/PLA woven fabric* | Biotex 40% Flax/PLA unidirectional fabric* | Test Method |
|----------------------|-----------------------------------|--|-------------|
| Fibre content by vol | 40%                               | 40%  |             |
| Density              | 1.33g/cm <sup>3</sup>             | 1.04g/cm <sup>3</sup>                      |             |
| Tensile modulus      | 13.2GPa                           | 27.4GPa                                    | ISO 527-4   |
| Tensile strength     | 102MPa                            | 157MPa                                     | ISO 527-4   |
| Tensile elongation   | 1.6%                              | 0.8%                                       | ISO 527-4   |
| Flexural modulus     | 7.8GPa                            | 22.6GPa                                    | ISO 14125   |
| Flexural strength    | 131MPa                            | 222MPa                                     | ISO 14125   |
| Charpy impact        | 32.8kJ/m <sup>2</sup>             | -  | ISO 179-1 U |

\*Data for laminates made from Biotex 40% Flax/PLA fabrics by press moulding and tested at ambient temperature.

## Processing

Biotex Flax/PLA fabrics can be consolidated by heating to 180-200°C and applying a pressure of 1-50bar. Typical processes include press moulding, vacuum bagging and autoclave. Care should be taken to avoid excessive temperatures and prolonged times at temperature which could cause thermal degradation of the flax. A processing guide is available on request.

## Packaging

Standard packaging details (other packaging options are possible on request):

| Packaging details |                |
|-------------------|----------------|
| Roll width        | 1250mm         |
| Roll length       | 50m            |
| Net weight        | 31kg           |
| Core              | Cardboard tube |
| Wrapping          | Polythene film |

Orders for multiple rolls are typically packed on a standard wooden pallet and covered with stretch wrap.

## Storage

Biotex Flax/PLA should be stored in a cool dry place away from direct sunlight. Flax and PLA can absorb moisture so drying may be required before use, especially if exposed to excessive humidity.

## Safety

Flax fibre is a naturally occurring, non-hazardous material, but typical precautions should be taken when handling the material including using appropriate PPE and adequate ventilation. See MSDS for details.

## Disclaimer

The information provided here is believed to be accurate but should be considered indicative only. It is the responsibility of the customer to check the suitability of the product for their specific application prior to use.

