2.3.3d Laminated fabrics

Laminated fabrics consist of two or more layers of fabric.

The thin layers are held together either by adhesives or by a thin layer of thermoplastic film that is heat set to fix the layers together.

Laminated fabric is often backed by a thin woven fabric which adds stability to the fabric.

Laminated fabrics combine the properties of each fabric, making a much superior fabric.

Laminated fabric can be engineered for specific purposes, for example for use in high-performance products.

Laminates are used in geotextiles, agricultural textiles, sport and leisure and in medical textiles.

Geotextiles

- Geotextiles are woven or bonded, natural or synthetic textiles that are permeable and originally used with soil to support drainage and protection against erosion.
- Uses now include road construction, agriculture and civil engineering.
- The roof of the Eden project in Cornwall shown below is an example of a geotextile.

Bonded fabrics

- Bonded fabrics comprise of a top fabric that is laminated to a thin layer of lightweight woven fabric.
- Adhesive is used to hold the two layers together.
- Bonding fabrics together adds to the stability of the main fabric, without spoiling its appearance.
- Bonded fabrics are more stable and stronger as a result of the process.

◊ Foam can be bonded to fine knitted or woven fabric to improve its functionality, as it can be difficult to work with on its own.

◊ Laminated foam is used in the car industry, interior furnishings, geotextiles, acoustic insulation and carpet underlay.

◊ Neoprene used in wetsuits and other textile products is an example of a bonded fabric.

◊ Neoprene is a foam rubber that is difficult to use on its own, but it has good insulative qualities. When bonded to a fine knit, its functionality is improved, and its usefulness extended.

◊ Faux leather is created by bonding woven cotton to plastic or polyurethane (PU) to create a fabric that simulates leather.

◊ This laminated fabric has many uses throughout textiles - upholstery in particular but also bags, purses, belts, and shoes.

◊ PVC is an example of a coated fabric where polyvinylchloride is applied to fabric, such as cotton, which is then heat set in an oven.

◊ Coated textiles can withstand many challenging uses.

Gore-Tex, Permatex, Sympatex

- Gore-Tex is an example of a laminated fabric that has been engineered for specific purposes.
- Gore-Tex includes a **permeable hydrophilic** membrane laminated between 2 other fabrics.
- Gore-Tex is used for high performance clothing and footwear.
- It works on the principle of allowing moisture (from perspiration) through from the inside but does not allow larger water droplets (from rain) to penetrate through from the outside.
- It is also wind resistant.
- When used in a jacket, it is a means of regulating the body temperature keeping the wearer more comfortable over long periods of activity.
- This laminated fabric appears breathable.
- Permatex and Sympatex are similar fabrics and work in the same way.

The diagram below shows the principle of how the hydrophilic membrane functions when laminated to other fabrics and used in clothing.