



TOTAL ENVIRONMENT CENTRE

our environment *it's a living thing*



Safer Solutions for Safer Renovations

The Essential Guide to Reducing Chemical Impacts from Home Renovations



Time to *Greenovate*

With climate change uppermost in people's minds, the demand for sustainable building designs and materials seems set to rapidly expand as we look for new ways to enhance our lifestyles with less impact on the planet.

Renovation trends show that people are seeking more earth-friendly approaches to their interior spaces with an emphasis on natural lighting and casual areas that integrate with the outside bringing in plenty of fresh air and a connection with nature.

But there are hidden costs to our home renovations that are often overlooked. Hazardous chemicals in products and materials can impact on the environment and there are potential health effects, especially on the more vulnerable members of our households, such as pregnant women, babies and young children.

The **Essential Guide to Reducing Chemical Impacts from Home Renovations** presents information on healthier choices and safer ways to *greenovate* your home.

Key *greenovation* steps:

AVOID hazardous chemicals

CHOOSE safer products

PRACTICE good techniques

SHARE your *greenovation* success stories!

Greenovation essentials

‘Government and industry must ensure hazardous chemicals are systematically removed from materials and products so that we have the safest options available.’

SAFER TIP

If you live in your home whilst renovating make sure you choose zero or low emission products and ensure rooms are well ventilated.

Australians on average move or renovate every seven years and over 50% of homeowners will look to renovate at some stage.

Whether it is a simple makeover, extension, or full-scale renovation, you will need to make choices about the best products and materials for your renovation needs. Why not choose designs and materials that are environmentally sustainable and good for your health?

Making better choices does take time and commitment but the effort is well worth it. Your home will be a healthier place to live and your impact on the environment reduced.

Read on for safer tips on:

- **Improving the quality of the air inside your home**
- **Selecting safer products and getting the most out of natural materials**
- **Creating a natural nursery**
- **Greenovating your kitchen and bathroom**
- **Where to find safe and healthy products and good greenovation advice**

The inside story



In urbanised societies like Australia we spend up to 60% of our time at home and another 30% in 'indoor environments' such as transport, school and the workplace, so it is vital we have clean air to breathe.

Inside air can be polluted by poor ventilation, mould and cigarette smoke but it is during building and renovating that high levels of chemicals are introduced from materials and products.

Research shows that it is common for the air inside our homes and buildings to be more polluted than the outdoor air due to a cocktail of chemical compounds.

Recent studies have also measured hundreds of everyday chemicals in our blood and mothers' breast milk, revealing that we are all exposed to an ever-present chemical soup. Children have higher levels of some chemical pollutants than their grandparents.

The long-term health effects of chemical exposure are simply unknown however researchers are concerned about the relationship between rising rates of asthma, allergies, learning disorders and childhood cancers and chemical pollution.

Off-gassing

Products and materials release or 'off-gas' their chemical constituents over time into the living space where they concentrate in the air, furnishings and also collect in dust. **New buildings and renovations have the highest level of chemical 'off-gassing'.**

Because chemical pollution is invisible, the problem is easily overlooked. One sign that you may be breathing in hazardous chemicals is when you detect a 'new' smell, or a strong odour associated with particular products like adhesives or paint.

SAFER TIP

Take note of your reactions when you first enter your home during renovations. Is the air stale? Can you smell chemicals? If yes, go outside and ensure rooms are aired well before returning.

Symptoms of chemical exposure include headache, sore eyes and throat, lack of concentration, fatigue, dizziness, breathing problems and nausea.

Please seek medical advice if you believe you have been exposed to chemicals.



Plants and soil bacteria are nature's bio filters! Indoor potted plants work miracles by removing significant levels of chemical pollutants directly from the air. Even more remarkable is that plants remove high concentrations of chemicals within 24hrs and they keep working day and night. If new chemicals are introduced, even at low levels, they go to work on them too.

Source: www.plantscleanair.com

**Nature's solution
to clean air is
right under
our noses.**

Making better product and material selections

Avoid hazardous chemicals

The best way to reduce off-gassing from materials indoors is for manufacturers to exclude hazardous chemicals. Some leading manufacturers are doing just that, which means we have a better range of products to choose from.

Eliminating hazardous chemicals at the source, rather than relying on ventilation systems to dilute them later on, has many benefits including: less reliance on petrochemicals; reduced energy use; safer working environments; healthier homes, schools and workplaces; a cleaner environment; less hazardous waste; and, easier materials to recycle.

Choose safer products

Read labels

Read labels carefully. They will not tell you everything but do state the main ingredients and include important safety and handling information. A toll-free customer number is often available if you need to request further information such as a Material Safety Data Sheet (MSDS).

Check product claims

Marketing claims need special attention. Who hasn't been caught out buying something claiming to be 'natural', only to discover later that 'natural' only referred to one minor ingredient while the others were far from it?

Product label claims to check closely include 'organic', 'low odour', 'solvent-free', 'low VOC', 'no VOC', 'zero emission', 'water-based' and 'plant-based'.

Good news for renovators

It turns out that *substitution* is the solution to chemical pollution. The European Union has introduced legislation requiring manufacturers to systematically remove hazardous chemicals from their products by substituting with safer chemical ingredients. Leading manufacturers in Australia are following suit.

Is it organic?

Accredited certifying organisations audit organic producers and products, but there is no enforceable standard in Australia that regulates the use of the term 'organic'. Make sure a product claiming to be organic is certified. This way you know it has been independently checked. The Organic Federation of Australia lists organic certifiers on their website www.ofa.org.au

Is it zero or low emission?

Defining claims such as 'low VOC', 'low odour' or 'solvent-free' is difficult as there are no accepted definitions across all products types. Emission generally refers to the volatility of the chemicals.

As a guide the **Australian Paint Approval Scheme** specifies that 'low odour' and 'low environmental impact' means a maximum of 5g/L of VOCs in untinted wet paint*. Note that tints themselves contain high levels of VOCs. The **Australian Ecolabelling Association** guide to low VOC in indoor paints is <20g/L which includes the VOCs from tints*. High VOC paints can contain anything from 80-100g/L.

*Sources: Volatile Organic Compounds (VOC) Limits APAS D181 www.apas.gov.au and www.aela.org.au

'The most effective way to keep chemical pollutants out of our homes is to not introduce them in the first place by choosing zero and low emission materials and products.'

Ecospecifier is an excellent one-stop shop for information about eco and health preferable products, materials and technologies.
www.ecospecifier.org

SAFER TIP



Important chemicals and

BROMINATED FLAME-RETARDANTS are a group of compounds, some build up in our bodies and the environment and are considered persistent organic pollutants. Used in electronic goods, cables, carpets, some paints, upholstery. Some are ear-marked for a global ban because of their health and environmental effects.

COPPER CHROME ARSENATE or CCA timber was recently restricted because of dangers it poses to our health and the environment. CCA timbers should not be used for children's play equipment, garden furniture, picnic tables, exterior seating, patio and domestic deckings and handrails. Contact the Australian Pesticides and Veterinary Medicines Authority (APVMA) for further information. www.apvma.gov.au

FORMALDEHYDE is the most common indoor pollutant. An odourless gas at room temperature, it often goes unnoticed. Widely used in a range of products including adhesives in reconstituted wood products, polyurethane foam and insulation. At very low concentrations in the air, it irritates the respiratory system and mucous membranes. It is recognised as causing cancer in people.

HEAVY METALS of concern in construction materials include mercury found in some switches, paint, wood preservatives and plastic as a fungicide; lead is found in old paint and ceiling dust, also in solder, electrical and duct tape; cadmium in solder, plastics and paints. These metals are neurotoxic and cadmium causes cancer.

PLANT-BASED PRODUCTS are those derived from various plant materials rather than petrochemicals. Plant ingredients do not automatically mean a product is safe, but they are widely considered to be less harsh for people and the environment. Plant-derived ingredients are now used in paints, varnishes and wood finishing products.



If you buy new furniture or building materials that have strong chemical odours, leave them outside under cover to air for several days before bringing them indoors.

SAFER TIP

terms

PLASTICISERS are added to make plastics softer and flexible. Common plasticisers such as phthalates and DEHA have been found to cause harm to the hormonal system at extremely low levels.

PRODUCT LIFECYCLE is the term used to describe the entire life of a product from its conception, through design and manufacture, to service and disposal. The 'cradle to grave' impact of materials is an important consideration in decision-making.

PVC OR POLYVINYL CHLORIDE is a widely used plastic in many construction materials. PVC releases highly toxic dioxins when it is made and PVC products release hazardous chemicals while in use and disposal. Plasticisers and heavy metals are added to PVC. There are global efforts to phase out PVC.

VOLATILE ORGANIC COMPOUNDS or VOCs, are compounds that have high volatility at room temperature. 'Organic' means the compounds contain carbon. Common VOCs include chlorinated solvents, aromatic solvents like toluene, benzene, xylene and synthetic solvents based on ethylene glycol. VOCs are found in a wide range of products like paint, varnish, sealers, glues, rubber cement, PVC-vinyl.

WATER-BASED PRODUCTS have a large portion of their liquid content as water to carry solid ingredients. Water-based does not mean the product is as 'safe as water' or that there are no other solvents or hazardous chemicals present. If products are water-based it means you can clean-up using water instead of hazardous solvents.

Guide to safer products and material selection

	CHOOSE SAFER SOLUTIONS	FIND OUT MORE
Adhesives and sealants	Water-based zero or low VOC	Ecospecifier www.ecospecifier.org Good Environmental Choice Australia www.aela.org.au/gec/adhesives.html
Appliances and electronic goods	Vented and serviced gas appliances Electronics free from brominated flame retardants	Commonwealth Government Technical Report No.9 'Unflued gas appliances and air quality in Australian homes' www.environment.gov.au Guide to Greener Electronics www.greenpeace.org
Flooring	Sustainable timber, bamboo, stone, slate, cork, tiles, concrete, sisal, coir, Linoleum, Marmoleum, Artoleum Zero or low VOC water-based sealants	Alternative Technology Association 'Focus on Flooring' www.ata.org.au Eco Flooring Systems www.ecoflooring.com.au Forbo Flooring www.forbo-flooring.com.au The Natural Floor Covering Centre www.naturalfloor.com.au
Furnishings and furniture	Sustainable timber, cane, metal, glass Untreated materials eg organic hemp, wool, cotton, linen, latex Plant-based, zero and low VOC adhesives and sealants	Ecospecifier www.ecospecifier.org Good Wood Guide www.greenpeace.org/australia/ Hemp Gallery www.hempgallery.com.au
Insulation materials	Cellulose fibre Wool Air-cell	Air-cell www.aircell.com.au Ecospecifier www.ecospecifier.org Your Home www.greenhouse.gov.au/yourhome

Carpets

Carpets emit large amounts of chemicals including formaldehyde and VOCs from backing materials, adhesives and underlay. Treatments such as stain guarding, fire retardants and moth proofing are also applied and these chemicals are released indoors. Carpets also act as 'sinks' for other pollutants such as pesticides and heavy metals. Babies and children in close contact with the floor are at high risk of exposure. Natural flooring materials such as sisal and jute can be used instead of carpets for warmth and noise reduction.

	CHOOSE SAFER SOLUTIONS	FIND OUT MORE
Paints and finishes	<p>Water-based zero or no-VOC paints</p> <p>Plant-based and mineral paints</p> <p>Untreated wax or water-based natural stain</p>	<p>Bauwerk Colour www.bauwerk.com.au</p> <p>Bioproducts Australia www.bioproducts.com.au</p> <p>Cooee www.cooeeproducts.com.au</p> <p>Organoil www.organoil.com.au</p> <p>Porter's Original Paints www.porterspains.com.au</p> <p>The Natural Paint Place www.thenaturalpaintplace.com.au</p>
Pest management	<p>Design to exclude termites and other pests</p> <p>Termite resistant materials eg steel, resistant timbers, physical barriers</p> <p>Regular inspections</p> <p>Baiting systems</p>	<p>Systems Pest Management www.systemspest.com.au</p> <p>Termimesh www.termimesh.com</p> <p>Granitgard www.granitgard.com.au</p>
Reconstituted wood-based products	<p>Sustainable solid timber</p> <p>Eco accredited laminates</p> <p>Gypsum plasterboard</p>	<p>Good Wood Guide www.greenpeace.org/australia/</p> <p>The Laminex Group www.thelaminexgroup.com.au</p>
Stains and varnishes	<p>Plant-based products</p> <p>Zero or low-VOC</p> <p>Natural oils and waxes</p>	<p>Bioproducts Australia www.bioproducts.com.au</p> <p>Cooee www.cooeeproducts.com.au</p> <p>Organoil www.organoil.com.au</p> <p>The Natural Paint Place www.thenaturalpaintplace.com.au</p>



Got the nesting instinct?

The nesting instinct may be a natural urge, but many of the products and materials used by expectant parents to create a nursery or children's room can be a danger to the health of babies and young children. This is a critical time to consider the impacts of chemical pollution and to take the time to create a healthy space for your little ones.

Babies are at greatest risk from chemical exposures because their skin absorbs up to three times the amount of chemical absorbed by an adult. Babies and young children breathe twice as much air as adults, so they have greater exposure to chemicals from the air and because they are rapidly developing they are at greater risk of damage to cells and organs.

Lead and asbestos are two unhealthy legacies from past construction practices.

Contact an accredited professional to check before renovations commence.

SAFER TIP

CHOOSE SAFER SOLUTIONS	SAFER TIPS
<p>Cots and bedding</p> <p>Sustainable solid unsealed timber cots and beds (if sealed: with plant or water-based zero or low VOC sealants or paints)</p> <p>100% cotton or wool futons</p> <p>Latex (natural rubber) mattresses</p> <p>Certified organic cotton bedding and pillows, natural fibres such as wool, linen, silk or hemp</p>	<p>Cots, beds and mattresses must meet required Australian Safety Standards</p> <p>Nature's Child has a range of organic bedding and mattresses www.natureschild.com.au</p> <p>Todae stock a wide range of eco products including organic bedding www.todae.com.au</p>
<p>Flooring</p> <p>Natural flooring such as timber, bamboo or cork sealed with zero or low-emission sealants, plant-based oils and waxes, tiles with throw rugs, natural fabrics such as sisal and coir</p>	<p>If you already have carpet have it steam cleaned with water and invest in a high efficiency vacuum cleaner</p>
<p>Furnishings and fabric</p> <p>Zero or low-emission furnishings and fabrics such as solid timber, cane or bamboo with zero or low VOC adhesives and sealants</p> <p>Natural untreated fabrics such as hemp and cotton</p>	<p>Use removable and washable covers for cushions, soft furnishings and curtains</p> <p>Minimise clutter to limit surfaces for dust collection and easy cleaning</p> <p>Check Safer Products Project www.safer-products.org as some companies have policies to remove hazardous chemicals</p>
<p>Paints and finishes</p> <p>Plant-based paints, zero or low VOC water-based paints, stains and varnishes</p>	<p>Always check for lead hazards before doing any painting</p> <p>Lighter pigments contain less VOCs</p> <p>Allow plenty of time for airing before inhabiting the room</p>
<p>Pest management</p> <p>Go non-chemical and install flyscreens and mosquito nets</p>	<p>Plenty of ventilation and sunshine discourages pests as does good storage and cleaning</p> <p>Potted plants out of harms way will help to keep the air fresh</p>



Designing and specifying tight fitting cabinetry will help to limit places for cockroaches and rodents to take up residence.

SAFER TIP

Greenovating your kitchen

It is little wonder the kitchen is the most renovated room in a house – it is the hub of activity and the heart and soul of any home.

Kitchens are functional spaces and need a well thought out design to suit your needs. Safety and practicality are key considerations as are good lighting and ventilation.

With so many choices to be made it is easy to overlook the importance of choosing zero or low-emission materials. As many kitchens often come 'ready-made' or in modules you will need to specify materials in your kitchen to ensure you get what you want in every component.

KITCHEN COMPONENTS	CHOOSE SAFER SOLUTIONS	SAFER TIPS
Appliances	Durable and easy to clean Gas appliances need good ventilation	Avoid perfluorinated 'non-stick' surfaces. The health and environment effects of these chemical compounds are currently under investigation. Environmental Working Group www.ewg.org
Cabinetry, counter tops & splashbacks	Sustainable solid timber, stone or timber veneers with zero or low-VOC sealants ABS edging tape instead of PVC Eco-accredited laminates and particleboard Glass and tile splashbacks with zero or low VOC adhesives Stainless Steel	The Laminex Group has several eco-accredited products www.thelaminexgroup.com.au Good Wood Guide www.greenpeace.org/australia/
Flooring	Sustainable timber, bamboo, cork, tiles, concrete with zero or low-VOC sealants Resilient surfaces such as Linoleum and Marmoleum with zero and low VOC emission sealants and adhesives	Alternative Technology Association 'Focus on Flooring' www.ata.org.au
Paints and finishes	Plant and water-based zero or low VOC	Durability and washability are important in a kitchen



SAFER TIP

Steer clear of highly scented products and 'air fresheners' and choose certified organic plant products instead.

Greenovating your bathroom

Along with kitchens, bathrooms are one of the most renovated rooms in the house. When you step into the bathroom the idea is to cleanse and relax, which is all the more reason to ensure the air is pure.

Selecting fittings and working out plumbing and lighting can take time. Bathrooms have special requirements for building and safety such as waterproofing so ensure your renovations comply.

Good ventilation and light are important to discourage mould build-up and to disperse chlorine gas from town water supplies. Aim for simple designs and materials with less clutter for easy cleaning.

Once you have built your bathroom be sure to choose personal care products that do not add chemical pollution.

BATHROOM COMPONENTS	CHOOSE SAFER SOLUTIONS	SAFER TIPS
Cabinetry	Sustainable timber or eco-certified laminates and particleboards	Ensure materials are mould resistant The Laminex Group has several eco-accredited products www.thelaminexgroup.com.au Good Wood Guide www.greenpeace.org/australia/
Fittings and appliances	Low water use appliances for toilets, showers and taps Install with zero or low VOC adhesives if required	Avoid fads such as double basins and showerheads as they use twice the resources
Flooring	Low-slip tiles, stone, marble, concrete, wood, bamboo or cork with zero or low VOC sealants and adhesives	Portland cement-based mortar is low VOC
Paints and finishes	Plant or water-based zero or low VOC	Mould is an important consideration Check fungicides in paint, some like mercuric salts are hazardous
Plumbing	Copper, high density polyethylene (HDPE), 100% lead-free solder, mechanical fasteners, zero or low VOC adhesives	For information on PVC plumbing see www.greenpeace.org/international/campaigns/toxics/polyvinyl-chloride
Waterproofing	Zero or low VOC	It is important to do the waterproofing step to avoid costly repairs in the future



Resources

Archicentre is the free building advisory service of the Royal Australian Institute of Architects
www.archicentre.com.au

Australian Handyman Reader's Digest magazine and website dedicated to DIY
www.handymanmagazine.com.au

Centre for Design offers information on sustainable materials and design
www.cfd.rmit.edu.au

Ecospecifier is an Australia-wide online resource to help you research eco and health preferable products, materials and technologies www.ecospecifier.org

DO it magazine offering DIY home improvement solutions
www.doitv.com.au

DIY Safe is a NSW government resource with useful links
www.diysafe.nsw.gov.au

Global Lead Advice and Support Service offers free telephone advice and information kits on lead safety
www.lead.org.au

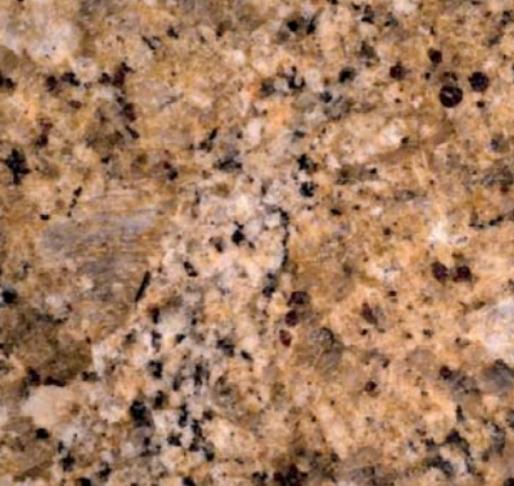
Good Environmental Choice label by the Australian Environmental Labelling Association
www.aela.org.au

Green Pages a national directory of environmentally sustainable products and services
www.greenpagesaustralia.com.au

Homesite a News Limited and Housing Industry Association home and garden information site which includes a renovate section
www.homesite.com.au

Organic Federation of Australia has a list of accredited organic certifying organisations
www.ofa.org.au

Plants Clean Air provides plant solutions for inside chemical pollution problems
www.plantscleanair.com



Renovate an Australian independent site dedicated to home renovations

www.renovate.com.au

Society for Responsible Design an organisation advancing sustainable designs

www.green.net.au/srd

The Building Centre offers assistance with all aspects of building and renovation

www.buildingcentre.com.au

The Owner Builder Australasian Homebuilder's magazine has plenty of sustainable material information

www.theownerbuilder.com.au

Your Home a guide for sustainable homes written by Commonwealth Government and industry

www.yourhome.gov.au

Share the success of your safer renovations to help others make better choices.

If you have a story to tell email the Safer Solutions team at safersolutions@tec.org.au.

**SHARE YOUR
SUCCESS**

Safer Solutions for Safer Renovations

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Safer Solutions
Keeping your home **healthy** and **green**



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