# TABLE OF CONTENTS

**ACM Panelworx partial list of projects completed since 1998**

**About ACM Panelworx Aluminum Composite Panels**

## GENERAL
- ALPOLIC corporate brochure
- ALPOLIC architectural brochure
- ACM Panelworx Rainscreen Systems product data
- ACM Panelworx Rainscreen Systems installation instructions
- ALPOLIC product data
- EVOMAXci datasheet
- EVOMAXci assembly guide

## DETAILS
- Rain screen system
- PX - 10 dry joint rain screen system
- PX - 20 wet joint rain screen system
- EVO details

## SPECIFICATIONS
- Section 07 42 13 metal wall panels
- Exova panel test report AAMA 508-14 of the PX-10 dry joint panel system
- INTERTEK test report
- EVO specifications
- EVOMAXci specifications
- EVOMAXci brochure
- EVO rivetless panel system performance evaluation

## SUNSHADES
- Solar Control Sunshades flyer
- Partial list of composite/extruded aluminum solar control projects
- Solar Control Sunshades specifications guide
- Summary of LEED credits
- Sunshades drawings

## ARCTIC PAN
- ARCTIC PAN specifications
- ARCTIC OAN product data sheet
- Galvanized Backpan/Arctic Pan comparisons
- ARCTIC PAN Jamb detail
- ARCTIC PAN Sill detail
- ARCTIC PAN flyer
- ARCTIC INFILL PANELS specifications
- ARCTIC INFILL product data sheet
- ARCTIC INFILL details

## FINISHES
- LUMIFLON brochure
- ALPOLIC color chart
At ACM Panelworx Inc., we are proud to have shared in an industry that has changed the face of modern architecture. As we move forward, our goal is to create relationships with clients and successfully use teamwork to complete all stages of a project from estimating and design/engineering to fabrication and installation. We wish to continue building these relationships as a foundation for the future and look forward to further ACM innovations and our continued success.

Branding made easy
Office buildings, healthcare facilities, entertainment complexes, retail chains, restaurants and even auto dealerships are creating a distinctive image and branding themselves faster and easier with ALPOLIC. ALPOLIC has even developed innovative two-tone painted ACM panels especially for specific corporations to meet their imaging needs and make their fabrication a one-step process.

A virtually endless palette of colors
With our high-performance fluorocarbon paint finishes, ALPOLIC can offer you a virtually endless palette of colors, glosses and finishes on both its ACM and MCM. Whether you want to design one building or re-brand an entire chain, you not only can match corporate colors perfectly with ALPOLIC, you can also create startling new effects and ensure complete consistency throughout your building designs both in and out.

Two systems to choose from

With ALPOLIC's ACM/MCM panels, you get exact corporate colors, better consistency, easier installation, lower labor costs and longer life.
At ACM Panelworx we are uniquely equipped with Panel Pro Software that provides a near flawless ability to make a seamless transition from site measurement to AutoCAD file and direct to production templates. Panel Pro is the industry leading software that enables us the ability to provide each client to have support and simplicity to maximize profits.

Project management by experienced people is a key factor to project success. To consistently achieve this success ACM Panelworx can provide assistance in project management from estimating/design and engineering/site verification/project installation and training.
# ACM PANELWORX PARTIAL LIST OF U.S.A. PROJECTS COMPLETED

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<tr>
<th>JOB NAME</th>
<th>GENERAL CONTRACTOR</th>
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<td>METAL ARTS CONSTRUCTION</td>
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<td>11282 West Carson City Rd., Greenville MI 48838</td>
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<tr>
<td>New Mexico, US</td>
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<td>8851 East 34 Road Cadillac, MI 49601</td>
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<td>11249 W Carson City Rd., Greenville, MI 48838</td>
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General Manager,
Mark Mrkalj
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<td>JURGENSEN Co. NEW OFFICE AGM - ARCHITECTURAL GLASS &amp; METAL CO INC</td>
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<td>K.O.R. VERIZON WIRELESS STORE - SUPPLY ONLY W.J. NORTHRIE CONSTRUCTION</td>
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<td>CAPS COLUMBUS AESTHETIC &amp; PLASTIC SURGERY - SUPPLY OF COLUMBUS GLASS &amp; MIRROR</td>
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<td>5005 Arlington Centre Blvd., Columbus Ohio 43220</td>
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<td>BMG BUFFALO MEDICAL BUILDING - SUPPLY ONLY STERLING GLASS</td>
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<td>CHESANING HIGH SCHOOL PHASE 2 - SUPPLY ONLY STRENG CONSTRUCTION</td>
<td>113</td>
<td>850 N 4th Street, Chesaning MI</td>
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<td>OHIO HEALTH - SUPPLY ONLY COLUMBUS GLASS &amp; MIRROR</td>
<td>114</td>
<td>NELSONVILLE, OH</td>
<td>Tel: 614-478-4527</td>
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<td>HOMEPWOOD SUITES - SUPPLY ONLY FREDERICKSBURG GLASS &amp; MIRROR, INC.</td>
<td>115</td>
<td>50 M STREET, SE, WASHINGTON DC</td>
<td>Tel: (540) 891-1360</td>
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<tr>
<td>CHUCK RENZE FORD DEALERSHIP METAL ARTS CONSTRUCTION</td>
<td>116</td>
<td>151 LAKESHORE DRIVE, MANISTIQUE MI</td>
<td>Tel: 989-772-0782</td>
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<td>260 WEST 153rd STREET APARTMENTS - SUPPLY ONLY HILDEGARDS GLASS INC.</td>
<td>117</td>
<td>260 - 4 West 153rd Street, New York</td>
<td>Tel: (631)928-1245</td>
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<tr>
<td>DETROIT EVENTS CENTER - SUPPLY ONLY UNIVERSAL GLASS &amp; METALS, INC.</td>
<td>118</td>
<td>Detroit, MI</td>
<td>Tel: 313-898-8225</td>
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<tr>
<td>STARBUCKS - SUPPLY ONLY SDI EXTERIOR SYSTEMS, LLC</td>
<td>119</td>
<td>BLOOMFIELD HILLS, MI</td>
<td>Tel: 248-474-7152</td>
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<td>ARCH STREET BUILDING &amp; HOTEL CONSTRUCTION - SUPPLY ON DALE CONSTRUCTION RELIABLE SHEET METAL</td>
<td>120</td>
<td>Philadelphia, PA</td>
<td>Tel: 215-886-1544</td>
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<td>PINE REST FLEX BED 2016 ADDITION - SUPPLY ONLY REILRE SHEET METAL</td>
<td>121</td>
<td>GRAND RAPIDS, MI</td>
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<tr>
<td>MARQUETTE HOSPITAL - SUPPLY ONLY KOCH CORPORATION</td>
<td>122</td>
<td>MARQUETTE, MI</td>
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<td>BALL PARK SQUARE - SUPPLY ONLY PIONEER CLADDING &amp; GLAZING, LLC</td>
<td>123</td>
<td>WASHINGTON, DC</td>
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<td>AMWAY EXHIBITORS BUILDING - SUPPLY ONLY REILRE SHEET METAL</td>
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<td>CABIN AT THE CREEK - SUPPLY ONLY MIDWEST METAL WALLS</td>
<td>125</td>
<td>THE MALL OF PARTRIDGE CREEK, CLINTON TOWNSHIP, MI</td>
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<tr>
<td>MOULTRE COURT HOUSE G - SUPPLY ONLY KOCH CORPORATION</td>
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<td>WASHINGTON, DC</td>
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<tr>
<td>ELL LILLY K302 - SUPPLY ONLY AGM INDIANAPOLIS</td>
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<td>SEYMOUR FORD QUICK LUBE - SUPPLY ONLY METAL TECH BUILDING SPECIALISTS</td>
<td>128</td>
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<td>LEE HOUSE - SUPPLY ONLY METAL TECH BUILDING SPECIALISTS</td>
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<td>LAKE ISABELLA, MI</td>
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<td>STANLEY CONVERGENT SECURITY HQ - SUPPLY ONLY AGM INDIANAPOLIS</td>
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<td>ADAC KEATING FACILITY - SUPPLY ONLY RELIABLE SHEET METAL</td>
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<td>MUSKEGON, MI</td>
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<td>FHL INPATIENT TOWER EXPANSION - SUPPLY ONLY PROCLAD INC</td>
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<td>LAFAYETTE&lt; IN</td>
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<td>HILLWOOD / HILLBROOK - BLDG 1&amp; 2 AGM INDIANAPOLIS</td>
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<td>SMYRNA, TN</td>
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<td>UNIVERSITY OF KENTUCKY - SUPPLY ONLY KOCH CORPORATION</td>
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<td>NATIONWIDE HUB &amp; SKYWALK RENOVATION - SUPPLY ONLY THE BLAKLEY CORPORATION</td>
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<td>COLUMBUS, OH</td>
<td>Tel: 317-842-9600</td>
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<td>UMASS ISENBERG SCHOOL OF MANAGEMENT - SUPPLY ONLY NATIONAL ENCLOSURE COMPANY, LLC</td>
<td>137</td>
<td>MASSACHUSETTS, BOSTON</td>
<td>Tel: 248-332-4250</td>
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137  OSU NEWARK RESIDENCE HALL - SUPPLY ONLY
     OHIO STATE UNIVERSITY
     COLUMBUS GLASS & MIRROR
     T: 614-478-4527

138  MAIN EVENT GRAPEVINE - SUPPLY ONLY
     GRAPEVINE, TEXAS
     KOCH CORPORATION
     T: 502-636-3571

139  LAKE HEALTH WILLOUGHBY CAMPUS - SUPPLY ONLY
     WILLOUGHBY, OH
     PIONEER CLADDING & GLAZING
     T: 216-503-6708

140  THE COE AT WEST VILLAGE - SUPPLY ONLY
     DETROIT, MI
     TRI-STAR ROOFING & SHEET METAL
     T: 810-937-2756

141  PARK AT PULLIAM - SUPPLY ONLY
     INDIANAPOLIS, IN
     PROCLAD INC.
     T: 317-645-5300
ACM PANELWORX PARTIAL LIST OF PROJECTS COMPLETED

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<tr>
<th>JOB NAME</th>
<th>GENERAL CONTRACTOR</th>
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<tbody>
<tr>
<td>TECUMSEH MEDICAL CENTER</td>
<td>PCR CONTRACTORS</td>
</tr>
<tr>
<td>11811 Tecumseh Rd E, Tecumseh, ON</td>
<td>Tel: 519-966-8718</td>
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<tr>
<td>WINDSOR FAMILY AQUATIC COMPLEX</td>
<td>ELLIS DON CORPORATION</td>
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<tr>
<td>401 Pitt Street West, Windsor On</td>
<td>Tel: 519-455-6770</td>
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<tr>
<td>WINDSOR STAR PALACE RENOVATION</td>
<td>MADI CONSTRUCTION</td>
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<tr>
<td>300 Ouellette Ave., Windsor On</td>
<td>Tel: 519-252-2500</td>
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<tr>
<td>BMW KITCHENER</td>
<td>MELLOUL BLAMEY CONSTRUCTION</td>
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<tr>
<td>1800 Victoria St N., Kitchener</td>
<td>Tel: 519-886-8850</td>
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<tr>
<td>ST.CLAIR COLLEGE - SPORTSPLEX/HEALTHPLEX</td>
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<tr>
<td>St Clair College Campus, Windsor On</td>
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<tr>
<td>ESSEX FIRE HALL</td>
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<td>Essex ON</td>
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<td>ST.CLAIR COLLEGE - STUDENT CENTRE ADDITION</td>
<td>ELMARA CONSTRUCTION</td>
</tr>
<tr>
<td>2000 Talbot Street West, Windsor ON</td>
<td>Tel: 519-737-1253</td>
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<tr>
<td>WINDSOR UTILITY COMMISSION</td>
<td>MARATHON-DELCO CONSTR.</td>
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<tr>
<td>Rhodes Drive, Windsor ON</td>
<td>Tel: 519-966-8100</td>
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<tr>
<td>DPR FINANCIAL</td>
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<td>2491 Ouellette Avenue, Windsor ON</td>
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<td>330 BOARDWALK (THE INCC CORP)</td>
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<td>330 Boardwalk, Kitchener On</td>
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<td>BANK OF MONTREAL</td>
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<tr>
<td>Tecumseh Road &amp; Walker Road, Windsor ON</td>
<td>Tel: 519-967-8669</td>
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<td>SCOTIA BANK</td>
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<td>5795 Malden Rd., LaSalle ON</td>
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<td>WINDSOR FAMILY CREDIT UNION</td>
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<tr>
<td>Amherstburg Retail Facility</td>
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<tr>
<td>CHATHAM COURTHOUSE</td>
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<tr>
<td>425 Grand Ave W CHATHAM ON N7L 324</td>
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<td>CITY CENTRE TRANSIT TERMINAL</td>
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<tr>
<td>300 Chatham Street Windsor, ON</td>
<td>Tel: 519-735-5220</td>
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<tr>
<td>CROP SCIENCE - UNIVERSITY OF GUELPH</td>
<td>MELLOUL BLAMEY CONSTRUCTION</td>
</tr>
<tr>
<td>50 Stone Rd E, Guelph, ON N1G 2W1</td>
<td>Tel: 519-886-8850</td>
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</table>

General Manager,
Mark Mrkalj

357 Croft Drive, Lakeshore ON N8N 2L9
phone (519) 739 2380 - toll free 1 866 501 9744 - fax (519) 739 1609 - email info@acmpanelworx.com - www.acmpanelworx.com
<table>
<thead>
<tr>
<th>No.</th>
<th>Company Name</th>
<th>Address</th>
<th>City, Province</th>
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<tr>
<td>17</td>
<td>LASALLE MUNICIPAL</td>
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<td>Windsor</td>
<td>519-969-7101</td>
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<tr>
<td>18</td>
<td>CENTERLINE HOLDINGS INC.</td>
<td>415 Morton Rd., Windsor On</td>
<td>Windsor</td>
<td>519-734-6511</td>
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<tr>
<td>19</td>
<td>NORFOLK OPP</td>
<td>548 Queensway W, Simcoe, ON N3Y 4J9</td>
<td>Simcoe, ON</td>
<td>519-620-7191</td>
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<tr>
<td>20</td>
<td>SAWMILL VALLEY</td>
<td>3625 Sawmill Valley Dr, Mississauga, ON</td>
<td>Mississauga, ON</td>
<td>905-791-5445</td>
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<td>21</td>
<td>HILLCREST PUBLIC SCHOOL</td>
<td>31 Renwick Ave., Cambridge On</td>
<td>Cambridge</td>
<td>519-576-8327</td>
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<td>22</td>
<td>ED KOEHN CHRYSLER - SUPPLY ONLY</td>
<td>11282 West Carson City Rd., Greenville Mi 48838</td>
<td>Greenville, Mi</td>
<td>989-772-0782</td>
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<td>23</td>
<td>MAITLAND RIVER ELEMENTARY</td>
<td>Lots S&amp;G, Con 1, Wingham On</td>
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<td>519-736-5800</td>
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<td>HURON LODGE LONG TERM CARE FACILITY</td>
<td>1881 Cabana Road West, Windsor ON</td>
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<td>SAFRANCE RESIDENCE</td>
<td>169 Lakeview Dr., Lakeshore On</td>
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<td>519-979-9767</td>
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<td>CHARTWELL SHOPPING PLAZA BUILDING B &amp; C</td>
<td>2362 Birmley Rd., Scarborough On</td>
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<td>PMG SOCORRO - SUPPLY ONLY</td>
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<td>EXTENDED ASSISTABLE LIVING LTC</td>
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<td>WATERLOO POLICE SERVICE</td>
<td>200 Maple Grove Drive, Waterloo</td>
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<td>ROUNDHOUSE CENTER, WINDSOR</td>
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<td>35</td>
<td>FANSHAWE COLLEGE, LONDON</td>
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<td>36</td>
<td>ECOLE ST JEAN BAPTISTE, AMHERSTBURG</td>
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<td>37</td>
<td>WINDSOR DISPOSAL SERVICES</td>
<td>2700 Deziel Drive, Windsor</td>
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<td>38</td>
<td>FLEX BUILDING - PROPERTIES 'R' US</td>
<td>465 Pinebush Road, Cambridge</td>
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<td>SHELBURNE PUBLIC SCHOOL</td>
<td>Fiddle Park Lane, Shelburne ON</td>
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<td>DOON PUBLIC SCHOOL RENOVATIONS</td>
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<td>P.X. SMITH MEDICAL</td>
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<td>43</td>
<td>LONDON SHOPPERS DRUG MART</td>
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<td>LaSALLE POLICE/ FIRE/ EMS</td>
<td>1900 Normandy Street, LaSalle ON</td>
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<td>MUCCHIPAC FARMS OFFICE</td>
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<td>JW GERTH PUBLIC SCHOOL ADDITION</td>
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<td>BMO BUILDING 'G' GUELPH</td>
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<td>ERIN MILLS MIDDLE SCHOOL ADD &amp; RENOV.</td>
<td>JASPER CONSTRUCTION</td>
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<td>HUMAN KINETICS - UNIVERSITY OF WINDSOR</td>
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<td>CONCOURS MOLD INC.</td>
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<td>NOUVELLE ECOLE DE LONDON</td>
<td>TONDA CONSTRUCTION</td>
<td>270 Chelton Rd, London</td>
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<td>PARIS ELEMENTARY SCHOOL, ON</td>
<td>BESTCO CONSTRUCTION (2005) LTD.</td>
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<td>905-304-4597</td>
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<tr>
<td>OFFICE BUILDING - PROPERTIES 'R' US</td>
<td>LEB MANAGEMENT</td>
<td>485 Prebush Road, Cambridge</td>
<td>905-639-7878</td>
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<td>EMPIRE ROOFING, WINDSOR</td>
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<td>WATERLOO LANDFILL WORKSHOP</td>
<td>DEVLAN CONSTRUCTION</td>
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<td>HOMEDALE FRENCH IMMERSION SCHOOL</td>
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<td>WALKERTON CLEAN WATER CENTRE</td>
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<td>ST.PETER CATHOLIC SCHOOL</td>
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<td>700 Woodward Ave, Milton, ON</td>
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<td>TD BANK - OFFICE TOWER</td>
<td>PETRETTA CONSTRUCTION</td>
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<td>MIDDLESEX CENTRE FAMILY DOCTOR TEACHING CLINIC:</td>
<td>BRONNENCIO CONSTRUCTION</td>
<td>40 Heritage Drive, Ilderton</td>
<td>519-666-2777</td>
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<tr>
<td>HESPELER PUBLIC SCHOOL</td>
<td>PM CONTRACTING</td>
<td>300 Winston Blvd, Cambridge</td>
<td>519-576-8327</td>
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<tr>
<td>STONEY CREEK ELEM.SCHOOL, LONDON</td>
<td>NORLON BUILDERS LONDON</td>
<td>1335 Nicole Ave, London, ON</td>
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<tr>
<td>DR. DAVID SUZUKI SCHOOL</td>
<td>MADDY CONTRACT DIVISION</td>
<td>6329 Raymond St, Windsor</td>
<td>519-252-2500</td>
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<tr>
<td>GREAT LAKES SPECIALTY MEATS</td>
<td>PK CONTRACTION INC.</td>
<td>5921 Frank Mitchell, ON</td>
<td>519-842-8001</td>
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<tr>
<td>CARADOC CENTRAL PS</td>
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<td>714 Bowan Street, Mount Brydges, ON</td>
<td>519-433-0634</td>
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<td>NORTH MIDDLESEX ARENA PARKHILL</td>
<td>K&amp;L CONSTRUCTION</td>
<td>229 Main Street Parkhill, ON  NO M 1K0</td>
<td>519-472-7164</td>
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<td>COLLINS BARROW - CANOPY</td>
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<td>SIR ADAM BECK P.S. WILMOT</td>
<td>PM CONTRACTING</td>
<td>1140 Snyder's Rd, West Wilmot, ON</td>
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<td>SPORTSWORLD ACADEMY</td>
<td>K-W GLASS</td>
<td>Sportsworld Drive &amp; King St, Kitchener</td>
<td>519-694-2137</td>
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<td>COUNTY OF BRANT TWIN PAD COMPLEX</td>
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<td>944 Powerline Road, Paris ON</td>
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<td>TRIAMICO NEW OFFICE</td>
<td>AMICO DESIGN BUILD</td>
<td>2199 Blackacre Drive, Oldcastle</td>
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<tr>
<td>ECOLE STE-MARGUERITA SCHOOL</td>
<td>REID &amp; DELEYE CONTRACTORS</td>
<td>700 Bristol St, Woodstock, ON</td>
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<td>LEAMINGTON MEDICAL VILLAGE - PHASE 2</td>
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<td>197 Talbot St, Leamington, ON</td>
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77 SPORTSWORLD ACADEMY
Sportsworld Drive & King St. Kitchener
K-W GLASS
Tel: 519-664-2137

78 MILLEN WOODS PUBLIC SCHOOL
640 New Hampshire, Waterloo
DEVLAN CONSTRUCTION
Tel: 519-736-5800

79 SIR ADAM BECK PUBLIC SCHOOL
1140 Snyder's Rd. West Wilmot, ON
PM CONTRACTING
Tel: 519-576-8327

80 ST.CLAIR COLLEGE MEDIAPLEX
Victoria St. Windsor, ON
AMICO DESIGN BUILD
Tel: 519-737-6299

81 SPORTSWORLD CROSSING BLDG. G Phase 1,3
Sportsworld Drive & King St. Kitchener
MELLOUL BLAMEY CONSTRUCTION
Tel: 519-886-8850

82 REVENBERG BUICK GMC
10150 Tecumseh Rd. E, Windsor
WOODALL CONSTRUCTION
Tel: 519-966-3381

83 860 TECUMSEH ROAD EAST BLDG
Windsor, ON
GROSSI CONSTRUCTION
Tel: 519-326-9081

84 LM CU Alpine
Michigan
GLASS DESIGN INC.Michigan
Tel: 616-874-9549

85 MONA SHORES MIDDLE SCHOOL
1700 Woodside Rd, Norton Shores, Michigan 49441
GLASS DESIGN INC.Michigan
Tel: 616-874-9549

86 BUFFALO WILD WINGS GRILL & BAR
2905 Geyser Dr. Colorado Springs, CO 80906 USA
CHENOWETH ROOFING INC.
Tel: 269-651-6175

87 WINDSOR ESSEX HEALTH UNIT
1005 Ouellette Ave. Windsor, ON
PETRETTA CONSTRUCTION INC.
Tel: 519-737-1292

88 KIA LONDON
PO # 1025A10 (SUPPLY ONLY)
WESTMINSTER GLASS& MIRROR LTD.
Tel: 519-461-0050

89 McDONALDS Mississauga
44 Bristol Rd. East
GROSSI CONSTRUCTION
Tel: 519-326-9081

90 BMO, LONDON
575 Westney Road South, London ON
CORPORATE CONTRACTING
Tel: 416-291-8644

91 McDONALDS Tillsonburg
170 Simcoe St. Tillsonburg, ON
GRAND RIVER CONTRACTING INC.
Tel: 519-748-4955

92 McDONALDS Fergus
870 Tower St. South Fergus, ON
GRAND RIVER CONTRACTING INC.
Tel: 519-748-4955

93 McDONALDS Winston Churchill
2965 Eglinton Ave. West, Mississauga, ON
GROSSI CONSTRUCTION
Tel: 519-326-9081

94 McDONALDS Hamilton (Barton & Lottridge)
787 Barton St. Hamilton, ON
CAMBRIA CONSTRUCTION MANAGEMENT
Tel: 905-830-6026

95 McDONALDS Sarnia
1330 Exmouth St. Sarnia, ON
HERDSENDRON BUILDERS LTD.
Tel: 519-332-4532

96 McDONALDS Kirkland Lake
155 Government Rd. W, Kirkland Lake, ON
OJIBWAY GENERAL CONTRACTING INC.
Tel: 519-969-8837

97 McDONALDS Toronto (Eglinton&Dufferin)
1807 Eglinton Ave. W, Toronto, ON
MIMCO GROUP INC.
Tel: 1-888-776-6492

98 McDONALDS Chatham
411 St. Clair St. Chatham, ON
JP CONTRACTORS
Tel: 519-351-8119

99 McDONALDS Caledonia
282 Argyle St. South, Caledonia, ON
JP CONTRACTORS
Tel: 519-351-8119

100 McDONALDS Brantford
299 Wayne Gretzky Pkwy, Brantford, ON
GRAND RIVER CONTRACTING INC.
Tel: 519-748-4955

101 McDONALDS Elmira
45 Industrial Drive, Elmira, ON
GRAND RIVER CONTRACTING INC.
Tel: 519-748-4955

102 McDONALDS Toronto (Yonge&Temperance)
123 Yonge St. Toronto, ON
CAMBRIA CONSTRUCTION MANAGEMENT
Tel: 905-830-6026

103 UNIV of GUELPH - AXELROD BLDG#31 (INT.)
570 Gordon St. Guelph, ON
HARBRIDGE & CROSS LTD.
Tel: 416-213-7165

104 NEW WATERDOWN ELEM.SCHOOL
55 Braeheld Ave. Waterdown, ON
TAMBRO CONSTRUCTION LTD.
Tel: 519-766-1234

105 ORCHARD # 3 ERA 108 PUBLIC SCHOOL
2474 Sutton Drive Burlington, ON
EVERSTRONG CONSTRUCTION LTD.
Tel: 519-415-3245

106 ST.CLAIR COLLEGE CAHS - INT.PANELS
2000 Talbot Street West Windsor, ON
OSCAR CONSTRUCTION
Tel: 519-737-0350
107 THAMES LEA PLAZA RENOVATION
Scotiabank, Chatham ON
ROSATI CONSTRUCTION
Tel: 519-734-6511

108 YMCA OF CHATHAM KENT
101 Courthouse Lane, Chatham, ON N7L 0B5
NORLON BUILDERS LONDON LTD.
Tel: 519-672-7590

109 CHATHAM KENT CONFERENCE & EXHIBITION CTR
Richmond St. Chatham, ON
NORLON BUILDERS LONDON LTD.
Tel: 519-672-7590

110 OLD REGISTRY BLDG - RENOV&ADD.
419 Hunter St. Woodstock, ON (County of Oxford)
PK CONTRACTION INC.
Tel: 519-842-8001

111 ST. JOHN'S COLLEGE
80 Paris Road, Bramford, ON
PM CONTRACTING LTD.
Tel: 519-576-8327

112 UNIVERSITY OF WATERLOO - GSC ELEVATOR
Waterloo, ON
PROTREND ARROW CONSTRUCTION INC.
Tel: 519-894-5789

113 DRIVE LOGISTICS
3315 Dennon Drive, Windsor, ON
PETRETTA CONSTRUCTION INC.
Tel: 519-737-1292

114 SCOTIABANK, LONDON
3100 Colonel Talbot Road, London ON
SOUTHSIDE CONSTRUCTION
Tel: 519-433-0634

115 FIRST BANK CADILLAC - SUPPLY ONLY
8851 East 34 Road Cadillac, MI 49601
STRENG CONSTRUCTION INC.
Tel: 989-845-6365

116 REALUM CHEVROLET
6555 Maiden Road LaSalle, ON
ROSATI CONSTRUCTION
Tel: 519-734-6511

117 MCDONALDS
Queen & Spadina, Toronto ON
ELMWOOD CONTRACTING INC.
Tel: 519-623-7000

118 McDonalds - SUPPLY ONLY
ODIN BUILDING SYSTEMS INC.

119 SCOTIABANK LONDON
1162 Oxford St. W, London ON
BRL CONTRACTING
Tel: 519-433-7587

120 TARGET STORE CONVERSION - INSTALL ONLY
Devonshire Mall, Windsor ON
ELLIS DON CORP.
Tel: 519-455-6770

121 BENNETT CHEVROLET
445 Hespeler Road Cambridge, ON
MELLOUIL BLAMEY CONSTRUCTION
Tel: 519-866-8850

122 ROYAL CANADIAN LEGION
5030 Howard Ave, Tecumseh, ON
PCR CONTRACTORS INC.
Tel: 519-966-8718

123 ESSEX ENERGY OFFICES
2155 Fasan Dr. Oldcastle ON
AMICO DESIGN BUILD
Tel: 519-737-6299

124 HEUVELMANS CHEVY GMC BUICK
300 National Rd. RR5, Chatham ON
VERTEC CONTRACTORS LTD.
Tel: 519-351-2886

125 DAVE HITCHCOCK CHEVY DEALERSHIP
224 Talbot St. N, Essex ON
WOODALL CONSTRUCTION
Tel: 519-966-3381

126 ROBERT DENOOYER CHEVY DEALERSHIP
600 East 8th Street Holland MI 49423
GLASS DESIGN INC Michigan
Tel: 616-874-9549

127 OAKLAND UNIVERSITY - EAST ENTRANCE
2200 N. Squirrel Rd. Rochester, MI 48309
MICHIGAN METAL WALLS, INC.
Tel: 734-281-0500

128 CLARKE CHEVY GMC BUICK
Amherstburg, ON
GROSI CONSTRUCTION
Tel: 519-526-9081

129 DOUGALL MEDICAL AND BUSINESS CENTRE
3295 Dougall Ave. Windsor, ON
PUPATELLO & SONS
Tel: 519-944-7878

130 GOODLIFE FITNESS, LONDON
925 Southdale Rd. London ON
SOUTHSIDE CONSTRUCTION
Tel: 519-433-0634

131 3 STOREY BLDG - SDM
451 Richmond St. London ON
AMICO DESIGN BUILD
Tel: 519-737-6299

132 McDONALDS, LaSalle
5631 Ojibway Parkway LaSalle ON
DeANGELIS CONSTRUCTION
Tel: 519-737-1888

133 FOUR POINTS BY SHERATON
316 W. Tennessee St. Tallahassee, Florida
GLASS DESIGN INC Michigan
Tel: 616-874-9549

134 GUELPH COMMUNITY HEALTH CENTRE
20 Shellbridge Cres. Guelph, ON
PM CONTRACTING LTD.
Tel: 519-576-8327

135 WEST OAKS TRAILS HIGH SCHOOL
2820 West Oak Trails Blvd. Oakville ON
TAMBRO CONSTRUCTION LTD.
Tel: 519-766-1234

136 MASTRONARDI BARBER SHOP
Leamington ON

137 WESTWOOD PAD2 - SHELL BLDG
425 Southdale Rd. West, London ON
SOUTHSIDE CONSTRUCTION
Tel: 519-433-0634
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<td>INVESTOR GROUP, LONDON</td>
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<td>BUFFALO WILD WINGS - SUPPLY ONLY</td>
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<td>22555 Three Notch Road, Lexington Park, MD 20653</td>
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<td>JOHNSTONE SUPPLY - SUPPLY ONLY</td>
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<td>TINNEY CHEVROLET - SUPPLY ONLY</td>
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<td>11249 W Carson City Rd, Greenville, MI 48838</td>
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<td>EAGLES ICE CENTER - SUPPLY ONLY</td>
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<td>Eagles Ice Center, 2600 Village Dr SE, Grand Rapids, MI 49506</td>
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<td>SPECTRUM HEALTH</td>
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<td>BEECH ELEMENTARY SCHOOL - SUPPLY ONLY</td>
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<td>17711 Kinloch, Redford, MI 48240</td>
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<td>MCLAREN HOSPITALITY HOUSE - SUPPLY ONLY</td>
<td>MICHIGAN METAL WALLS INC.</td>
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<td>McLaren Health Care, Flint, MI 48532</td>
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<td>OAKLAND REGIONAL HOSPITAL</td>
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<td>22401 Foster Winter Dr., Southfield Mi</td>
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<td>AAA AUTOMOBILE CLUB OF MICHIGAN - SUPPLY ONLY</td>
<td>MICHIGAN METAL WALLS INC.</td>
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<td>1100 &amp; 1200 South Main St., Ann Arbor Mi</td>
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<td>HARPER UNIVERSITY HOSPITAL - SUPPLY ONLY</td>
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<td>3990 John R St, Detroit, MI 48201</td>
<td>Tel: 734-281-0500</td>
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<td>GARBER CHEVROLET - SUPPLY ONLY</td>
<td>METAL ARTS CONSTRUCTION</td>
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<td>1700 North Saginaw Rd., MIDLAND MI 48640</td>
<td>Tel: 989-772-0782</td>
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<td>TEAM HODGES CHRYSLER PROJECT - SUPPLY ONLY WEST BRANCH, MI</td>
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<td>INNOVA FAIR OAKS HOSPITAL - SUPPLY ONLY</td>
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<td>3600 Joseph Siewick Dr, Fairfax, VA 22033</td>
<td>Tel: 540-891-1360</td>
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<td>ANNAPOLIS TOWNE CENTER - SUPPLY ONLY</td>
<td>FREDERICKSBURG GLASS &amp; MIRROR</td>
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<td>203 Harker Pl, Annapolis, MD 21401</td>
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<td>VCU - SUPPLY ONLY</td>
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<td>100 WEST GRACE ST N., RICHMOND VA</td>
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<td>RON CLARK FORD MOTORS</td>
<td>WELLINGTON BUILDERS INC.</td>
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<td>Wyoming ON</td>
<td>Tel: 519-786-2934</td>
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<td>14th &amp; WALLACH - SUPPLY ONLY</td>
<td>FREDERICKSBURG GLASS &amp; MIRROR</td>
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<td>Washington, DC</td>
<td>Tel: 540-891-1360</td>
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<td>GERMANN COMMUNITY COLLEGE</td>
<td>FREDERICKSBURG GLASS &amp; MIRROR</td>
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<td>10000 Germanna Point Dr, Fredericksburg, VA 22408</td>
<td>Tel: 540-891-1360</td>
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<td>166</td>
<td>GODERICH SEARCH &amp; RESCUE - SNUG HARBOUR</td>
<td>K &amp; L CONSTRUCTION (ON) LTD.</td>
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<td>North Harbour Road West, Snug Harbour, Goderich ON</td>
<td>Tel: 416-472-7164</td>
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<td>167</td>
<td>BRIGGS PARKING DECK</td>
<td>EDWARD GLASS CO.</td>
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<td>111 S. Old Woodward, Birmingham, MI</td>
<td>734-422-7540</td>
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168 SPRING ARBOR UNIVERSITY KRESGE ADDITION - SUPPLY ONLY OAKLAND METAL SALES, INC. Tichnor, Inc. 637 W. Michigan Ave., Battle Creek, MI 248-377-8847

169 CITY OF OAK PARK MUNICIPAL COMPLEX - SUPPLY ONLY Oak Park, MI STRENG CONSTRUCTION INC. 989-845-6365

170 HENRY FORD - DUANE DOTY SCHOOL ADD - SUPPLY ONLY 10225 3rd Street Detroit, MI 48202-1287 X-CALIBER SHEET METAL 734-942-3000

171 LOU LARICHE CHEVROLET - SUPPLY ONLY 40875 Plymouth Rd, Plymouth, MI 48170 X-CALIBER SHEET METAL 734-942-3000

172 BUFFALO WILD WINGS 1620 Niagara Falls Blvd., Tonawanda, NY 14150 BUFFALO CONSTRUCTION INC. 502-327-4686

173 TWO COLUMN COVER-AGT - SUPPLY ONLY 30” Diam. 112” High Tel: 734-942-3000 X-CALIBUR SHEET METAL

174 McDonalds Amherstburg - SUPPLY ONLY 151 Sandwich St. S, Amherstburg ON ODIN BUILDING SYSTEMS Tel: 519-737-1010

175 McDonalds Owen Sound - SUPPLY ONLY 1015 10th Street West, Township of Georgian Bluffs ODIN BUILDING SYSTEMS Tel: 519-737-1010

176 WINDSOR REGIONAL HOSPITAL, FAMILY LEARNING&POOL 3901 Connaught St., Windsor ON ALLIANCE GENERAL CONTRACTING Tel: 519-251-1111

177 NATIONAL BANK SHELL BUILDING 3139 Wonderland South, London ON SOUTHSIDE CONSTRUCTION Tel: 519-433-0634

178 NAAGHI RIDGE PUBLIC SCHOOL 20473 Victoria Road, Ridgetown ON ELRIC CONTRACTORS OF WALLACEBURG Tel: 519-627-6031

179 McDonalds (Tauton & Harmony) Oshawa 1369 Harmony Road North, Oshawa ON JP CONTRACTORS Tel: 519-351-8119

180 McDonalds (Oakwood&McLeod) Niagara Falls 7275 Oakwood Drive, Niagara Falls, ON ELMWOOD CONTRACTING INC. Tel: 519-623-7000

181 P.X.SMITH MEDICAL BLDG - SUPPLY ONLY 7875 Riverside Drive Windsor ON ODIN BUILDING SYSTEMS Tel: 519-737-1010

182 LINWOOD PUBLIC SCHOOL CANOPY 50 Pine Street, Linwood ON DAKON CONSTRUCTION Tel: 519-746-0920

183 FASHION VILLAGE, THE BOARDWALK BLDG 200, 210, 230; Kitchener ON GATEMAN - MILLOY INC. Tel: 519-748-6500

184 MCDONALDS (12-146), STRATFORD 709 Erie Street, Stratford On GRAND RIVER CONTRACTING INC. Tel: 519-748-4955

185 UNIV GUELPH CROP SCIENCE BLDG. 117 Reynolds Walk, Guelph ON MELLOUL BLAMEY CONSTRUCTION Tel: 519-886-8850

186 LaSALLE MUNICIPAL CENTRE 5950 Maidrn Rd. LaSalle ON ERC METAL CLADDING INC. Tel: 519-969-7101

187 W. ROSS McDonald SENIOR STUDENT RESIDENCE Brantford ON PCR CONTRACTORS INC. Tel: 519-966-8718

188 McArdle GMC CADILLAC - SUPPLY ONLY 2400 N. Saginaw Rd. Midland MI 48640 METAL ARTS CONSTRUCTION Tel: 989-772-0782

189 CENTRAL PHASE 2 Ottawa ON ACADIA METALS Tel: 613-830-2001

190 BENSON / TAYLOR PUBLIC SCHOOL - SUPPLY ONLY Windsor, ON EMPIRE ROOFING Tel: 519-737-7740

191 NEW CATHOLIC SECONDARY SCHOOL 2727 Tokala Trail, London ON SOUTHSIDE CONSTRUCTION Tel: 519-433-0634

192 AMICO LEASEHOLD IMPROVEMENTS 2199 Blackacre Dr. Windsor ON AMICO DESIGN BUILD Tel: 519-737-6299

193 ST. RITA CATHOLIC ELEMENTARY SCHOOL 1 Inverness Rd. Nepean ON ACADIA METALS Tel: 613-830-2001

194 ULMER STADIUM, UNIV of LOUISVILLE Louisville, Kentucky LAMBERT GLASS Tel: 502-937-3300

195 IMMACULATE HEART OF MARY PARISH - SUPPLY ONLY 1951 Plymouth Ave. SE Grand Rapids, MI GLASS DESIGN INC.Michigan Tel: 616-674-9549

196 DILAWRI CHEVY - SUPPLY ONLY Gatineau, Quebec VITRERIE DE LA VALLEE INC. QC Tel: 819-643-2391

197 SIMCOE COMMERCIAL DEVELOPMENT 185 Robinson Street Simcoe ON MCI DESIGN-BUILD CORP. Tel: 519-453-3979
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<td>198</td>
<td>BLUEWATER FORD TOWER</td>
<td>D&amp;D CONTRACTING LTD. Tel: 519-331-3788</td>
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<td>199</td>
<td>ST. ANNES CATHOLIC SCHOOL</td>
<td>ACADIA METALS Tel: 613-830-2001</td>
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<td>KEN KNAPP FORD</td>
<td>BARRINETI CONSTRUCTION Tel: 519-326-1479</td>
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<td>201</td>
<td>MONROE &amp; LEONARD-INTERACT LEASE SPACE - SUPPLY ONLY GRAND RAPIDS MI 49503</td>
<td>GLASS DESIGN INC. Michigan Tel: 616-874-9549</td>
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<tr>
<td>202</td>
<td>PORT HURON CONVENTION CTR - SUPPLY ONLY 500 Thomas Edison Parkway Port Huron, MI 48060</td>
<td>GLASS DESIGN INC. Michigan Tel: 616-874-9549</td>
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<td>203</td>
<td>SCHAFER CHEVROLET - SUPPLY ONLY 125 Marble St. Pinconning MI 48634</td>
<td>METAL ARTS CONSTRUCTION Tel: 989-772-0782</td>
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<td>204</td>
<td>WESTERN UNIV. AMP CTR TECHNOLOGY COMM. 2544 Advanced Ave. London ON</td>
<td>TONDA CONSTRUCTION LTD. Tel: 519-688-5200</td>
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<td>205</td>
<td>SCOTIABANK - SPRINGBANK/DEVONSHIRE</td>
<td>SIERRA CONSTRUCTION LTD. Tel: 519-421-7413</td>
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<td>206</td>
<td>RBC GATEWAY RENOV. - SUPPLY ONLY 360 March Rd. Kanata ON K2K 2J5</td>
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<tr>
<td>207</td>
<td>CHILDREN'S AID SOCIETY - SUPPLY ONLY Riverside Drive Windsor ON</td>
<td>EMPIRE ROOFING Tel: 519-737-7740</td>
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<td>208</td>
<td>350 THE BOARDWALK</td>
<td>PEER CONSTRUCTION INC. Tel: 519-578-4834</td>
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<td>209</td>
<td>OCEAN VILLAGE SECURITY &amp; GUARD BOOTH - SUPPLY ONLY 132 Beach 59th St. Arverne NY 11692</td>
<td>HILDRETH'S GLASS INC. Tel: 631-928-1245</td>
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<tr>
<td>210</td>
<td>WALGREEN'S - SUPPLY ONLY 797 Capitol Ave. Battle Creek MI</td>
<td>GLASS DESIGN INC. Michigan Tel: 616-874-9549</td>
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<td>211</td>
<td>WEST CENTURY PLAZA - SUPPLY ONLY 5015 Wes Main St. Kalamazoo MI 49009</td>
<td>GLASS DESIGN INC. Michigan Tel: 616-874-9549</td>
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<td>212</td>
<td>PARKVIEW PUBLIC SCHOOL 10008 Oxbow Drive, Komoka ON</td>
<td>K &amp; L CONSTRUCTION (ON) LTD. Tel: 416-472-7164</td>
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<td>213</td>
<td>ESSEX CIVIC CENTRE 360 Fairview Ave. West Essex ON</td>
<td>FRONT CONSTRUCTION Tel: 519-250-8229</td>
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<td>214</td>
<td>TAUT PUBLIC SCHOOL 184 Tait St. Cambridge ON</td>
<td>TRP CONSTRUCTION GC Tel: 905-336-1041</td>
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<td>215</td>
<td>FRANCO-CITE ECOLE SEC. - SUPPLY ONLY 623 Chemin Smyth Ottawa ON</td>
<td>ACADIA METALS Tel: 613-830-2001</td>
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<td>216</td>
<td>FLINT STATE OFFICE BLDG - SUPPLY ONLY Flint, MI</td>
<td>MIDWEST METAL WALLS, INC Tel: 734-281-0500</td>
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<td>OPTIO - SUPPLY ONLY 390 Spaulding Ave, Ada MI</td>
<td>GLASS DESIGN INC. Michigan Tel: 616-874-9549</td>
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<td>WOODSLEE LIBRARY 1925 South Middle Rd, Woodslee ON</td>
<td>BARRINETI CONSTRUCTION Tel: 519-326-1479</td>
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<td>219</td>
<td>INDEX ENERGY - SUPPLY ONLY Ajax ON</td>
<td>TRANSIT GLASS &amp; ALUMINUM LTD. Tel: 613-599-0092</td>
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<td>220</td>
<td>VEGA AMERICAN - AGM Co. INC. - SUPPLY ONLY 4241 Allendorf Drive Cincinnati OH</td>
<td>ARCHITECTURAL GLASS &amp; METAL Tel: 317-545-2401</td>
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<td>AQUINAS COLLEGE FIELD HOUSE - SUPPLY ONLY Grand Rapids MI</td>
<td>GLASS DESIGN INC. Michigan Tel: 616-874-9549</td>
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<td>222</td>
<td>325 CROSSWAYS - SUPPLY ONLY 325 Crossways Park Drive Woodbury NY</td>
<td>ABOVE ALL STORE FRONTS Tel: 631-627-3535</td>
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<td>MERCY HEALTH - SUPPLY ONLY 6050 Northland Drive, Rockford MI 49341</td>
<td>GLASS DESIGN INC. Michigan Tel: 616-874-9549</td>
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<td>RATTUDE BUILDING - SUPPLY ONLY Caledonia MI</td>
<td>GLASS DESIGN INC. Michigan Tel: 616-874-9549</td>
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<td>225</td>
<td>SVSU - RYDER CENTER - SUPPLY ONLY UNIVERSITY CENTER, MI</td>
<td>STRENG CONSTRUCTION Tel: 989-845-6365</td>
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<tr>
<td>226</td>
<td>MCDONALDS SIMCOE 77 Queensway East, Simcoe ON</td>
<td>GRAND RIVER CONTRACTING INC. Tel: 519-748-4955</td>
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<td>227</td>
<td>ROCKWOOD PUBLIC SCHOOL 207 MacLenan St. Rockwood ON</td>
<td>TAMBO CONSTRUCTION LTD. Tel: 519-766-1234</td>
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228 HUB INTERNATIONAL PIROLI CONSTRUCTION
24 Seaciff Drive East, Leamington ON
Tel: 519-967-8669

229 GUS REVENBERG BUICK GMC WOODALL CONSTRUCTION
10150 Tecumseh Rd. E, Windsor
Tel: 519-966-3381

230 LANSDOWNE PARK, BLDG.D - SUNSHADES & SUPPLY NCG NATIONAL CONTRACT GLAZING LTD.
1015 Bank Street Ottawa, ON
Tel: 613-731-2522

231 LANSDOWNE PARK, BLDG.H - SUNSHADES & SUPPLY NCG NATIONAL CONTRACT GLAZING LTD.
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232 IDI NORTH PARK - SUPPLY ONLY ARCHITECTURAL GLASS & METAL
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234 BRETON VILLAGE OUTLET - SUPPLY ONLY GLASS DESIGN INC. Michigan
Grand Rapids MI
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235 O.V.G. COMPANION ANIMAL HOSPITAL-UnivGuelph COLLABORATIVE STRUCTURES LTD.
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236 QUEEN ELIZABETH II PUBLIC SCHOOL AUBI AGRI - URBAN BUILDINGS INC.
363 Kerby St. Petrolia ON
Tel: 519-683-4415

237 WATSON METAL MASTERS - SUPPLY ONLY CARDOZA CONSTRUCTION
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Tel: 417-725-6717

238 CLEVELAND AIR TRAFFIC CONTROL - SUPPLY ONLY AMOS EXTERIORS INC.
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New York
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1919 14th Street NW, Washington DC
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245 OHIO STATE UNIV. NRDT-BLDG.A - SUPPLY ONLY KOCH CORPORATION
Columbus OH
Tel: 502-636-3571

246 OHIO STATE UNIV. NRDT-BLDG.E - SUPPLY ONLY AAG-AMERICAN ARCHITECTURAL GLASS
Columbus OH
Tel: 937-836-3422

247 DAN KANE CHEVY /CADILLAC WOODALL CONSTRUCTION
500 Division Rd. Windsor, ON
Tel: 519-966-3381

248 MID-TOWNE VILLAGE HOTEL - SUPPLY ONLY GLASS DESIGN INC. Michigan
433 Dudley Place NE, Grand Rapids MI
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580 Rolling Hills Waterloo, ON
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250 MONTGOMERY FORD MONTGOMERY FORD
1119 Sutton St. Kincardine ON
Tel: 519-396-3436

251 NEW YORK SUBWAY TURNSTYLE - SUPPLY ONLY CLEAR IMAGE STOREFRONTS & GLASS
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Tel: 631-580-5888

252 WINDSOR REGIONAL HOSPITAL WINDSOR REGIONAL HOSPITAL
Oullette Ave. Windsor
Tel: 519-436-1221

253 B & B TOOL ERC METAL CLADDING INC.
Windsor, ON
Tel: 519-966-7101

254 SAFRANCE RESIDENCE D&M GLASS & MIRROR LTD.
Belle River, ON
Tel: 519-733-0093

255 HALFORD RD.
Windsor ON
Tel: 519-969-7101

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Cincinnati OH
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257 WELCOME CENTRE, UNIVERSITY of WINDSOR AMICO DESIGN BUILD INC.
2598 Wyandotte St. West, Windsor
Tel: 519-737-6299
258 GM CARROL
Dartmouth, Nova Scotia
Tel: 902-481-5588

259 GM SWARTZ CREEK CCA
Warren, MI
SDI Exterior Systems, LLC
Tel: 248-474-7152

260 BURLINGTON COAT FACTORY
Middleton, OH
AGM-ARCHITECTURAL GLASS&Metal Co.
Tel: 317-545-2401

261 REPUBLIC SQUARE - 660 NORTH
660 North Capitol, OH Mason
PIONEER CLADDING&GLAZING, LLC Inc.
Tel: 513-583-5925

262 BENEDICT MANUFACTURING - SUPPLY ONLY
123 DeKraft Ave. Big Rapids MI 49307
GLASS DESIGN INC.Michigan
Tel: 616-874-9549

263 VICTORIA PARK SENIORS CTR
150 Albert St. Fergus ON
DAKON CONSTRUCTION LTD.
Tel: 519-746-0920

264 DISTRICT 3 POLICE HEADQUARTERS
Cincinnati OH
ANDY’S/ROBINSON GLASS
Tel: 513-240-9250

265 BRAVO
Cincinnati OH
AGM-ARCHITECTURAL GLASS&Metal Co.
Tel: 317-545-2401

266 WALSH COLLEGE
Troy MI
X-CALIBER SHEET METAL
Tel: 734-942-3000

267 OHIO STATE UNIV. NRDT-BLDG.A
Columbus OH
KOCH CORPORATION
Tel: 502-636-3571

268 UNITED MEDICAL CENTER ED VESTIBULE
430 TV DRIVE, FREDERICKSBURG, VA 22408
FREDERICKSBURG GLASS & MIRROR, INC.
Tel: (540) 891-1360

269 ST. JOHN YMCA
205 CHURCHILL BLVD. ST. JOHN, NEW BRUNSWICK
ATLANTIC WINDOOR LTD.
Tel: (506) 633-6604

270 HART FORD LINCOLN
117 Lake st. Roscommon, MI 48653
GLASS DESIGN INC.Michigan
Tel: 616-874-9549

271 WEST MICHIGAN PAIN CENTER
20095 Gilbert Road, Big Rapids, MI 49307
GLASS DESIGN INC.Michigan
Tel: 616-874-9549

272 BELCO INDUSTRIES
115 E Main Street, Belding MI 48809
GLASS DESIGN INC.Michigan
Tel: 616-874-9549

273 AECL- CHALK RIVER
CHALK RIVER, ONTARIO K0J1J0
NCG NATIONAL CONTRACT GLAZING LTD.
Tel: (613)731-2522

274 MERCY HEALTH WOUND CLINIC
1560 East Sherman Boulevard, Muskegon, MI 49444
GLASS DESIGN INC.Michigan
Tel: 616-874-9549

275 1401 NEW YORK AVE.
1401 New York ave. Washington, DC 20005
PIONEER CLADDING&GLAZING, LLC Inc.
Tel: 513-583-5925

276 RICKENBACKER AIR CONTROL TOWER
4600 International Gateway, Columbus, Ohio 43219
Columbus Glass & Mirror
Tel: (614) 478-4527

277 COBRE VALLEY REGIONAL MEDICAL CENTER
Craft's Quality Glass, Inc.
Tel: (602) 431-8833

278 AMERITAS CINCINNATI OFFICE BUILDING
Cincinnati, Ohio
AGM-ARCHITECTURAL GLASS&Metal Co.
Tel: 317-545-2401

279 FIVE I'S DIGITAL LLC DATA CENTER
5700 Innovation dr. Dublin, OH
Columbus Glass & Mirror
Tel: (614) 478-4527

280 EASTMAN PEDESTRIAN BRIDGE
4074 BETHANY RD., MASON OHIO 45040
PIONEER CLADDING&GLAZING, LLC Inc.
Tel: 513-563-5925

281 EASTMAN CBC, BUILDING #1
200 SOUTH WILCOX DR., KINGSPORT, TN 37660
PIONEER CLADDING&GLAZING, LLC Inc.
Tel: 513-563-5926

282 FRANKLIN FIRST UNITED METHODIST
FRANKLIN, TN
AGM - ARCHITECTURAL GLASS & METAL CO INC
Tel: (317)545-2401

283 LAKESHORE PLAZA
19 Mile Road & Hays Road, Sterling Heights, MI
MIDWEST METAL WALLS, INC.
Tel: (734)281-0500

284 FERGUS LIBRARY
Fergus, ON
TRP Construction
Tel: 519-336-1041

285 DOLLAR TREE
19 Amy Croft Drive, Tecumseh, ON
Titan Group
Tel: 519-977-1125

286 INCLINE THEATER
CINCINNATI, OH
ANDY’S/ROBINSON GLASS
Tel: (513) 240-9250

287 BILLY BEEZ
34 JAMAICA AVENUE, PORT JEFFERSON STA. NY 11776
HILDRETH’S GLASS INC.
Tel: (631)928-1245
<table>
<thead>
<tr>
<th>No.</th>
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<td>1310 E. BELTLINE, S.E. Grand Rapids, MI 49506</td>
<td>Tel: 616-874-9549</td>
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<td>289</td>
<td>WOODY SANDERS FORD, 235 w. Mitchell Ave., Cincinnati, OH 45232</td>
<td>ANDY’S/ROBINSON GLASS Tel: (513) 240-9250</td>
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<td>290</td>
<td>LOT 21 &amp; 23 BROADWAY PLAZA, 5520 Broadway, Bronx, NY 10463</td>
<td>CLEAR IMAGE STOREFRONTS &amp; GLASS Tel: (631) 580-5888</td>
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<tr>
<td>291</td>
<td>DUNDAS SELF STORAGE, 354 McNab, Dundas, ON</td>
<td>DeFaveri Group Contracting Tel: 905-560-2555</td>
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<td>292</td>
<td>WALTER REED BUILDING 9 AND 10, Bethesda, MD</td>
<td>KOCH CORPORATION Tel: 502-636-3571</td>
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<td>293</td>
<td>89 IONIA AVE., N.W. GRAND RAPIDS, MI 49503</td>
<td>GLASS DESIGN INC. Michigan Tel: 616-874-9549</td>
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<td>294</td>
<td>HDGH CARDIAC WELLNESS, HOTEL DIEU GRACE, WINDSOR ON</td>
<td>Adine Builders Tel: 519-966-1823</td>
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<td>295</td>
<td>MEDSTAR GUH PROTON THERAPY, 3970 Reservoir Road, NW, Washington DC 20007</td>
<td>PIONEER CLADDING &amp; GLAZING, LLC Tel: 513-583-5925</td>
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<td>296</td>
<td>BASF, 25 MIDDLESEX ESSEX TURNPIKE, ISELIN, NJ</td>
<td>SRS Siding &amp; Roofing Systems Tel: (513) 825-1022</td>
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<td>EAST SAINT JOHN TERMINAL FACILITY, Saint John</td>
<td>ATLANTIC WINDOOR LTD. Tel: (506) 633-6604</td>
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<td>CASCADE RIDGEMOOR &amp; OAKSTOWN MALLS, 117 LAKE STREET, ROSCOMMON MI 48653</td>
<td>GLASS DESIGN INC. Michigan Tel: 616-874-9549</td>
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<td>299</td>
<td>FOREVER 21, Devonshire Mall, Windsor ON</td>
<td>STC Construction Tel: 519-419-7828</td>
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<td>300</td>
<td>BUILDING ABC, 5575 Executive Parkway S.E. Grand Rapids, MI 49512</td>
<td>GLASS DESIGN INC. Michigan Tel: 616-874-9549</td>
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<td>301</td>
<td>LEGACY CENTER FIELDHOUSE, 9299 Goble Drive, Brighton, MI 48116</td>
<td>Metro Lakes Construction, LLC Tel: (248) 255-6754</td>
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<td>302</td>
<td>346 EAST 21ST STREET, NEW YORK NY 10010</td>
<td>HILDRETH’S GLASS INC. Tel: (631)928-1245</td>
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<td>303</td>
<td>ST. THERESE OF LISIEUX, 1760 Garth St., Hamilton, Ontario</td>
<td>DeFaveri Group Contracting Tel: 905-560-2555</td>
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<td>304</td>
<td>OHIO STATE UNIVERSITY BUILDING I, COOLUMBUS, OH</td>
<td>AAG-AMERICAN ARCHITECTURAL GLASS Tel: (937) 836-3422</td>
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<td>SOUTHERN MICHIGAN BANK &amp; TRUST, 531 West Kildore Road, Portage, MI 49002</td>
<td>GLASS DESIGN INC. Michigan Tel: 616-874-9549</td>
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<td>306</td>
<td>OHIO STATE UNIVERSITY- BLDG L, COLUMBUS, OH</td>
<td>AAG-AMERICAN ARCHITECTURAL GLASS Tel: (937) 836-3422</td>
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<td>ST. MARYS BUICK GMC, ST. MARYS, ONTARIO</td>
<td>Melloul Blamey Tel: 519-886-8850</td>
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<td>308</td>
<td>GERWECK NISSAN, 15407 N. Dixie HWY, Monroe Michigan</td>
<td>Quatro Construction LLC Tel: (734) 485-7737</td>
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<td>309</td>
<td>JOB SHOPPE, Windsor, ON</td>
<td>STC Construction Tel: 519-419-7828</td>
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<td>310</td>
<td>HERMAN K-12 SCHOOL, Oscar Construction</td>
<td>Tel: 519-737-0350</td>
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<td>311</td>
<td>JURGENSEN Co. NEW OFFICE, 11641 Mosteller Rd., Sharonville OH 45241</td>
<td>AGM-ARCHITECTURAL GLASS &amp; METAL CO INC Tel: (317)545-2401</td>
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<td>312</td>
<td>COULING CRESSENT PUBLIC SCHOOL, 595 WATSON PKY, N. GUELPH, ON N1E4M9</td>
<td>Devlan Construction Tel: 519-763-5800</td>
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<td>313</td>
<td>K.O.R. VERIZON WIRELESS STORE - SUPPLY ONLY, Port Jefferson Station, NY 1176</td>
<td>W.J. NORTHRIDGE CONSTRUCTION Tel: 631-421-1168</td>
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<td>314</td>
<td>CAPS COLUMBUS AESTHETIC &amp; PLASTIC SURGERY - SUPPLY OF COLUMBUS GLASS &amp; MIRROR, 5005 Arlington Centre Blvd., Columbus Ohio 43220</td>
<td>Tel: 614-478-4527</td>
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<tr>
<td>315</td>
<td>BMG BUFFALO MEDICAL BUILDING - SUPPLY ONLY, 325 Essay Road, Williamsville, NY 14221</td>
<td>STERLING GLASS Tel: 716-853-5800</td>
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<tr>
<td>316</td>
<td>CHESANING HIGH SCHOOL PHASE 2 - SUPPLY ONLY, 850 N 4th Street, Chesaning MI</td>
<td>STRENG CONSTRUCTION Tel: 989-845-6365</td>
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<td>317</td>
<td>OHIO HEALTH - SUPPLY ONLY, NELSONVILLE, OH</td>
<td>COLUMBUS GLASS &amp; MIRROR Tel: 614-478-4527</td>
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348 SEYMOUR FORD QUICK LUBE- SUPPLY ONLY
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   METAL TECH BUILDING SPECIALISTS
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   THE BLAKLEY CORPORATION
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   WILLINGHBY, OH
   PIONEER CLADDING & GLAZING
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   DETROIT, MI
   TRI-STAR ROOFING & SHEET METAL
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363 PARK AT PULLIAM - SUPPLY ONLY
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integrating vision and reality

4 HISTORY
6 MANUFACTURING
8 COLOR PALETTE
10 FINISHES
12 BRANDING
OUR HISTORY IS ONE OF INNOVATION. First introduced in Japan in the early 1970s, ALPOLIC® came to the United States in the early ‘80s with the goal of continuing the development of new, cutting edge surfaces and applications for modern architecture. Our state-of-the-art facility in Chesapeake, Virginia, began production in 1991, and is now, without a doubt, the most sophisticated composite panel manufacturing facility in America. The Chesapeake operation produces ALPOLIC®/fr, an outstanding material that combines advanced fire-retarding technology with affordability and a wide array of attractive options, all while meeting fire codes worldwide. Today, our history of innovation, quality and value have made ALPOLIC® a truly global presence, with manufacturing and distribution capabilities worldwide.
Starting with an already great technology, we’ve continued its development in unique and dynamic ways, making ALPOLIC® ACMs and MCMs products of the future, available today. Whether used for architectural cladding or for countless other applications, interior as well as exterior, these incredibly strong panels offer the rigidity of heavy-gauge sheet metal in a lightweight material with superior flatness, vibration dampening, durability, and ease of maintenance.

We can’t talk about our industry’s future for long without mentioning how ALPOLIC® has stepped up to offer better solutions to not just the architectural community, but to the larger community as well. To that end, ALPOLIC® has created Operation Encore. It’s a new program that emphasizes the recycling of our Aluminum and Metal Composite Materials, and also explores relationships with innovative architects and designers to find practical and innovative ways to use surplus materials for such socially important projects as low income housing, urban renewal projects, disaster shelters, and more. ALPOLIC® is working to move our industry further into a position of environmental and social responsibility.
1. Gijang Fire Station | Custom Prismatic & Orange
2. RAI Elucium | Stainless Steel (SCM) Dull Finish
3. Sacred Heart Learning Center | Red, White, Blue, Green & Yellow
4. CUBIS | Custom Green, Yellow, Orange & Stock White
5. Hakodate Racetrack | Timber Walnut
6. Office Building | Bone White
7. Marina Bay Sands | Silver Metallic, White, & Custom Metallic
OUR PALETTE OF COLORS IS VIRTUALLY LIMITLESS AND TOUGH AS NAILS  ALPOLIC® produces a wider variety of colors and finishes for our Aluminum and Metal Composite Materials than any other manufacturer, offering distinctive ways for architects, designers, and corporations to present themselves to the world. ALPOLIC® standard finishes utilize a FEVE paint system with LUMIFLON™, a remarkable second-generation fluoropolymer coating. LUMIFLON™ produces colors that are the strongest, brightest, and longest lasting of any ACM paint finish on the market today. This resin’s absolute clarity not only permits, but actually encourages the development of brighter, cleaner, more vivid colors, and also makes possible a gloss range that’s twice the industry standard. ALPOLIC®’s FEVE fluoropolymer coatings, from our wide range of stock colors through an infinite range of custom colors, are harder and more mar-resistant than other coatings. Whether you want to design one building or re-brand an entire chain, ALPOLIC® lets you match corporate colors perfectly, or create startling new effects while ensuring complete consistency throughout your building designs, inside and out.
1. WakeMed Healthplex | Pre Patina Copper & Beige
2. Panorama Shopping Center | Timber Maple
3. Software Park | Stainless Steel (SCM)
4. Casa Y Leon | Prismatic Red & Mica Platinum
5. Caja Vital Kutxa | Stainless Steel (SCM) Dull Finish
6. Changi Airport | White Ceiling Panels
7. Kyungnam University | Champagne Gold Metallic
ALPOLIC® OFFERS MORE UNIQUE SURFACES THAN ANY OTHER MANUFACTURER Using the latest in surface technologies and proprietary image transfer processes, ALPOLIC® continues to develop the most unconventional ACM and MCM products imaginable: faux finishes with the beauty of timber or stone, natural metals such as genuine copper, and decorative metals of polished aluminum. Prismatic panels that change appearance with the direction and intensity of the light, and two color panels join more traditional MCMs and painted ACMs to provide you with an unbeatable and truly exquisite selection of cladding materials.
1 H&M Store | Timber Walnut, CNC Charcoal, & HPA Aluminum
2 Pickering Town Centre | RVW White & TSB Black
3 Super Target | Target Red, Zinc Metallic, & Custom Iron Ore
4 Burger King | Custom Blue & Yellow
5 Smart Car Dealership | BLX Black
6 Royal Bank of Canada | RBS Blue
7 Twins Stadium | GRAPHIC-AL™ DP
Office buildings, healthcare facilities, entertainment complexes, retail chains, restaurants, auto dealerships and more are creating a distinctive image and branding themselves faster and easier with ALPOLIC®. ALPOLIC® has even developed innovative two-toned painted ACM panels especially for corporations to meet their specific imaging needs and to simplify their fabrication process. With ALPOLIC® ACM and MCM panels, you can get exact corporate colors, better consistency, easier installation, lower labor costs and a longer life. And GRAPHIC-AL™, a complete line of materials developed specifically for signage and display, completes the most comprehensive selection of architectural cladding and branding materials ever.
ALPOLIC®’s virtually unlimited selection of the finest Aluminum and Metal Composite Materials ever produced is a bonanza for the creative mind. Things that before ALPOLIC® could only exist in the imagination are now seeing the light of day in stunning applications all around the world. Take a closer look at ALPOLIC® and you’ll see countless ways to make your vision real. For more information, visit www.alpolic-northamerica.com.
For additional information, samples or a list of ALPOLIC® fabricators, please call 1-800-422-7270 or visit www.alpolic-northamerica.com

ALPOLIC® & ALPOLIC®/fr
MATERIALS

MITSUBISHI PLASTICS COMPOSITES AMERICA, INC.
Composite Materials Division
401 Volvo Parkway, Chesapeake, VA 23320
Telephone: 800-422-7270, Facsimile: 757-436-1896
www.alpolic-northamerica.com  e-mail: info@alpolic.com

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ALPOLIC® is a registered trademark of Mitsubishi Plastics Inc. KYNAR® is a registered trademark of Arkema, Inc.
LUMIFLON™ is a registered trademark of Asahi Glass Co., Ltd.
prismatic

ALPOLIC® Prismatic finishes combine our advanced Lumiflon® (FEVE) technology with specialized pigments to create unique colors and effects. The resulting finishes stand out beautifully, bringing 3-dimensional depth to your 2-dimensional surface. ALPOLIC® Prismatic finishes are perfect for making a dazzling creative statement with your corporate colors, or adding beautiful saturations of color and dramatic contrast to your architecture. Like our other aluminum and metal composite materials, ALPOLIC® Prismatic finishes provide the rigidity of heavy-gauge sheet metal at a fraction of the weight.

stone/timber series

ALPOLIC®’s Stone Series and Timber Series offer the genuine look and feel of these timeless materials, but in panels made of aluminum composite material (ACM) that are a whole lot more practical. In fact, our Stone and Timber Series panels are easily fabricated with ordinary metalworking tools. Made with a unique image transfer process developed by Mitsubishi Plastics, this innovative cladding material gives you the best of both worlds ± the lightweight durability of ALPOLIC® and the classic beauty of stone and timber.
stock & custom colors

Picture your next project in the bright, clean colors and designs that only ALPOLIC® lightweight aluminum composite material (ACM) panels can achieve. From Off White and Aluminum Grey to rich Metallics, our colors are always available in 4mm thickness and in various standard widths. ALPOLIC® uses Lumiflon™ (FEVE) fluoropolymer resin as the standard for both stock and pre-formulated color paint finishes, delivering superior durability, weatherability, and chemical resistance.

Metallic SMX Silver

stock & custom colors

FEDERAL GOVERNMENT ADMINISTRATIVE CENTER
PUTRA JAYA, MALAYSIA

natural metals

Copper evolves and weathers to a rich patina, adding beauty and depth to any building façade. Other metals ± stainless steel, titanium, zinc ± project an image of high-tech sophistication like nothing else. ALPOLIC’s Natural Metals line conveys the look of these materials so convincingly because each of them has its namesake metal built into the outer layer. Whether you’re cladding a new building, recladding an existing structure, or adding accents to masonry or other surfaces, ALPOLIC® Natural Metals offer a wealth of possibilities at only a fraction of the weight and cost of solid sheet alternatives.
ALPOLIC® isn’t just one of the most advanced fire-retarding cladding materials on the market ± it’s also affordable and available in a wide array of attractive options. No wonder it’s one of the most popular choices in the world for external claddings. Comprised of a mineral-filled, fire-resistant thermoplastic core sandwiched between two thin metal skins, ALPOLIC® has been used for landmark projects across the globe. By meeting fire codes worldwide while accommodating aesthetic and budgetary considerations, ALPOLIC® sets the standard for fire safety.

**fire resistant**

ALPOLIC® isn’t just one of the most advanced fire-retarding cladding materials on the market ± it’s also affordable and available in a wide array of attractive options. No wonder it’s one of the most popular choices in the world for external claddings. Comprised of a mineral-filled, fire-resistant thermoplastic core sandwiched between two thin metal skins, ALPOLIC® has been used for landmark projects across the globe. By meeting fire codes worldwide while accommodating aesthetic and budgetary considerations, ALPOLIC® sets the standard for fire safety.

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**frLT**

Offering lightness, fire resistance and a wide palette of available colors and finishes, ALPOLIC®/frLT is the new ACM of choice for indoor applications. This material of the future enables architects and designers to exceed fire safety standards while achieving sweeping designs and startling new effects. It’s perfect for use on interior walls, ceilings, columns, partitions and displays in shops, offices and factories. ALPOLIC®/frLT is also a good choice for light outdoor applications, including soffits, awnings, parapets and signs. With ALPOLIC®/frLT, we exceed all standards and expectations so you can do likewise.
Introducing ALPOLIC®/HD aluminum composite materials. These panels are manufactured with either a polyethylene or mineral filled fire resistant core. This product is produced with 0.032" top and bottom aluminum skins for added rigidity and strength. Any of our fluoropolymer paint finishes including solid, mica, metallic, and prismatic can be applied. ALPOLIC®/HD panels provide additional yield and tensile strength vs. standard ALPOLIC® panels along with over 5 times the flexural elasticity strength. For applications requiring heavy duty strength and exterior performance, ALPOLIC®/HD panels are the answer. These 4mm or 6mm panels are custom manufactured and not a stocked product.

Offering a complementary product to ACM, ALPOLIC® now offers Break Metal which can be formed with the use of a sheet metal break. The material is coated with Lumiflon® (FEVE) fluoropolymer resin paint and matched to more than 18+ of our most popular architectural stock 4mm and select specialty colors. The aluminum thickness is 0.032" and is coil coated and sheeted at MPCA. Break Metal is excellent for roof caps, flashing, fascia trim, and accents.
Examples of attachment systems

ALPOLIC® aluminum and metal composite materials have a track record second to none when it comes to the architect/fabricator relationship. The product of their teamwork has produced countless examples of cutting edge architecture that offers solutions to accommodate innovative "outside of the box" design applications. Sample cladding systems and their attachment methods are represented by the illustrations below.
What are the advantages of using ALPOLIC® in your design project?

**PRODUCT PROPERTIES – ALPOLIC®** Aluminum and Metal Composite Materials (ACM & MCM) feature such attributes as superior flatness, vibration dampening, durability and ease of maintenance. Both are produced by continuously bonding two thin sheets of aluminum or metal on either side of an extruded thermoplastic or mineral-filled thermoplastic core. The aluminum surfaces have been prefinished and coil-coated in a variety of paint finishes before bonding. ALPOLIC® ACM & MCM both offer the rigidity of heavy-gauge sheet metal in a lightweight composite material.

**EASE OF FABRICATION – ALPOLIC®** ACM requires no special tools for fabrication, ordinary metal working tools are all that are needed. Fabrication techniques such as cutting, grooving, punching, drilling, bending, rolling, and many other specialized techniques are easily accomplished.

**SURFACE TREATMENTS – ALPOLIC®** is available in the following finishes: standard Lumiflon® (FEVE) fluoropolymer finish tested to meet the performance criteria of AAMA 2605, with a wide color and gloss range, Kynar®(PVDF), polyester and Class 1 anodized. ALPOLIC®s advanced coating equipment also allows ease of manufacturing multiple color coil-coated panels.

**PAINT SYSTEM – LUMIFLON™ (FEVE)**
- ALPOLIC® offers you Lumiflon® (FEVE) based fluoropolymer finishes as a standard product.
- Lumiflon® (FEVE) is a high performance, second generation fluoropolymer with an available gloss range from 15% - 80%.
- ALPOLIC® with Lumiflon® (FEVE) finish offers bright, vibrant colors.
- Lumiflon® (FEVE) finish includes superior abrasion characteristics and field painting attributes.
- Kynar®(PVDF) meets AAMA 2605 but does not offer the high gloss or rich color palette as with Lumiflon®(FEVE).

**MANUFACTURING FLEXIBILITY – ALPOLIC®** is offered in a variety of thicknesses: 2mm, 3mm, 4mm and 6mm
- Standard widths include: 40, 48, 50, and 62
- Semi-standard widths: Consult Customer Service
- Custom widths: Consult Customer Service

**RANGE OF SIZES**
- Width: 33 ± 0.08 (826mm ± 1575mm)
- Length: 6 ± 24 (1829mm ± 7315mm)

**RANGE OF PRODUCTS – ALPOLIC®** offers you a variety of distinct, durable and diverse product lines:
- ALPOLIC®: standard PE core in a myriad of coil-coated finishes
- ALPOLIC®/fr: fire resistant core for architectural applications
- ALPOLIC®/frT: fire resistant core for interior applications
- ALPOLIC®-Natural Metals: unique exotic metal finishes
- ALPOLIC® Stone/Timber: natural classic beauty with ACM
- ALPOLIC® RF: Mirror like surface with ACM flexibility
- ALPOLIC® HD: Heavy Duty with thicker aluminum skin
- ALPOLIC® Decorative Metals: brushed metal and reflective ACM
- ALPOLIC® Anodized: Class 1 anodized panels in 5 shades
- ALPOLIC® Break Metal: 0.032 coil-coated aluminum

**PRODUCT TOLERANCE – ALPOLIC®** material is trimmed and squared with cut edges to offer the best panel edge conditions in the industry.
- Width: ± 0.08 (2mm)
- Length: ± 0.16 (4mm)
- Thickness: 3mm: ± 0.008 (0.2mm)
- 4mm: ± 0.008 (0.2mm)
- 6mm: ± 0.012 (0.3mm)
- Bow maximum: 0.5% of length and/or width
- Squareness maximum: 0.2 (5mm)

**SUSTAINABILITY –** The LEED (Leadership in Energy and Environmental Design) Green Building Rating System® is a voluntary, consensus-based national standard for developing high-performance, sustainable buildings. Members of the U.S. Green Building Council representing all segments of the building industry developed LEED and continue to contribute to its evolution.

LEED provides a complete framework for assessing building performance and meeting sustainability goals. Based on well-founded scientific standards, LEED emphasizes state of the art strategies for sustainable site development, water savings, energy efficiency, materials selection and indoor environmental quality.

LEED recognizes achievements and promotes expertise in green building through a comprehensive system offering project certification, professional accreditation, training and practical resources.

Mitsubishi Plastics Composites America, Inc. is a member of the U.S. Green Building Council and the Canadian Green Building Council and actively supports environmental responsibility. The raw materials used in the ALPOLIC® panel products have been selected to maximize the use of recycled content, both post consumer and post industrial. The coating and laminating lines are designed to make the most efficient use of energy and to comply with all regulations and codes relating to environmental quality. If there are specific questions please contact ALPOLIC®s Technical Services Group.
ALPOLIC® & ALPOLIC®/fr Fire Performance

ALPOLIC® (standard) with polyethylene core has been tested by independent testing laboratories using the following nationally recognized fire tests.

ASTM E84
Flame spread
- 3mm: .................................................. 05
- 4mm: .................................................. 00
- 6mm: .................................................. 00
Smoke developed
- 3mm: .................................................. 15
- 4mm: .................................................. 00
- 6mm: .................................................. 10

ASTM E108 modified
- 4mm: .......................................................... Passed
- 6mm: .......................................................... Passed

ASTM E162
Flame spread index
- 6mm: .................................................. 11

ASTM D1929
- Flash: .................................................. 716°F
- Ignition: .................................................. 752°F

ASTM D635
- 4mm: .................................................. Classified CC1

UL-94
- 3mm: .................................................. V-O rating

CODE EVALUATION REPORTS:
1. UL 94
2. UL 879
3. ICCES
4. Miami Dade
5. Florida Building Code
* Downloads available on our website

ALPOLIC®/fr (fire resistant) with a mineral-filled, thermoplastic core has been tested by independent testing laboratories using the following nationally recognized fire tests.

ASTM E84
Flame spread
- 4mm: .................................................. 00
- 6mm: .................................................. 00
Smoke developed
- 4mm: .................................................. 10
- 6mm: .................................................. 00

ASTM 108 modified: 4mm: .................................. Passed

ASTM E162
Flame spread index
- 4mm: .................................................. 0

ASTM 1929
- Flash: .................................................. 811°F
- Ignition: .................................................. 837°F

NFPA285 intermediate scale multi-story apparatus test:
- 4mm: .................................................. Passed
- 6mm: .................................................. Passed

ASTM E119 (1 and 2 hour ratings)
- 4mm: .................................................. Passed
- 6mm: .................................................. Passed

UBC 26-3 corner test:
- 4mm: .................................................. Passed
- CAN/ULC S102 & 134:
  - 4mm: .................................................. Passed
  - 6mm: .................................................. Passed

UBC 17-2, potential heat release: <6000 BTU/ft²

CODE EVALUATION REPORTS:
1. UL 94
2. ICCES
3. ICCES-ICBO
4. Miami Dade
5. Florida Building Code
6. New York City
7. CAN/ULC S102 & S134
* Downloads available on our website

For additional information, samples or a list of ALPOLIC® fabricators, please call 1-800-422-7270 or visit www.alpolic-northamerica.com

ALPOLIC® & ALPOLIC®/fr

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LUMIFLON™ is a registered trademark of Asahi Glass Co., Ltd.
ACMPANELWORX Aluminum Composite Panel Rainscreen Systems

PX10 (Dry Joint), PX20 (Wet Joint), EVO (Rivetless, Dry Joint)

All of our rainscreen systems are:

- Tested per AAMA 508-7, Pressure Equalized Rain Screen System
- Engineered to provide superior wind uplift resistance
- Tested for air, water, and structural per ASTM 283, 330, and 331
- Plank material is made in the USA by union craftsmen
- ACM panels are fabricated in Windsor, Ontario, Canada
- Broad spectrum of standard colours available to choose from as well as custom colours
- 2 layers of aluminum sandwiching a resin core
- Fire rated cores are also available
- Panel thickness vary from 3mm, 4mm, & 6mm
- Panels feature coil-coated Kynar PVDF & Lumiflon FEVE paint, offering the most advanced architectural coatings available
- 10, 20 & 30 year finish warranties
- Drained, back-ventilated design
- Metal flashing systems available to match, for a high quality façade system
INSTALLATION INSTRUCTIONS

ACM PANELWORX

RAINSCREEN SYSTEM
GENERAL NOTES

HANDLING, STORING, AND PROTECTION OF ALUMINUM COMPOSITE PANELS

The material must be protected against damage. The following precautions are recommended.

A. HANDLE CAREFULLY - Unload crates from truck. Do not stack crates. Use crates and separation materials to store panels until ready for use. Protect from elements and other construction trades. Wear proper personal protective equipment while handling panels. Do not remove protective wrap from face of panels until properly installed. Protective wrap must be removed once panels are installed, direct sunlight and heat can cause the protective film to bond to the panel if left on for a prolonged period.

B. CLEANING - Panels should be rinsed or cleaned immediately if materials from other trades such as cement, plaster and terrazzo come into contact with panels. The painted surfaces of the panels should be cleaned on a regular basis to prevent the build up of corrosive deposits. The required frequency and method of this cleaning is dependant on the local environment and conditions. Rinsing the panels with fresh water on a frequent basis can reduce the residue build up on the surface and there by reduce the need for more intensive cleaning.

Please refer to panel supplier cleaning and finish maintenance information for more intensive cleaning instructions if needed.

GENERAL INSTALLATION NOTES

The following practices are recommended for all installations:

A. CHECK APPROVED SHOP AND PRODUCTION DRAWINGS to become thoroughly familiar with the project. The installation instructions are of a general nature and cover common conditions only.

B. All materials are to be installed plumb, level and true.

C. All fasteners, sealants, shims and backer rod to be provided by installer.

D. Strapping to be provided by panel installer. Direct panel attachment to densglass and similar exterior sheathing is not recommended and will not be warranted. It is recommended that strapping/ z-girts/ hat channels be used unless attaching directly to concrete, secure metal framing or min. ¹⁄₈" plywood.

E. Concealed fasteners to be zinc plated.

F. All sealants to be applied in strict accordance with manufacturer’s published instructions.

G. All areas where this material is used will be field measured prior to release to fabrication.

H. Each panel product type has special characteristics that can affect visual consistency from lot to lot and even from panel to panel. ACM Panelworx will make every attempt to keep panels visually consistent but colour, flake, sheen, fade and natural patina differences may occur. Grain direction will be kept consistent per project, but may limit layout. All metallic finishes, mica finishes, natural metals, anodized and wood grained material will be designed so that grain direction runs in one direction unless otherwise noted and approved.
PART IDENTIFICATION

INTERMEDIATE ASSEMBLY CLIP
SUPPLIED IN 4” PIECES
8 PER PANEL. ADD 1 ADDITIONAL CLIP
PER 24” OF PANEL DIMENSIONS OVER 72”

BAR EXTRUSION SHOP ATTACHED TO ALL
PANEL RETURNS.

J-CLIP/ STARTER CLIP
SUPPLIED IN 4” PIECES

ALUMINUM COMPOSITE PANEL
0.5mm ALUMINUM SHEET
PE OR FR CORE
0.5mm ALUMINUM SHEET
TYP. OVERALL THICKNESS AVAILABLE
AS 3mm AND 4mm.
STEP 1.
MAKE CHALK LINE AS PER SILL DETAIL.

IF JOINT IS (TYP. ½) CHALK LINE TO BE 2¾” TO STARTER CLIP.

ANY FLASHING MUST BE APPLIED BEFORE STARTER STRIP.

INSTALL STARTER CLIPS ALONG CHALK LINE. APPROX. 2 – 3 CLIPS PER PANEL.
STEP 2.
PREP PANEL BY INSTALLING
TOP AND RIGHT SIDE
INTERMEDIATE CLIP TO PANEL.
STEP 3.
INSTALL PANEL ONTO STARTER CLIP.
STEP 4.
ONCE PANEL IS INSTALLED ON STARTED CLIPS. FASTEN UPPER CLIP INTO PLACE.
MATERIALS

1. Product Name
ALPOLIC® Aluminum Faced Composite Panel

2. Manufacturer
Mitsubishi Plastics Composites America, Inc.
401 Volvo Parkway
Chesapeake, VA 23320
(800) 422-7270
Fax: (757) 436-1896
E-mail: info@alpolic.com
www.alpolic-northamerica.com

3. Product Description
BASIC USE
ALPOLIC® is a lightweight, rigid, bendable and durable aluminum faced composite panel widely used as an interior and exterior wall cladding in commercial and institutional applications. It offers design flexibility through a wide variety of fabrication techniques, including panels into curves, angles and pan configurations.

COMPOSITION & MATERIALS
ALPOLIC panels consist of a core of thermoplastic material thermally bonded to face sheets fabricated of aluminum 3105 H14 alloy, 0.020" (0.5 mm) thick or an equivalent.

TYPES
Several types of ALPOLIC panels are available, including:
• ALPOLIC standard panels
• ALPOLIC A-LOOK® reflective finish panels
• ALPOLIC Stone Series simulated stone finish panel
• ALPOLIC Timber Series simulated wood finish panels
• ALPOLIC Decorative Metal panels
• ALPOLIC Natural Metals copper mill finish panels
• ALPOLIC anodized class 1 finish panels

SIZES
ALPOLIC panels are available in 3.4 and 6 mm thicknesses, in standard widths of 50" (1270 mm) and 62" (1575 mm) and standard lengths of 122", 146" and 196" (3099, 3708 and 4978 mm).

A range of custom sizes is available:
- Width - 32" - 62" (813 - 1575 mm)
- Length - 76" - 24' 2" (1930 - 7366 mm)

FINISHES
• Lumiflon® FEVE resin based fluoropolymer coil coat meets performance requirements of AAMA 2605 (standard)
• Kynar® PVDF resin based fluoropolymer coil coat meets performance requirements of AAMA 2605 (custom)
• Polyester
• Class I anodized - Clear, along with other colors

Standard ALPOLIC with Lumiflon FEVE fluoropolymer finishes are available in a broad spectrum of gloss levels from 30 - 70%. Contact the manufacturer for minimum quantities and availability. Lumiflon, in its ambient cure spray product, allows close-matching field touch-up and recoat.

A-LOOK Series offers an array of reflective surfaces for interior and exterior application. Stocked colors are chrome, gold and bronze.

Stone Series is a simulated stone fluoropolymer finish combined with fluoropolymer colors in white marble and red, pink, white and black granite finishes.

ALPOLIC Lumiflon FEVE colors are available in full gloss range with minimum 1000 ft² (93 m²) coil coated orders. Allow 8 weeks for shipment of custom colors.

Complete custom color matching, available in ALPOLIC Lumiflon FEVE coatings, is subject to minimum order quantities. A selection of stock fluoropolymer colors is available in a quick ship program in 4 mm panel thickness.

Quick Ship stock 4 mm thick ALPOLIC panel selections. Contact Mitsubishi Plastics Composites America, Inc. (MPCA) customer service for color and size availability.

SHAPES & FABRICATION
ALPOLIC panels can be cut, routed and formed with conventional woodworking tools. Angle bends are formed by routing the back of the panel prior to shaping. The common pan shape is formed by routing the back edges, trimming the corners and bending and reinforcing the edges.

ALPOLIC can be rolled on a pyramid or 4-stand roll bender to a curved shape for curved corners or column covers. Bumping on a press brake also can be used to produce a curved surface.

The bending radius of ALPOLIC 4 mm panels is as small as 2" (51 mm). Corner radii can be detailed as small as 1/8" (3.2 mm) using the back routed method described in ALPOLIC literature.

4. Technical Data
APPLICABLE STANDARDS
ASTM International
• ASTM C297 Standard Test Method for Tensile Strength on Flat Sandwich Constructions in Flatwise Plane
• ASTM D635 Standard Test Method for Rate of Burning and/or Extent and Time of Burning of Self-Supporting Plastics in a Horizontal Position
• ASTM D696 Standard Test Method for Coefficient of Linear Thermal Expansion of Plastics Between -30°C and 30°C With a Vitreous Silica Dilatometer
• ASTM D1781 Standard Test Method for Climbing Drum Peel for Adhesives
• ASTM D1929 Standard Test Method for Determining Ignition Temperature of Plastics
• ASTM E8 Standard Test Method for Tension Testing of Metallic Materials
• ASTM E72 Standard Test Methods for Conducting Strength Tests of Panels for Building Construction
• ASTM E84 Standard Test Method for Surface Burning Characteristics of Building Materials
• ASTM E108 (Modified) Standard Test Methods for Fire Tests of Roof Coverings
• ASTM E283 Standard Test Method for Determining the Rate of Air Leakage Through Exterior Windows, Curtain Walls, and Doors Under Specified Pressure Difference Across the Specimen
• ASTM E330 Standard Test Method for Structural Performance of Exterior Windows, Curtain Walls, and Doors by Uniform Static Air Pressure Difference
• ASTM E331 Standard Test Method for Water Penetration of Exterior Windows, Curtain Walls, and Doors by Uniform Static Air Pressure Difference
• ASTM E413 Standard Classification for Rating Sound Insulation

APPROVALS
ALPOLIC® Aluminum Faced Composite Panel meets the following standards:

- International Building Code (IBC)
- Underwriters Laboratories (UL): UL94, UL879
- Miami Dade NOA
- Florida Building Code

PHYSICAL/CHEMICAL PROPERTIES
See Table 1.

FIRE PERFORMANCE
See Table 2.

5. INSTALLATION
PREPARATORY WORK
The manufacturer recommends field measurement prior to fabrication. Verify alignment of surfaces to receive panels.

APPLICATION
ALPOLIC surfaces can be attached to one another or to other materials by conventional methods of attachment - rivets, bolts or screws. For interior installation, flat surfaces of ALPOLIC can be attached to substrates such as gypsum board using double-faced tape or non-hardening adhesive.

PRECAUTIONS
ALPOLIC panels are prefinished architectural products requiring care in handling to avoid damage to the finish. Handle, store, install and clean panels following the manufacturer’s instructions. Comply with manufacturer’s recommendations regarding expansion and contraction in detailing and installing ALPOLIC.

6. AVAILABILITY & COST

AVAILABILITY
ALPOLIC panels are available worldwide through the regional offices of Mitsubishi Plastics Composites America, Inc. Contact Mitsubishi for the location of an area ALPOLIC representative.

COST
Contact the area representative or the Mitsubishi Plastics Composites America, Inc, home office

<table>
<thead>
<tr>
<th>TABLE 1  PHYSICAL PROPERTIES</th>
<th>ALPOLIC</th>
<th>A-LOCK</th>
</tr>
</thead>
<tbody>
<tr>
<td>Properties</td>
<td>4 mm</td>
<td>6 mm</td>
</tr>
<tr>
<td>Aluminum thickness, in (mm)</td>
<td>0.020 (0.5)</td>
<td>0.020 (0.5)</td>
</tr>
<tr>
<td>Weight, psf (kg/m²)</td>
<td>1.12 (5.5)</td>
<td>1.50 (7.32)</td>
</tr>
<tr>
<td>Coefficient of expansion, ASTM D696, in/lbf/°F</td>
<td>$13 \times 10^{-6}$</td>
<td>$13 \times 10^{-6}$</td>
</tr>
<tr>
<td>Tensile strength, ASTM E8, psi (MPa)</td>
<td>6913 (48)</td>
<td>4978 (35)</td>
</tr>
<tr>
<td>Yield strength, ASTM E8, psi (MPa)</td>
<td>6429 (44)</td>
<td>4466 (30)</td>
</tr>
<tr>
<td>Bending strength</td>
<td>13.5%</td>
<td>17.5%</td>
</tr>
<tr>
<td>Thermal Conductance, ASTM C177b, Btu/(ft² x h x °F) (W/(m² x K))</td>
<td>10.75 (18)</td>
<td>8.53 (14)</td>
</tr>
<tr>
<td>Minimum Drum peel, ASTM D1781, in-lb/in(N-mm/mm)</td>
<td>22.5 (100)</td>
<td>22.5 (100)</td>
</tr>
<tr>
<td>Thermal resistance, in² x h x °F/Btu (m² x K/W)</td>
<td>0.09 (0.016)</td>
<td>0.12 (0.021)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>TABLE 2  FIRE PERFORMANCE PROPERTIES</th>
<th>ALPOLIC</th>
</tr>
</thead>
<tbody>
<tr>
<td>Properties</td>
<td>4 mm</td>
</tr>
<tr>
<td>Smoke developed index</td>
<td>450 maximum</td>
</tr>
<tr>
<td>Flame spread index</td>
<td>25 maximum</td>
</tr>
<tr>
<td>Vertical transmission, ASTM E108 (modified)</td>
<td>Passed</td>
</tr>
<tr>
<td>Ignition temperature, ASTM D1929</td>
<td>-</td>
</tr>
<tr>
<td>Rash ignition</td>
<td>716° F (380° C)</td>
</tr>
<tr>
<td>Self-ignition</td>
<td>752° F (400° C)</td>
</tr>
<tr>
<td>Rate of burning, ASTM D635</td>
<td>CCI</td>
</tr>
</tbody>
</table>
for ALPOLIC pricing. Costs vary due to project size, finish selection and panel sizes.

7. Warranty
Contact the manufacturer for information on panel and finish warranties.

8. Maintenance
LUMIFLON FEVE fluoropolymer is a long-term, maintenance-free finish. Under normal exposure and use, it is self-cleaning through rain washing. Water flush or power washing with a mild detergent is recommended to remove heavy soil.

9. Technical Services
Contact ALPOLIC for technical assistance with design and specification or for the name of a nearby representative.

10. Filing Systems
• SmartBuilding Index (SBI)
• MANU-SPEC®
• Additional product information is available from the manufacturer.
PRODUCT DESCRIPTION
Rmax EVOMAXci is an energy-efficient thermal insulation board composed of a closed-cell polyisocyanurate (polyiso) foam core bonded to glass fiber reinforced aluminum foil facers on both sides. Glass fiber reinforcement on both faces of the board offer enhanced durability, dimensional stability and fire performance. The printed side, exposed to the exterior, has a robust 12mil facer with an aluminum reflective surface ensuring jobsite security and enhanced radiant heat protection. EVOMAXci utilizes a CFC, HCFC and HFC free blowing agent that has zero Ozone Depletion Potential (ODP) and negligible Global Warming Potential (GWP). This insulation has been tested in multiple NFPA 285 assemblies and is approved for use in exterior walls of buildings of any height, as described within the data sheet for EVOMAXci. EVOMAXci allows for optimum efficiency through multiple design options, ease of construction, a better building envelope and reduced energy usage. Providing a direct impact on the savings throughout the life of the building, EVOMAXci is an excellent choice for exterior commercial wall design.

PRODUCT BENEFITS
• Part of the overall design solution
• Installed continuously to reduce thermal bridging
• Meets R-value requirements with a thinner profile
• Blocks air and moisture
• Mold resistant per ASTM D3273 (no defacement)
• Reduces energy costs
• Reflective facer acts as a radiant barrier
• Lightweight and easy to install
• Reduces material and labor costs
• Tested per NFPA 285 without requiring exterior gypsum board or fire-stops around header openings
• Contributes toward LEED credits in the following categories:
  • Energy & Atmosphere
  • Materials & Resources

COMPLIANCES
• ASTM C1289 Type I, Class 1
• ASHRAE 90.1
• International Energy Conservation Code (IECC)
• International Building Code (IBC) Section 2603, Foam Plastic
• Tested per NFPA 285 to comply with Section 2603.5.5 of the IBC
• Class A Flame Spread and Smoke Developed Indices per IBC Chapter 8, Interior Finishes

THERMAL PROPERTIES/PRODUCT DATA
“R” means resistance to heat flow. The higher the R-value, the greater the insulating power.

<table>
<thead>
<tr>
<th>Nominal Thickness</th>
<th>Thermal R-Value1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Inches</td>
<td>°F•ft²•hr/Btu</td>
</tr>
<tr>
<td>1.00</td>
<td>6.5</td>
</tr>
<tr>
<td>1.20</td>
<td>7.9</td>
</tr>
<tr>
<td>1.50</td>
<td>10.0</td>
</tr>
<tr>
<td>2.00</td>
<td>13.1</td>
</tr>
<tr>
<td>2.50</td>
<td>16.7</td>
</tr>
<tr>
<td>3.00</td>
<td>20.3</td>
</tr>
<tr>
<td>3.50</td>
<td>23.9</td>
</tr>
<tr>
<td>4.00</td>
<td>27.4</td>
</tr>
<tr>
<td>4.50</td>
<td>31.0</td>
</tr>
</tbody>
</table>

1Thermal values are determined by using ASTM C518 test method at 75°F mean temperature on material conditioned according to PIMA Technical Bulletin No. 101. NOTE: EVOMAXci is shipped in bundles that are approximately 48 inches high and wrapped in plastic for easy handling.

Visit [www.rmax.com](http://www.rmax.com) for a complete list of thicknesses and packaging information.
TYPICAL PHYSICAL PROPERTIES

Physical properties shown are based on data obtained under controlled conditions and are subject to normal manufacturing tolerances.

<table>
<thead>
<tr>
<th>Property</th>
<th>Test Method</th>
<th>Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>Density, Overall, Nominal</td>
<td>ASTM D1622</td>
<td>2.0 pcf</td>
</tr>
<tr>
<td>Compressive Strength</td>
<td>ASTM D1621</td>
<td>25 psi</td>
</tr>
<tr>
<td>Flame Spread, Faced1</td>
<td>ASTM E84</td>
<td>25 or Less</td>
</tr>
<tr>
<td>Smoke Developed, Faced1</td>
<td>ASTM E84</td>
<td>&lt; 450</td>
</tr>
<tr>
<td>Water Vapor Transmission</td>
<td>ASTM E96</td>
<td>&lt; 0.03 perm</td>
</tr>
<tr>
<td>Water Absorption</td>
<td>ASTM C209</td>
<td>&lt; 0.2% Vol.</td>
</tr>
<tr>
<td>Dimensional Stability</td>
<td>ASTM D2126, 7 days, 158°F, 98% RH</td>
<td>&lt; 2% Linear Change</td>
</tr>
<tr>
<td>Reflectance Emittance</td>
<td>ASTM E408</td>
<td>0.96, 0.04</td>
</tr>
<tr>
<td>Air Permeance</td>
<td>ASTM E2178</td>
<td>&lt; 0.02 L/(s.m²)</td>
</tr>
<tr>
<td>Service Temperatures</td>
<td></td>
<td>-40°F to +250°F</td>
</tr>
</tbody>
</table>

1 Flame spread and smoke numbers are shown for comparison purposes only and are not intended to represent the performance of EVOMAXci and related components under actual fire conditions.

LIMITATIONS

EVOMAXci is not intended for use on surfaces subject to continuous or intermittent immersion in water. EVOMAXci is not a structural panel. It must not be used as a nailing base for any other building products. Furthermore, stud walls insulated with EVOMAXci must be properly braced for lateral loads according to the requirements of local Building Codes.

WARNING

Polyiso foam is an organic material which will burn when exposed to an ignition source of sufficient heat and intensity and may contribute to flames spreading.

WARRANTY

See Rmax “Sales Policy” and “Fifteen Year Limited Thermal Warranty” for specific terms and conditions. Rmax does not assume any responsibility or liability for the performance of any products other than those sold by Rmax. **NOTE: All Rmax products must be tarped, placed on skids and kept dry before and throughout construction.**
## WALL COMPONENTS

<table>
<thead>
<tr>
<th>COMPONENT</th>
<th>MATERIALS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Base Wall</td>
<td>• Steel studs (3 5/8&quot; 20GA min) with interior gypsum wallboard (1/2&quot; min)</td>
</tr>
<tr>
<td></td>
<td>• Concrete or concrete masonry wall</td>
</tr>
<tr>
<td>Floor Line</td>
<td>• Mineral fiber insulation (4 pcf)</td>
</tr>
<tr>
<td>Fire-Stopping</td>
<td>• None</td>
</tr>
<tr>
<td></td>
<td>• Any non-combustible insulation</td>
</tr>
<tr>
<td>Cavity Insulation</td>
<td>• None</td>
</tr>
<tr>
<td></td>
<td>• Mineral fiber or fiberglass (faced or unfaced)</td>
</tr>
<tr>
<td>Exterior Sheathing</td>
<td>• None</td>
</tr>
<tr>
<td></td>
<td>• Exterior gypsum sheathing (1/2&quot; min)</td>
</tr>
<tr>
<td>WRB Over Sheathing</td>
<td>• BASF Enershield®-HP or Enershield®-I</td>
</tr>
<tr>
<td></td>
<td>• Dow WEATHERMATE™ or WEATHERMATE™ Plus</td>
</tr>
<tr>
<td></td>
<td>• Carlisle Barritech™ NP, Barritech™ VP or Fire Resist 705FR-A</td>
</tr>
<tr>
<td></td>
<td>• Henry Air-Bloc® 17, Air-Bloc® 21MR, Air-Bloc® 31MR, Air-Bloc® 33MR, BlueSkin® SA, BlueSkinVP™160, EnviroCap, FOILSKIN® or Metal Clad</td>
</tr>
<tr>
<td>Exterior Insulation</td>
<td>• Cladding Option 1-6 (non-open joint): EVOMAXci, 4.5&quot; max</td>
</tr>
<tr>
<td>WRB Over Insulation</td>
<td>• For use with all cladding options (any installation technique)</td>
</tr>
<tr>
<td></td>
<td>◦ None</td>
</tr>
<tr>
<td></td>
<td>◦ Tape over insulation joints (6&quot; max)</td>
</tr>
<tr>
<td></td>
<td>◦ Rmax R-SEAL 3000; any asphalt or butyl based</td>
</tr>
<tr>
<td></td>
<td>◦ Carlisle Fire Resist 705FR-A</td>
</tr>
<tr>
<td></td>
<td>◦ Henry FOILSKIN® or Metal Clad</td>
</tr>
<tr>
<td>Exterior Cladding Options 1-6</td>
<td>• Brick, standard 4” clay brick with maximum 2” air gap</td>
</tr>
<tr>
<td></td>
<td>• Stucco, cement plaster (¾” min) and lath with optional secondary WRB (not asphaltic or self-adered butyl)</td>
</tr>
<tr>
<td></td>
<td>• Limestone (2” min)</td>
</tr>
<tr>
<td>Exterior Cladding Options 7-12</td>
<td>• Any MCM (aluminum, steel, copper) that has successfully passed NFPA 285</td>
</tr>
<tr>
<td></td>
<td>• Metal panel, uninsulated (aluminum, steel, copper)</td>
</tr>
<tr>
<td></td>
<td>• Fiber-cement siding, uninsulated</td>
</tr>
<tr>
<td></td>
<td>• Stone/Aluminum honeycomb composite building panels passing NFPA 285</td>
</tr>
<tr>
<td></td>
<td>• Stone Panels, Inc. StoneLite panel system</td>
</tr>
<tr>
<td>Window Headers</td>
<td>• Aluminum flashing (0.078” min)</td>
</tr>
<tr>
<td>Flashing</td>
<td>• Rmax R-SEAL 6000; any asphalt, acrylic or butyl based (12” max)</td>
</tr>
</tbody>
</table>
Details
ACMPANELWORX
Rain Screen System
PX - 10 DRY & PX - 20 WET
② INTERMEDIATE JOINT DETAIL

FRAMING AND A/V BARRIER

COMPOSITE PANEL

TYPICAL INTERMEDIATE CONNECTION W/ FILLER STRIP
③ JAMB TO WINDOW DETAIL- CONDITION 1
③ JAMB TO WINDOW DETAIL - CONDITION 2
4 BATTEN DETAIL

FRAMING AND A/V BARRIER

COMPOSITE PANEL

BATTEN PANEL

TYPICAL INTERMEDIATE CONNECTION W/ FILLER STRIP

1" 2 1/4" MIN.
FRAMING AND A/V BARRIER

COMPOSITE PANEL
TYPICAL END CONNECTION

METAL SILL FLASHING

2 1/4"

3/4"

⑤ BASE CONDITION DETAIL

ACM Panelworx
COMPOSITE ALUMINUM PANELS

PX-10 RAIN SCREEN SYSTEM
WWW.ACM PANELWORX.COM
ROOF SYSTEM
FLASHING
ROOF TERMINATION
OPTION 'A' SHOWN
A/V BARRIER
FRAMING
COMPOSITE PANELS

2 1/4" 24"

5/8"

15 3/4"

5/8"

7"

2 1/4"

TYPICAL INTERMEDIATE
CONNECTION W/ FILLER
STRIP

TYPICAL TERMINATION TO WALL
PANEL W/ FILLER STRIP

WEEP HOLES AT 32"
O/C W/ BUG SCREEN

⑥ ROOF, SOFFIT, AND CANOPY DETAIL- OPTION A

ACMpanelworx
COMPOSITE ALUMINUM PANELS

PX-10 RAIN SCREEN SYSTEM
WWW.ACMPANELWORX.COM
ROOF SYSTEM
FLASHING
ROOF TERMINATION
OPTION ‘B’ SHOWN
A/V BARRIER
FRAMING
COMPOSITE PANELS

2 1/4
5/8
15 3/4
5/8
7

TYPICAL INTERMEDIATE
CONNECTION W/ FILLER
STRIP
TYPICAL TERMINATION TO WALL
PANEL W/ FILLER STRIP

WEEP HOLES AT 32"
O/C W/ BUG SCREEN

(6) ROOF, SOFFIT, AND CANOPY DETAIL- OPTION B
FRAMING AND A/V BARRIER

COMPOSITE PANEL

TYPICAL JAMB CONNECTION W/ FILLER STRIP

RECOMMENDED CAULK JOINT AND FOAM ROPE

END OF RUN DETAIL
INSIDE CORNER DETAIL

5/8"

2 1/4" MIN.

FRAMING AND A/V BARRIER BY OTHERS

COMPOSITE PANEL BY ACM PANELWORX

TYPICAL INSIDE CORNER CONNECTION W/ FILLER STRIP
HEAD & SILL AT WINDOW DETAIL
③ JAMB TO WINDOW DETAIL- CONDITION 1

FRAMING AND AV BARRIER
COMPOSITE PANEL
TYPICAL JAMB CONNECTION W/ FLASHING

2 1/4" MIN.
③ JAMB TO WINDOW DETAIL- CONDITION 2

FRAMING AND AV BARRIER
COMPOSITE PANEL
TYPICAL JAMB CONNECTION W/ FLASHING

2 1/4" MIN.
4 BATTEN DETAIL
5) BASE CONDITION DETAIL
ROOF SYSTEM
FLASHING
ROOF TERMINATION OPTION 'A' ShOWN
A/V BARRIER
FRAMING
COMPOSITE PANELS

2 1/4" 24"

2 1/4" 15 3/4"

5/8"

5/8"

7"

TYPICAL INTERMEDIATE CONNECTION W/ WET JOINT
TYPICAL TERMINATION TO WALL PANEL W/ WET JOINT

WEEP HOLES AT 32" O/C W/ BUG SCREEN

⑥ ROOF, SOFFIT, AND CANOPY DETAIL- OPTION A

ACMpanelworx
COMPOSITE ALUMINUM PANELS
PX-20 RAIN SCREEN SYSTEM
WWW.ACM PANELWORX.COM
ROOF SYSTEM
FLASHING BY ACM PANELWORX
ROOF TERMINATION OPTION 'B' SHOWN
A/V BARRIER
FRAMING
COMPOSITE PANELS

⑥ ROOF, SOFFIT, AND CANOPY DETAIL- OPTION B

ACMpanelworx
COMPOSITE ALUMINUM PANELS
PX-20 RAIN SCREEN SYSTEM
WWW.ACMPANELWORX.COM
FRAMING AND A/V BARRIER

COMPOSITE PANEL

TYPICAL JAMB CONNECTION W/ WET JOINT

2 1/4" MIN.

END OF RUN DETAIL
INSIDE CORNER DETAIL

FRAMING AND A/V BARRIER

COMPOSITE PANEL

TYPICAL INSIDE CORNER CONNECTION W/ WET JOINT

5/8"

2 1/4" MIN.
ROUND COLUMN ENCLOSURE DETAIL

TYPICAL INTERMEDIATE CONNECTION W/ WET JOINT

COMPOSITE PANEL

COLUMN
SQUARE COLUMN ENCLOSURE DETAIL

2 1/4" MIN.

1"

FRAMING AND A/V

COMPOSITE PANEL

COLUMN

TYPICAL INTERMEDIATE CONNECTION W/ WET JOINT

ACMpanelworx
COMPOSITE ALUMINUM PANELS

PX-20 RAIN SCREEN SYSTEM
WWW.ACMPANELWORX.COM
2 INTERMEDIATE JOINT DETAIL
3 JAMB TO WINDOW DETAIL – CONDITION 1
JAMB TO WINDOW DETAIL – CONDITION 2
BATTEN DETAIL
5 BASE CONDITION DETAIL
6) ROOF, SOFFIT & CANOPY DETAIL – OPTION B
INSIDE CORNER DETAIL
9 CORNER DETAIL

AV BARRIER AND FRAMING

4MM COMPOSITE ALUMINUM PANELS

WEEP HOLES W/ BUG SCREEN

TYPICAL INTERMEDIATE CONNECTION W/ FILLER STRIP

2 1/4" MIN. TYP.
ROUND COLUMN ENCLOSURE DETAIL
11 SQUARE COLUMN ENCLOSURE DETAIL
1 HEAD & SILL AT WINDOW DETAIL
2 1/4" MIN.
TYP.

5/8"

TYPICAL JAMB CONNECTION W/ BACKER ROD & CALKING

AV BARRIER AND FRAMING

4MM COMPOSITE ALUMINUM PANELS

② INTERMEDIATE JOINT DETAIL
3. JAMB TO WINDOW DETAIL – CONDITION 1
3 JAMB TO WINDOW DETAIL — CONDITION 2
4 BATTEN DETAIL
5 BASE CONDITION DETAIL

4MM COMPOSITE ALUMINUM PANELS

AV BARRIER AND FRAMING

2 1/4" MIN TYP.

3/4"

SILL FLASHING
ROOF, SOFFIT & CANOPY DETAIL – OPTION A
ROOF, SOFFIT & CANOPY DETAIL – OPTION B
7 END OF RUN DETAIL
INSIDE CORNER DETAIL

TYPICAL JAMB CONNECTION W/ BACKER ROD & CALKING

2 1/4" MIN. TYP.

A/V BARRIER AND FRAMING

4MM COMPOSITE ALUMINUM PANELS

EVO WET RAIN SCREEN SYSTEM

357 CROFT DRIVE
TECUISAN, ON
N9N 2L9
TEL: (519) 739-2380
FAX: (519) 739-1609
E: info@acmpanelworx.com

DRAWN BY
RJL

DATE
05.09.2016
9 CORNER DETAIL

4MM COMPOSITE ALUMINUM PANELS

WEEP HOLES W/ BUG SCREEN

2 1/4" MIN. TYP.

A/V BARRIER AND FRAMING

TYPICAL JAMB CONNECTION W/ BACKER ROD & CALUXING

5/8"
11  SQUARE COLUMN ENCLOSURE DETAIL
Specifications
This MANU-SPEC® utilizes the Construction Specifications Institute (CSI) Project Resource Manual (PRM), including MasterFormat™, SectionFormat™ and PageFormat™. A MANU-SPEC is a manufacturer-specific proprietary product specification using the proprietary method of specifying applicable to project specifications and master guide specifications. Optional text is indicated by brackets []; delete optional text in final copy of specification. Specifier Notes typically precede specification text; delete notes in final copy of specification. Trade/brand names with appropriate symbols typically are used in Specifier Notes; symbols are not used in specification text. Metric conversion, where used, is soft metric conversion.

This MANU-SPEC specifies composite metal panels for exterior and interior applications marketed under the ALPOLIC® trade name by Mitsubishi Plastics Composites America, Inc. Revise MANU-SPEC section number and title below to suit project requirements, specification practices and section content. Refer to CSI MasterFormat for other section numbers and titles.

SECTION 07 42 13
METAL WALL PANELS

PART 1 GENERAL

1.01 SUMMARY

A. Section Includes: Composite Metal panels.
   1. Applications of composite metal panels include:
      a. Exterior installation of composite metal panels.
      b. Interior installation of composite metal panels.

Specifier Note: Revise Paragraph below to suit project requirements. Add section numbers and titles per CSI MasterFormat and specifier’s practice.

B. Related Sections: Section(s) related to this section include:
   1. Cold-Formed Metal Framing: Division 05 Cold-Formed Metal Framing Sections.
   2. Sheet Metal Flashing and Trim: Division 07 Flashing and Sheet Metal Sections.
   5. Glazing: Division 08 Glass and Glazing Section.
   6. Metal Framed Curtain Wall: Division 08 Glazed Curtain Wall Sections.

Specifier Note: Article below can be omitted when specifying manufacturer’s proprietary products and recommended installation. Retain Reference Article when specifying products and installation by an industry reference standard. If retained, list standard(s) referenced in this section. Indicate issuing authority name, acronym, standard designation and title. Establish policy for indicating edition date of standard referenced. Conditions of the Contract or Division 01 References Section may establish the edition date of standards. This Article does not require compliance with standard, but is merely a listing of references used. Article below should list only those industry standards referenced in this section.

1.02 REFERENCES

A. General: Standards listed by reference, including revisions by issuing authority, form a part of this specification section to the extent indicated. Standards listed are identified by issuing authority, authority abbreviation, designation number, title or other designation established by issuing authority. Standards subsequently referenced herein are referred to by issuing authority abbreviation and standard designation.

B. ASTM International (ASTM):

C. American Architectural Manufacturers Association (AAMA):

D. Underwriters Laboratories Inc. (UL):
   1. UL 94 Standard for Flammability of Plastic Materials for Parts in Devices and Appliances.

E. International Organization for Standardization (ISO):

Specifier Note: Article below should be restricted to statements describing design or performance requirements and functional, not dimensional, tolerances of a complete system. Limit descriptions to composite and operational properties to extent necessary to link multiple components of a system and to interface with other systems.

1.03 SYSTEM DESCRIPTION

Specifier Note: Edit Paragraph below to suit project requirements.

A. Performance Requirements: Provide composite metal panels which have been manufactured, fabricated and installed to withstand loads from deflection and thermal movement and to maintain performance criteria stated by manufacturer without defects, damage or failure.

Specifier Note: Three subparagraphs below are generally applicable only to curtain wall systems and large wall areas. Delete this Article altogether, or modify it as appropriate for simple composite panel installations. Alternatively, refer to system manufacturer’s technical data for additional details. Edit text to suit project requirements; add text for performance criteria as applicable below.

B. Deflection and Thermal Movement: Provide systems that have been tested and certified to conform to the following criteria under wind loading of [Specify test loading] psf (___ kPa) inward and [Specify test loading] psf (___ kPa) outward:
   1. Normal Deflection: Deflection of perimeter framing member not to exceed L/175 normal to plane of the wall; deflection of individual panels not to exceed L/60.
   2. Anchor Deflection: At connection points of framing members to anchors, anchor deflection in any direction not to exceed 1/16 inch (1.6 mm).
   3. Thermal Movements: Allow for free horizontal and vertical thermal movement, due to expansion and contraction of components over a temperature range from [Specify temperature range] (___ – ___ degrees F) (___ – ___ degrees C).
      a. Buckling, opening of joints, undue stress on fasteners, failure of sealants, or any other detrimental effects of thermal movement will not be permitted.
      b. Fabrication, assembly and erection procedures shall take into account the ambient temperature range at the time of the respective operation.

C. Water and Air Leakage: Provide systems that have been tested and certified to conform to the following criteria:
   1. Air Leakage (ASTM E283): Not more than 0.06 (cfm)/sf of wall area (0.003 (L/s) m²), when tested at 1.57 psf (0.075 kPa).
   2. Water Penetration (ASTM E331): No water infiltration under static pressure at a differential of 10% of inward acting design load, 6.24 psf (0.299 kPa) minimum, after 15 minutes.
      a. Water penetration is defined as the appearance of uncontrolled water in the wall.
      b. Wall design shall feature provisions to drain to the exterior face of the wall any leakage of water at joints and any condensation that may occur within the construction.

D. Structural: Provide systems that have been tested in accordance with ASTM E330 at a design pressure of [Specify pressure] psf (___ kPa) and have been certified to be without permanent deformation or failures of structural members.

Specifier Note: Article below includes submittal of relevant data to be furnished by Contractor before, during or after construction. Coordinate this Article with Architect’s and Contractor’s duties and responsibilities in Conditions of the Contract and Division 01 Submittal Procedures Section.

1.04 SUBMITTALS

A. General: Submit listed submittals in accordance with Conditions of the Contract and Division 01 Submittal
Procedures Section.

B. Product Data: Submit product data, including manufacturer’s SPEC-DATA product sheet, for specified products.

C. Shop Drawings: Submit shop drawings showing layout, profiles and product components, including anchorage, accessories, finish colors and textures.
   1. Include details showing thickness and dimensions of the various system parts, fastening and anchoring methods, locations of joints and gaskets and location and configuration of joints necessary to accommodate thermal movement.

D. Samples: Submit selection and verification samples for finishes, colors and textures.
   1. Selected Samples: Manufacturer’s color charts or chips illustrating full range of colors, finishes and patterns available for composite metal panels with factory-applied finishes.
   2. Verification Samples:
      a. Structural: 12 inch × 12 inch (305 × 305 mm) sample composite panels in thickness specified, from an available stock color, including clips, anchors, supports, fasteners, closures and other panel accessories, for assembly approval. Include panel assembly samples not less than 24 inches × 24 inches (610 × 610 mm), showing 4-way joint.
      b. Include separate sets of draw down samples on aluminum substrate, not less than 3 inches × 5 inches (76 × 127 mm), of each color and finish selected, for color approval. Larger samples of standard colors are available with production applied coatings.

E. Quality Assurance Submittals: Submit the following:
   1. Test Reports: Certified test reports showing compliance with specified performance characteristics and physical properties.
   2. Certificates: Product certificates signed by manufacturer certifying materials comply with specified performance characteristics and physical requirements.
   3. Manufacturer’s Instructions: Manufacturer’s installation instructions.
   4. Manufacturer’s Field Reports: Manufacturer’s field reports.

F. Closeout Submittals: Submit the following:
   1. Warranty: Warranty documents specified herein.

Specifier Note: Article below should include prerequisites, standards, limitations and criteria that establish an overall level of quality for products and workmanship for this section. Coordinate Article below with Division 01 Quality Assurance Section.

1.05 QUALITY ASSURANCE

A. Qualifications:
   1. Installer Qualifications: Installer experienced in performing work of this section who has specialized in the installation of work similar to that required for this project.

Specifier Note: Retain Paragraph below to suit project requirements; otherwise, delete Paragraph below.

   2. Manufacturer Qualifications: Company with a minimum of 5 years of continuous experience manufacturing panel material of the type specified:
      a. Able to provide specified warranty on finish.
      b. Able to provide a list of 5 other projects of similar size, including approximate date of installation and the name of the Architect for each.
      c. Able to produce the composite material without outsourcing of coating or lamination process.
      d. Able to provide certificate of registration of ISO 9001-2000.
   3. Fabricator Qualifications: Company with at least 3 years of experience on similar sized metal panel projects and qualified by the panel material manufacturer. Capable of providing field service representation during construction.

Specifier Note: Retain Paragraph below for erected assemblies, either onsite or offsite, required for review of construction, coordination of work of several sections, testing or observation of operation. Mock-ups establish standards by which work will be judged. Coordinate below with Division 01 Quality Control, Mock-Up Requirements Section.

B. Mock-Ups: Install at project site a job mock-up using acceptable products and approved installation methods. Obtain Owner’s and Architect’s acceptance of finish color (draw down samples to be used for color approval of nonstandard coil coated colors), texture and pattern and workmanship standard. Comply with Division 01 Quality Control, Mock-Up Requirements Section.
Specify Note: Edit Paragraph below to specifying mock-up size.

1. Mock-up Size: [Specify size].
2. Maintenance: Maintain mock–up during construction for workmanship comparison; remove and legally dispose of mock-up when no longer required.
3. Incorporation: Mock-up may be incorporated into final construction upon Owner's approval.

Specifier Note: Coordinate Paragraph below with Division 01 Project Management and Coordination, Project Meetings Section.

C. Preinstallation Meetings: Conduct preinstallation meeting to verify project requirements, substrate conditions, installation instructions and warranty requirements. Comply with Division 01 Project Management and Coordination, Project Meetings Section.

D. Field Quality Control: Comply with panel system manufacturer’s recommendations and guidelines for field forming of panels.

Specifier Note: Article below should include special and unique requirements. Coordinate Article below with Division 01 Product Requirements Section.

1.06 DELIVERY, STORAGE & HANDLING

A. General: Comply with Division 01 Product Requirements Sections.
B. Ordering: Comply with manufacturer’s ordering instructions and lead time requirements to avoid construction delays.
C. Delivery: Deliver materials in manufacturer’s original, unopened, undamaged containers with identification labels intact.
   1. Protection: Protect finish of panels by applying heavy duty removable plastic film during production.
   2. Delivery: Package composite wall panels for protection against transportation damage. Provide markings to identify components consistently with drawings.
   3. Handling: Exercise care in unloading, storing and installing panels to prevent bending, warping, twisting and surface damage.
D. Storage and Protection: Store materials protected from exposure to harmful weather conditions and at temperature conditions recommended by manufacturer.
   1. Storage: Store panels in well-ventilated space out of direct sunlight.
      a. Protect panels from moisture and condensation with tarpaulins or other suitable weathertight covering installed to provide ventilation.
      b. Slope panels to ensure positive drainage of any accumulated water.
      c. Do not store panels in any enclosed space where ambient temperature can exceed 120 degrees F (49 degrees C).
   2. Damage: Avoid contact with any other materials that might cause staining, denting or other surface damage.

1.07 PROJECT CONDITIONS

A. Field Measurements: Verify actual measurements/openings by field measurements before fabrication; show recorded measurements on shop drawings. Coordinate field measurements, fabrication schedule with construction progress to avoid construction delays.

Specifier Note: Coordinate Article below with Conditions of the Contract and with Division 01 Closeout Submittals, Warranty Section.

1.08 WARRANTY

A. Project Warranty: Refer to Conditions of the Contract for project warranty provisions.
B. Manufacturer’s Warranty: Submit, for Owner’s acceptance, manufacturer’s standard warranty document executed by authorized company official. Manufacturer’s warranty is in addition to and not a limitation of, other rights Owner may have under the Contract Documents.

Specifier Note: Coordinate Paragraph below with manufacturer’s warranty requirements.

1. Warranty Period:
   a. Panel Integrity: 10 years commencing on Date of Substantial Completion.
   b. Finish: [Specify number of years] commencing on Date of Substantial Completion.

PART 2 PRODUCTS

Specifier Note: Retain Article below for proprietary method specification. Add product attributes, performance characteristics, material standards and descriptions as applicable. Use of such phrases as "or equal" or "or approved equal" or similar phrases
may cause ambiguity in specifications. Such phrases require verification (procedural, legal and regulatory) and assignment of responsibility for determining “or equal” products.

2.01 COMPOSITE METAL PANELS
   A. Manufacturer: Mitsubishi Plastics Composites America, Inc.

Specifier Note: Paragraph below is an addition to CSI SectionFormat and a supplement to MANU-SPEC. Retain or delete Paragraph below per project requirements and specifier’s practice.

   1. Contact: 401 Volvo Parkway, Chesapeake, VA 23320; Telephone (800) 422-7270; Fax: (757) 436-1896; E-mail: info@alpolic.com; website: www.alpolic-northamerica.com.

B. Proprietary Product: ALPOLIC Composite Metal Panels.
   1. Approved Fabricator - Acmpanelworx Inc.
      357 Croft Drive., Tecumseh, Ontario N8n-2L9, telephone (519) 739-2380; fax (519) 739-1609; e-mail mark@acmpanelworx.com; website www.acmpanelworx.com.

Specifier Note: Edit Paragraph below to suit project requirements. If substitutions are permitted, edit text below. Add text to refer to Division 01 Project Requirements, Product Substitutions Procedures Section.

2.02 PRODUCT SUBSTITUTIONS
   A. Substitutions: No substitutions permitted.

Specifier Note: Retain article below for alternates required for project; state wall panel work covered by alternate. Coordinate with Part 1 General Summary Article herein, applicable Division 01 Sections, and other Bid and Contract Documents. Consult Mitsubishi Plastics Composites America/ALPOLIC on the use of alternates. Delete article below if alternates are not required.

2.03 ALTERNATES
   A. Contract Provisions and Division 01 Requirements: [Specify coordination with provisions and requirements].
   B. Alternates:
      1. Base Bid/Contract Manufacturer: [Specify base bid/contract manufacturer].
         a. Product: [Specify product base bid/contract brand/trade name with product attributes and characteristics].
      2. Alternate No. [Specify #]: [Specify alternate manufacturer].
         a. Product: [Specify product alternate brand/trade name with product attributes and characteristics].
      3. Alternate No. [Specify #]: [Specify alternate manufacturer].
         a. Product: [Specify product alternate brand/trade name with product attributes and characteristics].

2.04 COMPOSITE METAL PANEL MATERIALS
   A. Composite Metal Panels:
      1. Core: Thermoplastic material that meets performance characteristics specified when fabricated into composite assembly.
      2. Face Sheets: Aluminum alloy 3105 H14, 0.020 inch (0.51 mm) thick and as follows: [Choose coil or spray as applicable to quantity].
         a. Coil coated with a fluoropolymer paint finish that meets or exceeds values expressed in AAMA 2605 where relevant to coil coatings.
      3. Bond Integrity: Tested for resistance to delamination as follows:
         a. Peel Strength (ASTM D1781): 22.5 in-lb/in (100 N-m/m) minimum.
         b. No degradation in bond performance after 8 hours of submersion in boiling water and after 21 days of immersion in water at 70 degrees F (21 degrees C).
      4. Fire Performance:
         a. Flamespread (ASTM E84): 25 maximum (4 and 6 mm).
         b. Smoke Developed (ASTM E84): 450 maximum (4 and 6 mm).
         c. Surface Flammability (Modified ASTM E108): Pass (4 and 6 mm).
         d. V-O Rating (4 mm): Comply with UL 94.

Specifier Note: Delete Paragraph above and retain following paragraph for quantities less than 2000 ft² (186 m²).

   b. Spray coated with specified finish [Less than 1000 ft² (93 m²) quantities].
   c. Thermally bonded in a continuous process, under tension, to the core material.

3. Bond Integrity: Tested for resistance to delamination as follows:
   a. Peel Strength (ASTM D1781): 22.5 in-lb/in (100 N-m/m) minimum.
   b. No degradation in bond performance after 8 hours of submersion in boiling water and after 21 days of immersion in water at 70 degrees F (21 degrees C).

4. Fire Performance:
   a. Flamespread (ASTM E84): 25 maximum (4 and 6 mm).
   b. Smoke Developed (ASTM E84): 450 maximum (4 and 6 mm).
   c. Surface Flammability (Modified ASTM E108): Pass (4 and 6 mm).
   d. V-O Rating (4 mm): Comply with UL 94.
B. Production Tolerances:
1. Width: +/- 2 mm.
2. Length: +/- 4 mm.
3. Thickness (4 mm Panel): +/- 0.008 inch (0.2 mm).
4. Thickness (6 mm Panel): +/- 0.012 inch (0.3 mm).
5. Bow: Maximum 0.5% length or width.
6. Squareness: Maximum 0.2 inch (5 mm).
7. Edges of sheets shall be square and trimmed.

Specifier Note: Edit Paragraph below. Select required panel thickness.

C. Panel Thickness: [4 mm] [6 mm].

2.05 ACCESSORIES
A. General: Provide fabricator’s standard accessories, including fasteners, clips, anchorage devices and attachments.

2.06 RELATED MATERIALS
A. General: Refer to other related sections for related materials, including cold-formed metal framing, flashing and trim, joint sealers, aluminum windows, glass and glazing and curtain walls.

2.07 FABRICATION
A. General: Shop fabricate to sizes and joint configurations indicated on the drawings.
1. Where final dimensions cannot be established by field measurements, provide allowance for field adjustment as recommended by the fabricator.
2. Form panel lines, breaks and angles to be sharp and true, with surfaces that are free from warp or buckle.
3. Fabricate with sharply cut edges, with no displacement of aluminum sheet or protrusion of core.

2.08 FINISHES
Specifier Note: Retain or delete Paragraph below per project requirements. Refer to manufacturer’s SPEC-DATA® sheet for availability of finishes and colors.

A. Factory Finish: A fluoropolymer paint finish that meets or exceeds values expressed in AAMA 2605 where relevant to coil coatings.

2.09 SOURCE QUALITY
A. Source Quality: Obtain composite panel products from a single manufacturer.

PART 3 EXECUTION
Specifier Note: Article below is an addition to the CSI SectionFormat and a supplement to MANU-SPEC. Revise Article below to suit project requirements and specifier’s practice.

3.01 MANUFACTURER’S INSTRUCTIONS
A. Compliance: Comply with manufacturer’s product data, including product technical bulletins, product catalog installation instructions and product carton instructions.

3.02 EXAMINATION
A. Site Verification of Conditions: Verify that substrate conditions are acceptable for product installation.

3.03 PREPARATION
A. Adjacent Surfaces Protection: Protect adjacent work areas and finish surfaces from damage during product installation.

Specifier Note: Coordinate Article below with fabricator’s recommended installation details.

3.04 INSTALLATION
A. General:
1. Install panels plumb, level and true, in compliance with fabricator’s recommendations.
2. Anchor panels securely in place, in accordance with fabricator’s approved shop drawings.
3. Comply with fabricator’s instructions for installation of concealed fasteners and with provisions of Section 07 90 00 for installation of joint sealers.
4. Installation Tolerances: Maximum deviation from horizontal and vertical alignment of installed panels: 0.25 inch (6.4 mm) in 20 feet (6.1 m), non-cumulative.
3.05 FIELD QUALITY REQUIREMENTS
Specifier Note: Edit Paragraph below. Establish number and duration of periodic site visits with Owner and fabricator, and specify below. Consult fabricator for services required. Coordinate Paragraph below with Division 01 Quality Assurance Section. Delete if fabricator’s field service not required.

A. Fabricator’s Field Services: Upon Owner’s request, provide fabricator’s field service consisting of product use recommendations and periodic site visit for inspection of product installation in accordance with fabricator’s instructions.
Specifier Note: Coordinate below Article with Division 01 Execution Requirements, Starting and Adjusting, Cleaning and Protecting Installed Construction Section.

3.06 ADJUSTING

A. Adjusting:
1. Repair panels with minor damage such that repairs are not discernible at a distance of 10 feet (3.1 m).
2. Remove and replace panels damaged beyond repair.
3. Remove protective film immediately after installation of joint sealers and immediately prior to completion of composite metal panel work.
4. Remove from project site damaged panels, protective film and other debris attributable to work of this section.
Specifier Note: Coordinate Article below with Division 01 Execution Requirements, Cleaning Section.

3.07 CLEANING

A. Cleaning: Remove temporary coverings and protection of adjacent work areas. Repair or replace damaged installed products. Clean installed products in accordance with manufacturer’s instructions prior to Owner’s acceptance. Remove construction debris from project site and legally dispose of debris.
Specifier Note: Coordinate Article below with Division 01 Execution Requirements Section.

3.08 PROTECTION

A. Protection: Protect installed product’s finish surfaces from damage during construction.
1. Institute protective measures as required to ensure that installed panels will not be damaged by work of other trades.

END OF SECTION
PERFORMANCE EVALUATION OF THE "PX-10 DRY JOINT PANEL SYSTEM" IN ACCORDANCE WITH AAMA 508-14 FOR PRESSURE EQUALIZATION BEHAVIOR & WATER PENETRATION RESISTANCE

Report to: ACM Panelworx Inc.
357 Craft Drive
Tecumseh, ON
N8N 2L9

Attention: Mr. Mark Mikalj

Telephone: 519-739-2380
E-mail: mark@acmpanelworx.com

Report No.: 15-06-M0059
8 Pages, 3 Appendices

Proposal No.: 14-006-317568

Date: May 8, 2015
1.0 INTRODUCTION

At the request of ACM Panelworx Inc., Exova was retained to evaluate the “PX-10 Dry Joint Panel System” exterior wall panel system in accordance with AAMA 508-14 for pressure equalization behavior, water penetration and structural resistance as outlined in Proposal number 14-006-317568.

Upon receipt, the specimen was assigned the following Exova Specimen Number:

<table>
<thead>
<tr>
<th>Client Specimen Description</th>
<th>Exova Specimen No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>PX-10 Dry Joint Panel System</td>
<td>15-06-M0059</td>
</tr>
<tr>
<td>(‘T’ Panel Scheme / 3 panels, not individually pressure isolated)</td>
<td></td>
</tr>
</tbody>
</table>

2.0 PROCEDURE

<table>
<thead>
<tr>
<th>Test Description</th>
<th>Test Method</th>
</tr>
</thead>
<tbody>
<tr>
<td>Voluntary Test Method and Specification for Pressure Equalized Rain Screen Wall Cladding Systems – Pressure Equalization Behaviour</td>
<td>AAMA 508-14, Section 5.5 – Referencing ASTM E1233 (Modified)</td>
</tr>
<tr>
<td>Voluntary Test Method and Specification for Pressure Equalized Rain Screen Wall Cladding Systems – Water Penetration Resistance</td>
<td>AAMA 508-14, Section 5.6 – Referencing ASTM E334</td>
</tr>
<tr>
<td>Voluntary Test Method and Specification for Pressure Equalized Rain Screen Wall Cladding Systems – Dynamic Water Test</td>
<td>AAMA 508-14, Section 5.7 – Referencing AAMA 501.1-05</td>
</tr>
</tbody>
</table>

Note: SI units are the primary units of measure.

Test Wall Section Description & Details:

The back-up test wall section (air / water barrier) was constructed in an Exova test frame as per the detail drawing below in accordance with AAMA 508-14, Section 5.0:

![Figure 1 – Back-up Test Wall Framing Construction](image-url)
Upon completion of the back-up wall, the Plexiglas joints and screw-heads were sealed to ensure the assembly was air-tight. After the air leakage validation for tightness was completed, as prescribed by AAMA 508-14, Section 5.2.2 & Figure 1A, three (3) mm diameter holes were introduced equally spaced 150 mm above horizontal seams and above the base of the mock-up in order for the air / water barrier to have an air leakage rate of 0.6 L/s·m².

The application of the cladding system on the test back-up wall was performed by ACM Panelworx Inc. authorized personnel on March 27, 2015. As permitted by AAMA 508-14, Note 5, the perimeter of the specimen was sealed to the fixture that the wall section was constructed into. No drainage/vent holes or critical areas of the specimen that would be affected by water infiltration / drainage or differential pressure were obstructed.

Using the procedure outlined in AAMA 508-14, Section 5.5, the pressure cycling tests were conducted as specified in ASTM E1233. However, ASTM E1233 was modified to incorporate a positive pressure from 240 Pa to 1200 Pa to 240 Pa based on a maximum average of three seconds for 100 cycles as per AAMA 508-14.

Upon completion of the pressure equalization behavior test, the AAMA 508-14, Section 5.6, water penetration test at 300 Pa for fifteen minutes was conducted.

Upon completion of the dynamic water penetration test as outlined in AAMA 508-14, Section 5.7, referencing AAMA 501.1-05, testing was conducted in accordance with AAMA 508-14, Section 5.8 referencing ASTM E330-00 for Structural Performance.

**Test Dates**

- Pressure Equalization Behaviour (AAMA 508-14, Section 5.5) | April 7, 2015
- Water Penetration Resistance (AAMA 508-14 Section 5.6) | April 7, 2015
- Dynamic Water Penetration Resistance (AAMA 508-14 Section 5.7) | April 11, 2015
- Structural Performance (AAMA 508-14 Section 5.8) | May 8, 2015

**Outdoor Conditions during Test (April 7, 2015):**

- Temperature: 20.6 °C
- Relative Humidity: 42.3 %RH
- Barometric Pressure: 102.8 kPa (*Environment Canada, Toronto Pearson International Airport*)
3.0 RESULTS

<table>
<thead>
<tr>
<th>Compartment Tested</th>
<th>Maximum External Gust Pressure of Pulse (Pa)</th>
<th>Maximum Cavity Pressure of Pulse (Pa)</th>
<th>Requirements</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Primary Compartment</td>
<td>1193</td>
<td>1219</td>
<td>Pressure differential on rain screen cladding shall not exceed 50% of maximum wind gust pressure</td>
<td>&lt; 0.08 seconds</td>
</tr>
</tbody>
</table>

Pressure equalization graphs are located in Figure 2.

- Air Leakage of Back-Up Wall (air / water barrier): 0.68 L/s m²
- Ratio of cavity volume to vent area (Upper Panels): 592.4 m³ / m²
- Ratio of cavity volume to vent area (Lower Panel): 293.7 m³ / m²
Table 2 – Static Water Penetration Resistance
AAMA 508-14, Section 5.6, Referencing ASTM E331-00 (2009)
Exova Specimen Number: 15-06-M0059

<table>
<thead>
<tr>
<th>Test Pressure (Pa)</th>
<th>Requirements</th>
<th>Results</th>
<th>Comments</th>
</tr>
</thead>
</table>
| 300 Pa (15-Minutes)| All water that penetrates the exterior rain screen cladding shall be controlled and drained to the exterior. All water that contacts the air/water barrier shall be visually observed and recorded:  
  a) Water mist or droplets on the air/water barrier surface; and/or  
  b) Water in continuous stream on the air/water barrier surface.  
Failure shall be defined as water mist or water droplets appearing in excess of 5% of the air/water barrier surface, or continuous streaming at any location on the air/water barrier. | No water mist and/or droplets were observed.  
No continuous streaming was observed. | Meets Requirement                           |

Table 5 – Water Penetration Resistance Using Dynamic Pressure
AAMA 508-14 Section 5.7, Referencing AAMA 501.1-05
Exova Specimen Number: 15-06-M0059

<table>
<thead>
<tr>
<th>Test Pressure (Pa)</th>
<th>Requirements</th>
<th>Test Results</th>
<th>Comment</th>
</tr>
</thead>
</table>
| 300 Pa (15-Minutes)| All water that penetrates the exterior rain screen cladding shall be controlled and drained to the exterior. All water that contacts the air/water barrier shall be visually observed and recorded:  
  a) Water mist or droplets on the air/water barrier surface; and/or  
  b) Water in continuous stream on the air/water barrier surface.  
Failure shall be defined as water mist or water droplets appearing in excess of 5% of the air/water barrier surface, or continuous streaming at any location on the air/water barrier. | No water mist and/or droplets were observed. | Meets Requirements             |

(2) 300 Pa = 22.1 m/s (or 50 mph / 80.5 km/h). Calculation based on the Ensewiler formula, where \( P = 0.613 \cdot V^2 \), \( V \) is m/s & \( P \) is N/m².
Table 3 – Support Wall Deflection Measurements - Infiltration
AAMA 508-14, Section 5.8, Referencing ASTM E330\(^{(1)}\)
Exova Specimen Number: 15-06-M0059

<table>
<thead>
<tr>
<th>Pressure Criteria</th>
<th>Test Pressure (Pa)</th>
<th>Gauge No. and Deflection (mm)</th>
<th>Net Deflection (Center Stud)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td><strong>Design Load</strong>(^{(1)})</td>
<td>1755 (37 psf)</td>
<td>-2.5</td>
<td>-0.2</td>
</tr>
<tr>
<td>Residual Deflection</td>
<td>-0.1</td>
<td>-0.4</td>
<td>-0.5</td>
</tr>
<tr>
<td><strong>150% Design Load</strong>(^{(2)})</td>
<td>2640 (55 psf)</td>
<td>-4.6</td>
<td>-1.2</td>
</tr>
<tr>
<td>Residual Deflection</td>
<td>0.2</td>
<td>-0.3</td>
<td>-0.3</td>
</tr>
</tbody>
</table>

* Gauge deflection locations found on the following page in Figure 3.

Table 4 – Support Wall Deflection Measurements - Exfiltration
AAMA 508-14, Section 5.8, Referencing ASTM E330\(^{(1)}\)
Exova Specimen Number: 15-06-M0059

<table>
<thead>
<tr>
<th>Pressure Criteria</th>
<th>Test Pressure (Pa)</th>
<th>Gauge No. and Deflection (mm)</th>
<th>Net Deflection (Center Stud)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td><strong>Design Load</strong>(^{(1)})</td>
<td>1755 (37 psf)</td>
<td>4.8</td>
<td>1.2</td>
</tr>
<tr>
<td>Residual Deflection</td>
<td>0.6</td>
<td>0.3</td>
<td>1.2</td>
</tr>
<tr>
<td><strong>150% Design Load</strong>(^{(2)})</td>
<td>2640 (55 psf)</td>
<td>6.9</td>
<td>2.0</td>
</tr>
<tr>
<td>Residual Deflection</td>
<td>1.1</td>
<td>1.7</td>
<td>1.2</td>
</tr>
</tbody>
</table>

* Gauge deflection locations found on the following page in Figure 3.

Positive Loading Net Deflection Design Load: (+1915 Pa) =
Negative Loading Net Deflection Design Load (-1915 Pa) =
Positive Loading Net Deflection 150% Design Load (+2873 Pa) =
Negative Loading Net Deflection 150% Design Load (-2673 Pa) =

\(1\) \(1,755 \text{ Pa} = 53.5 \text{ m/s (or 120 mph / 193 km/h)}, \text{Calculation based on the Ensewerl formula,}
\text{where } P = 0.613 \cdot V^2, \text{V is m/s & P is N/m}^2

\(2\) \(2,640 \text{ Pa} = 65.0 \text{ m/s (or 147 mph / 236 km/h)}, \text{Calculation based on the Ensewerl formula,}
\text{where } P = 0.613 \cdot V^2, \text{V is m/s & P is N/m}^2

\(3\) AAMA 508-14, Section 5.8 states: "When testing the actual air/water barrier for a project specific system, perform static structural performance test ASTM E330 at 0.5, 1.0 and 1.5 times the specified positive and negative design pressures." As the testing outlined in this report was not for a project specific system, a design pressure was not outlined. However at the request of ACM Panelworx, Exova performed structural testing of the rainscreen system in accordance with ASTM E330-00 to a maximum pressure of ±2,640 Pa (147 km/h) for informational purposes.
4.0 SYSTEM MODIFICATIONS

No modifications were made to the system as shown respectively in Appendix A.

5.0 DISCUSSION

The ACM Panelworx Inc. "PX-10 Dry Joint Panel System" (Exova Specimen No.:15-06-M0059) identified in this report met the requirements of AAMA 506-14 for cavity pressure differential, time shift of pulse and static and dynamic water penetration.

The system contained a cavity volume to vent area ratio of 592.41 m$^3$/m$^2$ (Upper Panel) & 293.66 m$^3$/m$^2$ (Lower Panels) and used two (2) 38mm x 8mm rectangular drain/weep holes for the upper panel and two (2) 38mm x 8mm rectangular drain/weep holes on each of the lower panels.

This report is not intended as a comprehensive evaluation of the system regarding performance and application to specific buildings.
6.0 REPORT REVISION HISTORY

<table>
<thead>
<tr>
<th>Date:</th>
<th>Revision:</th>
<th>Comments:</th>
</tr>
</thead>
<tbody>
<tr>
<td>2015-05-08</td>
<td>Original Document</td>
<td>N/A</td>
</tr>
</tbody>
</table>

Reported by:                                      Authorized by:

Edsel Lopez, Technologist, Ext. 11511  
Technologist, Building Systems  
Product Testing Division

Jordan M. Church, B.Tech. Technologist, Ext. 11546  
Technical Manager, Building & Energy Systems  
Product Testing Division

This report and service are covered under Exova Canada Inc.'s Standard Terms and Conditions of Contract which may be found on our company's website www.exova.com or by calling 1-866-263-9268.
APPENDIX A

Specimen Bill of Materials and Drawings

(4 Pages)
Bill Of Materials

1. Aipecic 4 mm SMX silver metallic panels fabricated with rout and return
2. Px-10 perimeter extrusion
3. #8 aluminum blind rivet
4. Installation clip aluminum
5. #8 pan head tek screw stainless steel
6. 16 gauge galvanized furring channel stiffeners
7. Tremco™ Spectrum 2 sealant
8. 1" galvanized z-girt 16 gauge
9. #10 pan head 1 1/2" stainless tek screw
10. #12 hex head 2" plated tek screw
11. 4mm spline
12. 0.040 aluminum sill
13. 1" Foam backer rod
Test Backup Wall Construction:

Units Presented are in Inches
Test Specimen Details (Provided by ACM Panelworx):
Test Specimen Details (Provided by ACM Panelworx):
APPENDIX B

Specimen Construction Photographs

(2 Pages)
Figure B1 – Backup Wall Framing and Plexiglas Installation

Figure B2 – Lower Panel Installation
(Installation by ACM Panelworx)
Figure B3 – Completed Wall (Installation by ACM Panelworx)

Figure B4 – Set up for Wall Pressurization and Static Water Pressure Resistance
APPENDIX C

AAMA 501.1-05 Photographs (Dynamic Pressure Test)

(2 Pages)
Evaluation of the "PX-10 Dry Joint Panel System" for ACM Panelworx Inc.

Figure C1 - Specimen Set up in front of viewing chamber

Figure C2 - Spray rack Set up for water penetration
Figure C3 - Wind Machine setup to simulate Dynamic Pressure (AAMA 501.1-05)
REPORT NUMBER: 3117763TOR-002
ORIGINAL ISSUE DATE: March 30, 2007

EVALUATION CENTER
Intertek Testing Services NA Ltd.
3210 American Drive
Mississauga, ON L4V 1B3

RENDERED TO
Attn: Tim Mrkalj
ACMpanelworx
357 Croft Drive
Lakeshore, ON N8N 2L9

PRODUCT EVALUATED: Exterior Aluminum Composite Panel
Cladding System
EVALUATION PROPERTY: Air Leakage, Water Penetration and Structural Performance

Report of Testing Exterior Aluminum Composite Panel
Cladding System, for compliance with the applicable
requirements of the following criteria:
  Leakage Through Exterior Windows, Curtain Walls, and Doors Under
  Specified Pressure Differences Across the Specimen”
- ASTM E331-00, “Standard Test Method for Water Penetration of
  Exterior Windows, Skylights, Doors, and Curtain Walls by Uniform
  Static Air Pressure Difference”
  of Exterior Windows, Doors, Skylights and Curtain Walls by Uniform
  Static Air Pressure Difference”
# Table of Contents

1. Table of Contents ................................................................. 2
2. Introduction ........................................................................... 3
3. Sample Description ............................................................... 3
4. Testing and Evaluation Methods ............................................ 4
   4.1. Air Tightness Tests ......................................................... 4
   4.2. Water Tightness Test ..................................................... 4
   4.3. Wind Load Resistance Tests ........................................... 4
5. Test Apparatus ....................................................................... 5
6. Testing and Evaluation Results .............................................. 6
   6.1. Air Leakage Test ............................................................ 6
   6.2. Water Penetration Test ................................................. 7
   6.3. Wind Load Resistance .................................................... 7
7. Appendix A – Drawings ......................................................... 9
2 Introduction

InterTek Testing Services NA Ltd. (InterTek) has conducted testing for ACMpanelworx on March 27, 2007. This report covers air leakage, water penetration and structural performance testing carried out on a 6' by 6' composite aluminum wall cladding assembly. The specimen was received and submitted for testing at InterTek on March 15, 2007. Testing was performed in basic accordance with the following standards:
- ASTM E331-00, "Standard Test Method for Water Penetration of Exterior Windows, Skylights, Doors, and Curtain Walls by Uniform Static Air Pressure Difference"

3 Sample Description

Designation: 6 x 6 Composite Aluminum Wall Cladding System

Manufacturer: D&M Glass & Mirror Ltd.

Condition: New and undamaged.

Description: The system is comprised of four individual composite architectural sandwich panels each consisting of an ALPOLIC® 4 mm aluminum composite panel covering 3" thick Roxul® mineral wool insulation and fastened by #10 x 1-1/2" self-tapping screws to "Blueskin® membrane covered with 1/2" plywood. The opposite side of the assembly consisted of 1/2" gypsum board. Top, bottom and sides were covered by 2" x 10" wood block and sealed with caulking.

Drawings: D&M Glass and Mirror – front view
D&M Glass and Mirror – cross-sectional view 1, 2, 3
D&M Glass and Mirror – cross-sectional view 4, 5

Deviations from Drawings Exterior panel (covered by Blueskin® membrane) is 5/8' thick plywood, not 5/8" drywall as indicated by drawing.
ALPOLIC® aluminum panel encapsulates 3" thick layer of mineral wool insulation, not rigid insulation as indicated by drawing.
4 Testing and Evaluation Methods

4.1 AIR TIGHTNESS TESTS

The Air Tightness test (Air Infiltration and Air Exfiltration) was conducted in accordance with ASTM E283-04, "Standard Test Method for Determining Rate of Air Leakage Through Exterior Windows, Curtain Walls, and Doors Under Specified Pressure Differential Across the Specimen". The Air Infiltration/Exfiltration tests were performed using test pressures of 75 Pa (1.57 psf) and 300 Pa (6.27 psf). An average air leakage rate was calculated at each pressure differential setting.

4.2 WATER TIGHTNESS TEST

The Water Tightness test was conducted in accordance with ASTM E331-00, "Standard Test Method for Water Penetration of Exterior Windows, Skylights, Doors, and Curtain Walls by Uniform Static Air Pressure Difference".

The Water Tightness test was performed at two pressure differentials (137 Pa and 700 Pa) and a water spray rate of at least 204 L/m² per hour (5.0 U.S. gal/ft² per hour) applied continuously for 15 minutes.

4.3 WIND LOAD RESISTANCE TESTS

4.3.1 Deflection Test

The Wind Load Resistance Deflection test was conducted in accordance with ASTM E330-02, "Standard Test Method for Structural Performance of Exterior Windows, Curtain Walls, and Doors by Uniform Static Air Pressure Difference".

The Deflection test was performed in both the positive and negative directions at various increasing pressure levels. After a 10 second preload (50% of the test load), followed by 1 minute with the pressure released, the test was conducted at the specified test pressure for a period of 10 seconds. Deflection measurements were taken at the mid-span and ends of the wall assembly. After the test loads were released, the wall system was inspected for failure or permanent deformation of any part of the wall system that would cause any operational malfunction. The client requested a specification of L/180 for the deflection limit of the wall panel.
# Test Apparatus

The test equipment used for the window system described in this report was as shown in the following table:

<table>
<thead>
<tr>
<th>Test</th>
<th>Application</th>
<th>Equipment</th>
<th>Intertek ID#</th>
</tr>
</thead>
<tbody>
<tr>
<td>Air Leakage Resistance</td>
<td>To develop the test pressures</td>
<td>Air blower</td>
<td>--</td>
</tr>
<tr>
<td></td>
<td>To measure the volume of air passing through the test sample</td>
<td>Memmert Instrument Co. laminar flow element, Model No. 50MW20-2</td>
<td>280-01-0573</td>
</tr>
<tr>
<td></td>
<td>To measure the chamber pressure</td>
<td>Dwyer 0-0.5&quot; H₂O manometer</td>
<td>280-01-0723</td>
</tr>
<tr>
<td>Water Penetration Resistance</td>
<td>To develop the test pressures</td>
<td>Air blower</td>
<td>--</td>
</tr>
<tr>
<td></td>
<td>To measure the pressures</td>
<td>Dwyer 0-4&quot; H₂O manometer</td>
<td>280-02-0090</td>
</tr>
<tr>
<td></td>
<td>To deliver the water on the test sample</td>
<td>Water spray assembly</td>
<td>280-01-0154</td>
</tr>
<tr>
<td>Wind Load Resistance</td>
<td>To develop the test pressures</td>
<td>Air blower</td>
<td>--</td>
</tr>
<tr>
<td></td>
<td>To measure the pressures</td>
<td>Dwyer 0-30&quot; H₂O manometer</td>
<td>280-01-0628</td>
</tr>
<tr>
<td></td>
<td>To measure deflection</td>
<td>Digital deflection gauge</td>
<td>280-01-0653</td>
</tr>
</tbody>
</table>
6 Testing and Evaluation Results

6.1 Air Leakage Test
ASTM E283-04

Air Infiltration – 75 Pa (1.57 psf)
Corrected infiltration: < 0.17 m³/hr (< 0.10 cfm)
Wall Panel Area: 3.34 m² (36.0 ft²)
Infiltration rate: < 0.05 m³/hr/m² (< 0.003 cfm/ft²)

Air Exfiltration – 75 Pa (1.57 psf)
Corrected exfiltration: < 0.17 m³/hr (< 0.10 cfm)
Wall Panel Area: 3.34 m² (36.0 ft²)
Exfiltration rate: < 0.05 m³/hr/m² (< 0.003 cfm/ft²)

Average air leakage rate: < 0.05 m³/hr/m² (< 0.003 cfm/ft²)

Air Infiltration – 300 Pa (6.27 psf)
Corrected infiltration: < 0.17 m³/hr (< 0.10 cfm)
Wall Panel Area: 3.34 m² (36.0 ft²)
Infiltration rate: < 0.05 m³/hr/m² (< 0.003 cfm/ft²)

Air Exfiltration – 300 Pa (6.27 psf)
Corrected exfiltration: < 0.17 m³/hr (< 0.10 cfm)
Wall Panel Area: 3.34 m² (36.0 ft²)
Exfiltration rate: < 0.05 m³/hr/m² (< 0.003 cfm/ft²)

Average air leakage rate: < 0.05 m³/hr/m² (< 0.003 cfm/ft²)
6.2. Water Penetration Test
ASTM E331-00

<table>
<thead>
<tr>
<th>Test Number</th>
<th>Pressure Differential</th>
<th>Test Time</th>
<th>Result</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>137 Pa (2.86 psf)</td>
<td>15 minutes</td>
<td>Fail</td>
<td>Leak through pinholes in BlueSkim® sheathing where screws had been holding the z-bar, but then were removed.</td>
</tr>
<tr>
<td>2</td>
<td>137 Pa (2.86 psf)</td>
<td>15 minutes</td>
<td>Pass</td>
<td>Put caulking over 4 pinholes in BlueSkim® sheathing where screws had been holding the z-bar.</td>
</tr>
<tr>
<td>3</td>
<td>700 Pa (14.6 psi)</td>
<td>15 minutes</td>
<td>Pass</td>
<td></td>
</tr>
</tbody>
</table>

6.3. Wind Load Resistance
ASTM E330-02

Deflection Tests

1. Panel Span
Span length: 845 mm (33-1/4")
Test pressure: +960 Pa (+20.1 psf) -960 Pa (-20.1 psf)
Net deflection (at midspan): 0.00 mm (0.000") 0.00 mm (0.000")
Allowable deflection (L/180): 4.80 mm (0.189") 4.80 mm (0.189")

2. Centre Span
Span length: 1743 mm (68-5/8")
Test pressure: +960 Pa (+20.1 psf) -960 Pa (-20.1 psf)
Residual Deflection: 0.09 mm (0.004") -0.00 mm (-0.001")
Maximum Net Deflection: 0.52 mm (0.021") 0.48 mm (0.019")
Allowable deflection (L/180): 9.68 mm (0.381") 9.68 mm (0.381")

3. Centre Span
Span length: 1743 mm (68-5/8")
Test pressure: +2160 Pa (+45.1 psi) -2160 Pa (-45.1 psf)
Residual Deflection: 0.08 mm (0.003") 0.14 mm (0.006")
Maximum Net Deflection: 1.28 mm (0.050") 1.71 mm (0.067")
Allowable deflection (L/180): 9.68 mm (0.381") 9.68 mm (0.381")

4 Centre Span
Span length: 1743 mm (68.5/8")
Test pressure: +3600 Pa (+75.2 psf) -3600 Pa (-75.2 psf)
Residual Deflection: 0.14 mm (0.005") 0.22 mm (0.008")
Maximum Net Deflection: 2.36 mm (0.093") 3.55 mm (0.140")
Allowable deflection (L/180): 9.68 mm (0.381") 9.68 mm (0.381")

5 Centre Span
Span length: 1743 mm (68.5/8")
Test pressure: +6120 Pa (+127.8 psf) -6120 Pa (-127.8 psf)
Residual Deflection: 0.26 mm (0.010") 1.15 mm (0.045")
Maximum Net Deflection: 5.27 mm (0.208") 8.22 mm (0.324")
Allowable deflection (L/180): 9.68 mm (0.381") 9.68 mm (0.381")

6 Centre Span
Span length: 1743 mm (68.5/8")
Test pressure: +8000 Pa (+167.1 psf) -8000 Pa (-167.1 psf)
Residual Deflection: 0.32 mm (0.012") 1.41 mm (0.056")
Maximum Net Deflection: 6.09 mm (0.240") 11.78 mm (0.464")*
Allowable deflection (L/180): 9.68 mm (0.381") 9.68 mm (0.381")*

*Exceeded the L/180 deflection limit

Tested by: Claudio Sacilotto

INTERTEK TESTING SERVICES NA LTD.

Reported by: D.J. Carter, P. Eng.
Building Products Engineer

Reviewed by: Van W. Jones, CET
Manager, Physical Testing Services

DJC/WW/sas

[Signature]
7 Appendix A – Drawings

(Drawings – 3 Pages)
SECTION 07 42 43

EVO™ ALUMINUM COMPOSITE METAL (ACM) WALL PANEL SPECIFICATION

SPEC NOTE: Optional text is indicated by square brackets []. Delete unwanted items and square brackets in final specification.

PART 1 - GENERAL

1.01 SECTION INCLUDES

.1 Aluminum composite material (ACM) [pressure equalized rainscreen] [wet-seal] [dry-seal] panels.

.2 [Supply only] [Supply and install].

. SPEC NOTE: Re 101.3. Items listed are available at extra cost and not included with basic panel package.

.3 Accessories including Z-girts, roof caps, drip flashing, jamb flashing through wall flashing, and all other architectural trims, fasteners and vapour and air barriers.

1.02 RELATED REQUIREMENTS BY OTHERS

[.1 Section 06 10 00 – Rough Carpentry]
[.2 Section 07 21 00 – Thermal Insulation]
[.3 Section 07 27 00 – Air Barrier]
[.4 Section 07 92 00 – Joint Sealants]

1.03 REFERENCE STANDARDS

.1 ACM Panels

.1 Coordinate products, techniques and sequencing of related work with Section [01 31 19 - Project Meeting] [and] [01 31 19.33-Pre-Installation Meetings].

1.05 SUBMITTALS

.1 Under provisions of [Section 01 33 00], provide the following:

.1 LEED Credits: Conform to [Section 01 81 13 “Sustainable Design Requirements”] for documentation of LEED Credits re: Certification of Project under LEED [caGBC] [USGBC] 2012 Rating System.

.2 Product Data: manufacturer’s printed sheets or pages illustrating the products to be incorporated into the project.

.3 Shop Drawings: Detail drawings showing openings, components, panel profile, dimensions, and other details of each condition and attachment such as treatment at edges, terminations, and flashings.

.4 Product Samples: 150 mm x 150 mm (6” x 6”) showing specified finish for each location.

.5 Product Test Reports: Indicate compliance of product requirements from qualified independent testing agency.

.6 Manufacturer’s Instructions: Indicate installation requirements, rough-in dimensions, and special procedures.

.7 Sample Warranty: As specified by this Section.

.8 Maintenance Data: Panel replacement instructions and cleaning information.

1.06 QUALITY ASSURANCE

.1 Metal Wall Panel Manufacturer Qualifications: Minimum 10 years’ experience in metal fabrication and supplying metal wall panel systems.

.2 Metal Wall Panel Installer Qualifications: Minimum 10 years’ experience installing commercial metal wall panel systems.

.3 Metal Wall Panel Manufacturers must be an approved EVO™ Licensee and must manufacture EVO™ architectural panels to the tolerances and attributes established
under the provisions of the EVO™ North American Licensees and their standards of conduct.

Preferred approved EVO™ Manufacturer: ACMpanelworx
(visit evopanels.com for complete list of manufacturers)

1.07 DESIGN & PERFORMANCE REQUIREMENTS

.1 Design, fabricate and install an Aluminum composite material (ACM) pressure equalized rainscreen panel system in [polyethylene (PE)] [fire-rated (FR)] core, to the following standards & requirements:

.1 The ACM panel design MUST be 100% free of all fasteners in both the panel face and panel perimeter. All mounting hardware must also be fully concealed with color matched splines utilizing the same PPG paint technology as the coil coated ACM provided by manufacturer.

.2 Only a Progressive System (independent panel, one-from-another), using sliding male-female clip components, which are held to the panels perimeter extrusion, without the use of rivets or screws, meets the description of an engineered EVO™ panel design. This design must enable a single panel to be independently removed and re-installed.

.3 Any ACM panel system not meeting the standards & requirements outlined above (1.07.1.1; 1.07.1.2), or any panel system utilizing a track or grid layout, or one that involves a “picture frame style” post-painted extrusion incorporating a face panel, or one that utilizes adhesives in place of mechanical fasteners in the panel design, are NOT considered as equal or comparable in design or performance, to the EVO™ architectural panel system.

.2 Structural Performance: EVO™ ACM panel system is capable of withstanding the effects of the following loads, based on testing in accordance to ASTM E 330-14:

Note: The default deflection of the support framing was restricted to L/180 referencing AAMA 508 Section 5.1.2

.1 Wind Load: Maximum Pressure achieved = 13,325 Pa¹ (278 lbs/ft²); (equivalent to 330 mph / 531 km/h based on Ensewiler formula)

.2 Specified Design Load: 3,591 Pa (75.0 lbs/ft²)

.3 Positive Loading Net Deflection: (+3,591 Pa; 75.0 lbs/ft²) = 0.204 inches (5.2mm)

.4 Negative Loading Net Deflection: (-3,591 Pa; -75.0 lbs/ft²) = 0.258 inches (6.6mm)

¹ Cladding system did not disengage from the wall assembly. The EVO™ Rivetless panel system did not fail at 13,325 Pa., whereas, the vertical supporting steel studs buckled in the center)
.3 **Air Infiltration**: Air leakage of not more than 0.06 cfm/ lbs/ft² (0.3 L/s per sq. m) when tested according to ASTM E 283-04 at the following test-pressure difference:

1. EVO™ Rivetless panel systems Test-Pressure Differential : Infiltration
   - 75 Pa @ 1.57 lbs/ft² : 0.05 L/s m² (0.01 CFM/ft²)
   - 300 Pa @ 6.24 lbs/ft² : 0.05 L/s m² (0.01 CFM/ft²)

.4 **Water Penetration under Static Air Pressure**: No uncontrolled water penetration when tested according to ASTM E 331-02 at the following test-pressure difference over a period of 15 continuous minutes:

1. Test-Pressure Differential: *Maximum Pressure achieved = 20 lbs/ft² @ 957 Pa*
   
   Note: No water penetration observed or droplets present on simulated exterior sheathing.

.5 **Thermal Movements**: EVO™ ACM panel system has been designed to accommodate vertical and horizontal thermal movement of components, preventing buckling, opening of joints and other detrimental effects when subjected to seasonal temperature cycles. Systems that incorporate enlarged holes or loose fitting attachments to accommodate for thermal fluctuations, are **NOT** considered as equal or comparable in design or performance, to the EVO™ architectural panel system.

1. Temperature Change (Range): [120 deg F 67 deg C , ambient; 180 deg F 100 deg C , material surfaces ].

.6 **Fire Propagation Characteristics**: Aluminum Composite material wall panel system NFPA 285 testing; CAN/ULC-S134-13.

1. EVO™ Rivetless panel system has been passed and approved by (Intertek, EXOVA) a qualified testing agency, certified to conduct the **NFPA 285 Fire Test Method** on wall panel assembly systems.

2. EVO™ Rivetless panel system has been passed and approved by (Intertek, EXOVA) a qualified testing agency, certified to conduct the **CAN/ULC-S134-13 Fire Test Method** on wall panel assembly systems.

3. Complying under the acceptance criteria of NFPA 285 testing, necessitates no deviations from the engineered design, components or the specified EVO™ Rivetless panel system assembly.

1.8 **TECHNICAL DATA**

Applicable Standards for the ACM component of the EVO™ panel systems:
RAINSCREEN TESTING
AAMA 508-07 Compliant

AIR/WATER/WIND PERFORMANCE
AAMA 501.1-05 (Dynamic)
ASTM E 1233 (Modified)
ASTM E 283 (Static)
ASTM E 330 (Static)
ASTM E 331 (Static)

EVOSTONE – Evaluation of `EVOSTONE’ Coating System testing in accordance with:
ASTM B117-11 (Salt Spray)
ASTM D4541-09 (Adhesion Strength)
ASTM D2794 (Impact Resistance)
ASTM D6944-09 (Thermal Cycling)
ASTM D2247-11 (Humidity Resistance)
ASTM G155 (Accelerated Weathering)
ASTM D1654 (Corrosion Creepback)

FIRE TEST METHOD
NFPA 285
CAN/ULC-S134-13
Standard Method of Fire Test of Exterior Wall Assemblies

1.09 MOCK-UP

SPEC NOTE: Mock-up is only specified for special or large projects and only upon request.

.1 Provide a mock-up on building consisting of complete cladding system, including but not limited to metal furring, panels, securement devices, sealants, and mouldings for approval. Cladding finish and mouldings to be of finish and colour as designated by the [Architect].

.2 Location of mock-up to be as directed by [Architect]. Size to be four panels minimum in a 2 over 2 configuration. Alternate pattern can be requested by Architect.

.3 Modify mock-up as necessary for [Architect] approval. Mock-up [may] [may not] remain in place as part of completed work. Mock-up to represent standard for completed work.
1.10 DELIVERY, STORAGE, AND HANDLING

.1 Handle and store products to prevent damage, soiling, and in accordance with manufacturer’s instructions.

.2 Store packaged or bundled products in original and undamaged crates with manufacturer’s seals and labels intact. Do not remove from packaging or crates until required for installation.

1.11 PACKAGING WASTE MANAGEMENT

.1 Return undamaged pallets and crates to manufacturer of systems employed. All other plastics, packaging foam, banding and fasteners are to be disposed of by panel installer.

1.12 ENVIRONMENTAL CONSIDERATIONS (LEED)

.1 ACM Coil MR (Material and Resources) Credit

Depending on the ACM coil manufacturer, the following is an example of the LEED credits that can be attained with aluminum composite materials. Points may vary with manufacturer.

**MR Credit 4:** Recycled Content: One point is awarded if the sum of post-consumer recycled content plus one half of the pre-consumer content is at least 10%. If the same value is at least 20% as determined by the same method then 2 points are awarded.

<table>
<thead>
<tr>
<th>Product Summary</th>
<th>Total Content (100% post + 50% Pre)</th>
<th>LEED Points</th>
</tr>
</thead>
<tbody>
<tr>
<td>3mm PE</td>
<td>37%</td>
<td>2 points</td>
</tr>
<tr>
<td>4mm PE</td>
<td>35%</td>
<td>2 points</td>
</tr>
<tr>
<td>4mm FR</td>
<td>17.3%</td>
<td>1 point</td>
</tr>
<tr>
<td>6mm PE</td>
<td>32.5%</td>
<td>2 points</td>
</tr>
</tbody>
</table>

.2 6061-T6 EVO™ Extrusion

Material percentages may vary from batch to batch. Standard blending formula calls for a **minimum of 10% post-consumer aluminum in every blend.** The final percentage is between 10% and 15% on 6063 type grades. Other alloys such as 6061 often have a higher percentage of post-consumer scrap. These alloys can contain in excess of **30%**. The **EVO™ architectural panel system is produced using 6061-T6.**

1.13 WARRANTY
.1 ACM Panels: Provide manufacturer’s standard [1 year] [2 year] warranty against panel integrity.

.2 Finish Coating Performance: Provide manufacturer’s standard [20 year] warranty against fading, colour change, chalking, peeling, cracking, or delaminating of the coating system.

PART 2 – PRODUCTS

2.01 APPROVED MANUFACTURERS

.1 ACMpanelworx - Composite Panel Manufacturer, 357 Croft Dr, Windsor, ON N8N 2L9 acmpanelworx.com

.2 Visit evopanels.com for complete list of manufacturers.

2.02 MATERIALS

.1 ACM Wall Panels

.1 EVO™ Architectural Panels by (Licensee name)[Pressure Equalized Rainscreen] [wet-seal] [dry-seal] wall cladding.

.2 Thickness: [4 mm (0.157’’)] [6 mm (0.250’’)].

.3 Panel Depth: (1.75’’) from face of panel too substrate.

.4 Core: [Polyethylene (PE)] [Fire Rated (FR)].

.5 Aluminum Composite Material: [Larson aluminum faced composite panel by Alucoil]; [Reynobond by Alcoa]; [Alpolic by Mitsubishi]; [Alucobond by 3A Composites USA].

.6 Manufacturer’s standard, as shown on drawings, and as follows:

.1 Z-girts: [18 ga.; 16 ga.] steel galvanized to ASTM A653 G90.

.2 Aluminum Extrusions: Mill finish (6061-T6)

2.3 FABRICATION
SPEC NOTE: see Quality Assurance (1.06.3 above for Manufacturer qualifications/criteria)

.1 ACM Wall Panels

[.1 PE ACM Pan Formed Panel: Comprised of a polyethylene extruded core sandwiched between two nominal 0.020” coil coated 3000 or 5000 series aluminum skins.]

[.2 FR ACM Pan Formed Panel: Comprised of a one hour fire rated, mineral-filled, fire-resistant extruded core sandwiched between two nominal 0.020” coil coated 3000 or 5000 series aluminum skins.]

.2 Fabrication Method: Rout and return system utilizing a CNC cutting table with automatic pressure foot to control cutting depth and vacuum bed for sheet support.

.3 Fabricated Panel Tolerances

.1 Length: Plus 1.6 mm (0.062 inch).

.2 Width: Plus 1.6 mm (0.062 inch).

.3 Depth: Plus or minus 0.2 mm (0.008 inch).

.4 Panel Bow: 0.8 percent maximum of panel length or width.

.5 Squareness: 5 mm (0.2 inch) maximum.

.4 Rainscreen Panels: Provide for positive drainage of condensation and water entering at joints to exterior face of wall in accordance with “Rain Screen Principles”. Panels to have drainage holes in bottom of each panel measuring 10 mm (3/8”) diameter on 610mm (24”) centres, to AAMA 508-07.

SPEC NOTE: Finish (2.03.5.1.-5.4) below is shown as example only. Specify actual finish(es) as per ACM coil manufacturer; (see 2.02.5 Materials above)

.5 Finishes

.1 PPG Duranar (PVdF) fluoropolymer containing 70% Kynar 500/Hylar 5000 resins to AAMA 620, [______colour].

.2 EVOStone – EVO nano stone, special coatings #09900. High solids exterior modified acrylic coating. Conforms to CGSB 1-162M & ASTM – 0822 A/W, [______colour].

.3 EVOWood – (PVdf) fluoropolymer containing 70% Kynar 500/Hylar 5000 resins to AAMA 620, [______ colour].
PART 3 – EXECUTION

3.1 EXAMINATION

.1 Verify that substrate conditions are acceptable (plumb and level) prior to installation of products. Commencement of work or any parts thereof indicate acceptance of prepared substrates.

.2 Surfaces to receive panel system barrier to be sound, dry, clean, and free from oil, grease, dirt, excess mortar or other contaminants. Fill spalled areas to provide an even plane.

3.2 PREPARATION

.1 Protect adjacent work areas and finished surfaces from damage by this Section of Work.

3.3 INSTALLATION

.1 ACM Panels
   .1 Install panels plumb, level and true, and in accordance with manufacturer’s written instructions.

   .2 Anchor panels securely in place in accordance with fabricator’s approved shop drawings.

   .3 Installation Tolerances: Maximum deviation from horizontal and vertical alignment of installed panels not to exceed 6.4 mm (0.25”) in 6.1 m (20 feet), non-cumulative.

3.4 SITE QUALITY CONTROL

.1 Upon Owner’s request, provide wall panel fabricator’s site service or periodic site visit to inspect product installation in accordance with fabricator’s instructions.

3.5 ADJUSTING

.1 Repair panels with minor damage so that repairs are not discernible at a distance of 3.1m (10’-0”).

.2 Remove and replace panels damaged beyond repair.
.3 Remove protective film immediately upon completion of panel installation and prior to application of any joint sealants.

3.6 CLEANING

.1 Clean installed products in accordance with manufacturer’s instructions prior to Owner’s acceptance.

3.7 WASTE MANAGEMENT

.1 Remove from site damaged panels, packaging, temporary coverings, protective film and other debris resulting from the Work of this Section.

3.8 PROTECTION

.1 Protect installed panel finishes from damage during construction.

.2 Provide protective measures as required to ensure that installed panels are not damaged by the work of other trades.

END OF SECTION
SECTION 07 42 43

EVOMAXci™ ALUMINUM COMPOSITE METAL (ACM)
WALL PANEL SPECIFICATION with PRODUCT DETAILS

SPEC NOTE: Optional text is indicated by square brackets []. Delete unwanted items and square brackets in final specification.

PART 1 - GENERAL

1.01 SECTION INCLUDES

.1 Aluminum composite material (ACM) [pressure equalized rainscreen] [wet-seal] [dry-seal] panels.

.2 [Supply only] [Supply and install].

. SPEC NOTE: Re 101.3. Items listed are available at extra cost and not included with basic panel package.

.3 Accessories including Z-girts, roof caps, drip flashing, jamb flashing through wall flashing, and all other architectural trims, fasteners and vapour and air barriers.

1.02 RELATED REQUIREMENTS BY OTHERS

[.1 Section 06 10 00 – Rough Carpentry]

[.2 Section 07 21 00 – Thermal Insulation]

[.3 Section 07 27 00 – Air Barrier]

[.4 Section 07 92 00 – Joint Sealants]

1.03 REFERENCE STANDARDS

.1 ACM Panels


1.04 PRE-INSTALLATION MEETINGS

.1 Coordinate products, techniques and sequencing of related work with Section [01 31 19 - Project Meeting] [and] [01 31 19.33-Pre-Installation Meetings].

1.05 SUBMITTALS

.1 Under provisions of [Section 01 33 00], provide the following:

.1.1 LEED Credits: Conform to [Section 01 81 13 “Sustainable Design Requirements”] for documentation of LEED Credits re: Certification of Project under LEED [caGBC] [USGBC] 2012 Rating System.

.2 Product Data: manufacturer’s printed sheets or pages illustrating the products to be incorporated into the project.

.3 Shop Drawings: Detail drawings showing openings, components, panel profile, dimensions, and other details of each condition and attachment such as treatment at edges, terminations, and flashings.

.4 Product Samples: 150 mm x 150 mm (6” x 6”) showing specified finish for each location.

.5 Product Test Reports: Indicate compliance of product requirements from qualified independent testing agency.

.6 Manufacturer’s Instructions: Indicate installation requirements, rough-in dimensions, and special procedures.

.7 Sample Warranty: As specified by this Section.

.8 Maintenance Data: Panel replacement instructions and cleaning information.

1.06 QUALITY ASSURANCE

.1 Metal Wall Panel Manufacturer Qualifications: Minimum 10 years’ experience in metal fabrication and supplying metal wall panel systems.

.2 Metal Wall Panel Installer Qualifications: Minimum 10 years’ experience installing commercial metal wall panel systems.

.3 Metal Wall Panel Manufacturers must be an approved EVO™ Licensee and must manufacture EVO™ architectural panels to the tolerances and attributes established under the provisions of the EVO™ North American Licensees and their standards of conduct.

Visit www.evopanels.com for information on approved fabricators.
1.07 DESIGN & PERFORMANCE REQUIREMENTS

.1 **Design**, fabricate and install an Aluminum composite material (ACM) pressure equalized rainscreen panel system in [polyethylene (PE)] [fire-rated (FR)] core, to the following standards & requirements:

.1 The ACM panel design **MUST** be 100% free of all fasteners in both the panel face and panel perimeter. All mounting hardware must also be fully concealed with color matched splines utilizing the same Kynar/PvDF paint technology as the coil coated ACM, provided by manufacturer.

.2 Only a Progressive System (independent panel, one-from-another), using sliding male-female clip components, which are held to the panels perimeter extrusion, without the use of rivets or screws, meets the description of an engineered EVO™ panel design. This design must enable a single panel to be independently removed and re-installed.

.3 Any ACM panel system not meeting the standards & requirements outlined above (1.07.1.1; 1.07.1.2), or any panel system utilizing a track or grid layout, or one that involves a “picture frame style” post-painted extrusion incorporating a face panel, or one that utilizes adhesives in place of mechanical fasteners in the panel design, are **NOT** considered as equal or comparable in design or performance, to the EVO™ architectural panel system.

.2 **Structural Performance**: EVO™ ACM panel system is capable of withstanding the effects of the following loads, based on testing in accordance to ASTM E 330-14:

*Note: The default deflection of the support framing was restricted to L/180 referencing AAMA 508 Section 5.1.2*

.1 Wind Load: **Maximum Pressure achieved** = 13,325 Pa¹ (278 lbs/ft²);  
(equivalent to 330 mph / 531 km/h based on Ensewiler formula)

.2 Specified Design Load: 3,591 Pa (75.0 lbs/ft²)

.3 Positive Loading Net Deflection: (+3,591 Pa; 75.0 lbs/ft²) = 0.204 inches (5.2mm)

.4 Negative Loading Net Deflection: (-3,591 Pa; -75.0 lbs/ft²) = 0.258 inches (6.6mm)

¹ Cladding system did not disengage from the wall assembly. The EVO™ Rivetless panel system did not fail at 13,325 Pa., whereas, the vertical supporting steel studs buckled in the center

.3 **Air Infiltration**: Air leakage of not more than 0.06 cfm/ lbs/ft² (0.3 L/s per sq. m) when tested according to ASTM E 283-04 at the following test-pressure difference:
.1 EVO™ Rivetless panel systems Test-Pressure Differential: Infiltration

75 Pa @ 1.57 lbs/ft² : 0.05 L/s m² (0.01 CFM/ft²)
300 Pa @ 6.24 lbs/ft² : 0.05 L/s m² (0.01 CFM/ft²)

.4 Water Penetration under Static Air Pressure: No uncontrolled water penetration when tested according to ASTM E 331-02 at the following test-pressure difference over a period of 15 continuous minutes:

.1 Test-Pressure Differential: Maximum Pressure achieved = 20 lbs/ft² @ 957 Pa
Note: No water penetration observed or droplets present on simulated exterior sheathing.

.5 Thermal Movements: EVO™ ACM panel system has been designed to accommodate vertical and horizontal thermal movement of components, preventing buckling, opening of joints and other detrimental effects when subjected to seasonal temperature cycles. Systems that incorporate enlarged holes or loose fitting attachments to accommodate for thermal fluctuations, are NOT considered as equal or comparable in design or performance, to the EVO™ architectural panel system.

.1 Temperature Change (Range): [120 deg F 67 deg C, ambient; 180 deg F 100 deg C, material surfaces].

.6 Fire Propagation Characteristics: Aluminum Composite material wall panel system NFPA 285 testing.

.1 EVO™ Rivetless panel system has been passed and approved by a qualified testing agency, certified to conduct the NFPA 285 Fire Test Method on wall panel assembly systems.

1.08 TECHNICAL DATA

Applicable Standards for the ACM component of the EVO™ panel systems:

RAINSCREEN TESTING
AAMA 508-07 Compliant

AIR/WATER/WIND PERFORMANCE
AAMA 501.1-05 (Dynamic)
ASTM E 1233 (Modified)
ASTM E 283 (Static)
ASTM E 330 (Static)
ASTM E 331 (Static)

EVOSTONE – Evaluation of `EVOSTONE’ Coating System testing in accordance with:
ASTM B117-11 (Salt Spray)
ASTM D4541-09 (Adhesion Strength)
ASTM D2794 (Impact Resistance)
ASTM D6944-09 (Thermal Cycling)
ASTM D2247-11 (Humidity Resistance)
ASTM G155-13 (Solar & Weathering)
ASTM D1654 (Corrosion Creepback)

FIRE TEST METHOD

NFPA 285

1.09 MOCK-UP

SPEC NOTE: Mock-up is only specified for special or large projects and only upon request.

.1 Provide a mock-up on building consisting of complete cladding system, including but not limited to metal furring, panels, securement devices, sealants, and mouldings for approval. Cladding finish and mouldings to be of finish and color as designated by the [Architect].

.2 Location of mock-up to be as directed by [Architect]. Size to be four panels minimum in a 2 over 2 configuration. Alternate pattern can be requested by Architect.

.3 Modify mock-up as necessary for [Architect] approval. Mock-up [may] [may not] remain in place as part of completed work. Mock-up to represent standard for completed work.

1.10 DELIVERY, STORAGE, AND HANDLING

.1 Handle and store products to prevent damage, soiling, and in accordance with manufacturer’s instructions.

.2 Store packaged or bundled products in original and undamaged crates with manufacturer’s seals and labels intact. Do not remove from packaging or crates until required for installation.

1.11 PACKAGING WASTE MANAGEMENT

.1 Return undamaged pallets and crates to manufacturer of systems employed. All other
plastics, packaging foam, banding and fasteners are to be disposed of by panel installer.

1.12 ENVIRONMENTAL CONSIDERATIONS (LEED)

.1 ACM Coil MR (Material and Resources) Credit

larson® by Alucoil® material manufactured by Alucoil North America, LLC. 1976 Joe Rogers Jr. Blvd, Manning, SC 29102 USA (803)-505-6543

MR Credit 4: Recycled Content: One point is awarded if the sum of post-consumer recycled content plus one half of the pre-consumer content is at least 10%. If the same value is at least 20% as determined by the same method then 2 points are awarded.

<table>
<thead>
<tr>
<th>Product Summary</th>
<th>Total Content (100% post + 50% Pre)</th>
<th>LEED Points</th>
</tr>
</thead>
<tbody>
<tr>
<td>4mm PE</td>
<td>35%</td>
<td>2 points</td>
</tr>
<tr>
<td>4mm FR</td>
<td>17.3%</td>
<td>1 point</td>
</tr>
<tr>
<td>6mm PE</td>
<td>32.5%</td>
<td>2 points</td>
</tr>
</tbody>
</table>

.2 6061-T6 EVO™ Extrusion

Material percentages may vary from batch to batch. Standard blending formula calls for a minimum of 10% post-consumer aluminum in every blend. The final percentage is between 10% and 15% on 6063 type grades. Other alloys such as 6061 often have a higher percentage of post-consumer scrap. These alloys can contain in excess of 30%. The EVO™ architectural panel system is produced using 6061-T6.

1.13 WARRANTY

.1 larson® by Alucoil ACM Panels: Provide manufacturer’s standard [5 year] [10 year] warranty against panel integrity.

.2 Finish Coating Performance: Provide manufacturer’s standard [10, 20, 30 year] warranty against fading, color change, chalking, peeling, cracking, or delaminating of the coating system.

PART 2 – PRODUCTS

2.01 MANUFACTURERS
.1 Aluminum composite metal panels to be obtained as single source from approved manufacturer. Visit [www.evopanels.com](http://www.evopanels.com) to locate Licensee in your region.

.1 ACMpanelworx - Composite Panel Manufacturer, 357 Croft Dr, Windsor, ON N8N 2L9 [acmpanelworx.com](http://acmpanelworx.com)

.2 Composite Panels

.1 larson® by Alucoil® material manufactured by Alucoil North America, LLC. 1976 Joe Rogers Jr. Blvd, Manning, SC 29102 USA (803-505-6543

.2 Aluminum Face Sheets:
   .1 Thickness: 0.50mm (0.020") (nominal)
   .2 Alloy: AA3000 or AA5000 Series (Painted material)

.3 Panel Thickness and Weight:
   .1 [4mm (0.157")]: 1.12 lbs./ft² [6mm (0.236")]: 1.50 lbs./ft²]

.4 Core: (PE) or (FR)

.5 Product Performance

.1 Bond Integrity
   When tested for bond integrity, in accordance with ASTM D1781 (simulating resistance to panel delamination), there shall be no adhesive failure of the bond a) between the core and the skin nor b) cohesive failure of the core itself below the following values:

.2 Peel Strength:
   Greater than 100 N-mm/mm (22.5 in-lb/in) as manufactured
   Greater than 100 N-mm/mm (22.5 in-lb/in) after 21 days soaking in water at 70°F

.6 Fire Performance
   .1 ASTM E 84: Flame Spread = "Passed Class A"
   .2 Smoke Developed = “Passed Class A”
   .3 NFPA 285 Tested EVO™/larson® Assembly: FR Core Only

2.02 MATERIALS

*SPEC NOTE: Delete items not required.*

.1 ACM Wall Panel Systems
.1 EVO™ Architectural Panels by (Licensee name)[Pressure Equalized Rainscreen] [wet-seal] [dry-seal] wall cladding.

.2 Thickness: [4 mm (0.157”)] [6 mm (0.250”)].

.3 Panel Depth: (1.75”) from face of panel too substrate.

.4 Core: [Polyethylene (PE)] [Fire Rated (FR)].

.5 Aluminum Composite Material: [larson aluminum faced composite panel by Alucoil] or approved alternate.

.6 Manufacturer’s standard, as shown on drawings, and as follows:

.1 Z-girts: [18 ga.; 16 ga.] steel galvanized to ASTM A653 G90.

.2 Aluminum Extrusions: EVO™ Rivetless extrusions (patent pending), Mill finish (6061-T6).

2.03 FABRICATION

SPEC NOTE: see Quality Assurance (1.06.3 above for Manufacturer qualifications/criteria)

.1 ACM Wall Panels

[.1 PE ACM Pan Formed Panel: Comprised of a polyethylene extruded core sandwiched between two nominal 0.020” coil coated 3000 or 5000 series aluminum skins.]

[.2 FR ACM Pan Formed Panel: Comprised of a one hour fire retardant, mineral-filled, fire-resistant extruded core sandwiched between two nominal 0.020” coil coated 3000 or 5000 series aluminum skins.]

.2 Fabrication Method: Rout and return system utilizing a CNC cutting table with automatic pressure foot to control cutting depth and vacuum bed for sheet support.

.1 Fabrication Method: Prepare EVO™ Rivetless extrusions (patent pending) for securing to ACM panel in accordance with manufacturer’s written instructions and in accordance with AAMA 508-07.

.3 Fabricated Panel Tolerances

.1 Length: Plus 1.6 mm (0.062 inch).

.2 Width: Plus 1.6 mm (0.062 inch).
.3 Depth: Plus or minus 0.2 mm (0.008 inch).

.4 Panel Bow: 0.8 percent maximum of panel length or width.

.5 Squareness: 5 mm (0.2 inch) maximum.

.4 Rainscreen Panels: Provide for positive drainage of condensation and water entering at joints to exterior face of wall in accordance with “Rain Screen Principles”. Panels to have drainage holes in bottom of each panel measuring 10 mm (3/8”) diameter on 406mm (16”) minimum to 610mm (24”) maximum centers, to comply with AAMA 508-07.

SPEC NOTE: Finish (2.03.5.1-.5.4) below is shown as example only. Specify actual finish(es) as per ACM coil manufacturer; (see 2.02.5 Materials above)

.5 Finishes

1 PPG Industries, Valspar, Akzo Nobel, Duracoat (PVdF) fluoropolymer containing 70% Kynar 500/Hylar 5000 resins to AAMA 620, select from color offerings [_____color].


3 EVOWood / larson® Wood (PVdf) fluoropolymer containing 70% Kynar 500/Hylar 5000 resins to AAMA 620, [_____ color].

4 EVOExotic / larson® Specials - PVDF or HDP High Durable Polyester finishes; MCM natural metals [ElZinc, Stainless Steel, Copper, Brass, Brushed Aluminum].

PART 3 – EXECUTION

3.01 EXAMINATION

.1 Verify that substrate conditions are acceptable (plumb and level) prior to installation of products. Commencement of work or any parts thereof indicate acceptance of prepared substrates.

.2 Surfaces to receive panel system barrier to be sound, dry, clean, and free from oil, grease, dirt, excess mortar or other contaminants. Fill spalled areas to provide an even plane.

3.02 PREPARATION

.1 Protect adjacent work areas and finished surfaces from damage by this Section of Work.

3.03 INSTALLATION
.1 ACM Panels
   .1 Install panels plumb, level and true, and in accordance with manufacturer’s written instructions.

   .2 Anchor panels securely in place in accordance with fabricator’s approved shop drawings.

   .3 Installation Tolerances: Maximum deviation from horizontal and vertical alignment of installed panels not to exceed 6.4 mm (0.25”) in 6.1 m (20 feet), non-cumulative.

3.04 SITE QUALITY CONTROL
   .1 Upon Owner’s request, provide wall panel fabricator’s site service or periodic site visit to inspect product installation in accordance with fabricator’s instructions.

3.05 ADJUSTING
   .1 Repair panels with minor damage so that repairs are not discernible at a distance of 3.1m (10’-0”).

   .2 Remove and replace panels damaged beyond repair.

   .3 Remove protective film immediately upon completion of panel installation and prior to application of any joint sealants.

3.06 CLEANING
   .1 Clean installed products in accordance with manufacturer’s instructions prior to Owner’s acceptance.

3.07 WASTE MANAGEMENT
   .1 Remove from site damaged panels, packaging, temporary coverings, protective film and other debris resulting from the Work of this Section.

3.08 PROTECTION
   .1 Protect installed panel finishes from damage during construction.

   .2 Provide protective measures as required to ensure that installed panels are not damaged by the work of other trades.

END OF SECTION
A PARADIGM SHIFT IN THE MAKING

Our objective is to establish the EVO™ RIVETLESS™ panel system as the highest standard of ACM panels, anywhere.

EVO’s™ elegant appearance offers superior Value and Performance to any type of façade, simple or complex.

EVO’s™ Exclusive Manufacturer’s Network in North America ensures Quality Assurance in production and installation procedures, attainable through our standardized system design. Architects, Developers and decision-makers will appreciate excellence in our planning, execution, delivery and service follow thru, as being a signature of our Network.

The EVO™ Network provides a collaborative resource between manufacturer’s to complete projects on-time, discuss innovations, remain competitively positioned with broad appeal in N. America and confidently be the leaders within their industry, year-after-year.

Future testing for compliance to: CAN/ULC S134-13, Miami-Dade HVHZ tests and others, will continue to position EVO™ RIVETLESS™ at the forefront of innovative solutions.
RAINSCREEN TESTING
AAMA 508-07 COMPLIANT
Voluntary Test Method and Specification for Pressure Equalized Rain Screen Wall Cladding Systems

AIR/WATER/WIND PERFORMANCE
AAMA 501.1-05 (Dynamic)
ASTM E 1233 (Modified)
ASTM E 283 (Static)
ASTM E 330 (Static)
ASTM E 331 (Static)

EVO STONE PERFORMANCE
Evaluation of EVO STONE Coating System testing in accordance with:
ASTM B1117-11 (Salt Spray)
ASTM D4541-09 (Adhesion Strength)
ASTM D2794 (Impact Resistance)
ASTM D6944-09 (Thermal Cycling)
ASTM D2247-11 (Humidity Resistance)
ASTM G155 (Accelerated Weathering)
ASTM D1654 (Corrosion Creepback)
ASTM G155-13 (Solar & Weathering)

FIRE TEST METHOD
NFPA 285

MATERIAL SIZE AVAILABILITY
PE & FR core options with sheet material sizes
W 50” | 62” L up to 196” T 4mm | 6mm

EVO™ Architectural Panel System (U.S. Pat. Pending)
GUIDING PRINCIPLES BEHIND OUR EVO™ RIVETLESS™ SYSTEM

“Design is not what it looks like and feels like. Design is how it works.”

STEVE JOBS

“Companies that do not practice Smart Lean Manufacturing are doomed to mediocrity & ultimately failure.”

J. LIKER

“Good design is nothing less than the translation of functional specifications. When it expresses & supports functionality, design becomes a selling point.”

EUGEN GASSMANN

“For you to sleep well at night, the aesthetic, the quality, has to be carried all the way through.”

STEVE JOBS

Time savings through implementing Lean Manufacturing practices can result in: cost savings, cost avoidance, and indirect savings, benefiting project outcome measurably.

ACM Panelworx Inc.
Aluminum Composite Panels

357 Croft Drive, Lakeshore, ON N8N 2L9, CANADA
Phone: (519) 739 2380
Toll free: 1 866 501 9744
Fax: (519) 739 1609
Email: sales@acmpanelworx.com
Website: www.acmpanelworx.com
THE 4E WALL ASSEMBLY FOR THE FUTURE

As the first line of defense within the EVO MAX™ system, the 4E™ panel performs well to address exposure to water and wind on the periphery, providing superior performance for the inside-out face rigid insulation. The overall efficiency of the system is enhanced because of the continuous insulation design and a barrier to any infiltration. Consequently, EVO MAX™ eliminates thermal bridging.

4E: Effective | Efficient | Economical | Environmental

**EFFECTIVE** — EVO MAX™ benefits the end-user because the spooler design performance results in a lighter but rigid assembly. It identifies the external elements of the outer skin, for industry, thermal credits, and as a shelter between the outside of the building envelope and the working atmosphere for people inside.

**EFFICIENT** — EVO MAX™ benefits the end-user through technically implemented mechanisms to gain more benefits from less effort of manufacturing to achieve a system. Such implementation results and study would have been impossible if traditional processes were used.

**ECONOMICAL** — EVO MAX™ benefits the end-user directly as costs related to construction and return value for the facility management are known. Demand for energy supply are reduced, and cost savings provide more space for buildings and buildings expenses. The result of this building will benefit and the investment pay-back even will be longer.

**ENVIRONMENTAL** — EVO MAX™ benefits the end-user in diverse ways that are qualitative and quantitative. The benefits are not only of the end-users in some cases, but will be future benefits.

Qualitative gains begin in the process of manufacturing the components to higher standards to meeting LEED requirements for water use and energy consumption. Buildings are designed to be sleek, efficient, and economically benefiting the society. Choosing a building envelope system is not only aesthetic but functional for keeping and energy efficiency can be obtained in this wall assembly design, limiting financial and resource costs associated with power consumption for new and the future.

When tested under laboratory conditions, the EVO MAX™ exterior panel system outlasted the replicated wind and rain exposure of 320 mph. Doing so was important for addressing the increasing climate changes in our coastal and mountain cities. Increasing the structural integrity of the exterior surface of buildings, benefits the life of our buildings and the safety of the occupants.
Sunshades
Project partner program
Project Partner Program

At ACM Panelworx we are uniquely equipped with Panel Pro Software that provides a near flawless ability to make a seamless transition from site measurement to AutoCAD file and direct to production templates. Panel Pro is the industry leading software that enables us the ability to provide each client to have support and simplicity to maximize profits.

Project management by experienced people is a key factor to project success. To consistently achieve this success ACM Panelworx can provide assistance in project management from estimating/design and engineering/site verification/project installation and training.

Solar Control Sunshades by ACM Panelworx
Solar Control Sunshades by ACM PanelWorx

Solar Control Sunshades by ACM PanelWorx helps reduce Solar Heat Gain by shading vision glass areas of a building envelope. This in turn reduces cooling costs, interior UV damage and increases interior comfort. All sunshades options are engineered for installation on any curtain wall section available using standardized and custom engineered bracket and fastening solutions.

Our building envelope engineering and design team with over 100 years of experience will examine each project to maximize design and functionality. A variety of architectural profiles are available with an optional custom ACM airfoil option which provides the designer the ability to customize airfoil design and material type and color.

LITE SHELF

A wide variety of interior LITE SHELF options engineered to fit multiple designs provides the opportunity to maximize daylight to the interior, reducing energy costs, increasing interior day lighting. A combination of both, an exterior solar control device and an interior liteshelf will provide your projects decades of solar utilization. That will result in incalculable benefits to a greener worldwide community.

ACM PanelWorx is a manufacturer of Building Envelope Products and has been part of the Mrkaj Holding Group that has engineered, supplied and installed hundreds of building envelope projects in North America. Please review the attached list of completed projects and contact any number of the General Contractors or designers for reference.

Solar Control Sunshades Products
# Partial List of Composite/Extruded Aluminum Solar Control Projects Completed since 1999

<table>
<thead>
<tr>
<th>No.</th>
<th>Job Name</th>
<th>General Contractor</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>University of Windsor Student Residence</td>
<td>Eastern Construction</td>
<td>Windsor, ON&lt;br&gt;Product - Extruded Aluminum Sunshade&lt;br&gt;Tel: 519-258-1200</td>
</tr>
<tr>
<td>2</td>
<td>Chatham Kent Integrated Child Services</td>
<td>Tonda Construction</td>
<td>Chatham, ON&lt;br&gt;Product - Extruded Aluminum Sunshade&lt;br&gt;Tel: 519-686-5200</td>
</tr>
<tr>
<td>3</td>
<td>Scotia Bank Lasalle</td>
<td>Piroli Construction</td>
<td>Malden Road, LaSalle ON&lt;br&gt;Product - Extruded Aluminum Sunshade&lt;br&gt;Tel: 519-967-8669</td>
</tr>
<tr>
<td>4</td>
<td>Winners/Jysk</td>
<td>Piroli Construction</td>
<td>London/Windsor ON&lt;br&gt;Product - Extruded Aluminum/Glass Sunshade Canopy&lt;br&gt;Tel: 519-967-8669</td>
</tr>
<tr>
<td>5</td>
<td>University of Windsor Medical Education Bldg.</td>
<td>Oscar Construction</td>
<td>Sunset Boulevard, Windsor ON&lt;br&gt;Product - Composite Aluminum Vertical &amp; Horizontal Sunshade&lt;br&gt;Tel: 519-253-4418</td>
</tr>
<tr>
<td>6</td>
<td>John McGivney Children's Centre</td>
<td>DeAngelis Construction</td>
<td>Malden Road, Windsor ON&lt;br&gt;Product - Extruded Aluminum Sunshade&lt;br&gt;Tel: 519-252-2602</td>
</tr>
<tr>
<td>7</td>
<td>Ontario Court of Justice</td>
<td>W.D. Lester Construction</td>
<td>Goyeau Street, Windsor ON&lt;br&gt;Product - Extruded Aluminum Security Canopy&lt;br&gt;Tel: 519-977-1111</td>
</tr>
<tr>
<td>8</td>
<td>Leamington Municipal Building</td>
<td>Oscar Construction</td>
<td>Leamington, ON&lt;br&gt;Product - Extruded Aluminum Vertical Sunshade&lt;br&gt;Tel: 519-737-0350</td>
</tr>
</tbody>
</table>
9 WALKERTON CLEAN WATER CENTER
Walkerton, ON
Product - Extruded Aluminum Sunshades

10 BANK OF MONTREAL
Mississauga, ON
Product - Custom Extruded Aluminum/Glass Sunshade Canopies/Vertical Screens

11 WALKER COMMONS
Walker Road, Windsor ON
Product - Extruded Aluminum/Glass Sunshades

12 WATERLOO LANDFILL SERVICES BUILDING
Waterloo, ON
Product - Composite Panel Sunshade Canopy

13 MIDDLESEX DOCTORS CLINIC
London, ON
Product - Composite Panel Sunshade Canopy

14 WATERLOO WWTP CONTRACT #1 OFFICE BUILDING
Waterloo, ON
Product - Extruded Aluminum Sunshades

15 WINDSOR INTERNATIONAL AIRPORT
Airport Road, Windsor ON
Product - Extruded Aluminum/Glass Vertical Sunscreen

16 TRIAMICO HEAD OFFICE
Lakeshore, ON
Product - Composite Panel Sunshade Canopy

17 DR. DAVID SUZUKI SCHOOL
Windsor, ON
Product - Composite Panel Interior Lite Shelf

18 WESTMINSTER WOODS SCHOOL
Guelph, ON
Product - Extruded Aluminum Sunshades/Composite Aluminum Interior Lite Shelf

19 ST. CLAIR COLLEGE MEDIAPLEX
Victoria Avenue, Windsor, ON
Product - Composite Panel Sunshade Canopy

20 UNIVERSITY OF GUELPH AXELROAD BLDG.
Gordon Street, Guelph ON
Product - Extruded Aluminum Sunshades

21 BENNET CHEVROLET/CADILLAC
Hespeler Road, Cambridge ON
Product - Extruded Aluminum Sunshades
22 TECUMSEH ROAD MEDICAL CENTER  
   Tecumseh Road, Windsor ON  
   Product - Composite Panel Sunshade Canopy  
   GROSSI CONSTRUCTION  
   Tel: 519-326-9081

23 WATERLOO WWTP CONTRACT 2  
   Waterloo, ON  
   Product - Extruded Aluminum Sunshades  
   STONE TOWN CONSTRUCTION LIMITED  
   Tel: 519-284-2580

24 DOUGALL MEDICAL OFFICE  
   Dougall Avenue, Windsor ON  
   Product - Extruded Aluminum Sunshades  
   PUPATELLO CONSTRUCTION  
   Tel: 519-944-7878

25 TULLIO RESIDENCE  
   Tecumseh ON  
   Product - Laminated Glass Sunshade Canopy  
   FRONT CONSTRUCTION  
   Tel: 519-250-8229

26 ALTON ELEMENTARY SCHOOL  
   Burlington, ON  
   Product - Extruded Aluminum Sunshades  
   SNYDER & ASSOCIATES INC.  
   Tel: 416-966-5444

27 TECUMSEH MEDICAL CENTER  
   Tecumseh Road, ON  
   Product - Extruded Aluminum Sunshades  
   PCR CONTRACTORS INC.  
   Tel: 519-966-8718

28 VCU VIRGINIA UNIVERSITY  
   Virginia USA  
   Product - Extruded Aluminum Sunshades/Composite Aluminum Vertical Screen  
   FREDERICKSBURG GLASS & MIRROR, INC.  
   Tel: 540-891-1360
Solar Control Sunshades by ACM Panelworx

DESCRIPTION

Solar Control Sunshades by ACM Panelworx help reduce Solar Heat Gain by shading vision glass areas of a building envelope. This in turn reduces cooling costs, interior UV damage and increases interior comfort.

Solar Control Sunshades by ACM Panelworx allow natural illumination, and maximize comfort, while adding definition and design feature to exterior aesthetics.

All sunshades options are engineered for installation on any curtain wall section available using standardized and custom engineered bracket and fastening solutions.

Our building envelope engineering and design team with over 30 years of experience will examine each project to maximize design and functionality.

A variety of architectural profiles are available with an optional custom ACM airfoil option which provides the designer the ability to customize airfoil design and material type and color.

LITE SHELF

A wide variety of interior Lite Shelf options engineered to fit multiple designs provides the opportunity to maximize daylight to the interior, reducing energy costs, increasing interior day lighting. A combination of both, an interior solar control device and an interior lite shelf will provide your projects decades of solar utilization. That will result in incalculable benefits to a greener worldwide community.

ACM Panelworx is a manufacturer of Building Envelope Products and has been part of the Mrkalj Holding Group that has engineered and installed hundred of building envelope projects in Ontario. Please review the attached list of completed project and contact any number of the General Contractors or designers for reference.
Part 1  GENERAL

1.1  REFERENCES

.1 American Society for Testing and Materials International, (ASTM)
   .1 ASTM A53/A53M-07, Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated Welded and  
   Steamless.
   .2 ASTM A269-08, Specification for Seamless and Welded Austenitic Stainless Steel Tubing for General Service.
   .3 ASTM A307-07b, Specification for Carbon Steel Bolts and Studs, 60,000 PSI Tensile Strength.
   .4 ASTM B209-02a, Specification for Aluminum and Aluminum-Alloy Sheet and Plate.
   .5 ASTM B221-02, Specification for Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes.

.2 Canadian Standards Association (CSA International)
   .1 CAN/CSA G40.20/G40.21-04, General Requirements for Rolled or Welded Structural Quality Steel.
   .2 CAN/CSA G164-M92 (R2003), Hot Dip Galvanizing of Irregularly Shaped Articles.
   .3 CAN/CSA S16.1-09, Limit States Design of Steel Structures.

1.2  DESCRIPTION

.1 Furnish all materials design, fabrication and installation to complete the installation of solar control device as  
manufactured by ACM Panelworx.

1.3  SUBMITTALS

.1 Provide submittals in accordance with Section Submittal Procedures.
.2 Shop Drawings
   .1 Indicate materials, core thicknesses, finishes, connections, joints, method of anchorage, number of anchors,  
   supports, reinforcement, details, and accessories.
   .2 Shop drawings to be designed by and bear seal of Professional DCC Representative licensed in Province of  
   Ontario.

1.4  PERFORMANCE REQUIREMENTS

.1 Design solar control device to meet the Structural requirements of L/120 of the span.
.2 The system should perform to the criteria provided by the designers, specific to structural design of any geographical  
area.

Part 2  PRODUCTS

.1 Px 1-24 airfoil design manufactured from aluminum alloy extrusions 6063-T5 or 6063-T6.
.2 Manufactured with material thickness of .085 inch, minimal airfoil wall thickness and outriggers with minimal wall  
thickness of .025 inch.
.3 All attachment hardware to be stainless steel.
SPECIFICATIONS GUIDE
EXTERIOR SUN CONTROL DEVICE

2.1 MATERIALS
  .1 Extruded aluminum: ASTM B221.
  .2 Sheet aluminum: ASTM B209.
  .3 Steel sections and plates: to CAN/CSA G4.0.20/G40.21.
  .4 Bolts and anchor bolts: to ASTM A307.

2.2 HORIZONTAL SUNSHADES
  .1 Sunshade system to be by ACM Panelworx.
  .2 Formed fins for horizontal sunshade applications.
    .1 Nominal 700mm depth from building face.
    .2 Form support arms if single aluminum extrusions for connection to curtainwall system.
    .3 Aluminum thickness as required for snow and wind loads as indicated in shop drawings.

2.3 FINISH
  .1 All exposed finishes to be free from blemish and adhere to specified finishes.

PART 3 EXECUTION

Follow all instructions provided by manufacturers engineered shop drawings.

3.1 FINISH
  .1 Erect sunshades square, plumb, straight, and true, accurately fitted to substrate connections.
  .2 Provide suitable means of concealed anchorage suitable to transfer snow and windloads from sunshades to curtainwall framing, in accordance with reviewed shop drawings.
  .3 Provide components for building by other sections in accordance with shop drawings and schedule.
  .4 Make field connections with bolts to CAN/CSA S16.1.
Summary of LEED Credits Version 2.2

MR Credit 2 – Construction Waste Management

The primary component in all Solar Control Sunshades as manufactured by ACM Panelworx is 100% recyclable aluminum type 6063-T5, 6063-T52, or 6061-T6. This contributes toward Credit MR2.1 (1 point).

MR Credit 4 – Recycled Content

The aluminum materials used for all Solar Control Sunshades as manufactured by ACM Panelworx can contain up to 30% pre-consumer recycled content and 10% post-consumer recycled content, which equates to a total recycled content of 20% per the LEED calculation procedure.

This contributes toward the 10% goal for Credit MR4.1 (1 point) and the 20% goal for Credit MR4.2 (1 point).

MR Credit 5 – Local/Regional Materials

Location for sales, manufacturing, and distribution of products manufactured by ACM Panelworx Solar Control Sunshades:

ACM Panelworx
357 Croft Drive
Lakeshore, ON N8N 2L9

Projects located within 500 miles of this location are eligible for a contribution toward 20% local manufacturing goal for Credit MR5.1 (1 point).

EA Credit 1.1 – Optimize Energy Performance

Improve energy performance above LEED’s baseline prerequisite standard; LEED provides four compliance paths by which builders may obtain the credit. (Available credits 1 – 10 points).
At ACM Panelworx we are uniquely equipped with Panel Pro Software that provides a near flawless ability to make a seamless transition from site measurement to AutoCAD file and straight to production templates. Panel Pro is the industry leading software that enables us the ability to provide each client with support and simplicity to maximize profits.

Project management by experienced people is a key factor to project success. To consistently achieve this success ACM Panelworx can provide assistance in project management from estimating/design and engineering/site verification/project installation and training.

357 craft drive | ecumseh, ON | NBN 2L9
phone (519) 737-2380 | toll free 1 866 501 9746 | fax (519) 739 1509
email: info@acmpanelworx.com
www.acmpanelworx.com
Solar Control Sunshades by ACM PanelWorx

Solar Control Sunshades by ACM PanelWorx helps reduce Solar Heat Gain by shading vision glass areas of a building envelope.
This in turn reduces cooling costs, interior UV damage and increases interior comfort.
Solar Control Sunshades by ACM PanelWorx allow natural illumination, and maximize comfort, while adding definition and design feature to exterior aesthetics.
All sunshades options are engineered for installation on any curtain wall section available using standardized and custom engineered bracket and fastening solutions.
Our building envelope engineering and design team with over 100 years of experience will examine each project to maximize design and functionality.
A variety of architectural profiles are available with an optional custom ACM airfoil option which provides the designer the ability to customize airfoil design and material type and color.

LITE SHELF

A wide variety of interior Lite Shelf options engineered to fit multiple designs provides the opportunity to maximize daylight to the interior, reducing energy costs, increasing interior day lighting. A combination of both, an exterior solar control device and an interior lite shelf will provide your projects decades of solar utilization. That will result in incalculable benefits to a greener worldwide community.

ACM PanelWorx is a manufacturer of Building Envelope Products and has been part of the Mirkaj Holding Group that has engineered, supplied and installed hundreds of building envelope projects in North America. Please review the attached list of completed project and contact any member of the General Contractors or designers for reference.
OPTION #1
PX124 WALL MOUNT

OPTION #2
PX124 CURTAINWALL MOUNT

OPTION #3
PX124 & PX16LS (LIGHT SHELF) CURTAINWALL MOUNT

ACM panelworx solar control
## OUTRIGGER

<table>
<thead>
<tr>
<th>PART NUMBER</th>
<th>&quot;A&quot; LENGTH</th>
<th>BLADE QTY</th>
</tr>
</thead>
<tbody>
<tr>
<td>PX124</td>
<td>24 INCHES</td>
<td>4</td>
</tr>
<tr>
<td>PX132</td>
<td>32 INCHES</td>
<td>5</td>
</tr>
</tbody>
</table>

**Diagram:**

### PX124

- 2'-0"
- 4"
- 47/8"
- 47/8"
- 47/8"

### PX132

- 2'-8"
- 4"
- 47/8"
- 47/8"
- 47/8"
- 47/8"
SUNSHADE ANCHOR BRACKET
FOR 2" OR 2 1/2" CURTAINWALL

EACH ATTACHMENT SYSTEM IS ENGINEERED TO PROJECT SPECIFIC REQUIREMENTS
# LIGHT SHELF

<table>
<thead>
<tr>
<th>PART NUMBER</th>
<th>PROJECTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>PX12LS</td>
<td>12&quot; PROJECTION</td>
</tr>
<tr>
<td>PX16LS</td>
<td>16&quot; PROJECTION</td>
</tr>
</tbody>
</table>

NOTE: OPTION ENGINEERED
ASSEMBLIES UP TO MAX. 48"
VERTICAL SUNSHADE

OPTION #1
PX1V WALL MOUNT

OPTION #1
PX2PV WALL MOUNT

ACMpanelworx
solar control
CUSTOM ACM AIRFOIL - PX2 SERIES
PROFILE OPTIONS / MATERIAL OPTIONS

<table>
<thead>
<tr>
<th>Optional Airfoil - ACM Material</th>
</tr>
</thead>
<tbody>
<tr>
<td>ALPOLIC - WOOD GRAIN</td>
</tr>
<tr>
<td>WALNUT</td>
</tr>
<tr>
<td>MAHAGONY</td>
</tr>
<tr>
<td>MAPLE</td>
</tr>
<tr>
<td>4-MPL-30</td>
</tr>
<tr>
<td>4-WLN-30</td>
</tr>
<tr>
<td>4-QAE-30</td>
</tr>
<tr>
<td>ALPOLIC - HLZ HAIRLINE ALUMINUM</td>
</tr>
<tr>
<td>4-HLZ-80</td>
</tr>
<tr>
<td>ALPOLIC - SCP PRISMATIC RED</td>
</tr>
<tr>
<td>SCP-30</td>
</tr>
<tr>
<td>ALPOLIC - CHOSEN FROM ALPOLIC STANDARD COLOUR CHART</td>
</tr>
</tbody>
</table>

ACMpanelworx
solar control
SAMPLE
Arctic Pan
SECTION 08910: ALUMINUM CURTAIN WALL

PART#2 PRODUCTS

2.2 MATERIALS

2.2.3 SPANDREL BACK-UP PANELS

Specifier Note: Depth of back-up panels should be \( \frac{1}{2} \)" deeper than desired depth of insulation.

.1 Sheet Steel: Zinc-iron Alloy (ZF) coated steel sheet to ASTM A653/A653M structural quality Grade A, with Z275 coating, for interior surfaces not exposed to weather, unpainted finish, minimum 0.036" base steel thickness. Overall panel depth of 3 ½ ".

Specifier Note: Insulation is approximately R-6.5 per inch, therefore edit desired thickness, as per Product Data Sheet.

.2 Foam insulation: POLAR PX-3000, overall insulation depth of 3".
   a. Density in place results: 40 kg/m³ or 2.50 lb/ft³, ASTM D 1622
   b. Thermal Resistance: R (3" thick panel).
      Results: 20.3 ft².h.°F/btu.in, ASTM C 518
   c. Flame Spread, Faced
      Results: 25 or less, ASTM E84
   d. Smoke Developed, Faced
      Results: < 450, ASTM E84
   e. Fasteners: non corrosive as recommended by the manufacturer.

.3 Product: Arctic Pan, by ACM Panelworx.
Tel: 1-866-501-9744 or 519-739-2380
Email: sales@acmpanelworx.com
       mark@acmpanelworx.com
**ARCTIC PAN Product Data Sheet**

**PRODUCT DESCRIPTION**

Arctic Pan is designed as high performance spandrel cavity insulation. Arctic Pan is available in galvanized backup panels for concealed areas and prefinished ACM backup panels for exposed interior panels. Both backup panels are housing a pre-formed closed cell polyisocyanurate foam core bonded to embossed, glass, and fiber reinforced aluminum foil face on both sides. The exposed side of the board has a heavy 12 mil facer with an aluminum reflective surface. This application is referred to as our Polar PX 300. This high performance insulation board is suitable for use in application for commercial, residential, institutional, industrial and agricultural projects both new construction and thermal retrofit.

**PRODUCT BENEFITS**

- Part of the overall design solution
- Installed continuously to reduce thermal bridging
- Meets R-value requirements with a thinner profile
- Block air and moisture
- Mold resistant per ASTM D3273 (no defacement)
- Reflective facer acts as a radiant barrier
- Pressure Washable
- Lightweight and easy to install
- Reduces material and labor costs
- Tested per NFPA 285 without requiring exterior gypsum board or fire-stops around header openings
- Contributes toward LEED credits in the following categories:
  - Energy and Atmosphere
  - Materials and resources

**THERMAL PROPERTIES / PRODUCT DATA**

<table>
<thead>
<tr>
<th>Nominal Thickness</th>
<th>Thermal R-Value</th>
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</thead>
<tbody>
<tr>
<td>Inches</td>
<td>°F-ft²-hr/Btu</td>
</tr>
<tr>
<td>0.50</td>
<td>3.2</td>
</tr>
<tr>
<td>0.75</td>
<td>5.0</td>
</tr>
<tr>
<td>1.00</td>
<td>6.0</td>
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<td>9.6</td>
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<tr>
<td>4.00</td>
<td>27.4</td>
</tr>
<tr>
<td>4.50</td>
<td>31.0</td>
</tr>
</tbody>
</table>

Thermal values are determined by using ASTMC518 test method at 75 F mean temperature on material conditioned according to PIMA Technical Bulletin No. 101.

**COMPLIANCES**

- ASTM C1289 Type I, Class 1
- ASHRAE 90.1
- International Energy Conservation Code (IECC)
- International Building Code (IBC) Section 2603, Foam Plastic
- Dri-TER 1309-03
- ESR-1864, ICC Evaluation Service
- Miami-Dade County Product Control Approved
- RR 2522, City of Los Angeles Research Report
- California Code of Regulations, Title 24
- Class A Flame Spread and Smoke Developed Indices per/IBC Chapter 8, Interior Finishes
- Tested per UL1715 to comply with IBC Section 2603, Special Approval paragraph.
  - Up to 4.5 inches on walls
  - Up to 12 inches on ceilings
- Tested per NFPA 285 to comply with IBC Section 2603.5.5
- Water-Resistant Barrier (WRB) per AC71 (ASTM E331, AATCC Test Method 127)
- Air Barrier Material per ASTM E2178
- 1, 2, 3 or 4 hour Fire Rated Assemblies as shown in the UL Fire Resistance Directory
  - Design No.: U026, U326, U330, U354, U424, U460, U902, U904, U905, U906, U907, V454, V499.

**TYPICAL PHYSICAL PROPERTIES**

Physical properties shown are based on data obtained under controlled conditions and are subject to normal manufacturing tolerances.

<table>
<thead>
<tr>
<th>Property</th>
<th>Test Method</th>
<th>Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>Density, Overall, Nominal</td>
<td>ASTM D1622</td>
<td>2.0 pcf</td>
</tr>
<tr>
<td>Compressive Strength (1)</td>
<td>ASTM D1621</td>
<td>20 psi Standard</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Also available in 25 psi upon request</td>
</tr>
<tr>
<td>Flame Spread, Faced</td>
<td>ASTM E84</td>
<td>25 or less</td>
</tr>
<tr>
<td>Smoke Developed, Faced</td>
<td>ASTM E84</td>
<td>&lt;450</td>
</tr>
<tr>
<td>Water Vapor Transmission</td>
<td>ASTM E96</td>
<td>&lt; 0.03 Perm</td>
</tr>
<tr>
<td>Water Absorption</td>
<td>ASTM C209</td>
<td>&lt; 0.2% Vol.</td>
</tr>
<tr>
<td>Dimensional Stability</td>
<td>ASTM d2126, 7 DAYS, 100ºF, 98%RH</td>
<td>&lt;2% Linear Change</td>
</tr>
<tr>
<td>Reflectance Emittance</td>
<td>ASTM E408</td>
<td>0.96</td>
</tr>
<tr>
<td></td>
<td></td>
<td>0.04</td>
</tr>
<tr>
<td>Air Permeance</td>
<td>ASTM E2178</td>
<td>&lt;0.02L/(s.m²)</td>
</tr>
<tr>
<td>Service Temperatures</td>
<td></td>
<td>-40ºF to +250ºF</td>
</tr>
</tbody>
</table>

(1) Less than 1” is only available at 16 psi.
GALVANIZED BACKPANS/ARCTIC PAN COMPARISON

Galvanized steel

- Conducts cold to the interior
- Easily penetrated to the interior causing A/V barrier failure and introducing moisture to the building envelope
- Dissimilar material can cause corrosion
- Welded stick pins and spot welded corners compromise galvanizing, allowing corrosion
- Limited to batt style insulation
- Unsightly interior finish
- Requires accessory finish metal liner to the interior with an accessory attachment system (costly)

Arctic Pan

- Aluminum Composite Material – no dissimilar materials with your aluminum curtainwall/window system
- Rigid material with PVDF finish to the interior creates an aesthetically modern and clean finish (reducing extra cost for interior finishes)
- Rigid material allows the use of polyurethane foam insulation Use of polyurethane foam increases insulating value almost twice the insulating value of mineral wool allowing more R-Value per inch of cavity depth
- Use of polyurethane foam seals completely to the aluminum skin, accidental penetration to the interior to have minimal impact on air loss, causing moisture in the spandrel cavity
- Use of polyurethane foam is completely moisture resistant allowing the insulated spandrel cavity to remain dry
RECOMMENDED CAULKING AND FOAM INSULATION FILL BETWEEN MULLION AND BACK PAN.

CURTAIN WALL

BACKPAN W/ FOAM INSULATION FILL TO SPECIFIED DEPTH UP TO R-28

SPANDREL GLAZING

ARCTIC PAN JAMB DETAIL
BACKPAN W/ FOAM INSULATION FILL TO SPECIFIED DEPTH UP TO R-28

SPANDREL GLAZING

BACKPAN W/ FOAM INSULATION FILL BETWEEN MULLION AND BACK PAN.

WEEPHOLES AT 32" O/C MIN.

CURTAIN WALL

ARCTIC PAN SILL DETAIL

ACMPANELWORX
COMPOSITE ALUMINUM PANELS

ARCTIC PAN
WWW.ACMPANELWORX.COM
RECOMMENDED CAULKING AND FOAM ROPE AT EDGES. FOAM INSULATION FILL BETWEEN.

CURTAIN WALL

BACKPAN W/ FOAM INSULATION FILL TO SPECIFIED DEPTH UP TO R-24

SPANDREL GLAZING

ARCTIC PAN JAMB DETAIL
BACKPAN W/ FOAM INSULATION FILL TO SPECIFIED DEPTH UP TO R-24

SPANDREL GLAZING

RECOMMENDED CAULKING AND FOAM ROPE AT EDGES. FOAM INSULATION FILL BETWEEN.

WEEPHOLES AT 32" O/C MIN.

CURTAIN WALL

ARCTIC PAN SILL DETAIL

ACMpanelworx
COMPOSITE ALUMINUM PANELS

ARCTIC PAN
WWW.ACMPANELWORX.COM
Creating better building envelopes.

For years polyurethane spray foam has been used with great success to improve R-Value, eliminate air penetration and alleviate moisture problems within building envelopes.

Building envelope design has greatly improved over a short history, while spandrel glazing insulation and A/V barriers within them have largely remained unchanged and inefficient for decades.

Until now, ACM Panelworx has designed and combined the benefits of polyurethane foam insulation and aluminum composite materials to re-invent spandrel infill & backpan and match the efficiencies of the modern building envelope.
Mineral wood insulated spandrel cavities have performed poorly for decades. The poor thermal performances within the curtainwall cavity and the narrow profile of aluminum window systems have limited the ability to achieve higher R-Values within the spandrel glazing cavity. Arctic Infill & Arctic Pan utilizes ACM, galvanized metal and high density polyisocyanurate sheet to re-invent spandrel cavity.

Its greatest advantage is the combination with RMAX TSX-8500 that will double the R-Value of standard mineral wool insulation, and RMAX TSX-8500 not only elevates the energy efficiency of our building envelope, but also creates a backpan resistant to air infiltration, and virtually eliminates moisture build-up within the insulating cavity.

For designers, the Arctic Infill panels provide the ability to use custom pre-finished ACM panels to your spandrel locations, utilizing finishes such as wood grain, exotic metals, corten, granite, stucco, embossed. This use of ACM panel also allows the ability to create different shapes and simple shadow box designs.

Contact us to help re-invent your next project!

ACM Panelworx
357 Croft Drive, Lakeshore, ON N8N 2L9
Phone: (519) 739 2380
Toll free: 1 888 501 9744
Fax: (519) 739 1609
www.acmpanelworx.com
ARCTIC PAN INFILL PANELS BY ACM PANELWORX

SECTION 08910: ALUMINUM CURTAIN WALL/WINDOWS

Part 2 - PRODUCTS

2.2 MATERIALS

2.2.3. Metal Infill Panels:

1. Panels to consist of ACM Panel fabricated to specific depth and design by project documents. For use within window or curtainwall system.
2. Reference standards:

   ASTM International (ASTM):
   4. Climbing Drum Peel Test for Adhesives.
   5. Method for Film Hardness by Pencil Test.
   7. Method for Measuring Adhesion by the tape test.

   American Architectural Manufacturers Association (AAMA):
   2. Pigmented Organic Coatings on Aluminum (Polyester)
   3. High Performance Organic Coatings on Aluminum (Kynar)

   Underwriters Laboratories Inc. (UL):
   1. UL 94 Standard for Flammability of Plastic Materials for Parts in Devices and Appliances

SUBMTTALS

A. Submit the following in accordance with Section [__________ – Submittal Procedures]
   1. Product Data: Insulated panel manufacturer’s printed product literature and specifications.
   2. Samples: Duplicate 300 mm x 300 mm (12” x 12”) samples of panel material, of color and profile specified, and two samples of each colour and finish texture in 75 mm x 125 mm (3” x 5”) size.

B. Warranty: Provide panel manufacturer’s sample warranty certificate.

C. Maintenance Instructions: Provide panel maintenance and cleaning instructions for [porcelain enamel] [anodized] [painted] finishes.

2.2.4. System description:

- Arctic Infill Panel
- 4mm aluminum composite material with PE core formed to Standard 1” nominal depth
- To fit within glazing pocket of specified system of this section.
- Insulated with RMAX TSX-8500.
2.2.5. Manufacturer:
Acceptable manufacturer:
ACM Panelworx
357 Croft Drive, Lakeshore, ON N8N 2L9
Phone: (519) 739 2380 • Toll Free: 1 866 501 9744 • Fax: (519) 739 1609
Email: sales@acmpanelworx.com

2.2.6. Panel Finish:
- Chosen from manufacturers full range
- Solid color
- Metallic
- Mica
- Custom
- Wood Grain
- Exotic Metal

Foam insulation: RMAX TSX-8500, overall insulation depth of 1”.
  a. Density in place results: 40 kg/m³ or 2.50 lb/ft³, ASTM D 1622
  b. Thermal Resistance: R (1” thick panel).
     Results: 20.3 ft²·h·°F/btu·in, ASTM C 518
  c. Flame Spread, Faced
     Results: 25 or less, ASTM E84
  d. Smoke Developed, Faced
     Results: < 450, ASTM E84
  e. Fasteners: non corrosive as recommended by the manufacturer.

Part 3 – EXECUTION

3.01 EXAMINATION
A. Before installation examine alignment of substrate and notify [Consultant] [Architect] [Engineer] in writing if substrate does not comply with requirements of panel installer.
B. Ensure panel surface are free from defects prior to installation.

3.02 INSTALLATION
A. Erect panels plumb, level and true.
B. Glaze panels securely and in accordance with approved shop drawings and manufacture’s instructions to allow for necessary thermal movement and structural support.
C. Do not install panels that are observed to be defective including warped, bowed, dented, scratched, and delaminating components.
D. Weather-seal all joints as required using methods and materials as previously specified.
E. Separate dissimilar metals using gasketed fasteners and blocking to eliminate the possibility of electrolytic reaction.

3.03 ADJUSTING AND CLEANING
A. Remove masking film as soon as possible after installation. Masking intentionally left in place after panel installation will be the responsibility of the contractor.
ARCTIC INFILL PANEL Product Data Sheet

PRODUCT DESCRIPTION

Arctic Infill Panels are designed as a high performance alternative to Spandrel glazing at concealed areas within a curtain wall or window assembly. Infill Panels are designed to work within any typical curtain wall or window assembly ranging from 1/4” to 5” in depth.

Arctic Infill Panels can be produced with either a laminated assembly utilizing prefabricated aluminum sheet on both sides or a fabricated ACM panel allowing the use of custom ACM finishes such as wood grain granite or exotic metals. As well as custom shapes and shadow box designs, insulating value comes from the use of preformed closed cell polyisocyanurate foam core bonded to embossed, glass and fibre reinforced aluminum foil face.

PRODUCT BENEFITS

- Part of the overall design solution
- Installed continuously to reduce thermal bridging
- Meets R-value requirements with a thinner profile
- Resistant to moisture
- Mold resistant per ASTM D3273 (no defacement)
- Reduces energy costs
- Design flexibility
- Oversize panels available
- Lightweight and easy to install
- Reduces material and labor costs
- Tested per NFPA
- Contributes toward LEED credits in the following categories:
  - Energy and Atmosphere
  - Materials and resources

TYPICAL PHYSICAL PROPERTIES

Physical properties shown are based on data obtained under controlled conditions and are subject to normal manufacturing tolerances.

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<td>0.50</td>
<td>3.2</td>
</tr>
<tr>
<td>0.75</td>
<td>5.0</td>
</tr>
<tr>
<td>1.00</td>
<td>6.0</td>
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<td>27.4</td>
</tr>
<tr>
<td>4.50</td>
<td>31.0</td>
</tr>
</tbody>
</table>

Thermal values are determined by using ASTM C1289 test method at 75°F mean temperature on material conditioned according to PIMA Technical Bulletin No. 101.

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<tr>
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<th>Test Method</th>
<th>Results</th>
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<tbody>
<tr>
<td>Density, Overall, Nominal</td>
<td>ASTM D1622</td>
<td>2.0 pcf</td>
</tr>
<tr>
<td>Compressive Strength (1)</td>
<td>ASTM D1621</td>
<td>20 psi Standard Also available in 25 psi upon request</td>
</tr>
<tr>
<td>Flame Spread, Faced</td>
<td>ASTM E84</td>
<td>25 or less</td>
</tr>
<tr>
<td>Smoke Developed, Faced</td>
<td>ASTM E84</td>
<td>&lt;450</td>
</tr>
<tr>
<td>Water Vapor Transmission</td>
<td>ASTM E96</td>
<td>&lt; 0.03 Perm</td>
</tr>
<tr>
<td>Water Absorption</td>
<td>ASTM C209</td>
<td>&lt; 0.2% Vol.</td>
</tr>
<tr>
<td>Dimensional Stability</td>
<td>ASTM C2126</td>
<td>&lt;2% Linear Change</td>
</tr>
<tr>
<td>Reflectance Emittance</td>
<td>ASTM E408</td>
<td>0.96</td>
</tr>
<tr>
<td>Air Permeance</td>
<td>ASTM E2178</td>
<td>0.04</td>
</tr>
<tr>
<td>Service Temperatures</td>
<td></td>
<td>-40°F to +250°F</td>
</tr>
</tbody>
</table>

(1) Less than 1” is only available at 16 psi.
RECOMMENDED CAULKING AND FOAM INSULATION FILL BETWEEN MULLION AND BACK PAN.

CURTAIN WALL

BACKPAN W/ FOAM INSULATION FILL TO SPECIFIED DEPTH UP TO R-28

STANDARD INFILL PANEL W/ INSULATION

ARCTIC PAN JAMB DETAIL W/ STANDARD INFILL PANEL
RECOMMENDED CAULKING AND FOAM INSULATION FILL BETWEEN MULLION AND BACK PAN.

CURTAIN WALL

BACKPAN W/ FOAM INSULATION FILL TO SPECIFIED DEPTH UP TO R-28

RAISED INFILL PANEL W/ INSULATION

ARCTIC PAN JAMB DETAIL W/ RAISED INFILL PANEL

ACMpanelworx
COMPOSITE ALUMINUM PANELS

ARCTIC PAN
WWW.ACMPANELWORX.COM
Finishes
when the standard’s just not enough
LUMIFLON is one of many quality products made by AGC - Asahi Glass Company - established in Japan in 1907. In just over a century, AGC has gone from a small glass company to a diversified, multi-billion-dollar enterprise. AGC first developed its solvent-soluble LUMIFLON fluoropolymer in 1982 — and it didn’t take long for manufacturers to discover that this resin was different. LUMIFLON resins allow coatings to be cured at room temperature. For the first time, the durability, weatherability and long-term cost effectiveness of fluoropolymer coatings were now available for field application. With their superior performance and life cycle cost advantages, it's no wonder fluoro resin paints based on LUMIFLON have since been produced by many manufacturers and applied to more than 150,000 industrial and architectural structures, aircraft and automobiles worldwide.

LUMIFLON is just one of the many innovative products and materials created by AGC, a company that’s driven to excel in a high-tech world. But what a difference it makes for manufacturers and builders who demand the combination of quality and value that only LUMIFLON delivers.

### Polymer Structure of Lumiflon

LUMIFLON is known generically as an FEVE resin. Its unique alternating structure is key to its ultra-weatherability.

**FE:** Fluoro Ethylene
- Durability

**VE:** Vinyl Ether
- R1=Transparency, Gloss, Hardness
- R2=Flexibility
- R3=Crosslinkability
- R4=Pigment compatibility, adhesion
why lumiflon

1. aesthetics:
LUMIFLON-based coatings offer brilliant, long-lasting colors with a wide gloss range.
They simply look great – and keep looking great year after year.

2. corrosion prevention:
LUMIFLON’s unique chemical structure improves resistance to corrosion from water, oxygen
and even chloride ions, ensuring a longer life for industrial structures like bridges with far less
need for repainting.

3. sustainability:
With its long lifespan, LUMIFLON eliminates the environmental impact of repeated
repainting and recoating – just one of the reasons LUMIFLON coatings can contribute to
LEED certification.

4. outperforms the competition:
No other coating type can match LUMIFLON’s combination of attractiveness, application
flexibility and – as tests and studies confirm – long life and weathering resistance.

5. lower life cycle cost:
Because they last so much longer, LUMIFLON-based coatings can substantially reduce any
project’s life space cycle costs, including maintenance costs, replacement costs and recoating costs.

name: coss y leon building, mexico
substrate: aluminum composite material
market: architectural

name: tsurumi tsubasa bridge, japan
substrate: concrete, steel
market: industrial maintenance
aesthetics

Because LUMIFLON-based coatings offer crisp, clean colors and a wide range of gloss, designers and builders choose them to achieve a superior look from day one. And with LUMIFLON’s ability to resist UV degradation, corrosion, and the ill effects of chemical exposure, projects using LUMIFLON continue looking good for years to come with little or no maintenance required. That means markedly less fading, discoloration and chalking for the life of the coating – estimated at up to 60 years! Meanwhile, AGC’s research and development team continues to press LUMIFLON’s aesthetic advantage with new FEVE resin formulations that add even more improvements, like the ability to resist dirt and grime.

bridge after fourteen years

name: daiichi mukaiyama bridge, japan
when: 1987
where: mountain area
new/repaint: new
how long: 14 years

FEVE resin topcoats accelerated weathering
QUV-A (ASTM D4587)

name: burj al arab hotel, dubai u.a.e.
substrate: aluminum composite material
market: architectural
photo by Satoru Mishima, Nikkei BP
Corrosion is a major problem that can dramatically add to a project's life cycle costs, especially for bridges, water towers and other metal structures.

**A LUMIFLON-based coating:**

- Resists degradation due to weathering and exposure to chemicals
- Over the course of many years, loses little of its thickness
- Keeps corrosion initiators from penetrating the topcoat and degrading the zinc-rich primer underneath
- Has an estimated coating life of 60 years or more

### Corrosion resistance of LUMIFLON FD-1000: Salt Fog Test

<table>
<thead>
<tr>
<th>Product (NCO index)</th>
<th>LUMIFLON FD-1000 (1.0)</th>
<th>Polyurethane dispersion¹</th>
</tr>
</thead>
<tbody>
<tr>
<td>Coating system</td>
<td>Primer²/topcoat/topcoat</td>
<td></td>
</tr>
<tr>
<td>Salt spray, 1000 hours</td>
<td>good (rating 0)</td>
<td>good (rating 0) very slight blisters 1mm (rating 1)</td>
</tr>
<tr>
<td>Salt spray, 1500 hours</td>
<td>good (rating 0)</td>
<td>slight blisters, 1mm (rating 2) slight blisters 2mm (rating 2)</td>
</tr>
</tbody>
</table>

¹Bayhydrol 145 (Bayer Corp.) ²Waterborne 2K epoxy primer

### Electrochemical Impedance Spectroscopy

Corrosion resistance is directly related to the slope of the line. The lower the angle difference from horizontal, the better the corrosion resistance.
name: kiyosu bridge, japan
substrate: steel
market: industrial maintenance

name: ntt sekimoku network center, japan
substrate: steel
market: industrial maintenance

name: water tower, usa
substrate: steel
market: industrial maintenance

name: rosemont water tower, usa
substrate: steel
market: industrial maintenance
The weatherability, longevity and the ability to formulate low VOC coatings with LUMIFLON resins are all features that contribute to its sustainability, a concept meaning: “to reduce consumption of non-renewable resources, minimize waste, and create healthy, productive environments” (www.gsa.gov).

“Reduce consumption of non-renewable resources”
LUMIFLON coatings can last up to 30 years without fading, reducing life cycle costs related to the maintenance, re-application and/or replacement of underlying surfaces. On existing roofs, a LUMIFLON topcoat can stop the degradation of the underlying reflective coating, thus extending the life and solar reflectance capability of the roof and minimizing the use of raw materials derived from oil.

“Minimize waste”
By extending the life of roof and wall systems, LUMIFLON topcoats reduce waste created from disposal of damaged roofing and walls; avoid energy consumption in the production, transportation and installation of new systems; and maintain energy and equipment savings from continued high-performance of the building envelope. In addition, the energy consumed in removing a coating from a building or structure can be avoided through the use of a new paint product containing a LUMIFLON clearcoat with excellent durability and weatherability.

“Create healthy, productive environments”
There are four types of LUMIFLON resins, three of which – solid, powder, and emulsion grades contain either zero volatile organic compounds (VOCs) or can be formulated to contain less than 50 g/L of VOCs, meeting the most stringent green building criteria in the US.

Due to its longevity, LUMIFLON reduces the environmental impact associated with production, transportation (energy consumed, greenhouse gases emitted), and VOCs off-gassed during the repainting/recoating process.

### Gloss and Color Retention of Tokiwa Bridge

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Initial gloss</td>
<td>Final gloss</td>
<td>Gloss retention</td>
</tr>
<tr>
<td>75</td>
<td>69</td>
<td>91%</td>
</tr>
</tbody>
</table>
Industry insiders know that, from buildings and bridges to water towers and automobiles, LUMIFLON-based coatings look great. But they look even better when cold, hard data comparing LUMIFLON with high-performance polyesters and other competitors are collected from tests and studies conducted in laboratories, simulators and harsh, real-world environments.

**Advantages of FEVE Based Coatings**

- Ambient or elevated temperature cure – field or shop applied coatings
- Solvent soluble – clean crisp colors and a wide gloss range
- Versatile – solvent grade, solid, water based and powder coating resins offered
- OH functional – polyurethane chemistry, use standard paint equipment
- Fluoropolymer segments – ultra-weatherable and corrosion resistant
- Longer life cycle – up to 60 years

**LUMIFLON vs. pvdf**

<table>
<thead>
<tr>
<th></th>
<th>LUMIFLON</th>
<th>pvdf</th>
</tr>
</thead>
<tbody>
<tr>
<td>resin type</td>
<td>solution</td>
<td>solvent dispersion</td>
</tr>
<tr>
<td>curing temperature</td>
<td>room temp. to 230°C</td>
<td>&gt;250°C</td>
</tr>
<tr>
<td>60° gloss</td>
<td>5 to 90</td>
<td>5 to 35</td>
</tr>
<tr>
<td>color range</td>
<td>&gt;230 colors</td>
<td>color selection is limited</td>
</tr>
<tr>
<td>recoatability</td>
<td>excellent</td>
<td>difficult</td>
</tr>
</tbody>
</table>
name: ferrari world, abu dhabi u.a.e  
substrate: aluminum  
market: architectural

The results confirm what you see with your own eyes every time you look at an attractive, long-lasting LUMIFLON coating all over the world; LUMIFLON outperforms the competition.

**natural exposure test on LUMIFLON**  
**Miami, Florida (ASTMG7)**

![Graph showing gloss retention over exposure time for LUMIFLON and Kynar in Miami, Florida.]  
**Exposure Time (Years)**  
Florida exposure test on LF-200  
Direct 30° south, open back

**Okinawa weathering chart**

![Graph showing gloss retention over exposure time for LUMIFLON and Kynar in Okinawa.]  
**Exposure Time (Years)**  
Okinawa Exposure Test

name: boeing 787 airplane  
substrate: aluminum alloy | composites  
market: aerospace

name: stadium seats, japan  
substrate: fiberglass  
market: architectural
There are those who make buying decisions based on price – and then there are those who are more interested in value. With LUMIFLON, the difference is clear.

- LUMIFLON-based coatings maintain gloss and color when applied to buildings, bridges, water towers, and other structures for between 20 and 60 years – significantly longer than other coating types.

- LUMIFLON resins protect steel, aluminum, fiberglass, concrete, and other materials from corrosion, sun, wind, rain and chemical exposure.

Over time, all that protection also protects your bottom line. Total life cycle costs, factoring in savings on maintenance, recoating and replacement, are much lower with LUMIFLON. Based on results from numerous projects, it’s estimated that the life cycle cost of LUMIFLON coatings is only 40-80% of that of polyurethane. Price versus value. Over the course of a project’s lifetime, the difference can be monumental.

**Life Cycle Cost Advantages**

- **Initial applied cost of FEVE-based topcoat:**
  5-10% higher than standard polyurethane topcoat

- **FEVE-based topcoat life expectation:**
  30-60+ years

- **Expected maintenance of standard polyurethane topcoat in this time frame:**
  2-3 repainting cycles

- **Additional costs of repainting:**
  Asset downtime
  Staging costs
  Environmental costs
  Emissions and CO₂ from equipment
Comparative life cycle costs: LUMIFLON coating and chlorinated rubber coating

<table>
<thead>
<tr>
<th>Coating Type</th>
<th>Process</th>
<th>Cost, $/m²</th>
<th>Initial Cost Ratio</th>
<th>Coating Life, Years</th>
<th>Cost/Year, $/m²</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chlorinated rubber</td>
<td>Surface Prep</td>
<td>$10.08</td>
<td>0.19</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Staging</td>
<td>$27.48</td>
<td>0.52</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Coating</td>
<td>$15.53</td>
<td>0.29</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>TOTAL</td>
<td>$53.09</td>
<td>1.00</td>
<td>8</td>
<td>$6.64</td>
</tr>
<tr>
<td>LUMIFLON coating</td>
<td>Surface Prep</td>
<td>$10.08</td>
<td>0.19</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Staging</td>
<td>$35.08</td>
<td>0.66</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Coating</td>
<td>$32.98</td>
<td>0.62</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>TOTAL</td>
<td>$78.14</td>
<td>1.47</td>
<td>&gt;21</td>
<td>$3.72</td>
</tr>
<tr>
<td>LCC Ratio</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>0.56</td>
</tr>
</tbody>
</table>

Life cycle cost analysis

Coating Type: FEVE, Polyurethane Initial, Polyurethane 10 Year

Name: Okayama Castle, Japan
Substrate: Concrete
Market: Architectural

Name: Chevy Cruze
Substrate: EPDM & Silicone
Market: Automotive

Name: C-17 Airplane
Substrate: Aluminum Alloy
Market: Aerospace
# LUMIFLON Solvent Grades

## Typical Properties

<table>
<thead>
<tr>
<th>Grade</th>
<th>LF-810</th>
<th>LF-552</th>
<th>LF-600X</th>
<th>LF-200</th>
<th>LF-910LM</th>
</tr>
</thead>
<tbody>
<tr>
<td>Characteristics</td>
<td>single component coatings</td>
<td>improved flexibility</td>
<td>improved flexibility</td>
<td>standard</td>
<td>lower VOC</td>
</tr>
<tr>
<td>Application Type</td>
<td>field application aerosols</td>
<td>factory coil coating</td>
<td>factory coil coating</td>
<td>field application</td>
<td>field application</td>
</tr>
<tr>
<td>Markets</td>
<td>architecture, industrial maintenance, transportation, aerospace</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Substrates</td>
<td>metal-steel &amp; aluminum, plastic, fiberglass, concrete</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Molecular Weight</td>
<td>High</td>
<td>High</td>
<td>High</td>
<td>Moderate</td>
<td>Low</td>
</tr>
<tr>
<td>Solid Resin, wt%</td>
<td>45</td>
<td>40</td>
<td>50</td>
<td>60</td>
<td>66</td>
</tr>
<tr>
<td>Tg, °C/F</td>
<td>45/113</td>
<td>20/68</td>
<td>20/68</td>
<td>35/95</td>
<td>37/99</td>
</tr>
<tr>
<td>Specific Gravity (as varnish), 25°C</td>
<td>0.98</td>
<td>1.06</td>
<td>1.08</td>
<td>1.12</td>
<td>1.16</td>
</tr>
<tr>
<td>OH Value, mg KOH/g-polymer</td>
<td>4</td>
<td>52</td>
<td>57</td>
<td>52</td>
<td>100</td>
</tr>
<tr>
<td>Acid Value, mg KOH/g-polymer</td>
<td>0.3</td>
<td>5</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Viscosity, stokes, cm²/s, 25°C</td>
<td>18</td>
<td>4</td>
<td>9</td>
<td>20</td>
<td>5</td>
</tr>
<tr>
<td>Solvent</td>
<td>Mineral spirits</td>
<td>Aromatic hydrocarbon</td>
<td>Solvent Cyclohexane</td>
<td>Xylene</td>
<td>Xylene</td>
</tr>
</tbody>
</table>

## LUMIFLON Aerospace Resins

<table>
<thead>
<tr>
<th>Grade</th>
<th>LF-9716</th>
<th>LF-9721</th>
<th>LF-910LM</th>
</tr>
</thead>
<tbody>
<tr>
<td>Markets</td>
<td>Aerospace, other military</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Substrates</td>
<td>Aluminum, composites, steel</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Solid Resin, wt%</td>
<td>70</td>
<td>70</td>
<td>66</td>
</tr>
<tr>
<td>Specific Gravity, 25°C</td>
<td>1.25</td>
<td>1.26</td>
<td>1.16</td>
</tr>
<tr>
<td>OH Value, mg KOH/g-polymer</td>
<td>170</td>
<td>160</td>
<td>100</td>
</tr>
<tr>
<td>Gardner Color</td>
<td>&lt;1</td>
<td>&lt;1</td>
<td>&lt;1</td>
</tr>
<tr>
<td>Viscosity, stokes, cm²/s, 25°C</td>
<td>35</td>
<td>30</td>
<td>5</td>
</tr>
<tr>
<td>Solvent</td>
<td>Ethyl 3-ethoxy propionate</td>
<td>Ethyl 3-ethoxy propionate</td>
<td>Xylene</td>
</tr>
</tbody>
</table>

## Solid Grades

<table>
<thead>
<tr>
<th>Grade</th>
<th>LF-200F</th>
<th>LF-916F</th>
</tr>
</thead>
<tbody>
<tr>
<td>Markets</td>
<td>Architecture, industrial maintenance, transportation, aerospace</td>
<td></td>
</tr>
<tr>
<td>Substrates</td>
<td>Metal-steel &amp; aluminum, plastic, fiberglass, concrete</td>
<td></td>
</tr>
<tr>
<td>Appearance</td>
<td>Pale yellow flake</td>
<td></td>
</tr>
<tr>
<td>Solid Resin, wt%</td>
<td>&gt;98</td>
<td>&gt;99</td>
</tr>
<tr>
<td>OH Value, mg KOH/g-resin</td>
<td>49</td>
<td>100</td>
</tr>
<tr>
<td>Tg, °C/F</td>
<td>35/95</td>
<td>34/93</td>
</tr>
<tr>
<td>Density, glcc, 25°C</td>
<td>1.42</td>
<td>1.39</td>
</tr>
<tr>
<td>Softening Point, °C</td>
<td>119</td>
<td>117</td>
</tr>
</tbody>
</table>
## Water Emulsion Grades

### Lumiflon Emulsion Grade Typical Properties

<table>
<thead>
<tr>
<th>Grade</th>
<th>FE-4300</th>
<th>FE-4400</th>
<th>FE-4500</th>
</tr>
</thead>
<tbody>
<tr>
<td>Characteristics</td>
<td>low OH value/low Tg</td>
<td>high OH value/high Tg</td>
<td>low OH value/low Tg</td>
</tr>
<tr>
<td>Markets</td>
<td>architecture, industrial maintenance, transportation</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Substrates</td>
<td>metal-steel &amp; aluminum, plastic, fiberglass, concrete</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Solid resin, wt%</td>
<td>50</td>
<td>50</td>
<td>50</td>
</tr>
<tr>
<td>Specific gravity, 25°C</td>
<td>1.13</td>
<td>1.16</td>
<td>1.17</td>
</tr>
<tr>
<td>OH Value, mg KOH/g-polymer</td>
<td>10</td>
<td>49</td>
<td>13</td>
</tr>
<tr>
<td>pH</td>
<td>7-9</td>
<td>7-9</td>
<td>7-9</td>
</tr>
<tr>
<td>Average particle diameter, µm</td>
<td>0.1-0.2</td>
<td>0.1-0.2</td>
<td>0.1-0.2</td>
</tr>
<tr>
<td>Ionic character</td>
<td>Anionic</td>
<td>Anionic</td>
<td>Anionic</td>
</tr>
<tr>
<td>Minimum film forming temperature, °C/F</td>
<td>30/86</td>
<td>55/131</td>
<td>28/82</td>
</tr>
</tbody>
</table>

## Water Dispersion Grade

### Lumiflon Dispersion Grade Typical Properties

<table>
<thead>
<tr>
<th>Grade</th>
<th>FD-1000*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Markets</td>
<td>architecture, industrial maintenance, transportation, aerospace</td>
</tr>
<tr>
<td>Substrates</td>
<td>metal-steel &amp; aluminum, plastic, fiberglass, concrete</td>
</tr>
<tr>
<td>Appearance</td>
<td>milky white liquid</td>
</tr>
<tr>
<td>Solid resin, wt%</td>
<td>40</td>
</tr>
<tr>
<td>Specific gravity, 25°C</td>
<td>1.13</td>
</tr>
<tr>
<td>OH Value, mg KOH/g-polymer</td>
<td>85</td>
</tr>
<tr>
<td>Acid Value, mg KOH/g-polymer</td>
<td>15</td>
</tr>
<tr>
<td>pH</td>
<td>7-9</td>
</tr>
<tr>
<td>Average particle diameter, µm</td>
<td>0.05-0.15</td>
</tr>
<tr>
<td>Ionic Character</td>
<td>Anionic</td>
</tr>
<tr>
<td>Minimum film forming temperature, °C/F</td>
<td>29/84</td>
</tr>
</tbody>
</table>

## Powder Coating Grades

### Lumiflon Powder Coating Grade Typical Properties

<table>
<thead>
<tr>
<th>Grade</th>
<th>LF-710F</th>
<th>EXLP-36*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Markets</td>
<td>architecture, transportation</td>
<td></td>
</tr>
<tr>
<td>Substrates</td>
<td>metal-steel &amp; aluminum</td>
<td></td>
</tr>
<tr>
<td>Solid resin, wt%</td>
<td>&gt;99</td>
<td>&gt;99</td>
</tr>
<tr>
<td>Tg, °C/F</td>
<td>51/125</td>
<td>50/122</td>
</tr>
<tr>
<td>OH Value, mg KOH/g-polymer</td>
<td>46</td>
<td>52</td>
</tr>
<tr>
<td>Softening point, °C/F</td>
<td>90/194</td>
<td>118/244</td>
</tr>
<tr>
<td>Solvent</td>
<td>none</td>
<td>none</td>
</tr>
</tbody>
</table>

*Commercial development products
solvent grades

name: spectrum building, usa
substrate: aluminum composite material

name: akashi straits bridge, japan
substrate: steel

name: rosemont water tower, usa
substrate: steel

solid resins

name: twin dragon towers gateway, usa
substrate: steel

name: aon center, usa
substrate: aluminum composite material

water emulsion resins

name: stadium seats, japan
substrate: fiberglass

name: mihama estate, japan
substrate: fiber reinforced concrete

name: okayama castle, japan
substrate: concrete

powder coating

name: the birmingham news, usa
substrate: aluminum

name: richmond city hall, usa
substrate: aluminum composite material
Superior durability and weatherability. More brilliant, longer lasting colors and a far wider gloss range. And the toughest, most durable finish ever with the industry’s leading longevity record. Add LUMIFLON’s unique capabilities for field application and you have an end product that looks better, longer – and ultimately costs less. Longer life is also a formula for sustainability, which is good chemistry for a blue planet. For more information on LUMIFLON’s applications worldwide, please call 800-424-7833, 610-423-4300 or visit www.lumiflonusa.com. Discover for yourself how good your bottom line looks when you raise your own standards with LUMIFLON.
Choose ALPOLIC®

make your project practical and durable.

Browse our offerings, and let's build.

created for your unique project. We use the advanced or 10 year finish warranty colors are stocked in either 3mm or 4mm thickness.

NATURAL METALS

offer a traditional look in a choice of five custom Class 1 colors. The 4mm panels are manufactured with 1100 alloy over 40 feet. Then choose a fluoropolymer paint finish (FR) core ± typically required by fire codes when building in a selection of 50- or 62-inch widths and 146- or 196-inch lengths.

STOCK painted colors are available on 4mm-thick panels. These 4mm panels offer the flatness and workability of aluminum composite. Your choice of metal surface while retaining the state-of-the-art panel system. These 4mm panels offer for the largest orders. Gain practically unlimited design flexibility, thanks to our ability to deliver short runs of custom colors in your choice of 40-, 50- or 62-inch widths.

STOCK paints offer for the largest orders. Gain practically unlimited design flexibility, thanks to our ability to deliver short runs of custom colors in your choice of 40-, 50- or 62-inch widths.

Rigid, lightweight panels that fulfill your vision with a finish of enduring quality – and natural metal surfaces, working with you to bring your design intent to reality.

Choose ALPOLIC® or the Kynar® finishes and colors ± Bright, clean high-gloss colors, or delete information herein without prior notice.

CUSTOM COLORS

± For best color effects and more: If you can imagine a color, we can make it. Lumiflon FEVE resin even ambient cure capabilities. Choose the Highest Standard of ALPOLIC® with you to help you choose the perfect look to convey.

HIGH-PERFORMANCE FLUOROPOLYMER RESINS

deliver superior durability, weatherability and chemical resistance. Choose Lumiflon® FEVE and Kynar® PVDF finishes, but delivers unprecedented coating, meets the weatherability and chemical-resistance standards meeting or exceeding AAMA 2605 specifications to create unique colors and effects. The resulting finishes combine Lumiflon® FEVE and Kynar® PVDF finishes, but delivers unprecedented coating, meets the weatherability and chemical-resistance standards meeting or exceeding AAMA 2605 specifications to create unique colors and effects. The resulting finishes combine Lumiflon® FEVE and Kynar® PVDF finishes, but delivers unprecedented coating, meets the weatherability and chemical-resistance standards meeting or exceeding AAMA 2605 specifications.

We recommend ordering finishes for your entire job consistency, maintain the same directionality throughout your entire project.

FINISH DIRECTIONALITY

will work with you directly to ensure the gloss level you want is achieved.

For expert assistance with product availability, material effects and more: If you can imagine a color, we can make it. Lumiflon FEVE resin even ambient cure capabilities. Choose the Highest Standard of ALPOLIC® with you to help you choose the perfect look to convey.

Chalking Resistance

Exceeds 2000 days with no measurable chalking.

Durability

Meets AAMA 2605

Field Touch-Up

This remarkable finish can also be touched up with Field Touch-Up Primer and Field Touch-Up Color/Mica.

Color Range

62-inch widths.

Durability

Meets AAMA 2605

Field Touch-Up

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Color Range

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Durability

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Durability

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Field Touch-Up

This remarkable finish can also be touched up with Field Touch-Up Primer and Field Touch-Up Color/Mica.

Color Range

62-inch widths.
Choose ALPOLIC® performance to make your project practical and durable. Choose ALPOLIC® finishes and colors to make it truly remarkable.

We offer an extensive selection of rich, vibrant colors and styles for both painted and natural metal surfaces, working with you to bring your design intent to reality. Rigid, lightweight panels that fulfill your vision with a finish of enduring quality— that’s the beauty of ALPOLIC® materials.

Browse our offerings, and let’s build.

Architectural Stock Finishes and Colors

STOCK painted colors are available on 4mm-thick panels, with many of the most popular choices stocked in a selection of 50- or 62-inch widths and 146- or 196-inch lengths. Specify a polyethylene (PE) or fire-resistant (fr) core typically required by fire codes when building over 40 feet. Then choose a fluoropolymer paint finish offered in a variety of solid colors, metallics and micas. These panels are manufactured to architectural standards and stocked for immediate shipment.

ANODIZED panels are manufactured with 1100 alloy aluminum. They are available in both 50- and 62-inch widths with a stock clear anodized Class 1 finish or a choice of five custom Class 1 colors.

NATURAL METALS offer a traditional look in a state-of-the-art panel system. These 4mm panels offer your choice of metal surface while retaining the flatness and workability of aluminum composite.

Specialty Stock Colors and Finishes

STONE/TIMBER SERIES finishes are produced using our proprietary image-transfer process in concert with Lumiflon® FEVE fluoropolymer coatings, providing exceptional protection with the classic beauty of stone or timber. We stock standard 62-inch panels for your immediate needs.

PRISMATIC finishes combine Lumiflon® FEVE fluoropolymer technology with specialized pigments to create unique colors and effects. The resulting finishes can make the surface glisten or even change colors with different lighting or the movement of the sun. Consult our Prismatic brochure to find the perfect color, gloss and effect for your design.

DECORATIVE panels use specially treated aluminum surfaces with crystal-clear coats of Lumiflon® FEVE resin to protect the panels and maintain a pristine look, even in harsh exterior applications. HPA offers a polished shine, while HLZ has the look of brushed stainless steel.

Corporate Identity - Stock Program Colors

PROGRAM or 10 year finish warranty colors are stocked in the standard options shown here, or can be custom-created for your unique project. We use the advanced Lumiflon® FEVE fluoropolymer resin in two or three coats, or the Kynar® PVDF coating system to create a vivid, extremely durable finish in an astounding range of colors and glosses, including metallic and mica options. Panels are stocked in either 3mm or 4mm thickness.

MULTI-COLOR panels incorporate an advanced coating process engineered by ALPOLIC® to accommodate almost any color scheme. From bright and glossy to muted and subtle, these rich and versatile color systems can only be accomplished by combining Lumiflon® FEVE technology with our advanced die coil coating system. We can work with you to help you choose the perfect look to convey your message.

CUSTOM COLORS Bright, clean high-gloss colors, rich metallics, low-gloss earth tones, prismatic special effects and more: If you can imagine a color, we can make it real. Contact customer service to connect with our color experts.
Choose the Highest Standard of Quality, Durability and Beauty

HIGH-PERFORMANCE FLUOROPOLYMER RESINS

Our Lumiflon® FEVE and Kynar® PVDF resins are the most advanced architectural coatings available, meeting or exceeding AAMA 2605 specifications to deliver superior durability, weatherability and chemical resistance. Choose Lumiflon® FEVE for the broadest color palette with a gloss range from satin to high luster. This remarkable finish can also be touched up with an air-dry system.

SHORT RUN CAPABILITIES

With our advanced die coating process and controlled curing, we can coil coat as little as 1,000 square feet of material in a broad choice of colors. You can count on the same color consistency, quality and lengthy warranty we offer for the largest orders. Gain practically unlimited design flexibility, thanks to our ability to deliver short runs of custom colors in your choice of 40-, 50- or 62-inch widths.

GLOSS RANGE

Different gloss levels can significantly change the eye’s perception of color. If you would like a different gloss level than the sample you submit for color matching, let us know. We will work with you directly to ensure the gloss level you want is achieved.

FINISH DIRECTIONALITY

For best color consistency, maintain the same directionality throughout design, estimation, fabrication and construction. We recommend ordering finishes for your entire job at one time, from one lot of material.

2 Coat Solid/Mica

3 Coat Metallic/Prismatic

LIGHT REFLECTANCE VALUE

LRV numbers indicate the percentage of visible light reflected by the surface. This value is defined in ASTM C609 as the Y value in an XYZ/Y:xy color space. While the LRV values shown on this chart are typical, there can be slight variations between individual lots.

SOLAR REFLECTANCE INDEX

SRI numbers, as defined by ASTM E1980 using 12 W/m2K values, indicate the material’s reflectivity (how well it reflects back instead of absorbing radiant energy) and emissivity (how well it radiates absorbed heat back into the environment). The Cool Roof Rating Council (CRRC) requires an SRI value of 29 or greater for steep-slope roofs to earn a Cool rating. Most of our Architectural stock colors meet this requirement, and we have added Cool after the SRI value for easy reference.

For expert assistance with product availability, material selection, sizing and colors, please contact your local ALPOLIC® sales office.
30 Year Finish Warranty Stock Colors

SOLID

- Bone White
  - LRV 78.50/SRI 82-Cool
- Oyster
  - LRV 72.46/SRI 82-Cool
- Mist White
  - LRV 69.96/SRI 75-Cool
- Aluminum Grey
  - LRV 31.60/SRI 26
- BGY Grey
  - LRV 10.41/SRI 7

- Bronze
  - LRV 7.95/SRI 14
- TOB Black
  - LRV 1.01/SRI 0

MICA

- Mica Platinum
  - LRV 30.88/SRI 53-Cool
- Mica Anodic Clear
  - LRV 34.43/SRI 56-Cool
- Mica Champagne
  - LRV 22.61/SRI 38-Cool
- Mica Grey
  - LRV 7.95/SRI 14
- Mica MF5 Grey
  - LRV 13.41

METALLIC

- BSX Silver Metallic
  - LRV 30.94/SRI 71-Cool
- Silver Metallic
  - LRV 36.59/SRI 63-Cool
- Champagne Metallic
  - LRV 31.19/SRI 59-Cool
- Medium Bronze Metallic
  - LRV 31.20/SRI 40-Cool
- Dark Copper Metallic
  - LRV 15.09/SRI 47-Cool

Stocked in 4mm thick panels

*Colors shown are as close to actual colors as allowed by the printing process. Mitsubishi Plastics Composites America, Inc. reserves the right to change or delete information herein without prior notice. Please refer to warranty details for exclusions and limitations. Additional warranty coverage may be given to some projects/products. Please call 800.422.7270 for more information.
### 20 Year Finish Warranty Stock Colors

<table>
<thead>
<tr>
<th>Color</th>
<th>Code</th>
<th>LRV</th>
<th>SRI</th>
</tr>
</thead>
<tbody>
<tr>
<td>BBR Red</td>
<td>4-BBR-30</td>
<td>8.06</td>
<td>3&amp;4mm</td>
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<tr>
<td>BTR Red</td>
<td>4-BTR-50</td>
<td>11.57</td>
<td>3&amp;4mm</td>
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<tr>
<td>TOR Red</td>
<td>4-TOR-70</td>
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<td>JLR Red</td>
<td>4-JLR-50</td>
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<td>JXR Red</td>
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<td>TRC Red</td>
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<td>AUB Blue</td>
<td>4-AUB-50</td>
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<td>RVW White</td>
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<td>TBL Black</td>
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<td>3&amp;4mm</td>
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**SOLID**

**METALLIC**

<table>
<thead>
<tr>
<th>Color</th>
<th>Code</th>
<th>LRV</th>
<th>SRI</th>
</tr>
</thead>
<tbody>
<tr>
<td>CVG Grey</td>
<td>4-CVG-50</td>
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<td>PEX Pewter Metallic</td>
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<td>TSZ Silver Metallic</td>
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<td>TBX Silver Metallic</td>
<td>4-TBX-70</td>
<td>38.75</td>
<td>3&amp;4mm</td>
</tr>
</tbody>
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10 Year Finish Warranty Stock Colors

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</tr>
</thead>
<tbody>
<tr>
<td>STR Red</td>
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<td>TRD Red</td>
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<td>FEF Red</td>
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<td>BPS Pearl</td>
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<tr>
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<td>CRY Oyster</td>
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<td>CTW White</td>
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<td>MCV White</td>
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<td>SAW White</td>
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<td>EWH White</td>
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<tr>
<td>DyB Blue</td>
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<tr>
<td>CFB Blue</td>
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<td>SHB Blue</td>
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<td>BGN Green</td>
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<td>BYL Yellow</td>
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<td>SOG Grey</td>
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**MULTI-COLOR**

<table>
<thead>
<tr>
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<td>55.00 Multi</td>
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**Specialty Stock Colors/Finishes**

**STONE SERIES | 20 Year Finish Warranty**

- **Black Granite**
  - LRV 4.28
- **MRT Prismatic Magma**
  - LRV 2.06

**TIMBER SERIES | 20 Year Finish Warranty**

- **Maple**
  - LRV N/A
- **Walnut**
  - LRV N/A
- **Mahogany**
  - LRV N/A

**PRISMATIC**

- **MRT Prismatic Magma**
  - 10 Year Finish Warranty
  - LRV 11.33
- **DQO Pearlescent Orange**
  - 10 Year Finish Warranty
  - LRV 22.21

**DECORATIVE**

- **HPA High Polished Aluminum**
  - 5 Year Finish Warranty
  - LRV 0.88
- **HLZ Hairline Aluminum**
  - 10 Year Finish Warranty
  - LRV 16.32

**MULTI-COLOR**

- **Red/White**
  - 10 Year Finish Warranty
  - LRV 11.64
- **Blue/White**
  - 10 Year Finish Warranty
  - LRV 8.00
- **Yellow/White**
  - 10 Year Finish Warranty
  - LRV 48.05

**Architectural Premium Stock Finishes**

**NATURAL METALS**

- **Stainless**
  - LRV 21.84
- **Zinc**
  - LRV 21.51
- **Copper**
  - LRV 5.03

**ANODIZED**

- **Clear**
  - LRV 34.31

*Colors shown are as close to actual colors as allowed by the printing process. Mitsubishi Plastics Composites America, Inc. reserves the right to change or delete information herein without prior notice. Please refer to warranty details for exclusions and limitations. Additional warranty coverage may be given to some projects/products. Please call 800.422.7270 for more information.*
Lumiflon® FEVE, a remarkable second-generation fluoropolymer coating, meets the weatherability and chemical-resistance standards you would expect from PVDF finishes, but delivers unprecedented design and performance advantages – a rich palette of vivid colors, a full gloss range, excellent adhesion, recoatability and even ambient cure capabilities.

<table>
<thead>
<tr>
<th></th>
<th>FEVE/Lumiflon®</th>
<th>PVDF/Kynar®</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Durability</strong></td>
<td>Meets AAMA 2605</td>
<td>Meets AAMA 2605</td>
</tr>
<tr>
<td><strong>Color Range</strong></td>
<td>Bright to Muted</td>
<td>Muted Only</td>
</tr>
<tr>
<td><strong>Color Retention</strong></td>
<td>Excellent</td>
<td>Excellent</td>
</tr>
<tr>
<td><strong>Gloss Range</strong></td>
<td>30–70</td>
<td>30–40</td>
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<tr>
<td><strong>Gloss Retention</strong></td>
<td>Excellent</td>
<td>Excellent</td>
</tr>
<tr>
<td><strong>Chalking Resistance</strong></td>
<td>Excellent</td>
<td>Excellent</td>
</tr>
<tr>
<td><strong>Field Touch-Up</strong></td>
<td>Excellent</td>
<td>Poor</td>
</tr>
<tr>
<td><strong>Marring Resistance</strong></td>
<td>Excellent</td>
<td>Good</td>
</tr>
</tbody>
</table>

For additional information, samples or a list of ALPOLIC® fabricators, please call 1-800-422-7270 or visit www.alpolic-americas.com.

**ALPOLIC® MATERIALS**

Let’s Build

**MITSUBISHI PLASTICS COMPOSITES AMERICA, INC.**

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www.alpolic-americas.com | e-mail: info@alpolic.com

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