



SUSTAINABLE INTERIOR DESIGN FOR THE BODY, MIND & SPIRIT www.daylelaing.com

This glossary of fabric definitions has been adapted in whole or part from the websites listed in each definition. It is not intended to be a rigorous review of the literature, but a guide to explaining terms in common use.



ACT (Association for Contract Textiles): A trade association that addresses a variety of issues related to contract (commercial) fabrics including criteria for performance standards such as abrasion, pilling, lightfast, colorfast, crocking, and flammability. www.contract-textiles.com

Bamboo: A grass with a hollow woody stem grown in tropical and semitropical areas. Bamboo requires chemicals to convert it into a useful textile fiber, but it is sustainable because it has a rapid growth and harvest cycle (3-5 years), does not require fertilizers or pesticides or watering. Bamboo takes in more carbon dioxide than trees and releases more oxygen into the air.

Biodegradable: a product can be decomposed or metabolized by microorganisms and reduced to organic or inorganic nutrients for further use. www.contract-textiles.com

Breaking Strength: is the measurement of stress exerted to pull a fabric apart under tension. www.contract-textiles.com

By-product: A secondary product of an industrial or biological process. www.contract-textiles.com

Certified Organic: Natural fibres that have been grown according to strict uniform standards that are verified by an independent organization. www.robertallendesign.com

Closed Loop: A type of manufacturing process that utilizes a cyclical material flow in order to minimize waste. www.contract-textiles.com The resulting recycled products should not suffer from lack of quality. Some manufacturers have programs so that old carpet is not 'downcycled' to carpet backing, but used to make new carpet. <http://shawfloors.com>

Colorfast: A material's degree of resistance to the fading effect of light. www.contract-textiles.com

Compostable: A product that can break down into usable compost (e.g. soil-conditioning material, mulch) in a safe and timely manner. www.contract-textiles.com

Cotton: is a natural cellulose fiber from the boll of a cotton plant. Production uses more chemicals per unit than any other crop. Organic cotton is grown without pesticides or chemical additives to fertilizer, relying instead on methods with less ecological impact, such as crop rotation. www.robertallendesign.com



Cradle-to-Cradle: A term used in life-cycle analysis to describe a material or product that is recycled into a new product at the end of its defined life. www.contract-textiles.com The name comes from the book by William McDonough, architect and Dr. Michael Braungart, chemist – co-founders of MBDC. Cradle-to-Cradle Design is MBDC's design paradigm, based on principles and an understanding of the pursuit of value, as well as MBDC's processes for product and material research and development, and for educating and training. The paradigm proposes that human design can learn from nature to be effective, safe, enriching, and delightful. Cradle-to-Cradle Design models human industry on nature's processes, in which materials are viewed as nutrients circulating in healthy, safe metabolisms. Industry must protect and enrich ecosystems — nature's biological metabolism — while also maintaining safe, productive technical metabolism for the high-quality use and circulation of mineral, synthetic, and other materials. www.MBDC.com

Crocking: Transfer of dye from the surface of a dyed or printed fabric onto another surface by rubbing. This is tested both wet and dry. www.contract-textiles.com

Chromium Dyes: In the 1920s and 1930s, chromium (as called chrome or chromate pigment) dyes became a more reliable alternative to aniline. These synthetic dyes have a much wider spectrum of colours (600) from which to choose than vegetable dyes. www.areasugfacts.com The International Agency for Research on Cancer (IARC), has concluded that chromium VI (hexavalent) is a Group 1 carcinogen to humans and cause cancer of the lung. <http://monographs.iarc.fr/ENG/Monographs/vol100C/mono100C-9.pdf>

Workers in the dyeing sector of the industry need to take precautions when handling chromium, and the waste effluent needs to be treated. See "Heavy Metal". See "ETAD" for trace amounts of chromium allowable. Metallic chromium and chromium III are Group 3, not classifiable as to carcinogenicity to humans. <http://monographs.iarc.fr/ENG/Monographs/vol49/mono49-6.pdf>

Downcycling: recycling synthetic fibres into a product of lesser quality. www.mbdc.com

Dye: Colour pigments in liquid form used give fabric, yarns or fibre solution a hue.

Environmental Protection Agency (EPA): U.S. federal agency established in July, 1970 to protect human health and to safeguard the natural environment air, water, and land upon which life depends; works closely with other federal agencies, state and local governments to develop and enforce regulations under existing environmental laws; provides leadership in the nation's environmental science, research, education and assessment efforts; and is responsible for researching and setting national standards for a variety of environmental programs & delegates to states and tribes; responsible for issuing permits, and monitoring and enforcing compliance. www.epa.gov There is also a Canadian Environmental Protection Agency called CEPA. <http://www.ec.gc.ca/lcpe-cepa/default.asp?lang=En&n=D44ED61E-1>



ETAD: Ecological and Toxicological Association of Dyes and Pigments Manufacturers – is an international organization, formed in 1974, that seeks to base its positions on sound science. They coordinate efforts of our members to minimize any possible adverse impact of organic colorants on health and the environment. Member companies are obliged to adhere to the code of ethics, which is based on the principles of responsible care. They must also comply with all national and international chemical regulations. There are voluntary regulations for classification and labeling of chemicals, and education programs. Trace amounts of heavy metals allowed: Antimony: 50ppm, Arsenic: 50ppm, Barium: 100ppm, Cadmium: 20ppm, Cobalt: 500ppm, Copper: 250ppm, Chrome: 100ppm, Iron: 2500ppm, Manganese: 100ppm, Nickel: 200ppm, Mercury: 4ppm, Selenium: 20ppm, Silver: 100ppm, Zinc: 1500ppm, Tin: 250ppm, Lead: 100ppm. www.etad.com

Fibre blends: "Mixtures of materials both technical (synthetic fibres) and biological (natural fibres), neither of which can be salvaged after their current lives." *Cradle to Cradle*, p. 99 The problem is that blends can only be landfilled.

Finishing: A process that coats a fabric to improve its appearance or provide protection from fire, water or stains.

Flammability: The measurement of a fabric's performance when it is exposed to specific sources of ignition. www.contract-textiles.com

Flame Retardant: Commercial textiles are often backcoated in or immersed in decaBDE (one of the PBDEs), to protect the furniture foam from combustion. Alternatively, use inherently flame-resistant fibres which burn very slowly and often self-extinguish, or treat fabrics with an organophosphorous chemical. DecaBDE is used due to low cost. Tightening the weave of a fabric prevents the circulation of oxygen which supports combustion can improve a fabric's ability to pass a flame retardant test. www.ecojustice.ca Placing a barrier of inherently flame-resistant material between the exterior fabric and the foam increases flame-retardancy. (eg. Kevlar flame blocker)

Formaldehyde: is used in textile production as a cross-linking agent to make fabric wrinkle resistant and soil releasing. Hatch KL. (1993) *Textile Science*, p.418. Formaldehyde is limited to 300mg/kg for decorative textiles and 75mg/kg for materials that come into direct contact with skin, for the Öeko-tex standard-100. http://www.oeko-tex.com/OekoTex100_PUBLIC/index.asp Formaldehyde is a Group 1 carcinogen to humans according to the World Health Organization's International Agency for Research on Cancer (IARC). <http://monographs.iarc.fr/ENG/Monographs/vol88/index.php>



GOTS: Global Organic Textile Standard – an international independent certification for organic textiles which prohibits substances such as: aromatic solvents, phenols, complexing agents, formaldehyde, fungicides, biocides, halogenated solvents, fluorocarbons, quaternary ammonium compounds, or bio-accumulative substances. All treatment wastewater must be treated. Heavy metals are limited to the trace values allowed by ETAD. www.global-standard.org

Green: A general word used to describe something that is thought to be beneficial to the environment. www.terrachoice.com To convey meaning, 'green' must have more description and be adequately defined.



Greenguard: is an industry-independent, third-party indoor air quality certification program for low-emitting products and materials, started in 2002. To date, more than 170 manufacturers across various industries offer GREENGUARD Indoor Air Quality Certified® Products. The GREENGUARD Environmental Institute (GEI) became an authorized national standards developer by the American National Standards Institute (ANSI). www.greenguard.org

Greenhouse gas: Certain gases (including water vapour, carbon dioxide, methane, nitrous oxide, and ozone and several classes of halogenated carbons that contain fluorine, chlorine and bromine) that allow solar radiation to reach Earth's surface and become absorbed, yet trap thermal radiation leaving the earth's surface. Outgoing thermal radiation absorbed by these

gases heats the atmosphere. The atmosphere then emits thermal radiation both outward into space and downward to earth, further warming the surface. www.contract-textiles.com

Greenpeace Pyramid of Plastics: a not-for-profit environmental organization that does research on environmental issues. Their Pyramid of Plastics article explains the relative toxicity of various plastics used in the textile industry. www.archive.greenpeace.org

Greenwashing: is the advertising practice of pretending that a product or material is environmental friendly when it is not or the link is very tenuous. Some companies not anxious to change their operation, instead use 'green' marketing to mask or soften their images. www.bankrate.com

Heavy metal: Any metallic chemical element that has a relatively high density and is toxic at low concentrations. (Examples are mercury, cadmium, arsenic, chromium, thallium and lead). Semi-metallic elements (such as antimony, arsenic, selenium and tellurium) are often included in this classification. www.contract-textiles.com These are examples of natural ingredients that can be harmful to human health. Their use is required in many processes and this may not be a problem as long as they can be captured at the end of the manufacturing process for reuse.

Hemp: Strong, sustainable cellulose fibres from inside the stalk of a tall plant. Little or no pesticides are used in the farming of hemp, and the plant replenishes soil with nutrients and nitrogen. Hemp used in fabrics does not contain the cannabis active ingredient THC (tetrahydrocannabinol).



ISO (International Standards Organization): A non-governmental organization located in Geneva, Switzerland, chartered to develop voluntary technical standards that aim to make the development, manufacture and supply of goods and services safer, cleaner and more efficient. www.iso.ch

ISO 14001: ISO standards and guidelines that address environmental issues. www.iso.ch

ISO 14024: specifically pertains to environmental labeling. www.iso.ch



LEED™- Leadership in Energy and Environmental Design: A point-based rating system developed by The U.S. Green Building Council Rating System for Sustainable Development (USGBC) to assess new and existing commercial buildings for a variety of earth-friendly features. www.usgbc.org There are also a Canadian GBC with chapters

across Canada and chapters around the world. www.worldgbc.org This system has been expanded to include certification for residential homes and existing buildings.

LEED Accredited Professional (AP): The LEED Professional Credentials (LEED AP and Green Associate) are professional designations for those who have demonstrated a thorough understanding of green building techniques, environmental issues, the LEED program and the certification process. The LEED credentials show differentiation in a growing and competitive industry and allow for varied levels of specialization. <http://www.usgbc.org/>

Linen: A natural cellulose fibre taken from the inside of the flax plant stalks. Fibres are very strong, have excellent sun resistance, but lack flexibility.

MBDC - McDonough Braungart Design Chemistry: company founded by William McDonough, American architect and Michael Braungart, German chemist that provides manufacturers with a means to tangibly and credibly measure achievement in environmentally-intelligent design. They provide 3rd party certification for environmentally safe and healthy materials; design for material reutilization, such as recycling or composting; use of renewable energy and energy efficiency; efficient use of water, and maximum water quality associated with production; and instituting strategies for social responsibility. www.mbdc.com

McDonough, William: American Architect, author of the **Hannover Principles**, presented at the Hannover World Fair Expo, 2000. **1.** Insist on rights of humanity and nature to co-exist; **2.** Recognize interdependence; **3.** Respect relationships between spirit and matter; **4.** Accept responsibility for the consequences of design; **5.** Create safe objects of long-term value; **6.** Eliminate the concept of waste; **7.** Rely on natural energy flows; **8.** Understand the limitations of design; **9.** Seek constant improvement by sharing of knowledge. www.mcdonough.com www.mcdonough.com/principles.pdf



Mobius Loop: This is the universal logo for recycling. By itself, it lacks significance without further explanation of percentage recycled and whether it is the product or only the packaging of the product has been recycled. The loop has been incorporated into more than 300 other corporate logos.

Mohair: Wool protein fibres from the shorn fleece of Angora goats. Mohair is durable and resilient and is often used in blends with wool because of high luster. It takes dye exceptionally well. Used in the pile yarns of velvet upholstery fabric.

Nonrenewable energy: An energy source, such as oil or natural gas, or a natural resource, such as a metallic ore, that cannot be replenished or replaced after it has been used. www.contract-textiles.com

'Non-toxic': a vague and misleading term. Salt is toxic if you ingest too much. www.terrachoice.com

Nylon: a synthetic fiber (a polymer from petroleum products) which has excellent resiliency and is very durable. It is used extensively for contract upholstery.

Occupational Safety & Health Administration: OSHA www.osha.gov



ÖEKO-TEX® - a European 3rd party certification organization that tests fabrics for harmful substances such as formaldehyde, heavy metals, pesticides, phthalates, PFOS, PFOA, toxic dyes, chlorinated benzenes and toluenes. (O in Oeko is silent) www.centexbel.be

Olefin: is a synthetic fibre that has a simpler polymer structure than PCV, and the highest potential for mechanical recycling. <http://archive.greenpeace.org/toxics/pvcdatabase/bad.html> There are two types: polypropylene (PP) and polyethylene (PE), which are both usually solution dyed and therefore colourfast, and bleach cleanable. Joseph ML. (1972) Introductory Textile Science, pp.151. Polyethylene has properties that make it superior to polypropylene for healthcare use, according to the manufacturer, Carnegie. It is produced with less energy, water consumption, no chlorine, no phthalates, no toxic dyes, no heavy metals, and it is inherently flame retardant, stain resistant, and does not support the growth of bacteria or fungi. http://www.carnegiefabrics.com/pdf_upload_files/TECHNICAL_INFO/XTTestRsIts/Xorel%20Summary%20of%20Test%20Results.pdf

Organic: fibres that have been grown without chemical fertilizers, pesticides, herbicides or fungicides. www.robertallendesign.com

Ozone: A bluish gas that is harmful to breathe. Nearly 90% of the Earth's ozone is in the stratosphere and is referred to as the ozone layer. Ozone absorbs a band of ultraviolet radiation called UVB that is particularly harmful to living organisms. The ozone layer prevents most UVB from reaching the ground. www.contract-textiles.com

PBDEs (Polybrominated diphenyl ethers): are a group of chemicals that are used as flame retardants in polymer resins and plastics. Found in some furniture, TVs, stereos, computers, carpets, and fabrics, they are harmful to the environment, build up in living organisms, and last a long time in the environment. Recent studies using rodents provide evidence that exposure to PBDEs during critical growth periods may lead to behavioural disturbances and liver effects and can also interfere with the normal production of some thyroid hormones. The European Union and the U.S. Environmental Protection Agency (EPA) has banned some forms of PBDEs. www.ec.gc.ca/cepaRegistry (Canadian Environmental Protection Agency)

PFOA (Perfluorooctanoic Acid) (Teflon®): also known as "C8" is a man-made chemical which does not occur naturally in the environment. It is used by companies to make fluoro-polymers for a stain repellent finish on textiles. The only company that manufactures PFOA in the United States is DuPont, though 3M also manufactured the acid up until the year 2002. The Environmental Protection Agency has been testing these products since the late 1990's and in 2005 initiated research on whether PFOAs are released over time as these products age and whether they cause systemic toxicity, developmental toxicity or carcinogenicity. The result is a Stewardship program commitment to reduce the use and emissions of PFOAs by 95% by 2010 and to eliminate them by 2015. www.pfoa.com and www.epa.gov/oppt/pfoa

PFOS (perfluorooctane sulfonate) (Scotchgard™): Scotchgard ingredients belong to a large family of chemicals that degrade to form a chemical called PFOS. They are fluorocarbons, related to CFCs, which are now banned as ozone depleters. 3M voluntarily discontinued the production of this stain and water repellent chemical in talks with the US EPA (Environmental Protection Agency) in 2002. It is believed that PFOS interrupts the body's ability to produce cholesterol, a necessary building block of nearly every system in the body. www.chemicalindustryarchives.org

Pilling: is the formation of fuzzy balls of fiber on the surface of a fabric that remain attached to the fabric. www.contract-textiles.com

Plastic: Any of various organic compounds produced by polymerization, capable of being molded, extruded, cast into various shapes and films or drawn into filaments used as textile fibers. www.contract-textiles.com

Polylactic acid (PLA): A biodegradable thermoplastic derived from the lactic acid in corn; resembles clear polystyrene. PLA can be used in a number of industrial products including textiles and carpeting. www.contract-textiles.com

Polyester: a synthetic polymer from petroleum products. Most virgin polyester uses the heavy metal antimony in the production, although this is not required. Recycled polyester uses yarns made from post-consumer and post-industrial polyester waste and lessens our dependence on oil, reduces waste and produces less pollution. www.mbdc.com Many of the microfiber non-woven fabrics are made from polyester.



Polyethylene terephthalate (PET): A thermoplastic material that is clear, tough and has good gas and moisture barrier properties. Used in soft drink bottles and other blow molded containers, although sheet applications are increasing. Cleaned, recycled PET flakes and pellets are used in some spinning fiber for carpet yarns, fiberfill and geo-textiles. Other applications include strapping, molding compounds and both food and non-food containers.

www.contract-textiles.com

Polyethylene: see Olefin

Polypropylene: see Olefin



Polyvinyl chloride (PVC) (Vinyl): Synthetic thermoplastic polymer made from vinyl chloride, PVC has been used extensively in healthcare upholstery. Upholstery fabrics are known as vinyl. PVC has excellent chemical resistance, and water and stain resistant properties. www.contract-textiles.com However, its stability makes it nearly environmentally indestructible, and it cannot be recycled due to high chlorine content. PVC releases dioxin and other persistent organic pollutants when produced, used or burned. <http://archive.greenpeace.org/toxics/pvcdatabase/bad.html> PVC is a known human carcinogen and it affects cardiovascular, hepatic and immunological systems, according to the Agency for Toxic Substances & Disease Registry. <http://www.atsdr.cdc.gov/substances/toxsubstance.asp?toxid=51>

Post-consumer: An adjective used to describe all or part of a consumer product that has reached the end of its useful life in that form. www.contract-textiles.com

Post-consumer recycling: The recycling of materials generated from residential and consumer waste for use in new or similar purposes, such as converting wastepaper from offices into corrugated boxes or soda bottles into polyester fiber. www.contract-textiles.com

Recycled Cotton: Cotton fabric which has been made from recovered cotton and would otherwise be cast off during the spinning, weaving or cutting process. www.robertaindesign.com

Recycled Polyester: Yarns made from post-consumer and post-industrial polyester waste. Post consumer polyester is made from waste left over once a product has been used by a consumer. Post industrial polyester is from waste generated by an industrial process before the polyester has been used by a consumer. Recycled polyester lessens our dependence on oil, reduces waste and produces less pollution. www.robertaindesign.com

Recycled product: A product made in whole or part from material recovered from the waste stream. www.ofee.gov/eo/greening.pdf (pp. 14-15)

Recycled Silk: Silk yarn/fabric waste from industrial weaving mills. www.robertaindesign.com

Recycling: The series of activities, including collection, separation and processing, by which products or other materials are recovered from the solid waste stream. The products are then used in the form of raw materials in the manufacture of new products, other than fuel for producing heat or power by combustion. www.ofee.gov/eo/greening.pdf (pp. 14-15). For this to be significant, a description of what is recycled and the percentage is required.

Renewable: Capable of being replaced by natural ecological cycles or sound management practices. www.contract-textiles.com

Renewable energy: Energy derived from sources that do not become depleted such as the sun, wind, oceans, rivers, eligible biomass and heat from the earth's interior. www.contract-textiles.com

Reusable: Capable of being used again after salvaging or special treatment or processing. www.contract-textiles.com

Seam Slippage: is the movement of yarns in a fabric that occurs when it is pulled apart at a seam. www.contract-textiles.com



SCS – Scientific Certification Systems – an international 3rd party environmental, sustainability and food quality certification, auditing, testing and standards development organization, which includes life cycle analysis, and certification of indoor air quality, recycled content and environmentally preferable products.

www.scs-certified.com

Silk: is a natural protein fibre extruded from a silkworm in its pupae stage of its lifecycle. It is lustrous, elegant, and very drapable, but lacks ability to resist sun damage. Depending on the weave, it may be flame retardant, but must be tested for FR labelling to be permitted.

Solid waste: Non-liquid, non-soluble materials from sources ranging from municipal garbage to industrial wastes that may contain complex and hazardous substances. Solid wastes also include sewage sludge, agricultural refuse, demolition wastes and mining residues. Technically, solid waste also refers to liquids and gases in containers. www.contract-textiles.com

Solution Dyed: means that color is added to the fibers while they are in a liquid state during the yarn manufacturing process. The color is integrated into the very fiber, which is why the fabric can be cleaned with bleach and still retain the color. Think of the analogy of a carrot and a radish; the color in the carrot is throughout, while the color on the radish lies on the outer surface. The carrot would represent a solution dyed fiber. www.bella-dura.com

Sustainable: a method of harvesting or using a resource so that the resource is not depleted or permanently damaged. www.contract-textiles.com Rapidly renewable in 10 years or less. www.cagbc.org

Sustainable product: A product that has no negative impact on natural ecosystems or resources. www.contract-textiles.com

Terrachoice: is a science-based environmental marketing agency that has conducted greenwashing research and published their results in "The Sins of Greenwashing Home and Family Edition 2010". They are part of the UL Global Network. They offer consultation and manage Environment Canada's EcoLogo program. www.terrachoice.com

Third Party Research: independent assessment of the complete manufacturing process of a product and the processes used to create it. The resulting certification is granted to companies displaying multiple attributes rather than a single attribute. www.mbd.com



U.S. Green Building Council: A coalition of representatives from the building industry that promotes buildings that are environmentally responsible, profitable and are healthful places to live and work. Certification – see LEED. There are now residential standards. www.usgbc.org There is also a Canadian GBC). www.cagbc.org

Volatile Organic Compound (VOC): Compounds that contains carbon and become a gas at room temperature. VOC emissions are regulated because they contribute to smog formation. The most common sources of VOC emissions are from storage and use of liquid and gaseous fuels, the storage and use of solvents and the combustion of fuels and can include housekeeping and maintenance products and building and furnishing materials. www.contract-textiles.com VOCs account for the 'off-gassing we associate with new materials. VOC emissions can cause eye, nose, and throat irritations. https://gupea.ub.gu.se/dspace/bitstream/2077/4199/1/ah1998_04.pdf Thirty three VOCs are cited by the Center for Disease Control and the International Agency for Research on Cancer (IARC) has classified 1,4-dichlorobenzene (one VOC) as a possible human carcinogen. <http://www.cdc.gov/exposurereport/pdf/FourthReport.pdf>

Wool: is a natural protein fibre from the fleece of sheep and other related animals. It is warm, absorbent and can be inherently flame retardant depending on the tightness of the weave and how much lanolin has been left on the fibers. The resilience makes up for the low strength. Sheep are shorn 1-2 times per year, making wool sustainable.

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Dayle Laing, B.A.Sc. in Consumer Studies, Dip. Interior Design, LEED Accredited Professional, taught Interior Design at Sheridan College for 19 years. Her paper, "The Greening of Healthcare: Fabrics used in Health Care Facilities" was published in the Journal of Green Building, Fall 2011, and the scientific poster and abstract were presented at an Inflammopharmacology Conference at Cambridge University in July, 2011. She presented this research at the EcoCare healthcare conference in London, Ontario in October, 2010. Three of her seminars are accredited by IDCEC for continuing education credits for Interior Designers across North America. Dayle was keynote speaker at Earth Matters Day at Sunnybrook Health Sciences Centre in 2011. In the past, Dayle had a successful career in sales and sales management in the pharmaceutical industry. Her clients include corporations for speaking engagements and consultation on their issues of sustainability. For more information about how Dayle can help you with your requirements, please contact the office at 905-846-3221 or info@daylelaing.com



We help people select the 'coolest shade of green' for beautiful sustainable interior design that enhances their body, mind & spirit.

www.daylelaing.com