Apparel Textile Testing Requirements

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QUALITY DEPARTMENT

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QUALITY

Table of Content

Introduction

This document contains Kmart's Apparel Testing standards. The guidelines and tables specify the test methods and performance requirements that apply for apparel products supplied to Kmart. This document has been compiled for the benefit of Kmart Team Members, Suppliers, factories and laboratories

The document has undergone extensive revisions during 2013 as part of an internal review of the Kmart testing standards. The review has aimed to simplify and clarify requirements for all parties.

Most tests are conducted as part of the pre-shipment approval process according to standards and guidelines contained in this document. Additional tests may be required upon request from Quality Team members (e.g. based on potential problems seen during sample evaluations or to investigate quality problems).

Kmart specifies the standard regime of testing, taking into consideration the commercial constraints and implications of excessive testing. Though adopting a rationed approach to testing, it remains incumbent on suppliers to ensure that **all products submitted to Kmart are fit for purpose and are of a commercially acceptable standard. If a product meets designated testing requirements, but fails to perform to an acceptable commercial standard, liability and accountability sits with the supplier.**

For example: Intimate apparel products are not tested for light fastness. Products that fade prematurely under store lighting are commercially unacceptable, and the supplier/factory assumes accountability for this quality problem.

There are many terms and names that have been defined for extra clarity and understanding. These are kept within the glossary section within this manual.

This document is designed to be used by:

- Kmart Quality Team members
- Kmart Buyers
- Kmart Merchandisers
- Vendors
- Manufacturers
- Agents
- Independent Laboratories

Use this document in conjunction with the following standards:

The following documents provide additional information on a broad range of quality requirements. These documents are accessible through the Kmart Quality Website. Note: Registration is required to gain access to these documents and forms.

- Merchandise Quality Standards—Apparel Finished Measurements
- Merchandise Quality Standards—Apparel Care Instructions
- Merchandise Quality Standards—Apparel Workmanship
- Merchandise Quality Standards—Apparel Fire Warning Standard
- KQCS Kmart Quality Compliance Standard.
- Fibre Content Labelling Policy
- Textile Query Form
- Textiles Request Form (TRF) for KAS suppliers

Vendor Responsibilities

All Kmart Apparel vendors must be familiar with and comply with the fabric performance requirements within this standard. Obligations include specifying requirements when sourcing fabrics and accessories, and testing to confirm that fabrics/accessories perform to the acceptable standards.

When vendors order/source fabrics:

When ordering/sourcing fabrics to be used for Kmart apparel products, the vendor should:

- Stipulate that fabrics must meet Kmart requirements, and provide relevant performance & testing details,
- Specify that fabrics must be tested to demonstrate that they meet these requirements and that an original-PDF test report from an independent laboratory should be provided,
- State clearly whether or not contrast trims/fabrics will be used on the garment. For example: “This fabric will be trimmed with white binding”,
- Indicate whether further processing will take place. For example: “placement print”, “garment washing”, and;
- Indicate that the use of dyestuffs or any substances used in the manufacture of the fabric or finishing of the garment that contain hazardous materials such as AZO dyes, are either prohibited or must meet EU requirements.

Test Report Application Procedures

KAS Suppliers

For vendors and factories who liaise directly with the KAS Quality & Merchandise teams, laboratory testing should be initiated by completing and submitting the TRF (Textile Request Form). The TRF is designed to capture all of the order details that influence test requirements, and then identifies all of the required tests. By using this form, only those tests that are required will be selected and those that are important will not be inadvertently overlooked.

Local Suppliers (i.e. outside of KAS)

A more traditional approach is taken for local suppliers. Suppliers will need to liaise with the laboratories to ensure that testing is conducted according to Kmart requirements, and that all of the necessary tests are conducted.

- Important order & product information must be provided to the laboratory. By example:
  - Style name or number—where there are multiple styles, list all styles.
  - A clear description of the fabric type with correct fibre content.
  - If a garment is submitted, a clear description of the style name or number, garment type, fabric type and correct fibre content.
  - For all colours being submitted, the colour names used on the test requests/applications must match the colourway names used on the contract.
  - If there is more than one piece/component within the garment/set, clearly identify each component (e.g. Pink cotton interlock top, Black Polyester/Cotton jersey pant and Black Nylon Lace trim for pant).
  - Advise the laboratory that testing is being conducted for Kmart according to Kmart standards, and that a copy of the test report should be made available to Kmart upon request
  - Provide the garment’s nominated care instruction. This is particularly important for shrinkage and appearance after washing test criteria as they are conducted in accordance with care instructions.
  - Indicate if the test report is for a resubmission.

Sample selection and test method guidelines

It is the vendor's responsibility to ensure that the correct sample and test method is selected. There are a number of situations whereby garment samples are required for testing instead of fabric lengths. This will depend on the type of product, fabric type, the trim or finishing process that has been applied or the fabric(s) it is made from.

1. Appearance after Washing Samples

All embellishments and trims must be tested for appearance after washing to ensure components are washable and that they maintain a satisfactory appearance after washing. The washing tests are conducted according to the garment's nominated care instruction.
The vendor must submit;

- samples using correct fabric and trim that represents bulk &/or
- mock-up samples with the trims/embellishments of the same size and length that represent bulk

Intimate garments (bras and briefs)

The Vendor must test;

a) One fully constructed garment of each style made using correct fabrics and trims.
Only one colour combination is to be tested; if available, the darkest and lightest (contrast) colour combination would be the option to be selected first. If the contrast colour combination is not available, then the darkest colour combination is to selected.

and

b) A mock-up sample with all trims and embellishments attached with all colourways;
- Dark back ground base fabric with all trims and
- light back ground base fabric with all trims

All other garments with trims and embellishments
The Vendor must test either:

a) A garment with trims and embellishments attached as per bulk production,

or

b) A mocked-up sample with all trims and embellishments attached.

2. Multiple Fabrics used in one garment

Where there is more than one fabric used within a garment or style:

- All fabrics are to be tested.
- Where marle fabrics are included are part of a plain dyed colour range, the marle is considered a different fabric. Both the marle and plain dyed fabrics must be tested.
- All fabrics should be compatible with each other.

3. Testing in accordance with care instructions

Many tests require testing in accordance with care instructions. When testing identical fabrics for garments that have different care instructions (due to styling or trim differences) it is recommended that tests are conducted according to the most severe care instructions. In this way, the test results can/may be considered representative for all garments and reduce the overall cost of testing. Alternatively, tests may be conducted according to each different set of instructions.

4. Advanced notification of anticipated quality problems

When suppliers have doubts or concerns that their fabrics/garments may not be able to meet Kmart's minimum quality standards, the supplier is obliged to raise these concerns immediately with Kmart's Textile Technologist prior to order placement. Further advice on possible improvements, corrective actions or revised testing requirements may be provided.

5. Industrial Garment Washing/ Washing Finishes

For any garments or fabrics which undergo garment washing or finishing treatments (e.g. enzyme wash, and stone wash treatments): The supplier must submit a garment/garment-panel for testing that has undergone all intended washing finishes. Physical tests and colourfastness tests must be performed on the fully-treated garment/panel.

6. Durability of Sew in labels or label information printed directly on garments

Label information may be provided on sew-in labels or may be printed directly onto garments (e.g. in the centre-back of underwear). In both cases, the instructions must be durable and legible for the life of the product to meet legal requirements.

To assess durability of label information such as care instructions, brand, country of origin, fibre content, products should be laundered for 5 cycles in accordance with care instructions. The label print/legibility shall meet a rating of 4/5 using the grey scales for change in shade after washing. Sew-in labels must remain securely attached.

NB: This is a test that will only be conducted by request (e.g. to investigate quality complaints).

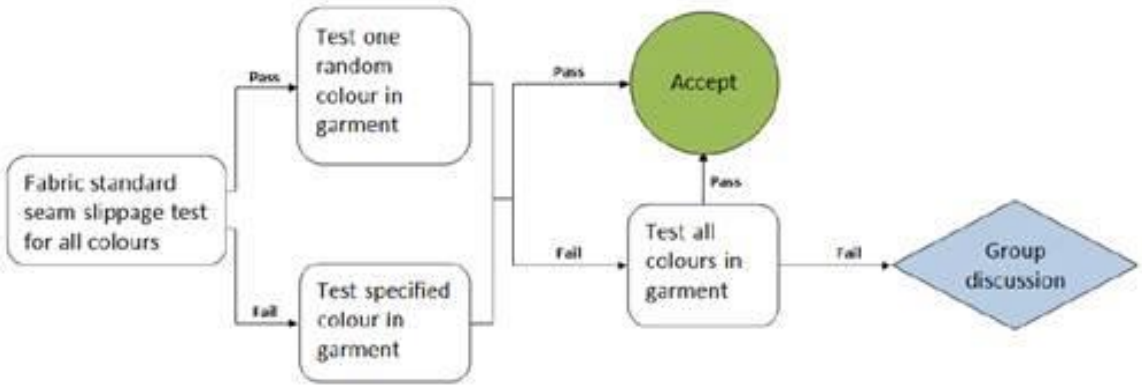
7. Hi-Visibility garments

Hi-Visibility safety garments are required to meet the performance and labelling requirements as specified in the two relevant Australian Standards: AS/NZS 4602.1 and AS/NZS 1906.4. Refer to the testing and approval guidelines contained in the appendices.

8. Seam Slippage/ Breakage

Seam testing is required on fabrics that are prone to seam slippage. The following flow diagram demonstrates the approach to testing. (i.e. whether to conduct standards seam tests on fabrics, or if seam tests are to be performed on a garment). For garment testing, all samples must be made in correct bulk fabric using seam constructions as will be used in production.

** For fabrications that fail in fabric stage, please consult Kmart/KAS Garment Technologist for guidance on modified seam reinforcement before submitting garment sample to test.



9. Colour Matching

The supplier must ensure that all batches of fabric are shade colour matched using the light source D65. All panels within a garment should be colour matched. All trims or accessories for which the colour has been approved must also follow this standard. The grey scale rating is to be a minimum of rating 4.

To ensure that colour variation under alternate light sources (metamerism) is not a concern, a comparison using light source TL84 should also be made. The grey scale rating is also to be a minimum of rating 4.

10. UPF testing

Ultraviolet protection factor (UPF) is a performance rating for sun protective fabrics/clothing. Fabrics are tested according to *"Australian Standard AS/NZS 4399; Sun protective clothing- evaluation and classification",* to determine the UPF rating. Garments are then labelled according to the rating system as specified in the standard.

Fabrics: It is a Kmart requirement that all fabrics, colours/panels and all-over prints are tested. All must meet the claimed UPF rating as will be stated on the swing-tag. Fabrics containing a placement print (e.g. a plastisol print) only require testing of the fabric without the placement print. Trims (e.g. bindings) do not require testing.

Garments: UPF claims should only be used for garments designed and engineered to provide coverage of the skin and therefore protection from the sun (e.g. rash vests, long sleeve workwear and legionnaire hats). UPF claims shall not be used on small items that provide very little coverage and therefore minimal sun protection (e.g. bathers and bikinis).

Multi-Stage Testing

Multi-stage testing is a "quality control re-testing" programme that has been established to ensure that fabrics utilised in high volume lines maintain a consistent level of quality. Once volumes have reached certain trigger levels, the supplier will receive instructions from the KAS Team for additional physical and colourfastness tests to be conducted.

The request for and frequency of testing will be managed according to the KAS "Standard Operating Procedures". For further queries, please contact KAS QA.

Test Report Review & Approval:

Upon receipt of test results, it is the vendor's responsibility to conduct the following:

- Confirm that the fabric details/specs matches the details specified on the Kmart contract (e.g. Fabric weight, construction, etc.)
- Assess test results to ensure they meet Kmart requirements. Marginal failures can be referred for commercial approval via the Exception Reporting Procedure (below)
- All test reports must be checked and approved by the vendor prior to the commencement of production.
- Test reports for every Garment Style are to be loaded into DSS (KAS model) or e-mail electronic copies (original pdf format) of test reports to the Kmart Textiles Product Technologist. If emailing, the e-mail subject line shall contain the garment style number(s) and Kmart Department numbers.
- Test reports are valid for 12 months.
- When a test report does not list all the style numbers that pertain to the same fabric, confirmation must be provided that includes a list of the relevant test report numbers and the additional style numbers.
- Upload test report into DSS (KAS Vendors) or for Local suppliers contact the relevant Kmart Textile Technologist.

Exception Reporting Procedure

Once test reports are reviewed: When a fabric/garment does not meet or conform to one or more of the test requirements set out within this standard, a decision is required to determine if the test results could be considered commercially acceptable for Kmart.

Suppliers are required to complete a "Textile Query Form" (available from the Kmart Quality Website, refer to the Control Guidelines and Form section) and submit the form to the Kmart Textile Technologist

This form provides an opportunity for suppliers to discuss the nature of the non-conformance, and explain why it is felt that the test results will be acceptable for Kmart and Kmart customers. The decision to accept sits with the Kmart Textile Technologist. The form shall be uploaded into DSS for traceability.

Selection and Frequency of Tests

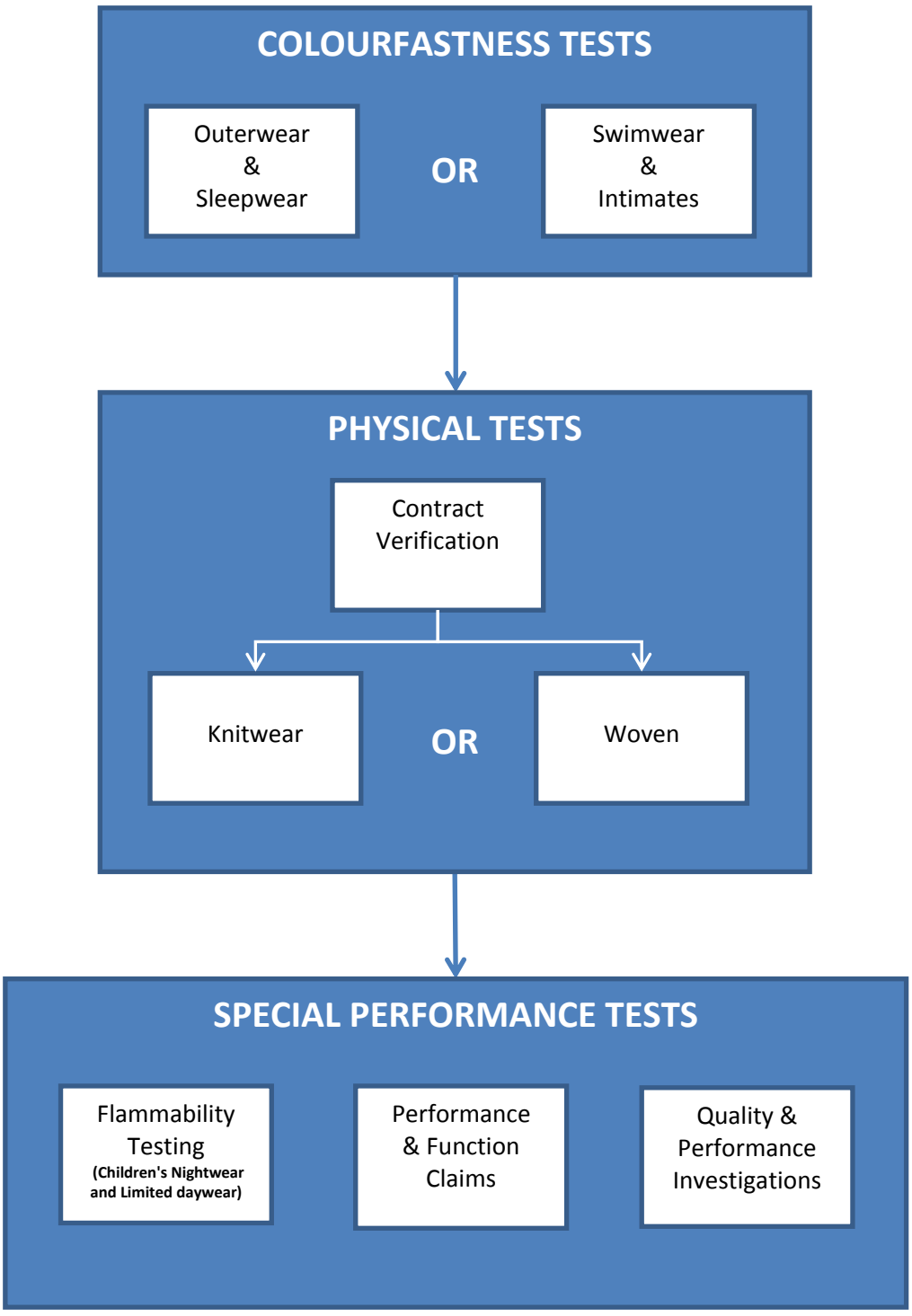
Selecting Relevant Tests

There is a 3 step approach to selecting the relevant/appropriate tests (as illustrated below):

Step 1. Colourfastness tests: Identify the table that relates to the products requiring testing. Step through the table to identify the tests based on product features.

Step 2. Physical tests: Firstly, identify tests that are needed to validate/substantiate details on the contract. Then identify appropriate physical tests based on fabric construction (i.e. either Knitted or Woven).

Step 3. Special Performance Tests: For children's nightwear, products making special performance claims or for quality/complaint investigation, select relevant tests.



Test Frequency

For a fabric that is being used for multiple colours/colour ways and/or across a number of styles, refer to the table below to determine the number of samples to be tested.

Product Category	Number of Colours/ Colourways	Physical Tests (Other Than Fibre Content Testing**)	Colourfastness Tests
Outwear & Sleepwear	-	All Colours	All Colours
Swimwear & Intimates	≤ 10	1 Colour	All Colours
	> 10	2 Colours	All Colours

**Fibre Content test details: Please refer to the test criteria outlined in Physical Test Minimum Requirements: Contract Verification Requirements Table

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Colourfastness Tests: Minimum Requirements

Colourfastness Tests - Minimum Requirements - Outerwear & Sleepwear

Instructions:

Step 1. From the table headings: Select the "Product/Finish Type" accordingly.

Step 2. Proceed to the "Product/Feature Testing Required" column to determine if your product or feature requires testing

Step 3. Conduct tests accordingly

COLOURFASTNESS TESTS: MINIMUM REQUIREMENTS	Product/Finish Type → / Property	▪ Garment washed/dyed (incl. Denim) ▪ Pigment Dyed ▪ Pigment Print	▪ Fluorescent Colours	▪ Brushed/Raised Fabrics	All other fabrics: ▪ Plain fabrics ▪ Solid Colours or non-pigment prints	Product/Feature Testing Required
WASHING AS2001.4.15B Neon colours: If care instruction states Cold Wash test at 40°C 45 min	SHADE CHANGE	3/4	3/4	3/4	4	All fabrics/garments: ▪ Medium to dark shades or ▪ Garments with contrast trims or main body contrast fabrics must be tested as a fabric/trim combination.
	SELF STAINING	4/5	4/5	4/5	4/5	
	STAIN COTTON	3	3/4	3/4	4	
	STAIN NYLON	2/3	3	3	3	
RUBBING* AS2001.4.3	DRY	3/4	4	3/4	4	All fabrics/garments: ▪ Medium to dark shades ▪ **NB**: Placement prints are not routinely tested but are still expected to meet requirements.
	WET	2	3	2/3	3	
	Garments with "wash before use" care instructions: if the colour fails colourfast to rubbing, the garment/fabric is to be washed & dried according to the care instructions and then re-tested. Both results are to be reported.					
WATER AS2001.4.E01	SHADE CHANGE	4	3/4	4	4	All fabrics/garments: ▪ Medium to dark shades or ▪ Garments with contrast trims or main body contrast fabrics must be tested as a fabric/trim combination.
	SELF STAINING	4/5	4/5	4/5	4/5	
	STAIN COTTON	3/4	3	4	4	
	STAIN NYLON	3/4	3	3/4	3/4	
PERSPIRATION AS2001.4.E04	SHADE CHANGE	4	3/4	4	4	Active wear: ▪ Medium to dark shades
	STAIN COTTON	3/4	3/4	4	4	
	STAIN NYLON	3/4	3	3/4	3/4	

COLOURFASTNESS TESTS: MINIMUM REQUIREMENTS	Product/Finish Type → / Property	▪ Garment washed/dyed (incl. Denim) ▪ Pigment Dyed ▪ Pigment Print	▪ Fluorescent Colours	▪ Brushed/Raised Fabrics	All other fabrics: ▪ Plain fabrics ▪ Solid Colours or non-pigment prints	Product/Feature Testing Required
LIGHT AS2001.4.21 60 HOURS AS2001.4.B02	SHADE CHANGE	Dark 4/5 Medium 3/4 Light 3/4	Other: 2/3 High Visibility: 4	Dark 4/5 Medium 3/4 Light 3/4	Dark 4/5 Medium 3/4 Light 3/4	▪ Outdoor work wear ▪ School wear
DRY CLEANING AS2001.4.16	SHADE CHANGE	N/A	N/A	4	4	▪ "Dry clean only" items
APPEARANCE AFTER WASHING ▪ 1 wash as per care instruction ▪ 3 washes for Prints ▪ 3 washes for glued trims & embellishments	SHADE CHANGE	3/4	3/4	4	4	▪ Multi component garments ▪ Garments with decorative washable trims ▪ Products with washable trims, embellishments and multiple fabrics NB: Testing should not be initiated due to the presence of functional trims (e.g. zipper, buttons, rivets or snaps). However functional trims should be assessed if they are on garments subjected to these tests. **NB**: If printed fabrics are washed for 3 cycles, there is no need for "Print Fastness" testing
	Common assessment criteria listed below but not limited to: ▪ Satisfactory general appearance (e.g. colour loss/change, fraying, distortion, delamination, shrinkage, damage) ▪ Minimal change to trims ▪ Minimal change to embellishments (including functional and decorative) when compared to unwashed samples ▪ Cross staining: 4/5 for contrast components/trims.					
PRINT FASTNESS (3 washes as per care instruction)	SHADE CHANGE	3/4	3/4	4	4	▪ All prints **NB:** Print fastness tests are not required if the "Appearance After Washing" tests have been conducted for 3 wash cycles.
	Common assessment criteria listed below but not limited to: ▪ Satisfactory general appearance (e.g. colour loss/change, fraying, distortion, shrinkage, damage) ▪ Negligible cracking and peeling					

Colourfastness Tests - Minimum Requirements - Swimwear & Intimates

Instructions:

Step 1. From the table headings: Select the "Product/Finish Type" accordingly.

Step 2. Proceed to the "Product/Feature Testing Required" column to determine if your product or feature requires testing.

Step 3. Conduct tests accordingly

COLOURFASTNESS TESTS: MINIMUM REQUIREMENTS	Product/Finish Type → / Property	Fluorescent Colours	Swimwear, board shorts, rash vests, surf wear and associated swimwear apparel	Intimates/Underwear ie. Underwear, singlets	Product/Feature Testing Required
WASHING AS2001.4.15B Neon colours: If care instruction states Cold Wash test at 40°C 45 min	SHADE CHANGE	3/4	4	4	All fabrics/garments: ▪ Medium to dark shades or ▪ Garments with contrast trims and/or fabrics must be tested as a fabric/trim combination.
	SELF STAINING	4/5	4/5	4/5	
	STAIN COTTON	3/4	4	4	
	STAIN NYLON	3	3/4	3/4	
RUBBING* AS2001.4.3	DRY	4	4	4	All fabrics/garments: ▪ Medium to dark shades **NB**: Placement prints are not routinely tested but are still expected to meet requirements.
	WET	3	3	3	
	Garments with "wash before use" care instructions: if the colour fails colourfast to rubbing, the garment/fabric is to be washed & dried according to the care instructions and then re-tested. Both results are to be reported.				
WATER AS2001.4.E01	SHADE CHANGE	3/4	4	4	All fabrics/garments ▪ Medium to dark shades or ▪ Garments with contrast trims and/ or fabrics must be tested as a fabric/trim combination.
	SELF STAINING	4/5	4/5	4/5	
	STAIN COTTON	3	4	4	
	STAIN NYLON	3	3/4	3/4	
PERSPIRATION AS2001.4.E04	SHADE CHANGE	3/4	4	4	Medium to dark shades. ▪ Basic undergarments i.e. Underwear, underpants, singlets
	STAIN COTTON	3/4	4	4	
	STAIN NYLON	3	3/4	3/4	

COLOURFASTNESS TESTS: MINIMUM REQUIREMENTS	Product/Finish Type → / Property	Fluorescent Colours	Swimwear, board shorts, rash vests, surf wear and associated swimwear apparel	Intimates/Underwear ie. Underwear, singlets	Product/Feature Testing Required
LIGHT AS2001.4.21 60 HOURS AS2001.4.B02	SHADE CHANGE	2/3	Dark 4/5 Medium 3/4 Light 3/4	Dark 4/5 Medium 3/4 Light 3/4	All shades. ▪ Swimwear ▪ Board short/rash vest/surf wear ▪ Associated swimwear apparel e.g. sarongs
SEA WATER AS2001.4.E02	SHADE CHANGE	2/3	4	N/A	All shades. ▪ Swimwear ▪ Board short /rash vest ▪ Surf wear ▪ Associated swimwear apparel e.g. Sarongs
CHLORINATED WATER (Chlorine 20mg/l) AS2001.4.5	SHADE CHANGE	2/3	4	N/A	All shades. ▪ Swimwear ▪ Board short /rash vest/ surf wear ▪ Associated apparel e.g. Sarongs
APPEARANCE AFTER WASHING ▪ 1 wash as per care instruction ▪ 3 washes for Prints ▪ 3 washes for glued trims & embellishments	SHADE CHANGE	3/4	4	4	▪ Multi component garments ▪ Garments with decorative washable trims ▪ Products with washable trims, embellishments and multiple fabrics NB: Testing should not be initiated due to the presence of functional trims (e.g. zipper, buttons, rivets or snaps). However functional trims should be assessed if they are on garments subjected to these tests. **NB**: If printed fabrics are washed for 3 cycles, there is no need for "Print Fastness" testing
	Common assessment criteria listed below but not limited to: ▪ Satisfactory general appearance (e.g. colour loss/change, fraying, distortion, shrinkage, delamination, damage) ▪ Minimal change to trims ▪ Minimal change to embellishments (including functional and decorative) when compared to unwashed samples ▪ Cross staining: 4/5 for contrast components/trims				
PRINT FASTNESS (3 washes as per care)	SHADE CHANGE	3/4	4	4	▪ All prints **NB:** Print fastness tests are not required if the "Appearance After Washing" tests have been conducted for 3 wash cycles.
	Common assessment criteria listed below but not limited to: ▪ Satisfactory general appearance (e.g. colour loss/change, fraying, distortion, shrinkage, damage) ▪ Negligible cracking and peeling				

Physical Tests: Minimum Requirements

Instructions:	**Step 1. Refer to "Contract Verification - Minimum Requirements". Select relevant tests** **Step 2. For knitted fabrics, refer to "Physical Testing: Knitted Fabrics"** **Step 3. For woven fabrics, refer to "Physical Testing: Woven Fabrics"**

Contract Verification - Minimum Requirements

Tests & Test Methods	Minimum Requirements		Test Criteria
FIBRE CONTENT AS 2001.7 AATCC TM 20A ASTM D629	Single Fibre or 100%	100% (No tolerance)	All fabrics (Excluding trims, 100%polyester lining, 100% polyester filling) ▪ 1 colour at random per fabric type and ▪ 1 marle colour at random per fabric type Requirement for Bras: Only the cup's shell and lining (if lining is other than 100% polyester) are to be tested
	Fibres < 100% but > 10%:	±5% (Max)	
	For Fibres ≤ 10% but > 1%:	±1% (Max)	
	For fibres ≤ 1% :	+ 1%(No negative tolerance)	
	By example: 1) Fabric with 60% cotton 2) Fabric with 5% Elastane	Acceptable range → Cotton 55% to 65% → Elastane 4% to 6%	
Fibre Content Verification: Fibre content testing verifies the composition stated within contract. If the content is **within tolerance**, the fibre composition stated within contract is to be used. Contract: 65% Polyester 35% Cotton Test result: 62.7% Polyester 37.3% Cotton Confirmed Fibre: 65% Polyester 35% Cotton			
FABRIC WEIGHT AS 2001. 2.13	+/-5% By example: Acceptable range for 200gsm is190gsm - 210gsm		All Fabrics/Products; All colours Excluding Traditional Knitwear
GARMENT WEIGHT	+/- 10% By example: Acceptable range for 10lbs/dozen is 9 -11 lbs/dozen		Traditional Knitwear only
CONSTRUCTION Woven fabrics: AS 2001.2.5 Knitted fabrics: AS 2001.2.6	+/-3%		Upon Request
YARN COUNT AS 2001. 2. 23 ISO 7211/5	+/-3%		Upon Request
AZO DYES EN 14362-1 : 2012 For Textile Material	No Detection		Denim styles only All other fabrics: Upon request

Physical Testing: Knitted Fabrics/Traditional Knitwear

Tests & Test Methods	Minimum Requirements		Test Criteria
DIMENSIONAL STABILITY Washing: AS 2001.5.4: 2005 Dry cleaning: AS 2001.5.7 Wash as per care instruction	General Length Width	+/-5%, -5%+2%	▪ All Knit body fabrics. ▪ All Knit lining fabrics. ▪ All Traditional Knitwear Note: Please refer to "**Testing in accordance with care instructions"** guidance provided within "Sample Selection and Test Methods Guidelines"
	≥50% Regenerated Length Width	-7% +5%, -5% +2%	
	Brushed fabrics Length Width	+/-6%, -5%~+2%	
	Rib fabrics Length Width	+/-5%, -7%~+2%	
SPIRALLITY Washing: AS 2001.5.4: 2005 Wash as per care instruction	Garment Length <60 cm	7%	Knit Fabrics/Traditional Knitwear with less than 50% synthetic fibre: ▪ Single knit and pique
	Garment Length >60 cm	5%	

PILLING ISO 12945-1 Pill Box 14,400 revs After 1 wash (as care instruction) Rating against pilling images SN 198525	General	3	Weft knit fabrics/Traditional Knitwear: ▪ Synthetic fibres ≥ 25% or ▪ Regenerated fibres ≥ 25% Work wear & School wear ▪ Wool fibres ≥ 25%
	Low Pill/ Anti pill fabrics	3/4	
STRETCH AND RECOVERY - BS 4952 No pre tension load General: Load 3 kgf Active wear: Load 6 kgf Stretch: 1 minute Recovery: 30 minutes	Stretch and Recovery requirements differ according to fabric construction and fibre content. Please refer to the Stretch and Recovery table (below) for full details.		Refer to the Stretch and Recovery table below

Stretch & Recovery Minimum Requirements Table

The following fabrics require stretch and recovery to be tested:

- Fabrics containing Elastane for underwear, swimwear, active wear.
- Rib for body fabrics (either with or without elastane)
- Rib trim is an optional test and only required upon request.

For fabrics not listed in this table: The laboratory should test and report results. Results should be referred to the Kmart Textile Technologist for an approval decision.

Standard Tests

Fabric Type	Stretch % (1 minute)		Recovery % (After 30 Min)	
	Length (Min)	Width (Min)	Length (Max)	Width (Max)
RIB with no Elastane	20%	150%	20%	80%
RIB with Elastane	70%	200%	20%	80%
JERSEY with Elastane	80%	130%	20%	35%
INTERLOCK with Elastane	15%	80%	20%	80%
OTHER FABRICS with Elastane	-	-	20%	80%

Test Upon Request

Fabric Type	Stretch % (1 minute)		Recovery % (After 30 Min)	
	Length (Min)	Width (Min)	Length (Max)	Width (Max)
JERSEY with no Elastane	25%	60%	20%	35%
INTERLOCK with no Elastane	15%	80%	20%	80%
OTHER FABRICS with no Elastane	-	-	20%	80%

Physical Testing: Woven Fabrics

<table>
<tr><th>Tests & Test Methods</th><th colspan="2">Minimum Requirements</th><th>Test Criteria</th></tr>
<tr><td rowspan="3">DIMENSIONAL STABILITY
Washing: AS 2001.5.4
Dry cleaning: AS2001.5.7
(NB: As per care instruction)</td><td>General Length
Width</td><td>+/-3%
+/-3%</td><td rowspan="3">▪ All body fabrics
▪ All lining fabrics.

Note: Please refer to “Testing in accordance with care instructions” guidance provided within Test Requirements Guidelines</td></tr>
<tr><td>≥ 50% Regenerated Length
Width</td><td>+/-5%
+/-5%</td></tr>
<tr><td>Cheese Cloth
Length

Width</td><td>+/-5%
+/-5%</td></tr>
<tr><td>SPIRALLITY
Washing: AS 2001.5.4
Wash as per care instruction</td><td colspan="2">Garments – All Lengths</td><td>3%</td><td>Denim jeans.

Note: A garment in correct fabric, workmanship and wash treatment should be tested.</td></tr>
<tr><td rowspan="2">PILLING
After 1 wash
(as per care instruction)
TWC (IWS) 196
Martindale 1,000 revs
Rated against pilling images SM50</td><td>General Fabrics</td><td>3/4
Rating against pilling images SM50</td><td rowspan="2">Business wear & School wear for: Jackets, pants and skirts
▪ Synthetic fibres ≥ 25% (excluding 100% synthetic fibres), or
▪ Regenerated fibres ≥ 25% (excluding 100% regenerated fibres)

Work wear & School wear
▪ Wool fibres ≥ 25% (NB: Includes 100% wool fibre)</td></tr>
<tr><td>Linen/Linen Blends</td><td>2/3
Rating against pilling images SM50</td></tr>
<tr><td>SEAM SLIPPAGE
AS2001.2.21 Given Seam
AS2001.2.22 Standard Seam</td><td colspan="2" rowspan="2">For Adults; Children’s sizes 8 and over:

<table><tr><th>Garment Type</th><th>Fitted and Regular Fit</th><th>Loose Fit</th></tr><tr><td>Coats</td><td>95N</td><td>80N</td></tr><tr><td>Dress</td><td>80N</td><td>65N</td></tr><tr><td>Dressing Gown</td><td>80N</td><td>80N</td></tr><tr><td>Jackets</td><td>95N</td><td>80N</td></tr><tr><td>Jeans/Denim</td><td>110N</td><td>95N</td></tr><tr><td>Lining</td><td>80N</td><td>80N</td></tr><tr><td>Overalls, Playsuits</td><td>95N</td><td>80N</td></tr><tr><td>Pyjamas/Nighties</td><td>80N</td><td>65N</td></tr><tr><td>Shirt, Blouses</td><td>95N</td><td>65N</td></tr><tr><td>Shorts</td><td>110N</td><td>95N</td></tr><tr><td>Skirt</td><td>95N</td><td>80N</td></tr><tr><td>Trousers, pants</td><td>110N</td><td>95N</td></tr></table></td><td>Fabrics below 150 gsm

The following fabric types/finishes
▪ Satin & Sateen
▪ Georgette
▪ Flannelette
▪ Loose and open weave fabrics
▪ Long Floats
▪ Brushed</td></tr>
<tr><td>SEAM BREAKAGE
AS2001.2.20
Knit/Woven combination</td><td colspan="2">For Children’s sizes up to and including size 7:

<table><tr><th>Garment Type</th><th>Fitted & Regular Fit</th><th>Loose Fit</th></tr><tr><td>Coats</td><td>80N</td><td>65N</td></tr><tr><td>Dress</td><td>65N</td><td>65N</td></tr><tr><td>Dressing Gown</td><td>65N</td><td>65N</td></tr><tr><td>Jackets</td><td>80N</td><td>65N</td></tr><tr><td>Jeans/Denim</td><td>95N</td><td>80N</td></tr><tr><td>Lining</td><td>80N</td><td>80N</td></tr><tr><td>Overalls, Playsuits</td><td>80N</td><td>65N</td></tr><tr><td>Pyjamas/Nighties</td><td>65N</td><td>65N</td></tr><tr><td>Shirt, Blouses</td><td>80N</td><td>65N</td></tr><tr><td>Shorts</td><td>95N</td><td>80N</td></tr><tr><td>Skirt</td><td>80N</td><td>65N</td></tr><tr><td>Trousers, pants</td><td>95N</td><td>80N</td></tr></table></td><td>Fabrics below 150 gsm

The following fabric types/finishes
▪ Satin & Sateen
▪ Georgette
▪ Flannelette
▪ Open Weave
▪ Long Floats
▪ Brushed</td></tr>
</table>

<table>
<tr><th>Tests & Test Methods</th><th>Minimum Requirements</th><th>Test Criteria</th></tr>
<tr><td>TEAR STRENGTH
AS2001.2.8</td><td>
<table>
<tr><th>Garment</th><th>Fitted & Regular Fit</th><th>Loose Fit</th></tr>
<tr><td>Coats</td><td>10N</td><td>8N</td></tr>
<tr><td>Dress</td><td>8N</td><td>6N</td></tr>
<tr><td>Dressing Gown</td><td>8N</td><td>8N</td></tr>
<tr><td>Jackets</td><td>10N</td><td>8N</td></tr>
<tr><td>Jeans/Denim</td><td>10N</td><td>8N</td></tr>
<tr><td>Lining</td><td>8N</td><td>8N</td></tr>
<tr><td>Overalls, Playsuits</td><td>8N</td><td>8N</td></tr>
<tr><td>Pyjamas/Nighties</td><td>8N</td><td>6N</td></tr>
<tr><td>Shirt, Blouses</td><td>10N</td><td>8N</td></tr>
<tr><td>Shorts</td><td>12N</td><td>10N</td></tr>
<tr><td>Skirt</td><td>10N</td><td>8N</td></tr>
<tr><td>Trousers, pants</td><td>12N</td><td>10N</td></tr>
</table>
</td><td>Fabrics:
Loose and open weave fabrics
Brushed fabrics
Treatments:
Wrinkle resistance
Garment washing
Overdyeing</td></tr>
<tr><td>TENSILE STRENGTH
AS 2001.2.3.2</td><td>
<table>
<tr><th>Garment</th><th>Fitted & Regular Fit</th><th>Loose Fit</th></tr>
<tr><td>Coats</td><td>190N</td><td>160N</td></tr>
<tr><td>Dress</td><td>160N</td><td>130N</td></tr>
<tr><td>Dressing Gown</td><td>160N</td><td>160N</td></tr>
<tr><td>Jackets</td><td>190N</td><td>160N</td></tr>
<tr><td>Jeans/Denim</td><td>190N</td><td>160N</td></tr>
<tr><td>Lining</td><td>160N</td><td>160N</td></tr>
<tr><td>Overalls, Playsuits</td><td>160N</td><td>160N</td></tr>
<tr><td>Pyjamas/Nighties</td><td>160N</td><td>130N</td></tr>
<tr><td>Shirt, blouses</td><td>160N</td><td>130N</td></tr>
<tr><td>Shorts</td><td>220N</td><td>190N</td></tr>
<tr><td>Skirt</td><td>190N</td><td>160N</td></tr>
<tr><td>Trousers, pants</td><td>220N</td><td>190N</td></tr>
</table>
</td><td>If Tear Strength fails</td></tr>
</table>

Special Performance Tests - Minimum Requirements

Performance & Function Claims

For products that are making specific or special performance &/or function claims, refer to the table below and select the appropriate tests.

- If there are special claims that are not listed within the below table, please refer to the Kmart Textile Technologist for guidance & further instructions.

Claims must be substantiated through documentation & testing. Further information is available in the **Claims Policy**.

Product Features or Performance Claims	Tests	Minimum Requirements
Glow in the dark	**DURABILITY OF "GLOW IN THE DARK"** (5 washes as per care instruction)	▪ Satisfactory general appearance ▪ Still functional. ▪ The "glow in the dark" areas still glow in the dark
Crease Recovery	**BS EN22313** **(3 washes as per care instruction)**	Before Wash 120 degree After 3 washes 115 degree
Wrinkle Resistance **(Appearance after repeated home laundering)**	**AATCC 124** **(5 washes as per care instruction)**	After 5 washes: 3/4
Water Resistance: Hydrostatic test **High performance garments** **E.g. Outdoor garments,** **Test : Body fabric and seams with a water proof claim**	**AS2001.2.17 Hydrostatic test** **(1 wash as per care instruction)**	Water resistant: 3000 – 5000 mm Water proof: >5000 mm
Water Repellence: Spray test **General performance garments** **E.g. light weight spray jackets**	**Other: AS 2001.2.16 Spray test** **(1 wash as per care instruction)**	Water repellent: Before Wash 90 After Wash 80
Wind Resistance: **High performance garments** **E.g. Outdoor garments**	**BS EN ISO 9237: Air Permeability**	Wind proof: 0 L/m²/sec Wind resistant: ≤2 L/m²/sec
Breathability: **High performance garments** **E.g. Outdoor garments**	**ASTM E96: Water Vapour Permeability** **Coated Fabric: Procedure BW** **Fabric with no coating: Procedure B**	Minimum: 1000 g/m²/24 hours Medium: 3000 g/m²/24hours High: 5000 g/m²/24hours
Moisture Management claims: **Sport/exercise garments** **(E.g. fast dry, wicking)** **Exempt: Open knit or mesh fabrics and decorative trims**	**Wicking** **Kmart Test Method: KTM 003** **As supplied and** **After 5 washes** **According to care instructions.**	7 cm (min)
Stain release	**AATCC TM 130**	Initial: 3.5 After Wash (5 washes); 3
UPF: **E.g. Claims used in work wear, swimwear, surf wear or swim associated apparel** **Please refer to Sample Selection and Test Method Guideline within this document for further details**	**AS/NZS 4399**	All fabrics/colours and panels except trims. Protection level as stated on label
High Visibility product: **E.g. Work wear**	**AS/NZS 4602: High Visibility safety garments** **AS/NZS 1906.4: Retroreflective materials**	Fluorescent colours: Colourfastness to light and washing, chromaticity and luminance factor Reflective tape performance: Photometric performance, washing test and abrasion.
Children's Sleepwear	**AS/NZS 1249**	Assessed & tested against the standard and rated/labelled accordingly.
Microbiological and Fungal claims	**AATCC TM 147** **AATCC TM 30**	No growth
Anti-Bacterial / Anti Odour	**ASTM E-2149-01** **Staphylococcus Aureus** **After 5 washes**	80%

	According to care instructions	
Abrasion Resistance	**AS2001.2.25: Martindale Abrasion method 10,000 cycles**	No fabric rupture

Quality & Performance Investigations

- The table below lists some of the test methods that will be adopted as part of quality assessment, investigating customer complaints or quality issues. This is not an exhaustive list, and other relevant tests will be adopted (as required).
-

Testing Required	Tests	Minimum Requirements
Complaint investigation	**FORMALDEHYDE** **ISO 14184-1**	100 ppm (max) Children up to 6 years 30 ppm (max)
Complaint investigation	**HEAVY METALS** **AS/NZS ISO 8124.3:2003**	As per AS/NZS ISO 8124.3
Complaint investigation	**PH LEVELS** **AS 2001.3.1**	5-8 pH
Complaint investigation	**AZO Dyes** **EN 14362-1 : 2012 For Textile Material**	No Detection
Complaint investigation	**BURSTING PRESSURE** **AS 2001.2.4**	330 kPa Fitted (tight fitting) knit items
Label Durability	**5 washes as per care instructions**	Shade Change: 4/5
White colours containing Nylon ▪ **Intimate apparel**	**PHENOLIC YELLOWING** **ISO 105-X18**	3/4
Pile Loss/Shedding	**FIBRE SHEDDING** **Kmart Test Method: KTM 001**	4 for Ages up to 7
Stretch and Recovery	**METHOD OF TESTING ELASTIC FABRICS** **BS4952** No pre tension load General Load 3KgF Sportswear Load 6KgF Stretch: 1 minute, Recovery: 30 minutes	See Stretch and Recovery section within Physical Testing: Knitted fabrics/Traditional Knitwear

Glossary

Terms	Definition
Breathability	The ability of a fabric to allow moisture vapour to be transmitted through the fabric structure from one side to the other.
Brushed	A fabric that has been mechanically brushed to raise fibres, giving a softer look and feel
Business wear	Garments that are intended for use as formal or semi-formal office attire. Includes such items as trousers, tailored jackets and business shirts.
Contrast	Where there are 2 or more significantly different colours in both the depth and hue used next to each other in the one product or applied as a trim on the main fabric. For example: White/pale colour fabric using Medium- Dark colour trims.
Crease resistance or wrinkle resistance	The ability for a fabric to be resistant to creasing during use by applying special finishes.
Fitted (in relation to garment fit)	“Fitted” refers to garments that are intended to sit more firmly against the body when worn. Typical examples include activewear, swimwear and underwear. NB: The designation is made by Quality Teams during briefing/Tech Pack process.
Glow in the dark	A printing process that has a phosphorescent finish and therefore “glows in the dark” after it has been subjected to light.
High visibility	Where a garment has fluorescent and/or retro reflective material used to achieve high visibility. These are specific to safety garments worn by people in situations where they may be exposed to hazards.
Labelling Information Printed on Garment	Labelling information that is printed on the back neck label for tops or below centre back waist for bottoms.
Light colour	Colours with less than 1/25 standard depth.

Terms	Definition
Long Floats	A float is a thread that is bought to or above the surface of a woven fabric, quite often over several intersecting yarns.
Loose / Open Weave	Where the ends and/or picks of a woven fabric are not compacted closely together thereby creating spaces/gaps between neighbouring yarns. These spaces often allow yarns to readily slide or be pulled within the open interlacing structure to create distortion/bruising of the fabric. Examples of open weave fabrics are cheese cloth, voile, lawn, chiffon and georgette. For confirmation/advice: Please consult the Kmart Textile Technologist.
Low Pill	A fabric that has been engineered or treated to reduce the number of pills.
Microfibre	A very fine filament or staple fibre that is less than 1 denier per filament or 10 microns in diameter.
Mainstream	Kmart's normal or mainstream product offering within the House brand range.
Moisture management fabric	Fibres that have been engineered or a fabric that has been treated to achieve wicking properties.
Overdyed	To either excessively dye or dye more than one time.
Permanent Label	A label containing fibre content, care instructions, country of origin etc., sewn or permanently attached to the garment.
Premium	Kmart's best offering within the House brand product range.
Print fastness	The ability for a print to retain its colour after washing.
Stain release	The ability for a fabric to resist spots or stains, achieved through applying special finishes.
Thermal performance	The extent to which a material or fabric can reduce heat loss or insulate from heat.
Thermal resistance (warmth rating)	The measure of what extent a filled product can retain heat. The product is tested to obtain a TOG rating.
Traditional knit or knitwear	Generic term to weft knitted outerwear garments such as sweaters.
Treated	A fabric that has been finished with a chemical treatment that provides it with a specialised feature such as wrinkle resistance.
Trims and embellishments	Decorative accessories that are attached to a product that serves as a functional or aesthetic property.
Verify to contract	The specification/contract/buyers product form must be substantiated, for example the weight that has been stated in the specification.
Regenerated Fibre	A fibre created from reducing cellulose from plants/trees into a liquid which is then extracted and reformed into a continuous fibre. Viscose, Modal, Bamboo & Lyocell are examples of regenerated fibres.
Water absorbency	The ability for a fabric to absorb water and its ratio by weight.
Water proof	The ability of a fabric to be fully resistant to the penetration of water.
Water repellency	The degree of a fabric to resist surface wetting.
Wettability	The ability for a fabric to become wet by allowing water to spread over the surface of the fabric and is represented by time.
Wicking	The ability for moisture to be drawn through the fabric.
Wind resistance	The ability for a fabric to prevent air from flowing /penetrating through the fabric structure.

KTM 001: Fibre Shedding

This test is intended to assess the amount of fibre removed from fabrics with a pile or nap under specific conditions of test. It is applicable to fabric with pile longer than 3mm, whereby loose fibre is removed using pressure sensitive tape.

APPARATUS

- Pressure sensitive tape[1], Ref 3M.853.25mm wide. NB: Tape to be purchased within the past 12 months.
- 1kg weight
- Mounting card

TEST SPECIMENS

Cut at least three specimens approx. size 200mm x 50mm with the longer length parallel to the lay of the pile. Samples must be large enough to allow a piece of tape sized 150mm x 25mm to be placed centrally onto test samples without contacting fibres around the perimeter of the sample.

TEST PROCEDURE

Condition the specimens for a minimum of four hours.

Apply the tape to the pile surface centrally so its length runs parallel to the pile direction/grain. Leave for 1 minute under a load of 1.0kg.

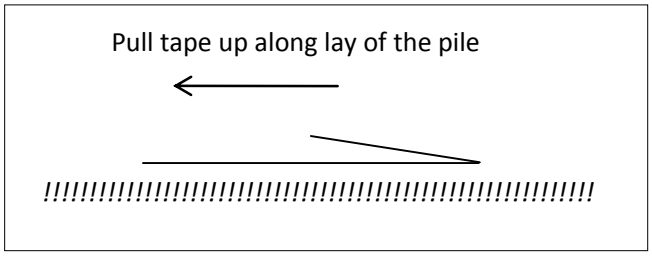
After one minute remove the weight and pull the tape off/upwards against the lay of the pile in a fast continuous motion. NB: Ensure the pulling hands remains in close contact with the pile whilst pulling (as per below image).

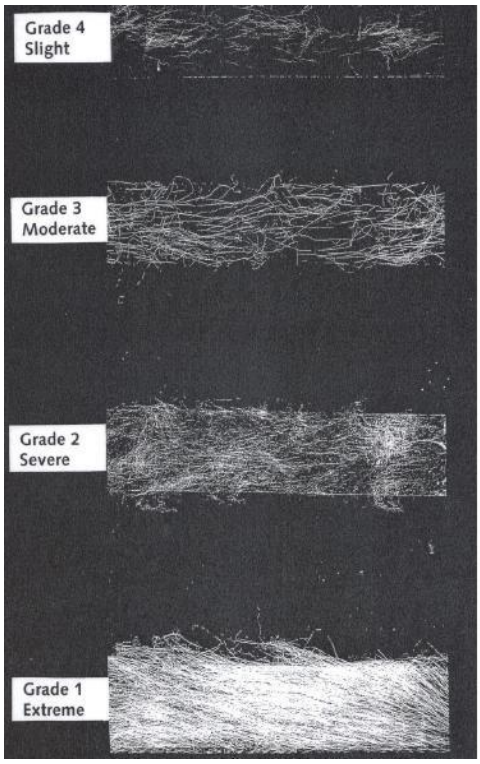
Mount the tape onto white or black card according to the colour of the pile and assess the amount of fibre stuck to the tape. (For dark coloured fabrics, use white card and visa-versa).

REPORTING

The level of fibre shedding to be graded as per the photographic example:

None	-	Grade 5
Slight	-	Grade 4
Moderate	-	Grade 3
Severe	-	Grade 2
Extreme	-	Grade 1





[1] Pressure Sensitive tape is available from: BDK Industrial Products, Levington Park, Nridge Road, Levington, Suffolk. IP10 0JE. Tel: 0143 765 9059 Fax: 0143 765 9104

KTM 002: Spirallity

This test is designed to assess the extent of distortion/twist that can occur with fabrics, especially once they are laundered. Spirallity can arise due to a combination of yarn, fabric and processing factors (e.g. twist-lively yarns, circular knit structures, from processing & handling fabrics/garments). The assessment can be conducted on either a piece of fabric or on fully constructed garments.

APPARATUS

- Laundering facilities: Washing machine, iron, drying, detergent (Omo), makeweights
- Laboratory conditions: Temperature $20^{o} \pm 2^{o}$, Relative humidity 65% ± 3%
- Measuring tape or ruler
- Fabric sample dimensional stability template
- Fabric marker

TEST SPECIMENS

Fabric samples: A fabric specimen of minimum 50 cm x 50 cm is laid flat and it is marked as per dimensional stability testing (i.e. using the dimensional stability template). Draw a line across the top of the template.

Garments: Samples are tested as submitted. NB: Not appropriate test for garments engineered with angled seams.

TEST PROCEDURES

Fabrics:

- Condition the fabric for a minimum of four hours.

Before Washing

- The fabric specimen is to be laid flat and relaxed. Align the side of the template (used for dimensional stability) with the grain/course/warp yarn.
- Draw a line along the warp yarn/grain and along the top of the template
- Mark the sample using the template used for dimensional stability testing.
- The fabric sample is to be washed and dried according to the garment's care instruction.

After Washing

- Condition the washed fabric specimen for a minimum of four hours after drying.
- Place the template onto the sample so the top right-hand corner aligns with the uppermost mark on the washed sample, and line up the top of the template with the line drawn on the fabric.
- Measure the distance between the warp yarn line drawn and the edge of the template. Known as the movement.
- Measured the distance from the top of the template to the bottom marker. (refer to diagram) Known as the length.

Garments:

- Condition the garment for a minimum of four hours.

Before Washing

- Asses garment spirallity prior to washing.
    a) Position garment so panels lay flat and relaxed.
    b) Measure the length of the seam from hem to top of seam.
    c) If the measured seam is not perfectly vertical and wraps a little to the front/back, measure the distance the seam has wrapped at the base (refer to diagram).
- The garment sample is to be washed and dried according to the garment's care instruction.

After Washing

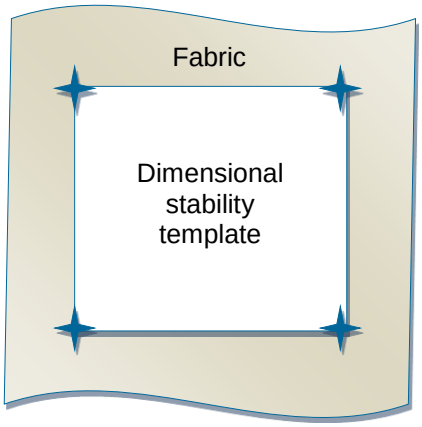
- Condition the washed garment for a minimum of four hours after drying.
- Position and measure the garment the same as prior to washing (i.e. as per steps a), b) & c) above)
- Use measurements to calculate spirallity before-wash and spirallity after-wash.

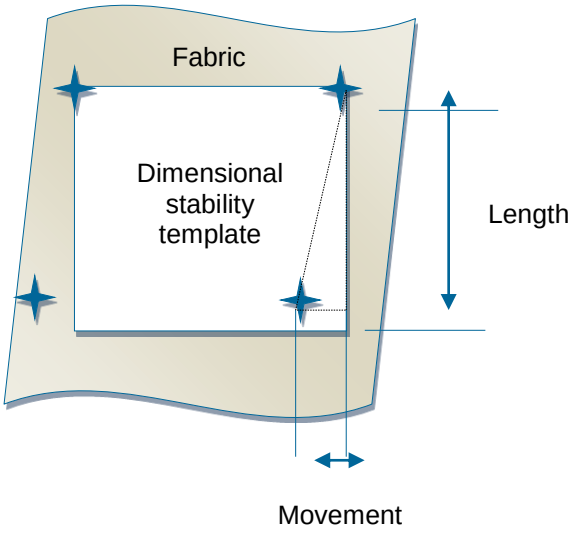
CALCULATING SPIRALLITY

Spirallity is calculated and reported as a percentage. For garments: The spirallity % is recorded prior to and after washing.

$$\text{Spirallity \%} = \frac{\text{Movement} \times 100}{\text{Length}}$$

SPIRALLITY: FABRIC ILLUSTRATIONS





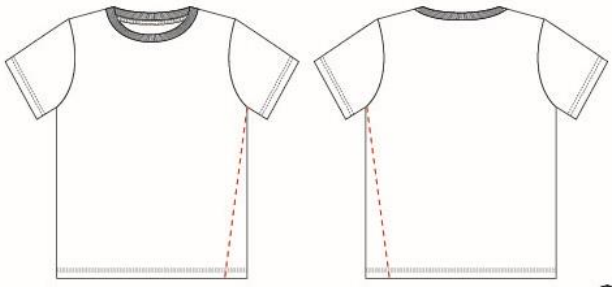
Unwashed sample:

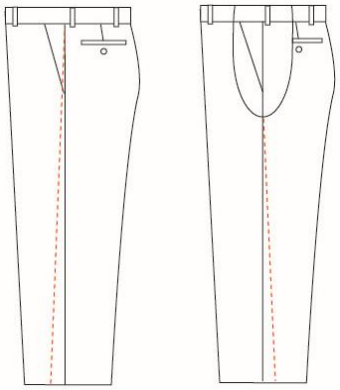
- Use the template to mark the sample.
- Draw a line across the top of the template.
- Proceed to washing.

Washed sample:

- Place template on washed sample. Align template with top corner and line.
- Length = length from top of the template down to the mark
- Movement = measurement from the edge of the template to the mark

SPIRALLITY: GARMENT ILLUSTRATIONS





Knit Tops:

- Measure length from top-of-seam (e.g. from underarm) vertically to hem (NB: Do not measure along seam)
- Measure distance from seam to edge of fabric when garment is laid flat/relaxed.

Woven Bottoms:

- Measure length from top-of-seam (e.g. out leg seam) vertically to hem (NB: Do not measure along seam)
- Measure distance from seam to the point on the hem that sits vertically directly under the top-of-seam point.

KTM 003: Wicking

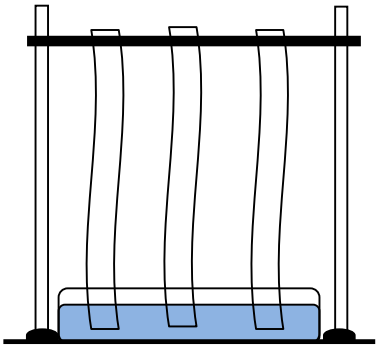
This test is designed to assess the moisture management (wicking) characteristics of fabrics. (i.e. the ability of moisture/perspiration to be drawn from the body/skin through the fabric structure to increase the rate of evaporation)

GENERAL PRINCIPLES

Thin strips of fabric will be dipped into shallow dishes of coloured water. The distance travelled by the coloured water over set time is measured to determine effectiveness of wicking properties. Fabrics are tested as-supplied and after one wash (as per proposed care instructions).

APPARATUS

- Laundering facilities: Washing machine, iron, drying, detergent (Omo), makeweights
- Laboratory conditions: Temperature 20^{o} ± 2^{o}, Relative humidity 65% ± 3%
- Distilled or purified water
- Food colouring
- Dish or pan with a depth of 3cm or greater
- Timer
- Mechanism for suspending test samples (refer attached image).
- Pegs, clips or tape to hold samples.



SPECIMEN PREPARATION

- For testing in as-is condition: Three samples are to be taken in both the length and width direction of the fabric (i.e. a total of 6 pieces). Each sample is to measure 30cm x 2cm. Sampling is to be taken from the left, centre and right of full width fabric pieces.
- For testing after washing: 3 samples, each 35cm x 35cm are to be taken from the left, centre and right of full width fabric pieces. These will be washed once and dried according to proposed care instructions. After washing, a 30cm x 2cm specimen shall be taken in both the width and length direction.
- On each of the specimens (6 x unwashed, 6 x washed), mark a line across each piece 2cm up from one end. This line will be used as an indicator when dipping samples into the test solution

TEST PROCEDURE

- Condition the washed and unwashed specimens for a minimum of four hours.
- Fill the dish/pan to a depth of 2.5cm to 3cm with distilled/purified water. Add food colouring.
- Place the sample suspension mechanism over the dish/pan.
- Lower each specimen into the test solution until the 2cm mark is at water level. Suspend the specimens. Start the timer.
- After 10 minutes, with samples still suspended, measure the height (to nearest 0.5cm) that the liquid has traversed each specimen. The test may be terminated after 5 minutes if there are no signs of liquid movement up specimens.

TEST RESULTS

The height for all test specimens shall be recorded (to the nearest 0.5cm).

Fabrics will be deemed to display moisture wicking properties if the average length traversed for all specimens reaches or exceeds 7cm.

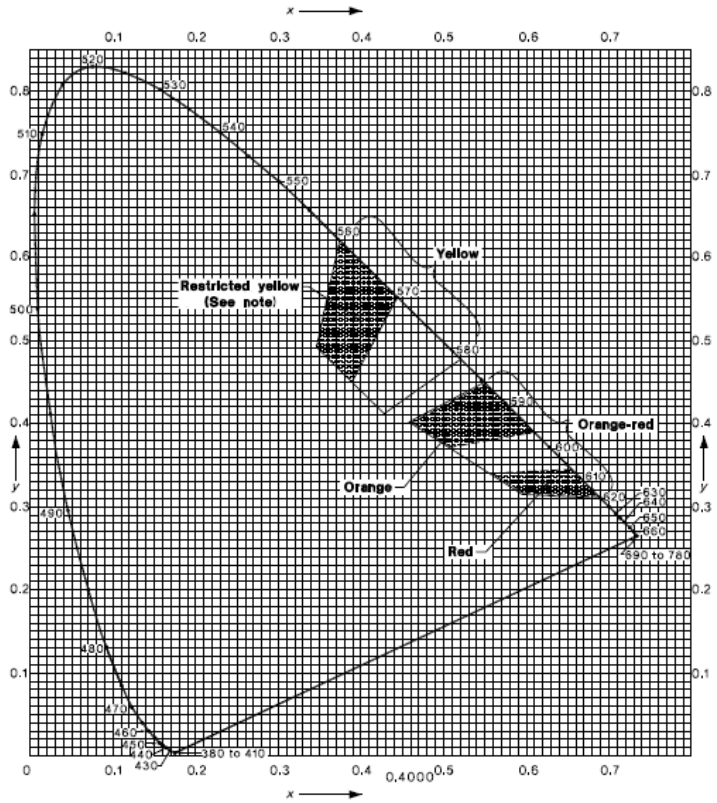
KTM 004: Hi Visibility: Test Result Approval

GENERAL PRINCIPLES

Hi-Visibility safety garments are required to meet the performance and labelling requirements as specified in the two relevant Australian Standards: AS/NZS 4602.1 and AS/NZS 1906.4.

The following is provided for further guidance:

- Hi-Visibility garments must be engineered in accordance with AS/NZS 4602.1
- Fluorescent fabrics must meet the colour assessment and performance requirements of clause 2.2.1 of AS/NZS 1906.4
- Fluorescent colours must have chromaticity coordinates (colour) and a luminance factor (brightness) as specified in AS/NZS 1906.4. These apply to the fabric as received and after the colourfastness to UV exposure tests.
- Reflective strips[2] for night or other dark conditions: Must meet reflection, colour and durability tests in accordance with Section 3 of AS/NZS 1906.4.
- Fluorescent yellow: It is a Kmart requirement that colours must fall within chromaticity coordinates as specified for “Fluorescent Yellow restricted” in Table 2.1 of AS/NZS 1906.4
- Fluorescent orange: Colours may be assessed in one of two ways:
    - **If there is also a red colourway:** If the orange products are ranged with or alongside products that include a red colourway, the fluorescent orange colour must fall within the chromaticity coordinates for “Orange”
    - **If there is NO red colourway:** If the orange products are NOT ranged with or alongside products that include a red colourway, the fluorescent orange colour can fall within the much broader coordinates for “Orange-Red”



Note: Reference to AS/NZS 1906.4 will be necessary to fully understand these requirements. Specifically to:

- Figure 2.1 (as provided
- Table 2.1, and
- Table 2.2

[2] Reflective strip are called “retroreflective materials” in AS/NZS 1906.4

Recognised Standard Test Methods

Test Items	Standard	Standard Name
APPEARANCE AFTER WASHING AND DRY CLEANING (After 1 wash as per care instructions)	Visual assessment after washing AS2001.5.4 AS2001.5.7	Dimensional change: Determination of dimensional change in laundering of textile fabric and garments – Automatic washing method. Dimensional change: Dry cleaning in Perchloroethylene excluding finishing – Machine method.
AZO Dyes	EN 14362-1	Textiles - Methods for determination of certain aromatic amines derived from AZO colorants
BREAKING FORCE/TENSILE STRENGTH	AS2001.2.3.2	Determination of maximum force and elongation at maximum force using the grab method.
BREATHABILITY	ASTM E96	Water Vapour Transmission of Materials
BURSTING PRESSURE	AS2001.2.4	Determination of bursting pressure of textile fabrics hydraulic diaphragm method.
COLOUR MATCHING	Visual comparison using D65 and TL84 light source	
COLOURFASTNESS TO CHLORINATED WATER (Available chlorine concentration 20mg/l)	AS2001.4.5	Determination of colourfastness to chlorinated swimming pool water.
COLOURFASTNESS TO DRY CLEANING SOLVENTS PERCHLOROETHYLENE	AS2001.4.16	Determination of colourfastness of textiles to dry cleaning solvents.
COLOURFASTNESS TO LIGHT	AS2001.4.21 60 hours AS2001.4.B02	Determination of colourfastness to light using an artificial light source (Mercury vapour – Tungsten filament – Internally phosphor–coated lamp). Determination of colourfastness to artificial light: Xenon arc fading lamp test.
COLOURFASTNESS TO PERSPIRATION (ALKALINE)	AS2001.4.E04	Determination of colourfastness to perspiration.
COLOURFASTNESS TO RUBBING	AS2001.4.3	Determination of colourfastness to rubbing.
COLOURFASTNESS TO SEAWATER	AS2001.4.E02	Determination of colourfastness to seawater.
COLOURFASTNESS TO WASHING	AS2001.4.15B	Determination of colourfastness to washing.
COLOURFASTNESS TO WATER	AS2001.4.E01	Determination of colourfastness to water.
CREASE RECOVERY	BSEN22313 (After 3 washes)	Textile fabric – Determination of the recovery from creasing of a horizontally folded specimen by measuring the angle of recovery.
DIMENSIONAL STABILITY TO DRY CLEANING (After 1 cycle)	AS2001.5.7 Method A Normal	Dimensional change: On dry cleaning in Perchloroethylene excluding finishing – Machine method.
DIMENSIONAL STABILITY TO WASHING (After 1 wash as per care instructions)	AS2001.5.4	Dimensional change: Determination of dimensional change in laundering of textile fabric and garments – Automatic washing method.
DURABILITY OF “GLUED” TRIMS/ EMBELLISHMENTS (After 3 washes as per care instruction)	AS2001.5.4	Dimensional change: Determination of dimensional change in laundering of textile fabric and garments – Automatic washing method.
FABRIC WEIGHT	AS2001.2.13	Determination of mass per unit area.
FEATHER & DOWN	AS2479	Down and/or feather filling materials and filled products.
FIBRE CONTENT	AS2001.7 AATCC TM20A ASTM D629	Fibre analysis series.
FIBRE DIAMETER	ISO 137	Textile test methods – Wool – Determination of fibre diameter – Projection microscope method.
FIBRE SHEDDING	KTM 001	Kmart test method is outlined within this manual
FORMALDEHYDE	ISO 14184-1 (If failure after 1 wash)	Textiles – Determination of formaldehyde – Part 1: Free and hydrolysed formaldehyde (Water extraction method).
HIGH VISIBILITY	AS/NZS 4602 AS/NZS 1906.4	High visibility safety garments. Retro-reflective materials and devices for road traffic control purposes Part 4: High-visibility materials for safety garments.

Test Items	Standard	Standard Name
LINTING/PILE LOSS (After 1 wash as per care instructions)	Weight check before and after washing and tumble drying calculated as % loss	
MICROBIOLOGICAL/FUNGAL	AATCC TM147 AATCC TM30	Antibacterial activity assessment of textile materials: Parallel streak method. Antifungal activity, assessment on textile materials: Mildew and rot resistance of textile materials.
PHENOLIC YELLOWING	ISO 105-X18	Textiles – Tests for colourfastness – Part X18: Assessment of the potential to phenolic yellowing of materials.
PILE RATIO	EN 14697	Textiles. Terry towels and terry towels fabrics. Specifications and methods of test.
PILLING	Knit fabrics: ISO 12945-1 Pill Box 14,400 revolutions	Textiles – Determination of fabric propensity to surface fuzzing and to pilling – Part 1: Pilling box method.
	Woven fabrics: TWC (IWS) 196 Martindale Pilling Test 1,000 revolutions	Martindale pilling test method.
PRINT FASTNESS (After 3 washes as per care) DURABILITY OF “GLOW IN THE DARK” (After 5 washes as per care instruction)	AS2001.5.4:2005	Dimensional change: Determination of dimensional change in laundering of textile fabric and garments – Automatic washing method.
SEAM SLIPPAGE	AS2001.2.21	Determination of seam opening due to the application of force in the transverse direction.
SPIRALLITY	KTM 002	Kmart test method is outlined within this manual
STAIN RELEASE	AATCC TM 130	Soil release: oily stain release method.
STRETCH AND RECOVERY	BS4952 General Load 3KgF Sportswear Load 6KgF Stretch: 1 minute, Recovery: 30 minutes	Methods of test for elastic fabrics.
TEAR STRENGTH	AS2001.2.8	Determination of tear force of fabrics using the ballistic pendulum method (Elmendorf).
THERMAL INSULATION PERFORMANCE: RATE OF THERMAL DIFFUSION ANNEX A	BS 6526	Domestic oven gloves – Requirements and test methods.
THERMAL RESISTANCE (Warmth Rating)	BS 5335-1	Determination of thermal resistance for quilts.
THREAD PER UNIT LENGTH (Ends & Picks) THREAD PER UNIT LENGTH (Wales & Courses)	AS2001.2.5 AS2001.2.6	Determination of the number of threads per unit length in woven fabric. Determination of the number of wales and courses in knitted fabric.
TRIM & ACCESSORIES: ATTACHMENT STRENGTH	AS/NZS ISO 8124.1 Section 5.24.6	Safety of toys Part 1: Safety aspects related to mechanical and physical properties. Reasonably foreseeable abuse tests – Tension test.
UPF	AS/NZS 4399	Sun protective clothing – Evaluation and classification.
WATER ABSORBENCY (After 1 wash as per care)	TARGET TP 73	
WATER PENETRATION-CONE TEST	AS2001.2.18	Determination of resistance of fabrics to water penetration – Cone test.
WATER PROOF	AS2001.2.16	Determination of water repellency of textile surfaces – Spray rating test.
WATER RESISTANCE	AS2001.2.16	Determination of water repellency of textile surfaces – Spray rating test.
WATER RESISTANCE	AS2001.2.17	Determination of resistance of fabrics to water penetration- Hydrostatic pressure test.
WETTABILITY (After 1 wash as per care)	AATCC79	Absorbency of textiles.
WICKING (After 1 wash as per care)	KTM 002	Kmart test method is outlined within this manual

Test Items	Standard	Standard Name
WIND RESISTANCE	BS EN ISO 9237	Determination of the permeability of fabrics to air.
WRINKLE RESISTANCE (Appearance after repeated home laundering)	AATCC 124 5 Cycles	Appearance of fabrics after repeated home laundering.
YARN COUNT	AS2001.2.23 OR ISO 7211/5	Determination of linear density of textile yarn from packages.

Testing Laboratories for Textile, Clothing & Footwear

Laboratories may be used as long as they are NATA, SATRA or HOKLAS registered or have an equivalent accreditation. Test reports from Government accredited laboratories are not acceptable.

International laboratories

The list of international laboratories is closely monitored by the KAS Apparel Testing team in Shanghai.
The preferred partners are SGS and ITS (Intertek). For a full list of laboratories or the use of a non-preferred laboratory please make contact with KAS team.

Australian laboratories

Refer to the table below for testing laboratories in Australia.

Australian Laboratories	
City	**Lab Name And Contact Details**
MELBOURNE	**ARP&NSA AUSTRALIAN RADIATION PROTECTION AND NUCLEAR SAFETY AGENCY** LOWER PLENTY ROAD, YALLAMBIE, VICTORIA 3085 tel: (613) 9433 2211 fax: (613) 9432 1835 e-mail: info@arpansa.gov.au web: http://www.arpansa.gov.au/
	AWTA AUSTRALIAN WOOL TESTING AUTHORITY—TEXTILE TESTING 26 ROBERTSON STREET, KENSINGTON, VICTORIA 3031 tel: (613) 9371 2126 fax: (613) 9371 2102 e-mail: awtainfo@awta.com.au web: http://www.awta.com.au/Contacts/Melbourne_Laoratory/Melbourne_Contacts.htm
	CSIRO TEXTILE & FIBRE TECHNOLOGY TEXTILE TESTING LABORATORY HENRY STREET, BELMONT, VICTORIA 3216 tel: (613) 5246 4000 fax: (613) 5246 4057 e-mail: Dale.Carroll@csiro.au web: http://www.csiro.au/resources/Textile-Testing-Rates.html
	DAVID J. HEFFER 22 HICKS STREET, LARA, VICTORIA 3212 tel: (613) 5282 1337 fax: (613) 5282 1003 e-mail: dheffer@djha.com.au
	RMIT UNIVERSITY TEXTILE TESTING SERVICE BUILDING 512, ROOM 14, 25 DAWSON STREET, BRUNSWICK, VICTORIA 3056 tel: (613) 9925 9120 fax: (613) 9925 9117 e-mail: trudie.orchard@rmit.edu.au

Australian Laboratories	
City	**Lab Name And Contact Details**
MELBOURNE	**TQRTM GRAHAM WALTERS & ASSOCIATES PTY LTD** 13/147 MARSHALLTOWN ROAD, GROVEDALE, VICTORIA 3216 tel: (613) 5243 7791 fax: (613) 5243 7741 e-mail: graham_walters@bigpond.com
	VICLAB VICKERY'S LABORATORY 5/383 DORSET ROAD, BORONIA, VICTORIA 3155 tel: (613) 9761 0766 fax: (613) 9761 0477 e-mail: viclab@bigpond.com
SYDNEY	**QUALSPEC TESTING AND RESEARCH CENTRE PTY LTD** LEVEL 1, 200 KINGSGROVE ROAD, KINGSGROVE, NSW 2208 tel: (612) 9150 5531 fax: (612) 9150 7794 e-mail: qualspec@qualspec.com.au e-mail: info@qualspec.com.au