CCMC News: Fall 1994, Issue No. 10

National Research Council of Canada. Institute for Research in Construction

Publisher's version / Version de l'éditeur:
https://doi.org/10.4224/40001920
CCMC News, 1994

NRC · CNRC

Fall 1994 • A publication of NRC's Institute for Research in Construction • Issue No. 10

CCMC NEWS

Liaison Agreement Signed with U.S. Evaluation Service

CCMC has signed a Liaison Agreement with the National Evaluation Service (NES). NES is an American corporation with a mandate to support technical innovation in the construction industry through product evaluations. It is composed of ICBO Evaluation Service, Inc., BOCA Evaluation Services, Inc. and the SBCCI Public Safety Testing and Evaluation Services, Inc. CCMC and NES recognize the need to reduce technical barriers to trade and have a shared interest in establishing the long term compatibility of technical requirements. In addition to formalizing the lines of communication between the two groups, the Liaison Agreement allows for the creation of common product evaluation requirements.✦

Thanks to IRC's expertise on contruction materials, codes and standards, we are helping to increase the competitiveness of Canadian products abroad. The role of CCMC/IRC is continually expanding, not only in aiding building officials but also in assisting Canadian manufacturers to reach foreign markets. The following articles on recent events demonstrate CCMC's position within the international product evaluation framework. By establishing contacts with our counterparts in other countries, CCMC can assist manufacturers to identify the technical requirements that will be imposed on their products.

Building Innovative Technology Evaluation Concept

BITEC may lead to the creation of a North American clearing house to steer manufacturers to the most appropriate route to acceptance in the building market.

CCMC has been participating in an initiative by the U.S. Civil Engineering Research Foundation (CERF) to move new innovations into practice. CERF is the research affiliate of the American Society of Civil Engineers. In September 1992, Guy Gosselin of the Canadian Construction Materials Centre participated in a forum held by CERF to discuss the formation of a new Highway Innovative Technologies Evaluation Center (HITEC). The HITEC concept originated from requests from the public and private sectors to provide a uniform method of evaluation for innovative products going into highway construction in the United States. Mr. Gosselin described CCMC's mandate, operational plan and evaluation strategy for building products.

A similar initiative by CERF on a Building Innovative Technology Evaluation Concept (BITEC) is currently under investigation. Guy Gosselin again was invited to discuss CCMC's evaluation activities in Washington in April 1994. More recently, John Berndt participated in a meeting between CERF, the National Evaluation Service and the ICBO Evaluation Service to identify how such an initiative might interact with the existing code-related evaluation services. Discussions may lead to the creation of a North American clearing house to aid manufacturers and others in determining the most appropriate route to acceptance in the building market.✦

International Technical Assessment Organizations Meet in Sao Paulo, Brazil

The first meeting of product evaluation organizations from around the world promises to reduce the level of repetitive testing manufacturers must undertake when exporting their products.

Representatives from 13 of CCMC's counterpart technical assessment organizations came together for the first time in June. The meeting was hosted by the Instituto de Pesquisas Tecnologicas (IPT) and allowed the participants to share information on their respective countries' systems and seek opportunities to eliminate obstacles in the field of technical assessment. Countries represented included Brazil, Britain, France, Italy, Portugal, Spain, Germany, Israel, South Africa, Australia, Japan, U.S.A. and Canada. Presentations ranged from "European Technical Approval" to "Types of Technical Approval in Countries with Rapid Economic Expansion." John Berndt participated on behalf of CCMC, making a case for "International Cooperation in the Acceptance of Building Products."

Participants in the conference recognized the similarities in their respective approaches to product assessment. They also agreed with the need to find ways to reduce

continued on page 2

International Technical Assessment...*continued from page 1*

the burden of repetitous product testing on the manufacturer.

In order to maintain the momentum of cooperation begun in Brazil, a second meeting is planned for May 1995 in France. One of the issues to be resolved at that time will be the creation of a Working Commission under the umbrella of the Conseil International du Bâtiment (CIB). In preparation for that meeting, the North American delegates, led by the U.S. Civil Engineering Research Foundation, are preparing a survey that may lead to an international registry of information on organizations involved in the technical assessment of innovative construction products.

Of particular importance to Canada's contruction industry was the opportunity for CCMC to establish direct contact with product assessment organizations in other countries. CCMC is now in a better position to identify the technical requirements that manufacturers must meet to gain acceptance from these countries. ✦

Foreign Acceptance of a Canadian Innovation

A CCMC Evaluation Report was essential to the foreign acceptance of a Canadian innovation.

As part of its mandate to support Canadian exports, CCMC evaluated a plastic housing system designed specifically for global markets. To establish performance expectations consistent with southern exposures, a primary market, CCMC staff consulted with authorities from the U.S. Southern Building Code Congress. Working with the manufacturer, Royal Building Systems (Cdn.) Limited, and technical experts in NRC's Institute for Research in Construction and the Industrial Materials Institute, CCMC prepared a set of requirements in a Technical Guide for Plastic Housing System that would assess the performance of the product.

The requirements and criteria in the technical guide were developed to evaluate the performance of the plastic housing system with respect to equivalency to the intent of the Standard Building Code (SBC) as a single family dwelling.

According to the manufacturer, the successful evaluation of this product was a prerequisite for acceptance into many countries such as Colombia, Argentina, Hungary, Japan, Italy, China, Spain, and El Salvador. The evaluation report also supported orders from India, the Caribbean, and Russia. The manufacturer claims that a CCMC Evaluation Report has provided world wide recognition for the product.

Information: Alphonse Caouette ✦

Materials, Products, Buildings of Tomorrow

The very structure of materials is providing more properties and greater performance with less matter.

The following article is the first of a three part series on the future of construction materials. It is adapted from an article published by the Centre Scientifique et Technique du Batiment (CSTB). In this rapidly changing world, CCMC appreciates the difficulties of judging the acceptance of a product for use in a building. To aid you in reaching a decision, we are continually expanding a knowledge base from which to evaluate the use of these materials. The knowledge base at CCMC is developed through in-house research at IRC as well as through information sharing with other research organizations throughout the world. (Original article published in "Cahiers du CSTB," Cahier no. 2670, Sept. 1993.)

The concept of materials is as old as the human race. For one million years, humans used mainly five materials: wood, stone, bone, horn and leather. Then came clay, wool, plant fibers, and finally the first metals. Materials can therefore serve as time markers. We are now in the age of information and "custom" materials. This new turning point in history corresponds to the introduction of plastics, i.e., synthetic materials whose properties are determined in terms of microstructure (macromolecular chains) and macrostructure (fillers, fibres, resin mortars, composite materials).

Compared to conventional materials, "custom" materials are special in that they do not exist as such prior to the item they are part of; they only appear at the end of the production phase, as a constituent of the finished item.

The age of composite materials

The introduction and development of synthetic materials has hastened the design and development of the following composite materials.

Organic materials

Polymer mixtures: ABS (acrylonitrile-butadiene-styrene) coated with PVDF (polyvinylidene fluoride), used mainly in the manufacturing of piping for residential and commercial buildings.

Reinforced polymers containing glass or carbon fibres: technical textiles are used increasingly as a roofing material in the construction industry.

All-polymer sandwich construction, such as polyester or isocyanurate resin-based sandwich laminates: used to manufacture building envelope sandwich panels, which, because of their excellent thermal and mechanical performance, serve both as insulators and structural supports.

Wood composites: plywood, pressed wood and glulam, as well as reinforced composites (carbon-epoxy reinforced wood in large structural components, for example).

Multimaterials: (plywood or pressed wood with a core of extruded polystyrene or rigid polyurethane foam), used to manufacture building envelope sandwich panels.

Metals

Multimetals: used for increased corrosion resistance (mechanical fasteners, certain types of roofing materials).

continued on page 4

New Product Evaluations

CCMC is pleased to announce the following new product evaluations that have been completed between the publication of the Summer issue of CCMC Registry of Product Evaluations and 20 September 1994. ✦

Manufacturer	Product Name	Product Type	Eval No.
Academy Patio Doors Limited	Academy 2 Panel Patio Door Series 800 and 1200	Sliding Glass Doors	12640L
Academy Patio Doors Limited	Academy 4500 Series	Aluminum Windows	12611L
Academy Patio Doors Limited	Academy 4520 Series	Aluminum Windows	12612L
Alpine Systems Corporation	Alpine Tension Web	Wood Beams and Joists	12635R
Aluminart Architectural Inc.	Fenêtre à battant LUMI LX 5 3/4	Aluminum Windows	12602L
American Polysteel Forms	Polysteel Forms	Polystyrene Concrete Forms	12638R
Andersen Corporation	Andersen SE606	Aluminum/Wood Windows	12639L
Anig Aluminum Manufacturing Limited	Horizontal Slider 4020 GP III	Aluminum Windows	12628L
Arcor PVC Windows Inc.	Regal Series Single Hung Window	Vinyl Windows	12624L
Arcor PVC Windows Inc.	Regal Series Vinyl Casement Window	Vinyl Windows	12623L
Arcor PVC Windows Inc.	Regal Series Vinyl Picture Window (Regal One-Lite)	Vinyl Windows	12625L
Bonneville portes et fenêtres	Fenêtre à battant en bois, recouvert de P.C.V.	Vinyl/Wood Windows	12597L
Brig-Eez Incorporated	BRIG-EEZ™	Bridging for Floor Systems	12555R
City Thermo Pane Ltd.	Solarseal Awning/Casement Window	Vinyl Windows	12585L
Dashwood Industries Ltd.	Gemini Casement	Vinyl Windows	12609L
Dashwood Industries Ltd.	SiteLine Primed Casement	Wood Windows	12580L
Deltech inc.	Guillotine simple	Vinyl Windows	12601L
Distribution Polycrete Montréal inc.	Polycrete	Polystyrene Concrete Forms	12607R
Emco Window and Door	028 Series Single Hung	Vinyl Windows	12613L
Emco Window and Door	028 Series Single Slider	Vinyl Windows	12615L
Emco Window and Door	Fixed Lite 028 Series	Vinyl Windows	12636L
Emco Window and Door	Single Hung 5000 Series	Vinyl Windows	12614L
Everlast Aluminum Products Inc.	Horizontally Sliding Window	Vinyl/Aluminum Windows	12608L
Everlast Aluminum Products Inc.	Series 1000	Aluminum Windows	12616L
Everlast Aluminum Products Inc.	Series 3000	Aluminum Windows	12618L
Everlast Aluminum Products Inc.	Series 5000	Aluminum Windows	12620L
Fenêtres Montmagny inc.	Modèle 1994	Vinyl/Wood Windows	12600L
Fiberglas Canada Inc.	PINKPLUS	Mineral-Fibre Batt Insulation	12588L
Forbo Industries Inc.	Colorex Style/EL/AS	Linoleum Products	12619L
Frost Wire Products Ltd.	Insteel 3-D Building Panel	Three Dimensional Steel Welded Wire Wall System	12621R
Georgia-Pacific Resins, Inc.	GP-4000, RPPY-4000 Resin P/F Parallam	Wood Adhesives	12630L
Insulate Industries, Inc.	Series 3001 Window System	Vinyl Windows	12590L
Insulate Industries, Inc.	Series 3002 Window System	Vinyl Windows	12591L
Insulate Industries, Inc.	Series 3004 Window System	Vinyl Windows	12592L
Insulate Industries, Inc.	Series 3006 Window System	Vinyl Windows	12593L
Insulate Industries, Inc.	Series 3007 Window System	Vinyl Windows	12594L
Insulate Industries, Inc.	Series 3100 Vinyl Patio Door	Sliding Glass Doors	12637L
Les fenêtres Élite inc.	Fenêtre à battant bois - PVC	Vinyl/Wood Windows	12622L
Louisiana-Pacific Corp.	Family 36, 36A and 56A GNI-JOISTS	Wood Beams and Joists	12626R
Masonite Corporation	Masonite X-90 Siding	Hardboard Siding	12606L
Plastmo Ltd.	Single Sliding Window	Vinyl Windows	12617L
Portes patio Résiver Patio Doors	R-500	Sliding Glass Doors	12643L
Produits Dalmen Products Limited	Comfort 2000	Vinyl Windows	12604L
Roxul Inc.	Roxul Drain Board	Mineral Fibre Insulation Board	12610L
Tecton Laminates Corp.	TLI™ 15 Prefabricated Wood I-Joist	Wood Beams and Joists	12632R
Thermoplast inc.	Concerto série 5500	Vinyl Windows	12605L
Thermoplast inc.	Fenêtre à guillotine double série 4000	Vinyl Windows	12596L
Thermoplast inc.	Fenêtre coulissante double Concerto série 4100	Vinyl Windows	12595L
Trus Joist MacMillan Limited	TJI®/255 and TJI/355 Series Joists	Wood Beams and Joists	12631R
Vinyl Window Designs Ltd.	Series 200S	Vinyl Windows	12603L

Materials, Products, Buildings of Tomorrow...*continued from page 2*

Surface treatment: used to give metals special lubricant properties or improved abrasion and corrosion resistance (mechanical fasteners, certain types of roofing material).

Multimaterials: (metals associated with other materials), extruded polymer profiles with a metal insert (large PVC exterior woodwork); building envelope sandwich panels (metallic siding with a polyurethane core, for example) and roofing sandwich panels; steel-ceramic multilayer materials (mechanical fasteners) and wood-aluminum, PVC-aluminum woodwork for residential and commercial windows.

Mineral materials

Cement-fibre composites (glass, metal, polymers): used as decorative or abrasion-resistant coatings for plant floors exposed to frequent heavy vehicle traffic.

Resin concrete (epoxy, vinyl ester or polyester): used as a waterproof coating (for bridge decks or indoor garages) or as a chemical-resistant coating (strong acids or bases).

Very-high-performance concrete (easier placement): used in major works such as hydroelectric dams, some bridges and skyscrapers.

Electrochromic glazing: used in the manufacturing of semi-reflecting windows.

Reinforced thermal insulation glazing (heavy gases under vacuum): used to manufacture commercial and residential windows.

Proliferation of materials

The proliferation of materials is such that an inventory is no longer possible. The number of materials is as high as the number of possible combinations of various components to achieve specific objectives.

Designers and industry are faced with an ever widening choice of possibilities. For a given product, there are now several competing materials. Only through in-depth analysis, covering the entire manufacturing process and the life of the product, is it possible to establish the most satisfactory solution.

The proliferation of materials points in fact to specialization in specific fields of application. This specialization leads in turn to various performance criteria. It will soon be possible to implement expert systems that will narrow down, by theoretical means, if not the end result, at least a narrow range of possible solutions, with only practical assessments remaining to be carried out. This will save both time and money.

Quality has therefore replaced quantity, the key words being:

- less material,
- less energy,
- more properties,
- the right performance,
- greater functionality,
- more information,

and life cycle, recycling and "zero waste" have recently become fully recognized criteria.

The very structure of materials is providing more properties and greater performance with less matter (e.g., new polymer alloys with enhanced mechanical properties). Greater formability (one of the reasons for the success of synthetic materials in technical applications) is making it possible to integrate several functions in one single item. It is also possible, in one single operation, to combine several materials each having a given function (definite economic advantage) while still providing the finishing touches that complement the overall qualities of the item.

These developments have given rise to a generation of items of greater density (in terms of functionality or intelligence), made of high-information materials or, in other words, providing high-intensity performance.

The integration of relatively simple functions (structural, esthetic or functional properties) is only one aspect of a very complex phenomenon which extends to the very make-up of materials, made possible by materials technoscience. For example, a window with a roll shutter is made up of various mobile assembled parts whose function it is to modulate the flux of incident light. Electrochromic or photochromic glazing fulfills the same function, but is made up of a single phase bringing together components that can modify, alone and without human intervention, both colour and transparency; such a product/component integrates the functions that were formerly carried out by several components and materials.

Research developments are leading to materials that are less easily reintegrated into natural cycles at the end of their useful life. Composite materials, in particular, are almost by definition non-recyclable, since they are the result of an almost irreversible combination of materials. Soon, however, "decomposition" techniques will make it possible to separate the various phases of composites.

Moreover, it is to be hoped that the study of process reversibility will soon make it possible to "deconstruct," "demanufacture," decompose and retire or recycle the various phases of intelligent materials or products.

The challenge then, is to find an acceptable balance between the development, inherent to the human race, of science, technology and their products, and the survival of our species in an environment that is changing so significantly.

Information: B. DiLenardo ✦

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CCMC News is a quarterly publication of the National Research Council of Canada and is produced by the Canadian Construction Materials Centre of the Institute for Research in Construction. Enquiries or comments should be addressed to CCMC News, Institute for Research in Construction, National Research Council of Canada, Ottawa, Ontario K1A 0R6. (613) 993-6189, Facsimile (613) 952-0268

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ISSN 0848-600X

Ce document est aussi p