

# Technical Data Sheet---Thinsulate Type D

## Product Description

3M™ Thinsulate™ Insulation Type D is an economical, 100% polyester mid-loft insulation. It may be quilted using conventional quilting equipment

- Nice drape characteristics
- Breathable
- Water-repellent
- Washed or dry-cleaned depending on individual manufacturers' recommendations
- Hypoallergenic

## Intended Uses

Outerwear, sportswear, work wear, gloves and accessories

## Fiber Composition

### US Convention:

Insulation:

100% Polyester

### ISO Convention:

Insulation:

100% polyester

## Warmth While Damp

Individual fibers absorb less than 1% by weight of water; Retains insulating ability even under damp conditions.

## Restricted Substances

Thinsulate insulation TypeK# meets the harmful substances requirements of Oeko-Tex Standard 100 and has been awarded the Oeko-Tex Certificate for Product Class 1 by Hohenstein Institutes (meets the human-ecological requirements of the standard presently established for baby articles).



## Available Product Forms

60" (1.52 m) roll width (nominal) with a 2" (5.1 cm) inside diameter core.

## Properties

| Thinsulate Type D |                  |                    |      |      |                                                      |                 |             |
|-------------------|------------------|--------------------|------|------|------------------------------------------------------|-----------------|-------------|
|                   | Basis Weight**   |                    | 厚度** |      | Thermal Resistance (R <sub>ct</sub> ) ASTM F 1868*** |                 | Roll Length |
|                   | g/m <sup>2</sup> | oz/yd <sup>2</sup> | cm   | inch | Clo                                                  | R <sub>ct</sub> | 米           |
| D80               | 80               | 2.36               | 0.9  | 0.35 | 1.9                                                  | 0.29            | 75          |
| D100              | 100              | 2.95               | 1.2  | 0.47 | 2.2                                                  | 0.34            | 60          |
| D120              | 120              | 3.54               | 1.4  | 0.55 | 2.6                                                  | 0.40            | 50          |
| D150              | 150              | 4.42               | 1.9  | 0.75 | 3.1                                                  | 0.48            | 42          |

## Construction Guidelines

### *General Manufacturing Guidelines*

3M™ Thinsulate™ Insulation products need to be properly used in order to produce their intended benefits in apparel and related articles. For this reason, specifiers, garment manufacturers and converters need to abide by the construction guidelines and care instructions in this Technical Data Sheet, as well as by the proper end-article placement and coverage guidelines in the Product and Brand Usage Standards (PBUS) brochure. It is primarily the garment manufacturer's / designer's responsibility to assure their end customers' satisfaction by:

1. Selecting appropriate shell and lining fabrics, including findings and recommended scrims for the intended application.
2. Following the construction guidelines supplied by 3M for the design and manufacture of each garment.
3. Determining the proper care label to be sewn into each garment, taking into account 3M care instructions.

### *General Fabric Recommendations*

The Thinsulate insulation family of products does not require down-proof fabrics in most instances. However, when using Thinsulate insulation with fabrics that are not down-proof, the potential for fiber migration should be determined.

- Fiber migration due to wash durability can be detected by sewing a pillow of the garment components—following the construction guidelines—and washing it five times as recommended. Observe the fabric surface for protruding fiber ends.
- Fiber migration caused by other mechanisms can be assessed by submitting fabric samples to the 3M laboratory through 3M sales representatives. The use of fiber proof scrims to separate the insulation from textured shell or lining fabrics, coated, micro-coated, or waterproof breathable fabrics is required when needed to prevent fiber migration. This can be accomplished by adding scrim(s) during the garment construction process when necessary. When using coated, micro-coated, or waterproof breathable fabrics, the durability of the insulation is decreased because of surface friction and because water cannot be flushed through the garment and an intervening layer of scrim should be used against such fabrics. Durability may also be enhanced by providing a means via openings or vents at the bottom of a garment through which water can be easily expelled to minimize stress on the insulation during agitation and water extraction.

### *Guidelines for Garment Construction*

Allow 24 hours for recovery of 3M™ Thinsulate™ Insulation Type G after removal from vacuum pack. Thinsulate insulation type G may be free-hung in edge stabilized constructions not exceeding 22" x 22". Thinsulate insulation type G may be quilted using conventional quilting equipment. Quilt spacings less than 4" are not recommended in order to maintain maximum warmth. Channel quilts of 4" to 7" are recommended.

**Thorough garment testing is necessary for quilt dimensions outside of the recommended range.**

For scrims please consult your 3M sales representative. Fiber migration should be expected with textured fabrics, micro-coated fabrics or taffetas, especially for constructions having less than 86 picks per inch / 34 picks per cm (or having a total thread count of less than 190 threads per inch/ 75 threads per cm). Applications with textured, coated or waterproof breathable fabrics may also cause abrasion due to surface friction. **All constructions, regardless of pick count, should be evaluated for fiber migration following the previously stated instructions.**

***Guidelines for Gloves and other Accessories Construction***

Allow 24 hours for recovery of Thinsulate insulation type D after removal from vacuum pack.

- Quality lamination processes will result in loftier and warmer end products.
- A tricot or scrim must be used between the Thinsulate insulation type G and the outer shell of the glove.
- **For details pertaining to proper placement in apparel, gloves or other accessories, please consult the brochure: *Product and Brand Usage Standards*.**

For questions, contact 3M Protective Apparel and Footwear Market Center Technical Service at 800-328-7098, option #3.

**CAUTION**

To reduce the inhalation of fibers or airborne dust, always use an appropriate respirator when the cutting or processing of rolls is expected to produce fibrous or airborne dust.

**Care Instructions**



Garments made with 3M™ Thinsulate™ Insulation Type D may be home machine washed or professionally dry-cleaned depending on the garment manufacturer's recommendation. Care instructions from the garment manufacturer need to be followed to ensure integrity of the overall garment. Instructions for:

**Machine wash only** garments:

+ Machine wash cold (30 °C, 85 °F), delicate cycle. Use only on-chlorine bleach when needed. Tumble dry, low heat. Do not steam press. Steam only or use cool iron.

**Important Notice to User**

**WARRANTY:** In the event any 3M™ Thinsulate™ Insulation product is found to be defective in material, workmanship or not in conformance with any express warranty for a specific purpose, 3M's only obligation and your exclusive remedy shall be to repair, replace or refund the purchase price of such parts or products upon timely notification thereof and substantiation that the product has

been stored, maintained and used in accordance with 3M's written instructions.

**EXCLUSIONS TO WARRANTY: THIS WARRANTY IS EXCLUSIVE AND IS IN LIEU OF ANY IMPLIED WARRANTY OR CONDITION OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE OR OTHER WARRANTY OR CONDITION OF QUALITY, EXCEPT OF TITLE AND AGAINST PATENT INFRINGEMENT.**

Special or consequential, arising out of the sale, use or misuse of Thinsulate insulation products or the user's inability to use such products. **THE REMEDIES SET FORTH HEREIN ARE EXCLUSIVE.** 3M's general terms and conditions also apply to the sale of this product. 3M may change the product, specifications and availability of the product as improvements are made: therefore, user should contact 3M for latest information before specifying the product. All Thinsulate insulation rolls are made within strict dimensional tolerance specifications. However, it is possible to shift, shrink, or otherwise change length and/or width dimensions to a maximum of  $\pm 4\%$  during handling or shipment.

Allow 24 hours for recovery after vacuum pack is removed.

**LIMITATION OF LIABILITY:** Except as provided above, 3M shall not be liable or responsible for any loss or damage, whether direct, indirect, incidental,



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