

**“Technical textiles” are a group of materials that have been engineered to perform specific physical tasks in addition to the conventional functions of textiles.**

### Biometric (electronic interactive) textiles



Biometric clothing is capable of measuring a wearer's vital signs and even delivering a dose of medicine into the skin. Conductive fibres, woven directly into the garment, relay information which is processed electronically.

### Phase changing materials. (Proactive heat management)

Phase Changing Materials (PCMs) change state from liquid to solid (and vice versa) whilst either absorbing or radiating heat. This is due to the heat energy absorbed or released during the change of state from liquid to solid.

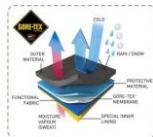


### Neoprene

Neoprene is a synthetic rubber that exhibits good chemical stability and maintains flexibility over a wide temperature range. Neoprene is sold either as solid rubber or in latex form, and is used in a wide variety of applications.



### Gore-tex



Gore-tex is woven in a way which allows moisture from the body to evaporate through it, whilst not allowing large water droplets (rain and snow) to get through. This makes it ideal for outdoor clothing as it is both breathable and wearable.

### Micro fibres in clothing manufacture

Micro fibre is a fine synthetic fibre made from polyesters and polypropylene. Micro fibre is used to make mats, knits, and weaves for clothing, upholstery, industrial filters, and cleaning products. The shape, size, and combinations of synthetic fibres are selected for specific characteristics, including softness, toughness, absorption, water repellency, electrostatics, and filtering capabilities.

### Thermo-chromic textiles

Thermo-chromic dyes can also be added to fibres or garments to make their colour change when heated or cooled.



### Fire retardant fabrics

When a fabric is designated as *inherently fire-retardant*, *permanently fire-retardant*, or *durably fire-retardant*, the flame retardancy will last for the life of the fabric, as it has been woven into the fabric fibre itself.



### Conductive fabrics (e-textiles)

E-textiles, also known as smart garments, electronic textiles or smart textiles, are fabrics that enable digital components such as a battery and a light (including small computers), and electronics to be embedded in them.

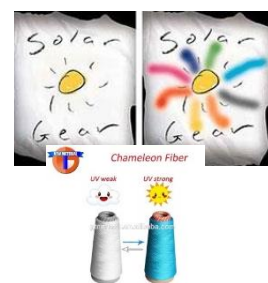


### Nomex



Nomex has excellent thermal, chemical, and radiation resistance for a polymer material. It is typically used in applications with a high risk of fire exposure.

### Photo-chromic textiles



Photochromic dyes can be added to textiles either in the fibre or to the garment. They change colour once they are exposed to UV radiation.

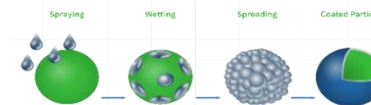
### Kevlar



Kevlar® is a liquid that is converted into a fibre (called aramid fibres) and then woven into a textile material. The resulting textile material is extremely strong, lightweight, corrosion and heat resistant. It is often used in combination with other materials, forming composites. Kevlar® has a high tensile strength to weight ratio, far exceeding steel and even specialist metal alloys, such as magnesium alloys, used in aerospace engineering

### Smart Fibres: Microencapsulation

Microencapsulation involves encapsulating liquid or solid substances in tiny thin-walled natural or synthetic bubbles. Microspheres gradually release active agents by simple mechanical rubbing, which ruptures the membrane over time. Encapsulation has allowed moisturisers, therapeutic oils, and insecticides to be incorporated into fabrics.



### Rhovyl- antibacterial fibre



Rhovyl is an innovative fibre containing an antibacterial substance. The bacteriostatic agent is integrated in the heart of the fibre and prevents the development of bacteria that form during any bodily activity. It also possesses fire retardant properties.

### Sun protective clothing

Sun protective clothing is specifically designed for sun protection and is produced from a fabric rated for its level of ultraviolet (UV) protection. Its weave structure produces sun protective properties. In addition, some textiles and fabrics may be pre-treated with UV-inhibiting ingredients during manufacture to enhance their effectiveness.



### Geotextiles for landscaping

Geotextiles are permeable fabrics which, when used with soil, have the ability to separate, filter, reinforce, protect, or drain. Typically made from polypropylene or polyester, geotextile fabrics come in three basic forms: woven (resembling mail bag sacking), needle punched (resembling felt), or heat bonded (resembling ironed felt).



- Biometric textiles
- Phase change materials
- Neoprene
- Gore-tex
- Microfibres
- Thermo-chromic
- Retardant
- Conductive
- Nomex
- Photo-chromic
- Kevlar
- Microencapsulation
- Rhovyl
- Antibacterial
- Geotextiles



In your exam you will often be asked about modern developments in materials. You need to be able to explain the properties of these Technical textiles and suggest products that are manufactured from them. Research into other products that use these textiles.

# Design and Technology

## Title: Technical Textiles