

A low-angle shot of a modern building's exterior. The building features large glass windows and white cladding. The sky is blue with some clouds. The text 'staron® IS SOLID SURFACES' is overlaid on the image.

staron[®] IS SOLID SURFACES

Exterior Wall Cladding

A photograph of a modern, multi-story building with a distinctive architectural design. The building features white, wavy balconies that create a rhythmic, undulating pattern across its facade. The balconies are set against a dark, possibly blue or black, background, which could be the sky or a dark part of the building's structure. The building is viewed from a low angle, looking up, which emphasizes its height and the dramatic play of light and shadow on its curved surfaces. The overall tone of the image is somewhat dark and moody, with a clear blue sky visible at the top.

1. Benefit

1. New Wall Cladding Materials

New wall Cladding Materials: Modern texture and color

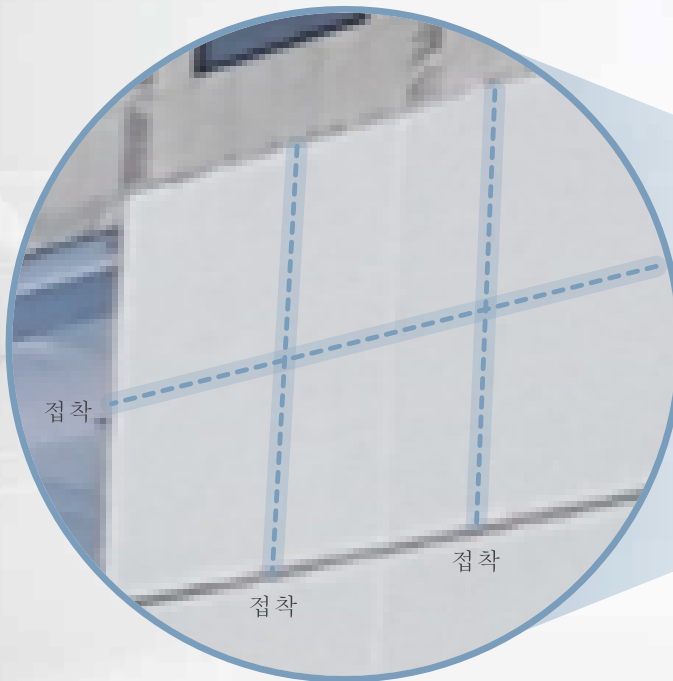
- | Modern texture and white colored Staron that is differentiated from natural stones makes about the possibility of creating modern style for exterior cladding
- | Staron enables consistent color and pattern evenly distributed throughout large-scaled surface while natural stones show color and pattern variation between slab to slab.



2. Dimensional Flexibility Seamless joint

Embodying large-scaled surface with seamless joints

- | With seamless joints between slabs, it is possible to produce wall with any large size
- | Color-matching adhesives that have the same components as Staron materials allows seamless joints



Size of slabs: 4,000 x 4,000 mm

3. Dimensional Flexibility_Curved

Possible to express various exterior wall design with 3D curving

- | Staron can be formed into many various shapes while most other existing finishing materials for exterior cladding are limited only by flat design
- | Staron can be used elegantly and freely for exterior design by thermoforming process



4. Light Weight Materials

Light weight material that is easily installed

| Since Staron is light and has less specific gravity compared to natural stones or tiles, it is suitable for exterior cladding

| It is 12mm thick and has strong resistance to scratch and shock, so it is solid enough to be used for exterior cladding



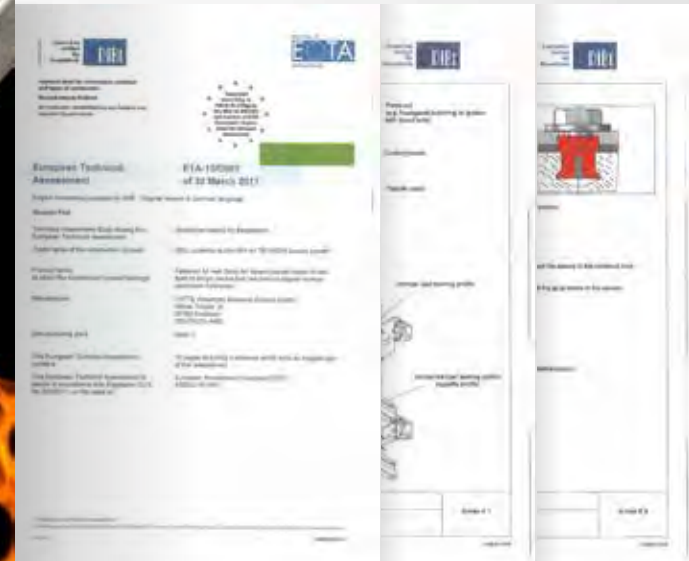
Size of a product: 1,000 x 1,000 mm

Local Union: 1 m²

TYPE	WEIGHT
Natural stone (Thickness: 30mm)	75 kg
Natural stone (Thickness: 20mm)	50 kg
Staron (Thickness: 12mm)	21 kg

5. Qualified Wall Cladding Materials

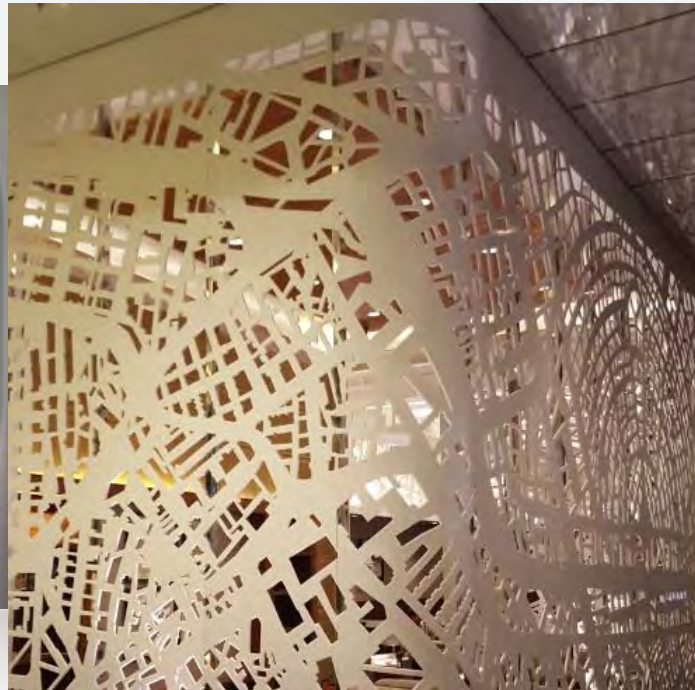
- | Staron is proved to be the reliable material by certification of ETA (European Technical Assessment)
- | Staron has excellent performance in durability, flame-resistance, low moisture absorption and weatherability



Staron is certified by ETA (European Technical Assessment, ETA-16/0091). It means that embodying Staron at outer wall comes up to standards of ETAG 034 (Guideline for European Technical Approval of Kits for External wall Claddings).

6. Various Design_CNC Effect

Expression of various designs using CNC (intaglio, emboss)



7. Lighting Effect

- | Translucent color of Staron offer convenient fabrication process to create various designs
- | By controlling thickness, shape and transparency, it is possible to maximize the effect of light and to express detail like pictures below





2. Case Gallery

Case Gallery

Single material that can create impact in a large space

- Does not require surface painting to achieve color or texture variety



Case Gallery

Single material that can create impact in a large space

- Does not require surface painting to achieve color or texture variety



Samung Auto Showroom, Seoul, Korea

Case Gallery

Single material that can create impact in a large space

- Does not require surface painting to achieve color or texture variety

Case Gallery

Strong material

- Light and durable material choice for interiors
- Restorable surface that keeps product looking “new”
- Surface that does not easily discolor in varying weather conditions.



Case Gallery

Strong material

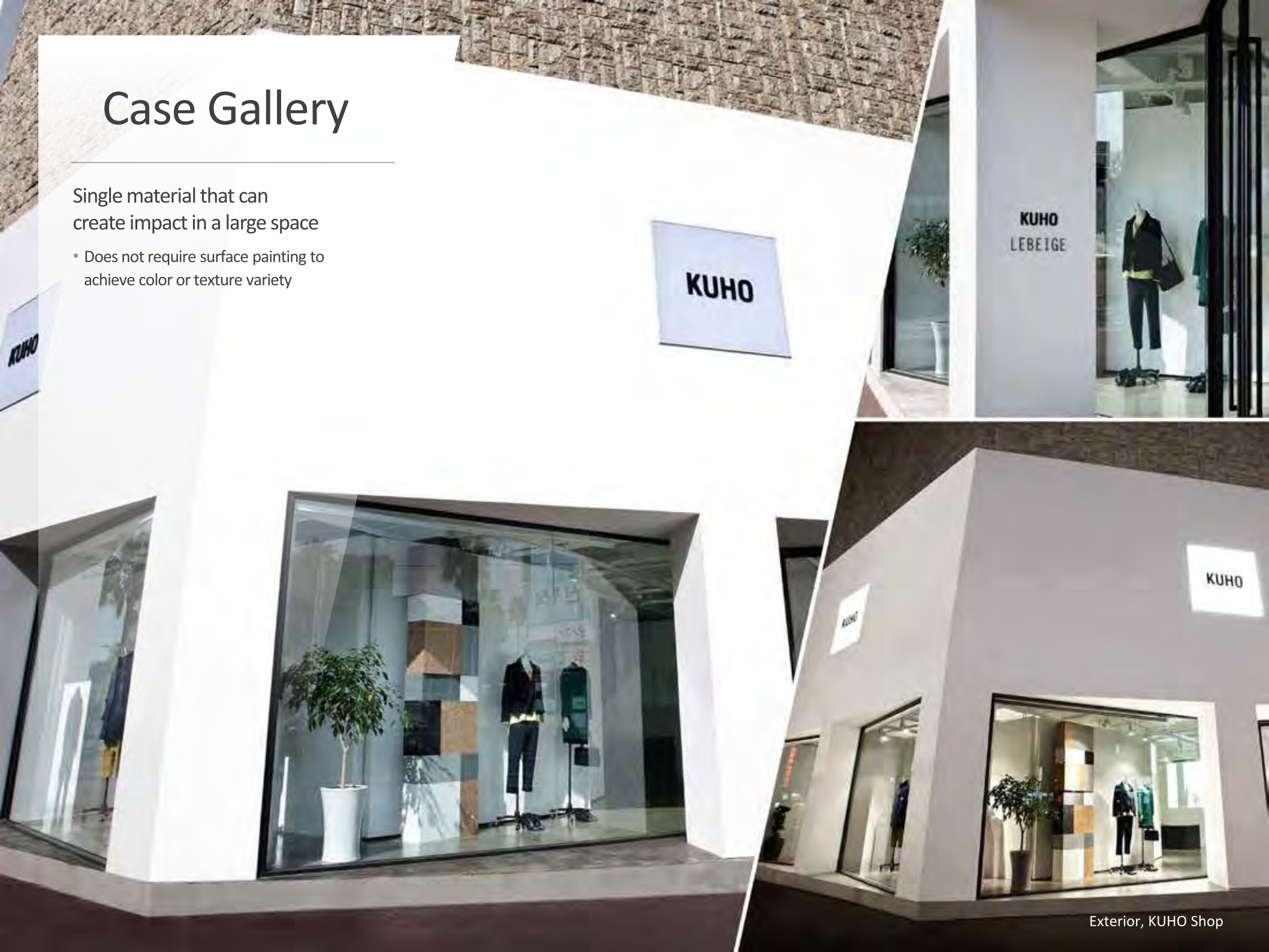
- Light and durable material choice for interiors
- Restorable surface that keeps product looking “new”
- Surface that does not easily discolor in varying weather conditions.



Case Gallery

Single material that can create impact in a large space

- Does not require surface painting to achieve color or texture variety

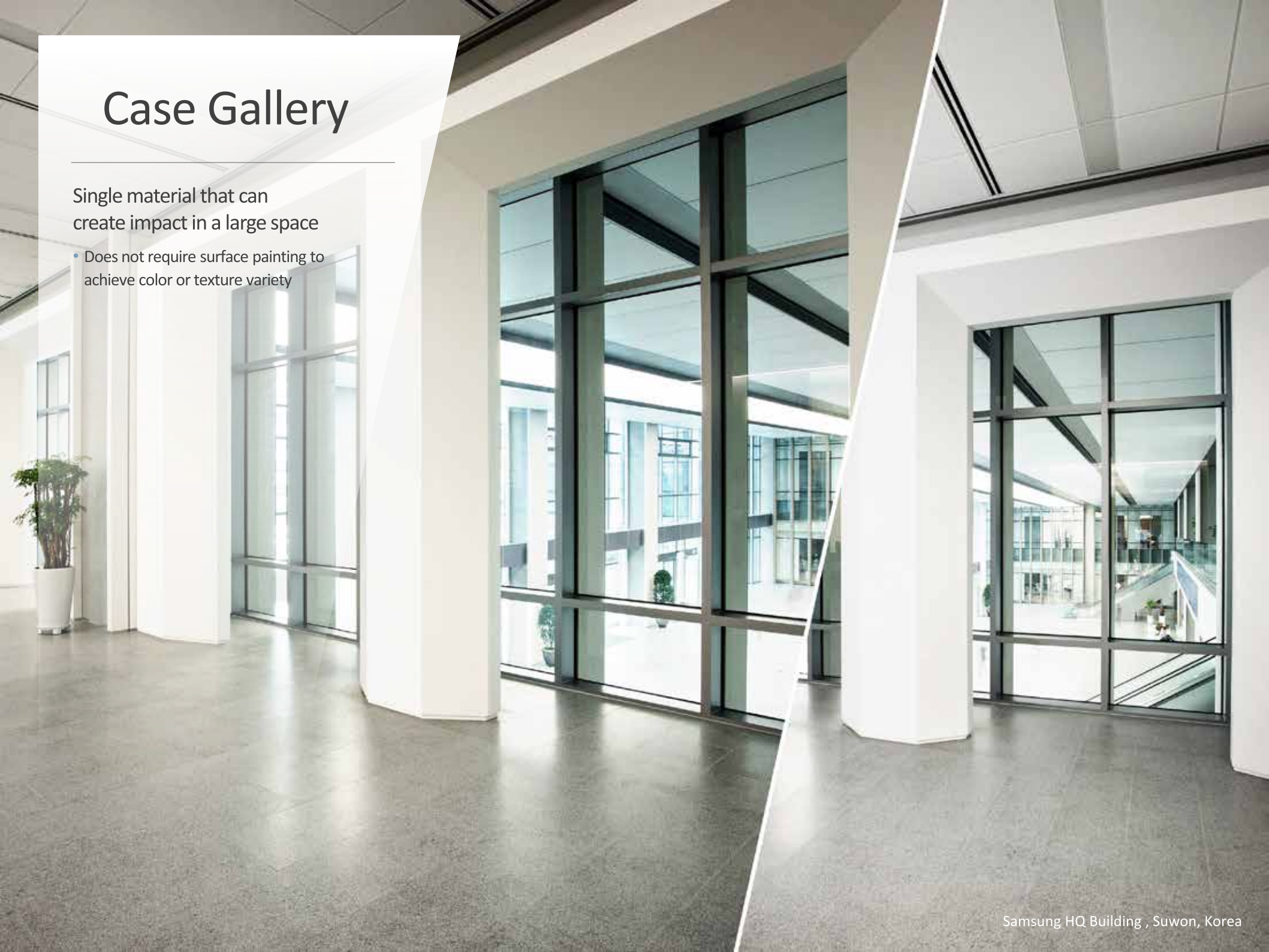


Exterior, KUHO Shop

Case Gallery

Single material that can
create impact in a large space

- Does not require surface painting to achieve color or texture variety



Case Gallery

Diverse styling options for interiors

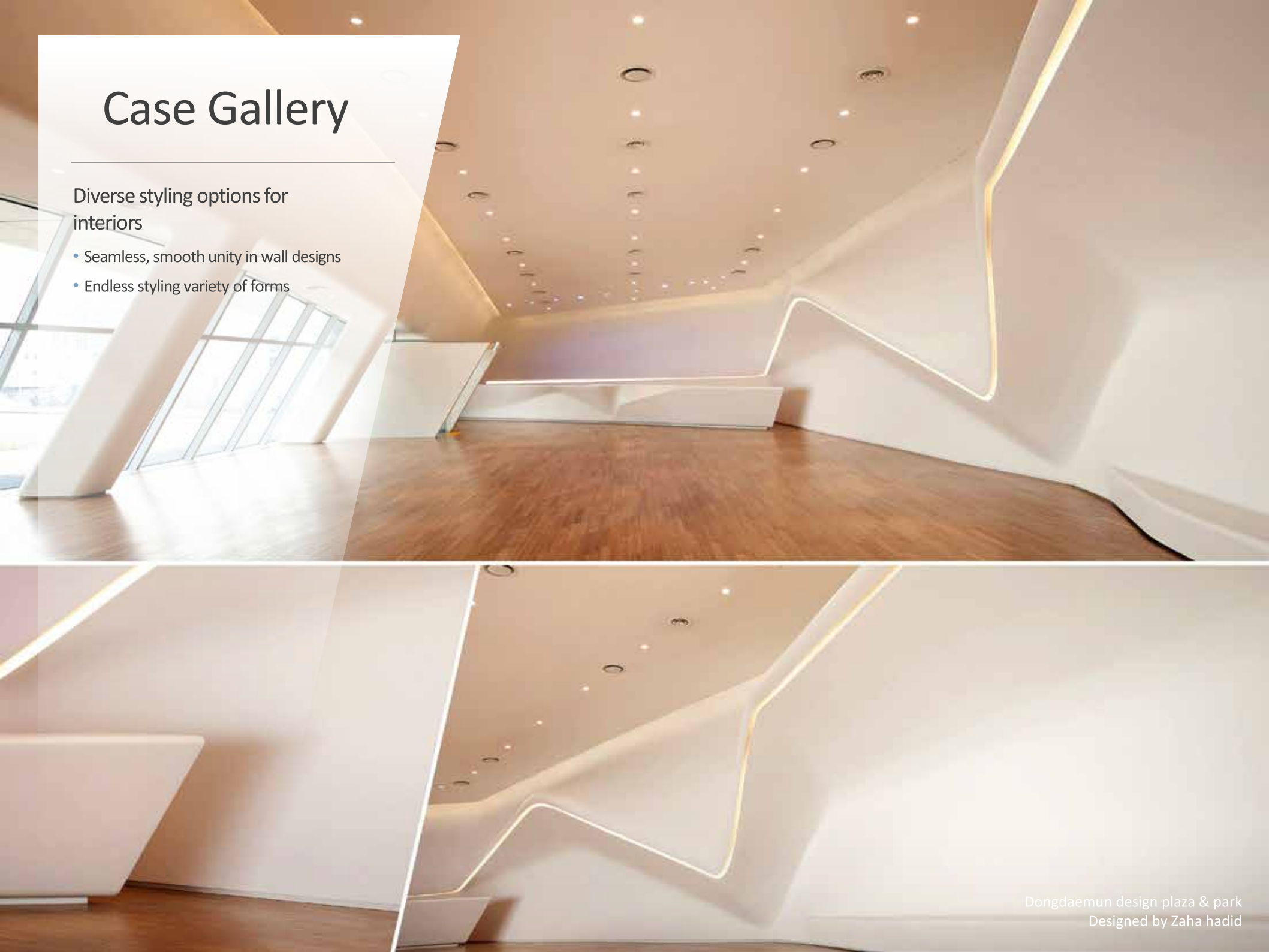
- Seamless, smooth unity in wall designs
- Endless styling variety of forms



Case Gallery

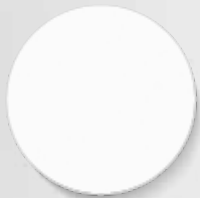
Diverse styling options for interiors

- Seamless, smooth unity in wall designs
- Endless styling variety of forms



3. Recommended Color for Wall Cladding

Staron is backed by the limited warranty that color will not fade or change by more than $\Delta E = 5$ for 10 years.



Bright White



Pure White



Quasar White



Tusk



Sanded Papyrus



Sanded Heron



Sanded Icicle



Pearl



Aspen Glacier



Aspen Snow



Sanded White Pepper



Aspen Fiesta



Sanded Sahara



Sanded Ginger



Sanded Vermillion



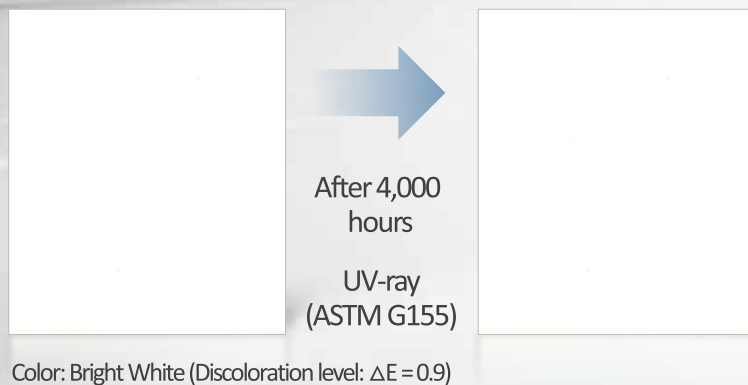
Sanded Grey



Aspen Slate

4. Technical Information

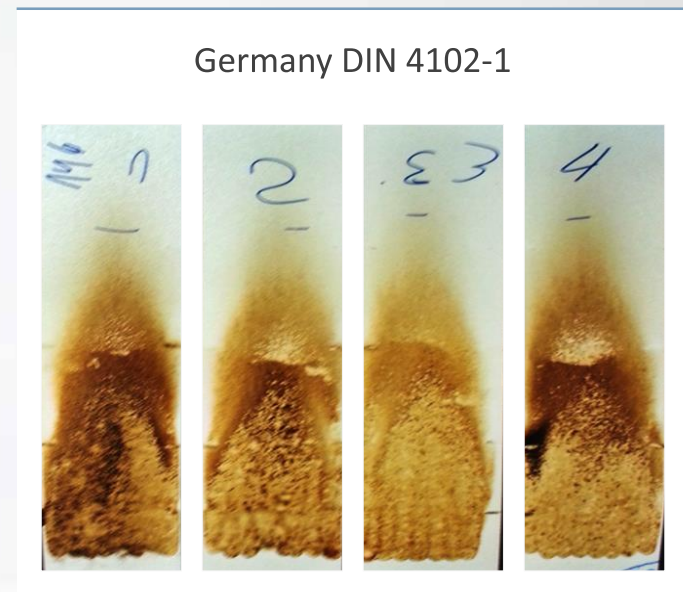
PROPERTY	METHOD	TYPICAL RESULT	EXPLANATION
Colorfastness	ASTM G155 (4000hr)	Discoloration is not on visible level	Recommended color of Staron for exterior cladding will not significantly discolored when they are exposed to UV
Water Absorption	ASTM D570 (24hr)	0.04%	Staron is safe from moisture/water absorption
Freeze/Thaw Resistance	ASTM C666	No Effect	Staron is not damaged at the degrees below the freezing point
Sulfur Dioxide Resistance	ASTM G85	No Effect	Staron is not damaged when they are exposed to acid rain
Fungus and Bacteria Resistance	ASTM G21 & G22	No Growth	Staron will not support the growth and spread of mold or bacteria



4. Technical Information

Fire-resistant

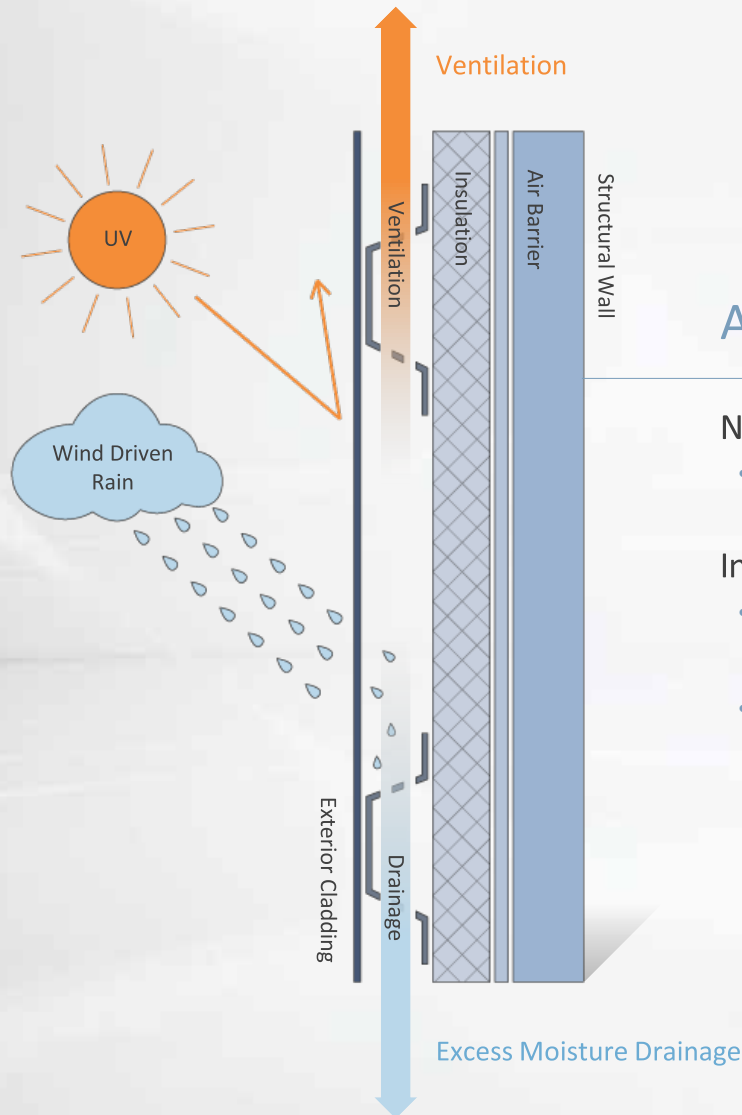
COUNTRY	TESTING METHOD	RESULT
Europe	EN 13501-1	B-s1, d0
Germany	DIN 4102-1	B1
France	NFP 92-501	M2
USA	ASTM E84	Class A



※ Staron is fire-resistant, but it is not incombustible. Thus, it has different limit on installation height depending on the country.
(ex. In Korea, buildings higher than 22 m must be constructed with incombustible material.). Since each country has different building laws or codes, please get counseling at Staron agency in your area,.

4. Technical Information

Ventilated facade (simplified model)



Advantage

Natural drying

- By sufficient clearance between the inside and the outside of a wall, water/moisture from rain or dew will be naturally air-dried.

Insulation Performance

- Staron bounces solar back and helps to provide air flow that cools down the wall inside.
- Staron can be installed with sufficient insulating material together that helps cost saving on heating.

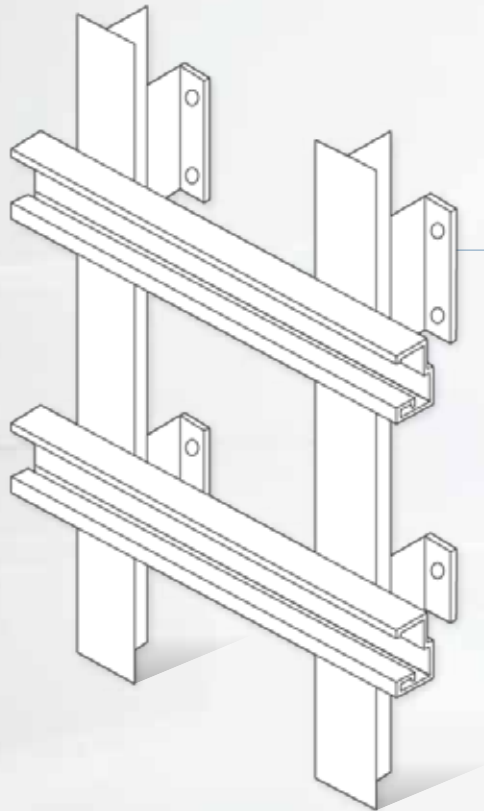


5. How to Make

5. How to Make

Staron Undercut Anchor Cladding System

Recommended construction method for Staron: Undercut Anchor Cladding System which is certified by ETA



Step1 Making frame

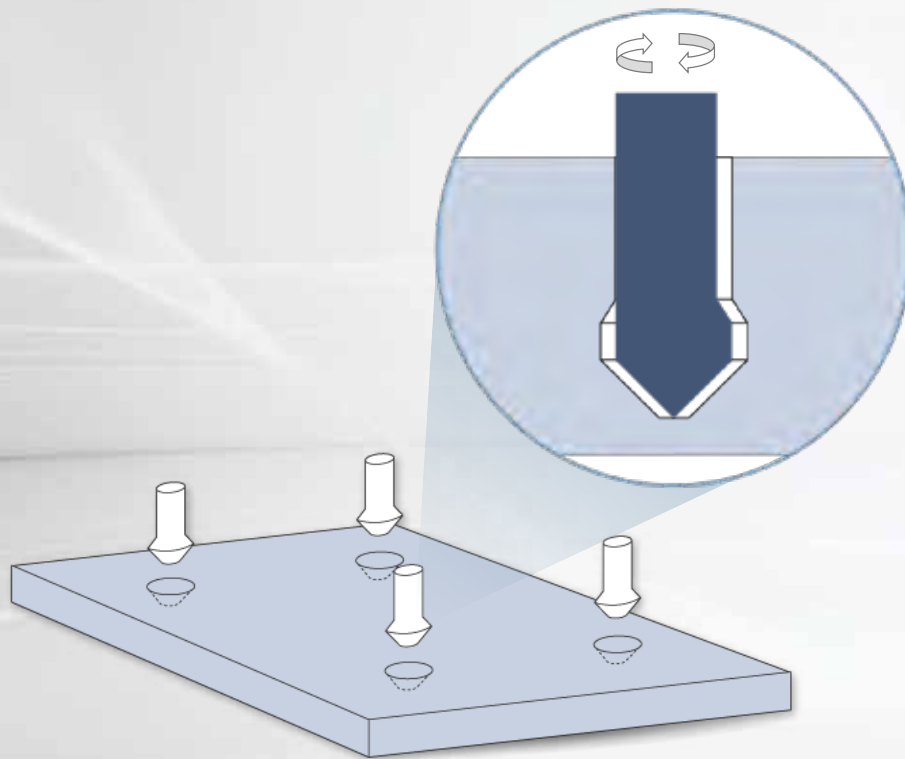
Frame is made with light weight alloy aluminum which has great flexibility and corrosion resistance.

Please consider the condition and design of building and get technical counseling from specialized company before selecting material.

5. How to Make

Staron undercut Anchor cladding System

Recommended construction method for Staron: Undercut Acker Cladding System which is certified by ETA



Step2 Drilling undercut hole

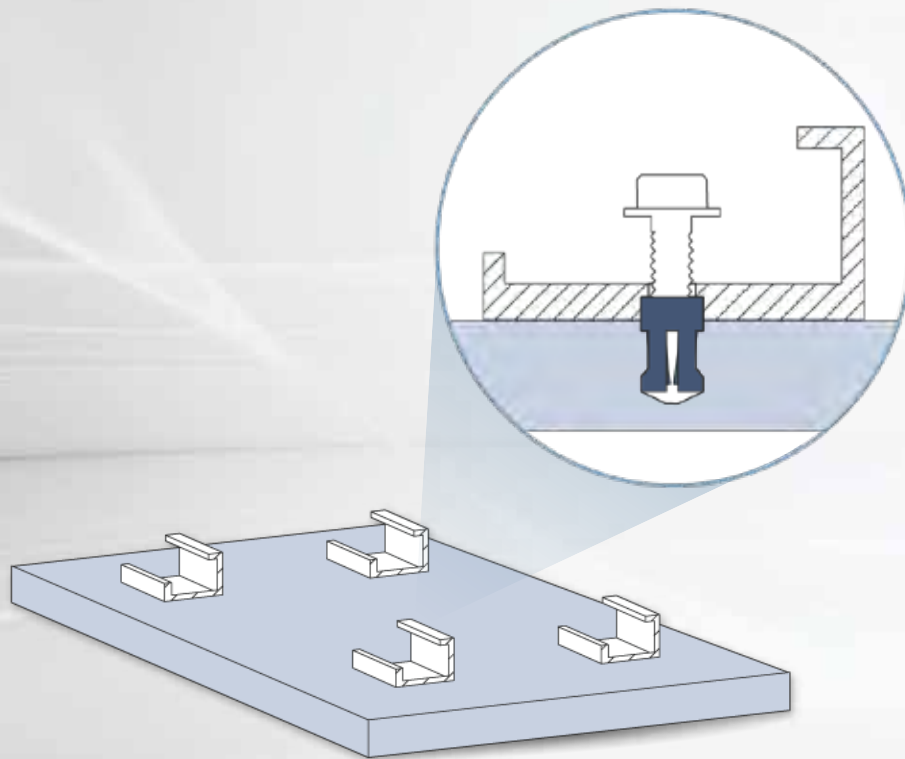
Drilling the back side is necessary.

To fasten stably, it is important to use exclusive drilling machine.

5. How to Make

Staron undercut Anchor cladding System

Recommended construction method for Staron: Undercut Acker Cladding System which is certified by ETA



Step3 Construction of Fasteners

Fasteners are composed of aluminum angle and under cut anchor.

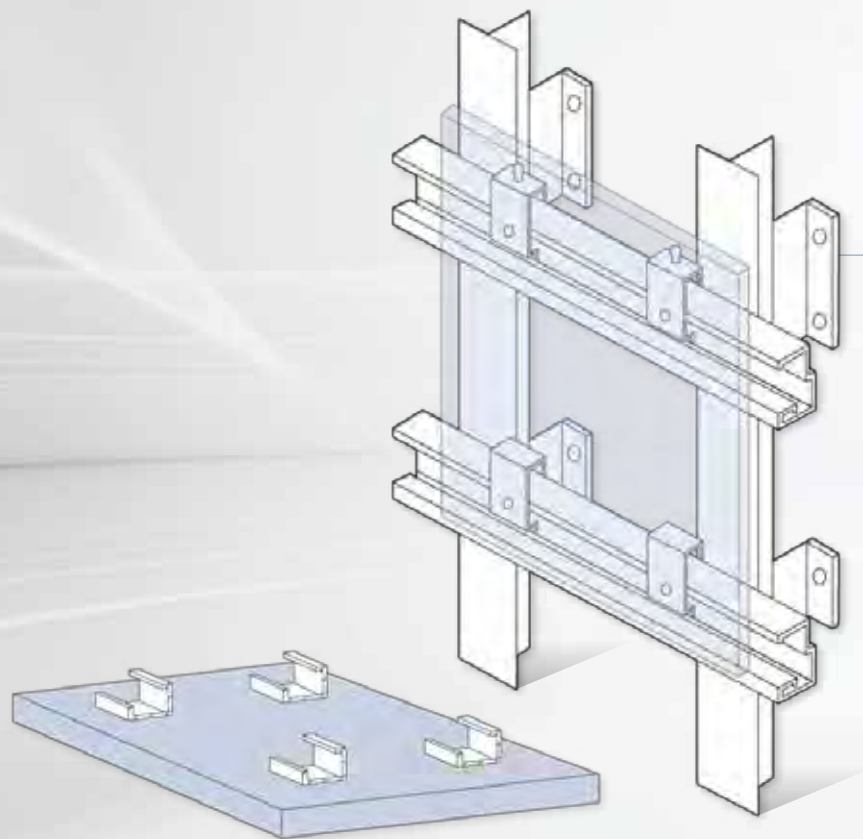
Under cut anchor is installed by fastening anchor at the back side so it is invisible when constructing open joint.

Size and sort of under cut anchor vary depending on the manufacturer, so please consider the quality, probable cost and workability of wall construction to choose proper under cut anchor.

5. How to Make

Staron undercut Anchor cladding System

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Step4 Attaching on Frame

Attach the fastener, which is attached to the slab, to the frame.
Insert bolts between the fastener and the frame to fasten solidly
and adjust the height properly.

5. How to Make

Possible to design various kinds of edges and corners using great workability

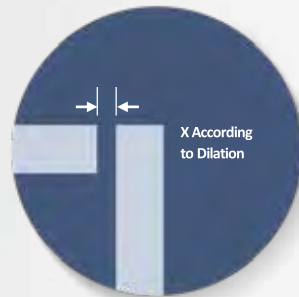


Figure F-1
Open Butt Corner

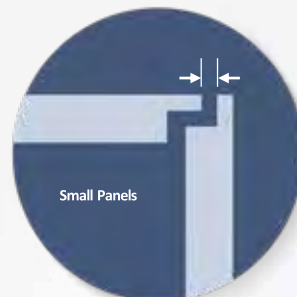


Figure F-2
Rebate Corner for Small Panels

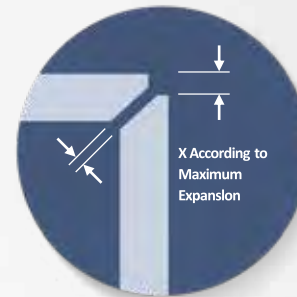


Figure F-3
Open 45° Corner

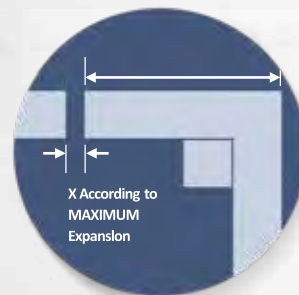


Figure F-4
Angled(glued) Corner

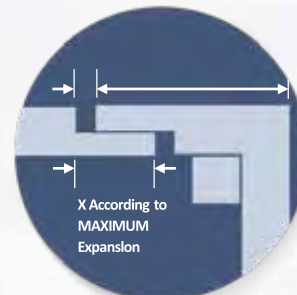


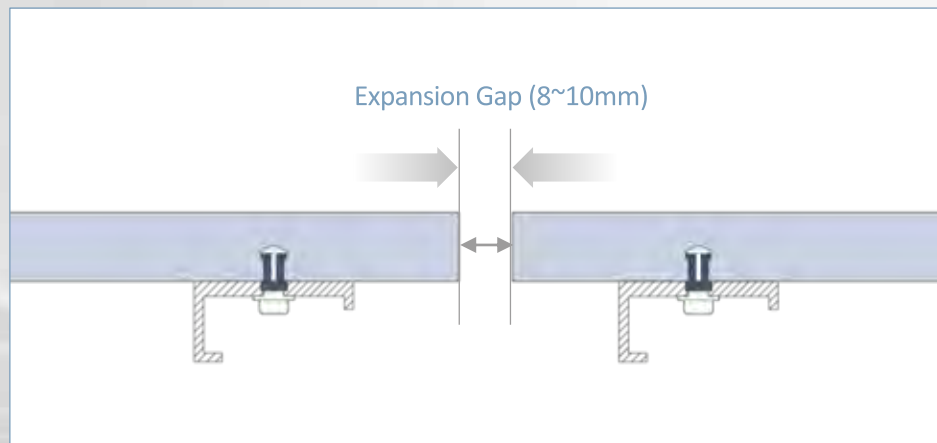
Figure F-5
Angled(glued) Corner with Overlap



Figure F-6
Thermoformed Corner

5. How to Make

Consider the coefficient of thermal expansion for expansion gap construction

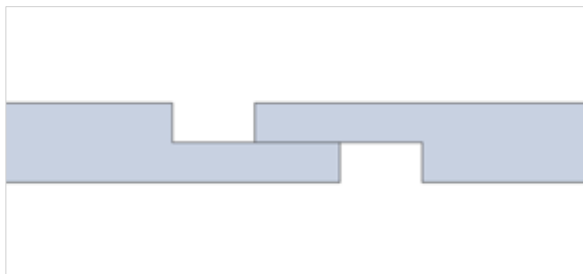


Expansion Gap construction is implemented with 8~10mm gap, considering contraction and expansion of the slabs .

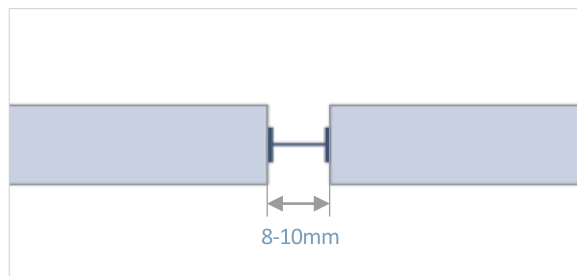
(coefficient of thermal expansion : $3.5 \times 10^{-5}/^{\circ}\text{C}$)

In the case of adhering the slabs, height of each slab must be within 5m

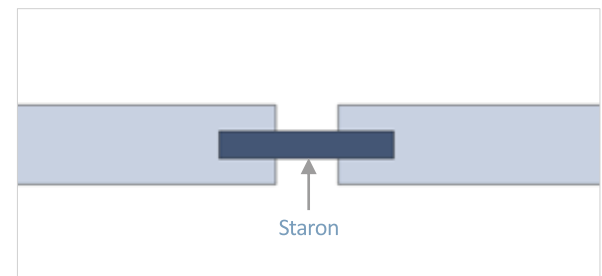
Expansion Gap Design



Over lap joint



Open joint



Tongue joint

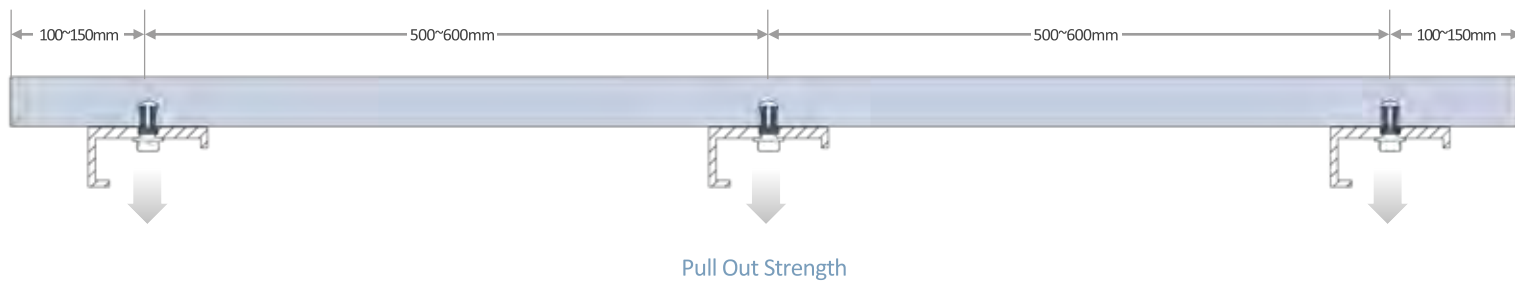
5. How to Make

Anchor fixing gap on slabs

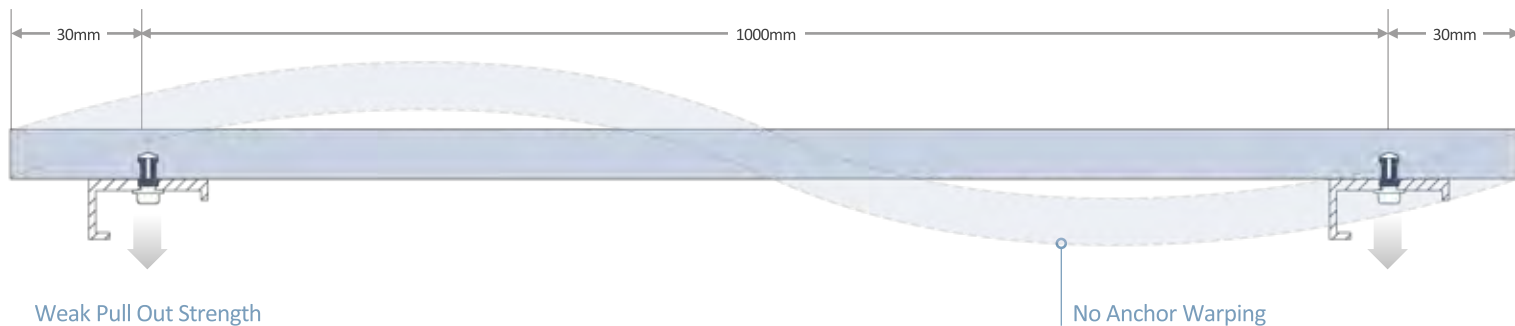
Slabs can be warped by moisture and heat from external environment,
so it is recommended that anchors fasten the slabs at intervals of 500mm~600mm.

The optimum fixing points: 100~150mm from the edge of a slab

Correct



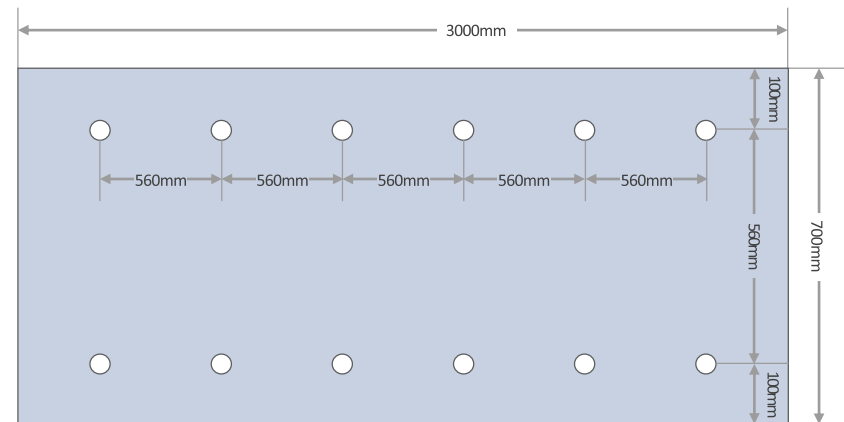
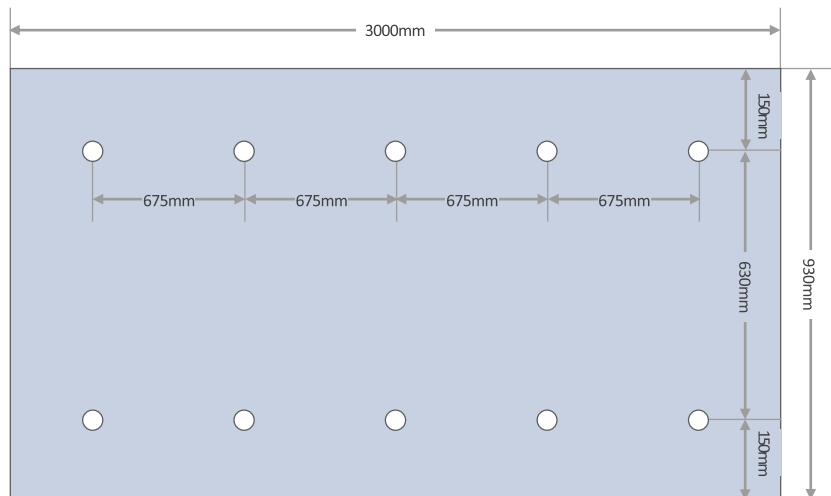
Incorrect



5. How to Make

Anchor fixing gap on slabs

Example of Fixing



6. Care and Maintenance

Maintenance of Staron exterior wall

Staron[®] is non-porous and
highly resistant to contamination

Large surfaces such as exterior wall can be washed
by watering with neutral detergent at high pressure
(less than 2800psi)

Severe contamination (ex. Graffiti)
can be removed by sanding the surface



LOTTE ADVANCED MATERIALS