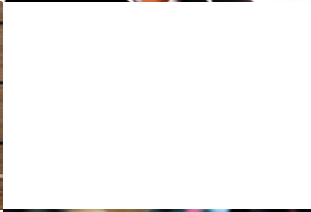




Clean Air Counts

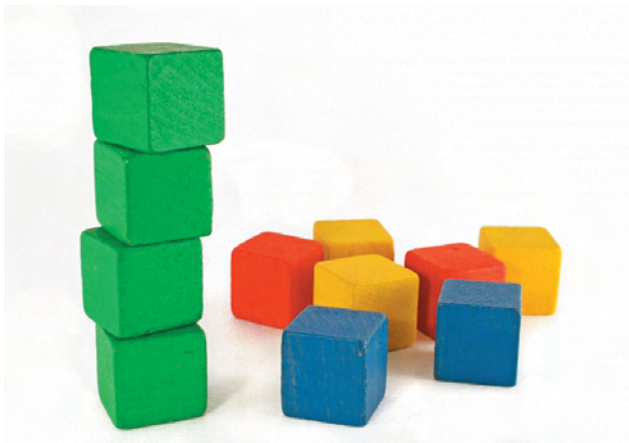
Strategy Fact Sheets

Low-VOC Building Products



CLEAN AIR COUNTS *Make A Visible Difference*





What Are Low-VOC Building Products?

Volatile organic compounds (VOCs) and other hazardous chemicals are contained in many construction materials and furnishings, posing a risk to public health. Today a number of low and no VOC building materials are available, including less polluting paints, adhesives, solvents, cleaning agents, caulks, wood products, carpets and sealants.

Using low-VOC building products for new construction and remodeling projects can significantly reduce the emission of smog-forming compounds. New homes and commercial buildings generally have VOC concentrations that are two to ten times higher than comparable older structures. These elevated levels have been linked to eye and respiratory irritation, headaches, fatigue and other symptoms associated with “sick building” syndrome.

The Benefits of Using Low-VOC Building Products Include:

- Cleaner indoor air quality for a more comfortable and productive environment.
- Value-added appeal to property buyers.

How to Implement a Low-VOC Building Product Program At Your Facility.

Depending on whether you are doing a new construction project, major rehab or simple interior re-design, there are many low-VOC products out there to choose from.

Step 1. REVIEW PRODUCTS.

Products should be reviewed specifically for impacts on human health and the environment. In some cases, your current building product distributor might carry a line of low-VOC or “green” building products. Ask your vendor representative for a list of these alternatives. More information on how to choose a low-VOC building product can be found at www.cleanaircounts.org.

Step 2. REWRITE SPECIFICATIONS.

Specifications or operations policies that call for low-VOC building products can be modified and inserted into project specifications. Visit the Clean Air Counts website and find sample specifications to use for this purpose.

Step 3. COMMUNICATE LOW-VOC BUILDING PRODUCT PROGRAM TO ALL TENANTS AND VISITORS.

Let your building tenants and visitors know about your initiative to promote and sustain better indoor air quality, with educational signage and programming. The more support you have from building occupants, the more success the program will ultimately have.

Step 4. REPORT YOUR ACHIEVEMENTS.

Go to www.cleanaircounts.org, log-in and enter information about your low-VOC building product program into the online database. Information about your low-VOC building product program is translated into an environmental impact assessment that will let you know the positive impact you’ve had on regional air quality. Need help? Email info@cleanaircounts.org.

- Reduced smog-forming chemical emissions from VOCs.
- Improved regional air quality.
- Improved worker safety and health.
- Reduced incidents of eye and respiratory irritation, headaches, fatigue and other symptoms of “sick building” syndrome.
- Reduction in air quality related illnesses, such as asthma.

How to Use This Brochure.

This brochure provides the assistance you will need to implement a successful low-VOC building products program. The following steps address ways in which you can identify features of low-VOC building products as well as examples of products you can use in your facility. Please refer to the product specifications included in this brochure to identify low-VOC building products.

Clean Air Counts is a voluntary, public-private initiative to reduce smog-forming pollutants and energy consumption in the greater Chicago, six-county region. It is a collaborative effort between the Metropolitan Mayors Caucus, the Illinois Environmental Agency, and US Environmental Protection Agency – Region 5.

Clean Air Counts is made possible through the support of The Chicago Community Trust, Gaylord and Dorothy Donnelley Foundation, Grand Victoria Foundation, John D. and Catherine T. MacArthur Foundation, and the U.S. Environmental Protection Agency.



Product Spotlight: Carpeting



Carpeting can negatively affect indoor air quality. The adhesives used for installation as well as some of the materials within the carpeting themselves “off-gas”, releasing Volatile Organic Compounds (VOCs), including polyvinyl chloride (PVC), a chemical that is suspected as harmful to human health. Additionally, dust particles and other allergens can become trapped in carpet fibers and cause respiratory irritation.

1. Before specifying carpet, consider alternatives. Hard flooring or other non-porous flooring material can be combined with natural-fiber area rugs to improve indoor air quality, as area rugs can be easily removed for cleaning. Wall-to-wall carpet tiles are a great alternative as well. Individual tiles can be removed and replaced with less hassle, less waste and more cost savings.

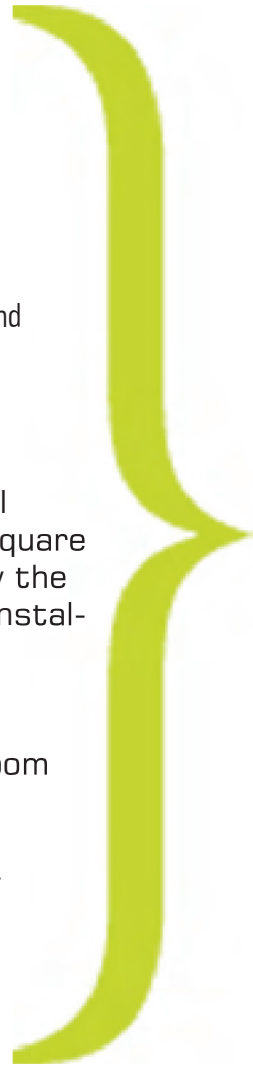
2. Use the Carpet and Rug Institute’s Green Label and Green Label Plus certification programs to find environmentally preferable carpet.
(More information about this and other standards below)

3. Require a warranty of safety. You should require test results far more detailed than the industry’s label requirements. Look for total VOC emissions below 100 micrograms per square meter per hour, measured after 24 hours. Have the manufacturer specify the adhesive as well, and request a warranty of total VOC emissions for the installation.

4. Avoid adhesives if possible. In homes and small commercial buildings specify only tackless strips at room perimeters. In commercial applications where heavy use or large spaces make perimeter connection insufficient, look for non-adhesive fastening systems such as Tac-Fast™, products that can be installed with double-stick tape, or peel-and-stick carpet tiles. If adhesive is needed, use only solvent-free, low-VOC products. These products can be more sensitive to ambient conditions such as temperature and humidity, so follow manufacturers’ directions carefully.

5. Clean old carpet before removal. There is a tendency to neglect carpet maintenance in the period leading up to replacement, which results in the carpet collecting dust and dirt of all types. This will likely release much of this dust back into the space when it is torn up. Those particles circulating in the air and HVAC system can cause indoor air quality problems.

6. Pre-ventilate new carpet elsewhere and maximize ventilation during installation. All the chemicals known to offgas from new carpet drop off significantly after several hours to several days. By unrolling and airing out new carpet for several hours or days in an uninhabited, well-ventilated space, most of the chemical emissions from the carpet itself can be avoided.



7. Clean often and thoroughly.

Regular vacuuming is critical to controlling contaminant levels in carpets, but typical paper vacuum bags often recirculate more dust than they hold. High Energy Particulate Air (HEPA) style filters are recommended for trapping particles as small as 0.3 microns.

Indoor Air Quality Carpet Standards

The Carpet and Rug Institute (CRI) administers the Green Label and Green Label Plus certification programs for environmentally preferable carpet. The Green Label Plus program is more stringent than the Green Label program and complies with the California Collaborative for High Performance Schools (CHPS) criteria for volatile organic compound and toxic chemical off-gassing. Green Seal and Scientific Certification Systems (SCS) are alternate “green” certification programs for carpeting. The SCS certification system utilizes the CHPS limit for volatile organic compounds but also evaluates other criteria such as product life cycle and corporate sustainability. It should be noted that the LEED certification for buildings specifies using carpeting that meets the Green Label Plus requirements in the Optimize the Use of Indoor Air Quality Products category.

In order for a carpet to be considered “green” under the Green Label Plus program the carpet must consistently meet the following requirements for off-gassing:

Total VOC:	0.50 mg/m ² hour
4-PC:	0.05 mg/m ² hour
Formaldehyde:	0.05 mg/m ² hour
Styrene:	0.40 mg/m ² hour

As compared to the Green Label program, Green Label Plus carpets must also meet testing standards for certain toxic chemicals. The following carpet manufacturers produce Green Label Plus compliant carpeting:

Bentley Prince Street Flooring
Collins and Aikmen Floorcoverings (Tandus Group)
Interface
Lees Carpet
Milliken
Mohawk Group
Shaw

For more information about indoor air quality standards for carpeting, visit the Clean Air Counts website at www.cleanaircounts.org or Carpet and Rug Institute <http://www.carpet-rug.org>

Product Spotlight: Sealants, Caulks, and Adhesives



Sealants, caulks and adhesives contain volatile solvents that off-gas in the indoor environment once applied. In response to a growing concern about indoor air quality, many manufacturers have responded by creating low and no VOC products. There are three types of low-VOC formulas: water-based (latex and acrylics); reactive (silicone and polyurethane); and exempt solvent-based (VOC-compliant) solvents.

Check to see if the product you're currently using is a low-VOC product and meets the requirements of the Green Seal Program at www.greenseal.org. A list of adhesive low-VOC content limits is

outlined below (Green Seal). Use products with VOC content that is at or under the figures in the table.

Floor VOC Content

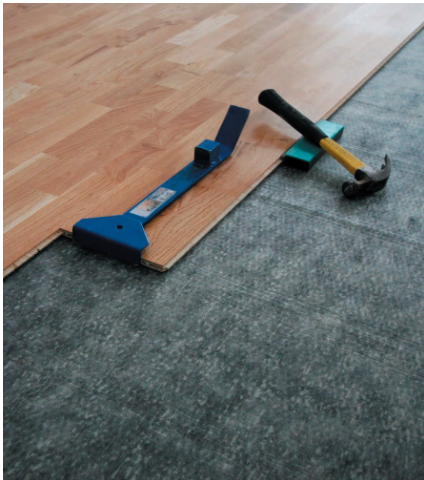
Adhesive Type	VOC weight in grams/liter minus water
Carpet Pad Installation	150
Ceramic Tile Installation	130
Contact Bond	250
Contact Bond-Specialty Substrates	400
Cove Base Installation	150
CPVC Welding	490
Indoor Floor Covering Installation	150
Multipurpose Construction	200
Nonmembrane Roof Installation/Repair	300
Other Plastic Cement Welding	510
Outdoor Floor Covering Installation	250
PVC Welding	510
Rubber Floor Installation	150
Single-Ply Roof Membrane Installation/Repair	250
Structural Glazing	100
Sheet Vinyl Flooring Installation	660
Waterproof Resorcinol Glue	170
Wood Flooring Adhesive 400	150

Adhesive VOC Content

Aerosol Adhesive	VOC weight in grams/liter minus water
General purpose mist spray	65% VOCs by weight
General purpose web spray	55% VOCs by weight
Special purpose aerosol adhesives	70% VOCs by weight



Product Spotlight: Wood



Wood products can contribute to poor indoor air quality due to added formaldehydes and VOC's in adhesives and sealants.

Formaldehyde is a chemical used for a wide variety of building materials household products. In buildings, the most significant sources of formaldehyde (more specifically urea-formaldehyde) are pressed wood products, as an adhesive resin. These pressed wood products include particle-board, hardwood plywood paneling, and medium density fiberboard. Medium density fiberboard is generally recognized as being

the highest formaldehyde-emitting pressed wood product.

Other pressed wood products, such as softwood plywood and flake or oriented strandboard, used for exterior construction, contain phenol-formaldehyde resin. Although formaldehyde is present in both types of resins, pressed woods that contain phenol-formaldehyde resin generally off-gas at considerably lower rates than those containing urea-formaldehyde resin.

When shopping for wood products:

1. Look for formaldehyde free wood products.
2. Use water based low-VOC adhesives with a VOC limit of 150 grams per liter.
3. Use low or no VOC paints and sealants for finishing wood once installed.



Product Spotlight: Office Furniture



Office furniture and equipment can emit high concentrations of VOC's, contributing to poor indoor air quality and resulting in reduced productivity, air quality related sickness and absenteeism. VOC's in paints, finishes, adhesives, and pressed wood products are found in common office furniture such as desks, chairs, cubicle dividers, carpeting, and filing cabinets.

Product certification programs for indoor air quality impact, such as GreenGuard, allow consumers to make informed decisions about purchasing office furniture. For a list of products that meet the

GreenGuard air quality standards, visit www.greenguard.org.

All products are tested in dynamic environmental chambers following ASTM standards D-5116-97 and D-6670-01, the U.S. Environmental Protection Agency's testing protocol for furniture and the State of Washington's protocol for interior furnishings and construction materials. Products are measured for emission levels, which must meet the following indoor air concentrations within 5 days of unpackaging. Air concentrations are based on the product being in a room 32 m³ in volume with an outdoor air concentration of 0.8 air changes per hour (ACH). Maximum allowable emission levels are those required by the state of Washington's indoor air quality program for new construction, the US Environmental Protection Agency's procurements specifications, the recommendations from the World Health Organization, and Germany's Blue Angel Program for electronic equipment. When multiple emission values are recommended, the lesser or more stringent is used as the acceptable emission value for GREENGUARD certification.

What to look for when shopping for office furniture:

1. Look for formaldehyde free pressed wood cubicle dividers and desks. If a formaldehyde free product is not available, phenol-formaldehyde is preferable over urea-formaldehyde.
2. Ensure that paints and stains used on office furniture are low-VOC.
3. When choosing metal filing cabinets, look for powder coating metal finishes.
4. Choose VOC free adhesives for carpet application. (This application can be difficult with the use of large rolls of carpet due to shape memory. Carpet tiles are more environmentally sound, cost effective and easier to use with VOC free adhesives.

Office Furniture: Seating

Individual VOCs	<0.1 TLV*
Formaldehyde	0.025 ppm
4-phenylcyclohexene	0.00325 mg/m ³
Total VOCs	0.25 mg/m ³
Total aldehydes	0.05 ppm