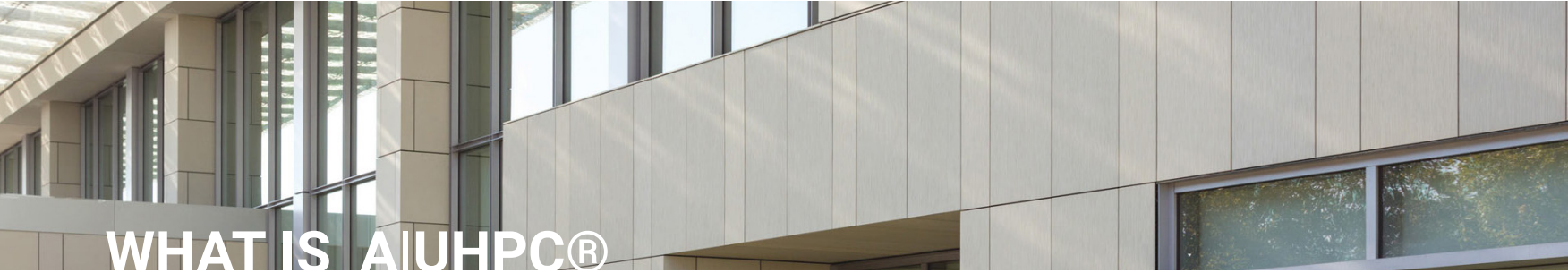
TAKTL®

Advanced Concrete Facades

Designed to Last the Life of the Building



WHAT IS A|UHPC®

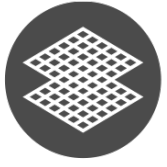
TAKTL Architectural UHPC (A|UHPC®) is Ultra High Performance Concrete, sourced regionally and optimized specifically for building envelopes. Ultra High Performance Concrete (UHPC) is a cementitious material with a closed particle packing matrix, engineered for longevity. The result is an extremely strong concrete without the voids or environmental vulnerabilities common to traditional concrete. TAKTL takes proven UHPC technology and augments its performance, resilience, and design characteristics for large-scale building facades.

It all starts with material science. Key material characteristics set UHPC distinctly apart from fiber cement, GFRC, and other cementitious facade materials. Scientists developed the first UHPCs to meet the extreme strength and durability requirements of advanced civil and industrial applications.

TAKTL A|UHPC goes even further – our research team consistently amplifies the material's inherent strength characteristics, and our designers work every day to celebrate its extraordinary design potential for facades. Learn more about what defines Architectural UHPC below.

7.2–8.5 lb/ft²
Weight

5/8 in.
Thickness



2 Layers of
Glass Fiber Mesh

NFPA 258
Noncombustible

Watertight

Miami Dade
NOA #21–0408.05

Micro-Engineered Material Composition is the basis for all Ultra High Performance Concrete, and TAKTL has refined its composition for architectural elements.

Two layers of glass fiber mesh increase flexural strength and allow for significantly higher impact resistance than other cementitious panels.

Surface quality, textural fidelity, and color integrity are the natural results of the highly engineered mix and meticulously sourced raw materials.

High matrix density achieved in manufacturing and curing minimizes voids and improves longevity

Freeze-thaw stability is the result of a densely packed, watertight particle matrix that extreme weather fluctuations will not degrade over time.

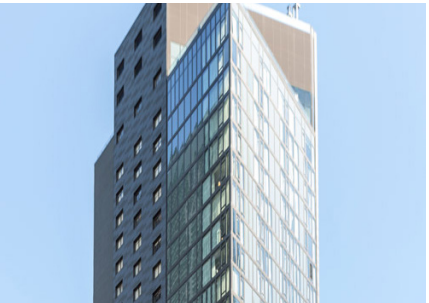
Superior flexural strength is an important defining aspect of A|UHPC as it directly lowers the number of attachment points needed even under the highest wind loads.

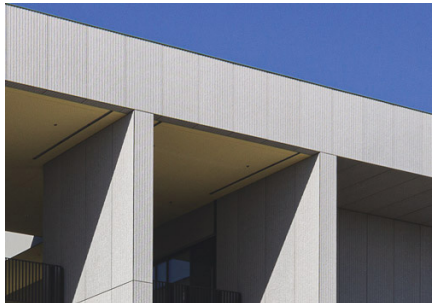
Extreme Impact Resistance means A|UHPC can be specified in schoolyards, on embassies, and even in hurricane zones with the possibility of high-velocity projectiles.

Regionally Sourced Raw Materials are key to our focus on manufacturing strategies that support lower emissions and the tightest control over quality and consistency.

RESILIENCE

How long will your building last? Resilience is at the core of good building materials and practices. At TAKTL, we view it in terms of how our facade elements can tangibly benefit the built environment. Durability, longevity, impact resistance, survivability in extreme events, assembly efficiency, strength-to-weight ratio, carbon emissions in manufacturing and delivery, and ultimate service life all play into the resilience equation for new buildings and re-clads.





TAKTL pursues rigorous testing to support applications in the most challenging environments from hurricane zones with high-velocity projectiles to climates with extreme temperature swings. We provide facades that contribute positively to the preparedness of buildings to deal with climate change, disaster risk reduction, and emergency response. Ask us more about our approach to resilience and learn about our special assembly tests.

Impermeable
TAKTL is moisture-impermeable, corrosion-resistant, and able to withstand the elements in coastal areas and flood zones

Superior Impact Resistance
Extremely high impact resistance means safety and durability even in hurricane-force winds carrying airborne projectiles

Impermeable
In climates with drastic temperature shifts, TAKTL's proven freeze-thaw performance ensures its integrity over decades

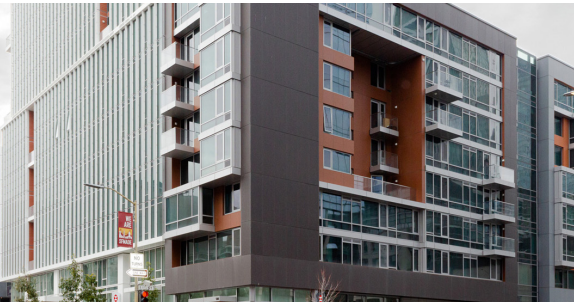
Non-Combustible
TAKTL panels are certified non-combustible under ASTM E136, and an NFPA 285 assembly test confirms the supporting rainscreen components are equally safe

Seismic Zones
With superior flexural strength, TAKTL can be safely installed in seismic zones and on tall towers with surprisingly few anchor points

Reduced Emissions
Regionally sourced raw materials, local manufacturing, and lower-cement TAKTL UHPC mixes lead to reduced emissions

FACADE ELEMENTS

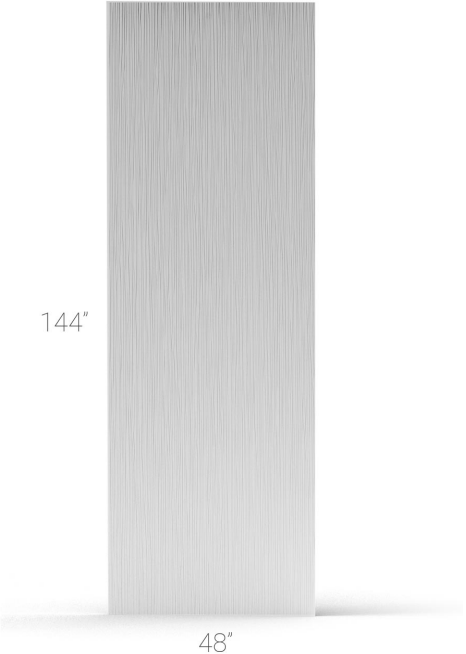
Our central focus at TAKTL is to design, manufacture, and deliver the highest quality Ultra High Performance Concrete facade elements in the world. Our proprietary Architectural UHPC (A|UHPC) facade panels are uniquely suited for 100-year buildings because of their enduring beauty, design flexibility, strength, durability, and weather performance. TAKTL's in-house team of experts helps our clients to optimize A|UHPC panels for project-specific design parameters, building efficiency into every aspect of manufacturing, delivery, and installation.



Field-Set Rainscreens
Lightweight and easy to handle in the field, with dozens of color and texture combinations, TAKTL panels are designed for lifetime performance across thousands of square feet of rainscreen assemblies. While the material is installed using familiar clips, rails, and anchors, the design potential and longevity of a TAKTL rainscreen is far from ordinary.

Prefabricated Assemblies
Whether the envelope design calls for a megapanel system, a custom unitized curtain wall, or a volumetric modular assembly, TAKTL facade elements are often chosen for their superior strength, resilience, and boundless opportunities for customization. Panels are cast in large sizes that make them a natural fit for most curtain wall units.

Interior Public Spaces
While TAKTL is designed for the highest level of durability in exterior applications, the ability of UHPC to pick up the finest micro-textures makes it just as visually exciting when viewed at close range.



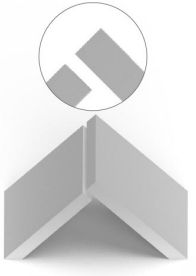
Reeds

Panel Details
TAKTL elements can be cast up to 60" X 144" (1,524mm x 3,657mm), with additional custom sizes available on a project-specific basis. Panels are cast and trimmed to large blank sizes, and then are cut in the TAKTL facility to a variety of smaller sizes based on project optimization, and in coordination with our installing contractors. The TAKTL technical team assists architects with panel layouts during early design phases to maximize material yield. Contact our team to review and optimize your proposed panel layout.

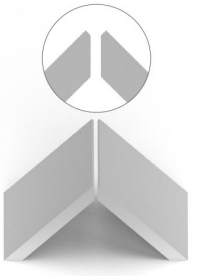
Min. Dimensions	6" x 48" (152mm x 1,219mm)
Max. Dimensions	48" x 144" (1,220mm x 3,657mm)
Max. Custom Dimensions	60" X 156" (1,524mm x 3,962mm)
Standard Thickness	5/8" (15.87mm)
Custom Thickness (Max.)	1 1/4" (31.75mm)
Panel Weight	7.2 lb/ft2 – 7.8 lb/ft2 (33.7kg/m2 – 38.08kg/m2)


SCOTTSDALE
FashionSquare

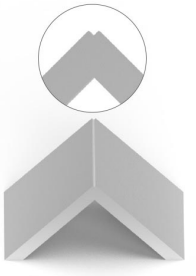
Corner Options
A variety of closed and open corner options are possible with TAKTL panels. TAKTL's CNC bridge saws precisely create straight and mitered edges as the finished panels are cut to size. Factory-adhered corners have been fully tested, with the strength of the joint matching or exceeding that of reinforced cast corners. Please contact our Technical Support Team to discuss custom corner options.



Open Square



Open MIter

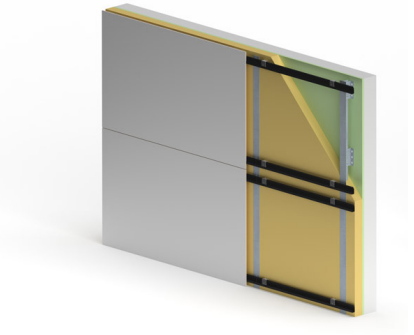


Factory-adhered Miter

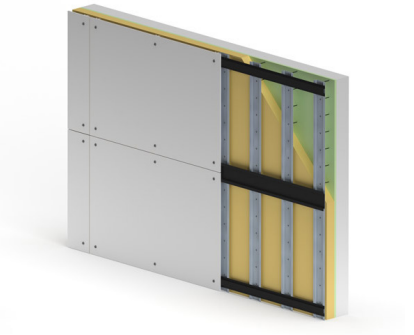
Wall Assembly Examples
TAKTL panels are compatible with a wide range of facade applications and cladding support systems, from rainscreens to interior lobby elevations. We've developed sample architectural details, available on our website, with some of the most common applications illustrated below featuring typical concealed and visible fastening options.

Fasteners (Concealed + Visible)
TAKTL panels can be attached with several types of fasteners. Undercut anchors provide concealed support; they are compatible with textured surfaces and install with a fast, adhesive-free process. TAKTL panels can also be attached to substructure framing with screws or rivets. All panels are pre-drilled for ease of fastener installation.

Rainscreen with Concealed Fasteners



Rainscreen with Concealed Fasteners



Rainscreen with Concealed Fasteners

COLOR

TAKTL's expressive colors come from integral, UV stable pigments, all tested and engineered for Ultra High Performance Concrete. Whether standard or custom, TAKTL Architectural UHPC panel colors can be formulated to harmonize with a subtly warm limestone, a cool precast gray, or a bright terracotta.

Custom colors are formulated in the TAKTL materials lab, where art and science meet. Our lab specialists collaborate with project teams in an iterative sampling process beginning with a color reference. Customization can start with a variation on one of TAKTL's standards, a reference to an adjacent building's aesthetic, or a departure into the bold and unique color territory.

Standard Color

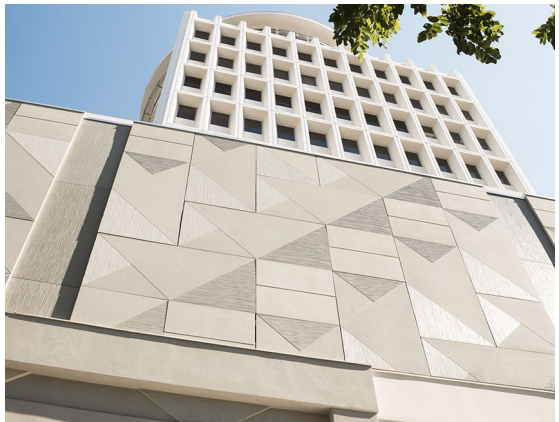
TAKTL Standard colors celebrate the mineral qualities of the raw ingredients in Ultra High Performance Concrete. Our standard colors were developed through years of formulation research and collaborative feedback from architects and designers. The standard palette is intentional in its range – it is intended to provide versatile complements to materials that often occur in architecture and nature. Color stability, colorfastness, integral pigments, and the highest quality raw materials are the basis for all of TAKTL's standard formulations.

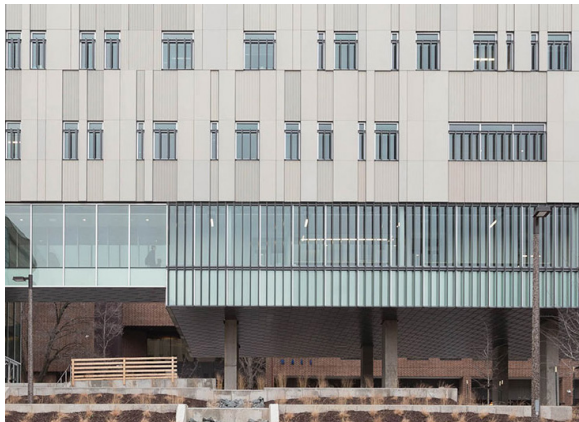
Color and Mediablast Finish

This process reveals a slightly different surface texture and perceived color. Mediablast can be used on its own or combined with a cast finish in order to introduce intentional color variation across a facade while using the same base color formula. The chart above illustrates this effect across the standard color palette.

TEXTURE

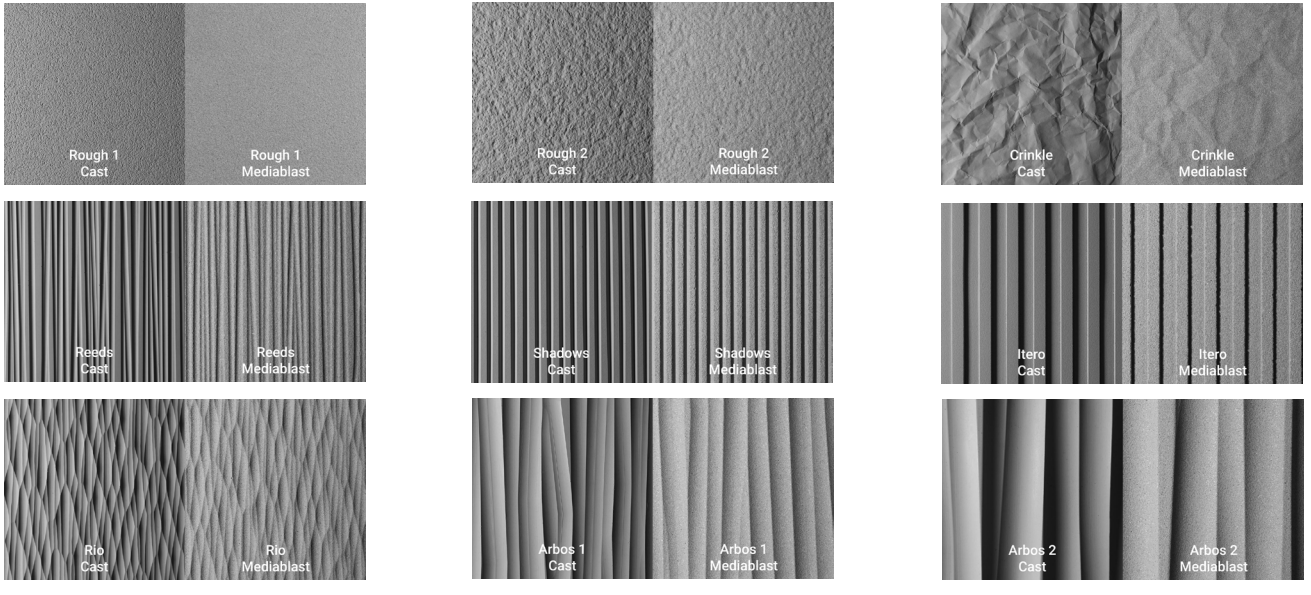
One of the key design characteristics of TAKTL A|UHPC is its ability to replicate the form and texture of any surface. With our in-house design team and fabrication specialists, TAKTL has engineered a mold system that best leverages the material's inherent ability to retain surface quality down to a single micron. TAKTL panels can feature a larger texture, such as a rib or a corrugation, in combination with a micro-detail or a subtle underlying pattern.





Standard Textures
The TAKTL team works with designers and architects around the world, using our collaborations to understand market needs and current facade intents. Our in-house team designs our standard textures and updates them regularly to respond to the market, with input from professionals working in the built environment, including architects, engineers, contractors, and building envelope consultants.

Texture and Mediablast
TAKTL's Mediablast process lightly abrades the cast surface of the A|UHPC panel in order to expose the underlying natural aggregates in the UHPC matrix below, while preserving integral textural fidelity. Above is a representation of each of our standard textures in both the as-cast finish and after mediablasting. Because the process removes the outermost layer of concrete, Mediablast finish will eliminate any reflectivity present in Cast finish panels and highlight the raw material composition of A|UHPC.



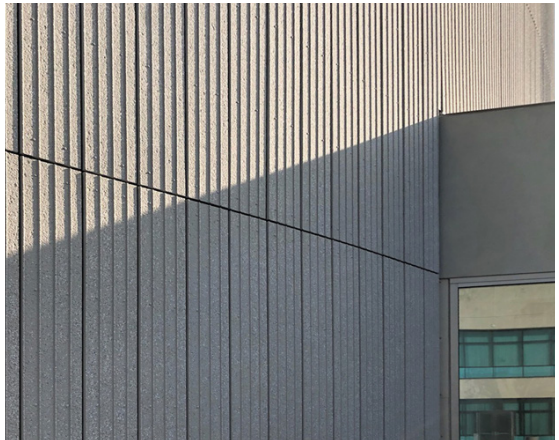
Collaborating on a Custom Texture
TAKTL takes an integrated approach to custom texture development, working closely with architectural teams to take an initial concept and translate it into a holistic manufacturing strategy that works within our automated, large-scale production system. This is always a collaborative process that involves two-way communication and often a visit to Pittsburgh to work directly with our design and fabrication experts.

Custom Texture Inspiration
Over the course of more than a decade, TAKTL has developed hundreds of custom textures, from extremely fine surface details to large-scale cast features. Below is an inspiration gallery that describes some of what is possible in TAKTL A|UHPC. Get in touch with our team to realize your custom texture concept with TAKTL.

FINISH

TAKTL offers several engineered finish and sealer options, all proven to stand the test of time.

Beyond texture and color, finishes are a way to accentuate the design of a custom facade by highlighting the surface properties of UHPC through clean lines, bright colors, or exposed aggregate.

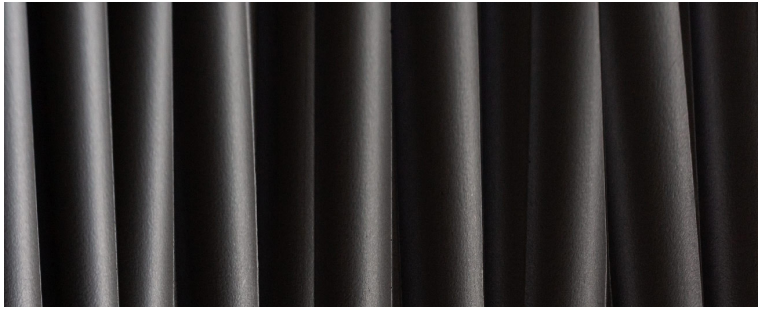


Finishes

Cast Finishes
Cast panels come straight out of the molds and mimic the finish of the urethane mold surface in high fidelity, whether the texture is smooth, rough, or linear.

Mediablast Finish
The precise, subtractive mediablast process reveals the underlying mineral raw materials in the A|UHPC mix without compromising integral texture definition.

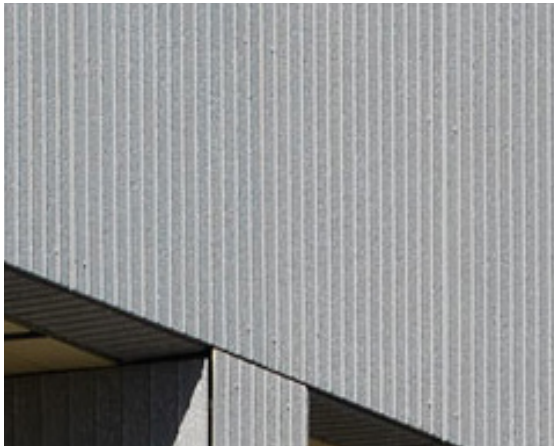
ColorSeal/T™
For projects in which color variation is not desired, we offer an alternative factory-applied finish, ColorSeal/T. This process affords tighter control of the surface color characteristics, mitigating the color variation that results from using mineral raw materials.



KORSA™
Within the TAKTL KORSA program, natural aggregate finishes can be added to standard TAKTL panels and customized for color, size, and density. KORSA is compatible only with Mediablast finish as the blasting process exposes the aggregate applied during casting.

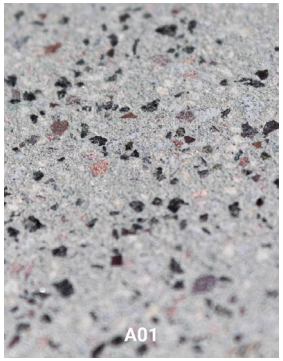
KORSA™ AGGREGATE

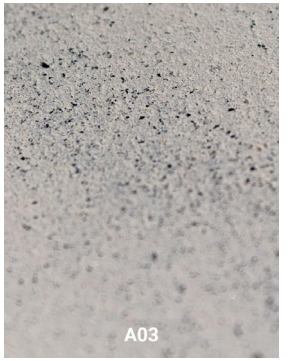
The KORSA™ collection combines the performance of A|UHPC with the depth and richness of exposed decorative aggregates. By incorporating aggregates of varying color and size into the face layer of the material, KORSA panels offer a wide palette of design options for large thin facade panels without the weight of stone or precast concrete.

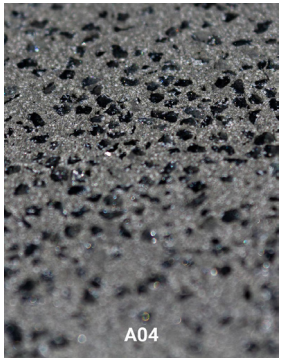


KORSA Standard
KORSA Standard Panels (A01, A02, A03, A04, A05) use materials that have been tested for compatibility with the TAKTL A|UHPC base formula (KORSA Standard Design Mixes), are readily available in sizes that fit within our standard thickness, have consistent supply sources.

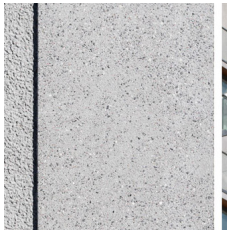
Color Flexibility
KORSA Standard Panels are cast in the TAKTL colors of Titanium 63, White 87, Bone 78, and Graphite 40, as reflected in the table below. KORSA Standard Design Mixes may be cast in any base color, either another TAKTL standard color or custom color.



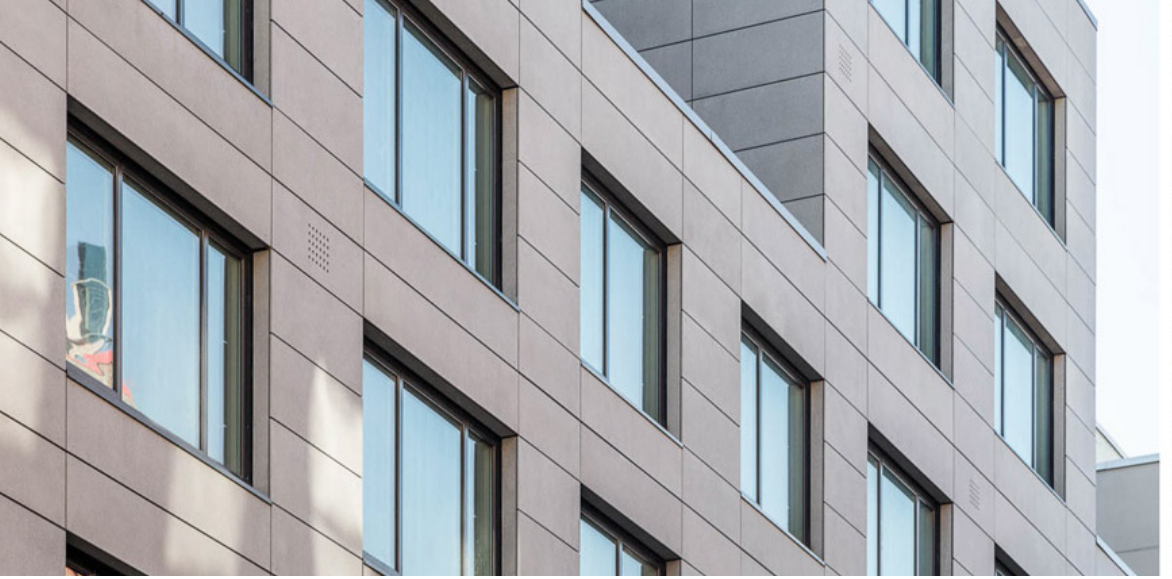


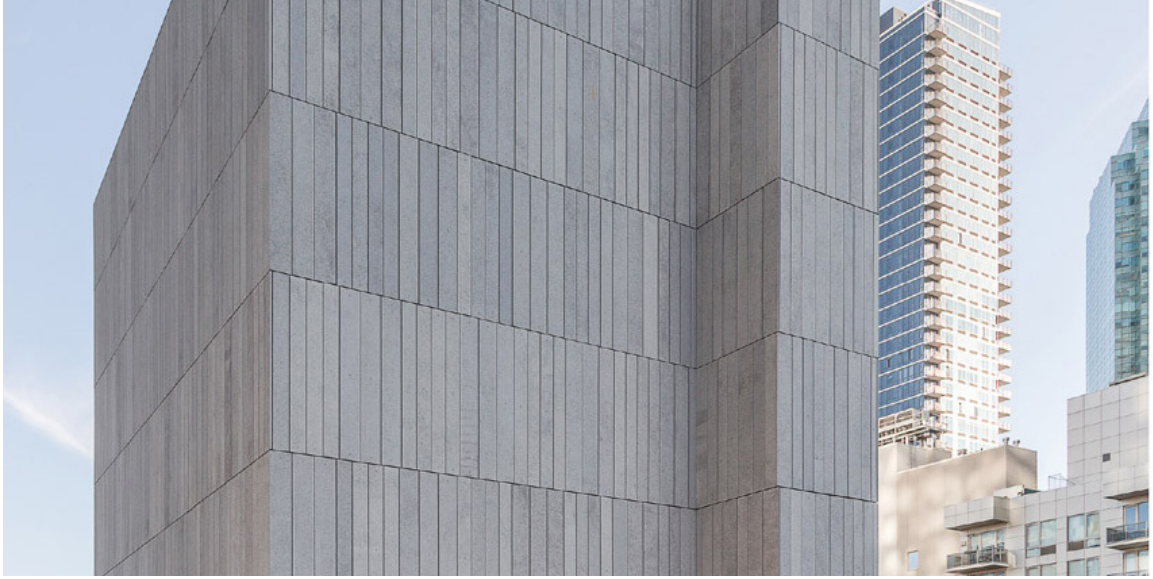


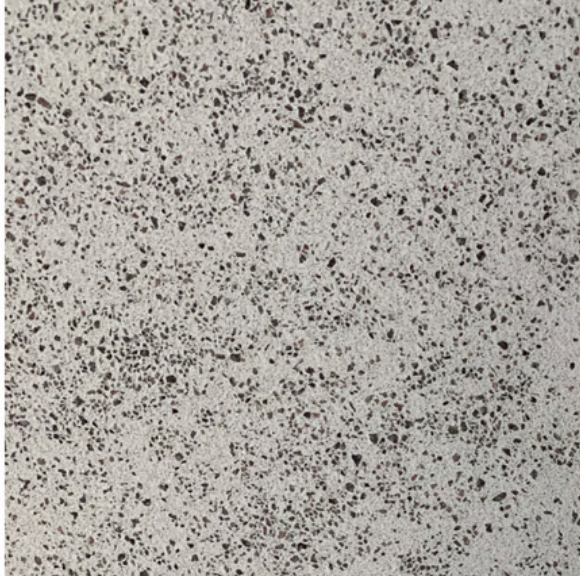
KORSA + Textures
Our research team has developed sophisticated methods for manufacturing UHPC panels with a decorative face layer that does not interrupt the micro-engineered packing matrix in our UHPC mix. The result is that most raised textures, including custom textures, are compatible with KORSA aggregate mixes.



Recycled Aggregates
We are always looking for creative ways to increase the use of recycled content. With KORSA as a basis, we can take building materials from a structure set for demolition, process it into a fine aggregate, and incorporate it into the face layer of custom TAKTL panels.



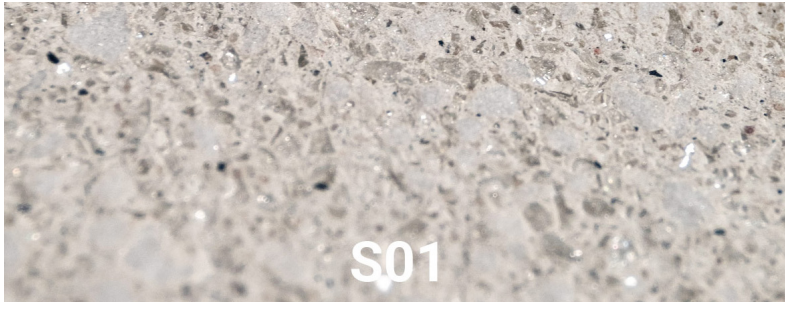


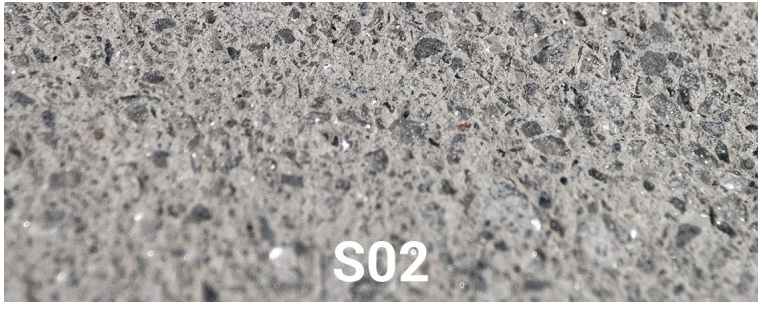


TAKTL SOLA™ is the world's first integrally self-cleaning, pollution-removing, and antimicrobial UHPC facade panel. Utilizing a combination of finely tuned aggregates and award-winning SC+ Technology developed in the TAKTL research lab, SOLA panels use the power of light to break down organic and inorganic contaminants and other environmental toxins, contributing to a cleaner and safer environment and lasting beauty in building facades.

SC+ Technology Benefits Use your facade to promote community and environmental health benefits. Test results show that TAKTL SOLA panels reduce the most prevalent family of harmful airborne pollutants, Nitrogen Oxides, by up to 35%, while also mitigating unsightly surface deposits and both bacterial and viral particles.

FAST COMPANY
2021 INNOVATION BY DESIGN FINALIST





Color + Finish
The design character of SOLA's colors and finishes is inspired by nature, incorporating elements of light refraction and dynamic responsiveness to sunlight. Regionally sourced natural materials show off their mineral qualities as they simultaneously support the panel's integral self-cleaning properties.

Environmental Health
The nano-engineered SC+ Technology in TAKTL SOLA panels breaks down contaminants and environmental toxins, with ISO-tested capabilities proven to mitigate air pollution. A single TAKTL SOLA panel neutralizes the same amount of harmful environmental toxins as do 4-6 urban trees.

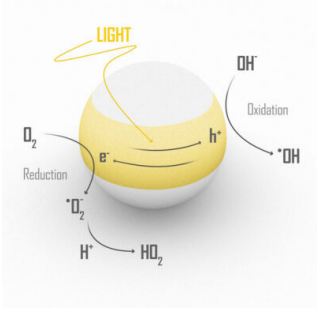
SOLA Aggregate
The aggregate mixes in TAKTL SOLA are not only designed for their appearance but also engineered to amplify the photocatalytic reaction inherent to the panel. Rigorous testing on our aggregates shows that the addition of specific elements boosts the panels' self-cleaning performance beyond the already exceptional characteristics of the TAKTL SOLA base matrix.

Dimensions
TAKTL SOLA panels are available in standard sizes up to 4' X 12' at 5/8" thick with custom sizes, profiles, and assemblies available on a project-by-project basis. S01 and S02 can be specified individually or together on the same facade for increased natural variation.

SOLA™ SCIENCE

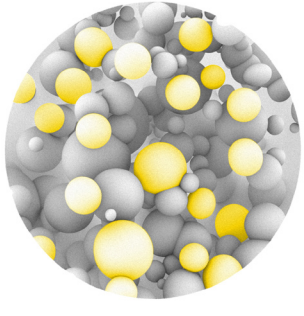
The Science: How Does It Work?

Chemistry | Photocatalytic Model



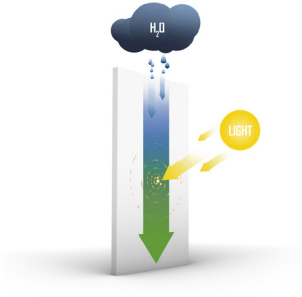
A photocatalytic reaction occurs when light activates the titanium-based nanoparticle. When activated, environmental humidity breaks down toxic NOx into harmless soluble solids.

Integral to the Mix | Formulation



TAKTL SOLA panels integrate SC+ technology to harness the power of photocatalysis. The panel's chemical properties combine TAKTL's proprietary A|UHPC mix with titanium-based nanoparticles.

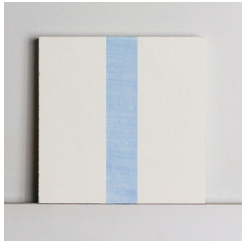
Product | Facade



When installed on the exterior or interior of a building, TAKTL SOLA self-cleaning panels work with environmental light and humidity to reduce airborne pollution, surface toxins, and microbial deposits.

Test Results

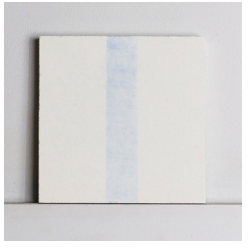
ISO 10678 Self-Cleaning Properties
Standard test (below) to predict SOLA's response to a wide variety of common particulates including nitrogen oxide (NOx), soot, grease, VOCs, and microbes. Results showed complete decomposition under UV-A light over 15 days.



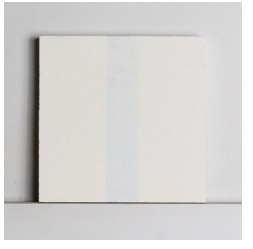
Day 1

Day 2

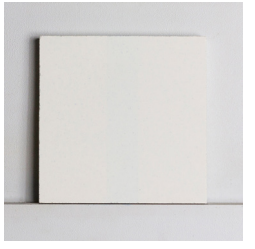
Day 3



Day 4



Day 5



Day 6

ISO 18061-2014 RESULTS

Sample	Human Coronavirus	Cell Line	Infectivity Titer TCID50/ml	UV Intensity (mW/cm2)	UV Radiation Time (h)	% Reduction*
1	HCoV-229E	MRC=5	10^5	0.25	4	100%
2						99%
3						100%
1	HCoVO-C43	HCT-8	10^5	0.25	4	100%
2						100%
3						100%

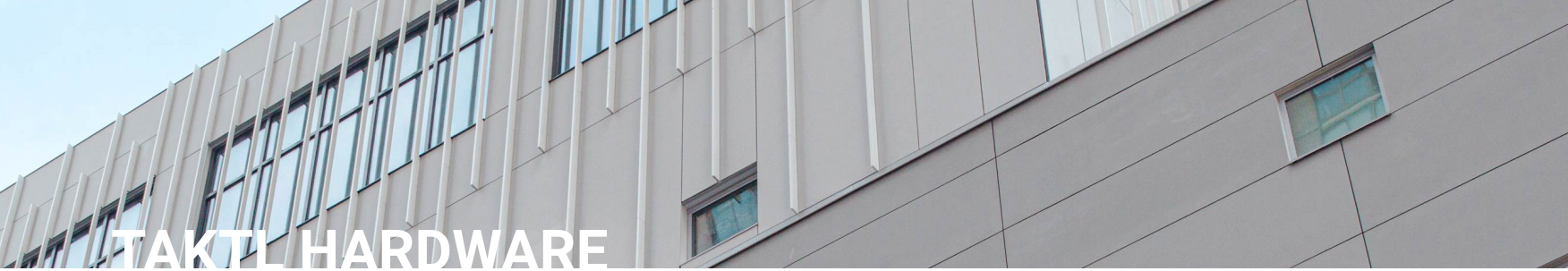
** Percentage reduction calculated per original infectivity titer of virus inoculum*

ISO 22197-1 RESULTS

	SOLA
Flow Rate (L/miin)	1.5
Nox Concentration (ppmv)	0.3
Humidity (%)	50
UV Light Intensity (W/m2)	10
NO Removed (%)	64.5
Selectivity (%NO2 gen.)	7.2
NOx Removed	**57.3%**

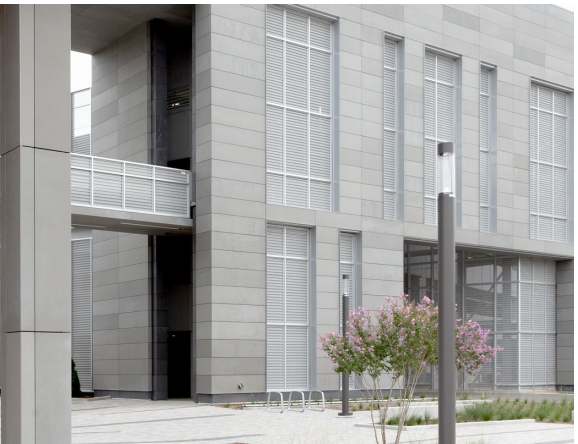
ISO 22197-1
Pollution Reduction Test to measure air purification activity using the oxidation of NO and NO2 into NO3, a pollutant with a major role in smog and ozone formation

ISO 18061 Viral Neutralization
Standard used to determine antiviral activity performed by the Tile Council of North America using species of the human coronavirus (229E).



TAKTL HARDWARE

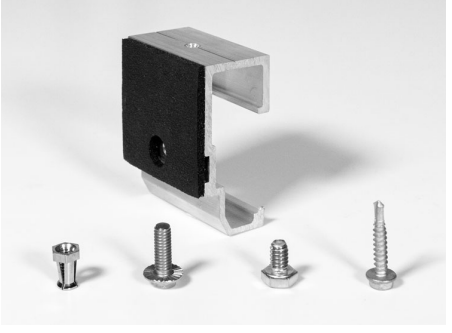
TAKTL offers single-source design and delivery with concealed and visible hardware components and systems, including anchors, clips, and rails. Our team has expertise in sub-girt systems and compatibility with a range of fixing components available in the market. We can advise knowledgeably on hardware specification strategies and efficiencies for your project.



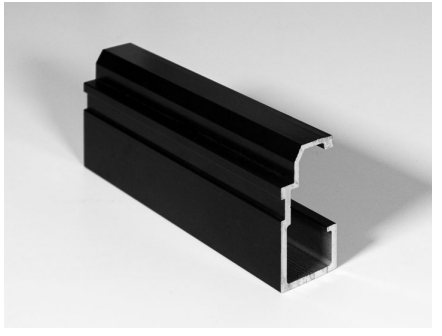
Concealed Fastening

Concealed Clips
The TAKTL extruded aluminum clips are designed to work in tandem with our continuous rails. Clips are shipped with KEIL stainless steel anchors and bolts, adjustment bolts, and fixing screws. TAKTL panels are factory-drilled to receive the concealed anchors, which engage mechanically to secure the clips.

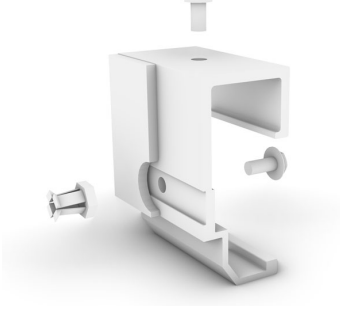
Extruded Aluminum Rails
TAKTL rails are shipped with a black finish to minimize hardware visibility between panel joints. The extrusion is designed with a 45-degree eased angle on the rear corner to easily engage the TAKTL clips on large panels. Aluminum rails are part of the concealed attachment system and come in varying lengths.



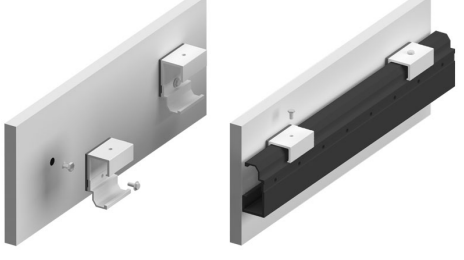
TAKTL Clip with Keil Anchor



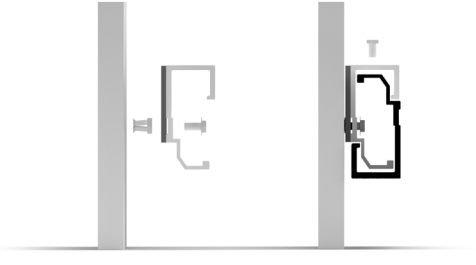
Extruded Aluminum Rail Section



TAKTL Clip with Keil Anchor



TAKTL Concealed Clip + Rail System



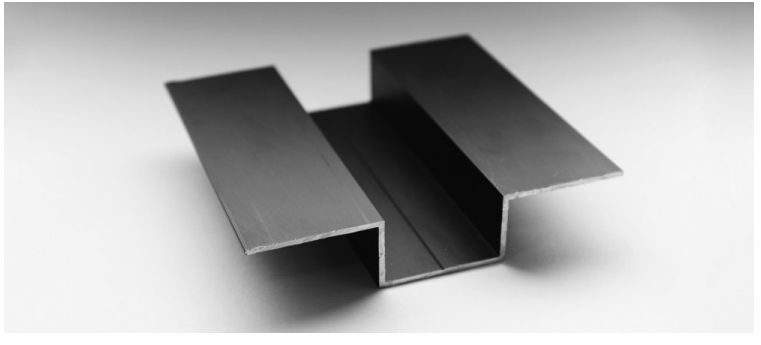
TAKTL Clip with Keil Anchor

Visible Fastening

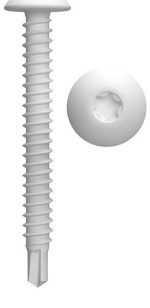
Color-Matched Fasteners
TAKTL visible fasteners are made of premium stainless steel and are color-matched to the face color of the panel, minimizing their appearance even when viewed at close range. Visibly fastened TAKTL panels can be installed over most rainscreen subframe systems.

Hat Channels
There is flexibility in the furring types available for visible attachment, with galvanized or aluminum hat channels as the most common fixing components. TAKTL will assist in developing the most efficient subframe specification for your project.

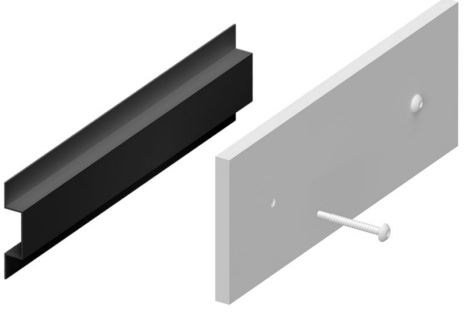
Stainless Steel Fastener Color Match to Panel Color



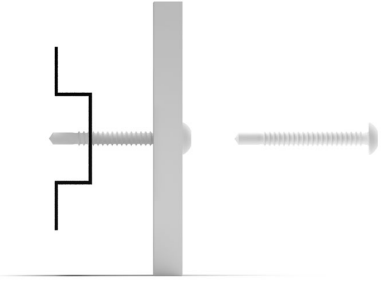
Extruded Aluminum Hat Channel Section



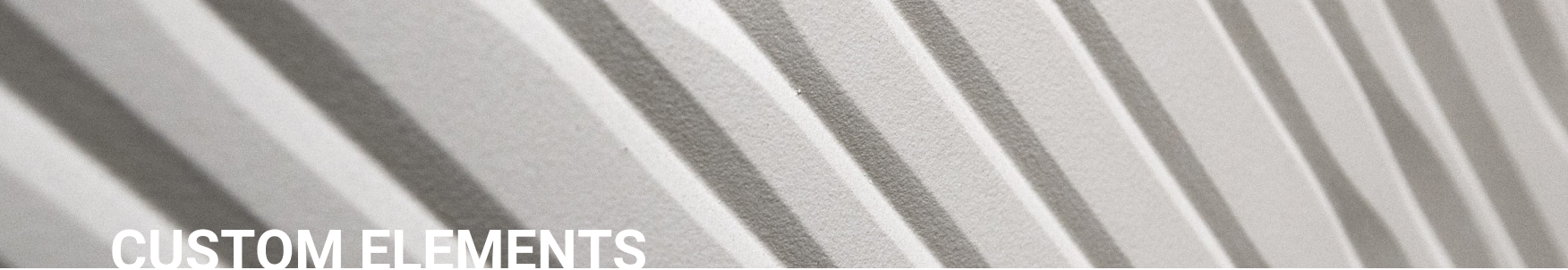
EJOT Visitble Buttonhead Fastener



Visible Fastener & Hat Channel

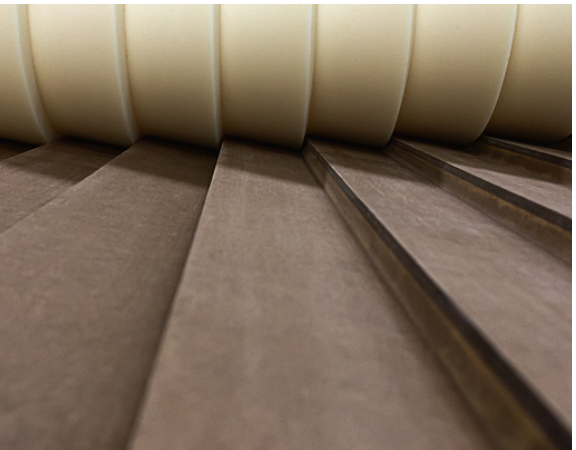


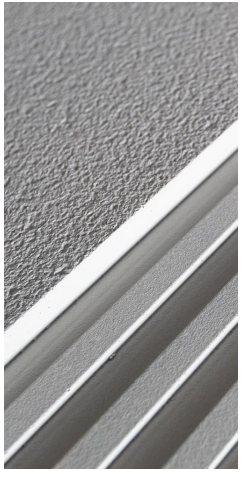
Visible Fastener & Hat Channel Profile



CUSTOM ELEMENTS

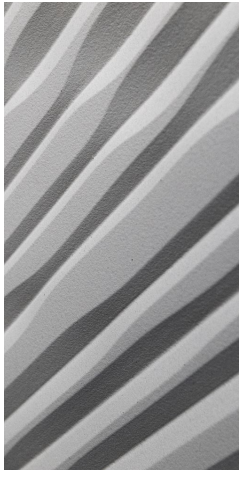
TAKTL custom texture development is a collaborative process. Texture development starts with the creation of a tool or pattern that is used to cast polyurethane molds. Patterns can begin with natural materials as varied as wood, glass, lace, slate, and paper, or can be machined using specialty construction materials and a 3D model of the profile.



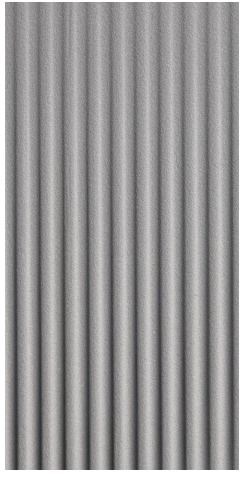


Custom Dual Texture

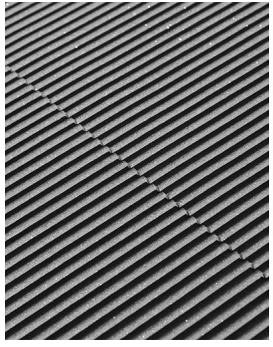
Custom Cedar Board Formed

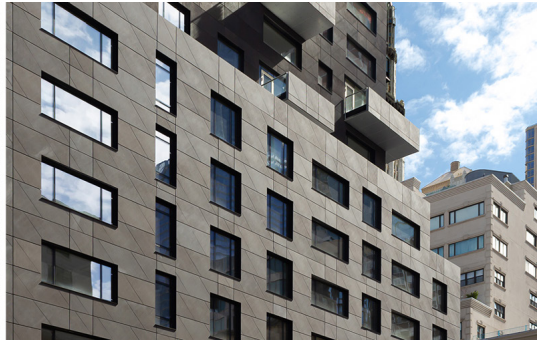


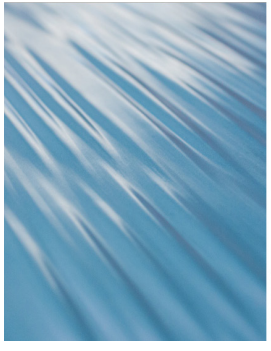
Custom Organic

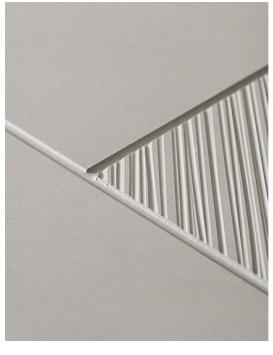


Custom Corrugated Fade









TAKTL®

TAKTL is an organization of researchers, designers, and manufacturers with an exclusive focus on Architectural Ultra Performance Concrete (A|UHPC®) facade elements.

Our culture is one of curiosity and collaboration. Backed by research and driven by the world's first vertically integrated UHPC manufacturing facility, we control every aspect of TAKTL's design and fabrication and consistently deliver the highest quality A|UHPC facade elements in the world.

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