

3form® | XT™

Exterior Solutions

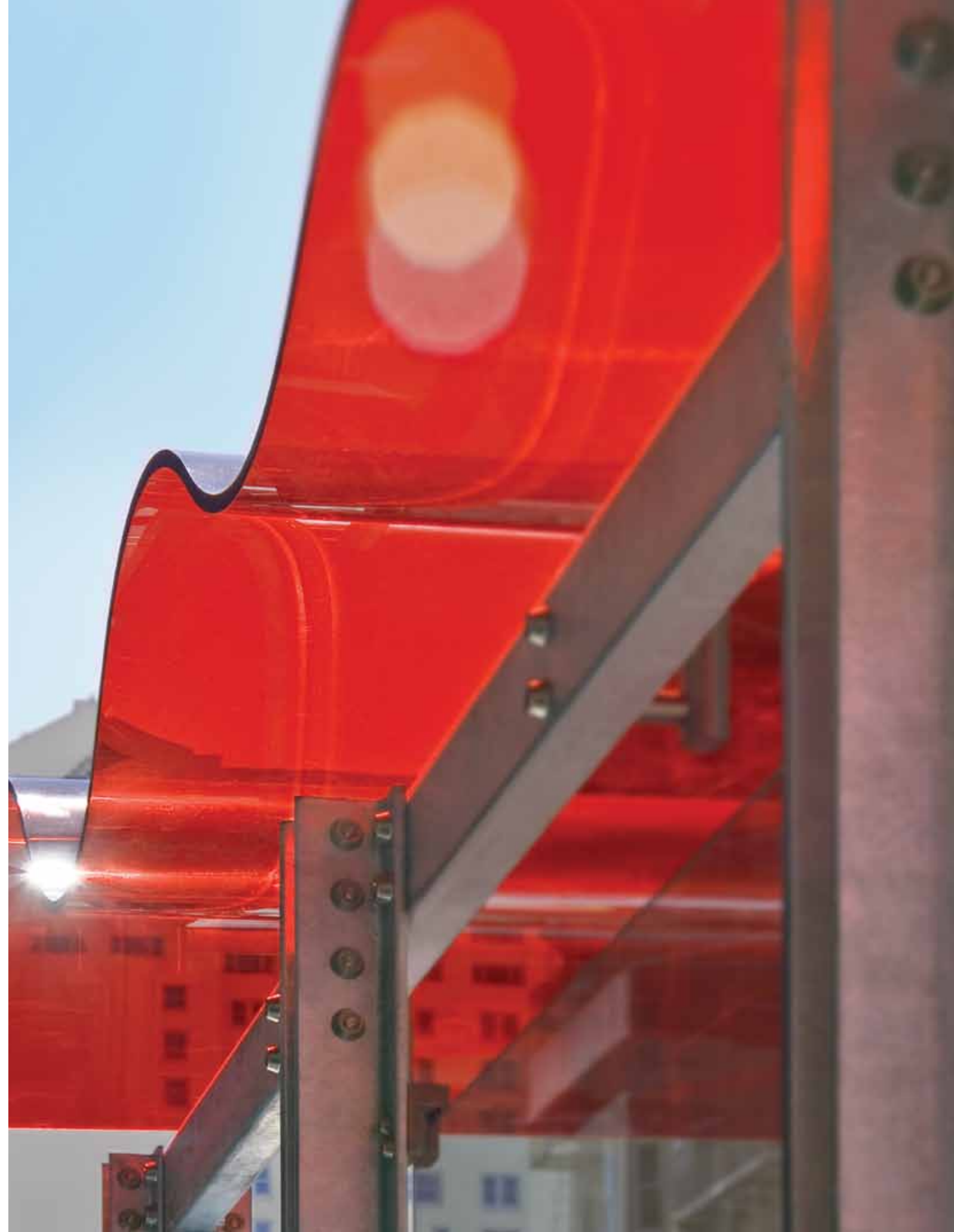


Design meets **Durability.**

INNOVATION AND DESIGN SHINE OUTDOORS WITH XT

3form® design-forward materials are specifically engineered for exterior use. Bring translucency, shape, design impact and proven performance to your exterior project for a stunning installation that allures from the outside in.

Partner with 3form to realize your unique design vision. Utilize 3form for material consultation, engineering services, and application development. Specify complete material assemblies from the leading manufacturer of sustainable translucent materials.





3form® | XT

Exterior Products

koda xt™ A high performance material with design capabilities and 40% recycled content. The optimal choice for exterior projects of any scale.

chroma xt Luminous color with a soft, saturated appearance and 40% recycled content. Ideal for horizontal spans and both edge and backlit applications.

varia ecoresin xt Boasts a 40% recycled content and has great design flexibility. Ideal for less demanding vertical applications.

pressed glass xt A design driven laminated glass uniquely suited for exterior applications. Add color and design elements to this timeless material.

100 percent xt Made from 100% post-consumer recycled HDPE. Ideal for landscape architecture. The ultimate in sustainable exterior products.

Exterior Applications

3form translucent materials enable architects to realize bold new designs transforming transit shelters into iconic elements of municipal landscape, or sound walls into artful community narratives. With 3form materials, functional exterior applications become unique opportunities to bring distinctive design outdoors.

- shelter
- wind screen
- sound barrier
- landscape
- parapet
- balustrade
- railing
- façade
- soffit
- awning
- canopy



1			
	2	3	4

1, 2 | CANOPY | **KODA XT** | FIRM: CBT ARCHITECTS
 3 | WIND SCREEN | **KODA XT** | FIRM: DART
 4 | LANDSCAPE | **CHROMA XT** | FIRM: RIOS CLEMENTE HALE STUDIOS

koda XT™

High Performance High Design Low Environmental Impact

HIGH PERFORMANCE POLYMER

Koda XT has over 100 times the impact strength of glass and over 60 times the impact strength of acrylic. This strong material is surprisingly lightweight and is both easy and efficient to install.

HIGH DESIGN AESTHETIC

Though incredibly tough, Koda XT can also be molded and manipulated to meet extreme design requirements. Specify custom colors and textures, and complete material assemblies for unprecedented design freedom and ease of specification.

LOW ENVIRONMENTAL IMPACT

Koda XT is made with 40 percent pre-consumer recycled content. It is the only architectural polycarbonate material available to use toward LEED MR Credit 4 for recycled content. Translucent material also qualifies for IEQ Credit 8.1 and 8.2 (Daylight and Views).

When specified in our standard colors, it is fully recyclable. Customize Koda XT to incorporate photovoltaic cells for power generation. Translucency allows daylighting for reduced energy consumption.





Cost Efficiency

EASY TO SHIP AND EASY TO INSTALL

This extremely durable material is half the weight of glass, making it incredibly cost efficient to ship, manipulate and install. Each high strength panel requires less base structural support, further minimizing costs.

DESIGNED AND INSTALLED MORE EFFICIENTLY THAN GLASS / CAN BE CUT AND COLD FORMED ON SITE

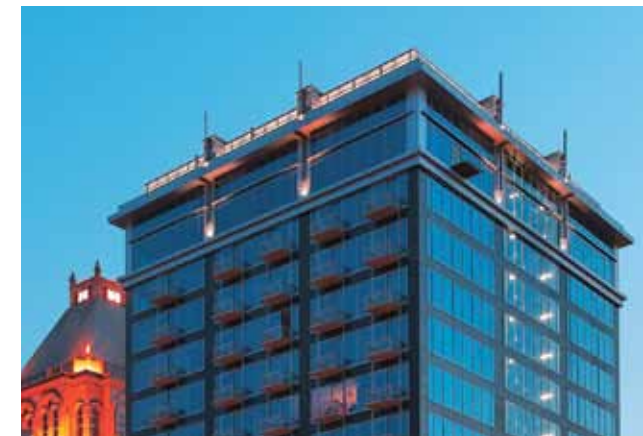
This durable material is extremely ductile. It can be cut on site from flat sheets and, when specified in a thin gauge, cold-formed into curves—neither of which are achievable with glass. Koda xt™ can efficiently create distinctive structures that feature dramatic expanses of curved glazing, and does not require complicated glass handling equipment.

DURABLE – WITH SUCH A STRONG MATERIAL THE COST OF REPLACEMENT BECOMES A LESS LIKELY CONCERN

Koda xt is chemically resistant and can be specified with abrasion-hiding finishes. And with 60x the impact strength of acrylic and 100x the impact strength of glass, Koda xt is virtually unbreakable. These three characteristics translate into a longer life span in extreme exterior applications, minimizing maintenance and the costs and hassles of replacing materials.

LIGHTWEIGHT – REPLACEMENT IS LESS OF A COSTLY CONCERN

Koda xt is more lightweight and versatile than glass. It can be replaced or re-installed by one person. And because Koda xt can be cut and drilled on site without complicated and costly glass-handling equipment, re-fit and reinstall costs are minimal.



1			
2	3	4	
		5	6

1, 2, 3, 4 | CANOPY | **KODA XT** | FIRM: K-NOW

5 | PARAPET | **KODA XT** | FIRM: MOSER MAYER PHOENIX ASSOCIATES

6 | CANOPY | **KODA XT** | FIRM: MOSER MAYER PHOENIX ASSOCIATES

Energy Efficiency

CLEAR KODA XT™ TRANSMITS 85% OF VISIBLE LIGHT / COLORED KODA XT CONTROLS HEAT GAIN

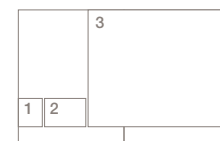
By allowing the transmittance of up to 85% of visible light, clear Koda xt is an excellent glazing material for a wide range of applications requiring translucency. Also available in colored tints, Koda xt controls heat gain, and provides a variety of privacy finishes for obscure glazing requirements.

COMPATIBLE WITH PHOTOVOLTAICS

3form provides the custom capability of Design Integrated Photovoltaics (DIPV)* for sustainable energy solutions and self-sustaining electrical power.

(SEE SAN FRANCISCO TRANSIT SHELTER CASE STUDY ON PAGE 20)

*SUBJECT OF ONE OR MORE PATENTS PENDING.



1, 2, 3 | CANOPY | KODA XT | FIRM: CARL DANIELS ARCHITECTS

Impact Protection and Life Safety

VIRTUALLY UNBREAKABLE: 60x THE IMPACT STRENGTH OF ACRYLIC, 100x THE IMPACT STRENGTH OF GLASS

Unsurpassed by any glazing product on the market, Koda XT™ is a hundred times stronger than glass and sixty times stronger than acrylic. This tough, long lasting material offers attractive protection in areas subject to high traffic, vandalism or burglary. It even withstands natural forces like severe wind, hail, and snow storms. In fact, Koda XT will meet stringent state mandates for hurricane resistant glazing materials.



GLASS WINDOW DAMAGE FROM HURRICANE



FAILED IMPACT TEST WITH GLASS USING STEEL DART WITH ONE INCH DIAMETER TIP

When tested against other materials for impact resistance, Koda XT far surpasses industry standards — 100x the strength of glass.

Impact Resistance*

Measured in ft-lbs/in — the energy required to cause a fracture in a given material.

GLASS

≤ 0.15 ft-lb/in

ACRYLIC

≤ 0.25 ft-lb/in

KODA XT

14 ft-lb/in

* BASED ON EQUIVALENT THICKNESSES USING THE IZOD METHOD



How to Specify koda XT

3 Options for Customization

OPTION 1: Standard koda XT™ Panels

KODA XT IS AVAILABLE IN 3 STANDARD COLORS.

Each 4x8 sheet is 1/2 inch thick with standard polished finishes.



Trans White



Crystal Clear

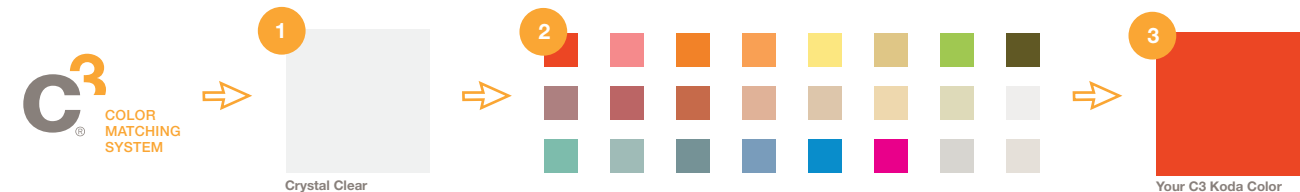


Glass Green

OPTION 2: C3 Color Customization*

SPECIFY KODA XT BY COMBINING CRYSTAL CLEAR WITH ANY OF OUR C3 COLORS.

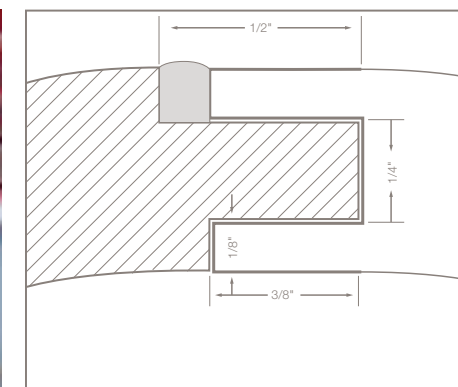
Combine up to 3 layers of color for up to 10,000 options. Choose Stucco, Sandstone or Patent finish.



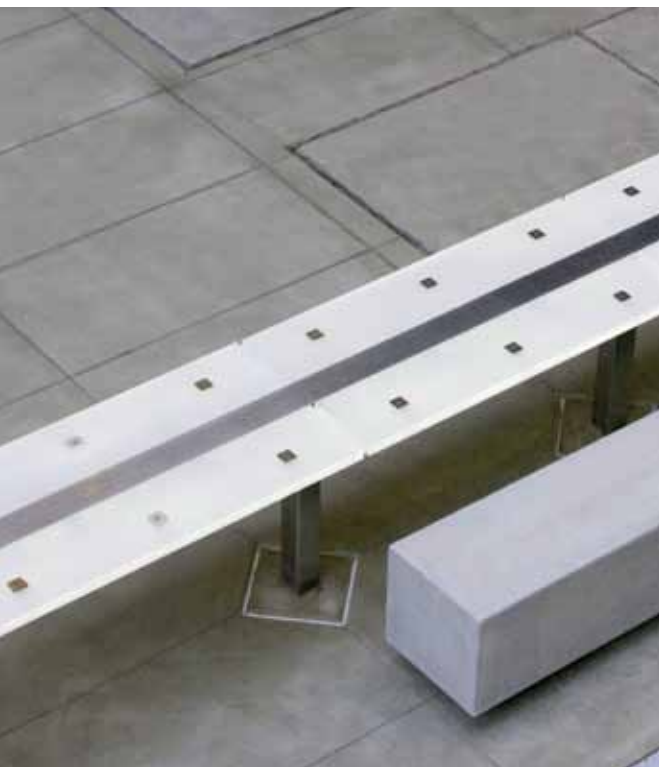
OPTION 3: Complete Customization

KODA XT CAN BE MANUFACTURED TO MATCH ANY CUSTOM COLOR, GAUGE AND FINISH.

Customization is offered for projects meeting yield and scope qualifications. Check with your sales rep to qualify your project.



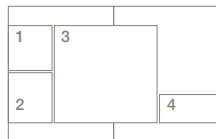
*SUBJECT OF ONE OR MORE PATENTS PENDING.



chroma[®] XT

LUMINOUS COLOR FOR GLOWING FEATURES

This monolithic material is ideal for horizontal exterior applications. The saturated color responds dynamically to both natural and artificial light making it well-suited for exterior focal pieces. Also contains 40% pre-consumer recycled content for projects seeking LEED certification.

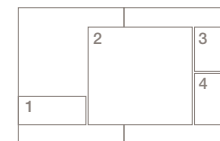
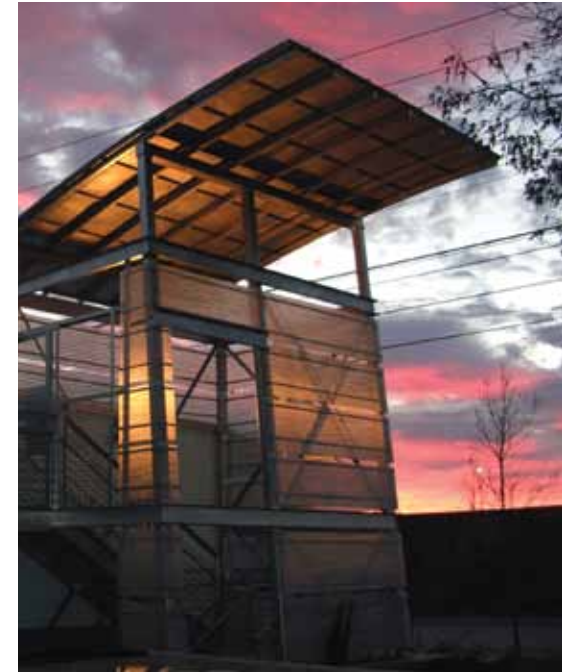


- 1 | AWNING | **CHROMA XT** | FIRM: CLARK CONDON LANDSCAPE ARCHITECTS
- 2 | LANDSCAPE | **CHROMA XT** | FIRM: RIOS CLEMENTE HALE STUDIOS
- 3 | AWNING | **CHROMA XT** | FIRM: THOMAS BALSLEY ASSOCIATES
- 4 | FAÇADE | **CHROMA XT** | FIRM: BAYSINGER PARTNERS ARCHITECTURE

varia ecoresin[®] XT

DESIGN VERSATILITY FOR VERTICAL APPLICATIONS

With a multitude of color, design elements, texture and finish options, Varia Ecoresin XT offers almost unlimited design freedom. Varia Ecoresin XT is ideal for vertical applications that are molded, formed and fabricated. With a 40% pre-consumer recycled content, this material contributes toward LEED credits.



- 1 | SIGNAGE | VARIA ECORESIN XT | FIRM: DAVID BAKER DESIGN
- 2 | FAÇADE | VARIA ECORESIN XT | FIRM: MASSIH ARCHITECTS
- 3 | FAÇADE | VARIA ECORESIN XT | FIRM: RUTLEDGE ALCOCK ARCHITECTS
- 4 | LANDSCAPE | VARIA ECORESIN XT | FIRM: CLARK CONDON LANDSCAPE ARCHITECTS

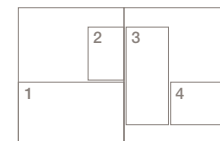
pressed glass™ XT

FOR PROJECTS REQUIRING THE RIGIDITY OF GLASS
Use 3form Pressed Glass xt to bring color and design to exterior elements. Create interpretive narratives with HighRes custom imagery panels that are UV stable.



100 percent® XT

THE ULTIMATE IN SUSTAINABLE EXTERIOR PRODUCTS.
Made from 100% post-consumer recycled HDPE, 100 Percent xt contributes to LEED credits for your exterior project. 100 Percent xt can easily be fabricated and is available in two contemporary color collections: Base and Blend.



1, 2 | FAÇADE | **PRESSED GLASS XT** | FIRM: POLK STANLEY ROWLAND CURZON PORTER ARCHITECTS
3, 4 | FURNITURE | **100 PERCENT XT** | FIRM: DELAWIE WILKES RODRIGUES BARKER

San Francisco Transit Shelters



The Challenge

To construct bold and iconic mass-transit shelters capable of energy generation—all produced from durable recycled materials. The iconic undulating canopy was inspired by seismic waves and the rolling hills of San Francisco.

FIRM: Lundberg Design

LOCATION: San Francisco, CA

PHOTOGRAPHY: Ryan Hughes

MATERIAL: Koda XT™ with photovoltaic cells* where specified

3FORM ADVANTAGE: Industry pioneering fabrication with an unprecedented recycled content material

*SUBJECT OF ONE OR MORE PATENTS PENDING.

“3form was great on this project. Without 3form, the end result would have never lived up to the concept. The roof was by far the biggest technical challenge and 3form made it happen.”

OLLE LUNDBERG



Engineering and Design Consultation

MATERIAL SELECTION

Originally conceived in glass, 3form® provided material engineering consultation regarding material fitness-for-use for this application. The team selected Koda xt™ for its extreme toughness, manufacturability, ease of installation, and relative cost.

STRUCTURAL ANALYSIS

3form Advanced Technology group modeled and modified the proposed resin structure to improve the structural integrity. 3form developed the technology to combine materials with photovoltaic modules to enable power generation.

SURFACE FINISHING

3form created custom surface finish for light diffusion and durability and reduced surface reflection, improving PV performance.

TIMELINES

Project taken from concept to reality in six months.

IMPLEMENTATION

3form developed a manufacturing process to accommodate the city-wide implementation of 1,100 new shelters over the course of five years.

CUSTOM COLOR DEVELOPMENT

The project specified San Francisco signature red and amber colors, engineered to withstand exterior exposures.

ENVIRONMENTAL CONSIDERATIONS

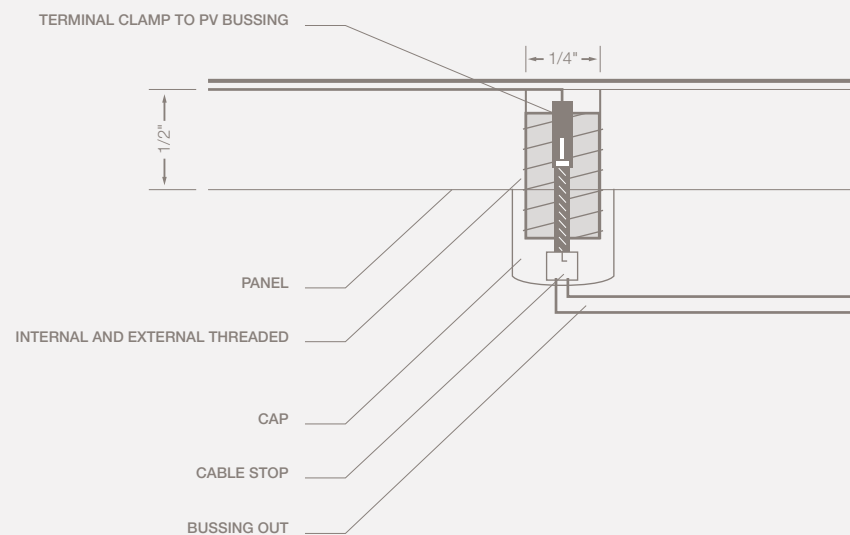
40% pre-consumer recycled content.

ARCHITECTURAL DETAILING

3form provided assembly details and collaborated with Lundberg to develop point support conditions. They created fabrication and seaming specifications and helped with mechanical connections for PV wiring specifications.



Bussing Connection Detail

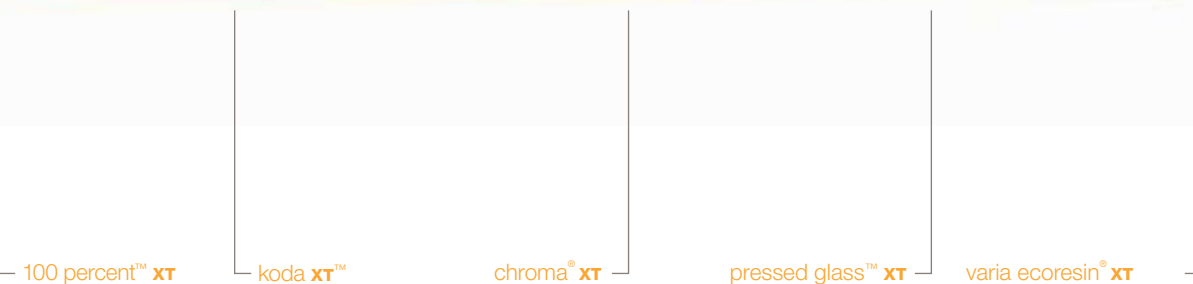


DESIGN PROPOSAL



SHAPE MODIFICATION FOR IMPROVED STRUCTURAL STRENGTH





100 percent™ XT

- 100% post-consumer recycled content
- Ideal for landscape architecture
- Chemically resistant

koda XT™

- Ideal for performance-driven exterior application
- 40% pre-consumer recycled content
- Extraordinary impact strength
- Easy to work with and install

chroma® XT

- Durable for horizontal applications
- Renewable Matte finish.
- Ideal for illumination
- 40% pre-consumer recycled content

pressed glass™ XT

- Optical clarity
- Rigidity in a thin gauge
- Made to order sizing
- Wide range of standard colors

varia ecoresin® XT

- Heat-formable and customizable
- 40 times the impact strength of glass
- 40% pre-consumer recycled content

XT Material Properties

++ | Exceeds Criteria
 + | Meets Criteria
 - | Does not meet Criteria
 Blank | Not Recommended

	koda XT™	chroma® XT	varia ecoresin® XT	100 percent™ XT	pressed glass™ XT
01 Flammability Resistance	+	-	+	+	++
02 Optical Clarity/Light Transmission	+	++	+		++
03 Impact Strength	++	-	+	+	-
04 Abrasion Resistance	-	+	-		++
05 High Service Temperature	++	+	-	-	++
06 UV Resistance	+	++	+	++	++
07 Chemical Resistance	+	-	+	++	++
08 Complex Fabrication	++	++	++	+	
09 Cold Bending	++	-	++	+	
10 Readily Recyclable	+	++	+	++	-
11 Formability	+	+	++		
12 Rigidity	-	+	-		++
13 Recycled Content	40%	40%	40%	100%	

Technical Support

For immediate consultation on material, hardware or fabrication options contact 3form technical support. This experienced team is on-call to assist in all technical questions at any point in the design or installation process.

877.649.2670
 technical.support@3-form.com

3form® | Advanced Technology

Breaking Boundaries, Delivering Value

3form® creates boundary-breaking solutions with innovative materials. Meet performance demands, cost constraints and aesthetic intent with 3form as your partner.

CONCEPT DEVELOPMENT COLLABORATION

- Material, geometry and system performance analyses to assist with concept approvals
- Design reviews to define project details to achieve design intent
- Preliminary cost analyses for early cost definition

ENGINEERING AND PROJECT MANAGEMENT

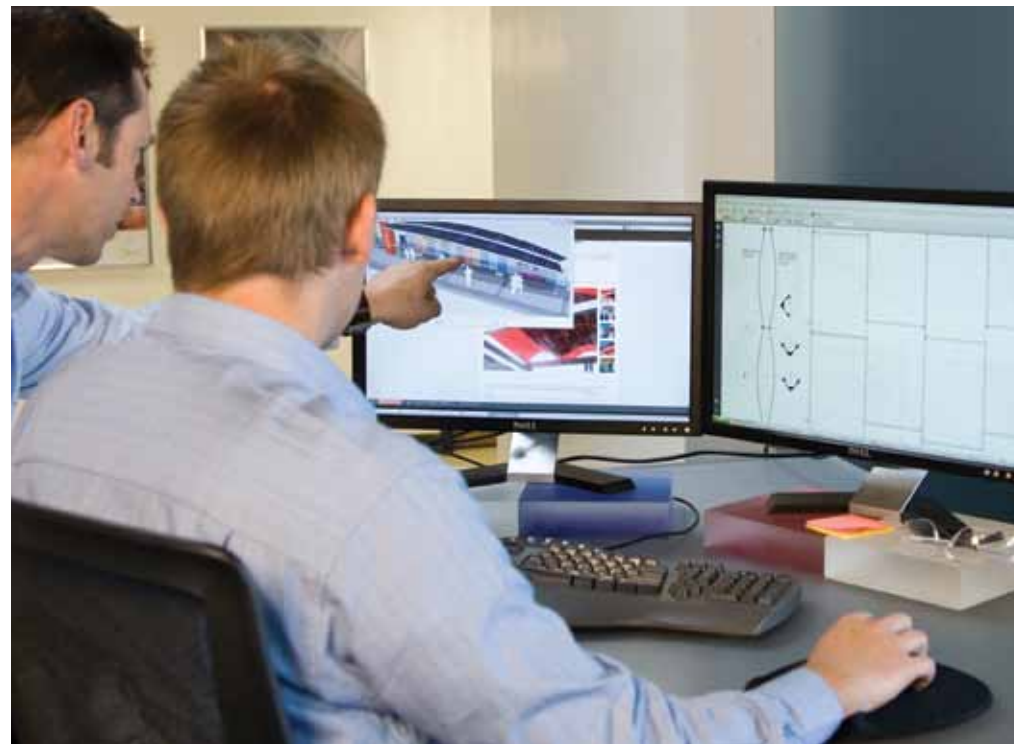
- Integrate emerging material technologies and building science expertise to pioneer ground-breaking projects
- Demonstrate proof of concept with prototyping, design validation and performance testing
- Reduce project risks and build efficiencies to achieve highly innovative solutions with extensive industry know-how

ADVANCE MANUFACTURING AND DELIVERY

- Cross functional operations and supply chain management bring a wide range of skills and perspectives to provide effective project coordination and delivery
- Minimize construction waste with computerized fabrication
- Projects are delivered as pre-assembled, turn-key solutions leading to sustainable, cost-effective construction

3FORM ADVANCED TECHNOLOGY COMPETENCIES:

- Material Engineering
- Hardware Engineering
- Architecture
- Structural Analysis
- Photovoltaic Integration
- Acoustic Analysis
- Testing (mechanical, structural, aging, weathering, and fire)
- Industrial Design
- LEED and Sustainable Design
- CAD-BIM Technologies (Revit, AutoCAD, Solid Works, Rhino)
- 3D Modeling
- Specification Writing
- Lighting
- Project Management
- Logistics
- Installation Support



"There wasn't a product in the marketplace that met what we proposed. We needed people who were willing to go down an R&D path with us to develop it."

BEN GILMARTIN, DILLER SCOFIDIO + RENFRO
discussing the Lincoln Center, Alice Tully Hall renovation.
Learn more at 3-form.com/Alice_Tully_Hall

About 3form®

BREAKTHROUGH PRODUCTS

From materials that break the mold, hardware solutions that simplify installations, to one-stop solutions that provide instant design possibilities, 3form has created a breadth and depth of offerings that make the connection from inspiration to installation seamless and uniquely yours.

COMMITTED PEOPLE

3form employees are a passionate, dedicated and knowledgeable group ready to assist you with simple design specification as well as the most complex custom design solutions. Our cross-functional team of trained architects, material engineers, and project experts, familiar with the unique properties of 3form materials, will realize and expand your innovative vision.

BETTER PLANET

Exceeding industry expectations, 3form has distinctively aggressive goals for minimizing the impact of not only our products, but our processes. Our Path to Zero goals are a commitment to continually reducing our overall environmental footprint toward the ultimate goal of total sustainability.

Please visit 3-form.com/about for more information.

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PAGE 07	James West		



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