

Material Behaviour & Chemistry Guide

Durafil Heat Fusible Yarn

Tex 40 | Low Melting Polyamide | Natural Colour

Understanding Thermal Bonding Yarn Performance in Textile and Industrial Applications

1. Purpose

This guide explains the practical material behaviour and chemistry of Durafil Heat Fusible Yarn.

The product is a low melting polyamide functional yarn designed to provide reinforcement, bonding support, and stabilisation through controlled heat activation.

Understanding how the yarn responds to heat, pressure, cooling, friction, and substrate type helps users achieve reliable production results.

2. Product Overview

Property	Description
Product Type	Heat Fusible Functional Yarn

Yarn Count	Tex 40
Base Polymer	Low Melting Polyamide
Colour	Natural
Functional Principle	Thermal softening followed by bonding on cooling
Softening / Activation Range	Approx. 80–90°C
Nominal Melting Point	Approx. 85°C

3. How the Material Works

Unlike conventional yarns intended only for mechanical stitching, low melting polyamide yarn is engineered to soften at relatively low temperatures.

When sufficient heat is applied:

- Polymer softens
- Surface flow begins
- Adjacent fibres or materials contact more closely
- Bonding develops during cooling
- Seam or construction gains reinforcement

This allows the yarn to act as both a textile component and a bonding aid.

4. Key Material Behaviours

A. Heat Response

The yarn becomes progressively softer as temperature rises toward activation range.

Too little heat may give weak bonding.

Too much heat may cause excessive flow, stiffness, marking, or surface visibility.

B. Pressure Response

Pressure during heating helps improve contact between softened polymer and surrounding materials.

Balanced pressure often improves bond consistency.

Excessive pressure may flatten fabrics or force material into visible zones.

C. Cooling Response

After heating, the polymer re-solidifies during cooling.

Stable cooling can improve bond integrity and consistency.

Handling while still hot may disturb final bonding.

D. Flexibility Response

Bonded zones may feel firmer than untreated material.

This depends on:

- Yarn quantity used
 - Bond area size
 - Substrate flexibility
 - Heat intensity
 - Pressure level
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E. Friction Response

Mechanical friction during rewinding or sewing can create local heat.

Excessive friction may affect running behaviour or damage the yarn before intended activation.

5. Interaction with Materials

Generally suitable for trials on:

- Polyester fabrics

- Polyester / viscose blends
- Cotton blends
- Polyamide blends
- Many industrial sewn textiles
- Selected non-textile flexible materials

Results vary by surface chemistry, coatings, finishes, density, and heat sensitivity.

Always test before production.

6. Difference from Conventional Yarn

Conventional Yarn	Heat Fusible Yarn
Primarily mechanical stitching role	Mechanical + bonding support role
Stable under moderate pressing heat	Designed to soften at lower temperatures
No bonding effect	Can create internal bonding effect
Seam strength only	Seam support + reinforcement

7. Common Process Mistakes

- Using excessive temperature
 - Uneven pressure application
 - No cooling stage
 - Excess yarn quantity in bond zone
 - High friction rewinding conditions
 - Assuming all materials behave the same
 - No trials on new substrates
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8. Best Practice for Consistency

- Trial each substrate type
- Use controlled heat conditions
- Use only necessary yarn quantity
- Allow cooling before handling
- Record approved settings
- Train operators on thermal sensitivity

9. Why Used by Thread Makers

Because the yarn can be rewound into kingspools or user-ready formats, thread makers can supply a specialist thermal bonding product to garment factories and industrial users without changing customer sewing habits.

10. Important Note

Final performance depends on heat source, pressure, dwell time, substrate type, construction design, and process control.

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

11. Contact for Technical Support

For technical queries:

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