CARPET INSTITUTE OF AUSTRALIA LIMITED



Version 2.2

CODE OF PRACTICE FOR

Environmental Management

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Introduction

Compliance with the Code of Practice is an important requirement of the Environmental Certification Scheme (ECS) for flooring products registered through the Carpet Institute of Australia Limited.

This Code provides a guide to good environment management in all aspects of manufacturing, and the subsequent life cycle performance management of registered flooring products.

The provisions of the Code are as follows:

Raw Materials

Manufacturers must ensure that:

- regulated substances banned from consumer products must not be used in the production of flooring products. These banned materials include brominated fire retardants, chlorinated phenols, PFAS, lead, asbestos and all materials with a carcinogenic rating
- monomer residues must be minimised within standards set for the particular polymer type
- formaldehyde and other aldehyde-based biocides, including pentachlorophenol (PCP) must not be used in formulations or within the manufacturing premises.

A full list of banned and controlled substances is provided in the ECS Technical Specifications Attachments 2, 3 and 4.

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

Manufacturing

Manufacturing facilities will be designed, operated and maintained to meet all regulatory requirements pertaining to the environment, health and safety.

An environment management system in line with the requirements of ISO 14001 is required to facilitate regular environmental monitoring and reporting. Manufacturing facilities will also have a system in place to manage occupational health and safety risks that complies with ISO 45001.

Climate change management

Manufacturers must develop carbon emission reduction plans by auditing carbon emissions through energy consumption measurement and developing technologies and management systems to minimise energy consumption.

The Code requires manufacturers to commit to a process of continuous improvement in environmental management, monitoring and reporting. To this end, participation in the Australian government reporting systems and climate action programs is encouraged.

Heat recovery from hot waste streams should be practiced where it provides an economic return to the company. The use of “green” electricity and self-generation through the use of solar photovoltaic panels is also encouraged. Electrification of processes where economic is also beneficial to the environment due to higher energy efficiency.



Emissions to air

In addition to compliance requirements, manufacturers must apply process controls to continuously reduce pollution loads emitted to the air. Discharges of pollutants to the air must be directed only through stacks to ensure maximum levels of dispersion.

Odour from manufacturing processes should not be detectable beyond the factory premise. If odour is detected, it must be the subject of a remediation program. Any odour complaints must be recorded and acted upon.

No visible air emissions should be observed from the factory premise, other than water vapour.

No ozone depleting substances will be used within the factory premise and none of these substances will be discharged during normal operations.

No classified carcinogenic substances will be used or discharged from the factory premise.

VOC emissions will be maintained within regulated limits and minimised where possible within the processes used.

The emissions of dusts to the air must be mechanically controlled to prevent exposure of the workforce and neighbours to hazards associated with this exposure.

Water conservation

It is incumbent on manufacturers to monitor water consumption as a function of production and develop water conservation strategies.

Cooling water and other clean wastewater streams should be recycled within the factory. The factory should also have examined the opportunity for rainwater harvesting and use. Boiler systems should have condensate return lines and boiler blow down should be monitored and minimised through appropriate boiler management. Cooling towers need to be adequately maintained to ensure emissions compliance and waste water loss minimisation.

Manufacturing facilities will conduct water balances that check water inputs against wastewater outputs to ensure that no water is lost through leakage, or misuse.

Waste water (trade waste)

All process waters discharged from the site will be directed to a central point and, if necessary, treated to comply with waste water regulatory requirements. No process water will be discharged to storm water drains or directly to land.

Trade waste heat recovery with incoming water flows will be practiced, if feasible, to reduce the trade waste temperature to less than 38°C.

Trade waste will not contain free heavy metals. All surfactants and scouring agents will be readily biodegradable and no free-floating oils will be allowed to contaminate waste. Salts will not be allowed to rise above levels that could compromise waste water reuse. Total dissolved salts (metals and chloride, sulphate, phosphate, nitrate) should be maintained below 800 mg per litre in the final effluent. (Total dissolved solids, including organic compounds to be maintained below 1000 mg per litre). In cases where treated waste water is discharged to sea, the limit for salts may be relaxed.

No toxins that may adversely affect aquatic biosystems should be discharged in trade waste. For example, pyrethroids must be within regulated limits or be discharged at less than 1.0 mg/L in trade waste when discharged to a municipal treatment system. Waters discharged directly to surface waters in the open environment should contain less than 0.1 (µg/L) microgram per litre of pyrethroids.

Dyeing practices must not include the use of free Chromium VI, as is undertaken in after-chroming (mordant dyeing). Dye fixation to the fibre should be maximised and dyes generating toxic residues should not be used. Prohibited dyes are those listed in Attachment 3 of the ECS Technical Guidelines.

Latex wastes should be settled to remove water before they are discharged. Unsettled latex wastes will not be discharged to trade waste. Where practical, waste latex may be mixed into latex storage for reuse.



Solid waste management

Solid wastes generated by manufacturing processes represent a direct cost to the manufacturer. The manufacturer should apply the hierarchy of waste management:

- avoid or reduce the waste
- recover and reuse the waste
- recover / recycle the waste raw materials
- recover energy in wastes
- dispose of wastes safely.

This hierarchy of waste management should also be applied to all waste streams in all manufacturing processes.

No hazardous materials (or dangerous goods) can be placed in waste for land fill.

No chemical containers, chemical residues, oils, solvents, or other liquids can be placed in general waste containers.

No recyclable materials can be commingled with solid waste – paper and cardboard, drink cans, metals, or recyclable plastics. These materials will be collected for external recycling.

Soft fibre, face fibre yarn and other mono-compositional wastes must be recovered as a segregated waste and recycled through suppliers or waste merchants. Wherever possible, larger floor covering off-cuts will be recycled.

Risk management

Manufacturers must establish a register of risks to health, safety and the environment from manufacturing operations. Risks should be assessed and, if considered significant, managed through a hierarchy of controls i.e.

- removal of risk
- risk reduction in frequency or impact
- risk impact mitigation or control
- target protection.

Hazardous substances and dangerous goods storage systems must be constructed to minimise the risk of spillage to open drains.

Process chemicals and liquid materials must be securely stored to reduce the risk of any spillage entering the open environment.

Obsolete equipment and used chemical containers must be drained of oils and chemicals before being stored.

Cooling towers, scrubbers and other liquid control systems must be drained to trade waste in the case of a leak, overflow, or spillage.

Provision must be made to protect against the possibility of chemical and oils/fuels loss in the cases of floods and storm damage.

Underground storage tanks must be monitored annually, evaluated and removed if found to be faulty or leaking.

Land and ground water management

Land must be assessed for contamination and managed to prevent the further spread of pollution into ground water or uncontaminated land.

Contamination may be the result of previous occupancies, the presence of underground storage tanks, spillage of oils and liquids, dumping of rubbish or fill into holes, or the leakage of oils from plant and equipment.

Asbestos must be checked and recorded if present on site. A management program must be established for all buildings, plant, equipment, or soils that contain asbestos.



Siting and premises maintenance

Siting of manufacturing facilities is a critical element in successfully fitting into a local environment. A suitable buffer zone of 100 to 300 meters away from sensitive land uses such as residential areas, hospitals and schools, is required for greenfield developments.

The factory premises should be enhanced, and protection afforded to neighbouring properties by the planting of trees and shrubs that provide additional buffering and attenuation of noise emitted from the site.

Emergency awareness and plans

Emergency plans are needed when a major incident occurs. For example, controls to prevent release of pollutants from the site include storm water pit valves, spill kits, sand and other absorbents and neutralising agents for spill control.

Employees must be trained on emergency awareness and emergency management plans.

Contractors and visitors should be informed of the emergency actions and evacuation procedures.

Records and reporting

Companies are required to address significant environmental issues and have duties to reveal pollution that they should be aware of, and they should establish practical measures to prevent or reduce pollution events.

Most environmental operating licences and trade waste contracts require regular monitoring and compliance reporting.

Under this Code companies must produce an annual occupational health, safety and environmental report based on the Code of Practice audit checklist. (Refer Attachment 2)

Product specification and installation

Certified carpet products must be ACCS graded. Other flooring products must meet the relevant specification standards for the application to ensure that they are 'fit for purpose' and satisfy all manufacturing regulatory criteria.

Guidance will be provided by the manufacturer on the most efficient floor covering installation methods (including the specification of water based acrylic or similar low-VOC adhesives) and after sales product care.

Product stewardship

An information package is a minimum requirement that indicates how best to care for the flooring products over its life and how to minimise the environmental impacts from product maintenance.

It must contain information that contributes to:
- maximising the useful performance of the product
- maintaining impact noise reduction performance;
- maintaining ambient noise reduction properties; and
- maximising walking safety.

Manufacturers must provide systems and information on environmentally efficient methods of end-of-life product removal, re-use, recycling and disposal. Guidance for the preparation of a product stewardship information package is contained in Attachment 3.



Environmental innovation in product development

The features provided in flooring products are largely designed to meet market requirements, however, environmental efficiency is also an element that should be addressed as part of product development by manufacturers.

Elements that enable efficient maintenance and removal at the end of life are important as environmental impacts largely occur in the use phase.

In addition, design for disassembly, raw material recovery, or transformation into down-cycled products will enhance the products life cycle environmental performance.

Please sign below to confirm the agreement of your company to comply with the ECS Code of Practice for Environmental Management

Signature .....

Print Name .....

Position.....

Company Name.....

Date .....



ATTACHMENT 1

Product specification and installation

It is the intention of this Code of Practice to provide a pathway to the safe manufacture of flooring products using materials that have a minimal impact on the environment and do not threaten the health of industry workers and the community.

Banned chemicals

Chemicals that present a clear risk to human health and the environment have been banned for use in ECS certified carpets. These are described in the Raw Materials section of the ECS Technical Specifications and detailed in Attachment 2 of the ECS Technical Specifications.

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. The toxic impacts covered are cancer, mutation, reproductive toxicity and sensitisation.

A list of banned dyestuffs is provided in Attachment 3 of the product ECS Technical Specifications.

Controlled chemicals

It is recognised that Polymers contain residual monomers that are reactive and often toxic. The ECS has placed a control on monomers and other toxic trace materials that may be present in carpet.

Other chemical species are volatile and can contaminate the factory atmosphere or indoor environment. The emission of volatile organic chemicals is controlled by the ECS. Controlled chemicals lists are provided in Attachment 4 of the product ECS Technical Specifications.



ATTACHMENT 2

Code of Practice Audit Checklist

Y = YES, N = NO, L = LEGAL REQUIREMENT, C = CODE OF PRACTICE REQUIREMENT

Company: _____

Address: _____

Contact: _____ **Date:** ..... / ..... / .....

	Y	N	L	C	Observations and Recommendations
1. Chemicals Management					
Dangerous Goods register			L	C	
Hazardous Substances register			L	C	
Chemicals Management System				C	
Chemical usage review – policy on chemicals					
Safety Data Sheet register			L	C	
Classified carcinogens in use				C	
High toxicity materials in use				C	
Ozone depleting substances in use				C	
Monomer residue specs checked					
Regulated substances in use				C	
VOC register					
2. Management Systems					
Environmental Management System					
Energy Management – Climate				C	
Environmental Improvement Plans				C	
Worksafe / OH&S System				C	
EPA licence / permit					
Company annual report – environmental section				C	
Incident reports				C	
Chemical handling procedures					
Waste handling procedures					
Hazardous waste management procedures					
Trade waste management procedures					
Storm water management procedures					
3. Environmental Monitoring Records					
a) Air emissions					
Stack tests					
Odour monitoring					
Carbon emission records				C	
b) Water					
Consumption records (cf production)				C	
Trade waste records				C	
Trade waste compliance records				C	
Storm water monitoring records					
Ground water monitoring records					
c) Solid wastes					
Raw material yield reports				C	
General waste records				C	
Waste recycling records				C	
Hazardous waste records			L	C	



Company: _____

Address: _____

Contact: _____ **Date:** ..... / ..... / .....

	Y	N	L	C	Observations and Recommendations
4. Risk management					
Risk register / Aspects register					
Legal issues register					
Risk management plans					
5. Site inspection					
a) Buildings					Buildings
– condition					
– asbestos present (register and plan)			L	C	
– oil contamination present					
b) Drains and containment					Drains
– drain condition			L	C	
– pits (no discharge of pollutants)			L	C	
– gutters (no oil stains)				C	
c) Grounds					Grounds
– vegetation condition					
– fence condition					
d) Site					Site
– buffer to sensitive uses					
– aesthetics					
– visible pollution				C	
e) Air emissions					Air
– visible emissions from stacks				C	
– fugitive emissions observed				C	
– odour detected at boundaries				C	
f) Energy / Climate					Energy
– steam leaks observed					
– idle processes running					
– lighting not required					
– boiler heat recovery systems					
– natural lighting systems					
– solar energy systems					
– heat recovery practiced					
– pipe lagging and insulation				C	
– compressed air leaks					
– motor variable speed drives efficiency					
g) Water					Water
– leaks observed					
– recovery of storm water					
– reuse of waste water					
h) Trade waste					Trade waste
– control systems in place				C	
– recovery system if non-compliant					
– recycling of treated waste water					



Company: _____

Address: _____

Contact: _____ **Date:** ..... / ..... / .....

	Y	N	L	C	Observations and Recommendations
i) Chemical storage					Chemical storage
– adequate bunding				C	
– delivery system					
– spill kits				C	
j) Underground storage tanks					USTs
– USTs present on site					
– delivery systems bunded				C	
k) General wastes					General wastes
– bins available			L		
– commingling of recyclables					
– hazardous wastes present					
l) Recycling systems					Waste recycling
– paper and cardboard				C	
– metals				C	
– plastics					
– soft fibre recycling				C	
– yarn recycling				C	
– carpet off-cut recycling					
– cropping waste recycling					
m) Hazardous wastes					Hazardous wastes
– bins available			L	C	
– segregation adequate				C	
– hazards controlled				C	

6. Product stewardship	
a) Information supplied	
– installation guidelines	
– maintenance guidelines	
– take-back, reuse and recycling	
– waste to energy / fuels	
– delivery and transport systems	
b) Design innovation	
– raw materials	
– manufacturing systems	
– product design	



ATTACHMENT 3

Guidance for the preparation of a product stewardship information package

Used product and installation wastes management

The objective of waste management is to maximise the lifetime of product use and reuse and then to minimise the impacts to the environment associated with disposal of the product after reuse and recycling options are exhausted. In this way the use of the raw materials is maximised and negative environmental impacts of the carpet are minimised.

These points should be examined in the order given.

Product performance life span

Maximise the use of the finished product by extending its life span in the original installation and subsequent installations by:

- appropriate choice of floor covering to meet the installation's trafficking and loading demands;
- installing and maintaining floor coverings in accordance with the requirements of relevant Australian / New Zealand standards.

Reuse before recycling

Often end-of-life wastes are satisfactory for reuse in other applications.. Installation wastes, if sufficiently sized, can be repurposed.

There are a number of used floor covering recycling companies that resell used products in reasonable condition.

Raw material recycling

Consider the use of raw material recycling facilities in operation in Australia or off-shore. There are some synthetic polymer recycling facilities that be a viable option if the economics of centralised collection and transport can be established.

Down cycling

Carpets can be shredded and used in the production of felt for underlay, resilient flooring and insulation products.

100% wool and other natural fibre-based carpets are biodegradable and can be used in a number of applications such as:

- weed matting
- geotextiles
- cover for land fills
- compost operations.

These applications are only economic within the local area that the carpet waste is generated. In some cases, down cycling is done on an ad hoc basis, but carpet retailers and recyclers should be aware of these operations when they are available.

Waste to energy

Floor coverings all have embodied energy that can be made available by shredding and gasifying the wastes producing secondary fuels. This operation is not restricted to a particular product types, but synthetic polymer based products are particularly suited to waste to energy operations.

Carpet can be used as a fuel in cement kilns where the by-products are incorporated into the cement matrix.



Other waste uses

Many other uses have been developed to keep floor covering wastes out of landfill. Examples of these uses are wall and ceiling insulation, weed control, mulch mats and even landfill waste covering.

Recyclers should be consulted about these options.

Disposal to land fill

Floor coverings that conform to the ECS are non-toxic in land fill and will not leach out toxic chemicals or salts that may adversely affect the environment. Nevertheless, disposed to land fill is wasted in terms of the raw materials and should be the last option for the disposal of used floor covering products

In general, the synthetic polymers will remain in land fill for centuries while natural fibres such as wool, wood fibre and jute may biodegrade in less than ten years. The degrading of natural fibres produces biogas (a mixture of methane and carbon dioxide), which may be captured and used as to generate electricity at the landfill.

Post-consumer floor covering and installation waste

The objective of waste management is to maximise the lifetime of the product and then to minimise the environmental impacts associated with disposal after reuse options are exhausted.

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