The Code Authority®

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Solar Reflectance Roof Covering Materials

A cool idea for saving energy

By Howard Hopper */ Managing Editor*

Energy conservation and green construction codes and regulations include requirements for buildings to be designed to use energy effectively to save natural resources. One method for doing this involves the use of solar reflectance roofing materials, sometimes referred to as "cool roofs." A cool roof works by both absorbing the sun's heat and reflecting (or radiating) it back to the sky instead of transferring it into the building structure.

The effectiveness of a cool roof is measured by solar reflectance and thermal emittance. Both properties are measured individually from 0 to 1.0, with 1.0 being the material with the best performance.

UL testing and certifications

UL evaluates solar reflectance roof covering materials using requirements developed by many sources. Solar reflectance measurements, which evaluate temperatures and heat flows across surfaces exposed to solar radiation, are typically determined in

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Scan with your mobile QR Code Reader to find out more about UL support for code authorities.

UL-ese

Definitions of terms frequently used at UL

UL Approved

An incorrect reference to a UL certification. UL Lists *or* Classifies *products. This certification indicates that the product has been evaluated and complies with a product safety standard or requirements. In contrast, code authorities* approve *the installation of a Listed product in accordance with model code requirements. Sometimes code authorities mistakenly refer to a product being UL approved, which really means that it is UL Listed or Classified.*



FROM THE MANAGING EDITORS DESK

World Class UL Fire Research

Complementary online training for your staff

By Howard Hopper */ Managing Editor*

Fire officials frequently contact us with a variety of fire safety related questions. After resolving their concerns, I sometimes ask if they are aware of any of our fire service related research initiatives. Many of these fire marshals and fire chiefs have no idea that we conduct world-class research on fire safety concerns that can directly affect their departments. They are even more surprised when they find out UL has free online training courses on this research that their staff can access at their leisure.

These courses include the following:

- Fire Behavior in a Single Family Occupancy
- Structural Stability of Engineered Lumber in Fire Conditions
- Firefighter Exposure to Smoke Particulates
- Impact of Horizontal Ventilation
- Performance of Special Extinguishment Agents for Firefighter Use
- Upholstered Furniture Flammability
- Impact of Vertical Ventilation, and others.

For more information on UL fire research and training courses, please visit our fire service research portal at www.ul./com/fireservice

Solar Reflectance Roof Covering Materials (continued)

accordance with ASTM C1549, Standard Test Method for Determination of Solar Reflectance Near Ambient Temperature Using a Portable Solar Reflectometer. Thermal emittance measurements, which evaluate temperatures, heat flows, and derived thermal resistances of materials, are typically determined in accordance with ASTM C1371, Standard Test Method for Determination of Emittance of Materials Near Room Temperature Using a Portable Emissometer.

UL certifies solar reflectance roof covering materials based on them meeting or exceeding the minimum initial solar reflectance measurements as specified in Product Specification Eligibility Criteria of the ENERGY STAR® Program Requirements for Roof Products, which includes a three-year weather exposure test. Materials evaluated for low-slope installations are intended for use on roof surfaces with an incline of 2-inch or less rise per horizontal foot. Materials evaluated for steep-slope installations are intended for use on roofs with an incline of greater than 2-inch rise per horizontal foot.

For certification of field applied roof coatings, the products are investigated on a smooth light-gauge metal substrate at the intended application thickness. For information on varying thicknesses of coating and alternate substrates, refer to the detailed installation instructions accompanying the certified product.

Roofing materials complying with the ENERGY STAR® program requirements are certified under the UL's Energy Efficiency Certification Program. Individual certifications including the manufacturer's name, material designations, and the Certificates of Conformance can be found in the UL Environment Database of Validated and Certified Products at www.ulenvironment.com/database under the Product Category "Building and Construction (Roofing, siding, trim), Evaluation Type (Energy Efficiency Certification). These certifications are also found on the EPA's ENERGY STAR® website at www.energystar.gov.

Certificate holders are also entitled to display the UL Energy Verified Mark for the certified products listed on the certificate. Information concerning the specific initial solar reflectance values is provided in the detailed installation instructions accompanying the certified product. UL has already certified nearly 700 products under the EPA's Energy Star program

Code enforcement considerations

Energy conservation and green construction codes are beginning to require roofing materials used in a variety of different occupancies and building types to meet specific solar reflectance and thermal emittance requirements. An example is the California Energy Code which, with some exceptions, requires nonresidential buildings with low-sloped roofs in climate zones 2 - 15 to have a minimum 3-year aged solar reflectance of 0.55 and a minimum thermal emittance of 0.75.

The information included with these UL certifications makes it easy to determine compliance with code requirements. For additional information on solar reflectance rated roofing materials please contact Dwayne Sloan in Research Triangle Park, NC, at Dwayne.E.Sloan@us.ul.com or at +1.919.549.1676.



FLOOR PROTECTORS AND WALL SHIELDS

Providing thermal protection for fuel burning appliances

By Howard Hopper */ Managing Editor*

Floor protectors, also referred to as hearth extensions, and wall shields are used in conjunction with heat producing appliances such as fireplaces, fireplace stoves, fireplace inserts, and solid-fuel type room heaters to protect adjacent combustible construction. Model codes include requirements covering the installation of these products. UL certifies products for use in these applications.

Certifications

Floor protectors and wall shields are certified (Listed) under the Floor Protectors and Wall Shields category (DFCV). Information on these certifications can be found in the Online Certifications Directory at www.ul.com/database. Certified products include a UL Listing Mark that indicates "Floor Protector", "Wall Shield", or "Floor Protector and Wall Shield".

These products are intended for use with Listed solid-fuel heat-producing appliances for the reduction of the surface temperature of combustible floor and wall construction materials, respectively. They should be installed in accordance with the installation instructions provided with each product.

Floor protectors are placed over combustible floor-construction materials beneath and adjacent to Listed fireplace stoves, solid-fuel room heaters, factory-built fireplaces, and fireplace inserts where reference to the Listed floor protector is specified. Floor protectors are identified as either Type 1 or Type 2 in the individual Listings.



Type 1 (ember) floor protectors are for use in applications not requiring thermal protection of the combustible floor. Type 2 (thermal) floor protectors are for use in applications requiring thermal protection of the combustible floor.

Wall shields are placed over combustible wall-construction materials for the purpose of reducing the clearance to combustible materials from that required for individually Listed appliances and equipment, except when the appliance or equipment listing specifically prohibits the reduction of clearances. The reduced wall clearances are specified as a percentage in the individual Listings. Wall shields are not intended to reduce clearances to less than 12 inches or for reducing clearances when the clearance specified by the appliance and/or chimney-connector Listing is 12 inches or less. However, clearances less than 12 inches are allowed when the specific appliance and chimney connector system has been tested and labeled together with a specific

wall shield at the clearances specified in the appliance's installation instructions.

Standard for Safety

The UL 1618 Standard for Safety for Wall Protectors, Floor Protectors, and Hearth Extensions is used to investigate these products. Among other things, the standard includes accelerated aging, thermal resistivity, radiant panel, burning brand, and impact and strength tests. It also includes a reduced clearance test for wall protectors as well as construction, marking, and installation instruction requirements.

Model code applications

The installation of floor protectors and wall shields are covered by codes such as the International Mechanical Code (IMC), International Residential Code (IRC) and the NFPA 211 Standard for Chimneys, Fireplaces, Vents, and Solid Fuel-Burning Appliances. Some of the installation requirements covering clearance reductions and hearth extensions are as follows.

Clearance reductions — IMC section 308 includes requirements governing the reduction in required clearances to combustible materials and combustible assemblies for chimneys, vents, kitchen exhaust equipment, mechanical appliances, and mechanical devices and equipment. This section allows clearance reductions for products using protective assemblies Listed and labeled in accordance with UL 1618. In order to determine compliance, individual certifications of floor protectors and wall shields indicate the clearance reductions percentage established for each product.

Hearth extensions — IMC section 903.2 and IRC section R1004.2 require hearth extensions to comply with UL 1618, be installed in accordance with the listing of the fireplace, and be readily distinguishable from the surrounding floor area.

When reviewing the installation of floor protectors, wall shields and hearth extensions, refer to the individual product certification, markings, and installation instructions to verify the specific application for which the products have been evaluated. This includes details for locating the products and joining multiple protectors and shields.

For additional information on floor protectors, wall shields and hearth protectors contact Maggie Carroll in San Jose, CA, at Marguerite.E.Carroll@ul.com or at +1.408.754.6560.



Questions & Answers

Are flammable liquid storage cabinets investigated for storing hazardous materials other than flammable and combustible liquids, and what is the maximum capacity of these storage cabinets?

Flammable liquid storage cabinets are Listed for the indoor storage of flammable and combustible liquids in containers. They have not been investigated for the storage of hazardous materials other than flammable and combustible liquids. The maximum capacity rating of the cabinet is assigned by the manufacturer, but cannot exceed 120 gallons.

These cabinets are investigated in accordance with the Standard for Safety for Flammable Liquid Storage Cabinets, UL 1275. Products complying with this standard are Listed under the Flammable-liquid Storage Cabinets category (EDJZ), which can be found in the Online Certifications Directory at www.ul.com/database. They are intended for use in compliance with the NFPA 30 Flammable and Combustible Liquids Code, the International Fire Code, and other model fire codes.

For more information on flammable liquid storage cabinets, contact Howard Hopper in San Jose, CA, at Howard.D.Hopper@ul.com or at +1.408.754.6609.

Gate Operators

An open and shut case for safety

By Joel Hawk */ Primary Designated Engineer*

An ever increasing number of commercial and residential facilities are installing motorized gates and barriers to enhance physical security. Like any outdoor installation of motorized equipment, there are electrical safety considerations that need to be addressed. In addition the very nature of motor driven electrical gates and barriers presents unique personal injury hazards. It is important for code authorities and installers to understand how these systems are to be selected, configured and installed to provide safe, code compliant installations.

In the late 1990s the US Consumer Product Safety Commission (CPSC) documented a number of deaths and injuries attributed to entrapment accidents involving automatically operated gates. This included a number of tragic incidents involving children playing on automatic gates that did not include sensing devices or reversing mechanisms to prevent the entrapment .

To address these hazards, CPSC worked with UL and other stakeholders to develop product safety requirements to reduce these risks, which were incorporated in the March 2000 edition of the UL 325, the Standard for Safety for Door, Drapery, Gate, Louver, and Window Operators and Systems.

UL 325 standard for safety

Gate operators are investigated in accordance with requirements in UL 325, which covers gates that are intended to control vehicular entrance and/or egress. Vehicular gates may be swinging or sliding type. Barrier arm operators are also considered a form of gate that controls a cantilever type device (or system), consisting of a mechanical arm or barrier that moves in a vertical arc, intended for vehicular traffic flow at entrances or exits to areas such as parking garages, lots or toll areas.



Vehicular gate operators are required to have provisions for, or be supplied with, at least one independent primary and one independent secondary means to protect against entrapment. Entrapment protection is not required for barrier arm operators that are not intended to move closer than two feet from a rigid object, provided they do not have pinch points between moving parts.

UL 325 includes specific requirements for vehicular gate operators based on their intended usage, as defined by one of the following four classifications:

- **CLASS I** – Those intended for use in a home of one-to four single family dwelling, or a garage or parking area associated therewith.
- **CLASS II** – Those intended for use in a commercial location or building such as a multi-family housing unit (five or more single family units), hotel, garage, retail store, or other building servicing the general public.
- **CLASS III** – Those intended for use in an industrial location or building such as a factory or loading dock area or other locations not intended to service the general public.
- **CLASS IV** – Those intended for use in a guarded industrial location or building such as an airport security area or other restricted access locations not servicing the general public, in which unauthorized access is prevented via supervision by security personnel.

The types of required primary and secondary entrapment protection vary, depending on the gate classification, and its intended movement. This protection can include the following methods, among other protection criteria:

- Inherent entrapment protection system that stops and reverses the gate within 2 seconds.
- A non-contact photoelectric sensor or the equivalent that stops or reverses the gate within 2 seconds.
- A contact sensor (edge device or the equivalent) that stops and reverses the gate within 2 seconds.
- An inherent adjustable clutch or pressure relief device that, upon sensing an obstruction in any direction, will stop the gate and not result in a closing force more than 10 percent higher than the initial setting required to stop the gate, which cannot exceed 40 lbf.
- An actuating device requiring continuous pressure to maintain opening or closing motion of the gate. Upon removal of pressure, movement of the gate must cease.
- An audio alarm.

UL certifications

Gate operators are certified (Listed) under the Door, Drapery, Gate, Louver, and Window Operators and Systems product category (FDDR) found in the Online Certifications Directory at www.ul.com/database. This category covers electrical and pneumatic door and gate systems, and door, drapery, gate, louver, window and turnstile operators, together with controls and accessories for use with such operators, and similar devices.

They are also marked to specify all intended use Classes, along with their maximum rated closing force.

Certified vehicular gate operators include a UL Listing Mark , the word LISTED and "Gate Operator" or other appropriate product name as shown in the individual Listings. They are also marked to specify all intended Classes of applications, along with their maximum rated closing force.

Installation considerations

Installers and code authorities need to be aware that the ultimate safety of the system is dependent upon proper installation. Particular attention needs to be given to the following:

1. Code authorities should be consulted prior to installation.
2. Verifying that the gate operator Class is appropriate for the intended installation.
3. Installation should be performed by a qualified installer using the manufacturer's instructions.
4. Special care should be exercised during installation to ensure that recommended safety devices, such as photoelectric sensors or reversing-edge switches, are properly installed.

For additional information on vehicular gate operators please contact Joel Hawk in San Jose, CA, at Joel.Hawk@ul.com or at +1.408.754.6575.

Regulatory Services Welcomes Ron Farr

UL is pleased to announce that Ron Farr recently joined UL's Regulatory Services Department. In this position Ron will work with fire officials and fire service organizations on key fire safety issues, provide education to the fire service and serve as a resource for UL fire service related research and initiatives.

Before joining UL, Ron served as the Michigan State Fire Marshal, where he was director of the Bureau of Fire Services. In this position he was responsible for regulatory functions (plan review, inspections, and code enforcement of state regulated facilities) and fire training for the state. Prior to that he was employed for 37 years by Kalamazoo Township, Michigan, where he served the last six years as its fire chief.

During his career, Ron has actively participated in a variety of fire safety organizations and committees, most recently serving on the NFPA Standards Council. He has also been active in and served on several technical committees. This included chairing the NFPA 1 Uniform Fire Code technical committee. Ron has been a long time member of the International Fire Marshals Association, and served as its president in 2001 and 2002

Ron is a Michigan Certified Fire Fighter and an NFPA and State of Michigan certified fire inspector.

Ron works out of UL's Kalamazoo, MI, office and can be reached at **Ronald.Farr@ul.com** or +1.269.364.7641.



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Calendar of Events



January 15-17, 2012
Intersec
Dubai, UAE
www.intersecexpo.com

January 17-19, 2012
International Disaster Conference and Expo
New Orleans, Lou.
www.internationaldisas-terconference.com/

January 23-27, 2012
NFPA Training Seminar Week
New Orleans, Lou.
www.nfpa.org

February 7, 2012
Northcentral Regional Fire Code Development Committee
Denver, Col.
www.nfpa.org

February 8-10, 2012
Fire Asia 2012
Hong Kong, China
www.fireasia2012.org

February 27-March 2, 2012
Educode training conference
Las Vegas, Nev.
www.iccsafe.org/EduCode

If you would like *The Code Authority* to consider publishing your upcoming events, contact Howard Hopper by e-mail at Howard.D.Hopper@ul.com. Please type "TCA Calendar" in the subject line.

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