

Top Down

Software simulations, online resources and new research improve roofing and cladding systems

by Godfrey Budd



Energy efficiency and durability are increasingly priorities for building owners and operators, especially for those in the institutional sector with long-term responsibility for their facilities. Besides the perennial quest for attractive roofing and cladding designs, and systems that come with trade-friendly installation potential, durability and energy efficiency are likely to remain key drivers of innovation and development of quality products and systems.

For buyers and tenants alike, in many instances, the curb appeal of a building can surely only increase as durability and energy efficiency improve – and annual repairs and HVAC costs drop. Besides the obvious benefits of reduced HVAC costs, building codes are expected to grow increasingly more stringent, reflecting environmental concerns. The US Environmental Protection Agency (EPA) says that energy used by the country's commercial and industrial buildings accounts for nearly 50 per cent of U.S greenhouse gas emissions.

Backed by today's more precise and comprehensive computer-based simulations, building envelope science and technology continue to improve. In both the Canadian and the U.S., government agencies, trade associations, research and academic institutions, as well as other non-profit building specialists have a range of resources to help experts develop better design and product solutions.

A few years back, for example, research showed that the impacts of thermal bridging had been underestimated. Design professionals and manufacturers have responded accordingly. "The issue is effective R-value. Industry has in the past assumed that continuous support elements like Z-bars and shelf angles have had only a minor effect on the R-value. Now, with better modelling and testing, it's been found that even small elements like brick ties can have serious impacts on thermal performance, sometimes by as much as 30 per cent or more," says Don Delaney, an engineer and business development specialist at Flynn Canada Ltd.

Northern Facades, a subsidiary of Flynn, has introduced the ISO Clip. It is a non-combustible thermal break device, part of a sub-frame system, which is suited for many cladding types, and works cost-effectively for both vertical and

horizontal installations. "It can be used for masonry or stud construction. This versatility is truly unique," Delaney says.

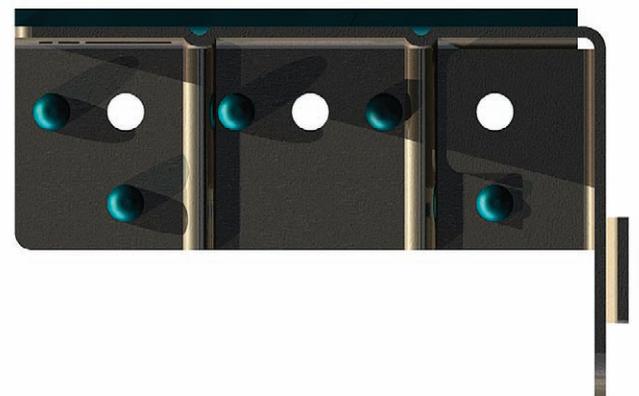
The patented roof system from Tri Thermal Roofing (TTR), the parent company of Cox Roofing Systems, is geared to increase a roof's R-factor and improve its waterproofing. The system came about partly as a result of problems with the foam insulation coatings when hit by harsh weather cycles. "Our system had not been done before" says John Justice, VP sales and technical director at TTR. "We were seeing coating failures in the field. In some cases, we installed EPDM (rubber) directly on top of the coating." The TTR concept involves two different roof systems, which, in combination, are designed to produce a solution that is better than either system on its own.

It consists of a spray-applied polyurethane foam roof with a single-ply membrane that is adhered to the foam with a proprietary spray-applied, slow-rise urethane-based adhesive. It is often used for repairing existing roofs.

A high-density waterproof polyurethane foam is applied to the surface of an existing roof. Once the foam is ready, an adhesive, then an EPDM membrane, are applied. "It allows for easy installation. There are no compatibility issues. It takes the best of both worlds."

In new construction or a complete removal installation an Iso Board is installed on deck either adhered or mechanically fastened. In either case, the polyurethane foam sprayed in place over the Iso Board removes thermal bridging from the equation. The polyurethane foam creates a complete seal negating the screws and gaps or joints in the insulation boards. "The TTR system is slightly more expensive, but there are big savings on energy costs – 25 to 30 per cent savings, typically," says John Justice, VP sales and technical director at TTR. Firestone Building Product's UltraPly TPO InvisiWeld is another system that addresses a problem, in this case, an almost uniquely Canadian one, namely some of the longest, coldest winters in the world. Its non-penetrating TPO membrane fastening system is mechanically based. The

Above: Firestone UltraPly TPO InvisiWeld System on Cawthra Mansions on College Street, Toronto, ON. Below: The ISO clip from Northern Facades and Flynn.





Above: Manufactura Outlet Village - Kiev, Ukraine. Chief Architect: Victor Salamatin. Skylight/Roof: SUNGLAZE 4/800 Solar Grey. Right: SUNPAL Sidelight at Heritage College, Melbourne, Australia. Architect: Narre Warren. Roof: SUNGLAZE 4/800 White opal, Blue, Solar-control, Solar-Ice. Photos courtesy Vicwest.

Gard EPDM membranes – in a comprehensive roofing solution. It uses UltraPly TPO for horizontal roof surfaces and either RubberGard EPDM or RubberGard EcoWhite EPDM for vertical surfaces such as parapet walls. “Now, with white EPDM available, the two systems have a seamless visual impact. The UltraBlend system is gaining traction as more people find out about it,” LeBeau says.

The system is geared for quick and easy installation, with heat-welded seams and the option to use various combinations of accessories and flashings from both product lines.

Some cladding products and systems don't have the practical utility of these Firestone systems, but can yield some very tangible benefits. Many cities and towns have what are sometimes called development service groups within its administrations. They encourage good building design and provide some “architectural control,” says John G. Smith, a regional sales manager at Dryvit Systems, Inc. “If a developer wants to build on the cheap, the city's development group might push back and ask for something more creative,” Smith says.

The principle invoked here might be expressed as a prohibition against installing a double-wide next to a terracotta-faced luxury boutique hotel. It also protects the investments

company says, “The roofing season can be extended since the InvisiWeld System functions well in many climates, including extremely cold environments where adhesives and asphalt are difficult to use.”

The VOC-free application features Firestone UltraPly TPO InvisiWeld plates

attached to the membrane using an induction welding tool. The system has taken off since it was introduced about four years ago. “As a method for installing membrane, InvisiWeld now has 70 per cent of the market for TPO installation,” says Jean LeBeau, principal at MJ Building Envelope Solutions Inc.

Firestone's UltraBlend Roofing System has also been trending upwards. It is designed to combine the strengths of two other products from the company – UltraPly TPO and Rubber-



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of those who have spent on quality. On the other hand, the cost-conscious developer probably doesn't want to spend any more than necessary to comply with the local esthetics police.

One relatively budget-sensitive solution, Smith says, might be to use Dryvit's TerraNeo line, which can be used for EIFS coatings or interiors. It is a high-end finish, and with a blend of multiple-sized quartz aggregates and mica particles it can replicate the look of granite. "It has the look of granite or stone, but with a lot less structure required. A full EIFS assembly weighs two pounds per square foot, instead of the 80 to 90 pounds per square foot if you used real granite," Smith says.

Reflectit is another Dryvit product that can help buildings make a great first impression. It is aimed at those who favour the modernist look of gleaming metal panel cladding but are put off by the \$70- to \$80-per-square-foot price tag. Dryvit Custom Brick, which offers a variety of textures and colours, works on the same idea as TerraNeo and Reflectit, and is another system that is helping EIFS attract customers, Smith says.

A new twist on traditional technology from IB Roof Systems could boost the esthetic appeal of PVC roofs. "It's an Italian product that includes the integration of real copper flakes in the liquid plastisol, so the material simulates the look of a copper roof as it patinas and oxidizes," says Brad Egan, a marketing communications manager at IB Roof Systems. Casting is the oldest way of making PVC. It's not the fastest method but the product has some good attributes, including better durability, Egan says. It also works well at producing the desired copper look for IB's new Forti-Guard line of PVC membranes. These are also available with a silver or white look.

When it comes to cladding products, European manufacturers and designers have had the field pretty much to themselves in some sectors. Until just recently, for instance, no one in North America was making phenolic resin panels for the cladding sector. "They all came from Europe," says Andrew Rogers, president of Sound Solutions Inc.

Cost and lead times have sometimes been an issue, Rogers says. Now, Fibersin Industries Inc., a U.S.-based manufacturer of laminate and phenolic panels, with decades of experience in thermal fusion-based products, has introduced Stonewood Architectural Panels. "This means much shorter lead times. We have a relationship with Wilsonart, so we have a huge range of colours available," says Rogers. He notes that Sound Solutions is the sole distributor in Canada.

The firm has supplied phenolic architectural panels for colleges, universities, municipal buildings, hospitals,

and some retail and restaurant chains. "Those with owner-occupied buildings are our biggest customers. They want something that will last," Rogers says.

Esthetics have always been a big factor for some clients. Others, on the other hand, are only now giving more weight to this aspect. Rogers says, "The institutional sector is changing its thinking and focusing more on the exterior."

Lightweight cladding and roofing products with a wide service temperature range are often a good fit for Canada's climate. Both are characteristic of today's polycarbonate roof systems.

Vicwest Corporation distributes Palram's polycarbonate Suntuf corrugated sheets to the DIY market in Canada. Recently, Vicwest's R&D department was asked to review Palram's architectural polycarbonate standing seam roof systems, Sunpal and Sunglaze, used in airports, railway stations and arenas, to see what demand there might be for these systems in Canada. "These products are popular in Europe and are now being sold in the U.S. It only seems natural that it will find its way to Canada," says Peter MacNab, an architect and ICI market development manager with Vicwest Canada.

With the increasingly wide range of roofing systems, online resources are assuming a greater role in the design community's tool kit. "Architects are using the [online] roofing practices manual. They can benefit by sending specs over to RCABC [Roofing Contractors Association of British Columbia] for review to see that they conform to standards in the RoofStar Guarantee Program," says Judy Slutsky, director of business development at RCABC.

Slutsky has been doing lunch-and-learn sessions with B.C. architects, however, some architects from outside B.C. have said that RCABC's services are also needed in other regions of Canada.

Of course, the type of construction being done varies across the country. "We're seeing increased demand for product, fuelled especially by northern Alberta," says Ryan Hunniford, operations manager at Tech-Crete Processors Ltd. The company is a manufacturer of composite insulating panels for roofing and walls. Tech-Crete's concrete-faced insulation (CFI) wall panels are pre-finished exterior insulating panels designed for use in perimeter foundation and low rise wall installation.

Then there are systems or products geared for conditions specific to certain regions. The snow retention guards and systems from Sno-Gem, Inc. are a case in point and are designed for stopping snow from sliding off roofs. "We have several systems, each for slightly different applications," says Jim Carpenter, VP operations at Sno-Gem. ■



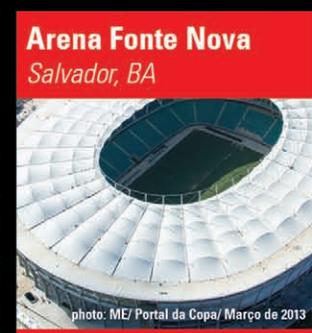
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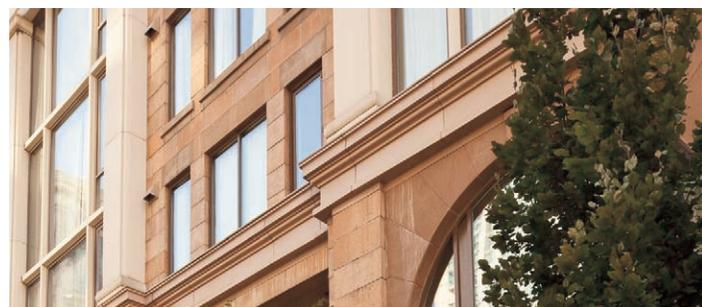
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