THE MEANING BEHIND THE WOOLMARK LOGO
TRAINING MANUAL
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The Woolmark logo is one of the world’s most recognisable textile symbols, and for most people it indicates that a product bearing the mark is made from 100 per cent Pure New Wool. These products meet key performance standards – providing confidence to consumers of product quality.

The Woolmark logo was designed by Italian graphic artist Francesco Saroglia and was launched in 1964 in the USA, Western Europe and Japan. Since then it has been promoted and used on end products in more than 100 countries across the globe.

**WOOLMARK**

100 per cent Pure New Wool. Up to 0.3 per cent non wool fibre contamination is usually permitted.

Since the introduction of the Woolmark logo, which represents products made from 100 per cent Pure New Wool, two other marks have been added to incorporate blends with other fibres.

**WOOLMARK BLEND**

Contains at least 50 per cent New Wool with a tolerance of +/- 3 per cent. Only one non-wool component is allowed in each singles yarn to help ensure the wool in the product has not previously been used in a fabric and is ‘new’. Wool and polyester fibres in a singles yarn form an intimate blend. Pure polyester singles yarn folded with a pure wool singles yarn is not an intimate blend. Likewise pure polyester yarns woven with pure wool yarns in the same fabric is also not an intimate blend.

**WOOL BLEND**

Established in 1999, Wool Blend is used on products which contain 30 – 49 per cent New Wool, with a tolerance of +/- 3 per cent. Only one non-wool component is allowed in intimately blended singles yarns.
SUB BRANDS

In addition to Woolmark, Woolmark Blend and Wool Blend, there are a number of sub-brands which are described later.

Today the Woolmark, Woolmark Blend and Wool Blend brands, along with the family of sub-brands are owned and managed by The Woolmark Company (TWC) and its affiliates.

These symbols or logos are not just brands, used for example for advertising purposes. Products carrying these marks are assessed against The Woolmark Company’s Product Specifications, which are backed up by rigorous Woolmark test methods. The Woolmark Company has clearly defined product Specifications, divided into product types such as Semi-Processed products, Apparel, Apparel Care, Interiors, Floorcovering, Approved B2B Products and Sheepskin products. These are available woolmark.com.

These comprehensive Specifications are regularly reviewed to ensure that Woolmark quality standards are maintained.

As well as determining wool or fibre content, the tests assess how the product is likely to look and perform during wear and in laundering.

Woolmark Specifications cover four main areas of performance:

- Fibre content
- Physical properties related to wear performance
- Colour fastness
- Dimensional stability

In order to use any of the logos, an end product must be tested at an independent authorised laboratory to ensure it meets the relevant product Specifications. A list of authorised laboratories can also be found in the Licensee Area of woolmark.com.

For items of apparel (knit, woven and accessories), this training manual describes the Woolmark Specifications and test methods and how they relate to practice.
## STANDARDS AND TESTING

### 1.1. TWC SPECIFICATIONS FOR APPAREL PRODUCTS

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<tr>
<th>WOOLMARK SPECIFICATION</th>
<th>ASSOCIATED PRODUCTS</th>
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<tr>
<td><strong>SPECIFICATION AK-1</strong></td>
<td>Sweaters including cardigans and waistcoats; jackets and coats; trousers; skirts; dresses; dressing gowns; shirts and blouses; underwear; nightwear; socks (including stockings and tights); leggings; multi-piece garment sets including mens and womens suits; accessories (hats, scarves, gloves, ties).</td>
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<tr>
<td><strong>SPECIFICATION AK-2</strong></td>
<td>Woolmark knitted apparel products (including yarns and fabrics) but not Woolmark Blend and Wool Blend products.</td>
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<tr>
<td><strong>SPECIFICATION AK-3</strong></td>
<td>Woolmark knitted apparel products (including yarns and fabrics) but not Woolmark Blend and Wool Blend products.</td>
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<tr>
<td><strong>SPECIFICATION AK-4</strong></td>
<td>All Woolmark apparel products (including yarns and fabrics) but not Woolmark Blend or Wool Blend products.</td>
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<td><strong>SPECIFICATION AW-1</strong></td>
<td>Products made from flat woven fabric including: coats (including waistcoats); suits (ie jacket plus trousers); trousers; dresses; kimonos; nightwear; accessories (hats, shawls, scarves, gloves, ties); jackets; costumes (ie jacket plus skirt); skirts; dressing gowns; shirts and blouses. Only Woolmark may applied to products made from pressed felt, pile garment shells or woven pile fabric.</td>
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<tr>
<td><strong>SPECIFICATION AC-1</strong></td>
<td>Woolmark and Woolmark Blend garments including sweaters and cardigans; coats; jackets; suits and trousers; costumes; skirts; dresses; kimonos; shirts and blouses; socks; underwear. Wool Blend labelling cannot be used on Cool Wool products.</td>
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<tr>
<td><strong>SPECIFICATION AM-2</strong></td>
<td>All Woolmark apparel products but not Woolmark Blend or Wool Blend products.</td>
</tr>
<tr>
<td><strong>SPECIFICATION AF-1</strong></td>
<td>All Woolmark and Woolmark Blend apparel products but not Wool Blend products.</td>
</tr>
<tr>
<td><strong>SPECIFICATION AD-1</strong></td>
<td>Apparel Products: trousers; jackets; dresses, skirts.</td>
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</table>
1.2. WOOL OR FIBRE CONTENT
(TM155 applicable to all apparel products)

Test method TM155 is used to determine the amount of wool present, and hence as proof of claim for a given mark. Fibre content can be determined in three ways: Part I Qualitative via microscope; Part II Qualitative via simple dissolution and Part III Quantitative via sequential dissolution and, in complex cases, might be the result of all three methods. In the case of woven products, the sample will usually be dissected first to separate warp and weft yarns, or in some cases individual yarn plies.

Decorative fibre:
Fibres that are visibly (to the naked eye) isolable, purely decorative and do not exceed the allowed percentage of the weight of the finished product, need not be mentioned in the fibre composition label.

If the added fibre or yarn cannot be easily seen, it is not decorative. The only exception to the visible rule is the use of filaments to create boucle-type loops in the decorative yarn. The rationale is that, without the filament, the decorative effect yarn could not be produced.

In some countries five per cent non-wool fibre is allowed for technical effects.

Embroidery may be applied to the garment up to 10 per cent of the surface area. In India, higher levels of embroidery are allowed on shawls and scarves but must have special labelling.

1.3. SURFACE PILE WEIGHT OF THE FABRIC
(TM277 applicable to woven products which have a surface pile)

The surface pile weight is the weight per unit area of all the pile in that area which can be shorn. The shorn pile weight is calculated from the difference in the mass of the unshorn and the shorn fabrics. The measurement of surface pile weight of the fabric is used for ensuring that the pile is dense enough to ensure a quality garment.

1.4. DICHLOROMETHANE (DCM) EXTRACTABLE MATTER
(TM136 applicable to woollen knitted products)

Woollen-spun products contain oil or processing aids, which are applied to the fibres during the yarn manufacturing process. Excessive amounts of these materials, such as oil, remaining on the garment may become rancid with time and cause a bad smell. Oil or similar processing aids may also cause yellowing during drying and help to attract soil and dirt. Oil also acts as a lubricant that enables the fibres to migrate out of the yarn and fabric structure and contributes to a poor pilling performance.

DCM extraction is the test used to determine the total amount of fatty matter (TFM) and uses Soxhlet extraction with an organic solvent. After extraction, the solvent is evaporated and the residue is weighed. The result is expressed as a percentage of the weight of the clean, dried wool.
1.6. TENSILE STRENGTH
(TM4 applicable to woven products)

Tensile strength is the load required to break a woven fabric when a uni-directional force is applied to the fabric. The results of the breaking strength test in both warp and weft directions are reported in Newtons. A less dense fabric usually gives a lower result which is useful to evaluate the durability of the fabric in wear or the suitability of the fabric for its intended end use.

1.7. ABRASION RESISTANCE
(TM112 applicable to woven products)

Abrasion resistance is the ability of a fabric to withstand loss of appearance and function caused by rubbing. Fabrics with high abrasion resistance are durable and long lasting. The principle of TWC’s abrasion resistance test is that a fabric sample is repeatedly rubbed against a standard abradant using a Martindale Tester until two threads fail or the shade changes. The result is reported in thousands of rubs. The required performance is dependent on end use of the fabric.

1.8. SEAM SLIPPAGE
(TM117 applicable to woven products)

Seam slippage is a measure of the separation of the yarns at a standard fabric seam. When the seam is under load gaps or holes develop on the seam. The test involves pulling apart warp and weft threads, but not yarn breakage. During testing, the fabric sample is stitched across its width under specific sewing conditions. A load is applied to the specimen at right angles to the seam and the extent to which the seam opens is measured. The test result depends on fabric density, weave and seam type.

1.9. PILLING
(TM152 & TM196 applicable to all apparel products)

During wear, knitted garments are subjected to rubbing actions which tease out loosely held fibres. These fibres tangle into small fibrous balls, known as pills, which are attached to the fabric by anchoring fibres.

In Test Method TM152, used by TWC for knitwear, knitted fabric samples are wrapped on rubber tubes which are tumbled in a cork-lined box for a time period. The test instrument is known as the ICI Pilling Box tester.

Test Method TM196 is used for woven products. Fabric samples are rubbed against a sample of the fabric in a Martindale tester and assessed after 1000 rubs.

Degree of pilling is assessed by comparison with standard photographs, with a rating from 5 to 1, where 5 is the best.

There are many factors which can influence pilling propensity and they also affect the handle of the final product, especially its softness. There is no simple answer to the control of pilling or to finding the optimum balance between pilling performance and handle.
1.10. COLOUR FASTNESS
(TM112 applicable to woven products)
Textile fabrics change colour; in use and as a result of environmental factors. Laundering or dry cleaning, light exposure and perspiration all contribute to colour change. The colour fastness is determined from the colour change and, in the case of cleaning, the degree of bleeding of the dye into an adjacent fabric. It is important to predict or know the colour fastness of a product to ensure that it would be considered acceptable by the end user.

The results of the colour fastness test are reported by a grading system (using grey scales) from 1 to 5. Grade 5 represents the best performance while grade 1 is the worst.

1. Colour Fastness to Light
(TM5 applicable to all apparel products)
This is the colour change of the textiles resulting from prolonged exposure to light. The test is conducted by exposing the sample to xenon arc lamp (which represents natural daylight) under controlled temperature and humidity. Dyed blue standards (blue wool reference) having known fading characteristics are exposed to the same light source together with the sample. Light fastness is evaluated by comparison of the colour change of the sample with that of the dyed blue standards. The light fastness rating corresponds to the number of the blue wool reference on the light fastness scale which shows a similar contrast.
2. Colour Fastness to Water
(TM6 applicable to all apparel products)

This is the test used to check the physical migration of colour from a coloured substrate to another, when both specimens are wet and in close contact. It can be used for checking if any unfixed dye not been removed during processing. The sample is attached to a similar-sized multifibre strip, immersed in water and placed between plastic plates under pressure in a Perspirometer. The instrument and specimens are held at a specified temperature for a specific time period inside an incubator oven. The fastness rating is determined by evaluation of the change in shade of the sample and staining on the multifibre strip.

3. Colour Fastness to Wet Alkaline Contact
(TM174 applicable to all apparel products)

Coloured garments continuously in contact with human perspiration may suffer local discoloration. The colour – which bleeds from the garment – may migrate to another substrate when both materials are wet and in close contact.

Colour fastness to wet alkaline contact is a test method used to determine the fastness of the colour of a wool sample in a damp alkaline environment, similar to perspiration, or in the condition where wool textiles are left to stand in an automatic washing machine after a wash cycle has completed. The testing and assessment procedures are similar to that of Colour Fastness to Water except that the sample is immersed in an alkaline-histidine solution during testing.

4. Colour Fastness to Washing
(TM193 applicable to all apparel products)

Colour fastness to washing is determined to assess the stability of colour after repeated home laundering as part of regular care. It is the primary factor that leads to customer dissatisfaction. The test for colour fastness to washing is an accelerated washing test that is roughly equivalent to five or more home or commercial launderings. The sample is attached to a multifibre strip, and washing is performed in a canister that is placed in a machine called a Launderometer. Standard reference detergent solutions are used. Evaluation of results is similar to that used to assess colour fastness to water.
1.12. LAUNDERING OR CLEANING PERFORMANCE

Garments always have a care claim label that provides instructions to consumers on how to launder, dry and iron the garment in order to retain its good shape. However, the cleaning process can affect various properties of the product such as dimensional stability, colour fastness and the general appearance, etc. To ensure a garment meets the proper care claims, there are a number of test methods developed to rate various performance in laundering and cleaning.

1. Dimensional Stability to Dry Cleaning
   (TM177 applicable to all apparel products)

Some garments should be taken to a professional dry cleaner to ensure the superior quality of the garment is maintained. The dimensional stability to dry cleaning is a test method intended to simulate dry cleaning and promote the dimensional changes occurring in a sample during dry cleaning. The marked fabric sample and a solvent are put into a closed cylindrical container which is attached to a rotor to give necessary agitation for cleaning. The dimensions of the fabric sample are measured after cleaning and drying to calculate the linear shrinkage in warp and weft directions separately. Three commercial dry cleaning procedures is an acceptable alternative test where the equipment for simulated dry cleaning is not available.

2. Dimensional Change to Hand or Machine Washing
   (TM31 applicable to all apparel products)

When a garment is washed, dimensional change may occur due to agitation, water and temperature effects. For wool products there will be two types of dimensional change depending upon the severity of the washing cycle. Relaxation dimensional change (shrinkage/extension) is caused by the release of strains introduced during fabric and garment manufacture. This dimensional change is only reported on finished products. Felting dimensional change is an irreversible shrinkage caused by progressive entanglement of the wool fibres induced by heat and agitation in an aqueous solution.

The test method of dimensional stability of wool textiles to laundering is applicable to all washable (Hand Wash, Machine Wash or Total Easy Care [TEC]) care claims. Tests are conducted with a special washing machine called Wascator, based on the 7A (relaxation and felting dimensional change) and 5A (felting dimensional change only) wash cycle programmes using a prescribed detergent and load. The choice of the wash cycle programme and the number of cycles to be used depends upon care claims and types of products. For TEC products, the contribution of tumble drying to dimensional change and appearance is also assessed.

For all products, the test results to be reported must include relaxation, felting and total dimensional change measured in both length and width directions and expressed as a percentage.

3. After Wash Appearance
   (TM298 & TM281 applicable to TEC products)

Apart from having good dimensional stability and colour fastness, it is also important for the garment to maintain its appearance and shape so that the garment continues to give outstanding value for money.

For knitted garments, the test used is TM 298: Knitwear Surface Appearance Assessed after Washing and Drying. The after-wash appearance of the sample is rated with a grade, ranging from 1 to 5, by comparison with a known standard. The overall assessment criteria also includes spot felting, evenness of colour, spiralling, garment symmetry and puckering.

For woven garments, the after–wash appearance test, TM281, applies to machine washable products. The woven fabric or garment is washed for the appropriate number of wash cycles and dried, then it is visually assessed in terms of fabric and seam smoothness and crease retention. The sample is compared to special Woolmark standards for fabric smoothness and crease durability, while seam puckering is judged with AATCC replicas. The result is reported by a rating system from grade 1 (bad) to 5 (excellent).
1.14. VISUAL APPEARANCE UPON MANUFACTURING
(TM206 & TM288 applicable to all apparel products)

In the fast-changing fashion market only the good-looking and faultless garment can arouse the interest of a consumer for purchase. Hence, to ensure the garment is faultless and has the expected appearance, inspection procedures should be conducted. Due to different manufacturing processes and product requirements, there are separate inspection procedures for knitted garments (TM206) and tailored (woven) garments (TM288).

For knitted garment inspection, assessment is conducted as received or after washing. Faults identified are recorded and classified by using fault codes. Faults found in a prominent position or easily visible are classified as major. Apart from garment defects, after-wash appearance includes colour, symmetry, seam distortion and spot felting as inspection criteria. The inspection report will record the number of major faults and the pass/fail status of individual samples of the batch.

For a woven garment, the sample is examined and any faults found are recorded as “acceptable” and “unacceptable” against the relevant criteria. Sew-in labels and tickets are also checked to conform with TWC’s requirements. This is generally a non-destructive and subjective test but the aim is to decide whether the garment is of merchantable quality.
The Woolmark Company introduced sub-brands to differentiate some of the specific attributes of wool. Sub-brands are also used to support technical and product innovation in wool fabric and garment performance enhancements.

## BENEFITS OF THE SUB-BRANDS

<table>
<thead>
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<th>SUB-BRAND</th>
<th>FEATURES THAT BENEFIT CONSUMERS</th>
<th>REQUIREMENTS</th>
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<tbody>
<tr>
<td><strong>PURE MERINO WOOL</strong></td>
<td>Specifies that the product is made from Merino wool with a naturally finer feel, is easy on the skin, and exhibits softness and supreme luxury.</td>
<td>The mean wool fibre diameter is less than 22.5 μm. (absolute maximum).</td>
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<tr>
<td><strong>AUSTRALIAN MERINO WOOL</strong></td>
<td></td>
<td>The mean fibre diameter is 19.5 micrometers or less.</td>
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<tr>
<td><strong>MERINO ULTRAFINE</strong></td>
<td></td>
<td>The mean fibre diameter is less than 17.5 μm.</td>
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<tr>
<td><strong>COOL WOOL</strong></td>
<td>Made from selected wool yarns that give the product a special feeling of comfort all year long and makes the most of wool’s unique ability to breathe and keep one cool.</td>
<td>Worsted – spun yarn should be used, product surface is clean, and fabric weight should not exceed 190 g/m². The mean wool fibre diameter has an absolute maximum: 22.5 μm. For flat knitted products, yarn with a minimum resultant count of Nm 12 should be used.</td>
</tr>
<tr>
<td><strong>SUPER S</strong></td>
<td>Super S labelling is administered by The Woolmark Company on behalf of IWTO. The Super S scheme is designed to identify fine wool fabric. It comprises a range of numbers from Super 80’s to Super 250’s. The higher the &quot;S&quot; number, the finer and hence softer the wool. The Super S fabric descriptors can be used in conjunction with the Woolmark symbol if the product meets both the TWC and IWTO product specification. TWC, on behalf of IWTO, licenses the use of the lazy &quot;S&quot; logo for Super S. products. If a company is also a Woolmark licensee then it can access a combined label showing both the Woolmark and the lazy &quot;S&quot;.</td>
<td>The product must be manufactured from Pure New Wool as defined in IWTO Code of Practice 2/102[2011]. The maximum mean fibre diameter should conform to the latest edition of the IWTO Code of Practice for “Super S”.</td>
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### SPECIFICATION

#### AK-4 AUSTRALIAN MERINO WOOL

All Woolmark apparel products (including yarns and fabrics) but not Woolmark Blend or Wool Blend products.

#### SPECIFICATION AF-1 WOOL FILLED APPAREL PRODUCTS

All Woolmark and Woolmark Blend apparel products but not Wool Blend products.

#### SPECIFICATION AD-1 WOOL CONTAINING DENIM APPAREL PRODUCTS

Wool Containing Denim Apparel Products: Trousers; jackets; dresses; skirts.
The Woolmark brand and its sub-brands are used to certify products in relation to fibre content, fitness for purpose, and performance in wear and care in order to ensure consumers’ expectations are met. Objective standards and quality control systems have been set up to ensure the Woolmark brands are used in a consistent way across the globe. The specifications and test methods are continually reviewed to ensure that they are consistent with current practice. This provides both the industry and consumers with peace of mind through quality assurance.