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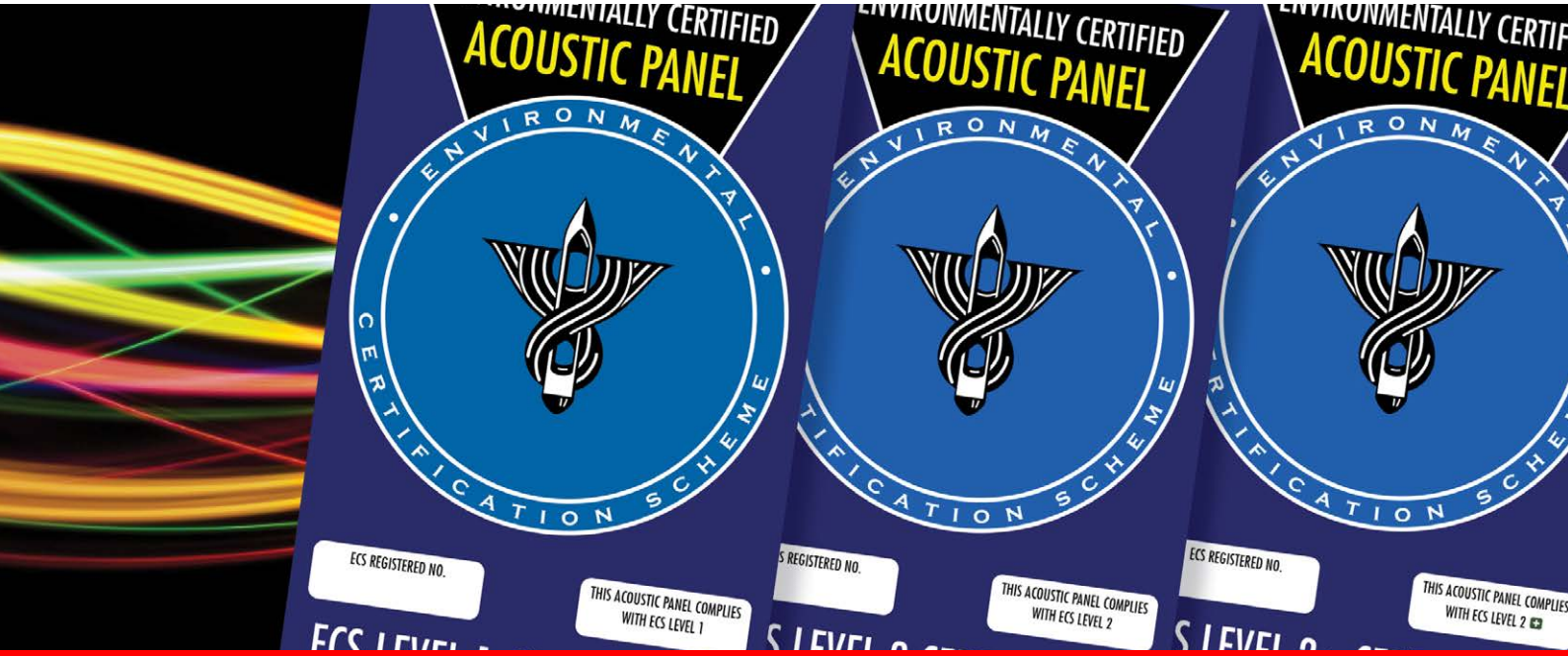

Version **1.0**

ECS

Acoustic Panels Technical Specifications

October 2023

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Product definition:

Acoustic panelling makes a decorative wall, ceiling or room divider that functions as a sound absorbing medium to improve room acoustics. While ceiling panels are generally suspended from the solid ceiling, wall panels can be stuck directly to the wall structure, or spaced out from the wall to gain more sound absorption.

A secondary function of acoustic panels is thermal insulation to make the building better insulated to use less heating and cooling energy when a thermal gradient is in evidence.

Acoustic panels are generally made from 100% homogeneous polyester (polyethylene terephthalate) fibre that is needle punched into a non-woven fabric. The thickness of the panel is directly proportional to the level of sound absorption and typically varies from 3mm to 50mm. Acoustic panels can be made with added polyethylene or other low melting point polymers to aid the adhesion of the non-woven fibres.

Ceiling panels and wall panels that are spaced out from the wall require mounting systems. These are most often made from aluminium extrusions formed into channels designed to enable panel mounting. These systems avoid the need for adhesives and facilitate disassembly for product reuse and recycling.

Objectives of the ECS acoustic panels

The Environmental Certification Scheme, ECS, was established by the Carpet Institute of Australia in 2006 to provide impetus for the carpet industry to ascertain and improve its environmental performance. Over recent years this has expanded to cover floor, wall and ceiling covering products with the objective of providing an eco-labelling system common to this segment of the building industry.

ECS objectives:

1. **Provide consumers with a certification system that shows certified products as good and best performing in safety, health, and environmental standards.**
2. **Allow the manufacturing industry to demonstrate these credentials.**
3. **Establish impetus for industry continuous improvement in energy, carbon emissions and waste reduction.**

The ECS acoustic panels standard is structured with a series of performance criteria designed to meet the requirements of environmentally conscious procurement agencies and building standards bodies such as the Green Building Council of Australia, GBCA. The ECS provides a convenient performance standard for specifying agencies in building materials.

The ECS acoustic panel and tiles is set at two basic performance levels:

Level 1 will meet a credit rating under the GBCA's Responsible Products Framework.

Level 2 will meet an exceptional performance rating under the GBCA's Responsible Products Framework as shown in the following table.

Level 2+ allows for additional product environmental performance standards.

Criterion no.	Level achievement	RPV points
1. Fit for purpose	ECS 1	-
2. Manufacturing safety, health and environmental management	ECS 1	2
3. low VOC emitting product	ECS 1	3
4. Raw material (low toxicity)	ECS 1	-
5. Transparency of product materials	ECS 1	1
6. Manufacturing declaration	ECS 1	-
7. Health product declaration	ECS 1	2
		8
8. Product stewardship	ECS 2	1
9. Manufacturing efficiency improvement	ECS 2	5
		14
10. Modern slavery declaration	ECS 2+	1
11. Environmental product declaration	ECS 2+	6
12. No chemicals of concern	ECS 2+	2
13. Product carbon neutral	ECs 2+	3
		26

Table 1. Summary of criteria

Note: The points provided are equivalent to Green Building Council of Australia's Responsible Product Framework point scores at the time of publishing. This may change over time.

ECS LEVEL 1 criteria

Level 1 criteria are all mandatory for a licensee to meet the requirements of the ECS. Points achieved are cumulative for each criterion.

Criterion 1. **Fit for Purpose**

The acoustic panels must meet the relevant standards set for that particular class of product under Australian conditions. The product must have suitable guarantees of performance for the intended application. Specifications of products where standards exist are provided in Table 2, these standards may be amended from time to time and it is the responsibility of the licensee to meet the standards as they are updated.

AS/NZS 2785:2020	Ceiling tiles Suspended ceilings – design and installation specification
AS/NZS 1530.3:1999	Acoustic panels Methods for fire tests on building materials, components and structures specification
AS5637.1:2015	Acoustic panels Wall and Ceiling Fire Hazard Properties specification

Table 2. specification standards

from the National Construction Code (NCC):

A wall or ceiling lining system must comply with the **group number** specified and for buildings not fitted with a sprinkler system (other than a FPAA101D or FPAA101H system) complying with **Specification E1.5** have—

a **smoke growth rate index** not more than 100; or

an **average specific extinction area** less than 250 m2/kg.

A **group number** of a wall or ceiling lining and the **smoke growth rate index** or **average specific extinction area** must be determined in accordance with AS 5637.1.

The NCC specifies noise reverberation times for certain building types. This is specified for sound absorption as Noise Reduction Coefficients, NRC. Acoustic panels function to reduce noise and as such are expected to have a minimum NRC of 0.2 or 20% noise reduction.

Performance requirement – noise reduction coefficient

Wall panel direct stuck	NRC	Explanation
12mm	0.45	45% noise reduction

Table 3. Noise reduction coefficient specification and standards

Claimed noise reduction must be accompanied by measurements following the international standards in Table 4.

Acoustics standard	Title
ISO 354:2002/2016	Acoustics measurement of sound absorption in a reverberation room
ISO 11654:2002/2016	Rating of sound absorption materials and systems

Table 4. Acoustics measurement standards

Manufacturers must declare compliance with specification standards with their application for ECS ratings.

Criterion 2. Manufacturing health, safety and environmental management

The manufacturer must declare compliance with all elements of the ECS Manufacturing Code of Practice for Environmental Management. The code describes performance standards for environmental manufacturing practices with appropriate controls to meet ISO 14001 requirements and occupational health and safety practices to meet ISO 45001 standards.

This code is available from the CIAL web site.

The manufacturing declaration is available and is attached to the ECS Acoustic Panels Guidance Manual.

Criterion 3. Indoor air quality – low VOC emitting product

The aim of the criterion is to ensure that emissions of volatile organic compounds (VOCs) from the environmentally certified acoustic panel do not exceed prescribed target levels for total emissions and particular chemicals of concern.

The certified acoustic panel or tile must pass a test in which its emissions of VOCs are assessed to be below the criteria set out in Table 5.

Chemical of Concern	**Criterion Maximum Emission Factor (28 day) µg/h/m²**
Acetaldehyde	20
Acetophenone	300
Benzene	10
Butylated Hydroxy Toluene	300
Caprolactam	120
Chloro-benzene	937
Chloroform	281
Dichloroethylene (1,1)	66
2-Ethylhexanoic Acid	46
Formaldehyde	10
1-Methyl-2-Pyrrolidone	300
Naphthalene	20
Nonanal	24
Octanal	24
4-Phenylcyclohexene	50
Styrene	410
Trichloroethylene	562
Toluene	280
Vinyl Acetate	100
2-Ethyl-1-Hexanol	50
Hydrocarbons (C10 – C14)	300
Vinyl Cyclohexene	85
Xylenes	50
MAXIMUM TOTAL VOC	500

Table 5. VOC emission rate limits

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, or ISO 16000-9 Indoor Air that describe the chamber method of emissions measurement.

This standard method provides a 28 day emission rate for VOC emissions with a conditioning period after product 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 (or with equivalent international recognition: ISO 17025) provided as per the declaration in Schedule 11 – Product Emissions. Alternatively the ECS will accept products gaining certification as low VOC under California's Department of Public Health Standard Method V1.1/1.2(CDPH), CRI Green Label Plus, or PRODIS-GUT certification.

Testing and certification of the product family using the heaviest weight product with the same chemical construction is accepted in this standard.

Criterion 4. **Raw material (low toxicity)**

Chemical constituents in acoustic panels have been reviewed and restrictions placed on these chemicals to ensure that the product and manufacturers do not suffer from toxic impacts of the product over its full lifecycle.

The CIAL has used health screening to establish the potential adverse health impact of the product is kept below the No Observable Adverse Health Level (NOAEL) during the manufacturing, use and end of life of the floor covering.

It is recognised that some regulated substances may be inadvertently produced in manufacture or may be present although not declared in proprietary products used in manufacture. It is incumbent on manufacturers to ensure that products 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 material safety data sheets, (SDS) or other raw material technical specifications, to identify chemicals that are either banned, limited in the final product, or of concern to evaluate compliance with the ECS Acoustic Panels 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.

Schedule 9 Attachment 1 provides guidance on the evaluation of raw material toxicity.

Regulated Substances that Must Not be Used in the production of acoustic panels.

Schedule 9 Attachment 2 contains a list of banned chemicals. For the purposes of the Technical Guidelines, banned substances include:

- all materials that are not registered for use in Australia by the Australian Industrial Chemicals Introduction Scheme (AICIS) in the Australian Inventory of Industrial Chemicals (AIIC).
- 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 SDS under the GHS system for chemical labelling.

A list of banned dyestuffs is contained in Schedule 9 Attachment 3.

Schedule 9 Attachment 4 contains a list of controlled or restricted use chemicals, in the production of 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).

The heavy metal requirements cover the following metals: Antimony, 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 (see: 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.

The material formulations of the certified acoustic panels 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.

This declaration is made for raw materials in the form provided in Schedule 9 (Guidance Manual).

Criterion 5. **Product composition transparency**

This standard requires complete transparency of product composition as declared in the raw material declaration (Schedule 9).

Substance composition down to 0.1% must be provided by the manufacturer for all chemical components and the demonstration that the composition meets the low toxicity requirements of the standard.

If a manufacturer wants to maintain a substance as confidential, they must provide adequate independent evidence of the safety and level of toxicity to the satisfaction of the panel. Otherwise the full product composition must be made publicly available through the licensees' web site.

Criterion 6. **Manufacturing declaration of performance**

Manufacturers must provide data on their plant efficiencies in energy usage, water consumption, carbon emissions (tier 2) and waste/recycling performance to meet this criterion. They must provide this on an annual basis and their plans for improvement in these facets of operations.

The manufacturing declaration should be provided in the format of Schedule 12 (Guidance Manual).

Criterion 7. **Health Product Declaration**

This declaration must be based on the product composition as provided in Criterion 5. The Health Product Declaration (HPD) must include all materials and substances that are a part of the product concerned (or family of products) and provide their impact to human health and to the environment, even if the substances are not currently regulated. The declaration[1] 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.

All criteria 1 to 7 are mandatory and will provide a total ECS Level 1 point score of 7. This should provide the product with a good performance rating under the GBCA's Responsible Product Framework.

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

LEVEL 2 criteria

The level 2 criteria are mandatory to the ECS for acoustic panels and must be achieved in addition to those given in Level 1.

Criterion 8. **Product stewardship**

The aim of this criterion is to maximize acoustic panels 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 acoustic panels shall be required to provide advice to purchasers on proper installation and maintenance of products that will meet manufacturer warranty requirements.

Licensees and/or suppliers of certified acoustic panels 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.

This product stewardship program must be demonstrated to the Panel using Schedule 13 provided in the Guidelines and contain an independent assessment of the product stewardship system stating its ability to achieve the product stewardship goals.

Criterion 9. **Manufacturing efficiency improvement**

To meet this criterion, manufacturers are required to achieve year on year improvements in manufacturing efficiencies per square meter of certified acoustic panels produced. These efficiencies must include the following metrics of manufacturing at the facility that produces the acoustic panels:

a) Total energy (electricity, gas, liquid fuels and other forms of energy used in MJ/m2 of product,

b) Total carbon produced as a tier 2 measure of carbon (kg CO2eq/m2),

c) Water consumption expressed as L/m2 of production and

d) Total waste generated and sent to landfill expressed as kg/m2 of production.

This data is to be provided on an annual basis for the manufacturing facility through the manufacturing declaration (Criterion 6.).

To satisfy this criterion a minimum 5% efficiency improvement over 5 years or a 1% reduction per year over the same period, must be achieved in all efficiency categories.

All criteria 1 to 9 are mandatory and will provide a total ECS Level 2 point score of 12. This should provide the product with a best performance rating under the GBCA's Responsible Product Framework.

ECS Level 2+

Additional ECS awarded credits given as specific credits at ECS Level 2+.

Criterion 10. Modern slavery

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/

or equivalent reporting standard.

Criterion 11. Environmental product declaration

To meet this criterion, manufacturers are required to have a product specific publicly available declaration showing the life cycle environmental impacts of specific classes of acoustic panels Accordingly manufacturers are required to produce an Environmental Product Declaration (EPD) in compliance with a recognised standard e.g. EN 15804 (ISO 14025).

The EPD must be written in accordance with Product Category Rules such as Floor Coverings (2018), PCR for Construction Products and Construction Services, or similar international system with a functional unit of 1m^2 (or 1 kg) of acoustic panel over one year of use and be officially registered.

Criterion 12. No chemicals of concern

To meet this criterion, manufacturers are required to 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 acoustic panels 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. This can be achieved through a recognised system of risk assessment following the ISO 31000 standard, using the Toxnot, or Toxscreen systems or making sure that the chemical inventory is free from chemicals of concern as defined in criterion 4.

The licensee may meet this requirement by providing evidence of it being Red List free.

Criterion 13. Carbon neutral product

To achieve this criterion manufacturers are required to establish a carbon neutral position for the product and publish a carbon neutral declaration for the product certified by the federal government.

Manufacturers must provide a third party verified product LCA or EPD that includes carbon emissions taken to mean climate change impacts in CO2eq per square meter of acoustic panels 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 Climate Active carbon neutral certification for the product.

ATTACHMENT 1

Evaluation of Raw Material Toxicity

Step 1: Identify all materials in the product

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

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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

ATTACHMENT 2

ECS Banned Chemicals

Raw materials banned from use in ECS certified textile products*	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/pigments that are toxic or metabolise to toxic substances	Probable carcinogen, mutagen, toxic to reproduction)	Dyes (see list in Attachment 3)
Dyes/pigments 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 carcinogens	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
Silica	Chronic toxicity (dusts)	Filler
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 floor coverings. New chemicals should be checked for safety and health impacts.

ATTACHMENT 3

Banned Dyestuffs and Pigments

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 textile products[2]. The toxic impacts covered are cancer, mutation, reproductive toxicity and sensitisation.

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]:

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 and pigments 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

or dyes and pigments 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 sensitising 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

ATTACHMENT 4

Chemical Control List

May be present in raw materials[1]	Problem	Probable Application of Concern	Maximum Concentration Allowable mg/kg	Maximum Emission Factor (28 day) ug/h/m²[2]
Acetaldehyde	Probable carcinogen	Biocide		20
Acrylamide	Probable carcinogen	Monomer of various acrylamide polymers	10	
Antimony and antimony compounds	Toxic	Catalyst residues	200	
Arsenic and arsenic compounds	Carcinogen	Filler contaminant	20	
Barium and compounds	Toxic	Filler contaminant	300	
Benzene	Carcinogen	Solvent constituent		10
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	Pesticide	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
Chloroform	Toxicity	PVC breakdown		281
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	1000	
DDT	Probable carcinogen / Persistent Pollutant	Pesticide	200	
Dichloroethylene (1,1)	Toxic	Solvent / PVC		66
Diphenyl Methane Diisocyanate (MDI)	Sensitizer / Possible carcinogen	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	
1-Methyl-2-Pyrrolidone (NMP)	Toxic	PVC adhesive		300
Naphthalene	Toxic/Probable carcinogen	pesticide		20
Nickel compounds	Carcinogen	Impurity, pigments	600	

Table: Chemical Control List (continued)

May be present in raw materials[1]	Problem	Probable Application of Concern	Maximum Concentration Allowable mg/kg	Maximum Emission Factor (28 day) ug/h/m²[2]
Nonanal	Toxic	Solvent constituent		24
Octanal	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	
Silica	Chronic toxicity	Impurity in limestone	5000	
Styrene	Probable carcinogen	Monomer in latex		410
Trichloroethylene	Probable carcinogen	Solvent/PVC		300
Toluene	Toxic	Solvent constituent		400
Vanadium	Toxic	Impurity	50	
Vinyl Acetate	Probable carcinogen	Solvent constituent		100
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 Technical Guidelines

About the Carpet Institute of Australia

The Carpet Institute of Australia Limited (CIAL) is the lead industry body for Australia's carpet industry. CIAL represents carpet manufacturers, carpet retailers and other suppliers of goods and services to the industry.

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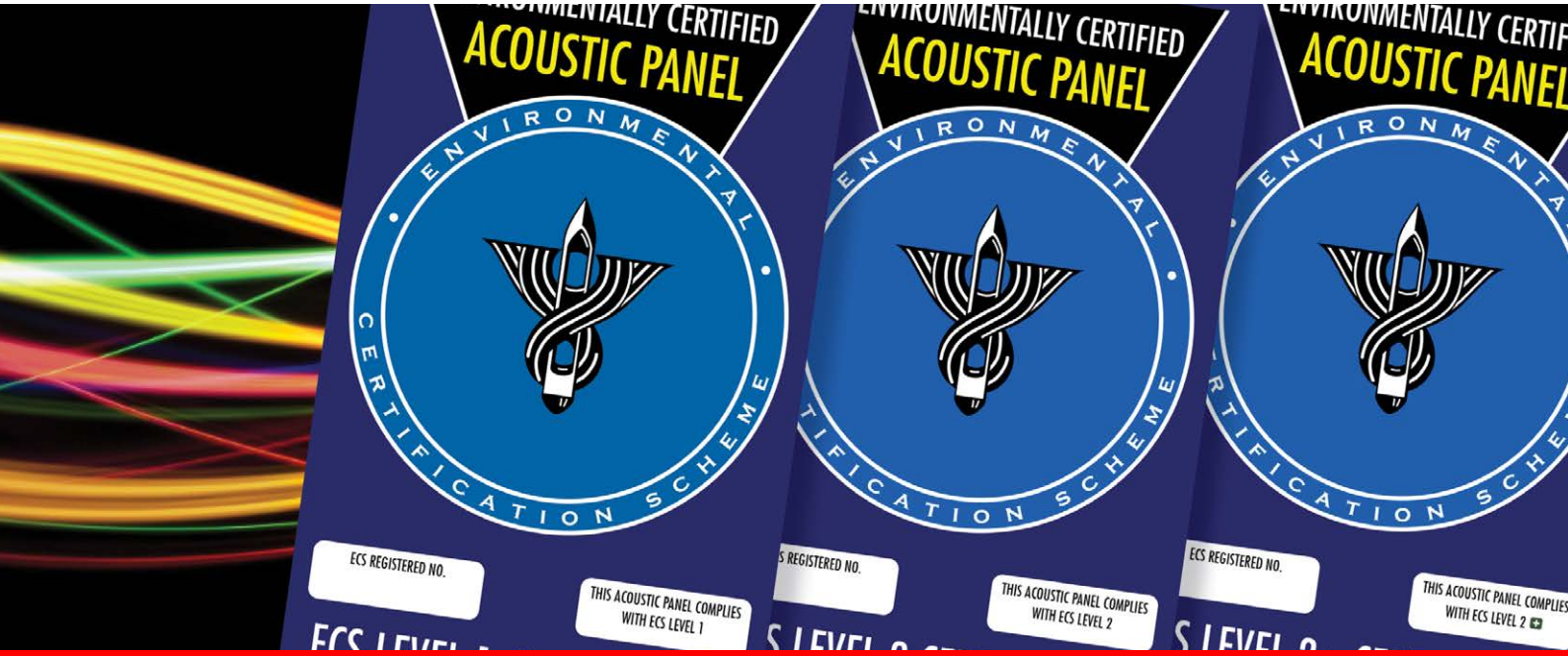

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