HANDS-ON
APPROACH

CARRIER'S
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THERMOSTAT
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EARTH FIRST
BuildingGreen
announces its top
products for 2017
PAGE 38

MOVE ALONG
Kinetic structures
transform to suit
changing needs
PAGE 42
INTRODUCING SuperLite II-XLM
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SAFTIFIRST
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MIX IT UP
Plumen’s 6-watt 003 bulb (top left) combines the functional benefits of a spotlight with the ambient glow of candlelight. The Soft Fold acoustic ceiling by Arktura (top right) has a parametric design and an NRC of 0.75. Doimo Cucine’s Soho kitchen (left) incorporates multiple finishing materials.
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Doorbusters? No Thanks.

I DON'T LIKE TO SHOP. I never have and expect I never will. But when I was five or six, I used to beg to go to one furniture store. It spanned all three floors of a converted Victorian home, with each room set up in vignettes. For me, it was like moving through a giant dollhouse, one where I could imagine a different life: the parties I'd have with my friends around that dining room table, the fun I'd have sleeping on the top bunk rather than in my twin bed, and how great my back would feel if we had a big massaging recliner.

That marketing technique of appealing to fantasy and aspiration is commonplace now, but it was new to me then. Perhaps I've grown immune to it as I've aged—or just become more time-pressed and distracted. But retail continues to be about creating an alternate world. Presentation is key, with visual displays and messaging becoming increasingly sophisticated.

In this issue, we examine how this plays out. The case study “Downtown Style” (page 14) delves into how Saks Fifth Avenue’s latest New York store fashioned a more youthful image for the brand. The feature (page 18) concentrates on products for Industry buyers.

Elsewhere, we look at advances in stairs and elevators (page 32) as well as in storefronts and entrances (page 34). We also include the top 10 green building products for 2017 (page 38) and a recap of the always provocative London Design Festival (page 57).

Wishing you a very happy holiday season,
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- **Sponsored by Tecton™ Masonry by Oldcastle**
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- **Sponsored by WRCLA; Western Red Cedar Lumber Association**
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**Understanding Anchorage Systems for Natural Stone Cladding**
- **Sponsored by MIA+BSI; The Natural Stone Institute**
- **Credit:** 1 AIA LU/HSW; 0.1 ACET CEU

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- **Sponsored by Chladiow; CRL-US Aluminum; EXTECH; Exterior Technologies, Inc.; Longboard™ Products; a Division of Mayne Coatings Corp.; New Millennia Building Systems/Prodeco; TAMLYNTILE EZE; and Watco Glass, LLC**
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Santa Monica Adopts Zero Net Energy Requirements for New Homes

In October, the city council of Santa Monica, California, approved a sweeping ordinance requiring all newly built single-family homes, duplexes, and low-rise multifamily buildings to have zero net energy (ZNE) consumption. According to the 2016 California Green Building Standards Code (CALGreen), whose definition was adopted for the ordinance, a ZNE home is one that produces as much renewable energy on-site as it consumes annually. The ordinance is the first of its kind in the world, according to officials.

The state of California already had an upcoming code requirement on the books for all new residential construction to achieve ZNE by 2020. But Santa Monica has often adopted its own ambitious policies on environmental issues as a way to drive change elsewhere, says Dean Kubani, the city's chief sustainability officer. “Many practitioners and cities in California aren’t aware this code change is coming in 2020—or they don’t believe the state will be ready,” he says. “Taking this action now gives us a pathway toward this goal, helps us raise awareness, and drives home the importance of the issue.”

The ordinance must be given the green light by the California Energy Commission (CEC) through a process that includes a public comment period. Kubani estimates that the guidelines could officially go into effect as soon as late February 2017.

Once the ordinance passes, all permit applications for new residential construction in Santa Monica will need to comply with ZNE. Projects in schematic design when the ordinance passes but not in compliance would have to be modified, while those with approved permits would be grandfathered in. The new measure will be enforced via the city’s existing building code, the same process the state intends to use in 2020.

Attaining ZNE status for newly built homes in sunshine-abundant California is “absolutely achievable” by 2020, says Kubani. The prices of solar electric and solar thermal systems have been steadily decreasing for years, as Santa Monica officials also worked closely with the CEC, local utilities, and local design and construction firms to assess the ordinance’s technical and cost feasibility. Furthermore, several energy-efficient affordable housing projects already exist in Santa Monica, such as Colorado Court and Pico Place, built, respectively, in 2000 and 2014 by Los Angeles firm Brooks + Scarpa.

The ZNE ordinance is just one of the city’s strategies for achieving its long-term goals for climate change mitigation; another is releasing zero carbon by 2050. “Ideally, we’ll show the country and world that ZNE buildings are practical and affordable,” says Kubani, “and eventually they’ll become the new normal.” —Deborah Snoonian Glenn

Products that Are Worth Celebrating

Building goods, lighting, and furnishings that benefited from engineering breakthroughs as well as those produced via digital technology dominated Architectural Record’s Products of the Year, the magazine’s annual award competition for the best and brightest offerings in the industry. A jury of six architects, lighting designers, and interiors experts—most with extensive knowledge in both engineering and production methods—judged the contest, which this year added a ninth category, Hardware, Software, & Control Systems, to address the growing role of sensors and connected devices.

Each juror rated hundreds of entries according to their usefulness, aesthetics, and degree of innovation. The winners, ranging from Arktura’s SoftFold parametrically designed acoustic ceiling to Shildan Group’s Fabrik dry-joint architectural mesh system, can be viewed in their entirety at architecturalrecord.com/2016-record-products. —Julie Taraska

Architectural Record’s Products of the Year winners include the SoftFold acoustic ceiling by Arktura (left) and the Fabrik architectural mesh system (below). Brooks + Scarpa’s Colorado Court (right), an affordable housing project built in Santa Monica, California, in 2000, has become a national model for energy efficiency.

In brief

FRESH IDEAS

The Products of the Year winners include the SoftFold acoustic ceiling by Arktura (left) and the Fabrik architectural mesh system (below). Brooks + Scarpa's Colorado Court (right), an affordable housing project built in Santa Monica, California, in 2000, has become a national model for energy efficiency.

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Mariano's Fresh Market, Oak Lawn, IL
Owner: Stony Creek LLC, Itasca, IL
Architect: Camburas & Theodore, Des Plaines, IL
General contractor: J. Divita & Associates, Spring Grove, IL
Installing contractor: WBR Roofing, Wauconda, IL
Profiles: Corrugated, Flat sheet
Color: Silver Metallic

"The design flexibility and economic value of PAC-CLAD metal panels contributed to the design vision in a way other materials couldn't."

Domenic Pezzuto, senior project architect, Camburas & Theodore Ltd.

PAC-CLAD
Corrugated
Silver Metallic - Energy Star - Cool Color
Bright options for contract, public, and residential spaces

1. **T-LIGHT**
   - **MANUFACTURER**: Boyd Lighting
   - **PERFORMANCE**: This linear pendant featuring etched white glass between parallel lengths of extruded aluminum contains two 3000K LED strips that can be dimmed separately.
   - **PRICE RANGE**: $$$
   - **APPLICATIONS**: The pendant comes in three lengths and nine powder-coat options.
   - **BOYDLIGHTING.COM** (SNAP #200)

2. **VIVE**
   - **MANUFACTURER**: Lutron
   - **PERFORMANCE**: Lutron Vive integrates with a wireless hub that lets facility managers monitor and adjust fixtures from any smart device.
   - **PRICE RANGE**: $-$ $$
   - **APPLICATIONS**: Ideal for industrial or exposed concrete ceilings. The dimmable 3½-inch-square units offer 25- to 90-degree beam spreads.
   - **LUTRON.COM** (SNAP #201)

3. **BEVELED BLOCK**
   - **MANUFACTURER**: USAI Lighting
   - **PERFORMANCE**: USAI Lighting Beveled Block
   - **APPLICATIONS**: The scalable Beveled Block integrates with HVAC, IT, audiovisual, and energy-management systems.
   - **PRICE RANGE**: $$$
   - **APPLICATIONS**: Dimmable strips work indoors and out, including in wet locations, and use fewer than 2 watts per foot.
   - **USAIALIGHTING.COM** (SNAP #202)

4. **LINILED RGB**
   - **MANUFACTURER**: Organic Lighting Systems
   - **PERFORMANCE**: These specification-grade, color-changing light strips, measuring ½ inch wide by ¼ inch high, have a bend radius of ½ inches.
   - **PRICE RANGE**: $$
   - **APPLICATIONS**: Ideal for industrial or exposed concrete ceilings, the dimmable 3½-inch-square units offer 25- to 90-degree beam spreads.
   - **ORGANICLIGHTING.COM** (SNAP #203)
5. ORIGAMI

**MANUFACTURER:** Troy Lighting

**PERFORMANCE:** An angular, hand-worked iron frame surrounds a frosted-glass globe encasing a 12-watt LED.

**PRICE RANGE:** $$-$$$ 

**APPLICATIONS:** Available as a wall sconce and a landscape pendant plus three vertical options. Origami comes in a bronze or graphite finish.

**TROY-LIGHTING.COM** (SNAP #204)

6. LIGHTOLIER CALCULITE LED

**MANUFACTURER:** Phillips

**PERFORMANCE:** You can upgrade the driver and light engine of these LED downlights without replacing the frame.

**PRICE RANGE:** $$

**APPLICATIONS:** A mounted spring secures the reflector to the luminaire, which comes in a range of trims, aperture sizes, and beam spreads.

**LIGHTING.PHILIPS.COM** (SNAP #205)

7. PLUMEN 003

**MANUFACTURER:** Plumen

**PERFORMANCE:** The lamp's faceted gold element combines the functional benefits of a spotlight with the ambient glow of candlelight.

**PRICE RANGE:** $$

**APPLICATIONS:** Plumen's glass and anodized-aluminum 6-watt LED bulb provides 250 lumens and lasts 10,000 hours.

**PLUMEN.COM** (SNAP #206)

8. LUMENALPHA SPOT LARGE

**MANUFACTURER:** Lumen Pulse Group

**PERFORMANCE:** Delivering up to 3000 lumens, this adjustable LED spotlight offers superior color stability.

**PRICE RANGE:** $$-$$$ 

**APPLICATIONS:** The fixture can be specified with Lumentalk, which allows for digital dimming of individual luminaires.

**LUMENPULSEGROUP.COM** (SNAP #207)
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CASE STUDY: DEPARTMENT STORE

BY LINDA C. LENTZ

ACROSS THE STREET from the 9/11 Memorial in New York City, Brookfield Place, the former World Financial Center designed by César Pelli in the 1980s, is undergoing a transformation. Located near the World Trade Center site and Santiago Calatrava’s Fulton Street transit hub, the office-building complex is luring not only corporate tenants like Time Inc. but also a spate of upscale food and retail businesses. Among them, a new Saks Fifth Avenue satellite is notable for its elegant yet hip boutique style—a fresh take for the iconic department store.

Designed by the London-based firm Found Associates, Saks Fifth Avenue Downtown is tucked into the first two stories of an octagonal pavilion at the base of one of the complex’s towers. Departing from the sharp edges of the building’s exterior, principal Richard Found stacked a pair of glazed rotundas behind the faceted facade, wrapping the glass on the inside with fixed, brushed-brass louvers that filter sunlight into the sales areas. “This allows views out to the World Trade Center,” says Found. “At the same time, it provides a backdrop for the merchandise.”

Throughout the store, color and material choices are subtle, serene, and surprisingly consistent for a multibrand retail establishment. The soft brass returns on garment racks and low-profile casework. Elsewhere, pastel upholstery wraps seating from Fritz Hansen and Hay, champagne-hued carpeting alternates with terrazzo floors, and hand-finished polished plaster coats the walls.

An open plan maximizes the quirky 65,000-square-foot space with avenues that branch from the rotundas back toward the building’s core. Whenever possible, Found fused structural, mechanical, and decorative elements. Escalators at the center of the rotundas bisect circular sales hubs, which are in turn ringed by

SAKS FIFTH AVENUE, NEW YORK

Downtown Style

PROBLEM: Create a youthful retail image for a storied brand.

SOLUTION: Craft an open-plan space with an effervescent palette, contemporary finishes, and designer furnishings.
If it looks too good to be true

Above: CastleTop® Shingles in multiple colors

- Embossed diamond-shaped shingles for roofs and walls
- Over 30 stock colors and over 65 designer colors in steel and aluminum with PVDF finish
- Choice of 12 natural metals including copper, zinc, and stainless steel
- One of many wall cladding options in addition to a full line of roof panels and accessories
- Ultimate design flexibility: from single color facades to bold staggered color patterns, CastleTop leaves a lasting impression

...it’s ATAS

ATAS International, Inc.
Sustainable Building Envelope Technology

ODYSSEY
2050 SOUTH

ATAS International, Inc.
Sustainable Building Envelope Technology
IN THE DETAILS
Polished plaster walls and poured terrazzo floors lend a quietly luxurious feel to the space.

The warm LED lighting is equally discreet. The fixtures are concealed in ceiling coves that follow the lines of the architectural elements, with the lights' glow creating halos around columns and above the rotundas. The lighting also delineates a long corridor leading to the shoe department, where sits Found's one touch of bling: a 15-foot-wide, half-spherical chandelier with 50 globes. Mounted on a polished-metal ceiling, it's a glittering orb—a dazzling effect, and all the more so in a Saks that offers an understated alternative to the usual luxury experience.

TRAVELMASTER 110
MANUFACTURER: Kone
PERFORMANCE: This escalator with a 30-degree incline and 31-foot vertical rise offers numerous energy-saving options, including reduced operating speed, a standby mode, and LED lighting.
PRICE RANGE: $$--$$$
APPLICATIONS: With its streamlined appearance and duty cycle of 12 to 16 hours a day, TravelMaster 110 suits indoor retail uses.
KONE.US
(SNAP #212)

RO LOUNGE CHAIR
MANUFACTURER: Fritz Hansen
PERFORMANCE: Spanish designer Jaime Hayon created this oversize armchair that mixes two fabrics—one on the seat shell and one on the cushions.
PRICE RANGE: $$$
APPLICATIONS: This chair for residential and hospitality use comes in nine colors, with oak or brushed-aluminum legs. A matching footstool is also available.
FRITZHANSEN.COM
(SNAP #209)

REGAL SELECT
MANUFACTURER: Benjamin Moore
PERFORMANCE: This low-odor, no-VOC interior paint has a mildew-resistant coating.
PRICE RANGE: $$
APPLICATIONS: Available in five finishes and dozens of colors, this 100 percent acrylic paint for high-traffic areas such as corridors and kids' rooms is durable and easily cleaned. It also offers excellent coverage for problem areas.
BENJAMINMOORE.COM
(SNAP #210)

SEDUCTION
MANUFACTURER: Fabrigure
PERFORMANCE: This dense cut-pile carpet made of 100 percent Stainmaster TruSoft BCF nylon type 6,6 has a velvety finish.
PRICE RANGE: $$
APPLICATIONS: Stain protection and static control make Seduction ideal for busy areas, while its 60 neutral colorways help it fit into nearly any interior scheme.
FABRICA.COM
(SNAP #211)

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Show-and-Tell

Architects discreetly work the details to create spaces that convey a brand’s DNA.

BY ALEX KLIMOSKI

FOR CLOTHING AND furniture retailers, showrooms offer inviting spaces where visitors can be immersed in their brands. More akin to galleries than retail storefronts, these appointment-only places are intended to cultivate a rapport with seasoned buyers, not provide eye candy to walk-in customers. To achieve their unique goals, designers of the following trio of showrooms combined a muted palette, targeted lighting, and a flexible floor plan to create interiors that allow products to shine.

CITIZENS OF HUMANITY, LOS ANGELES
Montalba Architects had specific aims for the showroom of premium denim brand Citizens of Humanity: The space needed to enhance the clothing’s quiet color palette, function as a work studio for company designers, and serve as a venue for PR events and fashion shows. “We had to create a simple backdrop that wouldn’t compete with the product,” explains principal David Montalba, “but rather let it be about the product.”

To achieve this, the Santa Monica, California–based firm stripped the heavy wood and rusted steel from the 4,000-square-foot industrial space, located on the top floor of a former piano factory. In its stead, a white-box gallery was fashioned from simple, straightforward materials. The team opened up the European oak floor by placing three evenly spaced canvas walls along both lengths of the main showroom. The rectangular surfaces, finished with Benjamin Moore Super White matte paint, appear to float off the original brick.
walls. Detachable stainless-steel rails for merchandise display punctuate each wall, creating visually quiet alcoves in which to examine the clothing.

At the floor's center, custom desks and Eames molded-plywood dining chairs form individual—and easily moved—workstations. More steel rails holding clothing separate each desk. A 40-inch linear skylight bathes the space in natural illumination. Lytespan's 22 MC6 track lighting supplements the efforts, adding spots of brightness as well as creating, according to Montalba, a soothing, "lightly spiritual" feel.

BERNHARDT DESIGN, NEW YORK
Bernhardt Design specializes in high-end contract furnishings and textiles. To welcome visitors and allow them to visualize how the products could fit various interiors, architect Lauren Rottet employed a milky-white palette, luxurious materials, and a spectrum of discreet lighting. The goal in this "gracious living space," as she describes it, was to achieve a background that was "almost invisible."

Upon entering the 20,000-square-foot showroom, located in New York's NoMad neighborhood, guests step into a serene reception area with a front desk and ceiling-height posterior wall both fashioned from Calacatta Lincoln marble. The marble appears again within the showroom's bar area, whose backlit, 20-foot-long overhang was made with Krion solid surfacing from Porcelanosa.

Custom cut walls by Chelsea Carpenters guide visitors through the space, framing products from multiple vantage points; lit from below with mounted linear cove lights, they appear to float. Contech's RAH/CTL130 and LT/CTL130 recessed track lighting illuminates the Bernhardt seating, table, and casegoods collections, which are arranged in vignettes. Third-party products including Flos table lamps, Jake Dyson task lights, and Alessi accessories are interspersed throughout. "We wanted to show how Bernhardt's pieces work both as a collection and in concert with other items you might have in your home or office," says Rottet.

The brand's extensive textile collection—displayed along a 30-foot wall by the bar area—lends a pop of color. The high-gloss, reflective terrazzo floor by Amadeus Marble & Granite serves to heighten the showroom's ethereal atmosphere.

KNOLL, HOUSTON
Manufacturer of iconic furnishings by Marcel Breuer, Mies van der Rohe, and Charles and Ray Eames, Knoll has a venerable history.
For its Houston showroom, the company wanted Architecture Research Office to highlight that legacy while imbuing the space with local flavor. The design team then worked with regional sales teams to understand the area's culture and clientele and determined that rather than, say, having a casual feel and stocking products popular with tech companies (as Knoll's San Francisco showroom does), the Houston site needed to be "dressy," according to ARO principal Kim Yao, and reflect the largely corporate market there.

"We played up details that were Texas-oriented and addressed the Knoll brand," says Yao of her team's approach. In the reception area, a wall made with leather by Knoll sister company Spinneybeck provides a backdrop for a corporate timeline. Other walls are stamped with Knoll's historic Circle K logo; brass versions serve as door handles and are even inlaid intermittently in the white epoxy terrazzo flooring.

Vaulted ceiling panels and acoustic baffles—designed by ARO and manufactured by FilzFelt, another Knoll subsidiary—line the 8,000-square-foot showroom. "The space allows you to draw connections between different parts of the brand," explains Yao. The same could be said of the nearly seamless mix of staged vignettes and work areas, all featuring Knoll furnishings in various applications.

The result is a showroom that guides the visitor and highlights products but leaves open the possibilities for their uses. It is only through the careful coordination of color, materials, and spatial organization that these goals are achieved—and that designers create interiors that are bright and inviting and, in the end, capture the brand.
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Finishing Touches

MARION CAGE MCCOLLAM’s cabinetry hardware is angular and oblique. That design direction makes sense when you learn that the New Orleans–based artisan is not only a licensed architect but also a former employee of Gensler, Zaha Hadid, and Bernard Tschumi Architects. “Much of what I do, whether it’s a design for a building or a drawer pull, is problem-solve,” she says. Her proclivity for finding—and creating—answers led her first to crafting jewelry and later to hardware and tabletop accessories.

The Peak collection—designed under the brand name Marion Cage—is composed of six faceted pulls and knobs handcrafted via lost-wax casting. The method, repopularized by jewelry design, involves creating a mold around a wax shape. Once the mold is made, the wax model is melted away so molten metal can be poured inside to form the desired shape. Transitioning from jewelry to bronze hardware was “a very natural evolution,” says McCollam. She also works with Rhino, a 3-D modeling software that helps her shift between scale and material.

Although every stage of her work demands intense focus, McCollam says the final product is almost always unexpected. “It’s very much about creating the right environment for happy accidents,” she says. Look for more of those soon, as she is introducing drapery hardware next.
—Ashleigh VanHouten
ODEN
MANUFACTURER: Krownlab
PERFORMANCE: This architectural sliding-door hardware system with custom-extruded track has no visible fasteners, creating the illusion of a floating door.
PRICE RANGE: $$$
APPLICATIONS: Available in a brushed or black stainless-steel finish, Oden can support panels up to 400 pounds and comes in single, bi-part, and bypass door configurations with adjustable stops.
KROWNLAB.COM (SNAP #213)

UNDULATE SUITE
MANUFACTURER: SA Baxter
PERFORMANCE: Created via lost-wax casting, this comprehensive collection of knobs, levers, rosettes, and pulls possess graceful curves and organic shapes.
PRICE RANGE: $$-$$$ APPLICATIONS: Cast in bronze, white bronze, and solid brass, this hardware suits hospitality and high-end residential use. The pieces, available in 30 finishes, incorporate recycled material.
SABAXTER.COM (SNAP #214)

TABLEAU COLLECTION
MANUFACTURER: Atlas Hardware
PERFORMANCE: The round and square base and handle components of these door and drawer pulls ship unassembled, so they can be combined for a custom look.
PRICE RANGE: $$ APPLICATIONS: Available in four finishes. Sizes range from 1 1/4 to 3 inches.
ATLASTHETRADE.COM (SNAP #215)

SATURN
MANUFACTURER: Manital
PERFORMANCE: This roughly 7-by-6-inch metal rosette door/knob set by Mario Mazzer and Giovanni Crosera has an inner disc that's customizable and removable.
PRICE RANGE: $$$ APPLICATIONS: Designed for use with Manital's Ratio lever, the door fixture comes in three finishes and multiple metal and leather disc options. The disc also can be laser-engraved.
MANITAL.COM (SNAP #216)

KEY $= VALUE, $$= MID-RANGE, $$$ = HIGH-END, ☢ = ECO-FRIENDLY ATTRIBUTES

Mixed Media
FOR NEARLY 40 years, Waterworks has been crafting metal bath and kitchen fixtures, bringing elegance to everyday fittings. In light of that mastery, it might come as a surprise that luxury leather goods inspired the Danbury, Connecticut-based company's latest collection of hardware and accessories. The nearly 80 offerings feature uncommon material pairings: Pulls are fashioned from saddle-stitched Italian leather, and knobs are made of solid walnut and polished brass. For direction, the team looked to "the decorative elements of antique furniture and steamer trunks, which balance wood and metal in a beautiful yet protective way," according to Peter Sallick, CEO and creative director of Waterworks. Other pieces are sculptural and organic, incorporating horn and onyx. "Mixing materials and finishes is very on-trend with designers right now," explains Sallick. "We're also seeing more interest in this from our clients." —Dina Hampton

GET A GRIP Inspired by antique furniture and steamer trunks, Waterworks' hardware collection—including (clockwise from top left) the Riverside leather pull, Stockton walnut knob, and Attersee leather pull—features unexpected material pairings.
Let's Go

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A Fan of the Arts

IN ADDITION TO eliciting chuckles with its cheeky name, Big Ass Fans drew much attention when it debuted its first collection of attractive, efficient, and, well, big-ass commercial fans in 1999. But in 2012, the Lexington, Kentucky-based company—now known as Big Ass Solutions—made even bigger waves with a modern and sculptural line called Haiku. In the latest twist, the manufacturer has updated these bestselling ceiling fans by turning their airfoils into triptych canvases.

The Artisan collection features screenprinted versions of seven original works created by local artists. Available on the 60- and 84-inch-diameter models, the reproductions boast all the functionality that the company’s fans afford, including an integrated motion sensor and mobile-app control. Each artwork exudes a different character to suit a range of residential and commercial interiors. Hunter and Amelia Stamps’s Flying Machine, for instance, with its Leonardo da Vinci–inspired drawings of old-fashioned airplanes, hot-air balloons, and bird’s wings, would suit a child’s room. Luke Achterberg’s Dapper Delineation, whose red racing lines reference tricked-out hot rods, would lend a splash of color to a restaurant or office space. The artists receive royalties on the sales of their fans as well as greater public exposure.

“The Artisan collection is our flagship method for inspiring people to think about their ceiling as the fifth wall,” explains company spokesperson Josh Kegley. The fans provide ways to “bring works of kinetic art into homes and businesses,” he adds. —Sharon Katz
Every Breath You Take

Today's smart-home market is flooded with connected security and HVAC automation solutions, so it was only a matter of time before these two categories merged. That's the idea behind Panasonic's Smart Home IAQ system. Expanding on the brand's existing Connected Home security-monitoring system, this new component, which debuted in November at Greenbuild, will use the same Wi-Fi communication hub for ventilation and fresh-air systems, too.

At press time, Smart Home IAQ was beginning a multiphase rollout starting with Panasonic's customizable WhisperGreen Select ventilation fans. Eventually the system will include a smart module; additional fresh-air and HVAC products; and a package of sensors for detecting moisture levels, temperature, and pollutants. The latter will work in concert with the hub to monitor and control airflow as well as expel airborne toxins. The manufacturer is even planning to incorporate kitchen exhaust systems at a future date.

In a statement, Jim Shelton, vice president of Panasonic Eco Solutions North America, said, "This platform will ultimately evolve to include other integrated systems such as smart lighting, appliances, solar, and energy storage." For homeowners and businesses, such a holistic wellness and security solution would be a breath of fresh air. —SK

Blown Away
Panasonic's nascent Smart Home IAQ system will eventually serve as a platform for monitoring and controlling a building's security, lighting, temperature, and fresh-air intake, among other things (graphic at left). The company's WhisperGreen Select ventilation fan (above) is the first item to be integrated into the system.
ALUMILINE –
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Alumiline Linear Metal Ceiling System planks are available in elegant 8', 10', or custom lengths. This industry-first in ceiling plank design is made from extruded aluminum and is not pan-rolled like traditional metal ceiling panels. Alumiline is an excellent choice for external applications or high-humidity environments such as soffits, carports, or swimming pools. For projects requiring sound absorption, recycled cotton acoustical backer can be installed above the Alumiline ceiling.

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Mix and Match

**These Days**, kitchen systems are taking a bolder approach to combining materials, marrying a variety of surface treatments in statement-making proportions. In the past, diverse options—such as a metal panel inset in a wooden doorframe—only served as accents. Now, contrasting materials can comprise an entire door or drawer front.

Exemplifying the mix-it-up trend is **Alno's Attract kitchen**, which pairs distressed oak with black-glass panels and bronzed-metal drawers. **Doimo Cucine**'s SoHo kitchen, conceived by **Imago Design**'s Willy Dalto and Antonella di Nuzzo, blends aged wood, copper, and brass on cabinet runs; it also offers glass doors. And the **Miuccia kitchen**, by **TM Italia**, unites rose-copper hardware and stone countertops with lacquered midnight-blue cabinet boxes.

The enhanced palette offers designers an alternative to the "kitchen as antiseptic laboratory" approach, says architect Christopher Rawlins. He continues, "I appreciate the more expansive notion that a kitchen can be as rich, warm, and tactile as one of our bespoke living rooms." —Leslie Clagett
**K2005 FAUCET**

**MANUFACTURER:** Cinaton  
**PERFORMANCE:** This single-hole faucet offers hands-free control of 13 functions, including temperature, flow rate, pause, and three user-defined presets.  
**PRICE RANGE:** $  
**APPLICATIONS:** ADA-compliant and WaterSense-certified, the fixture can pivot 150 degrees. It is available in brushed or polished nickel and comes with a 120/240 AC adapter and four AA backup batteries to ensure use in the event of a power outage.  
[CINATON.COM](SNAP #221)

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**36-INCH INDUCTION COOKTOP**

**MANUFACTURER:** Verona  
**PERFORMANCE:** The electric induction cooktop features an easy-to-clean black ceramic surface and soft-touch digital controls that sit at the front of the unit.  
**PRICE RANGE:** $  
**APPLICATIONS:** ADA-compliant and WaterSense-certified, all five burners can detect a pan's presence, while a fast-boil setting can be used on three at a time. An alarm signals accidental spills; there is also a hot-surface and residual-heat indicator.  
[VERONAAPPLIANCES.COM](SNAP #222)

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**CHEF CENTER SINK**

**MANUFACTURER:** Franke  
**PERFORMANCE:** Made of 18-gauge stainless steel, this undermount sink comes with a full line of accessories—colander, cutting board, and drain board—that lie flush with the counter.  
**PRICE RANGE:** $  
**APPLICATIONS:** ADA-compliant and WaterSense-certified, the sink is available in 28- and 34-inch widths that suit 30- and 36-inch cabinets. One lidded compartment flanking the bowl connects to the drain line to facilitate composting.  
[FRANKE.US](SNAP #223)

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**UPR 503 UNDERCOUNTER REFRIGERATOR**

**MANUFACTURER:** Liebherr  
**PERFORMANCE:** This 4/5-cubic-foot appliance, which has pull-out glass shelves and full-extension storage drawers, can be fitted with a custom panel to coordinate with the cabinetry.  
**PRICE RANGE:** $  
**APPLICATIONS:** The 24-inch, Energy Star-rated fridge needs no swing-out space. Its height and depth can be adjusted to align with counters up to 34 inches.  
[LIEBHERR-APPLIANCES.COM](SNAP #224)

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**GREEN LIVING** Formquadrat’s concept design for a kitchen that supports vegetarian cooking features an indoor gardening system, a spice-making station, and a bank of ceramic storage containers.

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**A Growing Concern**

**CAN A KITCHEN LAYOUT** change how we eat? Mario Zeppetzauer, a managing director of Austrian industrial-design firm Formquadrat, thinks so. With the Voking kitchen, he says, “We aim to show that design can make vegetarian cooks’ lives easier.” Currently in prototype, the kitchen features seven freestanding units that support the preparation of meat-free meals through specialized appliances, fixtures, and storage areas. The unit, which features active and passive zones, includes a module devoted to spice making—complete with a mortar carved into the counter and a bank of ceramic storage containers. Voking’s double-bowl sink accommodates seed-sprouting trays, while its glass-front cabinets incorporate Urban Cultivator’s indoor gardening system, which allows the user to grow microgreens and herbs.

Although there are no firm plans to produce the Voking, the project’s wide range of backers—including such kitchen, food, and furniture purveyors as Gaggenau, Dornbracht, Team 7, Cosentino, Eisinger Swiss/Franke, and Pfeffersack & Soehne—indicates there is interest in the subject. But Zeppetzauer says the aim is simple: “We want to have a positive impact on the future of nutrition and cooking.” —LC

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**SNAP FACT**

U.S. homeowners remodel a total of 1.8 MILLION kitchens each year.

SOURCE: SIZE OF INDUSTRY REPORT, JUNE 2016, NATIONAL KITCHEN AND BATH ASSOCIATION
Access Granted

THE LATEST ITERATION of Schindler's destination-dispatch elevator technology, myPORT creates a smart-building access system with users' cellphones. "What started out as a way to get better performance from elevators has become a sophisticated interface," says Jeff Blain, manager of destination products for the company. The free iPhone and Android app employs Bluetooth technology to summon an elevator. But it's able to unlock and open doors, too: a boon for disabled users.

The myPORT app serves as a building key, allowing registered residents to pass security; it then calls an elevator for them. Residents can also send visitors a text message with a unique color video that can be used at a myPORT terminal for onetime entry. Schindler tried QR codes for this feature, says Blain, but the images' geometry tended to misalign; the video works no matter how a phone screen is held to the scanner. "We couldn't find the right technology," he notes, so Schindler developed its own.

Introduced stateside last spring, myPORT is in use at the new ground-floor headquarters of the Independent Living Resource Center of San Francisco (ILRCSF), a disability-rights advocacy organization Schindler had previously partnered with on product development. All ILRCSF employees have some sort of physical or mental challenge, and the system assists them with entry and office doors. The partnership offers the manufacturer an intimate opportunity to "understand those with special needs," says Blain. It also gives Schindler a chance to study how myPORT can facilitate independence and seamless movement for all. — Braulio Agnese
History Lesson

WHEN PRESENT ARCHITECTURE undertook the revitalization of 660 Congress Street in Portland, Maine, the boarded-up 1886 building came with a landmarked facade and a burned-out interior. Given this blank slate, firm cofounders Andre Guimond and Evan Erlebacher took every opportunity to showcase their proclivity for subdued modernism throughout the building, most notably in the custom-designed, blackened-steel interior stairway connecting the residences on the second and third floors.

The New York City-based architects settled on a metal balustrade early in the design process. Guimond said their initial ideas, which ranged from “opaque and solid to organic or algorithmic,” reflected the partners’ earlier stints at Toyo Ito (Guimond) and Zaha Hadid (Erlebacher). Yet the final, understated solution—thin but wide balusters that alternate between fine and solid vertical lines—embodies the evolving style of the pair’s five-year-old studio.

Guimond credits the fabricators at Cumberland Ironworks and Larry Wichrowski of Engineering Design Professionals with helping Present Architecture understand what was technically and structurally feasible within the client’s $52,000 stair budget ($29,000 of it went to metalwork). Cumberland shop-fabricated the staircase in four pieces, which were then trucked to the jobsite and threaded through the front-door opening. The entire process, completed in one day, proved faster and more accurate than on-site fabrication would have been.

With the stairway, Guimond explains, “we wanted to be sensitive to the existing building.” But the journey to the winning design, he adds, helped Erlebacher and him “better understand where [the firm] was headed” both stylistically and intellectually. —BA
Among the Trees

ARCHITECT JEFFERSON BROWNE says "awesome" a lot when discussing Space Crab, a treehouse he built for Camp Southern Ground in Peachtree City, Georgia. One look at the 1,000-square-foot domed space reveals why. The structure—a cross between a spaceship and a horseshoe crab—is a stunning addition to the camp, which is devoted to the educational and emotional growth of children, especially those with disabilities.

Originally envisioned as a 300-square-foot retreat, the treehouse grew in response to calls for "maximum accessibility and a barrier-free experience of the outdoors," says Browne. To that end, the structure's entrance features two 9-foot-high, nearly 10-foot-wide doorways from C.R. Laurence's S80 Series Monterey bifold glass wall system. The black-frame doors, which tuck into exterior nooks, offer an expansive view of the surrounding woods, creating a seamless indoor/outdoor connection to the 300-square-foot deck.

The doors also facilitate access to the uncovered ADA-compliant ramp that winds from the deck to ground level, at 14 feet below.

Monterey's top-hung doors and flush threshold, as well as the doors' ability to disappear, proved essential to the treehouse's final design. To allow for the largest capacity possible, "we needed to ensure the doors cleared an exterior cantilevered roof beam," says Browne. So they did. The structure can now accommodate a group of 49 when its entryways are fully open.

The camp currently welcomes children in the fall on a weekend-only basis; the plan is to expand to weeklong summer sessions by 2018. The treehouse, however, is already providing a regular gathering place for adults, whether they're attending corporate events or training sessions for veterans wrestling with posttraumatic stress disorder. It's a peaceful, airy retreat for all that is, in a word, awesome.

—Braulio Agnese
FALLBROOK

**MANUFACTURER:** C.R. Laurence  
**PERFORMANCE:** This front-loaded, dry-glaze interior partition system with a minimal profile can accommodate ½- and ¾-inch-thick monolithic tempered glass.  
**PRICE RANGE:** $  
**APPLICATIONS:** With its ultrathin door frame and sidelight channels, this office-space system comes in a choice of two stainless-steel finishes and door hardware in round and square formats.

CRL-ARCH.COM  
(SNAP #229)

Superior Court

BECAUSE LEGAL proceedings frequently induce stress, designers of court buildings strive to soothe visitors' agitated minds through a variety of architectural and interior solutions. For HOK and Michigan-based TowerPinkster, that strategy translated into letting natural light—and plenty of it—into the pair's Gull Road Justice Complex in Kalamazoo, Michigan.

To achieve their aim, the firms opted to make the north face of the low-slung, 81,200-square-foot building, which houses the county's family courts, almost entirely glass. The structure's strategically placed rooftop clerestories also bring illumination deep into the structure, courtrooms included. "The concept was to put public and hearing-room entries along that facade," says Jason Novotny, director of design at TowerPinkster. That way, he continues, instead of being a dark, double-loaded space, the corridor along the facade "would be filled with diffuse light."

The firm turned to Tubelite when it came to the requisite transparency and security, specifying more than 14,000 square feet of storefront, framing, and other products. The manufacturer's 400 Series curtain wall, in particular, helped the team realize its design vision, in which the north facade was composed of a series of differently sized rectangles and squares.

Aside from letting the sunshine in, these varied glass shapes mitigate the imposing presence that court buildings traditionally possess. "Since this was a family court," TowerPinkster's Novotny explains, "we wanted to get away from [the usual] daunting hierarchy and provide a softer feel and a sense of clarity and individuality." You'll find no objection here. —BA

149 SERIES SWITCH

**MANUFACTURER:** DeltrexUSA  
**PERFORMANCE:** Designed to withstand vandalism, bad weather, and heavy use, this stainless-steel switch for standard and custom electric mounting boxes has a lifespan of up to 1 million cycles.  
**PRICE RANGE:** $  
**APPLICATIONS:** Suited to exterior, high-traffic, and public-access uses, the product has an actuator plate mounted flush with the base for easy maintenance.

DELTREXUSA.COM  
(SNAP #230)

Alumagril

**MANUFACTURER:** Babcock Davis  
**PERFORMANCE:** This modular 1-inch-deep aluminum entryway grille, usable in level-bed and deep-pit installations, has a 1,200-pound rolling load.  
**PRICE RANGE:** $  
**APPLICATIONS:** Offering a stainless-steel look at a lower cost, the grille comes in plank, waffle, and rectangular configurations in sizes up to 48 inches square.

BABCOCKDAVIS.COM  
(SNAP #232)

YHS 50 FS/FI

**MANUFACTURER:** YKKAP America  
**PERFORMANCE:** The latest addition to the ProTek line of hurricane-and blast-mitigation storefront systems spans up to 12 feet and can withstand pressure up to 90 PSF.  
**PRICE RANGE:** $$$  
**APPLICATIONS:** Especially useful in hurricane-prone zones, the YHS 50 FS/FI features inside-glazed construction that allows developers to opt for a storefront solution rather than a curtain wall.

YKKAP.COM  
(SNAP #231)

RAYS OF LIGHT

Tubelite's glass storefront and framing products—including its 400 Series curtain wall among them—helped architectural firms HOK and TowerPinkster flood the Gull Road Justice Complex in Kalamazoo, Michigan, with soothing natural light.

PHOTOGRAPHY COURTESY OF TUBELITE
Trains, Planes, and Pickups

Midwestern manufacturers are driving their states’ economies.

BY J. MICHAEL WELTON

PEOPLE ASSUME agriculture fuels the Midwest’s fortunes, but manufacturing plays a key role, too. The latter is the largest industry in Iowa, making up 17 percent of the state’s GDP. “We added 16,000 manufacturing jobs in 2014,” says Tina Hoffman, marketing and communications director at the state’s Economic Development Authority in Des Moines. As with agriculture, the market “has been contracting a bit” in the past two years, she notes. Nonetheless, building companies account for about 10 percent of Iowa’s 216,167 manufacturing jobs.

Though best known for aviation products, Kansas also has a thriving manufacturing industry. At Versaflex in Kansas City, sales of polyurea-based items are up by 10 percent in five years. President Dave Cercie expects more of the same in the future. “A large part of that will be based on continued infrastructure improvements on bridges and tunnels,” he explains. “We have good solutions for those types of problems.”

As for Missouri, “we’re a truck state,” says director Mike Downing of the Missouri Department of Economic Development in Jefferson City. He’s referencing a Ford F-150 plant in Kansas City and a GM plant in Wentzville. “Since 2009, we’ve created 16,200 automotive jobs, with over $2 billion in capital investment.”

Agriculture has declined in Nebraska thanks to corn’s plummeting prices. Manufacturing represents $14 billion of the state’s GDP, with building products accounting for less than a tenth of that. Bright spots are Kawasaki, which is making railcars for Washington, D.C.’s Metro, and Hastings HVAC, a leader in commercial heating and cooling goods. “We’re doing 10 to 15 percent better than last year,” says Hastings vice president Shawn Hartman, pointing out that this July was the best in the company’s 15-year history. You can’t ask for more than that.
IOWA
In the Hawkeye state, payroll costs are nearly 18.2 PERCENT below the national average.

Of the patents issued in Iowa over the last five years, 78 percent concerned advanced manufacturing needs.

SOURCES: STATE LIBRARY OF IOWA; IOWA DEPARTMENT OF ECONOMIC DEVELOPMENT

KANSAS
In 2015, the Sunflower state was the 30TH most expensive state in which to do business.

The Kansas economy shrank in 2015, contracting in three of four quarters.

SOURCES: KANSAS DEPARTMENT OF COMMERCE; THE WICHITA EAGLE

MISSOURI
Between 2015 and 2016, the Show-Me state climbed 12 positions, from 44 TO 32 on the ACEEE's annual State Energy Efficiency Scorecard.

The Tax Foundation has consistently ranked Missouri in the top 10 states for low corporate income taxes.

SOURCES: AMERICAN COUNCIL FOR AN ENERGY-EFFICIENT ECONOMY; THE MISSOURI PARTNERSHIP

NEBRASKA
In August 2016, the Cornhusker state's unemployment rate was 3.3 percent versus the national average of 5 percent.

In August 2016, Nebraska averaged 96,900 manufacturing jobs, which was 600 fewer than it had the month before.

SOURCES: NEBRASKA DEPARTMENT OF ECONOMIC DEVELOPMENT
Earth First!

On November 5, sustainable design resource BuildingGreen announced the 2017 winners of its Top 10 Green Building Products award. We offer an in-depth look at all the honorees.

1. AQUEOUS HYBRID ION “SALTWATER” BATTERY
Aquion Energy
Pittsburgh
aquionenergy.com

Aquion’s battery for grid-tied photovoltaic systems stores power by utilizing sodium-sulfate electrolytes rather than corrosive sulfuric acid or flammable lithium salts. These nonhazardous alternatives, including the attendant lithium manganese-oxide anode, are inexpensive, abundant, and safe to use. The battery contains no PVC and meets Cradle to Cradle standards. (SNAP #260)

2. ACETYLATED WOOD
Accoya
Dallas
accoya.com

A nontoxic alternative to chemically preserved wood, these FSC-certified radiata pine products are treated with acetic anhydride. The colorless acid changes the chemistry of the wood’s cell walls, making the material impervious to moisture and rot; it also keeps the wood from shrinking, swelling, or absorbing water. These properties make it an ideal choice for exterior applications, including windows, doors, decking, cladding, and engineered products. (SNAP #261)

3. HYPERPURE WATER PIPING
Legend
San Antonio
legendvalve.com

This flexible potable water pipe provides an inexpensive, simple-to-install, and environmentally friendly alternative to copper, chlorinated PVC, and cross-linked polyethylene options. The bimodal polyethylene product is easily recycled and does not leave the water with a chemical taste. (SNAP #262)

4. SECROCK EXOAIR 430
USG and Tremco
Chicago/Beachwood, Ohio
usg.com/tremcosealants.com

Unlike most weather-resistant barriers, Securock ExoAir 430 is easy to install: Simply hanging it completes 80 percent of the process. The fiberglass-faced sheathing comes with a factory-applied Tremco fluid barrier, which reduces time and trades needed on the site. It also ensures a more uniform application of the membrane and increased protection against air and moisture penetration. (SNAP #263)

5. PHOENIX COMPOSTING TOILET
Advanced Composting Systems
Whitefish, Montana
compostingtoilet.com

Because the toilet composts waste on-site, it eliminates the need for a septic tank or municipal sewer system. The unit uses a bio-chamber whose 4-watt fan creates negative pressure for ventilation. Daily upkeep is minimal—you mostly add wood shavings and mix the compost—and after 18 months, the resulting product can be used as a non-food crop fertilizer. (SNAP #264)
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6. POWER HUB DRIVER
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nextekpower.com

Most office equipment, including LED lighting and computers, runs on DC-grid power. However, for those devices that don’t, there’s Nextek’s Power Hub Driver (PhD), which converts AC into 380-volt DC, and then to a safe-to-handle 24-volt current. By doing so en masse instead of one machine at a time, PhD saves material costs, reduces e-waste, and increases a device’s reliability. (SNAP #265)

8. COMMERCIAL ELECTRIC LAWNMOWERS
Mean Green Products
Hamilton, Ohio
meangreenproducts.com

Mean Green lawnmowers require no fuel, produce zero emissions, and need minimal maintenance. They utilize lithium energy module (LEM) battery technology and last two to seven hours per charge. Mean Green offers 48-inch stand-on models and 52- and 60-inch ZTR riding options; all help meet LEED goals for building operations and maintenance. (SNAP #267)

9. D-RAIN JOINT
RAINWATER FILTER DRAIN
Biomicrobics
Shawnee, Kansas
biomicrobics.com

Used in place of pavers, the D-Rain offers a cost-effective solution to stormwater runoff. It resembles a standard concrete-slab expansion joint but offers a roughly 1-inch gap that allows water to drain just below the surface at a rate of up to 5 gallons a minute per linear foot. D-Rain comes in 8-foot lengths that can be installed in concrete and asphalt sidewalks and driveways. (SNAP #268)

7. DESIGNTEX TEXTILES
Designex
New York
designex.com

The global textile industry has one of the worst environmental records of any manufacturing sector; its complex supply chain also makes finding more equitable options difficult. Designex counters this with its catalog of over 8,000 materials, which allows specifiers to search by fabric, pattern, color, and environmental certification while filtering for a number of sustainability and performance metrics. (SNAP #266)

10. HVAC LOAD REDUCTION (HLR) VENTILATION
EnVerid
Boston
enverid.com

EnVerid’s HLR ventilation system cleans indoor air by running it through a recyclable sorbent cartridge that removes contaminants such as VOCs and formaldehyde. The system also brings in enough outdoor air to maintain positive pressure, with sensors providing real-time feedback to maximize air quality and energy savings based on a building’s needs. The modular product can be installed on a wide variety of HVAC systems, with each unit managing approximately 20,000 square feet. (SNAP #269)
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The Overly Evolution system can be installed on sloped roofs and vertical walls. Panels can be curved and/or tapered for barrel vaults and domes or spherical shapes. The system features hidden fasteners and an internal drainage component which removes any moisture that migrates into the system and skillfully designed joints which allow for expansion and contraction. The system is the exterior exposed component of a wall/roof composite assembly. Several composite assemblies are available ranging from thin to thick as determined by aesthetic preferences or as necessary to meet performance requirements such as thermal, structural and fire ratings.

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- Maximum Length of Panels: 40'
- Compression Extrusion Thickness: .056"
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SNAP 21
Movable Feasts

Dynamic structures with large-scale operable elements adapt and transform, responding to changing needs.

BY JOANN GONCHAR, AIA

BUILDINGS ARE GENERALLY designed to be permanent, immutable structures. But this is not always the case. In the early 1960s, the British architect Cedric Price proposed that a "Fun Palace" be built on the banks of the Thames in London. It was to be ever-changing, with moving and reconfigurable walls and floors. Price's vision was never realized, but a modern-day transformable structure inspired by his ideas and known as the Shed is taking shape in New York, on Manhattan's far west side, where the High Line meets Hudson Yards development—will sit at the base of a new residential tower.

The Shed, a multidisciplinary arts venue under construction in Manhattan, consists of a fixed building enclosed by a glass cable wall and an ETFE-clad diagrid shell that can be moved to cover a plaza. The structure, rising on the city's far west side—where the High Line meets the Hudson Yards development—will sit at the base of a new residential tower.

The venue's stationary structure has a conventional steel frame with 100-foot-long clear spans and is enclosed within a glass cable wall. The movable shell, meanwhile, comprises an exposed steel diagrid frame clad in translucent pillows made of the strong but lightweight ethylene tetrafluoroethylene (ETFE). Integrated within this cagelike structure are equipment and services such as power, lighting, theatrical rigging, and ducts, creating what Liz Diller, DSR founding partner, calls an "open infrastructure."

The shell, whose primary steel weighs 2,400 tons, will travel via a system based on gantry-crane technology, common in shipping ports. A rack-and-pinion drive moves the shell forward and back on six-foot-tall bogies, or wheels, that run in tracks at plaza level. It will take about five minutes to completely extend the shell, according to Diller, raising the possibility that its movement could be incorporated into a performance rather than merely in preparation for one. In fact, the building is inherently "performative," says David Rockwell, Rockwell Group founder.

But before the shell is deployed, the Shed's managers must conduct a multistep safety protocol to make sure that the path of travel is clear of obstructions—checking areas such as the plaza, the bogie tracks, and the space directly below the theatrical rigging. The location of the drive system—on the roof of the fixed building—keeps it secure, since the public has no access.
The friction and inertia forces from the drive are transmitted through the fixed building's steel frame, explains Scott Lomax, principal at Thornton Tomasetti, the project's structural engineer. Its elements have been sized to accommodate these forces, he says.

To deal with the environmental-control issues associated with temporarily enclosing outdoor space, the project team designed the plaza as a radiant floor that can be heated for winter events. In warm weather, the space under the deployed shell will be conditioned with cool air delivered through low-level ducts. Blackout shades can also be extended to make the hall suitable for multiple types of programming. The goal is a responsive, versatile building that can accommodate different media, showcase work at a variety of scales, and adapt to changing technologies. "What art will look like in the future is an open question," says Diller.

Of course, large-scale kinetic elements in the form of retractable roofs have long been a feature of stadia and ballparks for professional athletic teams. The operable coverings permit play in inclement weather and allow facilities to be used for multiple sports, as well as for other types of events including concerts and trade shows. They can also help facilitate the growth of natural turf.
One venue with a particularly unusual operable roof is the new facility designed by 360 Architecture (now part of HOK) for the National Football League's Atlanta Falcons. The $1.5 billion Mercedes-Benz Stadium, now under construction and on track for completion next summer, will have an operable roof comprised of eight ETFE-pillow-clad triangular "petals." These retract, much like the leaves in a camera shutter, to reveal a 380-foot-long and 305-foot-wide oval opening overhead.

The designers and owners envision that the roof will be open most of the time during NFL games, since the Atlanta weather in football season is mild. Bill Johnson, the HOK design principal leading the project, hopes the pool of sunlight that will move around the artificial-turf field during daytime play will bring to mind the Pantheon in Rome. "It was the inspiration," he says.

It might seem presumptuous to compare a professional sports venue with one of the most revered works of antiquity, but the stadium is an engineering feat in its own right. The roof includes an outer fixed portion clad in metal and a membrane that is folded and faceted to create something that resembles an eight-point pinwheel in plan. Its structure is a two-way system of steel trusses that span 730 feet between reinforced-concrete megacolumns positioned just outside the stadium's seating bowl. This fixed-roof assembly includes backspan members intended to support the upward forces created by the retractable petals, each of which weighs as much as 450 tons. The petals cantilever up to 200 feet—a dimension similar to


**STRUCTURAL GYMNASTICS**

The Mercedes-Benz Stadium’s fixed roof framing (three diagrams from top left) consists of a system of trusses that span more than 730 feet between megacolumns (above) and support the retractable petals (bottom), which cantilever as much as 200 feet over the oval aperture when closed.

The roof scheme bears the mark of the kinetic design consultant Chuck Hoberman, who was involved in the project’s early phases: Although the petals appear to rotate as the roof opens and closes, they move together at a diagonal but straight line. Each travels on a pair of rails set 40 feet apart and supported by the fixed-roof structure. But because of the opening’s oval shape, the petals have varying dimensions and weights. This not only made structural analysis more difficult, but it also meant that the petals travel at different speeds, creating an added challenge for synchronization and coordination.

And if the roof system was not complicated enough, it will also support a 58-foot-tall and 1,100-foot-long video scoreboard that wraps the perimeter of the roof opening. This configuration, an alternative to the typical Jumbotron, allows the Falcons’ fans to see the clouds and the sky, but, at 940 tons, it is almost 5 percent of the weight of the entire roof, says Hatfield.

The nodes where steel elements came together are particularly complex. So to facilitate their coordination, BuroHappold shared its 3-D model with the steel fabricator, ultimately checking the shop drawings in a digital environment. Hatfield says the process was a significant time-saver. She believes that it is the largest project ever to implement 3-D review for its steel package.

The roof isn’t the only moving or adaptable element at Mercedes-Benz. To reduce the stadium’s capacity for events such as soccer matches, corner sections of the stadium bowl retract, while upper portions can be closed off with a motorized curtain. The aim is to minimize conversion time, says Scott Jenkins, the facility’s general manager.

Compared with Mercedes-Benz, the new roof over the Arthur Ashe Stadium at the Billie Jean King National Tennis Center in Queens, New York, appears almost straightforward. The slightly domed 236,600-square-foot canopy contains two 500-ton rectangular panels that separate to frame a 250-foot-square slice of the sky. Designed by the Detroit-based architecture firm Rossetti, the new roof is the United States Tennis Association’s response to rain delays that in recent years had regularly plagued the U.S. Open Tennis Championships held in late summer at the Flushing Meadows complex.

But devising and constructing the $150 million shelter for the almost 24,000-seat venue was not so simple. The primary complicating factor: The original 1997 stadium, which was also designed by Rossetti, had not been conceived to support a roof. So the new element would need to be wholly independent of the original’s precast-concrete seating bowl and steel structure. What’s more, the team was hampered by the marshiness of the site, a former ash dump. Ahmad Rahimian, the U.S. director of building structures for WSP and the project’s structural engineer, sums up the challenges as “poor soil, long spans, and a tight budget.”

Rossetti principal Jon Disbrow refers to the solution as “an umbrella,” but one that straddles the existing stadium. It is supported on eight steel columns—each with two branchlike braces—placed just outside the corners of the existing building’s octagonal footprint. The columns, which sit on top of piles as deep as 200 feet, hold up four nearly 300-foot-long trusses, two spanning in each direction. These in
CONTINUING EDUCATION: KINETIC BUILDINGS
FROM ARCHITECTURAL RECORD

The new operable PTFE roof over the Arthur Ashe Stadium (above and left) in Queens, New York, is completely independent of the 1997 structure beneath it. The roof can be opened or closed in about six minutes. Turn support a network of steel joists and bracing, over which a membrane of polytetrafluoroethylene (PTFE)—a lightweight material resistant to heat and UV degradation—is stretched.

The new roof was built without disrupting the U.S. Open schedule. It was constructed, starting in late 2013, in three discrete phases, each conducted in the 11½-month period between tournaments: first the foundation work, then the primary steel structure, and finally, this summer, the retractable-roof components and PTFE skin.

Now that the new roof is in place, it looks as though it was always intended to be there, adding a bit of interest to the stadium’s stubby profile. But one aspect of the newly covered stadium that not everyone is pleased with is its acoustics. Some players at this summer’s Open reportedly complained that the roof amplifies the noise made by the spectators, making it hard to concentrate. As part of
Rossetti's design, perforated metal panels backed with mineral wool were installed at the roof's perimeter to dampen reverberation, according to Disbrow. He says that additional measures could be implemented, but so far the USTA hasn't asked the firm to do so.

Although acoustics may still need to be addressed, the new canopy does work admirably in a variety of modes and conditions, as any adaptable building should. Even in the open position, the majority of the venue’s seats are in shade, shielded by the fixed roof’s PTFE skin, which blocks 90 percent of visible light. So even though the new lid was conceived primarily as an umbrella, it also serves as a parasol, allowing fans to enjoy tennis at Arthur Ashe, rain or shine.

The completions of Mercedes-Benz and the Shed are still in the future. It is not yet clear if the highly mechanized buildings will function as flawlessly as their designers predict. Or more to the point, if they will readily adapt to needs yet to be identified. But Jenkins at Mercedes-Benz is confident. He says the roof has been mocked up and thoroughly tested, and its controls are straightforward. But he does concede that “until we actually operate it, we won’t know what we don’t know.” His project and others could be just the beginning of a future for flexible architecture that may turn out to be even more fun than Cedric Price dreamed it would.

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**Learning Objectives**

1. Discuss the design, construction, and operational challenges presented by buildings with large-scale kinetic elements.
2. Describe three such current projects and explain the mechanisms that allow their kinetic elements to move.
3. Explain the structural solutions presented by these projects.
4. Explain the indoor environmental-control solutions presented by these projects.

AIA/CES Course #Kv1610A.
MANUFACTURERS' SPOTLIGHT SECTION

Look to these pages for products brought to you directly from manufacturers. You'll find price, application, performance data, and contact information—the facts needed to make the right decisions. Use the reader service card in the issue or go online at architecturalrecord.com to request further details.

Mixing disparate materials such as brass, aged wood, and wired glass, Doimo Cucine's SoHo kitchen has a refined look that further blurs the divide between living and cooking spaces. (SNAP #233)

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Doors, Windows

Doors, windows, storefronts, entrances, skylights, framing systems, glazed curtain walls, and translucent wall and roof assemblies. Page 50

Equipment

A broad range of electrical and tech goods, among them audiovisual, multimedia, and control systems. Also covers elevators and appliances. Page 50

Interior Finishes, Furnishings

Products for finishing and furnishing building interiors, including flooring, wallcoverings, ceilings, furniture, shelving systems, and window treatments. Page 52

Landscaping, Sitework

Exterior improvement products such as site furniture, bollards, pavers, landscape edging, and exterior green walls. Also includes gazebos and other site structures. Page 52

Materials

Basic products used in construction, among them lumber, concrete, and masonry units. Includes paint, coatings, and structural materials and fittings. Page 52

Mechanical Systems, HVAC, Plumbing

Products for conditioning, moving, holding, and controlling air, water, and other fluids. Examples include fans, ventilators, and boilers. Page 52

Roofing, Siding, Thermal & Moisture Protection

Goods for constructing the building envelope, such as exterior wall and roof panels, sheathing, thermal insulation, and waterproofing. Pages 52, 53

Specialty Products

Products for special applications or that apply to more than one category, such as gates, ladders, columns, signage, awnings, canopies, and railing systems. Pages 53, 54
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SNAP 234

DOORS, WINDOWS

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SNAP 235

DOORS, WINDOWS

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SNAP 238

DOORS, WINDOWS

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New Permanent Display of Architecture
December 17, 2016—June 25, 2017
Chicago, Illinois
This exhibition highlights the Institute’s collection via three provocative vignettes: the modern chair, the emergence of postmodern design, and contemporary identity systems in graphic design. Boundary Lines: A custom-designed installation by graphic designer Anri Beričć that brings together the three parts, occupies the gallery windows overlooking Griffin Court. For more information, visit archrecord.com.

New and Upcoming Exhibitions

Design Episodes: Form, Style, Language
New York City
December 17, 2016—January 15, 2017
This exhibition explores the design process behind Snøhetta’s expansion of the Stedelijk Museum. Architectural models, sketches, an interactive app, and a narrated walk-through of the building reveal how Snøhetta responded to the built environment and cultural context of the expansion-to-be, chronicling how the firm arrived at the space that opened its doors on May 14. For more information, visit sfmoma.org.

Architecture and Innovation
New York City
February 27, 2017—May 29, 2017
Modern design—that once-radical break with the past—is now itself a thing of history, with contemporary artists viewing modern design as icons that can be incorporated into their own work. The result is metamodernism, in which the original source is changed and abstracted, and the outcome is self-referential. The artists in this exhibition held at the Palm Springs Art Museum, challenge the tenets of modernism, whether they’re working in the United States, Europe, or Latin America, in a range of media. For more information, visit palmseum.org.

Vignettes: The Modern Chair
San Francisco
January 14, 2017—February 28, 2017
In this exhibition, the work is from a team that designed with practical and polemical intent: MetaModern. This exhibition investigates how emerging ideas and design principles can be applied to the design of the modern chair and how they might be relevant today. For more information, visit meta-modern.org.

One and One Is Four: The Bauhaus
Pittsburgh
February 3, 2017—March 26, 2017
This exhibition is the first exhibition to focus on the early career of Peter Voukouls, whose radical methods and ideas opened up the possibilities for clay in ways still reverberating today. Held at the Museum of Arts and Design (MAD), this exhibition is a part of MAD Transformations, a series of six shows addressing artists who have changed our understanding of modern craft media. For more information, visit madmuseum.org.

Tracing Displacement and Shelter
New York City
February 22, 2017—April 30, 2017
This MoMA exhibition explores how architects and designers have considered the meaning of shelter in light of the global refugee crisis. Works on display examine such trends as the strengthening of national borders in response to the influx of migrants and the growing need for affordable, adaptable, and mobile housing for transient populations (currently estimated at more than 60 million worldwide). For more information, visit moma.org.

Ongoing Exhibitions

Michael Sorkin Studio and Terreform: Metaphysics
Los Angeles
Through December 4, 2016
This exhibit foregrounds projects with meanings rooted in the urban, including buildings and sites designed with practical and polemical intent. On view at SCI-Arc, the work is from a team that operates as both a traditional architectural studio responding to clients and a research practice that formulates its own agenda of investigation and intervention. For more information, visit sciac.edu.

Oskar Hansen: Open Form
New Haven
Through December 17, 2016
This exhibition traces the evolution of Hansen’s theory of open form from its origins in the architect’s own projects to its application in film and other artistic practices. Hansen was a member of Team 10, the architectural group that formed the first critical voice against the then-charter’s modernist orthodoxy and Corbusier followers. Hansen proposed parting ways with the model of the all-knowing expert, instead advocating for viewing participation. Oskar Hansen: Open Form, at the Yale School of Architecture, is divided into seven sections exploring Hansen’s theories. For more information, visit architecture.yale.edu.

Reading Room: A Catalog of New York City’s Branch Libraries
New York City
Through January 1, 2017
On display at the Center for Architecture is Elizabeth Felicella’s work documenting all 210 branches of New York City’s extensive public-library systems. From full-scale exterior shots to intimate studies of window plants and pencil sharpeners, the subtle and technically accomplished photographs—depicting the libraries from a variety of vantage points—invite the viewer to appreciate the intricacy, complexity, and vast scope of these vital and evolving public resources. For more information, visit cfa.alany.org.

Authentication and Innovation
New York City
Through January 14, 2017
A particularly relevant topic for a metropolis characterized by perpetual change, Authenticity and Innovation explores preservation in contemporary New York City. Although the city’s Landmarks Preservation Commission oversees about 1,500 individual landmarks and 139 historic districts, this exhibition at the Center for Architecture will feature 28 projects not officially designated as significant, but whose reuse represents a phenomenon that can be called preservation beyond the preservation law. For more information, visit cfa.alany.org.

MetaModern
Palm Springs, California
Through February 27, 2017
Modern design—that once-radical break with the past—is now itself a thing of history, with contemporary artists viewing modern design as icons that can be incorporated into their own work. The result is metamodernism, in which the original source is changed and abstracted, and the outcome is self-referential. The artists in this exhibition held at the Palm Springs Art Museum, challenge the tenets of modernism, whether they’re working in the United States, Europe, or Latin America, in a range of media. For more information, visit palmseum.org.

Zoning at New Heights: Supertalls and the Accidental Skyline
New York City
December 8, 2016
New Yorkers have long had a love-hate relationship with height. And as the age of the supertall tower sets a new precedent for what’s possible, controversy is growing. In response, the Municipal Art Society launched its Accidental Skyline report in 2013 to track the construction of supertalls along the southern border of Central Park. Since then, countless more such structures have sprouted up around the city. In this conversation at the Museum of the City of New York, leading experts will consider whether the zoning regulations created to tame towers in the early 20th century have kept pace with the evolving skyline. For more information, visit mcnyc.org.

Competitions

Kip Island Auditorium International Competition
Registration deadline: January 18, 2017
The Riga Exhibition Centre, located in the heart of the Latvian capital, is soliciting design proposals for an iconic addition to its complex that houses conference rooms, meeting rooms, and two large exhibition halls. The new addition will include an auditorium and conference rooms, and another exhibition hall. For more information, visit kipslandauditorium.beebreeders.com.

eVolo 2017 Skyscraper Competition
Registration deadline: January 24, 2017
Established in 2006, this annual contest recognizes outstanding ideas that redefine skyscraper design through the implementation of novel technologies, materials, programs, aesthetics, and spatial organization, along with manifesting flexibility, adaptability, and change wrought by globalization and the digital revolution. Designs should reflect investigation of public and private space and the role of the individual in relation to the collective in a dynamic vertical community. There are no restrictions on site, program, or size. For more information, visit evolo.us.

Nikon Photo Contest
Submission deadline: January 27, 2017
This contest supports filmmakers and photographers who wish to use images to share stories and influence how people think. The competition’s 16th edition will feature two new categories: the Nikon 100th Anniversary Award, which celebrates the company’s 2017 centennial, and the Next Generation Award, for anyone under the age of 30. Acclaimed graphic designer and art director Neville Brody is serving as lead judge. For more information, visit nikon-photoc ompetition.com.

The SOURCE Awards
Submission deadline: January 30, 2017
Now in its 40th year, the SOURCE Awards competition is open to all lighting designers, architects, engineers, professional designers, and consultants who use Eaton’s lighting fixtures and lighting control systems in interior or exterior design projects. Students currently enrolled in any of these disciplines are also eligible to enter projects based on conceptual lighting designs that utilize Eaton’s lighting and controls products. For more information, visit thelightingresource.eaton.com.

 Metals in Construction Magazine 2017 Design Challenge: Reimagine Structure
Submission deadline: February 15, 2017
This competition invites architects and engineers to submit designs for a high-rise that integrates its enclosure and its primary structure for the purpose of minimizing embodied energy. It challenges participants to substitute a hybrid frame-and-skin system for the typical aluminum-and-glass curtain wall. Entries will be judged on embodied energy reduced and overall performance, with a prize of $5,000. For more information, visit metalsinconstruction.org.
The Fair's the Thing

The London Design Festival takes over the British capital, offering a bounty of fresh ideas and visual treats.

FOR NINE DAYS in September, when the London Design Festival's distinctive red signage appeared at scores of event locations, the remarkable breadth and depth of the U.K.'s design industry was suddenly made visible. The 14th edition, held September 17 to 25, was a sprawling affair: Hundreds of designers and manufacturers hosted events across the city as five separate trade fairs ran concurrently.

Commissioned projects gave a sense of order to the dizzying array of pop-ups and partnerships, lectures and launches. At the Victoria & Albert Museum, the festival's official hub, several temporary large-scale exhibits were installed among the permanent displays. The Green Room, by London-based product designers Glithero, featured a massive cylindrical curtain of 160 brightly hued cords that dropped down a six-story stairwell; individual strands gently rose and fell over the course of a minute, offering onlookers a new way to visualize the passing of time.

In the Tapestry Room on an upper floor, Benjamin Hubert’s wavelike Foil—an animated ribbon of 50,000 stainless-steel mirrors—scattered light across the walls like a giant disco ball.

At nearby Chelsea College of Arts, another ambitious project occupied the courtyard. Alison Brooks Architects’ The Smile, a pavilion in the form of a curved box beam, demonstrated the constructional capabilities of cross-laminated American tulipwood. While the center of the 112-foot-long arc lightly rested on the ground, both ends rose 11 feet into the air, culminating in large openings that offered those inside framed views of the college and the sky. (Unlike most of the installations, which ended when the festival did, The Smile remained on view through October 12.)

In Shoreditch, architect Asif Khan erected three enigmatic translucent polycarbonate structures, which he then stocked with furniture and thickets of plants. The project, called Forests, which was commissioned by MINI Living, explored the potential of “third places” in the city: spaces to gather in the public realm, away from home and work. Khan, who designed the inaugural London Design Biennale. For it, curatorial teams from design museums in 37 nations produced pavilions that responded to the theme of Utopia, selected by show director Christopher Turner to mark the 500th anniversary of Thomas More’s classic work. Occupying a prominent spot in the center of the entrance courtyard was Barber Osgerby’s Forecast. The supersize weathervane, anemometer, and wind turbine alluded to Britain's maritime history, tumultuous politics, and—of course—fabled obsession with the weather.

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ARC DE TRIOMPHE

Created by Alison Brooks Architects, the Smile installation provided a material lesson as it showed possible applications of cross-laminated American tulipwood.
a summer house for the 2016 Serpentine Pavilion program, explained that he hoped his interventions would foster interaction between strangers as well as raise questions about the relationship between public and private space.

_Bompas & Parr_ also used vegetation as a material in L'Eden, a bioresponsive garden installed in a Soho gallery. In the fairy-tale-like indoor landscape, concealed mechanics and motion detectors animated living plants, causing them to "react" as visitors moved through the space. Thus, under a starlit LED curtain, tendrils drew themselves back to private space.

ARTY FACTS

_Foil_, by Benjamin Hubert, cast flecks of light around the Victoria & Albert Museum's Tapestry Room (top), while Glithero's _The Green Room_, a column of 160 bright cords, cascaded down the museum's six-story stairwell (far left and detail). At the first London Design Biennale, Barber Osgerby's _Forecast_ showed which way the wind was blowing (center right).
clear a path, and a dancing tree bent and swayed along with spectators’ motions.

Similar levels of ingenuity were evident in designers’ studios and showrooms. For example, to introduce his new lighting range, Lee Broom transformed his East London store with an Op Art-inspired installation. Opticality featured geometric-pattern pendant fixtures endlessly replicated by mirrored walls, creating the illusion of infinite space.

Eley Kishimoto took its energy to the streets—literally. With help from design consultancy Dolman-Bowles, the fashion duo applied its signature Flash pattern to crosswalks at busy Brixton intersections, improving safety while adding visual flair to the urban environment.

In all, the London Design Festival’s messy diversity is its strength: Grand spectacles coexist with subtle interventions, and culture cozies up to commerce. As the event expands into new territory and broadens its international scope, the mix grows even richer.

—Chris Foges

In its garden, L’Eden (top), Bompass & Parr included sensors and mechanics that responded to visitors’ movements. Architect Asif Khan created three temporary structures brimming with plants, giving Londoners extra green space in which to relax and interact (above and center). To heighten safety awareness at busy intersections, design duo Eley Kishimoto applied its Flash pattern to crosswalks (left).
ARCHITECTURE RESEARCH OFFICE’S 2013 redesign of Knoll’s Midtown showroom not only garnered awards but also won the Manhattan-based firm a new client. ARO’s inspired use of FilzFelt, which included wrapping an entire staircase in the high-quality material, made a product collaboration with the Knoll sister company a perfect fit. “They are architects, and architects are our target audience,” says Kelly Smith, creative director of FilzFelt.

With their shared interest in environmental responsibility, the two parties settled on a brief: find an elegant way to repurpose remnants from FilzFelt’s projects and production runs. The result, ARO Blocks, is a line of sound-absorbing tiles, panels, screens, and baffles.

The modular solutions feature scraps of the company’s Wool Design fabric mounted on 10-millimeter-thick PET acoustic substrate. The 100 percent VOC-free tiles come in four patterns — rectangles, asymmetric angles, and two sizes of triangles— and offer a 0.65 NRC. Dozens of colors are available.

“The pieces are flexible and low-tech,” says ARO principal Kim Yao. They’re also a lesson in artful sustainability. (SNAP #270)
Introducing the 6002 Wheelchair Mirror, the latest addition to AAMSCO Lighting’s collection of energy saving bath and vanity luminaires. Designed to meet the requirements of the Americans with Disabilities Act.

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