

Moreland Greenlist



Moreland City Council would like to acknowledge VicUrban as the owner of the Intellectual Property of the Materials Eco Selector used in the creation of the *Moreland Greenlist*. The VicUrban Materials Eco Selector was a DRAFT at the time the Moreland Greenlist was created and will change and evolve over time.

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Contact details for suppliers were current at the time of publication (March 2004.)

Aim of the STEPS Materials Module

The STEPS Materials Module was developed in response to a need for the impacts of building materials to be included in the building approvals process. Building materials are a significant environmental burden but today's building materials may, with good management, become a resource to the community in the future.

The aim of the Materials Module is to assist applicants achieve healthy and environmentally preferable developments within the context of the planning approvals process. This will generate measurable improvements in the impacts of projects that achieve a high score in the STEPS material module. Care has been taken to select products that are currently commercially available.

It is anticipated that the use and trial of the Moreland STEPS tool will provide valuable feedback to contribute to the ongoing development of the materials module and the continued evolution of the sustainable materials industry.

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Acronyms

ACQ	Ammoniacal Copper Quaternary
CCA	Copper Chrome Arsenate
E0	Zero emission of formaldehyde
EE	Embodied energy
FCS	Forest Stewardship Council
GJ	Gigajoule
LVL	Laminated Veneer Lumber
LOSP	Light Organic Solvent Preservative
MDF	Mean Double Fold
PVC	Poly-vinyl Chloride
VOC	Volatile organic Compounds

Approved timbers must meet one of the following criteria:

- Third party certified - Forest Stewardship Council or Australian Forestry Standard
- Plantation softwood or hardwood
- Recycled; or
- Bamboo.

Builders must provide satisfactory documentary evidence from suppliers to support claims about third party certification, plantation-grown or recycled.

Recycled plastic products must meet the definition of 'recycled' in the Australian Standard for environmental claims (AS/NZS ISO 14021: 2000):

- It must be either pre-consumer recycled material which is material diverted from the waste stream during a manufacturing operation, or post-consumer recycled material which is recovered from households, commercial, industrial or institutional facilities.
- It excludes regrind which is capable of being recovered within the same process.

Embodied energy is the amount of energy used in the raw material extraction, production of products and materials.

Passive Design is a design that does not require mechanical heating or cooling.

Rainforest timber: These include such species as Merbau, Meranti, and Kwila. For a list of rainforest timber species to avoid and their conservation status see either:

www.cites.org or www.unep-wcmc

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Floors and Footings

The floor structure is a very important and essential part of a home. There are two types of floor structure systems: the 'slab on ground' and the suspended timber floor. Environmentally the issues with these systems are:

Slab on ground:

- Uses a lot of high embodied energy cement and steel
- Chemical termite protection leaches into the ground and contaminates it.

By selecting the products in this chart you have the potential to reduce the Embodied Energy (EE) in the slab on ground system by more than half (i.e. from 1.4GJ/m² to 0.6 GJ/m²). For a 150m² home you are saving 95 GJ of energy or enough to power a home for over one year.

Hints

- 30% slag and/or fly ash in cement in most applications does not extend drying times
- Specify recycled aggregate to concrete suppliers
- Seek higher than 50% recycled/extender content cement– up to 90% can be achieved
- Insulate around slab edge and ensure compatibility with the termite protection system you are using

Suspended timber floor:

- Avoiding gluing of timber floors is recommended to enable recycling at end of life.
- Chemical termite protection leaches into the ground and contaminates it
- Polyurethane pre-coat not as preferable as beeswax or nut oil coating.
- Requires substantial concrete for footings and extra bricks due to the extra building height
- Costs more energy to heat in winter (unless well-insulated) and requires more cooling in summer in Melbourne's climate.

For the suspended timber floor by selecting plantation timbers you are reducing the potential impacts on biodiversity, and by selecting low EE concrete and bricks you will be reducing energy consumption and greenhouse emissions.

Hints

- Insulate under the floor
- Expose slab if you are using thermal mass for passive design

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Floors and Footings

Slab on ground

Application	Element	Environmental Benefit	Product	Company contact
Slab on ground	Concrete – whole product	Concrete contains recycled aggregate and flyash and slag. Reduced resource use and lower embodied energy.	Green concrete	Boral 03 9508 7111 up to 60% recycled agg & fly ash
			Ecomax	Readymix 131188
			Up to 40% slag/fly ash, or 10% silica fume. With 100% recycled aggregate.	Hy Tec Industries 1300 550 499
	Blended cement	Supplementary cementitious materials added (either fly ash, blast furnace slag, silica fume, or a combination of these). This reduces resource use and waste products and embodied energy. These additions can increase strength depending on % and application.	Slag Blend	Anacon laboratories (Pronto) 03 9646 5520
			Blend 35 (35% slag)	Cement Australia 03 9688 1920
			Blended Cement (Blend of fly ash and slag up to 80%).	Independent Cement & Lime 03 9676 0000
			Blended cement concrete (up to 80%)	Readymix 131188
			Supply powder: Slagment Triple Blend Flyash Blended cement	Blue Circle 03 5241 8291
		Up to 30% replacement of GP with fly ash/slag	Statewide Concrete Industries 13 2662 02 9623 2638	

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Suspended timber framed floor

Floors	Using plantation or recycled or FSC certified reduces impact on biodiversity	Radiata pine	Carter Holt Harvey 1800 335 293,
Floors	Uses plantation, recycled or FSC certified reduces impact on biodiversity	Radiata pine	BBC Hardware 1800 333 378
Floors	Using plantation timber reduces impact on biodiversity	Hoop Pine	Hyne Wholesalers 07 4121 1211
Wood flooring and cladding	Hard wearing and treated by environmentally preferred LOSP	LOSP treated pine (rather than CCA treated)	The Pine Centre 03 9354 3665
Stumps	Concrete stumps last longer, are naturally termite resistant and if recycled content cement used, has excellent environmental performance.	Concrete stumps	Various local suppliers
Joists/Bearers	Composite I shaped beam which reduces resource use	Composite I beam with timber and steel	TecBeam 03 9794 8155
Joists/bearers	Using plantation, recycled or FSC certified reduces impact on biodiversity	Posi-STRUT	Mitek P/L 03 9730 5555
Joists/bearers	Using plantation, recycled or FSC certified reduces impact on biodiversity	Posi-STRUT	Gang Nail 03 9763 4444
Joists/bearers	Using plantation, recycled or FSC certified reduces impact on biodiversity however there can be low level emissions from the synthetic resins can be used in the production of LVL. Both products are designed to reduce resource consumption	I beam & LVL	Various suppliers

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Wall and Roof Framing

Almost all residential houses use either timber or steel for wall and roof framing. There are some environmental issues with both framing techniques.

Steel:

- Steel is very high in EE. Recycled content reduces this, although steel for house frames currently contains only a small proportion of recycled material.
- Steel is also less thermally efficient than timber, as steel can create a thermal bridge between internal and external elements, increasing heating and cooling energy use.
- On the positive side, steel is durable and recyclable at end-of-life.

Hints

- If you use steel ensure the detail of the roof and insulation deals with thermal bridging, eg strip of timber over the steel beam – if not this can reduce effectiveness of insulation by up to 30%.
- Use steel in structural situations only where plantation timber or composite elements are not suitable, i.e. long spans or when the timber member may be too deep dimensionally.

Timber

- Timber framing can involve the use of non-plantation (i.e. biodiversity effecting) material.
- Timber has lower EE than steel.

Hints

- Ortech Industries' Easiboard can be used to replace internal stud walls. It is not generally used in load bearing situations, and there can be issues with service access and finish. It has an extremely low embodied energy, and walls can be erected cheaply and quickly.
- If you can use finger joined timber this allows you to use smaller pieces of wood and saves on resources.
- Specify recycled, plantation or third-party certified timbers

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Framing

Steel framing

Element	Environment benefit	Product	Company contact
House frame	High EE but durable, 20% recycled content and 100% recyclable.	Steel house made from ZINCALUME®	BlueScope Steel 1800 022 999
House frame	High EE but durable and recyclable.	Steel house frame	Stratco Australia P/L 08 8349 5555 03 9761 6922

Timber Framing

Studs, Noggins, Plates	This uses plantation timber, which is renewable and has less impact on biodiversity	MGP pine	All timber merchants
Beams	Resource reduction as this replaces standard beam with an 'I' shaped beam. It is made from engineered wood and structural plywood which is recycled or reconstituted wood that has been laminated.	Hybeam made with Hyspan LVL	Futurebuild CHH 03 9258 7600
Structural framing	Plantation pine timber framing	Rhino Framing	Pine Solutions 03 9706 6174
Beams	Plantation pine timber	LVL Beams	Pine Solutions 03 9706 6174
Truss	Plantation pine timber	Truss	Bendigo Trusses 03 5448 4300
Various timber products	Plantation timber	CHH products	Bowens 03 9796 3003
Various timber products	Plantation timber	Radiata pine	Peuker and Alexander 03 93091777

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Wall Cladding

The use of high EE products is discouraged, where possible, throughout the project. If they are designed to last a long time and to be very efficient this can offset the embodied energy.

Environmental issues associated with cladding types:

Bricks:

- Fired clay bricks are very high in EE and their use as a cladding material should be minimised where possible.
- If you choose bricks from an efficient firing manufacturer, you can reduce the embodied energy from 10 – 25 GJ /1000 bricks to 5-5.5 GJ/1000 bricks.

Hints

- Use of an M2 mortar (1:2:9) with lime makes it easier to recycle at the end of life
- Buy pre scored bricks for more accurate splitting
- Store half bricks in one area for reuse
- Avoid use of raked mortar joint – use ironed or flush as this will make the wall last longer and stop moisture entering the wall
- Use second-hand or 'seconds' bricks where practicable
- Avoid using acid to wash bricks clean – use high pressure water instead
- Avoid painting brickwork

Timber:

- Suggested timber cladding, fibre cement sheet cladding and their derivative systems, considerably lower embodied energy if selected over brickwork.
- The main environmental issue is the impacts associated with harvesting timber from native forests.

Rendered finishes:

- Render finishes on a polystyrene substrate have some benefits, but at the expense of higher EE and reduced ability to recycle at end of life.

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Brick veneer

Element	Environment benefit	Product	Company contact
Damp proof course	100% Recycled plastic	Builder's film	Plastic Technology 03 9546 2855
Bricks	Lower embodied energy compared to other bricks and efficient manufacturing process	Clay brick	Austral bricks (Nubrik) 03 9801 1122
		Clay brick	Boral Bricks 13 30 35
		Clay Brick	Selkirk 03 9546 2855
Bricks	Lower embodied energy compared to other bricks	Clay brick	Selkirk 03 9546 2855
Concrete blocks	Lower embodied energy than bricks and reduced amount of concrete used	AAC Hebel blocks	For distributors call CSR 1300 369 448
Concrete bricks	Lowest embodied energy , about 1/8 of clay bricks	Concrete blockwork	C&M 03 9305 3922
Recycled Bricks	Reduced resource use through recycling and no chemicals used in cleaning process	Second hand and recycled bricks	Paddy's Bricks 03 9687 2338

Weatherboard

Weatherboards	Less biodiversity impact and low resource consumption as it is recycled	Shiplap hardwood weatherboards in range of species	Shiver Me Timbers 03 9379 5993 * ask for recycled timber – company also supplies virgin timber
Ply Sheet Cladding	Less biodiversity impact as it comes from a plantation.	Ecoply shadow clad	Carter Holt Harvey 1800 335 293
Weatherboards	Weatherboards coated with cement and sand but uses PVC fittings	Primeline weatherboards	James Hardie 13 11 03
Steel Weatherboard cladding	High EE but durable with 20% recycled content and 100% recyclable	Weatherboard cladding made from COLORBOND® steel	BlueScope Steel 1800 022 999

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Cladding

Concrete and expanded polystyrene wall system	High thermal performance due to insulating qualities. Need to specify high recycled content cement.	THERMOMASS wall system	Composite systems 03 9824 8211
Rendered wall system	Good insulation qualities and resource efficient product – using Styrofoam and concrete	Unitex Thermal Wall System	Unitex 03 9706 5279
Internal stud walls (non-load bearing)	Low EE and a renewable material. Use of a waste product. Acoustic and thermal insulation properties.	Easiboard Straw panels	Ortech Industries 1800 805 919 03 9580 7766
Steel wall cladding	High EE but durable with 20% recycled content and 100% recyclable	Wall cladding made from COLORBOND® steel	BlueScope Steel 1800 022 999
Fibre Cement Sheet	Low EE and resource use reduction	Harditex	James Hardie 13 11 03
Fibre Cement Sheet	Low EE and resource use reduction. There is PVC in it.	Texturebase sheet	CSR 02 9844 7935
Fibre Cement Sheet	High emissions. Better insulating, is rendered so has higher EE.	Maclad System	Melbourne Acrylic Coatings 03 9558 5568
Rendered FC Sheet wall system	Lower EE than brick and masonry walls.	Rendaline CMX wall system Rendered Wall cladding system	CSR 02 9844 7935 James Hardie 13 11 03 GRN Wallboards 03 9314 9966

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Roof Cladding

There is very little environmental difference between sheet metal roofing and concrete tiles. The decision will depend on design issues.

The environmental issues are:

Steel Roofing:

- High embodied energy, but low maintenance and light weight (less supporting structure and transport), help to reduce its impact
- High recyclability at end of life

Tile Roofing:

- High embodied energy unless using concrete tiles;
- Industry standard for battens is hardwood (biodiversity impact)

Hints:

- Use light colours for roofing to improve passive thermal comfort
- It is important to ventilate roof spaces if using dark coloured roofing
- If using tiles, select concrete tiles in preference to fired terracotta, for lower Embodied Energy
- Encourage alternatives to hardwood battens, especially for tile roofs
- Ensure compatibility with capture and use of rainwater – including design of gutters to limit leaf litter build-up and design of roof to minimise pipework to tank

Roof Tiles

Concrete Tiles	Lower EE than baked tile but sealants can be toxic	Concrete tile	Various suppliers
Concrete Tiles	High recycled content cement (80% slag) and lower EE than baked tile but sealants can be toxic	Concrete tile with recycled content cement	Alice Roof Tiles 03 5367 6212
Ceramic tiles	Higher EE but long lasting	Ceramic tile	various

Steel Roofing

Steel roofing	Lower EE than baked tile, less material needed	Zinc aluminium or colour coated steel	Various suppliers
Steel roofing	Lower EE than baked tile, less material needed. Locally manufactured, 20% recycled content, 100% recyclable.	Roofing made from COLORBOND® or ZINCALUME® steel	BlueScope Steel 1800 022 999
Steel roofing	Lower EE than baked tile, less material needed		JJ Steelworks 03 9737 0666

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Windows

Openings

Windows (Aluminium)	Uses recycled aluminium	Windows	G James Glass & Aluminium Pty, 03 9219 2077
Windows (Timber)	Efficient resource use and energy efficient double glazed windows; wood sourced from pine plantations (Primex product only)	Energy rated Primex timber windows. Primex is treated with LOSP and can't be stained.	Primex – Canterbury Windows 03 9558 5222
Windows (Timber)	Efficient resource use	Windows	Pickering Joinery 03 5243 4166
Windows (timber)	Energy efficient	Tyrol tilt& turn double glazed windows	Paarhammer 03 5368 1999
Windows (Timber)	Recycled windows	Windows	Woodhill Timber Windows and Joinery 02 4228 8899
Windows (aluminium)	Recycled plantation rubber and 15-20% recycled aluminium content	Windows	Geelong Windows 03 5278 5511
Windows (Aluminium)	Aluminium frame with recycled content, pre-primed and energy efficient glass	Sliding window	A& L Windows 03 8786 0000

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Outdoor Structures

The careful selection of materials for outdoor structures can also minimise environmental impacts.

Timbers:

The issues for timber used are:

- Concerns about the chemicals in CCA (copper chrome arsenate) treated timber leaching into the soil and water table
- Concerns about the impacts of timber harvesting (e.g. old growth forests).

Hints

- Use plantation, recycled or third party certified timbers for decking
- Look for alternatives to CCA treated timber, e.g. Tanalith 'E', 'ACQ', Light Organic Solvent Preservative (LOSP)
- Use recycled sleepers

Element	Environment benefit	Product	Company contact
Timber preservative	Copper treatment for wood (not as problematic in disposal as CCA).	NatureWood ACQ (up to H3) treatment	Osmostone 1800 088 809
Timber preservative	Light Organic Solvent Preservative (LOSP) treatment for timber fencing (not to be used on posts that go in the ground)	Protim H3 LOSP treated timber	Osmostone 1800 088 809
Timber preservative	Tanalith E is rated to H4 (in ground applications e.g. fence posts)	Tanalith E	ITI Mark McFarlane State Manager (03) 9392 8400.
Decking	Alternative to CCA treated timber	ACQ treated timber decking	DaVIDS Timber 03 9822 9344
Decking	100% recycled plastic	Anti-skid Decking	Repeat Plastics 03 9739 6919
Decking	Made from non-virgin wood and recycled plastic	Modwood Decking	Modwood Technologies 03 9462 4333
Decking and beams	Plantation timber with copper content in the preservative	Preserveply and Norply	Norply 02 6632 2400
Sleepers, decking and fencing	Less toxic timber treatment. Check source of timber.	Tanalith E treated timber	Koppers 02 9954 5411
Bench tops and Decking	Reclaimed and salvaged timber	Solid timber bench tops, decking, stair treads, skirting boards, posts and beams. Range of species.	Shiver Me Timbers 03 9397 5993 * ask for recycled timber – company also supplies virgin timber

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Wood Panels, Timber Floors and Paints

Paint and joinery products are major causes of toxicity leading to poor indoor air quality. Where possible, alternatives have been suggested that produce less or no toxic emissions while still satisfying environmental and cost criteria. Environmental issues associated with fittings and finishes:

Woods:

- Formaldehyde emissions from MDF, plywood and particleboard are major contributors to airborne toxins in homes, although this off-gassing does diminish with time.
- Where possible, these materials may be sealed to reduce emissions, but this benefit only lasts as long as the seal remains intact.

Hints

- Low emission MDF options and alternatives are available.
- Use whole woods wherever possible.

Finishes:

- Oil based finishes will give off VOC emissions. Affects the applicator more than the home owner as it mostly disperses in 1-6 months.
- Chemically sensitive people will be affected longer.

Hints

- Use natural oils or beeswax rather than products containing solvents or synthetics.
- Simple non-toxic finishes may be used to seal interior and many exterior woods.
- Acrylic render systems and non-toxic, durable paints for external walls are widely available and used in the industry. Many options are listed.

Rule of Thumb – the priority is to use mechanical fixings and minimise painting, then water-based finishes, glues, adhesives and paint where possible.

Insulation:

- The important thing is to use the right R value insulation.

Hints:

- Make sure your insulation covers the space entirely
- Insulate roof right up to the edge of the ceiling (but stop insulation contacting the roof). A combination of foil under the roofing material with an airspace below it and bulk insulation on the ceiling works very well in Melbourne.

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Fittings and Finishes

Timber and wood products

Particleboard Flooring	Pine plantation timber	Particleboard flooring	D&R Henderson 03 9768 3320
Floors	Plantation but transport distance is a negative impact	Hardwood (Oak, Oak Rustic, Mahogany Beech, Jarrah, Ash, Beech, Nordic White)	Swedish company Tarkett 03 9764 1711
Floors	Re-milled hardwood timber which is recycled and salvaged wood.	Hardwood in range of species	Shiver Me Timbers 03 9397 5993 * ask for recycled timber – company also supplies virgin timber
Floors	100% recycled hardwood timber	Hardwood tongue and groove flooring	Nullarbor Forest Timber Industries 03 9484 9215
Floors	Regenerates quickly, as strong as hardwood.	Bamboo	BT bamboo distributor: Riband floors 03 9888 5635
Floors	Regenerates quickly, as strong as hardwood.	Bamboo	Living Choice Group 03 9546 6115
Floors	Regenerates quickly, as strong as hardwood.	Bamboo	Bamboo Australia 07 5447 0299
Floors	Regenerates quickly, as strong as hardwood.	Bamboo	Style Plantation 08 9244 8888
Floors	Regenerates quickly, as strong as hardwood.	Bamboo	Bamboo Floors Australia 1800 042 150
Floors	Regenerates quickly, as strong as hardwood.	Bamboo (imported)	PlyBoo (USA company) PLYBOO@aol.com
Various timber applications	Independently third party verified plantation Vic Ash – lower biodiversity impacts	VicAsh FSC certified	Hancock, Druin West 03 5134 4377
Board and Ply	Exceeds Industry standard low emission and plantation timber	E0 (zero emission of formaldehyde) board and Ply	Brims Wood Panels 03 9763 6700
MDF	Exceeds Industry standard low emission and plantation timber	E0 Alpine MDF – export only but could change with increased demand	Alpine MDF Industries 03 9663 5833
Hoop pine plywood	Plantation timber and low emission	Board and ply	Carter Holt Harvey 1800 335 293

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Hoop pine plywood	Plantation timber and low emission	Board and ply	Brims Wood Panels 03 9763 6700
Pine particleboard	Pine plantation timber	Particleboard	D&R Henderson 03 9768 3320
Floor coverings			
Matting	Hard wearing, natural fibres.	Sisal, seagrass and natural matting that rolls like carpet or as a mat.	Floospace 03 9822 4455
Cork flooring	Renewable source from a recycled product. Polyurethane cured.	Cork and rubber flat sheet flooring	Comcork distributor 02 9555 2131 03 9544 2288
Floating floors	Timber alternative	HDF: Kronotex Laminate	Fowles Carpet 03 9644 9090
Floating floors	Uses 75% less hardwood. Take care to specify non rainforest timbers (i.e. Hevea which is renewable).	Timber veneer plywood: Embelton	Fowles Carpet 03 9644 9090
Floating floors	Take care to specify non rainforest timbers (i.e. Hevea which is renewable).	Timber veneer plywood: Unique timber flooring	Fowles Carpet 03 9644 9090

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External Paint

Element	Environment benefit	Product	Company contact
Paint	Lower toxicity less emissions. Very durable.	Granital mineral paint	Keim distributor 02 9211 6644
Paint	Lower toxicity, less emissions. Plant and mineral based paint	BIO Paints Wall paint	Energy and Water Solutions 02 9519 0433 Going Solar 03 9348 1000
Water-based paint	Lower toxicity, less emissions, water based less EE.	Taubmans Murowash and Pentimento (limewash)	Bristol 03 9518 0700 Murobond 02 9906 7299
Render	Lower toxicity less emissions, water based less EE	Acrylic Render Granosite Cement based and coloured renders Duraguard	Dulux 13 23 77 Wattyl 13 21 01 Rockcote 1800 267 737 Solver Paints 03 9484 6100 (distributor Preston)
Finish	Acrylic paint, durable. Look and feel of render. Finish for brick, masonry, concrete and fibre cement	Taubmans Outdoor Colour range	Taubmans 131 686
Timber finish	Lower toxicity and less emissions. Stain needs reapplication.	Organoil Woodguard	Mitre 10 Advice line 13 63 10 Bunnings Building Supplies – Epping (03) 9408 9100 Evergard Industries 03 9762 9588
Timber finish	Lower toxicity and less emissions. Very durable.	Woodman's specialised timber coatings	Victorian distributor 03 9762 9588

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Internal Finishes

Paints	Low toxicity paint, low emission	Range of limewash, acrylic, milk, mineral and silicate paints	Porters Paints 1800 656 664
Paints	Lower toxicity less emissions, water based paint	Breatheasy Taubmans Livos EcoStyle Ecosil Organoil BIO Paints Auro paints Maxi Wash	Dulux 13 23 77 Bristol 03 9518 0700 Dubron 02 4782 6155 Rockcote 03 9308 7233 Keim distributor 02 9211 6644 Mitre 10 Advice line 13 63 10 Bunnings Building Supplies – Epping (03) 9408 9100 Going Solar 03 9348 1000 Going Solar 03 9348 1000 Solver Paints 03 9484 6100 (distributor Preston)
Paints	Low toxicity paint	Oikos acrylic paints	Oikos distributors: 1300 303 802
Paint	Low toxicity paint	Acrylic paints	Wattyl 13 21 01