

Fine Knitwear Preservation & Blocking Handbook

The Biophysics of Keratin Cuticle Scales, Directional Friction, and Shrinkage Reversal

1. The Felting Triad: Mechanical Physics vs. Temperature Myths

Physical Variable	Fiber Impact on Keratin	Felting Contribution Level
Mechanical Agitation	Causes directional cuticle scales to slide past each other and lock irrevocably.	90% Primary Cause. Friction acts as a microscopic ratchet mechanism.
Sudden Thermal Shock	Abrupt change from hot to cold water contracts polypeptide chain helix.	Catalyst. Accelerates mechanical bonding if agitation is simultaneously present.
Water pH Deviation	Alkaline detergents swell cuticle scales outward, maximizing friction coefficient.	Critical Enabler. High pH leaves cuticles standing open and vulnerable to snagging.

2. The Emergency Wool Relaxation & Blocking Rescue Protocol

Step Number	Action Item & Solution Chemistry	Structural Mechanism
1. Cationic Soak	Submerge shrunken knit in lukewarm water with 2 tbsp hair conditioner for 30 min.	Cationic surfactants lubricate keratin scales, allowing locked fibers to unlatch.
2. Compression Roll	Roll garment inside a dry Turkish cotton towel; press firmly without twisting.	Extracts 80% of retained water without creating directional friction.
3. Grid Pin Blocking	Lay on blocking mat; gently massage to original dimensions; secure with T-pins.	Re-sets hydrogen bonds in extended state as natural air drying occurs.