

THERMOLITE® Performance Standards for Woven and Knit Fabrics

THERMOLITE® fabrics keep the wearer warm and dry without adding bulky layers. Fabrics can be certified as either “THERMOLITE®” or, for a higher level of performance, “THERMOLITE® Pro”.

INVISTA has established quality standards for certifying THERMOLITE® fabrics, and identified test methods to determine whether fabrics meet the standards. These are presented in Tables 1 and 2 for woven and knit fabrics respectively. In addition to the standards, all fabrics must have a premium appearance that is consistent with the quality that consumers expect from INVISTA-certified fabrics. For more information about THERMOLITE® certification, contact your INVISTA representative.

Standards and Testing

Content

To ensure long-term performance, THERMOLITE® fabrics must contain the prescribed percentage of INVISTA THERMOLITE® qualifying yarns.

Minimum Fabric Weight

Sufficient fabric weight ensures proper thermal performance of THERMOLITE® fabrics.

CLO per Unit of Fabric Weight

CLO is a measure of the insulative value of a fabric. To test for CLO, fabric samples are placed on a hot plate that produces a known quantity of heat energy. The air temperature above the fabric is then measured, and CLO is calculated according to a prescribed equation.

Maximum Shrinkage (AATCC 150)

Fabrics are subjected to home laundering and tumble-drying conditions. The resulting fabric shrinkage is measured and recorded.

Air Permeability (ASTM D-737-75)

An air permeability tester creates a prescribed pressure differential between two sides of a fabric. The subsequent air flow through the fabric is measured and recorded.

Vertical Wicking (INVISTA Test Method 348)

This standard applies only to THERMOLITE® knit base-layer fabrics. A fabric strip is hung vertically with a clamp and the free end is dipped into distilled water to a specified depth for a specified time. The height of the water that wicks upward through the fabric strip is measured and recorded.

Table 1. THERMOLITE® performance standards for wovens



	Content Qualifying Yarns	Minimum Fabric Weight g/m² (oz/yd²)	CLO per... g/m² (oz/yd²)	Maximum Shrinkage (AATCC 150)	Air Permeability (ASTM D-737-75)
THERMOLITE®	20% minimum	169.5 (5.0)	0.00074 (0.025)	5.0%	15 cfm maximum
THERMOLITE® Pro	60% minimum	203.4 (6.0)	0.0016 (0.055)	5.0%	10 cfm maximum

Table 2. THERMOLITE® performance standards for knits

	Fleece Outer-Layer		Fleece Lining		Knit Base-Layer*	
	THERMOLITE®	THERMOLITE® Pro	THERMOLITE®	THERMOLITE® Pro	THERMOLITE®	THERMOLITE® Pro
Content Qualifying Yarns	30% minimum	70% minimum	30% minimum	70% minimum	35% minimum	85% minimum
Minimum Fabric Weight g/m ² (oz/yd ²)	135.0 (4.0)	180.0 (5.3)	135.0 (4.0)	180.0 (5.3)	101.7 (3.0)	135.6 (4.0)
CLO per... g/m ² (oz/yd ²)	0.0021 (0.07)	0.0029 (0.10)	0.0021 (0.07)	0.0029 (0.10)	0.00088 (0.03)	0.0015 (0.05)
Maximum Shrinkage (AATCC 150)	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%
Air Permeability (ASTM D-737-75)	300 cfm maximum	300 cfm maximum	400 cfm maximum	400 cfm maximum	200 cfm maximum	200 cfm maximum
Vertical Wicking After 30 Minutes (DTM 348)	—	—	—	—	4 in. (10.2 cm) minimum	5 in. (12.7 cm) minimum
Moisture Management (INV CTL 79)						
Absorbency (Time)	—	—	30 sec. maximum	20 sec. maximum	20 sec. maximum	20 sec. maximum
Planar Wicking* (Wetted Area)	—	—	—	—	4 in ² (25.8 cm ²) minimum	5 in ² (32.3 cm ²) minimum
Halo* (Two-Sided Fabric)	—	—	—	—	Area of surface wetness greater on front than back	Area of surface wetness greater on front than back

* Knit base-layer fabrics certified as “THERMOLITE®” may also be branded as “COOLMAX® Active” if they meet the COOLMAX® standards for Active. Knit base-layer fabrics certified as “THERMOLITE®” Pro may also be branded as “COOLMAX® Extreme” if they meet the COOLMAX® standards for Extreme. For more information, see: COOLMAX® Performance Standards for Circular, Warp, and Seamless Knits, and Woven Fabrics (Doc. Ref. #P010).

Moisture Management (INVISTA Test Method CTL 79)

For THERMOLITE® fabrics, the industry standard absorbency test (AATCC 79) has been modified to yield three measures of performance:

- Absorbency (knit fleece linings and knit base-layer fabrics only)
- Planar wicking (for those knit base-layer fabrics that are designed to spread moisture for efficient evaporation)
- Halo (for those knit base-layer fabrics that are designed to transport moisture from the inner fabric surface to the outer surface)

THERMOLITE® knit base-layer fabrics must meet the standard *either* for planar wicking *or* for halo.

To test moisture management, a fabric is mounted in an embroidery hoop with the fabric back facing outward. A prescribed amount of water is allowed to fall upon

the fabric from a fixed height. The time required for the puddle to become absorbed enough to lose its shine is measured and recorded as the *absorbency*.

After the water has been absorbed by the fabric, the wet area (length x width) is measured and recorded as *planar wicking*.

The hoop is then turned over to expose the fabric front. If the wet area of the fabric front is greater than that of the fabric back, then a *halo* has been achieved, indicating good moisture transport.

Unmatched Technical Support

As always, count on INVISTA to provide industry-leading technical support for your development efforts when you use INVISTA yarns for apparel.



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