THE COMMERCIAL FLOORING REPORT

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Discoloration of Resilient Floor Covering

This issue of the Commercial Flooring Report was written and contributed by Ray Thompson associate of LGM. Ray has over 3 decades of resilient flooring expertise having worked as a trainer/technical expert with both manufacturers and distributors. Ray also has expertise in substrate technology. Also contributing to this article is Tim McAdoo who is the Installation Specialist with J.J. Haines and Company. We are especially appreciative for Tim's photos of resilient discoloration issues.


Ray Thompson

Resilient floors have been experiencing discoloration problems. They became more visible/noticeable when the industry went to lighter-colored products. While most of the discoloration occurs in rotogravure (printed) products, even inlaid, heterogeneous and homogeneous materials are subject to this problem. Most of these products are affected by discoloration from the bottom-up.

Following are some of the causes of bottom-up discoloration. Hopefully, this information will help you identify potential causes of these problems and ways to avoid them:

Adhesives: While once a big problem, bottom-up discoloration has lessened considerably during the past few years. In an attempt to save money installers and/or retailers will choose an adhesive not recommended for use under resilient materials. Caused by antioxidant or processing oil ingredient in the adhesive, this discoloration will be yellow and appear in various shapes and sizes.

Alkali Discoloration: Associated with moisture migration, alkaline salts usually travel with water vapor and attack the printing and PVC components of resilient material. This alkali attack bleaches out the material and gives the floor a milky appearance.

Bacterial Discoloration: Mold and mildew, which are also associated with moisture migration, appear to be bluish-gray to black in color. Promoted by an accumulation of stagnant moisture, micro-organism growth produces a spot that will continue to expand. When the wear surface is removed, the backing will have a pungent, musty odor and the backing will feel damp.

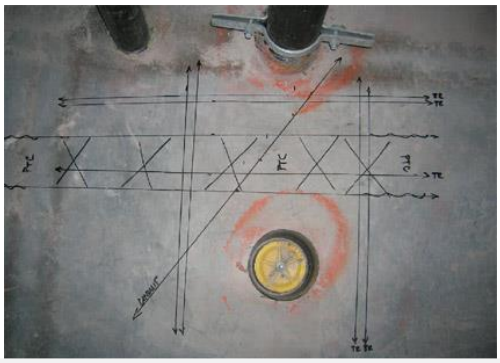
Construction Adhesives: Some construction adhesives contain an antioxidant known as butylated-hydroxyl-toluene (BHT) which has been known to sublime (off-gas) up into the material and cause a yellow discoloration. This often surfaces as spots where the gas from the adhesive migrated up around nail heads or in straight line above the underlayment joints. Sometimes, it mirrors the pattern of the adhesive application straight over the floor joists and swirled beneath underlayments.

Fungal Discoloration: Fungal activity requires three components: a fungi spore, which is present virtually everywhere; a food source, which can be found in some gypsum-based products (i.e. taping compound, wall texture overspray and some gypsum patching compounds): and excessive moisture. This discoloration is often found over concrete and gypsum substrates that are too wet to install over. Generally speaking, the discoloration is pastel-pink, bluegreen, blue, and yellow or tan-colored spot that grows larger over time.

Patching compounds and embossing levelers: Installation of resilient materials over un-dried patching compounds and embossing levelers can create either a bacterial or fungal discoloration, often yellow or gray in color.

Residuals on the surface of the substrate: Many reagents cause discoloration and/or damage to resilient materials from beneath. Among the culprits are:

- Adhesive residues – Cutback (asphalt) and latex (SBR based)
- Adhesive removers – Oil and citrus based
- Concrete markers – Spray paint, felt tip markers and wax marking crayons
- Concrete waterproofing sealers – oil based
- Equipment leaks – Oil and grease
- Heating products – Kerosene, diesel and heating oil
- Painting products – Paint thinner, mineral spirits, oil-based stains, and paint spills
- Plumbing residues – PVC pipe primer, oil from threading machines and oil residues from pipe.
- Roofing tar and other asphalt products - Drive way sealer



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Solvent attack: Installation of resilient materials over a recent solvent spill permits solvent to migrate up into the material where it distorts the material's surface that diffuses light differently. This usually creates a dull spot.

Underlayment edge treatments: Some wood panels used for underlayment are treated with a preservative or sealer on the edges of the skids. Some of these edge treatments contribute to debonding, discoloration or both. Rarely are these products designated for underlayment usage. This type of discoloration is generally in a straight line directly over the underlayment joints.

Underlayment fasteners: Often underlayment fasteners will promote resilient discoloration that appears as yellow spots. This problem is the result of one or more of the following:

- BHT migration – Discoloration is caused by off-gassing of BHT found in construction adhesives
- Coated nails (sinkers) – Sinkers which are not a proper fastener for underlayments, are a leading cause of floor discoloration. The anti-rust coating on the nails, usually gold or black in color, will off-gas up into the material and affect both felt- and vinyl-backed materials. Most sinkers can be identified by their diagonal checkered pattern on their heads.
- Coated staples – as with sinkers coating on some staple fasteners will also affect resilient products. In this case the discoloration is either pink or tan.
- Oil residue from pneumatic nailers or staplers – During use, over-oiled, worn out or poorly maintained air driven fastening equipment will often spit a small residue of oil onto the substrate. This residue migrates up into the material and creates a yellow spot in the material.
- Rusty fasteners – Excessive moisture in the substrate will allow fasteners to rust creating a reddish-brown discoloration

LGM is Supporting a Local Artist.
Lisa Q. Caldwell
This piece is in our Dalton office, along with others.
Dogwood Woman - 48" w x 24" h x 1 ½" d
Mixed Media Painting w/real,preserved dogwood blooms.
See page 6 for more information.
lisaqcaldwellfineart.com

Foreign matter in wood underlayments: Occasionally, foreign wood chips get into the mix used to make oriented strand board (OSB) or wafer board underlayment. These chips can cause discoloration. Red cedar and redwood chips will leave a reddish color. Chips that contain creosote and pitch will leave a yellowish color and chips from bark and pine cones will leave a brownish discoloration. It is extremely difficult to determine which chips will cause discoloration. Even worse, no one wants to accept responsibility when the problem occurs.

Wood filler (plastic patch): Plywood manufacturers that use synthetic wood filler must exactly mix the patching compound components to the specified portions. If not done the filler may off-gas and migrate up into the resilient sheet material where it leaves a yellow discoloration that mirrors the shape of the synthetic patch. Over time the patch will shrink and create a show-through problem, as well.

While I have attempted to cover as many causes of bottom-up discoloration as I can, there are many yet to be identified. Hopefully, the information presented here will give you knowledge to identify potential causes and remove them.

Even then, there are many undiscovered causes of discoloration that lead to complaints. Resilient manufacturers have made great strides to help eliminate bottom-up discoloration. The installer and flooring contractor need to be aware of these concerns. But the general contractors also need to be accountable for using the right products and protecting substrates from possible reagent exposures prior to the start of the installation.

Even if markings on concrete substrates are mechanically removed or not visible before the vinyl flooring is installed, there may be enough residual contaminate absorbed into the concrete substrate to cause discoloration of the vinyl flooring.

Covering the subfloor markings with a cementitious patching compound will not stop the contamination bleed through. Patching compounds are porous materials and will allow the subfloor markings to bleed through and stain the vinyl flooring products. In general, the marking contaminates must be mechanically removed. But, even if they are removed or not visible before the flooring is installed, there may be enough residual material absorbed into the substrate to cause discoloration of the vinyl flooring.

It is important to make sure, whether the substrate is new or decades old, concrete or wood, that it be free of any contaminants or agents that can affect a vinyl flooring material. Never assume something beneath vinyl flooring won't bleed through. The substrate should be mechanically ground and sealed where a contaminant exists. If you have questions or need help with any flooring or substrate concerns LGM has the answers.

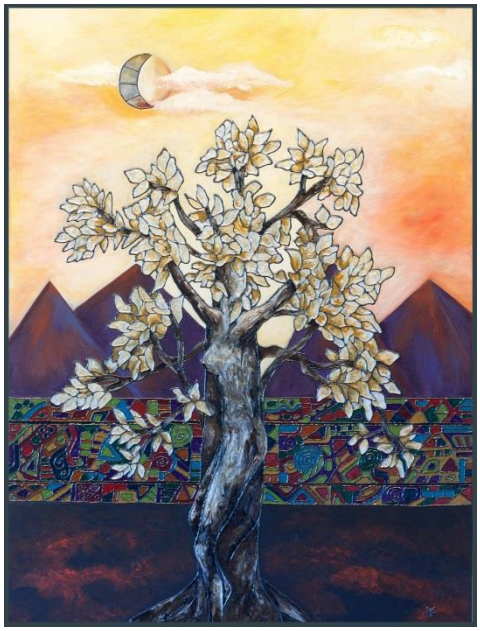
See next page for information on Lisa Q. Caldwell Fine Art

lisa q caldwell fine Arts

Artist Statement - The process for my canvas paintings begins with a smooth painted background. The main focus of the piece has areas that are slightly built up with the use of fabric, glass, and acrylic paints and mediums which gives a complexity to the surface and allows the illusion of stained glass. The foreground of the piece has a 3D tactile quality and visual effect. Nature sometimes supplies the remaining layer to my paintings. When the life cycle ends for an insect, a snake, a plant and or other various objects I collect and repurpose them into my artwork. They may be found in the driveway, by the light of a business or even on the grill of a car. My husband and friends are always collecting them for me. Be sure and look close at the paintings and see if there may be a treasure that is getting a second life as a piece of art.

Forever Eve - 30" w x 40" h x 1 ½" d
Framed Mixed Media Painting – Call for pricing

Close up view of stain glass illusion.



Forever Eve is currently on display at the Booth Western Museum.
Please visit my website to view more of my work.
http://www.lisaqcaldwellfineart.com/

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