What is Polyvinyl Alcohol?

Understanding Water-Soluble PVA Fibre

1. Chemical Composition

Durafil Water Soluble Thread (WST) is manufactured from **Durafil PVA fibres**, produced from **Polyvinyl Alcohol (PVA)**.

Polyvinyl Alcohol is a **synthetic polymer** created through the polymerization of vinyl acetate followed by hydrolysis.

The repeating chemical structure of PVA can be represented as:
$(C_2H_4O)n$

The polymer chain contains a high concentration of **hydroxyl groups (–OH)**. These hydroxyl groups enable strong interaction between the polymer and water molecules.

Because of this chemical structure, materials made from **Durafil PVA fibres** behave very differently from most common synthetic fibres such as polyester or nylon.

2. Structure of PVA Fibre

Durafil PVA fibres are produced by spinning the polymer into **filament or staple fibres**, which are then processed into **Durafil yarns and threads**.

The fibre structure contains strong intermolecular bonding between polymer chains.

This bonding gives materials made from **Durafil PVA fibres** good tensile strength in their dry state.

When exposed to water, the polymer chains interact with water molecules through hydrogen bonding. As this interaction increases, the fibre structure gradually weakens and begins to dissolve.

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3. Water Solubility

One of the most distinctive properties of **Durafil PVA fibres** is their ability to dissolve in water under controlled conditions.

Durafil Water Soluble Thread (WST), manufactured from **Durafil yarns and threads**, is engineered so that the material dissolves in water at:

20°C and above

Higher water temperatures generally increase the **rate of dissolution.**

The dissolution process depends on several factors, including:

- Water temperature
- Water movement or agitation
- Exposure time
- Fabric construction surrounding the thread

4. Biodegradability

Polyvinyl Alcohol is widely recognised as a **biodegradable synthetic polymer** under suitable environmental conditions.

Microorganisms are capable of breaking down PVA molecules over time. Because of this property, materials produced from **Durafil PVA fibres** can be used in applications where temporary materials are desirable.

Examples of applications where PVA materials are commonly used include:

- Water-soluble packaging films
- Detergent capsules
- Agricultural materials
- Textile processing products

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5. Hygroscopic Behaviour

Durafil PVA fibres are **hygroscopic**, meaning they can absorb moisture from the surrounding environment.

Moisture absorption can influence the handling and processing behaviour of the material. For this reason, **Durafil yarns and threads** should be stored under controlled humidity conditions.

Maintaining stable storage conditions helps preserve consistent fibre behaviour during textile processing.

6. Thermal Behaviour

Materials produced from **Durafil PVA fibres** are **sensitive to heat and friction**.

Elevated temperatures can influence the stability of the polymer structure, particularly when combined with moisture.

During textile processing operations involving **Durafil yarns and threads**, careful control of heat generation and friction is important to maintain material integrity.

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7. Industrial Applications of PVA Fibre

Materials made from **Durafil PVA fibres** are used in several industrial applications where water-soluble behaviour is required.

Typical applications include:

- Temporary textile stitching
- Embroidery support threads
- Textile processing aids
- Water-soluble films and packaging
- Specialty reinforcement fibres

The ability of **Durafil PVA fibres** to dissolve in water under controlled conditions makes them useful for applications where materials must later be removed.

8. Key Material Characteristics

Materials produced from **Durafil PVA fibres** typically exhibit the following characteristics:

- Water solubility at controlled temperatures
- Good tensile strength in dry conditions
- Hygroscopic behaviour
- Sensitivity to heat and friction
- Biodegradable characteristics under suitable environmental conditions

These properties make **Durafil PVA fibres** a unique class of synthetic textile materials.

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9. Contact for Technical Support

For technical queries:

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