

Q1: Will the changes in this credit (if any) affect your ability to help transform the healthcare facility market? If so, please explain how and why.

Yes, this draft credit, as written, could drastically limit the ability of builders and architects to choose beneficial, critical building materials. Components manufactured with halogenated compounds are in many cases the best performing materials with respect to energy efficiency, low maintenance cost, easy, reliable watertight joining and water repellency. PVC's affordability translates into more affordable health care.

CREDIT FAILS TO RECOGNIZE PERFORMANCE BENEFITS OF PVC

The credit fails to recognize the important performance benefits of PVC (and other halogenated building products).

- PVC building products are widely used in healthcare settings and other buildings precisely because of their superior performance, maintenance and other benefits. This is widely recognized by interior designers. (Vinyl_in_Design 2007)
- Low-cost fire suppression systems utilizing CPVC pipe, as well as fire-retardant materials, can save lives of both patients and health-care workers. CPVC pipe also provides an economical option in retrofitting older buildings destined for nursing and other health care service with sprinkler systems.
- Fire suppression systems and fire retardant materials also serve to reduce patients and occupants exposure to PBTs as well as polycyclic aromatic hydrocarbons (PAHs), which may pose fire risks equal to or greater than those of dioxins.
- Some environmentally important products, such as photovoltaic-embedded PVC roofing membranes, are simply not available in non-halogenated materials.

PVC products are recognized for their superior, even unique performance

Pipe

- Properly designed and installed, PVC pipe has an estimated life span of more than 100 years, with little or no loss of strength. The National Research Council of Canada estimates the "break rate" for vinyl water distribution pipe at 0.5 breaks per 100 km (62 miles) per year compared with 32.6 breaks per 100 km per year for cast iron and 7.9 breaks per 100 km per year for ductile iron (Rajani and McDonald 1995)

- Chlorinated polyvinyl chloride, more commonly referred to simply as CPVC, has proven to be a viable alternative for numerous healthcare applications. And although it has gained acceptance and is used for fire sprinkler applications in the health care industry, it is currently not utilized to its full potential in other applications....

While metallic systems have been subject to premature failures in potable water systems due to pitting and corrosion, these are never concerns with CPVC - even under the harshest pH conditions. CPVC will never scale even in the most aggressive water conditions, so piping systems maintain their full water-carrying capacity throughout their entire service life. This combined corrosion and scale resistance minimizes maintenance requirements and related costs over the long term....

Numerous tests conducted over the years by third-party organizations, such as Factory Mutual and Underwriters Laboratories (UL), however, have proven that CPVC is a fire-safe material. That is why it has been successfully used in fire protection systems for more than 20 years. Such tests have repeatedly confirmed the superior flame and smoke characteristics of CPVC, which have resulted in its extensive use in other highly sensitive applications, including aircraft interior construction and the semiconductor industry....

In addition, CPVC has been proven to not contribute to a fire's fuel load. Nor will it support combustion the way some other non-metallics do, such as polypropylene. That's because CPVC has a very high limiting oxygen index (LOI) of 60, which means it cannot sustain burning on its own. LOI is the percentage of oxygen needed in the atmosphere to support combustion. (Massel and Hutton 2007)

- A fire sprinkler company recommended using a CPVC fire sprinkler system in the renovation of three floors of Mercy Medical Center in Ohio. The recommendation was based in part on concerns about problems in retrofitting a steel fire sprinkler system. "We explained to Mercy that CPVC was the best possible material for their installation," according to Steve Comunale of S.A. Comunale, Inc., an 80-year old, national fire sprinkler company. "In hospitals, CPVC fire sprinkler systems make the most sense because of the space constraints." (Noveon 2001)
- "The California Building Standards Commission unanimously adopted rules that will allow the use of chlorinated polyvinyl chloride (CPVC) pipe in homes where local building officials conclude that copper pipes may fail because of water or soil conditions." (Gannett_Sacramento_Bureau 2000)
- "One other advantage is durability. CPVC piping systems have been in field testing and actual installations for more than 40 years, including hospitals, hotels, major universities and numerous high-rise applications." ("What's the Alternative? A snapshot of non-metallic piping alternatives, namely CPVC and PEX, reveals a number of benefits including cost-savings, flexibility and efficiency.") (Horwitz-Bennett 2004)

- “The combustibility and toxicity of CPVC during a fire were the focus of a controversial debate between 2003 and 2004 in Chicago where a recent code change finally allowed the city to join other large U.S. metropolitan areas in approving the use of CPVC fire sprinkler pipe in high-rises. Although the decision was initially prompted by economics and the need to identify a cost-effective material for retrofitting Chicago high-rises with life-saving fire sprinkler systems, it was only after test data and more than 45 years of field performance proved that CPVC pipe could be used safely during a fire that the new code was passed.” (Massel 2006)

Windows and Doors

- [In answer to a question regarding whether aluminum or vinyl windows are more energy-efficient] “A: Vinyl is a lot more energy efficient because aluminum conducts cold. Even with your [aluminum] storms, which help to insulate your home, you can put your hand on the frame in the winter and find it very cold to the touch. You'll probably even have moisture accumulating along the frame. Vinyl is not as much of a conductor of moisture. Of course, wooden, vinyl-clad and fiberglass windows are even more energy-efficient than aluminum.” (“Vinyl windows better than aluminum ones,” (Grossman 2003)
- “Windows made of vinyl are convenient and long lasting. Because the color goes all the way through the frame, vinyl windows do not need painting and do not show scratches as easily as aluminum and wood windows do. Vinyl does not conduct heat or cold, reduces frost and condensation and is warmer to the touch than glass. Today, about one-third of all replacement windows have vinyl frames, and in the northern United States, the percentages are higher.” (Baron 2002),
- “Doug Williams, window consultant for Newmar Windows, notes: ‘In the Toronto area, 98 per cent of new home builders use vinyl windows. Builders are offering their customers more glass area than ever before and vinyl windows offer low maintenance, no shrinkage and no warping.’ (Gillespie 2005)

Roofing

- A study sponsored by the U.S. Environmental Protection Agency (EPA) and the U.S. Department of Energy (DOE) measured and analyzed summertime air-conditioning energy savings and power-demand reduction of a large retail store in Austin, Texas, that was retrofitted with a reflective roof membrane. The cost-competitive reflective roof membrane reduced the average summertime daily maximum roof-surface temperature of a retail store in Austin, Texas, from 168°F (76°C) to 126°F (52°C). The total air-conditioning energy use was thereby reduced by 11% and peak air-conditioning demand

fell by 14%. This 100,000-ft² building is predicted to save about \$65,000 over the life of the roof. (Vinyl_in_Design 2007)

- “According to Lisa Gartland, an industry consultant in Sacramento, Calif., a traditional asphalt roof in that community can reach 150°-190° F in midafternoon. Cool roofs manufactured from materials such as PVC and TPO can downgrade the peak temperature to 120° F or lower.” (DeRosa 2001)
- PVC roofing membranes with embedded photovoltaics are unique in the marketplace. (Debbie Raphael, City of San Francisco, speaking at GreenBuild, Chicago, November 7, 2007)

Floors

- “Among the most common types of slip-free flooring used in hospitals are profiled/embossed vinyl composition tile (VCT), profiled/embossed higher-end vinyl enhanced tile (VET), and profiled/embossed solid vinyl tile (SVT).” (Sandrick 2004)
- “The vinyl flooring and plasterboard walls on the first floor stopped the fire from spreading, Capt. Metterville said. Two carpeted rooms were within inches of where the fluid was dumped.” (Croteau 2006)
- “In the manufacture of all its vinyl products, Tarkett reuses scrap material from production lines, and utilizes a closed-loop process so that nothing is wasted. Slightly outpacing their recycled-content counterparts, these ‘green or sustainable’ floor coverings, Hendry says, will see estimated sales growth of as much as 20 percent over the coming years.” (“Manufacturers read the writing on the wall: recycled content, renewable raw materials. No longer strangers to resilient floor coverings,”) (Broadhurst 2004)
- “Last year, Wal-Mart began remodeling the apparel, home, and electronics sections in 1,800 stores, replacing miles of that stain-colored carpeting with vinyl that looks like wood. To Fleming, the new “simulated wood” floor is all about aesthetic improvement. His boss takes the classical Wal-Mart view. “The truth is that vinyl costs less,” Scott says. “And the maintenance on the vinyl costs less than the maintenance on the carpet.” (Bianco 2007)

Fabric

- A little redecorating could help wipe out more germs in hospitals. A new study suggests that vinyl clad-furniture-- properly cleaned--can help fight the spread of drug-resistant germs in the hospital. It appears that crevice-filled fabrics on hospital furniture may harbor bacteria that can jump from patient to patient, according to an analysis in one Chicago hospital. (Reuters_Health 2000)

Siding, Fences, Decks, Railings

- “Vinyl's growth also extends to one of its newest incarnations: insulated vinyl siding. First introduced about six years ago by Crane, it is backed with expanded polystyrene foam for support and insulation value. It's available in both Dutchlap and clapboard profiles from Crane, CertainTeed (TrueComfort), Heartland (CedarMax) and Norandex (Polar Wall Plus). Royal's DuraPlank claims to be the thickest panel (.054 inch) and features an Energy Star-rated extruded foam backing for straighter walls and enhanced energy savings. It can also withstand winds up to 265 mph.” (Scripps-Howard 2005)
- "It costs about half to twice as much as wood, but it's a good choice if this is going to be installed in the last home you expect to buy," says Marra. "Even pressure-treated wood will need to be replaced eventually - and you might expect to replace the wooden fence twice before the PVC fence shows any signs of aging. It is an investment." (Devine 2002)
- “Vinyl fencing is probably your best option. It's very easy to install yourself with ordinary household tools, though installation can be quite time-consuming...For durability, co-extruded vinyl fencing is best. This production method creates fencing with an outer layer that resists the sun's damaging rays, and an inner core for strength. Some designs also have internal steel reinforcement for extra rigidity.” (Dulley 2005)
- “Harsch says nonwood fencing is gaining rapidly on the market leader, wood, because once a vinyl fence is in place, there is virtually no maintenance aside from an annual hosing off of dirt and grime.” (Bradley 2003)

REFERENCES

- Baron, L. M. (2002). "How to Replace The Windows: Carefully; Choice of Materials Looms Large," *Washington Post*, August 10, 2002
- Bianco, A. (2007). "Wal-Mart's Midlife Crisis," *Business Week* April 30, 2007:
- Bradley, D. (2003). "Easy-care vinyl fencing growing in popularity," *Associated Press*, November 20, 2003
- Broadhurst, M. (2004). "Recycled Content, Renewable Raw Materials No Longer Strangers to Resilient Floor Coverings," *Environmental Design & Construction* June 1, 2004:
- Croteau, S. (2006). "Arson at new women veterans shelter," *Telegram & Gazette*, August 18, 2006
- DeRosa, A. (2001). "Cool roofs getting warm reception," *Plastics News*, August 14, 2001
- Devine, N. (2002). "Take neighbourly approach when it comes to fences," *Toronto Star*, April 25, 2002
- Dulley, J. (2005). "Sensible Home. Good Fences," *Philadelphia Inquirer*, September 11, 2005
- Gannett_Sacramento_Bureau (2000). "Rules adopted for drinking water pipes in homes," *AP Newswire*, Nov 2000
- Gillespie, D. (2005). "It's time to go window shopping for windows," *Toronto Star*, January 29, 2005
- Grossman, C. (2003). "Vinyl Windows Better Than Aluminum Ones," *Detroit Free Press*, October 19, 2003
- Horwitz-Bennett, B. (2004). "What's the Alternative?" *Consulting Specifying Engineer* May 1, 2004:
- Massel, T. (2006). "How Well Does CPVC Perform Under Fire?" *PM Engineer* March 15, 2006:
- Massel, T. and B. Hutton (2007). "Hospital Plumbing: Making a Case for CPVC," *Plumbing Engineer* Feb, 2007:
http://www.plumbingengineer.com/feb_07/cpvc.php.
- Noveon. (2001). "BlazeMaster® Fire Sprinkler System retrofit puts safety and needs of patients first." Retrieved December 14, 2007, 2007, from <http://www.blazemaster.com/CaseStudies/hospital.pdf>
- Rajani, B. and S. McDonald (1995). "Water Main Break Data for Different Pipe Materials for 1992 and 1993," *National Research Council, Canada*.
- Reuters_Health (2000). "Vinyl divine at keeping germs off hospital furniture," *Reuters Health*, August 28, 2000
- Sandrck, K. (2004). "No-slip solutions: Vendors rush to address hospital slip-and-fall concerns," *Health Facilities Management* November 2004:
- Scripps-Howard (2005). "All types of siding are available to dress up your home," *Scripps-Howard News Service*, April 25, 2005
- Vinyl_in_Design. (2007). "Cool Roofs Save Energy Measured Energy Savings in a Large Retail Store." Retrieved December 14, 2007, 2007, from <http://www.vinylbydesign.com/site/tertiary.asp?CID=214&DID=355>
- Vinyl_in_Design. (2007). "Growing Demand for 'Cool' Vinyl Roofing." Retrieved December 14, 2007, from <http://www.vinylbydesign.com/site/tertiary.asp?CID=137&DID=564>
- Vinyl_in_Design. (2007). "Survey Outlines Materials Selections In Healthcare Design." Retrieved December 12, 2007, from http://www.vinylbydesign.com/site/page_two_col.asp?CID=213&DID=359