



THE WOOLMARK COMPANY

WOOLMARK SPECIFICATION

KNITTED APPAREL PRODUCTS

SPECIFICATION AK-1

Effective 1 January 2016

WOOLMARK SPECIFICATION

SPECIFICATION AK-1: 2016

KNITTED APPAREL PRODUCTS

PRODUCTS

The **Woolmark**, **Woolmark Blend** or **Wool Blend** logo may be applied to the following knitted apparel products:

- sweaters, cardigans and waistcoats
- jackets and coats
- trousers
- skirts
- dresses
- dressing gowns
- shirts and blouses
- underwear
- nightwear (excluding dressing gowns)
- socks, stockings and tights
- leggings
- multi-piece garment sets, including suits and costumes
- accessories (hats, scarves, gloves, ties)

Pile garment shells: Only Woolmark may be applied to these products.

Specifications for Woolmark Blend and Wool Blend products are the same as those for Woolmark, except where indicated.

Accessories. The Woolmark Company must be contacted directly if an accessory product is other than hat, scarf, glove or tie.

Multi-piece garment sets including suits and costumes. If component items are made from different fabric, the individual components must be evaluated according to the appropriate specification.

Wool pile footwear: Only Woolmark may be applied to these products. The specification covering these products are considered in the Appendix.

SPECIFICATIONS – All Products

Property	Test method	Product type						
		1 Trousers, leggings suits	2 Costumes, skirts, dresses, jackets, coats, dressing gowns	3 Shirts, blouses, underwear, nightwear, next-to-skin	4 Socks, Stockings, tights	5 Sweaters, cardigans, waistcoats	6 Accessories	7 Pile garment shells
Wool content (%: minimum)	155	Woolmark: 100% (see Specifications F-1, F-2, F-3, F-4) Woolmark Blend: 50% (see Specification F-5) Wool Blend: 30% (see Specification F-7)					Woolmark Blend and Wool Blend not applicable	
Colourfastness to light Blue reference (grade: minimum) Not applicable to underwear, nightwear, socks, stockings and tights	5	Darker than 1/12 standard depth:			4			
		Lighter than, or equal to, 1/12 standard depth:			3			
		Bright and pastel colours:						
		Darker than 1/12 standard depth:			3			
Lighter than, or equal to, 1/12 standard depth:		2-3						
Surface pile weight (g/m ² : minimum)	15	–					220	
Cover factor (mm tex: minimum) Plain knit semi-worsted and woollen- spun products only	169	–			1.0		–	
DCM extract (%: maximum) Woollen-spun products only	136	1.5						
Colourfastness to rubbing - dry Stain (grade: minimum) Products darker than 1/12 standard depth only	165	3-4						
Burst strength (kPa: minimum) Plain knitted products only	29	400	325	325 250 (fine gauge apparel)	400	Worsted: 325 Woollen only Class 1: 200 Class 2: 225	–	
Spirality (angle in degrees: maximum) Plain knitted products only	276	5			–	5	–	
Garment inspection	206	Pass						

This table must be read in conjunction with the notes that follow.

NOTES

1. Woolmark TM155: Wool content

The wool content of Woolmark labelled products is described in Specifications F-1 to F-4.

1.1 Knitwear elastic threads:

A maximum of three courses is permitted in both the welt and the cuffs.

The wool content of Woolmark Blend labelled products is described in Specification F-5.

The wool content of Wool Blend labelled products is described in Specification F-7.

All pile products must have a pure wool pile but the backing material may be manufactured of an alternative material.

2. Woolmark TM5: Light fastness

For products sold in Australia and South Africa, colourfastness to light, blue reference grade 5 is required for shades darker than 1/3 standard depth and grade 4 for shades between 1/3 and 1/12 standard depth.

2.1 Undyed and bleached white products

Products of this type **must not** be evaluated

2.2 Naturally coloured wool

Such wools may exhibit poor colourfastness to light but the product may carry the Woolmark or Woolmark Blend if the following text (or similar) is used on the ticket:

'It is an inherent feature of some naturally coloured wools that the colour may fade'.

2.3 Bright and pastel colours

Only the specific shades given on The Woolmark Company shade reference card - Bright & Pastel Colours and intermediate shades at maximum brightness are included. No other shades will be classed as bright or pastel shades without prior approval by the Woolmark Management Group.

3. Woolmark TM15: Surface pile weight

This test is only applied to garment the shell fabric of which is a pile.

4. Woolmark TM169: Cover factor

This test is only applied to plain knit semi-worsted and woollen spun product in the form of cardigans, sweaters and pullovers.

Definitions:

'Plain knit': the stocking stitch or 'jersey' like fabric (simplest knitted structure).

'Semi-worsted spun': yarns made from sliver produced by carding and gilling, in which the carded sliver has not been condensed or combed.

5. Woolmark TM136: DCM extractable matter

This test is to be conducted on woollen-spun products only. Products treated with a fluorocarbon finish or machine washable products that have been processed with shrink-resist polymer treatments (from solvent) may give results greater than the permitted maximum since these additives may be removed in addition to any oils or softeners present. In these cases, a figure greater than the maximum may be allowed, provided that the sample meets all other requirements; such cases **must** be referred to the Woolmark Management Group.

6. Woolmark TM165: Colourfastness to rubbing

Testing required for shades heavier than 1/12 standard depth.

7. Woolmark TM29: Burst strength:

7.1 Applied to plain knitted products only.

7.2 Woollen sweaters and cardigans.

Class 1 products defined as resultant yarn count = 14Nm (or finer).

Class 2 products defined as all other products.

Note: this requirement is not applicable to waistcoats.

7.3 Fine gauge apparel products

Resultant yarn count of 32Nm (or finer), and fabric weight less than or equal to 200g/m².

8. Woolmark TM276: Spirality

Garments knitted in a plain, single jersey structure, including those made from multiple coloured yarns, must be assessed. Lightweight single jersey products may be approved the Woolmark Management Group where the angle of spirality is >5degrees, if the overall appearance after washing of the garment is acceptable and the seams are not distorted.

9. Woolmark TM206: Garment inspection

An inspection procedure is required to assess the general quality of knitted products, etc.

Products with a 'Dry clean only' care claim

Property	Test method	Product type						
		1 Trousers, leggings	2 Skirts, dresses, jackets, coats, dressing gowns	3 Shirts, blouses, underwear, nightwear, next-to-skin	4	5 Sweaters, cardigans, waistcoats	6 Accessories	7 Pile garment shells
Dimensional change (% maximum)	ISO 3175	Length and width change $-5 < DC < 5\%$						
Number of cycles		3 × ISO3175 Normal or CDT						
Colourfastness to water	6							
Change of colour (grade: minimum)		3-4						
Stain wool (grade: minimum)		3						
Stain cotton (grade: minimum)		3						
For blend products Stain other fibre: Worst fibre (grade: minimum)		3					NA	

- Note. Tables must be read in conjunction with the notes that follow.

NOTES

1. Product type

'Dry clean only' care claim is not allowed for socks, stockings and tights.

2. ISO 3175: Dimensional stability to dry cleaning

In the event that ISO 3175 'Normal' is not available, three commercial dry clean test (CDT) cycles is a suitable alternative.

'Shrinkage' is denoted by a negative (-) value and an 'extension' by a positive (+) value.

$-5 < DC < +5$ indicates that the fabric must not shrink more than 5% nor expand by more than 5% in either warp or weft direct.

3. Woolmark TM6: Colourfastness to water

Undyed and bleached white products must not be evaluated.

'Stain other fibre' is defined as the most severely stained synthetic fibre in the adjacent fabric.

Products with a 'Hand wash' or 'Hand wash or dry Clean' care claim

Property	Test method	Product type						
		1 Trousers, leggings	2 Skirts dresses, jackets, coats, dressing gowns	3 Shirts blouses, underwear, nightwear, next to skin	4 Socks, stockings, tights	5 Sweaters, cardigans, waistcoats	6 Accessories	7 Pile garment shells
Dimensional change – relaxation (%)	31							
Width (plain knitted products only)		–	–	DC < +5	–	–8 < DC < +5	–	–
Length		–	–	–10 < DC	–	–10 < DC	–	–
Area		–	–	–	–	–	–	–
No. and type of wash cycles		1 × 7A	1 × 7A	1 × 7A	1 × 7A	1 × 7A	1 × 7A	1 × 7A
Dimensional change – felting (%)	31							
Width		–	–	–	–	–	–	–
Length		–	–	–	–10 < DC	–	–	–
Area		–	–	–8 < DC	–	–8 < DC	–8 < DC	–
No. and type of wash cycles		1 × 7A	1 × 7A	1 × 5A	1 × 5A	1 × 7A	1 × 7A	1 × 7A
Dimensional change – total (%)	31							
Width		DC < +5	DC < +5	–	–	–5 < DC	–	–
Length		–5 < DC	–5 < DC	–10 < DC	–	–5 < DC	–	–3 < DC
Area		–	–	–	–8 < DC	–	–	
Colourfastness to hand washing	250							
Change of colour (grade: minimum)		3–4			3	3–4		
Stain wool (grade: minimum)		4			3	4		
For blend products only								
Stain other fibre (grade: minimum)		3–4			3	3–4		NA
Colourfastness to wet alkaline contact	174							
Change of colour (grade: minimum)		Multi-coloured products only				Multi-coloured products only		
Stain wool (grade: minimum)		3–4			3	3–4		
Stain wool (grade: minimum)		4			3	4		
For blend products only								
Stain other fibre (grade: minimum)		3–4			3	3–4		NA

This table must be read in conjunction with the notes that follow.

NOTES

1. Care claim

If the fabric care claim (words or symbols) is for both 'Dry clean' and 'Hand wash', the fabric shall meet both claim requirements.

2. Woolmark TM31: Dimensional stability

DC < +5 indicates that the extension in washing must not exceed 5%.

-8 < DC indicates that the shrinkage of the product in washing must not exceed 8%.

-8 < DC < +5 indicates that shrinkage must not exceed 8% and extension must not exceed 5%.

For products in Category 3 (shirts, blouses, underwear, nightwear, next to skin), the specification for total dimensional changes only applies to garments having full-length legs.

For products in Category 5 (sweaters, cardigans, waistcoats), the specifications for total dimensional change are only applicable to 'boiled wool' products.

Definition:

'Boiled wool': products made of wool or wool blend yarns, felted or partially felted deliberately during the manufacturing process in order to achieve the desired texture and density.

This test must include both measurements required by this specification **and** the other measurement made (e.g. length and width dimensional change in relaxation and felting). The full set of measurements are included to assist retailers in making garment assessments related to their own requirements whilst also using the Woolmark specifications.

3. Woolmark TM250: Colourfastness to hand washing

Undyed and bleached white products must not be evaluated.

'Stain other fibre' is defined as the most severely stained fibre in the adjacent fabric.

4. Woolmark TM174: Colourfastness to wet alkaline contact

This test is only carried out on multi-coloured products.

'Stain other fibre' is defined as the most severely stained fibre in the adjacent fabric.

Products with a 'Machine wash' care claim

Property	Test method	Product type						
		1 Trousers, leggings	2 Skirts, dresses, jackets, coats, dressing gowns	3 Shirts, blouses, underwear, nightwear, next-to- skin	4 Socks, stockings, tights	5 Sweaters, cardigans, waistcoats	6 Accessorie s	7 Pile garment shells
Dimensional change – relaxation (%)	31							
Width (plain knitted products only)		–	–	DC < +5	–	–8 < DC < +5	–	–
Length		–	–	–10 < DC	–	–10 < DC	–	–
Area		–	–	–	–	–	–	–
No. and type of wash cycles		1 × 7A	1 × 7A	1 × 7A	1 × 7A	1 × 7A	1 × 7A	1 × 7A
Dimensional change – felting (%)	31							
Width		–	–	–	–	–	–	–
Length		–	–	–	–10 < DC	–	–	–
Area		–	–	–8 < DC	–	–8 < DC	–8 < DC	–
No. and type of wash cycles		3 × 5A	3 × 5A	5 × 5A	5 × 5A	2 × 5A	2 × 5A	3 × 5A
Dimensional Change – total (%)	31							
Width		DC < +5	DC < +5	–	–	–5 < DC	–	–
Length		–5 < DC	–5 < DC	–10 < DC	–	–5 < DC	–	–3 < DC
Area		–	–	–	–	–8 < DC	–	–
Colourfastness to machine washing	193							
Change of colour (grade: minimum)			3–4		3		3–4	
Stain wool and nylon (grade: minimum)				4		3		4
Stain other fibre: worst fibre (grade: minimum)				3–4		3		3–4
Colourfastness to wet alkaline contact	174							
Change of colour (grade: minimum)			Multi-coloured products only				Multi-coloured products only	
Stain wool and nylon (grade: minimum)				3–4		3		3–4
Stain other fibre: worst fibre (grade: minimum)				4		3		4
			3–4		3		3–4	

This table must be read in conjunction with the notes that follow.

NOTES

1. Woolmark TM31: Dimensional stability

DC < +5 indicates that the extension in washing must not exceed 5%.

-8 < DC indicates that the shrinkage of the product in washing must not exceed 8%.

-8 < DC < +5 indicates that extension must not exceed 5% and shrinkage must not exceed 8%.

This test must include both measurements required by this specification **and** the other measurement made (e.g. length and width dimensional change in relaxation and felting). The full set of measurements are included to assist retailers in making garment assessments related to their own requirements whilst also using the Woolmark specifications.

For products in Category 3 (shirts, blouses, underwear, next to skin), the specification for total dimensional changes only applies to garments having full-length legs.

For products in Category 5 (sweaters, cardigans, waistcoats), the specifications for total dimensional change are only applicable to 'boiled wool' products.

Definition:

'**Boiled wool**': products made of wool or wool blend yarns, felted or partially felted deliberately during the manufacturing process in order to achieve the desired texture and density.

'Boiled wool' products requiring a machine wash label must be submitted to the Woolmark Management Group for assessment and approval.

2. Woolmark TM193: Colourfastness to machine washing

Undyed and bleached white product **must not** be evaluated.

'Stain other fibre' is defined as the most severely stained fibre in the adjacent fabric.

The test method is divided into two parts:

Part A: standard detergent without perborate

Part B: standard detergent with perborate.

Both test methods are to be carried out and both sets of results must be reported.

If products pass Part A but fail Part B, additional labelling requirements must be observed to prevent problems that could arise during the washing of garments should a bleach containing detergent be used. In this case, all labels and tickets attached to garments must carry an advisory statement: 'Wash using a Woolmark approved detergent' (or similar). Full details of these additional requirements are available from The Woolmark Company.

3. Woolmark TM174: Colourfastness to wet alkaline contact

Undyed and bleached white product **must not** be evaluated.

'Stain other fibre' is defined as the most severely stained fibre in the adjacent fabric.

This test is required for multi-coloured products only.

Products with a 'Machine Wash and tumble dry or 'Total Easy Care' care claim

Property	Test method	Product type							
		1 Trousers, leggings	2 Skirts, dresses, jackets, coats, dressing gowns	3 Shirts, blouses, underwear, nightwear, next-to-skin	4 Socks, stockings, tights	5 Sweaters, cardigans, waistcoats	6 Accessories	7 Pile garment shells	
Dimensional change – relaxation (%)	31	–	–	DC < +5	–	–8 < DC < +5	–	–	
Width (plain knitted products only)		–	–	–10 < DC	–	–10 < DC	–	–	
Length		–	–	–	–	–	–	–	
Area		–	–	–	–	–	–	–	
No. and type of wash/dry cycles		1 x [7A+TD]	1 x [7A+TD]	1 x [7A+TD]	1 x [7A+TD]	1 x [7A+TD]	1 x [7A+TD]	1 x [7A+TD]	
Dimensional change – felting (%)	31	–	–	–	–	DC < +10	–	–	
Width		–	–	–	–10 < DC	–10 < DC < +10	–	–	
Length		–	–	–8 < DC	–	–8 < DC	–8 < DC	–	
Area		–	–	–	–	–	–	–	
No. and type of wash/dry cycles		5 x [5A+TD]	5 x [5A+TD]	5 x [5A+TD]	5 x [5A+TD]	5 x [5A+TD]	5 x [5A+TD]	5 x [5A+TD]	
Dimensional change – total (%)	31	DC < +5	DC < +5	–	–	–	–	–	
Width		–5 < DC	–5 < DC	–10 < DC	–	–	–	–3 < DC	
Length		–	–	–	–	–	–	–	
Area		–	–	–	–	–	–	–	
Afterwash appearance (grade: minimum)		3			–	3		–	
Colourfastness to machine washing	193	Multi-coloured products only							
Change of colour (grade: minimum)		3–4			3	3–4			
Stain wool and nylon (grade: minimum)		4			3	4			
Stain worst other fibre (grade: minimum)		3–4			3	3–4			
Colourfastness – wet alkaline contact	174	Multi-coloured products only							
Change of colour (grade: minimum)		3–4			3	3–4			
Stain wool and nylon (grade: minimum)		4			3	4			
Stain worst other fibre (grade: minimum)		3–4			3	3–4			

This table must be read in conjunction with the notes that follow.

NOTES

1. **'Tumble dry'** may only be applied to machine washable Woolmark, Woolmark Blend or Wool Blend knitted apparel products. The term 'Total Easy Care – TEC' is also applied to products that may be machine washed and tumble dried.

2. **Woolmark TM31: Dimensional stability**

DC < +5 indicates that the extension in washing must not exceed 5%.

-8 < DC indicates that the shrinkage of the product in washing must not exceed 8%.

-8 < DC < +5 indicates that extension must not exceed 5% **and** shrinkage must not exceed 8%.

[7A+TD] – a 7A wash followed by a tumble dry.

[5A+TD] – a 5A wash followed by a tumble dry.

This test must include both measurements required by this specification and the other measurement made (e.g. length and width dimensional change in relaxation and felting). The full set of measurements are included to assist retailers in making garment assessments related to their own requirements whilst also using the Woolmark specifications.

For products in Category 3 (shirts, blouses, underwear, nightwear, next to skin), the specification for total dimensional change only applies to garments having full-length legs.

After wash and dry appearance

Tumble drying can have an adverse effect on garment appearance.

This specification requires that Woolmark TWC-TM31, Appendix 6 be carried out. This test method includes a subjective assessment after 1 × 7A + 1 × TD cycle and 2 × (1 × 5A + 1 × TD) cycles. TM298 may also be used.

3. **Woolmark TM193: Colourfastness to machine washing**

Undyed and bleached white products must not be evaluated.

'Stain other fibre' is defined as the most severely stained fibre in the adjacent fabric.

The test method is divided into two parts:

Part A: standard detergent without perborate

Part B: standard detergent with perborate.

Both test methods are to be carried out and both sets of results must be reported.

If products pass Part A but fail Part B, additional labelling requirements must be observed to prevent problems that could arise during the washing of garments should a bleach containing detergent be used. In this case, all labels and tickets attached to garments must carry an advisory statement: 'Wash using a Woolmark approved detergent' (or similar). Full details of these additional requirements are available from The Woolmark Company.

4. **Woolmark TM174: Colourfastness to wet alkaline contact**

Required for multi-coloured products only.

TEST AND REPORT CRITERIA

All samples must be tested using the test methods listed below, however there is no pass or fail criteria for the properties tested. The licensee must test all samples to the appropriate method and report the result to the customer.

The failure of the product to meet the guideline performance level must be highlighted in the report to the licensee. When requested, The Woolmark Company can provide advice or assistance to the licensee to improve the performance of the product under normal commercial arrangements for consultancies.

The decision to accept or reject a particular fabric should be subject to agreement between the fabric manufacturer and the customer. The Woolmark Company **shall not** act to arbitrate between the two parties on such issues.

Woolmark TWC-TM152: Indication of pilling propensity

Testing **must** be carried out on all categories, except accessories, and the results reported. This specification is not applicable to accessories.

Due to the many factors affecting pilling there is no universally accepted test method that accurately predicts the likely propensity of a fabric to pill during use. However, products **must** be tested according to Woolmark TWC-TM152. The actual performance will depend on the application, wearer and the commercial constraints on the garment.

Pilling in wear is a highly variable process. The same fabric worn by different people under similar circumstances may pill quite differently. Further differences exist between consumers in their perception of what is unacceptable. The Woolmark Company pilling test is a simple method that indicates the propensity to pilling for most knitted fabrics, although it may not always give a true comparative indication of differences between fabrics because pilling is assessed after a fixed time interval.

Pilling is a dynamic property and the rate of pilling can often change according to time and wear. Some of the most important factors influencing the pilling propensity are:

- fibre diameter
- fibre length
- twist level
- fabric construction.

APPENDIX:

SPECIFICATIONS FOR WOOL PILE FOOTWEAR

PRODUCTS

The **Woolmark** logo may be applied to sliverknit footwear products meant for indoor use only, like slippers or boots, made from sliver knit pile fabric (sheepskin products are covered by Woolmark Specification P-1).

All products must be submitted to the Woolmark Management Group for approval, but they must meet the criteria in the following table prior to submission.

Property	Test method	Pass level
Wool content of pile (%:minimum)	155	Woolmark – Pure New Wool (see specification F-1, F-2, F-3 or F-4 as appropriate)
Surface pile weight (gm ² : minimum)	277	250
Pile height (mm: minimum)	279	7
Colourfastness to rubbing – wet and dry: (grade: minimum) Products darker than 1/12 standard depth only	165	3–4
Extractable matter of pile (%: maximum)	136	1.0
Colourfastness to light (grade: minimum) Dyed products only	5	Darker than 1/12 standard depth: 4 Lighter than, or equal to, 1/12 standard depth: 3

- This table must be read in conjunction with the notes that follow.

NOTES

1. Woolmark TM155: Wool content

Only the Woolmark logo can be used for wool pile footwear. Other fibres cannot be used for pile components in any part of the product, including lining

2. Woolmark TM277: Surface pile weight

To correctly measure the surface pile weight, samples of the fabric used for producing the footwear must be supplied to the authorised laboratory together with the products.

3. Woolmark TM165: Colourfastness to rubbing

This test is only applicable to products darker than 1/12 standard depth.

4. Woolmark TM136: DCM extractable matter

No further comment.

5. Woolmark TM05: Colourfastness to light

This test is only applicable to dyed products.

Additional mandatory requirements for dry clean only products

Property	Test method	Pass level
Appearance after three dry clean cycles – pile Sliver knit products only	287	Acceptable (satisfactory after wash level of fibre clumping, felting and consolidation)
Appearance after three dry clean cycles – footwear construction	–	Acceptable (the product must not disassemble, unglue or lose components)

- This table must be read in conjunction with the notes that follow

NOTES

1. Woolmark TM287: Appearance retention of sliver knits

- Three dry clean cycles according to ISO 3175-1 'Normal', or equivalent for the commercial dry clean test (CDT).

Felting can occur during use (in addition to that during cleansing). It is essential that all products exhibit an acceptable degree of appearance retention during use, irrespective of care claim.

2. Sample for Testing

A complete footwear product must be tested for evaluation of after wash pile appearance and resistance of the construction.

3. Appearance after dry cleaning footwear construction

Dry cleaning must be carried out according to ISO 3175-1 (or equivalent) using a solvent system charged with 2% water. In assessing the acceptability of a product, the assembling quality before and after the specified cleaning cycles will be considered.

OPTIONAL CARE CLAIMS

All products submitted for approval for the use of the Woolmark label must be submitted to the Woolmark Management Group (WMG). All information on constructional parameters for submitted products must be included with products for all care claims. Testing and approval or rejection of products with care claim not listed in this specification will be arranged by the WMG.

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THE WOOLMARK COMPANY

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