

An Eco-Designer's Building Materials Checklist

Building Material	Made from	Possible Environmental Issues	Digging Deeper...
 PaperStone The Earth's Surface™	PaperStone is a composite material made using 100% recycled paper or cardboard and a natural resin binder called PetroFree, a 100% natural and ecological product not derived from petroleum. PaperStone does not contain any VOCs, including formaldehyde, and it does not emit radon gas.	Since PaperStone is a 100% totally natural product, it does not emit any toxic gases in cases of combustion. It is completely free of formaldehyde. It can be recycled at the end of its life cycle.	PaperStone complies with the most stringent standards currently in use for classifying materials in the furnishings sector. It is FSC certified, and one of the few materials that is also certified by the Smartwood Program of the Rainforest Alliance, the strictest and most restrictive standard that exists today.
Composite Organic Panels and Boards	Wood chips, particles, veneers, flakes, papers and boards plus bamboo, wheat straw and sorghum. All typically bonded with isocyanate, phenolic, melamine or urea or epichlorohydrine-based resins.	Most of these resins are made with formaldehyde and may emit it in use. Isocyanates are made from formaldehyde and phosgene gas and give off cyanide when burned. Soy-based, 'formaldehyde-free' resins contain epichlorohydrin	Where did the organic material come from? How was it grown? Alternative land and material uses? Resin/s used to bond the material? Emissions in use?
HPL laminated plastic	Composed of 3 kraft paper elements, decorative paper, melamine resin.	Cellulose is used for the production of kraft paper, therefore a material obtained through the cutting of trees. Kraft paper is soaked in phenol resin directly obtained from petroleum.	Is the kraft paper used for production FSC certified? How is the laminate disposed of at the end of its life cycle? Furthermore, the melamine resin is obtained through poly-condensation of formaldehyde with the melamine. Therefore, the production of this material is absolutely not eco-sustainable.
Wood	CO ₂ , water and sunlight- If it is grown and harvested responsibly, it doesn't get much better than that!	May or may not grown and harvested responsibly. Large amounts of carbon may be stored or released into the atmosphere. According to the Economist, \$30 billion of wood is illegally harvested and sold each year.	FSC-certified? FSC COC #? Where, very specifically, did it come from?
Granite, Other Stone	Brazil supplies the majority of the granite slabs. The majority of the marble originates in Italy. Onyx also comes from Italy. Marble comes from Spain. China supplies brown granite.	Radon may be an issue. Mining issues (environmental impacts, worker welfare impacts) may also be a concern. Stone is heavy and it is sourced globally.	It's not difficult not expensive to test for countertop radon levels. Trace the source of the stone and the entire supply chain?
Concrete, Concrete Encapsulated Materials	About 12% cement (a mixture of oxides of calcium, silicon and aluminum), roughly 80% coarse and fine aggregate (stone) and 8% water.	Manufacturing 1 ton of cement releases roughly 1 ton of carbon-dioxide into the atmosphere- a major source of GHG's. 1 million btu's of energy are required to make 1 barrel (376#) of concrete.	Where was it made? With what process? How will it be disposed of?
Glass, Glass Encapsulated Materials	Sand, soda ash, limestone, dolomite and feldspar are baked in a blast furnace at temperatures over 2700 Degree F.	As much as 2 tons of CO ₂ is emitted for every 1 ton of glass manufactured. Embodied Energy is about 12.7 MJ/Kg (versus an aluminum value of 170, cement 5.6 and kiln dried sawn softwood 3.4). Sand mining is also required.	Recycled glass content? Some glass production uses over 45% post-consumer recycled content. Where was it made? With what process? How will it be disposed of?
Steel	The raw materials-iron ore, chromium, silicon, nickel, etc. - are melted together in an electric furnace. This step usually involves 8 to 12 hours of intense heat.	Mining of chromium ore exposes workers to heightened cancer risk. Processing requires enormous amounts of energy and releases GHG's, carcinogens, particulates and toxic materials.	Certified post-industrial and/or post-consumer recycled content? Where was it made and with what process?
PVC	Vinyl chloride monomers, made from ethylene and chlorine, are combined with water, polyvinyl alcohol, a catalyst (Luaroyl peroxide) and dioctyl phthalate, a plasticizer.	Dioxins are created when PVC is manufactured and burned. Dioxins are a potent carcinogen and they are also persistent bioaccumulative toxicants. Phthalates may have effects on reproductive, respiratory and endocrine systems.	Are alternative materials available? www.healthybuilding.net has put together a list of the alternative materials that are currently on the market.
Polyurethane	Isocyanates are combined with alcohols (EG) to make the urethane monomer. Most commercial polyurethanes come from MDI, PMDI, or TDI.	Once again, Isocyanates are made from formaldehyde and phosgene gas and give off cyanide when burned. Isocyanates are severe bronchial irritants and asthmagens. Chronic exposure can be fatal.	Are alternative natural materials (e.g. shellac and waxes) available?
Acrylic Composites	Methyl methacrylate (acrylic resin) and alumina trihydrate (filler, fire retardant and smoke suppressant) that is refined from bauxite ore.	Resine derivate dal petrolio, derivate da cianuro idrogeno. L'alluminio triidrato è noto anche come sostanza neurotossica per gli esseri umani. Conseguenze derivate dallo smaltimento.	Are alternative natural materials (e.g. shellac and waxes) available?
Epoxy	A diepoxy is made from bisphenol A and epichlorohydrine. Both are derived from petrochemicals	Petroleum-derived resin. Possible human endocrine disruptive effects from BPA and the EPA has cited human health issues with exposure to epichlorohydrine.	Credible 3rd party certification of emissions in use? Where was it made and where did it come from?
Engineered Quartz	Polyester resin, 93-95% quartz and other siliceous materials. May include antimicrobials.	Petrochemical-derived resin, made from para-xylene. Toxicological issues with para-xylene (increased risk of non-Hodgkin's lymphoma). Possible issues with antimicrobial additives.	Environmental and social impacts of the mining? The supply chain and carbon footprint? Are antimicrobials used? What is done with it when it is no longer wanted?
Acrylic and polyester-infused and encapsulated 'natural' and recycled materials	Methyl methacrylate (acrylic resin) or polyester resin and plant, wood and wood composites, recycled glass, metals, etc.	Petroleum-derived resins, made from hydrogen cyanide and/or para-xylene.	What resin and resin additives are used? The supply chain and carbon footprint? What is done with it when it is no longer wanted?



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