Material Behaviour & Chemistry Guide

Durafil Water Soluble Yarn

20°C Soluble | Ne 40/1

Understanding PVA Temporary Process Yarn Performance in Textile Manufacturing

1. Purpose

This guide explains the practical material behaviour and chemistry of Durafil Water Soluble Yarn.

The product is a Polyvinyl Alcohol (PVA)-based yarn designed to provide temporary support, stabilisation, separation, or structure during weaving and knitting processes, followed by removal through controlled water dissolution.

Understanding how the yarn responds to moisture, tension, fabric construction, and wash conditions helps users achieve reliable production results.

2. Product Overview

Property	Description
Product Type	Water Soluble Temporary Process Yarn
Yarn Count	Ne 40/1
Base Polymer	Polyvinyl Alcohol (PVA)
Appearance	White / Off-white
Construction	Spun Yarn
Functional Principle	Temporary structural support followed by water dissolution
Dissolution Start Point	Approximately 20°C water and above

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3. How the Material Works

Unlike conventional textile yarns intended to remain in the fabric, PVA yarn is engineered to dissolve in water under suitable conditions.

During manufacturing, the yarn behaves as a textile component providing temporary structure.

During wet processing:

- Water penetrates the yarn structure

- Polymer begins hydrating and dissolving
- Yarn strength falls
- Fibres disperse into solution
- Temporary yarn disappears from fabric construction

This allows advanced textile constructions that are later transformed after washing.

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4. Key Material Behaviours

A. Moisture Sensitivity Before Use

PVA yarn is sensitive to moisture before intended processing.

Exposure to humidity or water before use may affect:

- Package condition
- Running behaviour
- Yarn strength
- Processing consistency

Dry storage is important.

B. Tensile Behaviour During Use

As a spun yarn, the product provides temporary process strength during weaving or knitting.

Performance depends on:

- Machine tension
- Friction points
- Yarn path quality
- Environmental humidity
- Construction design

C. Dissolution Behaviour

The yarn begins dissolving in water at approximately **20°C and above**, depending on conditions.

Dissolution speed depends on:

- Water temperature
- Liquor ratio
- Agitation / movement
- Wash duration
- Accessibility of trapped yarn
- Fabric density

D. Residue Behaviour

When fully processed under correct conditions, residue should be minimal or absent.

If conditions are weak, residue may remain in dense or trapped areas.

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5. Interaction with Fabric Structures

Results vary by textile construction.

Faster Removal Often Seen In:

- Open knits
- Loose weaves
- Accessible lace structures

Slower Removal Often Seen In:

- Dense woven fabrics
- Compact multilayer areas
- Tight constructions with trapped yarn paths

Fabric geometry matters as much as chemistry.

6. Why Used as a Temporary Yarn

PVA yarn allows manufacturers to:

- Weave delicate fibres more effectively
- Stabilise knit structures temporarily
- Create removable pattern elements
- Support fragile yarn systems
- Engineer structures difficult with permanent yarns

After removal, the final fabric can become softer, lighter, or more open.

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7. Difference from Conventional Yarn

Conventional Yarn	Water Soluble Yarn
Intended to remain in textile	Intended for later removal
Water resistant or stable	Designed to dissolve in water
Permanent structural role	Temporary process role
Final fabric component	Manufacturing aid component

8. Common Process Mistakes

- Humid storage before use
- Water exposure before processing
- Excess machine tension
- Insufficient wash water volume
- Low agitation in wash stage
- Drying before complete dissolution
- Assuming all fabric constructions dissolve equally

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9. Best Practice for Consistency

- Keep yarn dry until use
- Use only where temporary function is needed
- Trial each construction type
- Use adequate wash volume and movement
- Confirm complete dissolution before drying
- Record approved settings

10. Important Note

Final performance depends on process conditions, construction design, storage control, and system discipline.

Users are responsible for testing, process adjustment, and validation before production.

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11. Contact for Technical Support

For technical queries:

Email: info@durafil-group.com