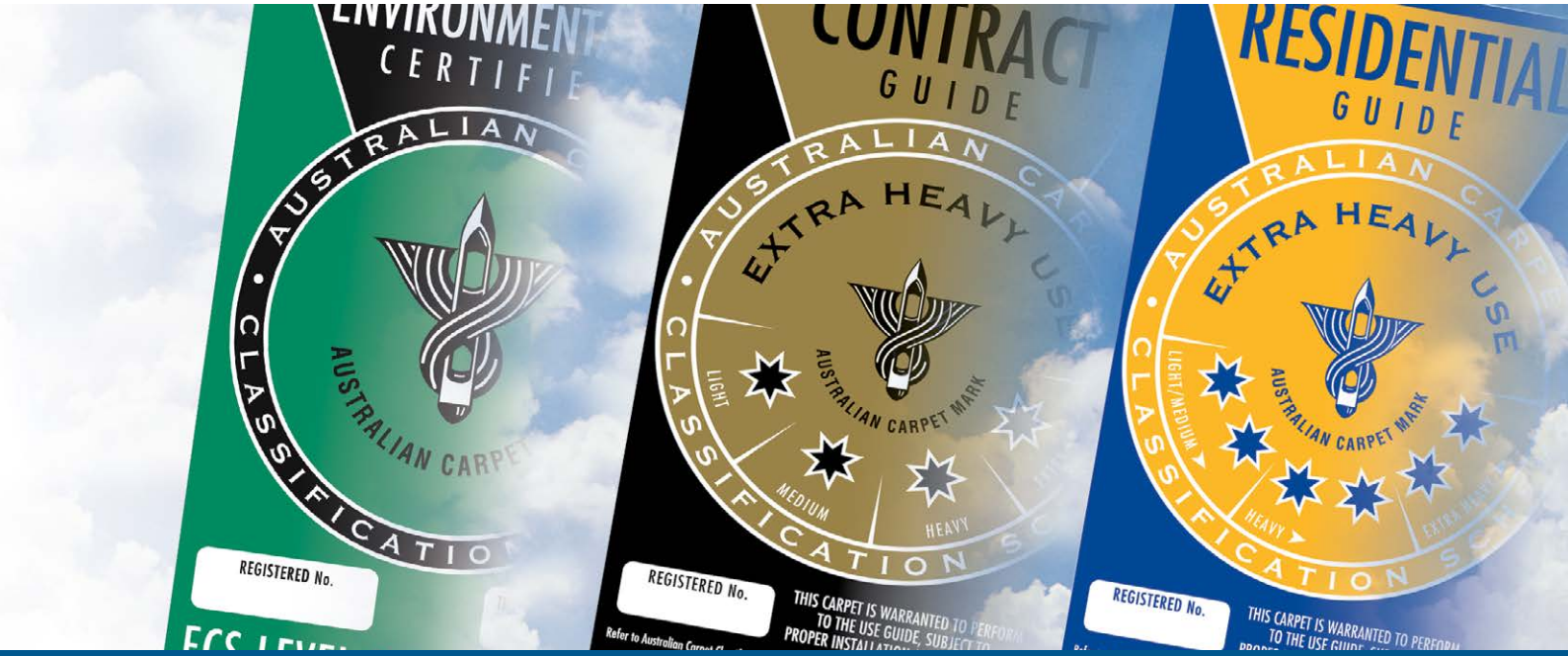
CARPET INSTITUTE OF AUSTRALIA LIMITED



Version 2.2

ACCS ECS

Carpet Technical Specifications

May 2023

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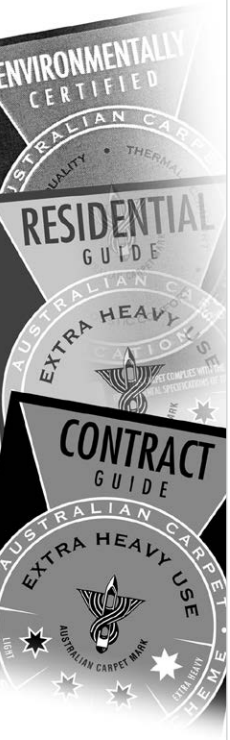

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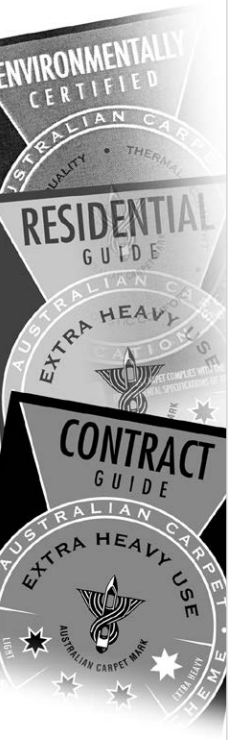
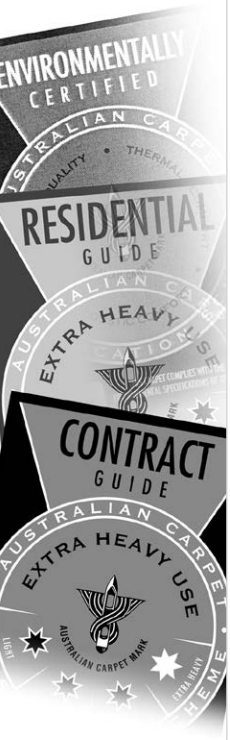




Introduction

The Australian Carpet Classification Scheme (ACCS) is a voluntary industry labelling and grading scheme for textile floor coverings (carpets) manufactured in Australia and New Zealand or imported from other countries for use within Australia.

The ACCS, a multi-fibre grading scheme is designed to provide purchasers of carpet (both residential and contract) with easy-to-understand information on carpet quality and performance in terms of durability and appearance retention (Location Guidance Classification) and environmental factors (ECS Certification).

The ACCS is a Certification Trademark Scheme. Under the Certification Agreement, signatories to the ACCS (licensees) agree to abide by strict Rules and Licensing Arrangements and are required to submit their products for assessment according to the ACCS Technical Guidelines.

This document includes a description of the criteria applying to the Environmental Certification Scheme, ECS, in section 2. Both the ACCS and ECS are accessed through application procedures that are provided in the Guidance Manual. The ECS also refers to the Code of Practice for Environmental Management; both documents are available through the Carpet Institute of Australia.

1. AUSTRALIAN CARPET CLASSIFICATION SCHEME

1.1 Summary

The ACCS awards up 90 out of a total 100 points for objectively assessed attributes described below. The remaining 10 points are awarded for 'overall product performance contribution' by an experienced industry panel. The breakdown of the allocation of points and the points allocated to durability and appearance retention is detailed in the section titled 'Methods of Calculating Points Scores for Carpet Classification and Minimum Criteria' – Refer to' Allocation of Points'.

1.2 Major technical features

1.2.1 Surface pile mass/pile height ratio

Two similar constructions of different pile height but having the same surface pile mass will perform differently. The one with lower pile height will have a higher density and therefore, a better performance. This relationship is assessed against a pile height standard of 10mm for Residential gradings and 5.5mm for Contract gradings.

The Guideline Surface Pile Mass figure used in the ACCS calculations is based on floor trials and in-service performance information gained over many years on carpets of diverse constructions and of differing fibre type combinations. For each fibre, the Guideline Surface Pile Mass is related to gauge and differs for cut or loop pile. For any fibre blend, the figures are taken in the same proportion as the components of the blend.

1.2.2 Volume density

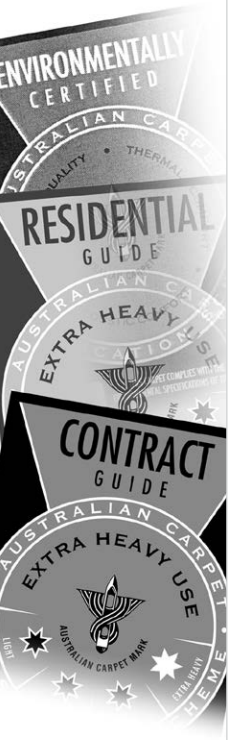
Volume density is a measure of the g/cm³ in the surface pile and is compared with a standard of 0.150g/cm³ for loop pile carpets and 0.175g/cm³ for cut pile carpets. Any carpet achieving these figures or better achieves the maximum points allocation. For example, a 'same gauge, same stitch rate' 1/8th gauge loop pile using Resultant Tex R800 yarn count almost achieves the maximum points allocation and thus, would be expected to perform well.

1.2.3 Tuft density

The tufts per square decimetre have a significant effect on durability and appearance retention. A point awarded for each 200 tufts per square decimetre up to a maximum points value.

1.2.4 Dynamic loading

This test makes an estimate of pile crushing or flattening under traffic loadings. Points awarded relate directly to test results achieved or by use of the ACCS database Dynamic Loading test results.



1.2.5 Static loading

This test measures the ability of the carpet pile to recover from flattening produced by pressure, such as under furniture. Points awarded relate directly to test results achieved or by use of the ACCS database of Static Loading test results.

1.2.6 Propensity for soiling

Research and floor trials produced ratings of resistance to soiling of carpet fibres.

The allocation of points to fibres is monitored closely and reviewed with changes in fibre technology, as well as any developments in fibre treatments.

1.2.7 Abrasion

A variety of abrasion tests have been shown to produce different relativities between fibres. There have also been large discrepancies between laboratories using the same test apparatus and method. Consequently, it is very doubtful that any single abrasion test can consistently and effectively rate all fibres across the range of carpet constructions. For these reasons an in-service performance experience-based Table of relative abrasion resistance was established.

1.2.8 Appearance retention

The overall performance, in-service or useful life of a carpet, is determined by appearance retention properties rather than the carpet being worn out due to fibre or pile loss. Appearance retention refers to the ability of a carpet to resist excessive short term and long-term appearance loss – usually seen as flattening or pile thickness loss, loss of texture or structure, colour change, or pattern loss. Appearance retention also considers the ability of the carpet to resist or conceal soiling.

The ACCS Panel believes that there is currently no single test method or test methods that accurately predict the actual appearance change in a carpet that will occur when a carpet is in-service due to the many challenges faced by carpet in a very wide variety of installations.

Another consideration is that all the recognised test methods rely on subjective assessments (tested samples compared to a set of 'standardised levels of change' samples) of the texture or structure and colour changes of the carpet pile. However, after extensive research using various test methods and comparisons with floor trials, the Hexapod Tumbler Tester method has been shown to provide the appropriate information on appearance changes likely to occur when the carpet is in use.

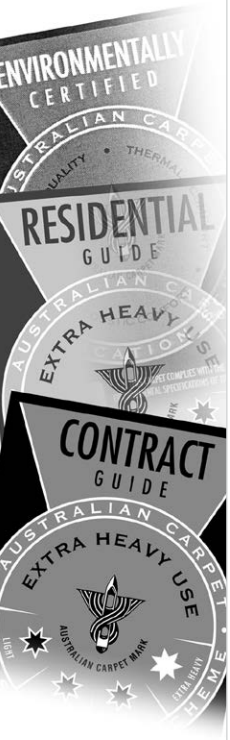
For a particular type of construction in a single fibre, useful comparisons can be made between different densities, pile heights, and pile thicknesses. It is also possible to make consistent comparisons between different constructions across the range of fibres.

As a result, the ACCS uses this test method and its results to assess the appearance retention properties for any carpet submitted for classification. In addition, there are other elements of appearance retention assessed subjectively by the ACCS Panel.

1.2.9 Hexapod tumbler tester

The Hexapod Tumbler Tester method is used by the ACCS to assess anticipated short term and long-term appearance change in the texture or structure, colour and pile thickness loss of carpets. Assessments of texture or structure and colour change, together with pile thickness loss, are made at 1,500 cycles (simulated 9-12 months in-service) and 8,000 cycles (simulated 3-4 years in-service).

In addition, the ACCS conducts an ongoing program of carpet floor trials to assess the predictability of the Hexapod results across a wide range of carpet constructions. The trials are used to monitor in-service appearance retention changes with corresponding Hexapod test results.



1.2.10 Panel assessment

Carpet classifications are assigned by the ACCS Panel. While calculated factors and the results of performance testing remain the most important determinant of the classification awarded, all carpets are subject to review by the ACCS Panel. As part of the classification procedure, the Panel awards up to 10 points for yarn and fibre characteristics (yarn twist, twist set, appearance, and construction) and pile construction and character.

1.2.11 Minimum criteria

No carpet will be classified unless it meets all the relevant criteria.

1.2.12 Additional criteria

During a previous review of the scheme, additional criteria were developed (Density Factor and Overall Appearance Factor – OAF) to further segment the Residential Heavy Duty and Residential Extra Heavy Duty categories. If a carpet is unable to meet the desired OAF and Density factors for a particular grading category, it cannot be graded at that level.

– **Density factor**

The Density Factor is the relationship between Surface Pile Mass above the backing and Pile Thickness. It measures surface mass of yarn per cubic centimetre as this provides a much better method of comparing one carpet to another, considering different pile thicknesses. The ACCS Panel has set a Density 'benchmark' for each grading classification level, fibre and construction type.

– **Overall appearance factor (OAF)**

The OAF is a point score derived from the Hexapod Tumbler Tester – the internationally used short term and long-term carpet appearance retention test. The OAF is a weighted system and uses the Hexapod results compared to calculated benchmarks and specified minimum requirements to better predict early appearance loss within the first 12 months and late appearance loss within 36-48 months of carpet life.

1.2.13 Basis of classification

Carpet qualities are classified under the ACCS labelling system according to their ability to perform in a wide range of traffic loadings in a variety of 'carpet-in-service' conditions.

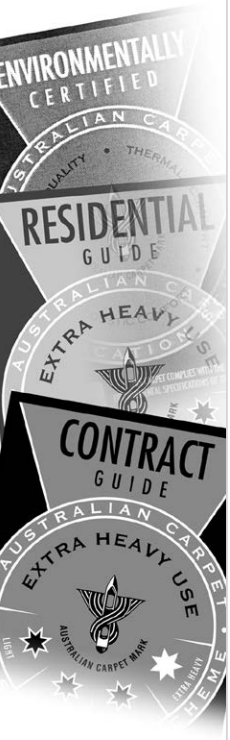
The method of determining the Location Guidance Classifications is as follows:

– the ACCS Grading Panel assigns the classification. The classification is determined after an examination of technical data supplied by Licensees, based on test results conducted by independent testing laboratories (NATA or equivalent), and a point score generated by the ACCS calculations.

– in determining the location guidance classification, the overriding criterion is the appearance retention properties of the carpet. Appearance retention assessment is reflected in both the objective scoring system (90 out of 100 points) and Panel Assessment (the remaining 10 points).

– carpet qualities submitted to the ACCS must also meet minimum standards for a range of construction and performance properties before they will be graded.

The method of calculating the ACCS points, the independent testing requirements, and the Minimum Criteria are detailed in the following section, 'Methods of Calculating Points Scores for Carpet Classification and Minimum Criteria'.



1.3 Classification categories

1.3.1 ACCS Residential Gradings

ACCS Residential Gradings

Residential carpets are rated using a 6-star classification system.

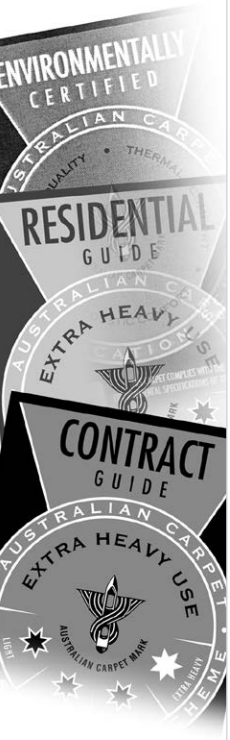
The categories are:

Residential Light Duty (RLD)	★
Residential Medium Duty (RMD)	★★
Residential Heavy Duty (RHD1)	★★★
Residential Heavy Duty (RHD2)	★★★★
Residential Extra Heavy Duty (REHD1)	★★★★★
Residential Extra Heavy Duty (REHD2)	★★★★★★

Location Guidance for ACCS Residential Carpet Gradings.

Location guide	Traffic passages per week	RLD R1*	RMD R2*	RHD1 R3*	RHD2 R4*	REHD1 R5*	REHD2 R6*
Bedroom with light traffic flow	Less than 500	✔	✔	✔	✔	✔	✔
Living room, entertainment area with light to medium traffic flow	Less than 1,500		✔	✔	✔	✔	✔
Hallway, entertainment area with heavy traffic flow	1,500 – 2,499			✔	✔	✔	✔
Hallway, entertainment area with heavy traffic flow	2,500 – 3,999				✔	✔	✔
All surface areas with extra heavy traffic flow	4,000 – 5,500					✔	✔
All surface areas with extra heavy traffic flow	4,000 – 5,500						✔

Note: A traffic passage is defined as one person walking through a particular area once.



1.3.3 ACCS contract gradings

The gold and black labels identify carpets graded for contract or commercial use. Contract ratings have a maximum of four stars. Some carpets will carry both Residential and Contract gradings.

Commercial or contract carpets are rated using a 4-star classification system.

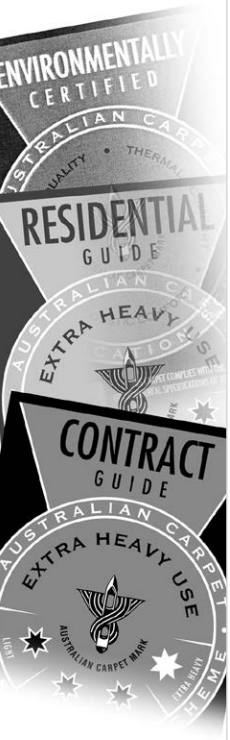
The categories are:

Contract Light Duty (CLD)	★
Contract Medium Duty (CMD)	★★
Contract Heavy Duty (CHD)	★★★
Contract Extra Heavy Duty	★★★★

1.3.4 Location guidance for ACCS contract carpet gradings.

Location guide	Traffic passages per week	CLD C1*	CMD C2*	CHD C3*	CEHD C4*
Hotel bedroom, office, shops with light traffic flow	Less than 2,999	✔	✔	✔	✔
Shop, office, hotel lounge with frequent traffic flow	3,000 – 6,999		✔	✔	✔
Busy shop, public areas, office, club, hotel with very heavy traffic flow	7,000 – 14,999			✔	✔
Very busy shop, public area, office, club, hotel with extremely heavy traffic flow	More than 15,000				✔

A traffic passage is defined as one person walking through a particular area once.



1.3.5 Suitable for use on stairs icon

The 'Stair' icon means the product is suitable for use on stairs. Carpet installed on stairs is subject to severe wear and, as a result, will demonstrate change in appearance in a shorter time than a carpet installed on a level surface. This is due to the narrow trafficking pattern, as well as the foot action that occurs on the stair tread and nosing.

A primary requirement for a carpet to be considered as 'suitable for use on stairs' is that it must meet the specifications for Residential Heavy Duty (3-stars) as a minimum. There is also a minimum pile density, a maximum pile height/pile thickness, and the carpet must not show 'grin-through to the backing' when bent around a stair nosing.

As a result of the very concentrated wear, the performance life of a carpet carrying the 'stair icon' installed on multi step stairs will be significantly reduced.

1.4 Items not covered by ACCS grading

1.4.1 Carpet Subjected to Unprotected Use by Furniture with Castor Wheels

Carpet subject to use by furniture with castor wheels, such as office chairs, is designated by carpet manufacturers globally as a 'severe-use situation'. A chair pad to protect the carpet pile, as well as the total carpet structure is necessary.

Failure to provide a chair mat to protect the carpet can result in localised severe pile distortion and pile damage. The total carpet structure can also be affected causing pile removal and loss of dimensional stability. In the case of tufted carpets, this loss of stability may be due to the breakdown of adhesion between the primary and secondary backings.

Where carpet protection is not used for furniture with castor wheels, the carpet may not perform in accordance with the Star grading recommended by ACCS and any damage to carpet found to be caused by furniture with castor wheels is unlikely to be covered by any warranty or guarantee issued by the manufacturer/ supplier of the carpet.

1.4.2 Localised severe wear

Accelerated appearance change can also occur where the carpet is subject to very concentrated or localised abrasive conditions, such as in front of chairs where there is a constant scuffing and grinding motion of footwear. For example, accelerated change in carpet appearance is usually most evident in front of seating used when television viewing.

Protective mats are an especially useful form of carpet pile protection in these areas. However, the risk of trips and falls associated with the use of loose mats needs to be carefully considered.

1.4.3 Permanent pile reversal shading effects

The phenomenon of Permanent Pile Reversal Shading (PPRS) can affect the visual appearance of carpet. However, a propensity towards pile reversal or non-pile reversal of any carpet structure cannot be assessed by testing to establish grading data or during the ACCS rating process. As a result, it is excluded from the ACCS grading system.

(Information on PPRS is available from this link – click here)

1.5 Warranties

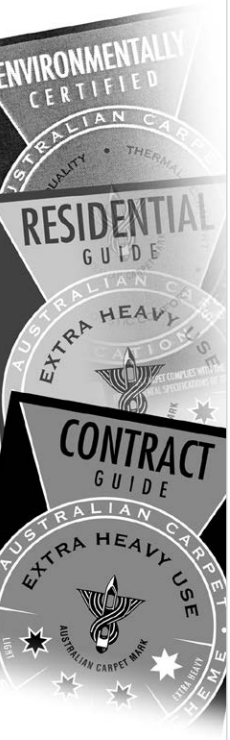
The Carpet Institute of Australia Limited (CIAL) does not provide any warranty in respect of any carpets assessed by the ACCS.

ACCS licensees may warrant their products to perform in accordance with the grading shown on the ACCS label, subject to proper installation and correct cleaning and maintenance of the carpet in line with the manufacturer's recommendations.

Most carpet manufacturers/suppliers require their products to be:

– installed in accordance with the requirements of Australian Standards AS 2455.1:2019 & AS2455.2:2019 Textile floor coverings – Installation practice – Part 1: General and Part 2: Carpet tiles and

– maintained in accordance with Australian/New Zealand Standard AS/NZS 3733: 2018 Textile floor coverings – Cleaning maintenance of residential and commercial carpeting.



1.6 Allocation of points for carpet classification

Properties for which points are allocated and the maximum values are:

Property	Points for each property	Points allocated Durability	Points allocated appearance retention
Surface pile mass/pile height	16	8	8
Volume density	20	10	10
Tuft density	9	5	4
Dynamic loading	5	0	5
Static loading	5	0	5
Propensity for soiling	14	0	14
Abrasion resistance	10	10	0
Appearance retention factors assessment	11	0	11
Sub total	90	33	57
Panel discretion	10	6	4
Total =	**100**	**39**	**61**

1.6.1 Details of points calculations

Each calculation result is rounded off to the nearest tenth of a point (0.1), up or down, depending on whether the next digit is above or below 5.

- Surface pile mass/pile height ratio (Calculated Value) – 16 points maximum value

  Points are assigned by the following calculations:

  Residential gradings

  $$\frac{\text{surface pile mass}}{\text{guideline surface pile mass}} \times \sqrt{\frac{10}{\text{pile height}}} \times 12$$

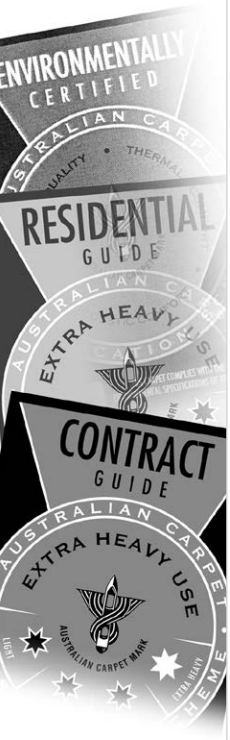
  Contract gradings

  $$\frac{\text{surface pile mass}}{\text{guideline surface pile mass}} \times \sqrt{\frac{5.5}{\text{pile height}}} \times 12$$

  The surface pile mass in g/m^2 is assessed by AS/NZS 2111.4. The pile height in millimetres is calculated from:

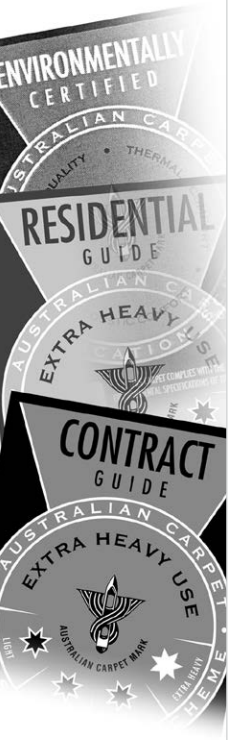
  $$\frac{\text{Surface pile mass} \times 10^4}{2 \times \text{pitch or gauge/100mm} \times \text{rows or stitches/100mm} \times \text{resultant tex}}$$

  The Guideline Surface Pile Mass for the relevant fibre and gauge is shown in the following table, the values for loop pile being lower than for cut pile. In a cut and loop construction the values are interpolated according to the percentage by area covered by each pile type.



1.6.2 Guideline weights for surface pile mass (g/m²)

Gauge	/100mm	Style	Polypropylene Spun	Nylon Spun	Polypropylene BCF	Nylon BCF	Wool	Triexta BCF	Acrylic	Polyester
1/16	63.0	Loop	555	485	415	365	695	365	655	625
		Cut	680	590	505	445	850	445	800	765
5/64	50.4	Loop	595	520	445	390	745	390	705	670
		Cut	925	635	545	475	910	475	860	820
1/10	39.4	Loop	630	555	475	415	790	415	745	710
		Cut	770	680	580	505	965	505	910	865
1/9	35.4	Loop	650	570	490	430	815	430	765	735
		Cut	795	695	600	525	995	525	935	900
1/8	31.5	Loop	670	590	505	445	840	445	795	755
		Cut	820	720	615	545	1025	545	975	920
1/7	27.6	Loop	700	610	525	460	875	460	830	790
		Cut	855	745	640	560	1070	560	1015	965
5/32	25.2	Loop	725	635	545	475	905	475	855	815
		Cut	885	775	665	580	1105	580	1045	995
1/6	23.6	Loop	740	650	55	485	925	485	875	835
		Cut	905	795	680	590	1130	590	1075	1020
3/16	21.0	Loop	770	670	575	505	960	505	905	865
		Cut	940	820	700	615	1170	615	1105	1055
1/4	15.7	Loop	840	735	630	550	1050	550	990	945
		Cut	1025	895	770	675	1280	675	1210	1155
5/16	12.6	Loop	890	780	670	585	1115	585	1055	1005
		Cut	1085	950	820	715	1360	715	1290	1225
3/8	10.5	Loop	930	815	700	615	1165	615	1100	1050
		Cut	1135	995	855	750	1420	750	1345	1280
15/32	8.4	Loop	975	850	730	640	1215	640	1130	1095
		Cut	1190	1040	890	780	1485	780	1405	1335
5/8	6.3	Loop	1020	895	765	670	1275	670	1205	1150
		Cut	1245	1090	935	820	1555	820	1470	1405



Example:

A 25.2/100mm gauge cut and loop BCF nylon has 36 stitches per 100mm, Resultant Tex 320 Yarn Count, 80% cut pile and 20% loop pile. The surface pile mass assessed by AS/NZS 2111.4 is 930g/m². The Guideline Surface Pile Mass (GPSM) for 25.2/100mm gauge BCF nylon is 580g/m² cut pile and 475g/m² loop pile, therefore for this cut/loop construction, the GSPM is: 80/100 x 580 + 20/100 x 475 = 559g/m². The calculated pile height (mm) is:

(930 x 10,000)/ (2 x 25.2 x 36 x 320) = 16

Therefore, the points calculation is:

$$\frac{930}{559} \times \sqrt{\frac{10}{16}} \times 12 = 15.78, \text{rounded to } 15.8 \text{ points}$$

1.6.3 Volume density (calculated value) - 20 points maximum

The simplest measure of density (g/m³) that works for both woven and tufted constructions is the formula: Number of tuft legs per m² x Yarn Resultant Tex)/ 1,000,000,000, noting that the Yarn Resultant Tex is the yarn count in the finished carpet. For a normal tufted or woven construction, the density in g/cm³ can be restated as:

(2 x pitch or gauge/100mm x rows or stitches/100mm x Yarn Resultant Tex)/ 10,000,000

Care must be taken to ensure that the value for Resultant Tex is the yarn count in the finished carpet considering yarn bulking and relaxation achieved during the carpet finishing processes, and any less common features such as two ends per needle or partial and double lifts in a Wilton carpet. In the former case, the yarn count is the sum of the yarn counts of the two ends.

The density figure calculated is divided by either 0.175 g/cm³ for cut or cut and loop styles, or by 0.150 for loop styles, and then multiplied by 20 to give the points for volume density, up to a maximum of 20 points.

Example (1): a loop pile carpet of 31.5/100mm gauge, 32 stitches per 100mm and R800 Tex yarn has a volume density point score of:

$$\frac{2 \times 31.5 \times 32 \times 800}{10{,}000{,}000} \times \frac{20}{0.150} = 21.5, \text{ rounded to the maximum of 20 points}$$

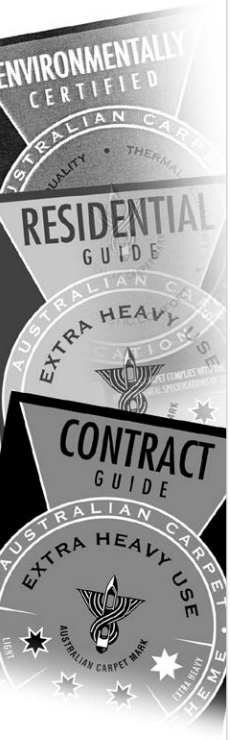
Example (2) : a cut/loop carpet of 21.0/100mm gauge, 36 stitches per 100mm and R250 Tex yarn has a volume density point score of:

$$\frac{2 \times 21.0 \times 36 \times 250}{10{,}000{,}000} \times \frac{20}{0.175} = 4.32, \text{ rounded to the maximum of 4.3 points}$$

1.6.4 Tuft density (calculated value) - 9 points maximum

A point is awarded for each 200 tufts per square decimetre up to a maximum of 9 points.

For example, if a carpet has a gauge of 32/100mm and rows of 25/100mm, the tufts/10,000mm are 800 and a points value of 4 is obtained.



1.6.5 Dynamic loading (Test method: AS/NZS 2111.2) - 5 points maximum

Points values are determined based on pile thickness loss after 1000 impacts (no recovery time) as follows:

≤ - 15 % loss	5 points
16 – 25 % loss	4 points
26 – 35 % loss	3 points
36 – 45 % loss	2 points

Points awarded relate directly to test results achieved or by use of the ACCS database for this parameter.

Note: The ACCS Panel retains the right to refuse to classify a carpet with a loss of thickness of greater than 45%.

Carpets having integral backings of foam rubber, PVC or urethane are tested after the backings have been removed as far as is practical without damaging the substrate. This does not apply to carpet tiles. The dynamic loading test is carried out with the carpet only; no underlay is to be used in the test.

1.6.6 Static loading (Test method: AS/NZS 2111.14) - 5 points maximum

Points values are based on the pile thickness loss after 24 hours recovery time, as follows:

≤ - 10 % loss	5 points
11 – 20 % loss	4 points
21 – 30 % loss	3 points
31 – 40 % loss	2 points

Points awarded relate directly to test results achieved or by use of the ACCS database for this parameter.

Note: The ACCS Panel retains the right to refuse to classify a carpet with a loss of thickness of greater than 40%.

Carpets having integral backings of foam rubber, PVC or urethane are tested after the backings have been removed as far as is practical without damaging the substrate.

This does not apply to carpet tiles. The static loading test is carried out with the carpet only; no underlay is to be used in the test.

1.6.7 Appearance retention testing (Test method: TWC 247/251/284)

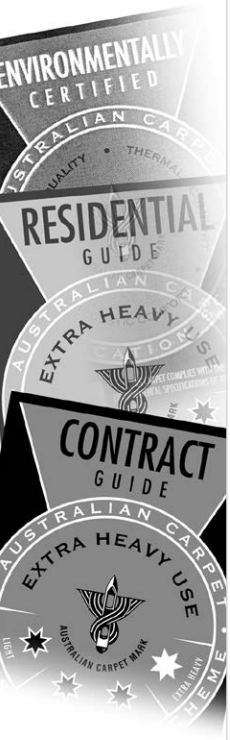
Hexapod Minimum Texture or Structure and Colour Change results for ACCS gradings are shown in the table below. Pile Thickness Loss results will be evaluated according to research data and the construction parameters of the carpet.

Carpets tested without underlay:

Cycles	Texture or Structure Change	Colour Change
1,500	3	2-3
8,000	2	1-2

Carpets tested with underlay:

Cycles	Texture or Structure Change	Colour Change
4,000	3	2-3
12,000	2	1-2



All of the Hexapod results are used to calculate an Overall Appearance (Retention) Factor (OAF) using the above Minimum criteria and calculated Benchmark values for Pile Thickness Loss.

Each Residential and Contract Grading Category has a specified minimum OAF. The OAF and the each of the individual appearance retention results achieved are further evaluated for Appearance Retention Points of 11 points maximum.

Hexapod results may also be used to assist the Panel in the allocation of Discretionary Points (10 points maximum). The ACCS Panel reserves the right to override these minimums or request the Licensee to carry out further Hexapod testing including participation in CIAL floor trial programs.

1.6.8 Propensity for soiling - 14 points maximum

Points are allocated based on accepted soiling propensity characteristics of the major carpet fibres as follows:

	Points
Wool	14
Wool/nylon: 80/20	14
*Nylon Group A	12
*Nylon Group B	11
Polypropylene	10
Triexta	11
Acrylic	6
Polyester/PET	10
Modified Rayon	2

*Nylon Group A: modified cross section with integral anti-static component
*Nylon Group B: modified cross section

1.6.9 Anti-soiling treatments

The following criteria must be observed:

– the resultant treatment must pass the chemical manufacturer's minimum standards for oil and water repellence, and dry soil resistance

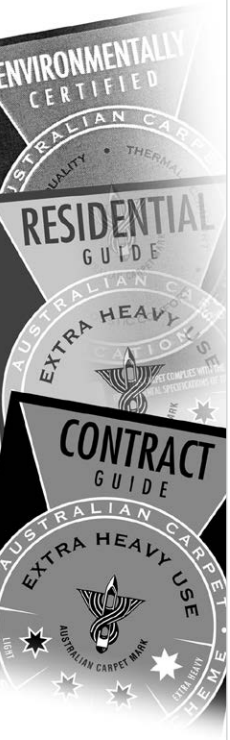
– the provision of a compliance certificate or warranty from the carpet manufacturer and/or fibre supplier in relation to the performance of anti-soiling treatments for respective end-use markets.

1.6.10 Stain resist treatments

The following criteria must be observed:

– carpet treated must achieve a level of stain resistance that satisfies the minimum requirements of the chemical manufacturer's standards appropriate to the fibre being treated

– the provision of a compliance certificate or warranty from the carpet manufacturer and/or fibre supplier in relation to the performance of stain resistant treatments for respective end-use markets.



1.6.11 Abrasion Resistance (Calculated value) – 10 points maximum

The following table contains a listing of surface pile mass wear relationship factors. Dividing 1980 g/m² by the fibre's factor gives the Guideline Surface Pile Mass (g/m²) (Abrasion) for use in calculation of the Durability points. For fibre blends, a proportion of the additional point is applied according to the components of the blend.

Fibre/ Staple	Factor	Guideline Surface Pile Mass (g/m²) (Abrasion)
Modified rayon	1.0	1980
Modacrylic	1.2	1650
Cotton	1.3	1523
Wool	1.5	1320
Acrylic	2.0	990
Polypropylene	4.8	413
Polyester	4.8	413
Nylon	5.8	341
BCF		
Polypropylene	6.0	330
Nylon	7.2	275
Polyester/PET	6.0	330
Triexta	7.2	275

The factors apply proportionally for blends. For example, 80/20 wool/nylon has a factor of: 80/100 x 1.5 + 20/100 x 5.8 = 2.36. Then, 1980/2.36 = 839 which is the Guideline Surface Pile Mass (Abrasion) for 80/20 wool/nylon. The Surface Pile Mass of the carpet being considered is divided by the appropriate Guideline Surface Pile Mass (Abrasion) and multiplied by 7 to give the Durability points score to a maximum of 10 points.

Example

A 100% wool with a Surface Pile Mass of 1000 g/m² would score 1000/1320 x 7 = 5.3 points

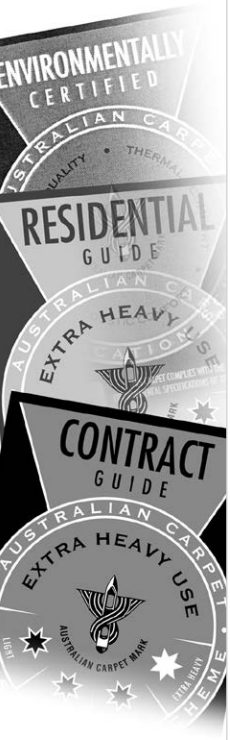
A BCF nylon with a Surface Pile Mass of 750 g/m² would score 750/275 x 7 = 19.1 rounded to the maximum 10 point

1.6.12 Discretionary points (allocated by the ACCS Panel) 10 points maximum

The ACCS Panel will award discretionary points based on a collective assessment of the various characteristics of the carpet submitted as outlined below. The Panel will collectively score the carpet on each of these factors and the individual factor scores will be totalled.

	Maximum
1. Yarn twist, twist set, appearance and construction	4
2. Pile construction and character	4
3. Special properties	2

Note: The ACCS Panel retains the right to refuse to classify a carpet submitted to protect the Scheme from a contrived construction.



1.6.13 Minimum Criteria

Schedule 6 of the ACCS General Register Form requires any product submitted for ACCS classification to be accompanied by the following declaration by the Licensee:

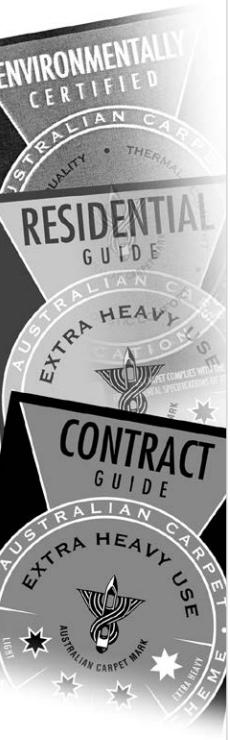
It is hereby certified that the accompanying sample of .....(carpet quality name) has been tested in accordance with Appendix B1 and, in addition, it will meet or meets the minimum criteria set out in the ACCS Section of the ACCS/ECS Technical Guidelines.

Name: Company Name

Position: Date

Minimum criteria requirements may be able to be met by submitting a test result or by certification that the product will meet or meets the minimum(s) specified.

- **Colourfastness to water**
  Test Method: AS 2001.4.EO1. Minimum result of 3-4 is required
- **Colourfastness - shampoo solution**
  Test Method: AS/NZS 2111.19.2). Minimum result of 3-4 is required
- **Colourfastness to rubbing**
  Test Method: [AWTA T52B] AS 2111.9.1. Minimum results of Wet: 3, Dry: 3-4 is required.
- **Colourfastness to light (Test Method: BS1006-B02)**
  Minimum result of 5 is required. For those products which cannot achieve rating 5, it is recommended that manufacturers state this qualification on samples.
- **Slip resistance**
  Dry Floor Friction Slip Resistance: Test Method: AS/NZS4586 Appendix B) or reference to 'Slip Resistance Assessment of Carpets for Compliance to National Construction Code of Australia EP 153410, Revision D 2020 reissue, Copyright CSIRO 2020©
- **Pilling & fuzzing - loop pile and cut/loop wool & wool blends**
  Test Method: [AWTA T44E] TWC TM 253. Minimum results for pilling of 3 and fuzzing of 3 is required
- **Soiling propensity**
  Test Method: [AWTA T86] TWC TM267. Pass levels according to the original colour
- **Oil and water repellence**
  Test Method: Water - AATCC 22; Oil: AATCC 118. If treatments have been applied, test results for oil and water repellence are required or provision of a compliance certificate or warranty from the carpet manufacturer and/or fibre supplier in relation to the performance of the stain resistant treatments for respective end-use markets
- **Thermal insulation**
  Test Method: ISO 8302:1991 or meet the 'Deemed to Satisfy' criteria required for ECS Accreditation



- **Acoustic properties**
  Test Method: AS/NZS 2107:2000, AS/NZS 1191-2002 & ISO 717-2:2004 or meet the 'Deemed to Satisfy' criteria required for ECS Accreditation

  * Note: Acoustic & Thermal Insulation results are only required if submitting data and a request for ECS Classification

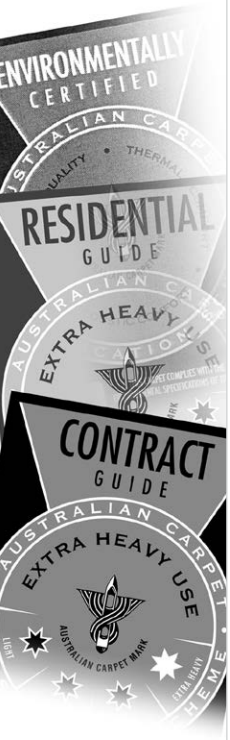
- **Secondary backing delamination**
  Test Method: AS/NZS 2111.16

The following minimums are applicable – based on a 50mm strip.

Secondary Backing Type	Open-weave Synthetic	All other Backings
Installation system: conventional underlay		
Residential	30 newtons	30 newtons
Contract	40 newtons	40 newtons
Installation system: direct stick or double stick		
Residential	30 newtons	30 newtons
Contract	35 newtons	40 newtons

- **Extractable matter**
  Test Method: AS 2001.3.4) - wool and artificial fibres 1.5%. The solvent used in this test will depend on the fibre type being tested. Note: A test result is required.

Fibre Composition	Solvent Used
100% Wool	Dichloromethane (DCM)
Wool/Nylon Blend	Dichloromethane (DCM)
Wool/Nylon/Polypropylene Blend	Petroleum Spirit
Wool/Polypropylene Blend	Petroleum Spirit
Wool/Polyester Blend	Petroleum Spirit
Wool/Nylon/Polyester Blend	Petroleum Spirit
Wool/Acrylic Blend	Dichloromethane (DCM)
100% Nylon	Dichloromethane (DCM)
100% Triexta	Petroleum Spirit
Nylon/Polypropylene Blend	Petroleum Spirit
100% Polypropylene	Methanol
100% Polyester	Petroleum Spirit
Polyester Blend	Petroleum Spirit
100% Acrylic	Dichloromethane (DCM)

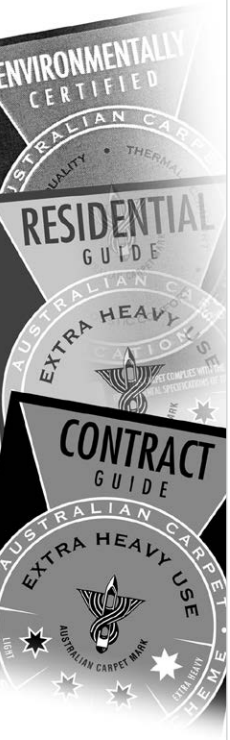


- **Tuft anchorage**
  Test Method: AS/NZS 2111.15. The following minimums are applicable.

	Residential	Contract
Woven Carpet Construction		
Loop	10 newtons	10 newtons
Cut	3 newtons	6 newtons
Tufted Carpet Construction		
Loop	20 newtons	30 newtons
Cut/Stepover*	6 newtons	6 newtons
Cut**	10 newtons	10 newtons

* A construction of 'stepover' or 'crossover' stitching has a requirement of 6 newtons
** All other cut constructions have a requirement of 10 newtons

- **Burning behaviour**
  Must pass AS/NZS 2111.18 when read in accordance with AS 2404. Note: A test result is required.
- **Foam delamination**
  Test Method: AS/NZS 2111.16. - Residential only, 50mm strip, 6 newtons.
- **Foam density**
  Test Method: BCMA 1076. Residential only, 0.17g/ cm^3
- **Ageing properties – foam backed carpet**
  A sample of carpet should be subjected to 12°C for 48 hours in an air-circulating oven. The sample is removed and conditioned to room temperature, then bent through 180°. The sample should not rupture or crack on bending.
- **Minimum twist for certain yarns**
  Minimum twist for balance plied heat-set BCF Nylon finished yarns on cone shall be 145 turns per metre (tpm) in the range 2 x 1000 to 2 x 1500 decitex and 135 tpm for those yarns exceeding 2 x 1500 decitex.
- **Insect resist treatments**
  Where yarns used in the carpet are wool or wool blends, the pile fibre should be treated to resist moth and carpet beetle attack by applying an approved insecticide in accordance with the ACCS Panel requirements. The current requirements are as per Woolmark Specification CP-4 – Products for the Insect Resist Treatment of Wool.



1.7 APPENDIX A:

Table 1: ACCS Grading Specifications, Table 2: Panel Discretionary Points, Table 3: Grade & Carpet type, Required Minimum Points and Traffic Passages/Week

Table 1: ACCS Grading Specifications

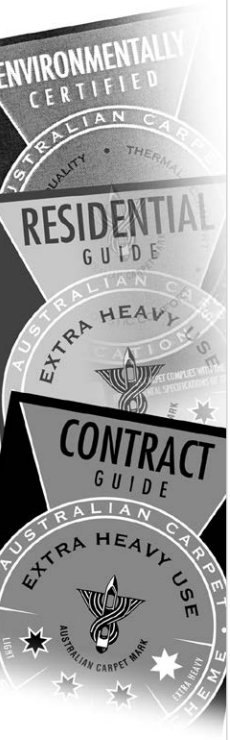
NYLON		WOOL (80 TO 100%)		WOOL BLEND (0 TO 79% WOOL)		POLYPROPYLENE		POLYESTER	WOVEN
LOOP PILE	CUT PILE	LOOP PILE	CUT PILE	LOOP PILE	CUT PILE	LOOP PILE	CUT PILE	CUT PILE	
★ RESIDENTIAL LIGHT DUTY									
37-46 points	37-46 points	37-46 points	37-46 points	37-46 points	37-46 points	37-46 points	37-46 points	37-46 points	37-46 points
★★ RESIDENTIAL MEDIUM DUTY									
47-57 points	47-57 points	47-57 points	47-57 points	47-57 points	47-57 points	47-57 points	47-57 points	47-57 points	47-57 points
★★★ RESIDENTIAL HEAVY DUTY (Lower to Mid Range)									
Existing RHD or min. 58 points	Existing RHD or min. 58 points	Existing RHD or min. 58 points	Existing RHD or min. 58 points	Existing RHD or min. 58 points	Existing RHD or min. 58 points	Existing RHD or min. 58 points	Existing RHD or min. 58 points	Existing RHD or min. 58 points	Existing RHD or min. 54 points
★★★★ RESIDENTIAL HEAVY DUTY (Mid to Higher Range)									
min. 58 points and density 0.090g/cm³ and 3.5 OAF or 70 contract points or existing CMD	min. 58 points and density 0.103g/cm³ and 3.5 OAF or 70 contract points or existing CMD	min. 58 points and density 0.136g/cm³ and 2.7 OAF or 70 contract points or existing CMD	min. 58 points and density 0.139g/cm³ and 2.7 OAF or 70 ontract points or existing CMD	min. 58 points and density 0.138g/cm³ and 3.0 OAF or 70 contract points or existing CMD	min. 58 points and density 0.140g/cm³ and 3.0 OAF or 70 contract points or existing CMD	min. 58 points and density 0.120g/cm³ and 2.7 OAF or 70 contract points or existing CMD	min. 58 points and density 0.138g/cm³ and 3.0 OAF or 75 contract points or Floor trial results	min. 58 points and density 0.138g/cm³ and 3.0 OAF or 75 contract points or Floor trial results	min. 54 points and density 0.126g/cm³ and 2.7 OAF or 62 contract points or existing CMD
★★★★★ RESIDENTIAL EXTRA HEAVY DUTY (Lower to Mid Range)									
min. 69 points and density 0.090g/cm³ and 3.5 OAF or 70 contract points or existing CMD	min. 69 points and density 0.103g/cm³ and 3.5 OAF or 70 contract points or existing CMD	min. 69 points and density 0.136g/cm³ and 2.7 OAF or 70 contract points or existing CMD	min. 69 points and density 0.139g/cm³ and 2.7 OAF or 70 contract points or existing CMD	min. 69 points and density 0.138g/cm³ and 3.0 OAF or 70 contract points or existing CMD	min. 69 points and density 0.140g/cm³ and 3.0 OAF or 70 contract points or existing CMD	min. 69 points and density 0.120g/cm³ and 2.7 OAF or 70 contract points or existing CMD	min. 69 points and density 0.138g/cm³ and 3.0 OAF or 75 contract points or Floor trial results	min. 69 points and density 0.138g/cm³ and 3.0 OAF or 75 contract points or Floor trial results	min. 64 points and density 0.126g/cm³ and 2.7 OAF or 62 contract points or existing CMD
★★★★★★ RESIDENTIAL EXTRA HEAVY DUTY (Mid to Higher Range)									
min. 69 points and density 0.120g/cm³ and 3.5 OAF or 78 contract points or existing CHD	min. 69 points and density 0.140g/cm³ and 3.5 OAF or 78 contract points or existing CHD	min. 69 points and density 0.140g/cm³ and 3.0 OAF or 78 contract points or existing CHD	min. 69 points and density 0.143/cm³ and 3.0 OAF or 78 contract points or existing CHD	min. 69 points and density 0.143g/cm³ and 3.2 OAF or 78 contract points or existing CHD	min. 69 points and density 0.145g/cm³ and 3.2 OAF or 78 contract points or existing CHD	min. 69 points and density 0.132g/cm³ and 2.7 OAF **and either** 70 calculated points or 78 contract points	min. 69 points and density 0.150g/cm³ and 3.5 OAF or 80 contract points or Floor trial results	min. 69 points and density 0.150g/cm³ and 4.0 OAF or 80 contract points or Floor trial results	min. 69 points and density 0.130g/cm³ and 3.0 OAF or 69 contract points or existing CHD

Table 2: Panel discretionary points

PANEL DISCRETIONARY POINTS	
Yarn twist, twish set, appearance and construction	4 points
Pile construction and character	4 points
Special properties	2 points

Table 3: Grade and Carpet type related to Required Minimum Points and Traffic Passages/Week

RESIDENTIAL	OTHER THAN WOVEN POINTS	WOVEN POINTS	RESIDENTIAL TRAFFICKING PASSAGES PER WEEK	CONTRACT	OTHER THAN WOVEN POINTS	WOVEN POINTS	CONTRACT TRAFFICKING PASSAGES PER WEEK
Light Duty	37-46		Less than 500				
Medium Duty	47-57		Less than 1,500				
Heavy Duty/Stairs	58-68	54-63	1,500-3,999	Light Duty/Stairs	60-69	60-63	Less than 2,999
Extra Heavy Duty/Stairs	69+	64+	4,000-5,500	Medium Duty/Stairs	70-77	64-68	3,000-6,999
				Heavy Duty/Stairs	78+	69+	7,000-14,999
				Extra Heavy Duty/Stairs	Panel Discretion	Panel Discretion	More than 15,000



1.8 APPENDIX B: B1 – Test methods for ACCS grading submissions

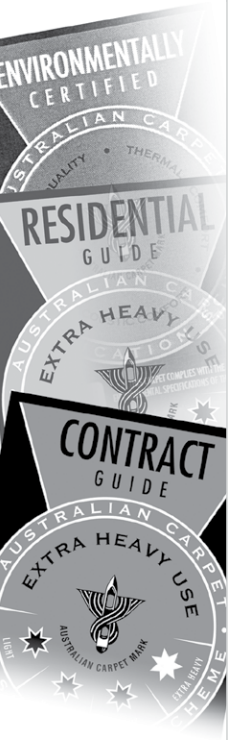
Test method	Test method description
AS/NZS 2111.4-1996	Determination of surface pile mass above the substrate
AS/NZS 2111.5-1996	Determination of thickness of pile above the substrate
AS/NZS 2111.9-1996	Determination of the number of tufts per unit length and per unit area
AS 2001.3.4-1995	Determination of solvent soluble matter
TWC TM 247/251/284 (2009)	Changes in surface texture and colour of textile floor covering s (Hexapod Test) Note: TM284 Pile thickness measurement of a textile floor covering before and after the hexapod test
AS 2111.18-1997	Burning behaviour – Tablet test at ambient temperature Note: Result(s) to be read in conjunction with AS 2404

Appendix B: B2 - ACCS quality assurance assessments (when required

Test method	Test method description
AS/NZS 2111.4-1996	Determination of surface pile mass above the substrate
AS/NZS 2111.5-1996	Determination of thickness of pile above the substrate
AS/NZS 2111.9-1996	Determination of the number of tufts per unit length and per unit area
TWC TM 247/251/284 (2009)	Changes in surface texture and colour of textile floor coverings (Hexapod Test) Note: TM284 Pile thickness measurement of a textile floor covering before and after the hexapod test

1.9 APPENDIX C – Changes to the sample and data assessed by the ACCS panel

After a product is awarded an ACCS grading, any changes made i.e., carpet construction or change of component supplier(s), the licensee must confirm that the main construction parameters of the graded carpet are true to the registered ACCS product specification by submitting to the Panel an Abbreviated ACCS QA Test Report from a NATA registered laboratory. (Refer Appendix B: B2).



2 ACCS ENVIRONMENTAL CERTIFICATION SCHEME

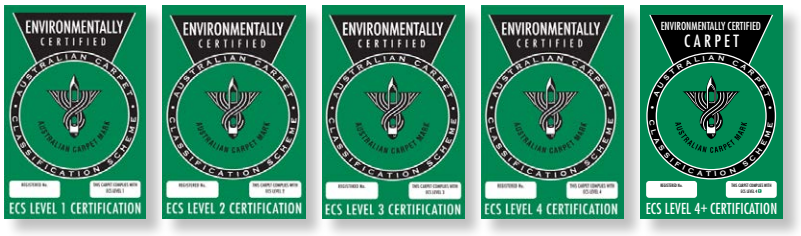
2.1 Introduction

The ACCS ECS Carpet technical Specifications provides a guide to the environmental performance of certified textile floor covering products through their full lifecycle. In this case, lifecycle is defined as the processes involved in the production of raw materials, manufacturing of carpet, installation and use of carpet through to its final disposal, recycling, or reuse.

2.2 Certification categories

The ECS consists of 5 levels of certification and requires licensees of the scheme to satisfy incrementally more demanding performance criteria.

ECS Level 1	Entry Level Certification
ECS Level 2	Raw Materials
ECS Level 3	Manufacturing
ECS Level 4	Product Stewardship[1]
ECS Level 4+	Extra Performance Criteria

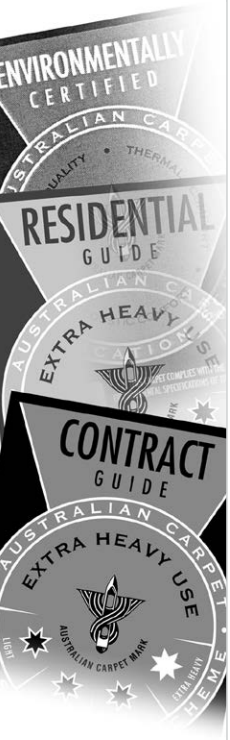


ECS Levels 1, 2, 3, 4 and 4+ have been developed to align with the requirements of Green Building Council of Australia's (GBCA) Responsible Products Framework values (RPV).

2.3 Overview of performance requirements

These requirements, shown in the first column of the following Table, are accumulative. Hence the criteria for Levels 1, 2 and 3 carry through to ECS Levels 4 and / or 4+.

ECS Level 1	**Status**	**Cumulative RPV points**
Environmental management	core	1
Current ACCS rating	core	0
Achieves IAQ, acoustical and thermal insulation benchmarks (customer health)	core	1 2 points
ECS Level 2		
Raw materials (toxicity) declaration	core	0
Public disclosure of raw materials	core	1
Risk based chemical assessment to limit exposure	core	0
Manufacturing Health & Safety		1
Industry environmental product declaration		1 5 points
ECS Level 3		
Manufacturing declaration	core	0
Health product declaration	core	2 7 points
ECS Level 4		
Product stewardship	core	0 7 points



ECS Level 4+	Status	Cumulative RPV points
Manufacturing improvement		
Energy use reduction	core	1
Water use reduction	core	0
Waste reduction	core	2
Carbon emissions reduction	core	1
Modern slavery declaration	core	1
		12 points
Product declarations		
Product EPD	elective	5
Environmental impact reduction	elective	0
No chemicals of concern	elective	2
Other environmental impacts reduction	elective	0
Material extraction reduction	elective	0
Carbon neutral product	elective	3
	at the discretion of the licensee	22 points

To obtain ECS Level 1 (entry level) certification, licensees are required to complete the core (meaning mandatory) units shown in the Table above to achieve 2 RPV points.

ECS Levels 2 and 3 have additional performance requirements, all of which must be satisfied to achieve these certifications.

ECS Level 4 (Product stewardship) is the key performance criterion.

The top certification, ECS Level 4 +, requires licensees to:

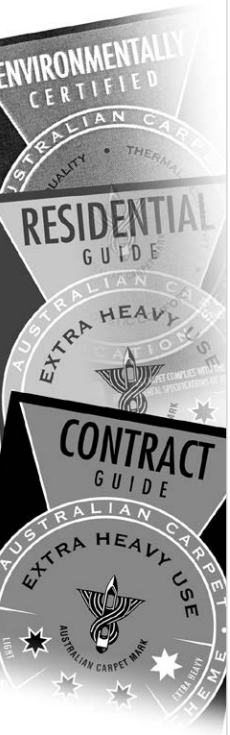
satisfy the requirements of ECS Levels 1, 2, 3 and 4;
meet the core performance criteria under Manufacturing improvement;
at the licensee's discretion additional elective criteria may be satisfied to gain extra ECS points to a maximum of 22.

2.4 Detailed performance requirements

2.5 ECS Level 1

Fitness for purpose criterion

The aim of this criterion is to ensure that an ECS certified textile floor covering has a positive effect on indoor environmental quality and is fit for its intended use.



The performance requirements are as follows:

2.5.1 Current ACCS location guide rating

A certified textile floor covering must be graded by the Australian Carpet Classification Scheme (ACCS). The ACCS classifies textile floor coverings according to their suitability for use in residential and contract installations. ACCS assesses the durability and appearance retention properties of textile floor coverings.

If at the time of application for ECS certification the ACCS grading is more than two years old, the licensee must demonstrate that the main construction parameters of the product remain within 5% manufacturing tolerance of the original specification registered with the ACCS. This requires the licensee to have the product tested at a NATA registered laboratory to the requirements of the ACCS Abbreviated Quality Assurance Test Package.

The licensee must provide an ACCS Abbreviated Quality Assurance test report from a NATA registered laboratory if the ACCS grading was awarded more than two years prior to date of the application for environmental certification.

2.5.2 Code of Practice for Environmental Management

The manufacturer of the carpet must sign and agree to be bound by the provisions of the attached ECS Code of Practice for Environmental Management.

The Code of Practice provides performance standards for choice of raw materials and their production, good environmental manufacturing practices with appropriate measures to control environmental impacts, reduce raw material consumption and performance reporting. The manufacturer must provide a safe and healthy manufacturing environment.

In addition, the Code of Practice includes a section on product stewardship with recommended practices for carpet installation and uplifted carpet disposal. This requires the manufacturer to provide information about the systems available to reduce environmental impacts at installation, during use and at the end of the carpet's life.

2.5.3 Indoor Air Quality

The aim of the criterion is to ensure that emissions of Volatile Organic Compounds (VOCs) from environmentally certified carpets do not exceed prescribed target levels for total emissions and 13 chemicals of concern.

The certified carpet must pass a test in which its emissions of VOCs are assessed to be below the criteria set out in the Table:.

Chemical of Concern	**Criterion Maximum Emission Factor (24 hr) µ/h/m²**
Acetaldehyde	20
Benzene	55
Caprolactam	120
2-Ethylhexanoic Acid	46
Formaldehyde	10
1-Methyl-2-Pyrrolidone	300
Naphthalene	20
Nonanal	24
Octanal	24
4-Phenylcyclohexene	50
Styrene	410
Toluene	280
Vinyl Acetate	400
2-Ethyl-1-Hexanol	50
Hydrocarbons (C10 – C14)	300
Vinyl Cyclohexene	85
Xylenes	50
MAXIMUM TOTAL VOC	**500**

Testing must be undertaken according to the test method: ISO 10580:2010 Resilient, textile and laminate floor coverings – Test method for volatile organic compound (VOC) emissions.

This standard method provides a 24-hour emission rate for VOC emissions immediately after carpet manufacture. The emission rate is measured as an emission factor (EF) in micro grams per square metre of floor covering per hour.

The licensee shall provide a relevant test report from a NATA registered laboratory provided as per the declaration in Schedule 11 – Product Emissions provided in the ECS Carpet Guidance Manual.

2.5.4 Acoustic Performance

Textile floor coverings function in an indoor environment to dampen the noise level by, first, **sound absorption** – carpet increases the amount of sound absorption in a room and reduces 'reverberation' (the term used to describe the degree to which sounds live on within a room). And second, – **impact sound isolation** – a carpeted floor almost eliminates impact noises produced by footsteps, items dropped on the floor and chair legs scraped across a floor.

These factors are critical to the indoor environment as high background noise levels can create stress and productivity loss in work areas. To ensure good speech intelligibility, a room needs a Reverberation Time (T60) not more than 1 second for normal speech.

The ECS acoustic criteria for Textile Floor Coverings are shown in the Table below. The required Impact Sound Ratings of both broadloom and modular carpet easily exceed the National Construction Code of Australia requirements for Class 2 and 3 buildings, demonstrating that carpet provides a superior acoustic environment.

Acoustic Criteria for Textile Floor Coverings

	Impact Sound Insulation Ln,w[1](dB)	Noise Reduction Coefficient / NRC[2] (Reverberation Control)
ACCS ECS – Broadloom carpet [3]	≤ 50	≥ 0.20
ACCS ECS – Modular carpet [3]	≤ 55	≥ 0.15
NCC (Class 2 and 3 buildings)	≤ 62	Not applicable

Notes:

1. Ln,w = 'Weighted normalized impact sound pressure level'. Impact sound insulation of the floor is measured in accordance with ISO 10140-3 and the single figure rating is calculated in accordance with ISO 717-2. Lower rating = better impact sound control.
2. The single figure NRC is determined in accordance with ISO 354 (reverberation chamber method) or ISO 10534.2 (impedance tube method). Higher rating = better reverberation control.
3. The ECS impact criteria for Textile Floor Coverings are defined in relation to a 150 mm thick concrete slab without a ceiling installed in the space below. Different ratings may be met by the floor coverings installed with lightweight floor / ceiling systems.
4. Measurements used to determine Impact Sound Pressure Level Ln,w and Noise Reduction Coefficient NRC should be undertaken in laboratories that conform to ISO 10140-5.

The ECS Actual and Deemed to Satisfy criteria for broadloom and modular textile floor coverings are:

Broadloom Carpet

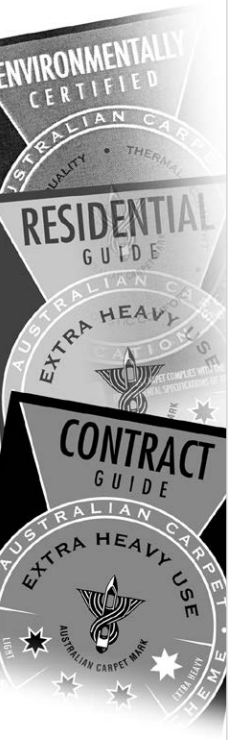
- Actual: NRC - ≥0.20
- Deemed to Satisfy: Pile thickness - ≥5.0 mm.

NOTE:
The licensee will be required to submit an acoustic test report for a product with measured pile thickness less than the 5.0 mm benchmark. The Panel will accept as evidence of compliance an acoustic test report demonstrating that the product has an NRC - ≥0.20 and an Ln,w ≤ 50 dB.

Modular and Broadloom with a Pile Thickness of ≤5.0 mm

- Actual: NRC ≥0.15
- Deemed to Satisfy: Pile thickness - ≥3.0 mm

NOTE:
The licensee will be required to submit an acoustic test report for a product with measured pile thickness less than the 3.0 mm benchmark. The Panel will accept as evidence of compliance acoustic test reports demonstrating that the product has an NRC - ≥0.15 and an Ln,w ≤ 55 dB.



2.5.5 Thermal Insulation

The comfort factor supplied by carpet is due to its insulating and low thermal conduction properties. Thermal comfort also translates into energy and Greenhouse savings in room heating and cooling.

A certified carpet must meet the relevant criterion specified in the Table below:

The test method required for thermal insulation is ISO 8302:1991 Thermal Insulation - Determination of Steady State Thermal Resistance and Related Properties - Guarded hot plate apparatus.

Table: Thermal Insulation Criteria for Textile Floor Coverings

	"R" value (m2K/W
ACCS ECS Broadloom carpet Category A / Category B	≥ 0.10
ACCS ECS Modular carpet	≥ 0.075

NOTE. The R – value for thermal resistance, measured in metric units of watts per metre squared per degree Kelvin, varies with the thickness of the carpet installation.

The ECS Actual and Deemed to Satisfy criteria for broadloom and modular textile floor coverings are:

Category A: Broadloom with a Pile Thickness of >5.0 mm

- Actual: R-value - ≥0.10
- Deemed to Satisfy: Pile Thickness Density Factor (PTD*)
  - Synthetic: PTD - ≥30
  - Wool and wool rich blend: PTD - ≥20

Category B: Broadloom with a Pile Thickness of ≤5.0 mm and Modular

- Actual: R-value - ≥0.075
- Deemed to Satisfy: PTD - ≥15

NOTE:
*Calculation of PTD: [Pile thickness (mm) above backing]^2 x 1000 /Surface pile mass (g/m^2)]

2.6 ECS Level 2

2.6.1 Raw materials (toxicity)

The aim of this criterion is to:

– restrict or ban the use in certified textile floor coverings of toxic substances, heavy metals and hazardous substances; and

– ensure that any substance with an adverse health effect is kept at a level below the No Observable Adverse Effect Level (NOAEL) for that substance during the useful life and at the end of life of the textile floor covering.

It is recognized that some regulated substances may be inadvertently produced in manufacture or may be present although not declared in proprietary products used in carpet manufacture. It is incumbent on manufacturers to ensure that carpets do not contain more than 0.1% by weight of these substances unless a lower concentration is required in other sections of this document.

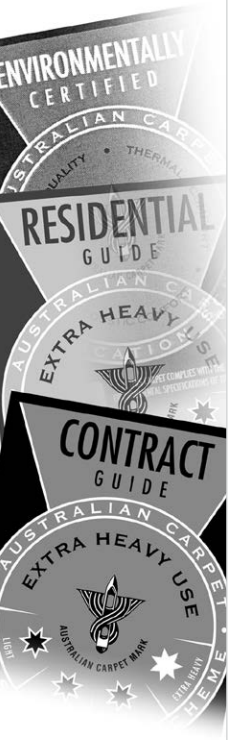
Manufacturers must examine Safety Data Sheets (SDS) to identify chemicals that are either banned, limited in the final product, or of concern to evaluate compliance with the ACCS ECS Carpet Technical Specifications.

Additionally, selection criteria for raw material suppliers should include their ability to control environmental outcomes, reporting on environmental performance and their regulatory compliance record.

Attachment 1 provides guidance on the evaluation of raw material toxicity.

Regulated Substances that Must Not be Used in the Production of Textile Floor Coverings

Attachment 2 contains a list of banned chemicals. For the purposes of the ACCS ECS Carpet Technical Specifications, banned substances include:



– all materials that are not registered for use in Australia by the National Industrial Chemicals Notification and Assessment Scheme (NICNAS) in the Australian Inventory of Chemical Substances (AICS)
– IARC classified carcinogens in groups 1 and 2A available at http://monographs.iarc.fr/ENG/Monographs/vol91/index.php
– Substances listed in the Stockholm Convention on Persistent Organic Pollutants (Annex A) available at http://chm.pops.int/Convention/tabid/54/language/en-US/Default.aspx
– Substances classified as carcinogenic, mutagenic, or reproductive toxins (CMR) Categories 1 and 2 listed in Annex 1 of EU Directive 67/548/EEC available at http://www.reach-compliance.eu/english/legislation/docs/launchers/launchannex-1-67-548-EEC.html
– Chemicals listed in Annex III of the Rotterdam Convention as toxic industrial chemicals and pesticides with impacts on human health and ecology
– Substances with a hazard rating provided in the SDS under the Globally Harmonised System (GHS) for chemical labelling.

A list of banned dyestuffs is contained in Attachment 3.

Attachment 4 contains a list of controlled or restricted use chemicals, in the production of textile floor coverings.

A maximum level of toxic heavy metals shall be restricted to below the NOAEL as determined as the Health Investigation Level (HIL A) for metals listed in Table 5-A of Schedule B (1) of the National Environmental Protection Measures (NEPM).

This covers the following metals: Arsenic, Barium, Beryllium, Cadmium, Chromium (III and VI), Cobalt, Copper, Lead, Manganese, Mercury, Nickel and Vanadium.

- **Monomer residues**

The monomer residues present in the polymeric substances used to manufacture textile floor coverings shall be restricted to a maximum concentration in the finished polymer of 10 mg/kg of the polymer weight. The VOC emission requirements take precedence over this limit.

- **Substances of concern**

Other substances that have an elevated level of concern may be found at: http://echa.europa.eu/chem_data/authorisation_process/candidate_list_table_en.asp

Products containing these substances at levels greater than 0.1% by weight must be registered if entering EU countries on or before June 1, 2011 http://echa.europa.eu/doc/candidate_list/candidate_list_obligations.pdf.

The EU REACH "Substitute It Now" (SIN list) reviewed as PBT, CMR or of equivalent concern should be consulted as a source of chemicals of concern - available at http://www.chemsec.org/list/use-the-sin-list

Some worked examples of chemical evaluation are contained in Attachment 5.

The material formulations of the certified textile floor covering must be provided by the licensee together with a declaration of compliance with the above-mentioned criteria supported by Safety Data Sheets and relevant test reports.

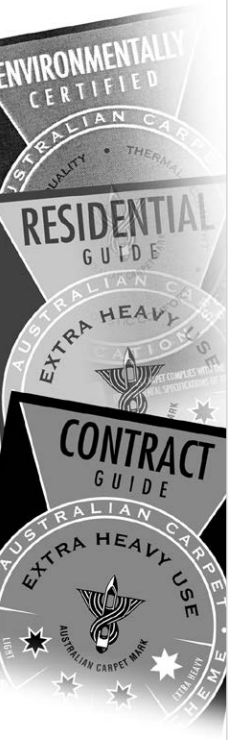
2.6.2 Public disclosure of raw materials

Licensees must declare the components of the product publicly so that this data is available to consumers. The ECS administration will take random checks of this data to confirm its accuracy.

The raw materials declaration form must be used as provided in Schedule 9 – Raw Materials (ECS Carpet Guidance Manual).

2.6.3 Industry environmental product declaration

This criterion is satisfied because the Carpet Institute of Australia, the administrator of the ECS, has produced compliant EPDs for carpets manufactured in Australia and New Zealand. The publication numbers of these EPDs are EPD-CIA-20210345-CBH-EN and EPD-CIA-20210316-CBH-EN.



2.7 ECS Level 3

2.7.1 Manufacturing declaration

The aim of this criterion is to promote good environmental practice at the plant-level by requiring licensees to collect relevant data with a view to optimizing production processes and mitigating any consequential adverse environmental impacts.

- **Data collection**

Licensees are required to gather data on material and energy usage and waste generation with a view to optimizing the production process to achieve better environmental outcomes at the plant level.

- **Process improvement to achieve better environmental outcomes**

As part of this criterion, licensees are required to:

– monitor water consumption as a function of production and develop water conservation strategies, which may include recycling cooling water and other clean wastewater streams; rainwater harvesting and use and appropriate boiler management

– apply the hierarchy of waste management to all waste streams in all manufacturing processes:

  o avoid or reduce the waste
  o recover and reuse the waste
  o recycle the waste raw materials
  o recover energy in wastes
  o dispose of wastes safely.
  o ensure that no recyclable materials can be co-mingled with solid waste – paper and cardboard, drink cans, metals, or recyclable plastics. These materials will be collected for external recycling
  o segregate and recycle soft fibre, face fibre yarn and other mono-compositional wastes.

– an environment management system in line with the requirements of ISO 14001 will facilitate regular environmental monitoring and reporting.

Licensees must seek to optimize materials sourcing and production processes in accordance with resource and materials efficiency measures that reduce negative environmental impacts from materials sourcing, use and disposal of environmentally certified textile floor coverings.

These measures may include, but are not limited to:

– use of recycled materials
– use of rapidly renewable materials
– reduction and and/or reuse of manufacturing waste
– dematerialization

The licensee shall provide a declaration of compliance with the criterion (Schedule 12 ECS Carpet Guidance Manual) and supporting documentation.

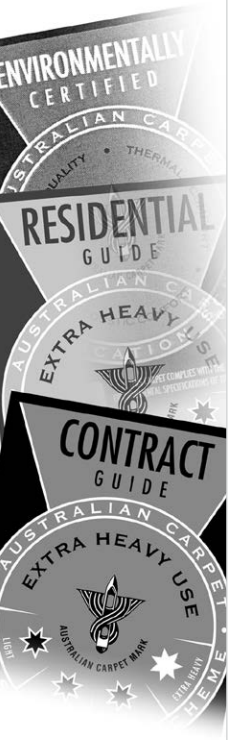
2.7.2 Public disclosure of health impacts of material ingredients

The Health Product Declaration must include all materials and substances that are a part of the carpet concerned (or family of carpets) and provide their impact to human health and to the environment, even if the substances are not currently regulated. The declaration must screen all substances for toxic impact.

The declaration must be published to the rules and in a format as set out in the Open Standard for Health Product Declarations and be publicly available on the licensee's website.

The Health Product Declaration must include the declaration form as provided in Schedule 9b – Health Product Declaration (ECS Carpet Guidance Manual).

[1] Health Product Declaration Collaborative www.hpd-collaborative.org



2.8 ECS Level 4

2.8.1 Product stewardship

The aim of this criterion is to maximize textile floor coverings useful life and then minimize the impacts to the environment associated with disposal of the product after recycling and reuse options are exhausted.

In the interests of extending the useful life of certified products, licensees and/or suppliers of textile floor coverings shall be required to provide advice to purchasers on proper installation and maintenance in line with the requirements of:

- AS 2455.1:2019 (Textile Floor coverings – Installation Practice – Part 1: General)
- AS 2455.2:2019 (Textile Floor coverings – Installation Practice – Part 2: Carpet tiles)
- AS/NZS 3733: 2018 Textile floor coverings – Cleaning maintenance of residential and commercial carpeting

Licensees and/or suppliers of certified textile floor coverings must have a product stewardship program in place. The program shall be publicly available and include contractual arrangements with their customers to take back product at the end of the products' useful life for reuse, recycling or reprocessing.

Licensees and/or suppliers of certified textile floor coverings must provide independent verification that the product stewardship program is in place and can deliver the outcomes claimed by the licensee. The declaration to be provided to the ACCS panel is Schedule 13 in the ECS Carpet Guidance Manual.

2.9 ECS Level 4+

The following criteria are core performance requirements that must be met to gain ECS Level 4+.

Manufacturing improvement

2.9.1 Energy use reduction

The aim of this criterion is to require manufacturers to achieve year on year improvements in energy consumed per square meter of certified textile floor covering produced.

The licensee is required to report on all forms of energy usage in the production of certified textile floor coverings, in the most recent and previous year.

To satisfy this credit a 5% reduction in energy use over 5 years or a 1% reduction per year over the same period, must be achieved

2.9.2 Water use reduction

The aim of this criterion is to require manufacturers to achieve year on year improvements in water usage per square meter of certified textile floor covering produced.

The licensee is required to report on water usage in the production of certified textile floor coverings, in the most recent and previous year.

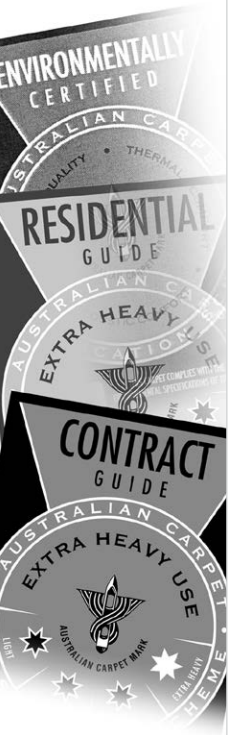
To satisfy this credit a 5% reduction in water use over 5 years or a 1% reduction per year over the same period, must be achieved.

2.9.3 Waste reduction criterion

The aim of this criterion is to require manufacturers to achieve year on year improvements in waste reduction per square meter of certified textile floor covering produced.

The licensee is required to report on waste streams in the production of certified textile floor coverings, in the most recent and previous year.

To satisfy this credit a 5% reduction in waste over 5 years or a 1% reduction per year over the same period, must be achieved.



2.9.4 Carbon emission reduction

The aim of this criterion is to require manufacturers to achieve year on year reductions in carbon emissions per square meter of certified textile floor covering produced.

The licensee is required to report on carbon emissions in the production of certified textile floor coverings, in the most recent and previous year.

Carbon emissions must be calculated according to Government protocols e.g. the National Greenhouse energy reporting framework.

To satisfy this credit a 5% reduction in carbon emissions over 5 years or a 1% reduction per year over the same period, must be achieved.

Licensees must report on manufacturing efficiency measures annually using the Manufacturing declaration form (Schedule 12) available in the ECS Carpet Guidance Manual.

2.9.5 Modern slavery declaration criterion

The aim of this criterion is to require manufacturers to investigate, act on and report on:

– the risks of modern slavery in their operations and supply chains,

– findings of supply chain investigations and corrective actions undertaken to address these risks

– annual updates of plans to address all modern slavery risks .

The declaration must be published in a format as set out in the federal Government document entitled – Commonwealth Modern Slavery Act 2018 - Guidance for Reporting Entities - https://antislavery.org.au/commonwealth-modern-slavery-act-2018-guidance-for-reporting-entities/

The declaration and annual updates must be publicly accessible on the licensee's website and /or the Commonwealth Modern Slavery Statements Register. The licensee should use the declaration form provided in Schedule 14f of the Guidance Manual.

The following criteria for ECS Level 4+ are elective and can gain the licensee additional ECS points

Elective (non core) Level 4+ criteria

2.10 Product specific declarations

2.10.1 Environmental product declaration

The aim of this criterion is to encourage manufacturers to have a publicly available declaration showing the life cycle environmental impacts of specific classes of textile floor coverings, in accordance with a recognised standard e.g. EN 15804 achieve year on year reductions in carbon emissions per square meter of certified textile floor covering produced.

The EPD must be written in accordance with the Product Category Rules: Floor Coverings (2018) with a functional unit of 1m2 of textile floor covering over one year of use and be officially registered.

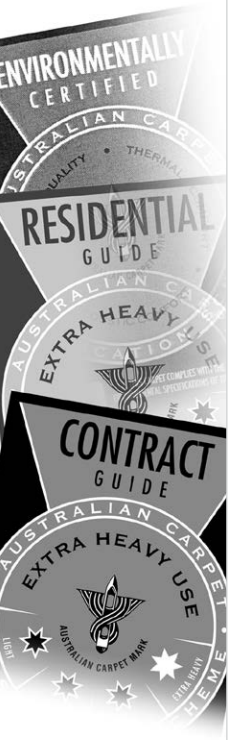
The ECS Panel must determine that the registered EPD is representative of the class of textile floor covering products submitted for certification

2.10.2 Product environmental impact reduction

The aim of this criterion is to encourage manufacturers to achieve year on year reductions in other environmental impact categories from the product Life Cycle Assessment report.

To satisfy this credit a 5% reduction over 5 years or a 1% reduction per year over the same period, per m² of textile floor covering, must be achieved in one or more of the following environmental impact categories: land use, ozone depletion, eutrophication, acidification, photochemical ozone formation, aquatic ecotoxicity, chronic and acute toxicity, physical resource depletion (minerals) and resource depletion (energy use).

The licensee must submit to the ECS Panel an electronic copy of the LCA report on which the claimed impact category reduction(s) is based. The LCA must follow the methodology as set out in ISO 14040 or equivalent and be verified by a qualified assessor.



2.10.3 Product material extraction reduction

The aim of this criterion is to encourage manufacturers to achieve year on year reductions in the material extraction environmental impact.

To satisfy this credit a 5% reduction over 5 years or a 1% reduction per year over the same period, per m² of textile floor covering, must be achieved in material extraction where the environmental impact is measured as a function of one square meter of textile floor covering installed for one year.

The licensee must:

– submit to the ECS Panel an electronic copy of the LCA report on which the claimed reduction in the material extraction impact, is based

– provide a copy of a verified LCA report or published EPD that provides the impact data required.

2.10.4 No chemicals of concern

The aim of this criterion is to encourage manufacturers introduce risk management practices to eliminate chemicals of concern with human and environmental exposure to a level that is beyond regulatory compliance at each stage in the life cycle of the textile floor coverings manufactured (production, installation, and maintenance).

The inventory and risk assessment showing residual risks after management actions have been taken must be reviewed by a suitably qualified and experienced assessor prior to lodgement.

The declaration of Additional Chemical Hazard Management is provided in Schedule 14e of the ECS Carpet Guidance Manual.

2.10.5 Carbon neutral product

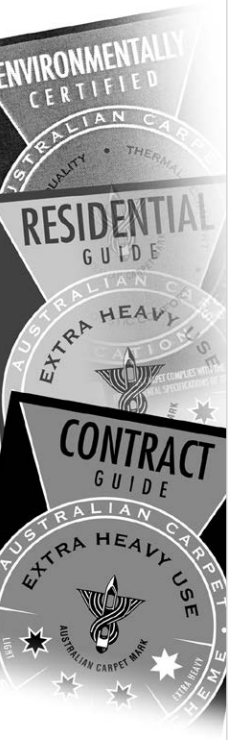
The aim of this criterion is to encourage manufacturers to achieve a carbon neutral position for the product and publish a carbon neutral declaration endorsed by the federal government.

Manufacturers must provide a verified product LCA or EPD that includes carbon emissions taken to mean climate change impacts in CO2eq per square meter of textile floor covering over the product life cycle. This must be accompanied by a certificate of carbon offset purchased by the licensee and its share allocated to the textile floor covering submitted for ECS certification. OR The licensee can submit a verified Carbon Active declaration for their product. These declarations should use the form provided in Schedule 14d of the Guidance Manual.

Note:

Licensee declarations will be subject to scrutiny by the ECS Panel and potentially independent verification provided to the panel.

ECS Level 4+ submissions should include the points score card provided in Schedule 14g of the ECS Carpet Guidance Manual.



3 ATTACHMENT 1

3.1 Evaluation of Raw Material Toxicity

Step 1: Identify all materials in the product

Step 2: Examine the chemicals identified in the Safety Data Sheets for each material

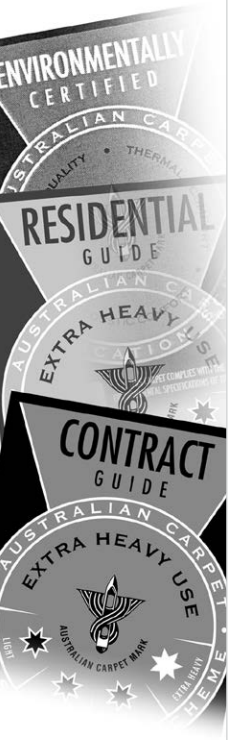
Step 3: If a chemical is on the banned list, replace the product and find a safer alternative

Step 4: If a chemical is on the control list, determine the concentration of the chemical in the product

Step 5: If a concentration is above the maximum level set, reduce the concentration or replace the chemical

Step 6: If a chemical is otherwise of concern, regularly review the chemical for updates on toxicity and hazards

Step 7: If a chemical is not on the banned list and is below the maximum concentration level, then the raw material is of sufficiently low toxicity to be compliant

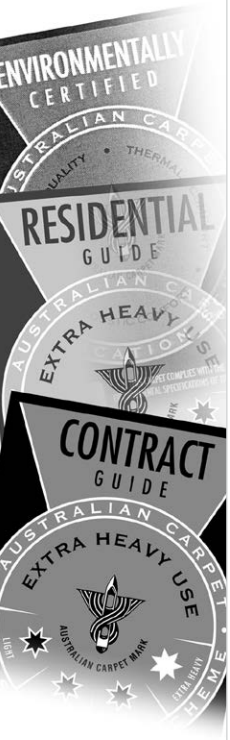


4 ATTACHMENT 2

4.1 ECS Banned Chemicals

Raw materials banned from use in carpets*	Why	Probable Application / Source
1,4-Dioxane	Carcinogenic	Solvent
Acetaldehyde	Probable carcinogen	Biocide/antimicrobial
Antimony Trioxide	Probable carcinogen	Flame retardants
Arsenic and arsenic compounds	Carcinogen	Filler contaminant
Asbestos	Carcinogen	Filler contaminant
Benzyl Butyl Phthalate (BBP)	Reproductive toxin	Plasticiser
Di Butyl Phthalate (DBP)	Reproductive toxin	Plasticiser
Cadmium and compounds	Carcinogen	Dyes and pigments
Chromium (VI) compounds Chromate – Chromic Acid – Dichromate	Carcinogen	Dyes and Pigments
Chlorinated hydrocarbon waxes	Persistent, bio accumulative, toxic	Plasticiser
Di Ethyl Hexyl Phthalate	Reproductive toxin	Plasticiser
Di Isononyl Phthalate	Reproductive toxin	Plasticiser
Dimethyl Fumerate	Irritant	Anti-fungal agent
Dyes that are toxic or metabolise to toxic substances	Probable carcinogen, mutagen, toxic to reproduction)	Dyes (see list in Attachment 3)
Dyes that are potentially sensitising	Skin and eye irritants	Dyes (see list in Attachment 3)
Ethylene Diamine Tetra Acetic acid (EDTA)	Toxic Respiratory sensitiser	Dyeing auxiliary Biocide
Formaldehyde	Carcinogen	Biocide/antimicrobial
Lead and compounds	Probable carcinogen	Heat stabilizer
Mineral oils (untreated, mildly treated)	Carcinogen	Lubricants, spinning oils
Nonyl Phenol Ethoxylates	Persistent pollutant – toxic	Surfactant
Para alkyl phenols	Endocrine disruptor	Surfactant precursor
PAHs (Polyaromatic Hydrocarbons)	Probable carcinogen	Tar constituent
PBDE (Polybrominated diphenyl ether)	Persistent pollutant – toxic	Flame retardants
PCP (Pentachlorophenol)	Persistent pollutant - toxic	Disinfectant
PFAs (Perfluoro alkane substances)	Persistent toxin	Stain resist treatment
Organotin complexes	Toxic	Biocide
Trichloroethylene	Probable carcinogen	Solvent degreasing
Tetrachloroethylene	Probable carcinogen	
Triclosan	Persistent pollutant	Biocide / antimicrobial

* Other materials may be banned but not mentioned in this list as they were not identified as in current use in manufacture of carpet. New chemicals should be checked for safety and health impacts.



5 ATTACHMENT 3

5.1 Banned Dyestuffs

These include those dyes that may induce a toxic effect on exposed people. There are a number of categories of toxic impact that a chemical may affect, and the guidelines derived in this code are derived from European Commission decisions for Eco-Labelled textiles[2] . The toxic impacts covered are cancer, mutation, reproductive toxicity and sensitization.

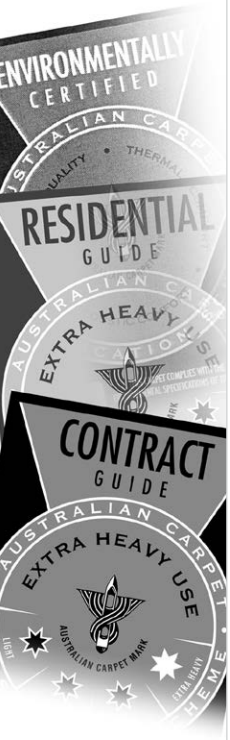
EC Decision 1999/178/EC and subsequent amendments:

Clause 20.

Azo dyes shall not be used that may cleave to any one of the aromatic amines as listed[3]:

	CAS no.
4-Aminobiphenyl	92-67-1
Benzidine	92-87-5
4-Chloro-o-toluidine	95-69-2
2-Naphthylamine	91-59-8
o-Aminoazotoluene	97-56-3
2-Amino-4-nitrotoluene	99-55-8
p-Chloroaniline	106-47-8
2,4-Diaminoanisol	615-05-4
4,4.-Diaminodiphenylmethane	101-77-9
3,3.-Dichlorobenzidine	91-94-1
3,3.-Dimethoxybenzidine	119-90-4
3,3.-Dimethylbenzidine	119-93-7
3,3'-Dimethyl-4,4'-diaminodiphenylmethane	838-88-0
p-Cresidine	120-71-8
4,4'-Methylenebis(2-chloroaniline)	101-14-4
4,4'-Oxydianiline	101-80-4
4,4'-Thiodianiline	139-65-1
o-Toluidine	95-53-4
2,4-diaminotoluene	95-80-7
2,4,5-Trimethylaniline	137-17-7
4-Aminoazobenzene	60-09-3
O-Anisidine	90-04-0
2,4-Xylidine	95-68-1
2,6-Xylidine	87-62-7
2-amino-2-ethoxy naphthalene	293733-21-8
4-amino-3-fluoro phenol	399-95-1
o-Anisidine (2-methoxy aniline)	90-40-0

[2] EC Decision 1999/178/EC establishing the ecological criteria for the award of the Community eco-label to textile products and subsequent decisions
[3] http://www.etad.com/information/etad_information_19th_amendment.pdf



Clause 21

Dyes that are carcinogenic, mutagenic or toxic to reproduction:

C.I. Basic Red 9
C.I. Disperse Blue 1
C.I. Acid Red 26
C.I. Basic Violet 3
C.I. Basic Violet 14
C.I. Disperse Orange 11
C.I. Direct Black 38
C.I. Direct Blue 6
C.I. Direct Red 28
C.I. Disperse Yellow 3
C.I. Basic Blue 4
C.I. Basic Blue 26
C.I. Pigment Black 25
C.I. Pigment Yellow 34
C.I. Pigment Yellow 157
C.I. 77332
C.I. Pigment Red 104

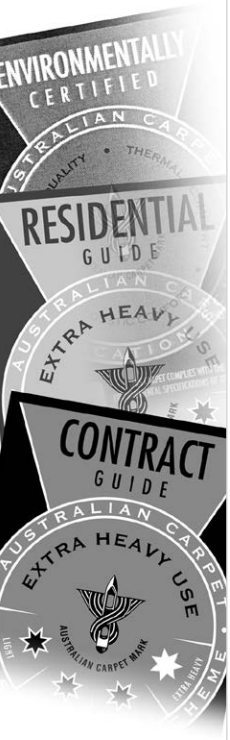
and/or dyes that contain more than 0.1% by weight of substances specified under the following risk phrases:

R40 (limited evidence of carcinogenetic effect)
R45 (may cause cancer)
R46 (may cause heritable genetic damage)
R49 (may cause cancer by inhalation)
R60 (may cause infertility)
R61 (may cause harm to an unborn child)
R62 (possible risk of infertility)
R63 (possible risk of harm to an unborn child)
R68 (possible risks of irreversible effects)

Clause 22

Potentially sensitizing dyestuffs:

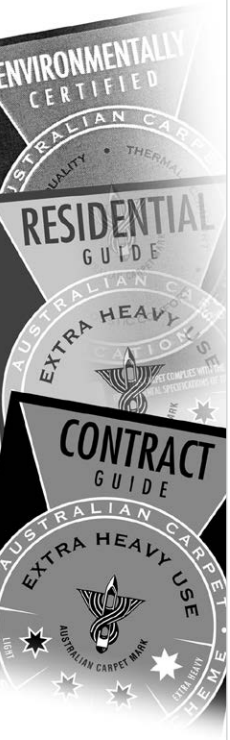
C.I. Disperse Blue 1
C.I. Disperse Blue 3
C.I. Disperse Blue 7
C.I. Disperse Blue 26
C.I. Disperse Blue 35
C.I. Disperse Blue 102
C.I. Disperse Blue 106
C.I. Disperse Blue 124
C.I. Disperse Red 1
C.I. Disperse Red 11
C.I. Disperse Red 17
C.I. Disperse Orange 1
C.I. Disperse Orange 3
C.I. Disperse Orange 37
C.I. Disperse Orange 76
C.I Disperse Orange 149
C.I. Disperse Yellow 1
C.I. Disperse Yellow 9
C.I. Disperse Yellow 23
C.I. Disperse Yellow 39
C.I. Disperse Yellow 49
C.I. Disperse Brown 1



6 ATTACHMENT 4

6.1 Chemical control list

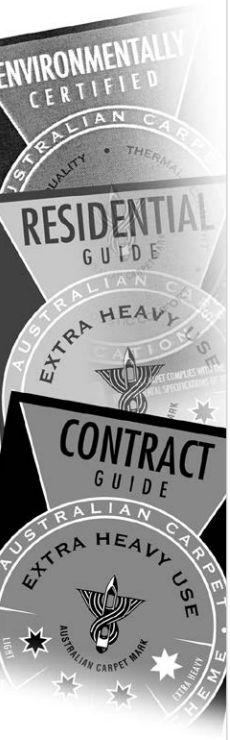
May be present in raw materials[1]	Problem	Probable Application of Concern	Maximum Concentration Allowable mg/kg	Maximum Emission Factor[2] (24 hr) ug/h/m²#
Acetaldehyde	Probable carcinogen	Biocide		20
Acrylamide	Probable carcinogen	Monomer of various acrylamide polmers	10	
Arsenic and arsenic compounds	Carcinogen	Filler contaminant	20	
Barium and compounds	Toxic	Filler contaminant	300	
Benzene	Carcinogen	Solvent constituent		55
Benzo[a]anthracene	Probable carcinogen	Tar constituent	5	
Benzo[a]pyrene	Carcinogen	Tar constituent	1	
Beryllium	Carcinogen	Impurity in fillers	20	
Boron and compounds	Toxic	Moth proofer	3,000	
1,3-Butadiene	Carcinogen	Monomer in latex	10	
Butylated Hydroxy Toluene	Toxic	Antioxidant	1,000	
Cadmium and compounds	Carcinogens	Dyes and pigments	20	
Caprolactam	Toxicity	Polyamide monomer		120
Chromium (VI)	Carcinogen	Dyes and pigments	10	
Chromium (III)	Toxic	Dyes and pigments	120,000	
Cobalt and compounds	Probable carcinogen	Dyes and pigments	100	
Copper	Toxic	Dyes and pigments	1,000	
DDT	Probable carcinogen / Persistent Pollutant	Pesticide	200	
Diphenyl Methane Diisocyanate (MDI)	Sensitizer	Polyurethane monomer	35	
2-Ethyl-1-Hexanol	Toxic	Solvent constituent		50
Formaldehyde	Carcinogen	Biocide / antimicrobial		10
Lead and compounds	Probable carcinogen	Heat stabilizer / pigment	300	
Manganese	Toxic	Impurity in fillers	1,500	
Mercury	Toxic	Impurity in fillers	10	
Methanol	Toxic	Solvent Compound	143	



May be present in raw materials[1]	Problem	Probable Application of Concern	Maximum Concentration Allowable mg/kg	Maximum Emission Factor (24 hr) ug/h/m²#
1-Methyl-2-Pyrrolidone (NMP)	Toxic	PVC adhesive		300
Naphthalene carcinogen	Toxic/Probable pesticide			20
Nickel compounds	Carcinogen	Impurity, pigments	600	
Nonanol	Toxic	Solvent constituent		24
Octanol	Toxic	Solvent constituent		24
PAHs Polycyclic aromatic hydrocarbons	Probable carcinogen	Tar constituents	20	
4-Phenylcyclohexene	Toxic	Latex impurity		50
Pesticides	Probable carcinogen /Persistent pollutant	Pesticide residues	10	
Styrene	Probable carcinogen	Monomer in latex		410
Toluene	Toxic	Solvent constituent		400
Vanadium	Toxic	Impurity	50	
Vinyl Acetate	Probable carcinogen	Solvent constituent		400
Vinyl Chloride	Carcinogen	Monomer PVC	10	
Vinyl Cyclohexane	Probable carcinogen	Latex impurity		85
Xylenes	Toxic	Solvent constituent		50

[1] This list is not exhaustive and other chemicals may require controls to reduce their impact below NOAELs

[2] VOC emission rate limits are designed to protect user health and are tested as a requirement of the ACCS ECS Carpet Technical Specifications.



7 ATTACHMENT 5

7.1 Examples of chemical evaluation

Latex filler

The Safety Data Sheet reveals that the filler contains 400 mg/kg of Barium but Barium is not in the banned list (Attachment 2). However, Barium and compounds are in the Control List (Attachment 4). If the filler represents 29% of the product weight, the final concentration of Barium in the product is 400 mg/kg x 29% = 116 mg/kg. This concentration of Barium is below the level of concern (300 mg/kg). Therefore, the filler is compliant, and no formulation change is required.

Solution Dyed Fibre

A solution dyed fibre contains 150 mg/kg of Lead Chromate (PbCrO4) pigment.

Chromate is Chromium (VI) which is banned in Attachment 2. Lead is also banned in Attachment 2.

Therefore, the use of alternative pigments should be considered that do not use Chromium (VI) or Lead.

A pigment contained Copper Oxide (CuO) at 120 mg/kg and the pigmented fibre represents 30% of the product weight, then the amount of copper in the product carpet is 120 x 0.3 mg/kg = 36 mg/kg of copper. Attachment 4 shows the maximum Copper concentration to be 1000 mg/kg so the pigment is compliant.

Carpet Backing

PVC backing in a carpet has a weight percent of 43% while the residual monomer, Vinyl Chloride, (VCM) concentration in the PVC is 35 mg/kg. The total concentration of VCM in the product is then 35 x 0.43 mg/kg = 15 mg/kg. Attachment 4 shows the maximum allowable concentration of Vinyl Chloride is 10 mg/kg, so the PVC is not compliant and an alternate grade of PVC is required to comply.

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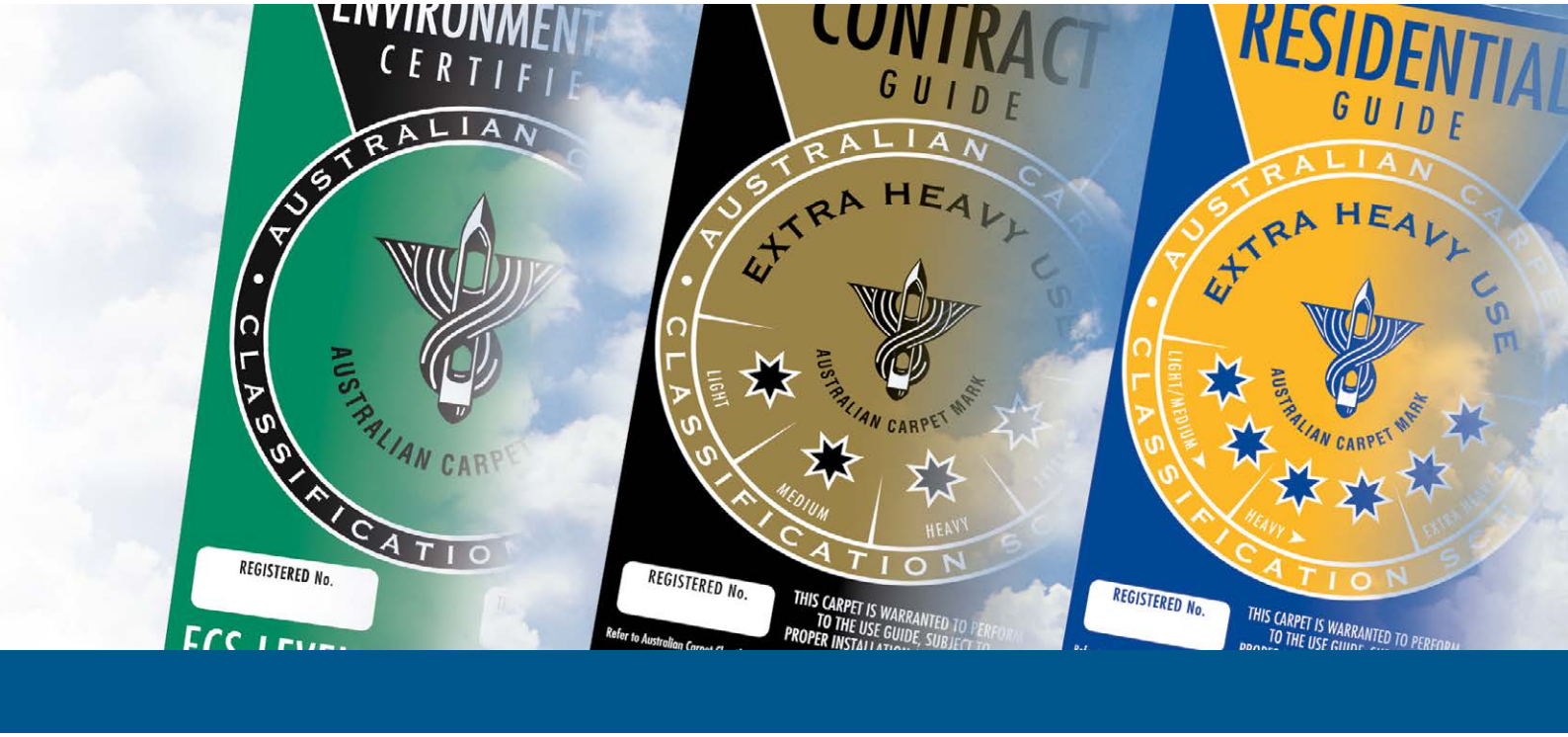

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