

The Australian Ecolabel Program Good Environmental Choice Australia Standard

Hard Surfacing



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Use of This Standard

This voluntary environmental labelling standard may be used by competent environmental assessors to establish product compliance to the Australian Ecolabel Program. Products that are certified with the mark of conformity, the “Good Environmental Choice Label” have been independently tested and demonstrate compliance to the environmental and social performance criteria detailed in this standard. The overall goal of environmental labels and declarations is the communication of verifiable and accurate information, which is not misleading, on environmental aspects of products and services. This encourages the demand for, and supply of, those products and services that cause less stress on the environment, thereby stimulating the potential for market-driven continuous environmental improvement.

This standard identifies environmental, quality, regulatory and social performance criteria that products sold on the Australian market can meet in order to be considered as good “environment practice”. Products that have been certified as complying to this standard may gain greater market recognition and a marketing advantage in government and business procurement programs, as well as broad consumer preference.

This standard can be used by Australian producers to guide their designs for environment programs by using the environmental criteria as key performance benchmarks to reduce the environmental loads of their product. The standard is necessarily restricted in its identification of environmental loads from the product life-cycle. Producers should consider other environmental measures along the product cycle, which are not included in this standard, in their environment program designs for and aim for even higher levels of environmental performance where technically possible.

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GOOD ENVIRONMENTAL CHOICE AUSTRALIA STANDARD

Hard Surfacing

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Abstract

This Standard specifies environmental performance requirements of hard surfacing products for the Australian Ecolabel Program. The Australian Ecolabel Program complies with ISO 14024: "Environmental labels and declarations - Guiding principles" which requires environmental labelling specifications to include criteria that are objective, reasonable and verifiable.

Definitions

Processed Products: Products that are either fired products (e.g. ceramic tiles, clay tiles, glass tiles) or hardened products (e.g. concrete pavers and flags, agglomerated stone tiles, terrazzo tiles).

Natural Stones: Pieces of naturally occurring rock, including marble, granite and other naturally occurring stones.

Granite: A common mineral assembly classified as a "natural stone" for the purposes of this standard. Granite is a plutonic igneous rock having visibly crystalline texture of medium to coarse graining; generally composed of feldspar and mica and quartz crystals (see "natural stone" definition).

Marble: A hard crystalline metamorphic rock resulting from the metamorphism of limestone that takes a high polish. For the purposes of this standard Marble is classified as natural stone (see "natural stone" definition)

Sandstone: A clastic sedimentary rock composed of sand sized grains set in a matrix of silt or clay, and firmly united by a cementing agent (silica, iron oxide, or calcium carbonate). For the purpose of this standard, Sandstone is classified as a natural stone (see "natural stone" definition).

Limestone: A sedimentary rock composed largely of the mineral calcite (calcium carbonate: CaCO_3) that is the deposited remains of marine animals. For the purpose of this standard Limestone is classified as natural stone (see "natural stone" definition)

Slate: A fine-grained, metamorphic rock derived from an original shale-type sedimentary rock composed of clay or volcanic ash through low grade regional metamorphism. For the purposes of this standard slate is classified as natural stone (see "natural stone" definition)

Pegmatites: Very coarse-grained granite that has a grain size of 20 mm or more. Pegmatites crystals are composed mainly of quartz, feldspar and mica.

Gypsum: A very soft mineral composed of calcium sulphate dihydrate, with the chemical formula $\text{CaSO}_4 \cdot 2\text{H}_2\text{O}$

Glass: An amorphous, highly silicious material which can incorporate various impurities or additives. Examples include soda-lime glass and borosilicate glass.

Cement: For the purpose of this standard, cement refers to any binder substance used to bind and harden a product. This includes both non-hydraulic and hydraulic cements (including Portland cement and its various

blends).

Concrete: A material obtained by mixing sands, gravel, cement, inorganic pigments and additives, to form a man-made rock.

Agglomerated stones: Industrial products manufactured from a mixture of aggregates (typically natural stone grid of various size and type, sometimes mixed with other compatible material), additions and binder. The binder can be resin, hydraulic cement or a mixture of both in various percentages. The products are realised in form of blocks or slabs, which can be transformed in finished slabs, tiles, vanity tops or similar elements complementary to products for flooring and wall finishes, obtained by moulding technique which can or cannot be subsequently cut to size. Products realised with the technology of the agglomerated stones could be impregnated by suitable chemicals in order to impermeabilize the open pores.

The agglomerated stone products are classified according to the manufacturing technology, the type of binder and the type of stone elements.

Classification according to the type of binder:

Agglomerated stone products can be bound by unsaturated polyester resin or other cross-linking resin

Agglomerated stone products can be bound by cement (white or grey).

Agglomerated stone products can be bound by mixture of resin and cement.

Classification according to the mineral composition of the stone elements:

Agglomerated stone products can be constituted of stone elements of carbonate minerals

Agglomerated stone products can be constituted of stone elements of silica minerals.

Agglomerated stone products can be constituted of stone elements both of carbonate and silica minerals.

Terrazzo Tiles: A suitably compacted element of uniform shape and thickness which meets specific geometric requirements. For the purpose of this standard Terrazzo Tiles are classified as a sub category of Agglomerated stones. The product usually is comprised of irregular, often coloured fragments of marble or stone, set in a matrix of white or coloured cement.

Ceramic Tiles: Thin slabs made from clays or other inorganic raw materials extruded or pressed at ambient temperature, followed by firing at temperatures sufficient to develop the required properties.

Clay Tiles: Thin slabs used for the surface course of pavements and is manufactured predominantly from clay minerals. The areal density of such tiles shall not exceed 40 kg / m². This restriction does not apply for fired clay pavers.

Dimensional stones: Stone materials that are sawn to particular dimensions and finished to particular textures.

Primary material: The main economic product made in the operation.

Recycled Content includes both pre- and post-consumer recycled content. Post-Consumer content is as material generated by households, or by commercial, industrial and institutional facilities in their role as end-users of the product, which can no longer be used for its intended purpose. This includes returns of material from the distribution chain. Pre-Consumer content is material diverted from the waste stream during a manufacturing process. Excluded is re-utilisation of materials such as rework, regrind or scrap generated in a process and capable of being reclaimed within the same process that generated it.

Clinker: A general name given to waste from industrial processes - particularly processes that involve smelting metals, burning fossil fuels and using a blacksmith's forge. Clinker often forms a loose, black deposit that can consist of coke, coal, slag, charcoal, grit, and other waste materials. Clinker may be reused to make hard paths. It is laid and rolled, and forms a hard path with a rough surface.

Slag: A by-product, containing inert materials, produced during the blast furnace smelting process and other metallurgic operations

Ramsar Wetland is an area of wet habitat composed of vegetation identified under the Ramsar treaty. It provides the framework for national action and international cooperation for the conservation of wetlands and their resources. See <http://www.ramsar.org> for more information.

Confined Aquifer: An aquifer (composed of porous rock) that is bound above and below by dense layers of non porous rock. The aquifer contains water under pressure which is significantly greater than atmospheric pressure.

Suspended Solids: Organic or inorganic particles that are suspended in and carried by water. The term includes sand, mud, and clay particles as well as solids in wastewater.

R - Phrases: Abbreviation for Risk Phrases. These phrases are defined in Annex III of European Union Directive 67/548/EEC: *Nature of special risks attributed to dangerous substances and preparations.*

ICP-AAS: Means Inductively-Coupled Plasma Atomic Absorption Spectroscopy

ISO: Is the Acronym for the International Organisation for Standardisation.

GECA-Label: Means the Good Environmental Choice Australia Label.

IARC: Is the Acronym for the International Agency for Research on Cancer

EPBC: Is the acronym for the Environment Protection and Biodiversity Conservation Act 1999 (Commonwealth).

NATA: Is the acronym for the National Association of Testing Authorities (see: <http://www.nata.asn.au/>)

Populated Area: For the purpose of this standard, Populated Area is defined as any area with a habitant density of more than 50 habitants per square kilometre (> 50 hab/km²)

1 INTRODUCTION

1.1 Purpose

This Standard sets an environmental performance benchmark for hard surfacing products. The voluntary environmental labelling standard implemented by Good Environmental Choice Australia (GECA) as part of the Australian Ecolabel Program specifies environmental performance criteria for hard surfacing and flooring including a wide range of stone, tile and concrete products. This standard stipulates limits for the environmental load of such products throughout the major phases of their life cycle.

While Standards set by Standards Australia define “fit-for-purpose” criteria, they do not provide assurance of environmental preferability. This standard is a voluntary environmental labelling standard that sets an environmental performance benchmark above and beyond the Australian product standards.

All GECA voluntary ecolabelling standards require that products satisfy the relevant Australian or International Standard as a prerequisite for GECA certification.

1.2 Background

Naturally occurring substances (e.g. clay, sand and rocks) have been quarried and used for construction work for as long as history can recall. Nowadays, manufacture of hard surfacing products is an established industry and a major part of the multi-billion dollar building industry.

Ranging from the energy spent in sourcing the raw materials and the adverse effects of quarries, to air and water pollutants emitted during the finishing operations, Hard Surfacing products have the potential to create significant burdens on the environment. Considering the size of this particular industry and thus the amount of sourced, finished and installed hard surfacing products, it is important that the key environmental impacts of this group of products are identified and minimised.

Quarrying, fabrication and testing of stone products is more sophisticated than ever before. Technical improvements have been made over the millennia, but nowadays accelerate even more. These circumstances give the clear potential to establish best practice methods to lower the environmental footprint of the stone industry sector.

This Standard identifies the key environmental loads of Hard Surfacing products and specifies requirements to lower the impact of certified products. Specifically, this Standard stipulates criteria for quarrying and mining raw materials, emissions to waterways and air, as well as the responsible use of energy resources. Hard Surfacing products which comply with this Standard will have considerably lower adverse environmental impacts compared its competitors.

2 STANDARD CATEGORY SCOPE

This standard is applicable to the following categories of hard surfacing products for interior or exterior use, without any structural function, and suitable for use as horizontal or vertical surfacing:

- Natural stone
- Agglomerated stones
- Concrete paving units
- Terrazzo tiles
- Ceramic tiles
- Clay tiles
- Glass tiles

Other environmentally innovative hard surfaces that do not directly fit the above categories may be considered for certification provided the product fulfils the requirements of relevant sections of this Standard. This standard is regularly reviewed so other categories may be added at a later date.

This Standard excludes roof tiles and exterior building cladding.

This Standard excludes hybrid and composite products and those containing materials not directly specified in the scope of this standard.

3 ENVIRONMENTAL PERFORMANCE CRITERIA

3.1 Fitness for Purpose

To become certified, a product must perform well when used in accordance with the manufacturer's instructions. Conformance with existing standards of quality and durability are pre-requisite for the Good Environmental Choice Australia Label. The manufacturer must ensure that the product is fit for its advertised purpose and:

3.1.1 Product Data Sheet

The product must be supplied to each customer with a data sheet compliant with the requirements of Appendix 1, such that a qualified person may easily determine fitness for purpose on a project specific basis.

The test methods recommended in Appendix 1 can be used as a guideline to provide minimal information to the customer. Alternative test methods might be used if they lead to comparable results.

New testing to support such data sheets must be undertaken at least on a 3 yearly basis.

3.1.2 Quality Assurance Program

The manufacturer must have a quality assurance program in place that demonstrates conformance of the certified products with the specified limits in the data sheet. A record of all non-conformant products must be kept, and a procedure for dealing with non-conformance must be in place. Evidence of corrective action must be provided where non-conformant products have been reported in the last two years.

3.2 Raw Material Requirements

3.2.1 Quarried or Mined Materials

The geographical origin of pre-consumer recycled and virgin quarried or mined material must be documented, to enable confirmation of the origin throughout the supply chain.

Quarried or mined mineral for use as raw materials in hard surfacing products must be sourced from a production facility that complies with Section 4 of this Standard.

The requirements of the following sub-sections (3.2.1.1 to 3.2.1.8) apply only to the quarry or mine which is the major supplier of quarried or mined raw materials for the certified product.

3.2.1.1 Water Resource Use

The quarry or mine pit must not interfere with a confined aquifer. Water may be drawn from confined aquifers provided that the bore is sealed and the flow rate is measured. Bore use must not be continued if the flow rate decreases by greater than 20 % of the initial rate, averaged over a five year period.

Surface water must not be used if the water body is located within, or is directly connected to a:

- National Park,
- Drinking water catchment area,
- Ramsar Wetland
- Area identified by the EPBC Act as containing threatened species or ecological communities.

For areas outside Australia, reference to national classification frameworks comparable to the EPBC Act must be provided.

Quarrying and mining operations must be able to demonstrate procedures or measures to minimise the impact of water use. This may include, but is not limited to, water recycling, rainwater collection and settling ponds.

Water released off-site directly from quarrying and mining operations must not exceed 5 L/m³ of extracted material. This limit does not include natural runoff from the site during rain events or water consumed in closed loop recycling systems. Suppliers are requested to obtain and provide data on water release from the main quarrying operation for the purpose of refining this criterion in future versions of the standard.

3.2.1.2 Site Rehabilitation

The main quarry or mine must lodge a rehabilitation guarantee with the relevant state or federal government agency. Where there is no relevant agency, the quarry or mine must have a published and publicly available environmental remediation plan acceptable to GECA, underwritten by a trust fund established for the purpose.

The main quarrying and mining operations must be able to demonstrate site-specific weed control measures in relevant areas where existing vegetation is disturbed by the operation.

3.2.1.3 Usable Material Ratio

The extraction efficiency of the main mining or quarrying operation must meet the requirements listed in Table 1. This requirement only applies to primary materials but not to by-products of mining operations or recycled waste materials.

Primary Material	Extraction Ratio
Marble	0.30
Granite	
Sandstone	
Limestone	
Slate	
Other natural stones	
Sand and aggregate	0.60

Table 1: Extraction efficiency requirements for mining and quarrying operations. Figures are given in m³ of usable material per m³ of total extracted material.

3.2.1.4 Operating Equipment

All mechanical operating equipment must be regularly maintained at the intervals recommended by the manufacturer of the equipment.

Used motor oil must be recycled or disposed of by a licensed waste contractor.

A procurement policy must be in place that gives preference to operating equipment on the basis of fuel economy and energy efficiency.

3.2.1.5 Dust Emissions

The PM10 dust emissions to air must be less than 100 µg/Nm³ where the main mine or quarry is located within 5 km of a:

- Populated area
- National Park
- Drinking water catchment area
- Ramsar Wetland
- Area identified by the EPBC Act as containing threatened species or ecological communities.

The test method must be in line with EN 12341 or equivalent.

3.2.1.6 Water Emissions

Suspended solids in effluent water must be less than 30 mg/L, where the operation discharges to surface waters that interact with a:

- National Park
- Drinking water catchment area
- Ramsar Wetland
- Area identified by the EPBC Act as containing threatened species or ecological communities

Suspended solids in effluent water can not exceed 40 mg/L.

The test method must be in line with ISO 5667-17 or equivalent.

3.2.1.7 Noise

Where the main mine or quarry is located within 5 km of a Populated Area, the noise level from the operation must not exceed 70 dB(A), measured at the perimeter of the mine or quarry.

The test method must be in line with ISO 1996-1 or equivalent.

3.2.1.8 Visual Impact

Where the mine or quarry is located within 5 km of a Populated Area, the visual impact of the operation must not exceed 30 as defined in Appendix 3 of this standard.

3.2.2 Plastics and Other Synthetic Materials

Petrochemical products for use as raw materials in hard surfacing products must be sourced from a production facility that complies with Section 4 of this Standard.

Synthetic resins (including polyester) must not comprise more than 10 % of the weight of the certified product.

3.2.3 Adhesives, Coatings, Waterproofing, Sealers, Fillers and Other Treatments

Recommended adhesives must comply with the labelling requirements in Section 3.6.2

All component parts (including adhesives, coatings, waterproofing agents, sealers, fillers, other treatments or backings) used in the manufacture or in the recommended installation of certified products must be previously certified by Good Environmental Choice Australia, carry another ISO 14 024 based ecolabel acceptable to GECA, or comply with the requirements of the relevant GECA standard. If no GECA standard is available for specific component parts than these products must comply with the material requirements in this standard (in particular, Section 3.3).

3.2.4 Cement Content of Certified Products

Products that use cement must demonstrate that:

- Raw materials for cement production comply with Section 3.2.1.
- Direct Energy Consumption (see Section 3.5.1 and Appendix 2) of the cement production process is less than 3800 MJ/t.
- The finished certified product can meet the requirements of Section 3.5. Cement content must be included in the energy calculation for that section.
- Air emissions from cement manufacture must be less than the following limits for the whole process:

Pollutant	Emission limit	Recommended Test Method
Dust	65 g/t	ISO 9096 or equivalent
Sulphur Dioxide (SO ₂)	350 g/t	ISO 7935 or equivalent
Nitrogen Oxides (NO _x)	900 g/t	ISO 11564 or equivalent

Table 2: Air emission limits for the cement manufacturing process

3.3 Hazardous Materials

3.3.1 Prohibited Substances

The following compounds, their functional derivatives or in-situ precursors must not be added to products, their component parts, their packaging or be used at any stage of the manufacturing process, including as preparatory agents, cleaners or degreasers in the production facility:

- The heavy metals arsenic, chromium, tin, mercury, lead, cadmium or antimony
- Elemental Chlorine or other materials that can give rise to dioxins
- Halogenated organic flame retardants (e.g., decaBDE, chlorinated paraffins, etc)
- Flaming additives for natural products
- Halogenated organic solvents
- Aniline based amines
- Aziridine or polyaziridines
- The phthalates DEHP, DBP, DAP, BBP, DMP, DMT, DEP, DMEP and DIBP
- Alkylphenolethoxylates (APEO) or their derivatives (APDs)
- 1,3 Butadiene

Furthermore, substances bearing any of the following Risk Phrases or classified in categories 1 or 2A as classed by the IARC – <http://monographs.iarc.fr/ENG/Classification> must not be used in the manufacturing process of the certified product:

- R 46 May cause heritable genetic damage
- R 50/ 51 (Very) Toxic to aquatic organisms
- R 52 Harmful to aquatic organisms
- R 53 May cause long term adverse effects in the aquatic environment
- R 60 May impair fertility
- R 61 May cause harm to the unborn child

For IARC listed substances dosage, exposure rates and pathways need to be taken into account. Further information on these subjects can be found within the IARC-monographs for listed substances. Summaries of the monographs are available under: <http://monographs.iarc.fr/ENG/Monographs/allmonos90.php>

Lead, cadmium or antimony can be used in additives for glazing if the total content and release rates of these heavy metals are less than the limits listed in Table 3. Release rate testing must be undertaken in conformance with ISO 10545-15, or equivalent.

Parameter	% by weight of glaze	Release Rate (mg/m ²)
Lead	0.5	80
Cadmium	0.1	7
Antimony	0.25	na

Table 3: Heavy metal content limits and release rate limits for glazes.

Certified products using Lead, Cadmium or Antimony must undertake a research program intended to replace heavy metal glazes with environmentally preferable alternatives. Heavy metal glazes will not be permitted in later versions of the Standard in accordance with the principle of continual improvement.

3.3.2 Overall Pollutant Loads

In order to reduce pollutant hazards in the disposal, landfill and/or recycling at the end-of-life phase of products, these substances must not be detectable in certified products:

- Tar oils (benzo(α)pyrene)
- Pentachlorophenol (PCP)
- Asbestos
- 2,3,7,8 Tetrachlorodibenzo-p-dioxin (TCDD, dioxin)

The heavy metals listed in subsection 3.3.1 may not comprise more than 0.05 % by weight (in total) of the finished certified product, regardless of origin (whether a natural impurity or additive).

3.3.3 Radioactivity

This criterion applies to products intended for indoor use that contain greater than 75% by mass of:

- Granites, pegmatites or gypsum,
- Slag, clinker, or other waste from smelting, or
- Ash from coal or peat.

Radioactive safety may be demonstrated in *either* of the following ways:

a. Direct physical measurement

The effective concentrations (C) of the Potassium isotope K_{40} (C_K), of the Radium isotope Ra_{226} (C_{Ra}) and of the Thorium isotope Th_{232} (C_{Th}) must not exceed these two limitations:

- $\frac{C_K}{3000} + \frac{C_{Ra}}{300} + \frac{C_{Th}}{200} < 1$ and
- $C_{Ra} < 1$

To test for radioactivity the material has to be crushed during preparation. The effective concentration (C) must be measured with gamma spectroscopy.

b. Chemical composition

The finished certified product must not contain more Uranium, Thorium and Potassium than specified in Table 4.

Element	Content limits (mg/kg)
Uranium	8
Thorium	15
Potassium	50000

Table 4: Content limits for some potentially radioactive elements

The content of these elements has to be measured by a strong acid digest ICP-AAS method..

3.4 Environmental Emissions

3.4.1 Water Emissions

This Section applies to all products (both natural and processed).

Effluent waters discharged to the environment from processing or finishing operations must not exceed the following limits. These limits apply after water treatment either on- or off-site. Municipal sewage treatment plant emission levels may be used if waste water is discharged directly to the sewer by permit from the relevant local authority.

Emission	Limit (mg/L)	Recommended Test Method
Suspended solids*	40	ISO 5667-17 or equivalent
Cadmium	0.015	ISO 8288 or equivalent
Chromium (VI)	0.15	ISO 11083 or equivalent
Iron	1.5	ISO 6332 or equivalent
Lead	0.15	ISO 8288 or equivalent

Table 5: Water emission limits for all finished products.

* Where finishing operations are conducted on the same site as extraction operations, Section 3.2.1.6 shall be used as the suspended solids emission limit.

3.4.2 Air Emissions

Air emissions for each material type are to be measured as follows:

- Agglomerated Stone, Terrazzo Tile and Concrete Paving Units – whole manufacturing process
- Clay and Ceramic Tile – firing stage (cold emissions are covered below)
- Glass Tile – whole manufacturing process
- Natural Products – finishing stage.

If the finishing operation for natural stone products is conducted at a different site from the extraction operation, a human health risk assessment must be undertaken to identify the nature and possible risks of particulate emissions associated with finishing operations. Where finishing operations for natural stones are conducted on the same site as extraction operations, Section 3.2.1.5 shall apply as the air emission requirement.

Emissions to air must not exceed the following limits.

Emission	Limit Values (mg/m ² of product)				
	Agglomerated Stones	Ceramic or Glass Tiles	Clay Tiles	Terrazzo Tiles or Concrete Paving	Natural Products
Dust	300	200	250	300	300
SO ₂	850	1500	2000	1500	na
NO _x	1200	2500	3000	2000	na
F	na	200	200	na	na
Styrene	2000*	na	na	na	na

Table 6: Air emission limits for certified products. Recommended test methods are the same as specified in Table 2 and ISO/CD 15713 or equivalent for Fluorine. The limit values for Styrene include the production of any synthetic resin that may be used.

Total cold emissions (from pressing, glazing and spray drying) during clay and ceramic tile manufacture must not exceed 5 g/m² of product.

3.5 Energy and Waste Management

3.5.1 Direct Energy Consumption

Energy consumption during the production of certified products must not exceed the limits specified in Table 7 when calculated using the method and figures given in Appendix 2. Applicants must undertake an energy audit including all energy flows in the production process for the purpose of informing future energy efficiency improvements and refining this criterion in future versions of the standard.

Material Type	Limit Value (MJ/m ² of product)
Agglomerated Stone	100
Terrazzo Tile	60
Ceramic Tile (specific weight >19 kg/m ²)	50
Ceramic Tile (specific weight <19 kg/m ²)	70
Clay Tile	60
Glass Tile	50
Flamed Natural Products	65

Table 7: Energy consumption limits for certified products.

3.5.2 Energy Management

In order to reduce energy consumption during installation, dimensional stone producers must be able to provide stone to the exact thickness required for each order (± 2 mm).

For processes involving firing, the manufacturer must either:

- Be able demonstrate energy recycling and/or heat recovery systems. These may include, but are not limited to, cogeneration systems and/or the re-use of kiln heat for drying.
- Procure at least 10 % of total energy used in firing from a government approved Green Power provider, or other renewable energy source acceptable to GECA.

3.5.3 Waste Management

Manufacturers must be able to demonstrate the following elements, as minimum, in a waste management program covering all operational sites:

- Functioning procedures for diverting recyclable and reusable materials from the waste stream.
- Functioning procedures for the recovery of waste materials for other purposes.
- Contracts with registered hazardous waste contractors, where hazardous waste is generated by the process.
- Waste recovery or diversion from landfill, where technically possible.

3.5.4 Recycled Content Requirements

Glass tiles must incorporate at least 50 % by weight recycled content.

3.6 Post Consumption Recycling and Labelling

3.6.1 Packaging Requirements

Chlorinated or halogenated plastics must not be used in product packaging.

Used packaging shall be capable to be recycled by local recycling systems.

3.6.2 Product Information

The manufacturer must provide written information to the consumer clearly stating:

- The intended use of the product.
- Instructions for correct use and storage so as to maximise the product lifetime (e.g., whether the product needs coating or sealing, etc).
- Installation instructions including recommended techniques and materials. These instructions must not specify nor require the use of any component that does not comply with the materials requirements of this Standard.
- Maintenance instructions, if required. Maintenance instructions must not specify nor require the use of any chemical or coating limited by any part of this Standard.
- Recycling or environmentally preferable disposal instructions for the product end-of-life.
- A clear declaration on the use of fillers, sealers, coatings or any other treatments that may have been applied to the product during manufacture or processing.

3.7 Other Environmental Claims

Any product making environmental claims beyond the scope of this Standard must comply with ISO 14 021 and be able to verify these claims to GECA, if such claims are to be used in conjunction with the ecolabel.

Any product making greenhouse related claims must comply with ISO 14 064-3 “Specification with guidance for the validation and verification of greenhouse gas assertions” and be able to verify these claims to GECA, if such claims are to be used in conjunction with the ecolabel.

For claims outside the scope of ISO 14 021 or 14 064, clear statement of the test method and the conditions under which the product was tested is required, along with a clear explanation of the relevance of the test method to environmental claim.

4 COMPLIANCE TO ENVIRONMENTAL REGULATIONS

The applicant is required to comply with relevant environmental legislation and government orders at the Local, State, and Commonwealth levels, if these have been issued. An applicant's compliance with these criteria may be established by undertaking a series of random checks; and/or by gathering samples of applicant operational procedures and documents from approved assessors as evidence to support compliance during the verification. Where an applicant is from an overseas jurisdiction, that jurisdiction's environmental regulations apply. Where the applicant is subject to a guilty verdict by a legally constituted court in the last 24 months on the basis of a breach of any environmental legislation or permits, there must be evidence of corrective action.

5 COMPLIANCE TO LABOUR, ANTI-DISCRIMINATION AND SAFETY REGULATIONS

An applicant shall demonstrate that all employees are covered by a Federal or State award or a certified industrial agreement or a registered workplace agreement as determined by the Industrial Relations Commission, the Employment Advocate or a State or Territory Workplace Relations Agency or a workplace agreement in compliance with Workplace Relations Act 1996 Part 7 – The Australian Fair Pay and Conditions Standard.

An applicant shall demonstrate general compliance to the terms of State or Territory Legislation concerning Occupational, Health and Safety and/or the *Commonwealth Safety, Rehabilitation and Compensation Act 1988*, where applicable. Where the applicant is subject to a breach order by a government agency, or a guilty verdict by an Australian Court within the last 24 months, on the basis of a breach of State, Territory or Commonwealth Occupational, Health and Safety Legislation, there must be evidence of corrective action.

The applicant shall demonstrate general compliance to the requirements of the Racial Discrimination Act 1975, Sex Discrimination Act 1984, Disability Discrimination Act 1992, Equal Opportunity for Women in the Workplace Act 1999, and complementary State Legislation. Applicants cannot be in the list of 'named' or non-compliant employers under the Equal Opportunity for Women in the Workplace Act 1999. Where the applicant is subject to a breach order by a government agency, or a guilty verdict by an Australian Court in the last 24 months on the basis of a breach of these Acts, there must be evidence of corrective action.

Where an applicant is from an overseas jurisdiction, the applicant shall demonstrate general compliance to that jurisdiction's anti-discrimination, occupational health and safety, and workers' compensations regulations. Where the applicant is subject to a breach order by a government agency, or a guilty verdict by a legal court in their respective country within the last 24 months on the basis of a the breach of anti-discrimination, occupational health and safety, and workers' compensation regulations, there must be evidence of corrective action.

An applicant's compliance with these criteria may be established by undertaking a series of random checks; gathering samples of applicant operational procedures and documents from approved assessors; and/or by providing a self-declaration document signed by an executive officer of the applicant organisation as evidence to support compliance during verification.

6 EVIDENCE OF CONFORMANCE

6.1 Audit Methodology

Conformance with this Standard shall be demonstrated by undertaking an assessment under the above criteria by an approved assessor, following the certification and verification procedures detailed in the Good Environmental Choice Australia Ltd Documented Quality Management System, which generally follows the environmental auditing requirements of ISO 19 011.

6.2 Assessor Competency

The Australian Ecolabel Program classifies approved assessors as:

- a. Assessors registered by Good Environmental Choice Australia Ltd as environmental professionals that hold expertise relevant for an assessment, and who have undertaken training in the procedures of the Australian Ecolabel Program; or
- b. Environmental auditors accredited with the RABQSA.

6.3 Suitable Sources

Audit evidence should be of such a quality and quantity that competent environmental auditors, working independently of each other, will reach similar audit findings from evaluation of the same audit evidence against the same audit criteria.

Suitable sources of information to establish compliance may be, but are not limited to:

- a. Technical specification of the product.
- b. Obvious characteristics of the product under examination.
- c. Scientific test results and reports.
- d. Environmental management system and audit reports and results.
- e. Life-cycle assessment of each stage of the product life-cycle via a physical audit and examination.
- f. Life-cycle assessment via scientific testing.
- g. A statement of confirmation by an executive officer.
- h. An assessment of company or government records.
- i. Other material that can be considered objective evidence.

6.4 Laboratory Testing

New testing shall be undertaken by a laboratory accredited by the National Association of Testing Authorities (NATA), or an ISO 17 025 registered laboratory, or a similarly independent accreditation agent who can conduct the relevant tests and/or provide documentation detailing environmental performance against the criteria of this standard. The test results should be presented on NATA-endorsed reports or from a laboratory acceptable to Good Environmental Choice Australia Ltd.

If test results or environmental auditing results are not available, and/or there is insufficient data to establish full compliance with the criteria required by this standard, then certification cannot be awarded.

APPENDIX 1 – PRODUCT DATA SHEET

A1.1 Data Requirements for Dimensional Stone:

Details of the test procedures and results shall be provided together with a declaration that the product is fit for use based on all other information about the best application by the end-user. Table A1 outlines minimum data provision requirements for dimensional stone products.

The test methods recommended in this Appendix can be used as a guideline to provide required minimal information to the customer. Alternative test methods might be use if they lead to comparable results.

Category	Stone Type	Test Method (or equivalent)	Property	Notes
1	Granite	ASTM C615	Absorption Density Compressive Strength Modulus of Rupture Flexural Strength Abrasion Resistance	1
2	Marble	ASTM C503	Absorption Density Compressive Strength Modulus of Rupture Flexural Strength Abrasion Resistance	1
3	Limestone	ASTM C568	Absorption Density Compressive Strength Modulus of Rupture Abrasion Resistance	1
		AS/NZS 4456.10(A)	Resistance to Salt Attack	2
4	Sandstone	ASTM C616	Absorption Density Compressive Strength Modulus of Rupture Abrasion Resistance	1
		AS/NZS 4456.10(A)	Resistance to Salt Attack	2
5	Slate	ASTM C629	Absorption Modulus of Rupture Abrasion Resistance Acid Resistance	1
6	Other	See Note 3	Absorption Density Compressive Strength Modulus of Rupture Flexural Strength Abrasion Resistance	1

Table A1: Minimum requirements for data provision for dimensional stone products for the purpose of fit-for-purpose assessments by engineers and product specifiers.

Notes:

1 – This requirement is optional if the material is used solely for vertical surfaces.

2 – Only required for low-density limestone.

3 – Where the natural stone material cannot be classified within a specific category, the fitness for use will be independently evaluated based on results of appropriate physical property tests.

A1.2 Data Requirements for Stone Tiles:

Details of the test procedures and results shall be provided together with a declaration that the product is fit for use based on all other information about the best application by the end-user. Table A2 outlines minimum data provision requirements for stone tiles.

Where already test data for the product exist which were gained in accordance with Appendix A1.1 no double testing is necessary to provide sufficient information to the customer.

The test methods recommended in this Appendix can be used as a guideline to provide required minimal information to the customer. Alternative test methods might be use if they lead to comparable results.

Requirements and Test Method (or equivalent)	Property
EN 12057	Flexural Strength
	Water Absorption
	Open Porosity
	Frost resistance
	Abrasion resistance

Table A2: Minimum requirements for data provision for stone tiles for the purpose of fit-for-purpose assessments by engineers and product specifiers.

A1.3 Data Requirements for Paving Units and Flags:

Details of the test procedures and results shall be provided together with a declaration that the product is fit for use based on all other information about the best application by the end-user. Table A3 outlines minimum data provision requirements for Paving Units and Flags as specified in AS/NZS 4455 Masonry units and segmental pavers.

Where already test data for a natural stone product exist which were gained in accordance with Appendix A1.1 no double testing is necessary to provide sufficient information to the customer.

The test methods recommended in this Appendix can be used as a guideline to provide required minimal information to the customer. Alternative test methods might be use if they lead to comparable results.

Material	Test Method (or equivalent)	Property
Natural Stone	AS/NZS 4456.3	Dimensional Deviation
	AS/NZS 4456.4	Unconfined Compressive Strength
	AS/NZS 4456.5	Breaking Load
Concrete	AS/NZS 4456.9	Abrasion Resistance
Fired Clay	AS/NZS 4456.10	Salt Attack Resistance
	AS/NZS 4456.11	Moisture Expansion
	AS/NZS 4456.14	Water Absorption
	AS/NZS 4456.15	Modulus of Rupture

Table A3: Minimum requirements for data provision for Paving Units and Flags for the purpose of fit-for-purpose assessments by engineers and product specifiers.

A1.4 Data Requirements for Agglomerated Stone Products:

Details of the test procedures and results shall be provided together with a declaration that the product is fit for use based on all other information about the best application by the end-user. Table A4 outlines minimum data provision requirements for agglomerated stone products.

The test methods recommended in this Appendix can be used as a guideline to provide required minimal information to the customer. Alternative test methods might be use if they lead to comparable results.

Test Method (or equivalent)	Property
EN 14617.1	Density and Water Absorption
EN 14617.2	Flexural Strength
EN 14617.4	Abrasion Resistance
EN 14617.9	Impact Resistance
EN 14617.12	Dimensional Stability
EN 14617.15	Compressive Strength
EN 14617.16	Geometric Characteristics and Surface Quality

Table A4: Minimum requirements for data provision for agglomerated stone products for the purpose of fit-for-purpose assessments by engineers and product specifiers.

A1.5 Data Requirements for Terrazzo Tiles:

Details of the test procedures and results shall be provided together with a declaration that the product is fit for use based on all other information about the best application by the end-user. Table A5 outlines minimum data provision requirements for Terrazzo tiles.

The test methods recommended in this Appendix can be used as a guideline to provide required minimal information to the customer. Alternative test methods might be use if they lead to comparable results.

Classification	Requirements and Test Methods (or equivalent)	Property
Terrazzo tiles for internal use	EN 13748-1	Geometric Characteristics Surface Characteristic Mechanical Strength
Terrazzo tiles for external use	EN 13748-2	Geometric Characteristics Surface Characteristic Mechanical Strength Weather Resistance

Table A5: Minimum requirements for data provision for Terrazzo tiles for the purpose of fit-for-purpose assessments by engineers and product specifiers.

A1.6 Data Requirements for Ceramic Tiles:

Details of the test procedures and results shall be provided together with a declaration that the product is fit for use based on all other information about the best application by the end-user. Table A6 outlines minimum data provision requirements for ceramic tiles. The properties of the product have to comply with the requirements outlined in the Australian Standard AS 4662 or equivalent international standards.

The test methods recommended in this Appendix can be used as a guideline to provide required minimal information to the customer. Alternative test methods might be use if they lead to comparable results.

Test Method (or equivalent)	Property
AS 4459.2	Dimensional Characteristics and Surface Quality
AS 4459.3	Water Absorption
AS 4459.4	Module of rupture and Breaking Strength
AS 4459.5	Impact Resistance
AS 4459.7	Surface Abrasion
AS 4459.10	Moisture Expansion
AS 4459.15	Lead and Cadmium Release Rate

Table A6: Minimum requirements for data provision for ceramic tiles for the purpose of fit-for-purpose assessments by engineers and product specifiers.

Notes:

Surface Abrasion and Lead/ Cadmium Release Rate are only relevant for glazed ceramic tiles.

The tests described in Table A6 may alternatively be performed in compliance with the Standard ISO 10545.

A1.7 Data Requirements for Glass Tiles:

Due to the lack of available product standards for this product group, the characteristics of glass tiles shall be determined in accordance with the test methods used for ceramic tiles and as outlined in Table A7.

The test methods recommended in this Appendix can be used as a guideline to provide required minimal information to the customer. Alternative test methods might be use if they lead to comparable results.

Test Method (or equivalent)	Property
AS 4459.2	Dimensional Characteristics and Surface Quality
AS 4459.4	Module of rupture and Breaking Strength
AS 4459.5	Impact Resistance

Table A7: Minimum requirements for data provision for glass tiles for the purpose of fit-for-purpose assessments by engineers and product specifiers.

A1.8 Slip Resistance

Products which are intended to use on floors must also provide on the product data sheet slip resistance data gained in accordance to AS/NZS 4586 - Slip resistance classification of new pedestrian surface materials, or equivalent international standards or equivalent test methods.

APPENDIX 2 – ENERGY USE

When providing a calculation of process energy requirement (PER) or energy requirement for firing (ERF), the correct energy carriers shall be taken into account (see Table A7). Gross calorific values (high heat value) of fuels shall be used to convert energy units to MJ (see Table A8). In case of use of other fuels, the calorific value used for the calculation shall be specified. Electricity means net imported electricity coming from the grid and internal generation of electricity measured as electric power.

Product Category	Requirement Type	Energy flows to take into consideration
Agglomerated stone Terrazzo tiles Cement	PER	all energy flows entering the production plant both as fuels and electricity
Ceramic tile Clay tile Flamed natural products	ERF	all energy flows entering all the kilns as fuels for the firing stage

Table A7: Energy flows relevant for the calculation of the PER or ERF for each product group

Production Period	Day:	From:	To:	
Quantity of product (tonnes or m ³):				
Equals to surface area of final product (m ²):				
Fuel	Quantity	Units	Conversion Factor	Energy (MJ)
Natural gas		kg	54.1	
Natural gas		Nm ³	38.8	
Propane		kg	50	
Butane		kg	49.3	
Kerosene		kg	46.5	
Gasoline		kg	52.7	
Diesel		kg	44.6	
Gas oil		kg	45.2	
Heavy fuel oil		kg	42.7	
Dry steam coal		kg	30.6	
Anthracite		kg	29.7	
Charcoal		kg	33.7	
Industrial coke		kg	27.9	
Electricity		kWh	3.6	
Total energy use				
Consumption per tonne of product (MJ/t): or, consumption per m³ of product (MJ/m³): Consumption per square meter of finished product (MJ/m²):				

Table A8: Energy use calculation table for hard surfacing products.

APPENDIX 3 – CALCULATION OF THE VISUAL IMPACT

The calculation of the Visual Impact of Mines and Quarries for the purpose of this standard is based on the calculation described in the Technical Appendix A1.9 of the EU Commission Decision 2002/272/EC.

The calculation of visual impact lies in tracing cross sections passing through the quarry front and other external “visual points”, which are important to determine the visual impact (for example either from nearby towns or from frequented places or major roads, etc.). The calculation of the final score, measured as a percentage, shall be taken from the highest value of originally calculated values (worst case situation). A short explanation for the finally chosen “visual point” should be submitted to the Competent Body. From each visual point (P), the “bottom radius” is traced, tangent to the topographic surface and intercepting the lowest point of the “visible quarry area”. The visible quarry area is regarded as the area where the excavation is carried out or where there is an active dump. Already rehabilitated areas (both in front area and dumps) need not be considered. From the same visual point a second radius (called “top radius”) is traced, intercepting the highest point of the quarry front. The top radius and bottom radius allow the identification on the section of the quarry of the limits of the height of the visible front (the vertical distance from top to bottom radius matching the front). The calculation could be made on the basis of the quarry project. These geometric data are put into the following formula and the result is the quotient of visual impact of the quarry affecting a specific visual point.

$$x[\%] = \frac{h^2}{(L \cdot \tan 30^\circ)^2} \cdot 100\%$$

- h → vertical height of front visible from visual point P (meters)
- L → Horizontal distance between the worst visual point P and the front
- $\tan 30^\circ$ → Tangent of the average angle of the human eye vision cone
- $x[\%]$ → Percent of visual impact

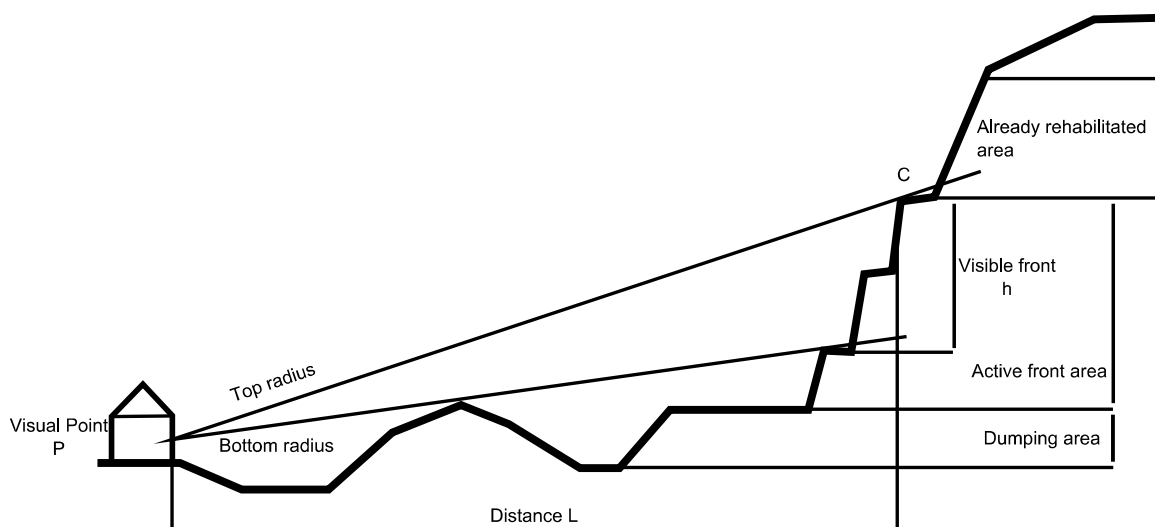


Figure A1: Graphical definition of the visual impact indicator