

For
Architect &
Designer

**LOTTE
ADVANCED
MATERIALS**

**Staron &
Radianz**

LOTTE
ADVANCED MATERIALS

LOTTE ADVANCED MATERIALS, a creator of high-quality materials and refined sensibilities.

LOTTE ADVANCED MATERIALS, formerly Cheil Industries which was established in 1954 as the founding parent company of the Samsung Group, kicked off its chemical business as part of its portfolio expansion strategy.

In 1992, the company started its solid surface business. In 2009, it made a foray into engineered stone business in a move to strengthen its business portfolio further.

In May 2016, the company was renamed as LOTTE ADVANCED MATERIALS, a move forward toward achieving a greater vision of becoming a global powerhouse of high-quality materials.

Widely used for interiors of kitchen, bathroom, office spaces, and homes. The combination of high technology and high design in these materials can turn any remodeling project & new construction project into a fully-functional work of art. LOTTE ADVANCED MATERIALS products are a top-of-the-line product which has been certified with ISO 9002 (International Quality Certification) and ISO 14000 (International Environmental Management certification). Furthermore, it has been certified with NSF51 (Food Zone), meeting the stringent standards for health and environmental science industries. Our high-quality solid surface & quartz surface are an integration of expertise and technology.

staron®

Solid Surfaces

Your Story Teller

Staron® Premium Solid Surface

The internal composition of Staron® is uniform and non-porous with luxurious soft textures. It is available in attractive natural textures of a wide range of colors and is a practical choice for kitchens, living rooms, bathrooms, and an artful addition to your living spaces.

The infinite design possibilities with Staron® can produce a variety of creative living spaces and cultures.



DEPENDABLE PERFORMANCE



KEEPING THE SURFACE HYGIENIC



DIMENSIONAL FLEXIBILITY



INFINITE RANGE OF COLORS



SEAMLESS



ILLUMINATING THE ENVIRONMENT



GLOBAL NETWORK



EXCELLENT QUALITY

DEPENDABLE PERFORMANCE

Innovation meets superior standard
Offering higher performance to suit commercial environments
Homogenous material which allows the surface to be easily restored

KEEPING THE SURFACE HYGIENIC

Designed with end-users in mind, your environment can be protected from the growth of bacteria or fungi
Resistant to harsh chemicals
Easy to maintain

DEPENDABLE PERFORMANCE & KEEPING THE SURFACE HYGIENIC



* HD Expo 2013, Las Vegas, USA

DIMENSIONAL FLEXIBILITY & INFINITE RANGE OF COLORS



DIMENSIONAL FLEXIBILITY

Bringing another layer of depth & sophistication
Free forming of 3 dimensional representation is possible
Excellent workability & precise expression of various design

INFINITE RANGE OF COLORS

From natural to vivid palette tones, Staron® offers over 140 range of colors
World's first "Jewel-like", Tempest®
Collaboration with color trend experts to develop trendy color choices

* HD Expo 2013, Las Vegas, USA

SEAMLESS

Easily create variety of smooth forms that is like an artwork
These subtle features increase the value of the completed design

ILLUMINATING THE ENVIRONMENT

Excellent processability and backlighting to create various image and text related effects
Brightness & Transparency can be adjusted by the modifying the thickness

SEAMLESS & ILLUMINATING THE ENVIRONMENT

* Milan Design Weeks 2013, Italy

GLOBAL NETWORK

Operating regional branch offices around the world in addition to global distribution networks

EXCELLENT QUALITY

High quality control policy & 10 years warranty
Certified eco-friendly, Staron® creates for you a comfortable and safe environment

GLOBAL NETWORK
& EXCELLENT QUALITY



STARON® BENEFITS



DEPENDABLE PERFORMANCE

- Innovation meets superior standard
- Offering higher performance to suit commercial environments
- Homogenous material which allows the surface to be easily restored



KEEPING THE SURFACE HYGIENIC

- Designed with end-users in mind, your environment can be protected from the growth of bacteria or fungi
- Resistant to harsh chemicals
- Easy to maintain



DIMENSIONAL FLEXIBILITY

- Bringing another layer of depth & sophistication
- Free forming of 3 dimensional representation is possible
- Excellent workability & precise expression of various design



INFINITE RANGE OF COLORS

- From natural to vivid palette tones, Staron® offers over 140 range of colors
- World's first "Jewel-like", Tempest®
- Collaboration with color trend experts to develop trendy color choices



SEAMLESS

- Easily create variety of smooth forms that is like an artwork
- These subtle features increase the value of the completed design



ILLUMINATING THE ENVIRONMENT

- Excellent processability and backlighting to create various image and text related effects
- Brightness & Transparency can be adjusted by the modifying the thickness



GLOBAL NETWORK

- Operating regional branch offices around the world in addition to global distribution networks



EXCELLENT QUALITY

- High quality control policy & 10 years warranty
- Certified eco-friendly, Staron® creates for you a comfortable and safe environment

CASE STUDY



Healthcare



Hospitality



Retail



Restaurants



Workspace &
Education



Wall-cladding



Kitchen & Bath



Creative Work



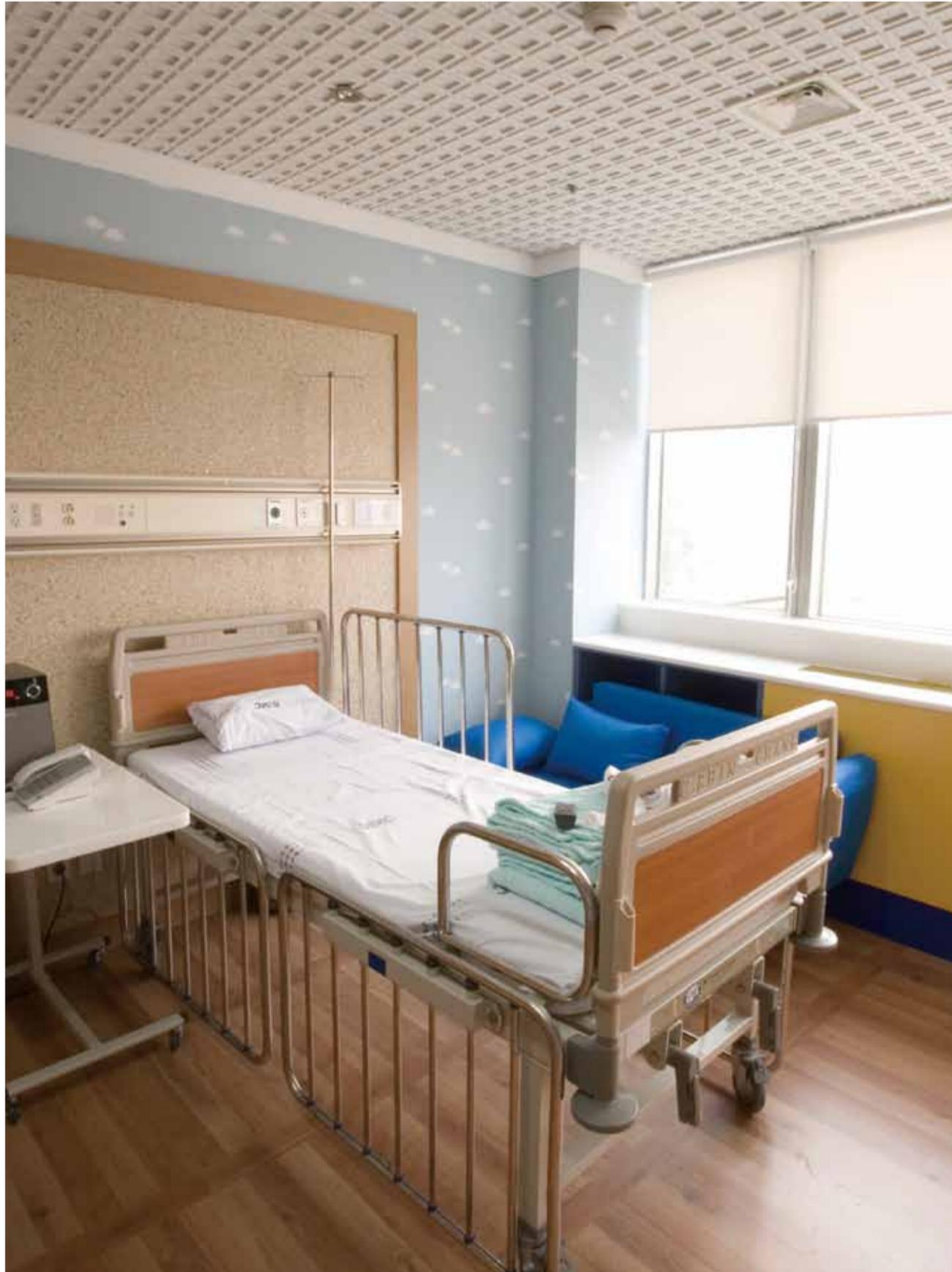
HEALTHCARE



Non-porous surfacing material

Provide the highest material standard by eliminating the growth of germs, fungi or mold

Maintain a hygienic setting with a touch of modern sophistication



Hygienic

- Non-porous surfacing material eliminates the growth of germs, fungi, or mold
- Seamless countertop installation provides another layer of assurance to prevent the growth of bacteria or fungi

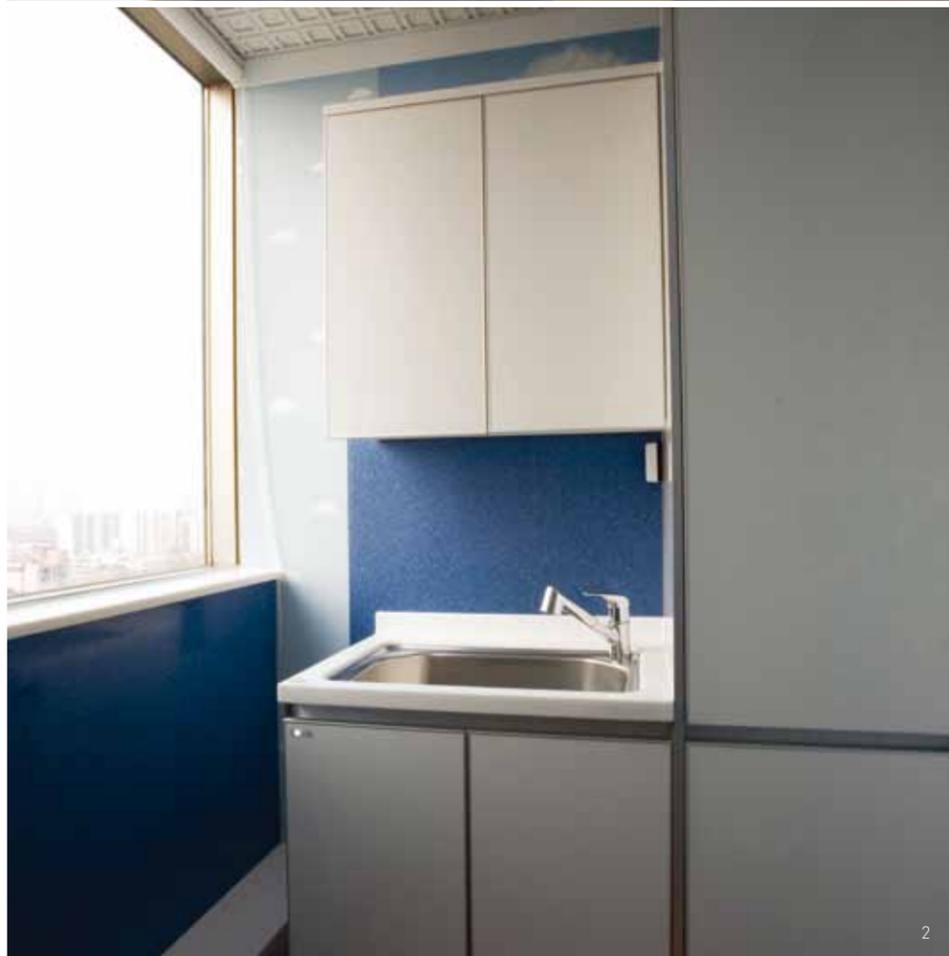
Dependable Standard

- Class a fire rating standard
- Green-guard certified

Enhancements

- Incorporate unique colors and designs to bring elevate the environment
- Thermoforming allows 2D/3D designs

1 Samsung Medical Center
 2 Operation Room, Taiwan
 3 Reception, St. Joe's Healthcare, USA



1, 2 Samsung Medical Center
3, 4 Wall, Wash Bowl, Woori Hospital, Seoul, Korea
5 Riverside Dental, Queensland, Australia (Designed by Anthony Connor, Ego Squared Design)

6, 7 Nurse's Room Geneva University Hospital, Geneva, Switzerland
8 Wall, Wash Bowl, Geneva University Hospital, Geneva, Switzerland
9, 10 Wash bowl, Creche Les Tilleuls Prilly, Switzerland



HOSPITALITY



Bring unparalleled design & style options to accentuate the decor space

Exceed beyond the original standard

Deliver warm ambience



Innovative Designs

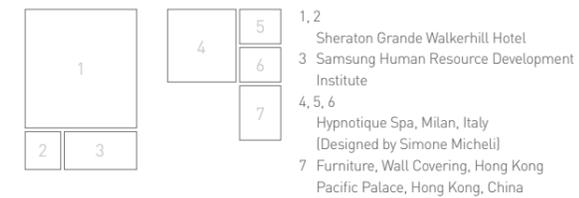
- Endless styling options
- Seamless surface material integration
- With over 140 color offerings, transform the area with a touch of vibrancy and sophistication

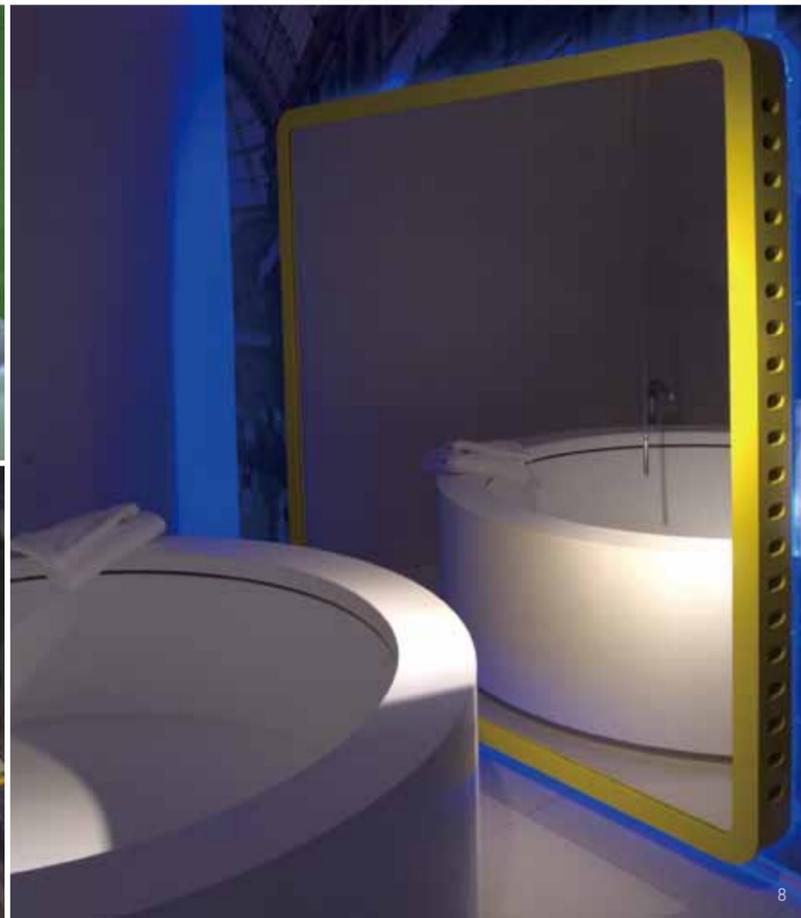
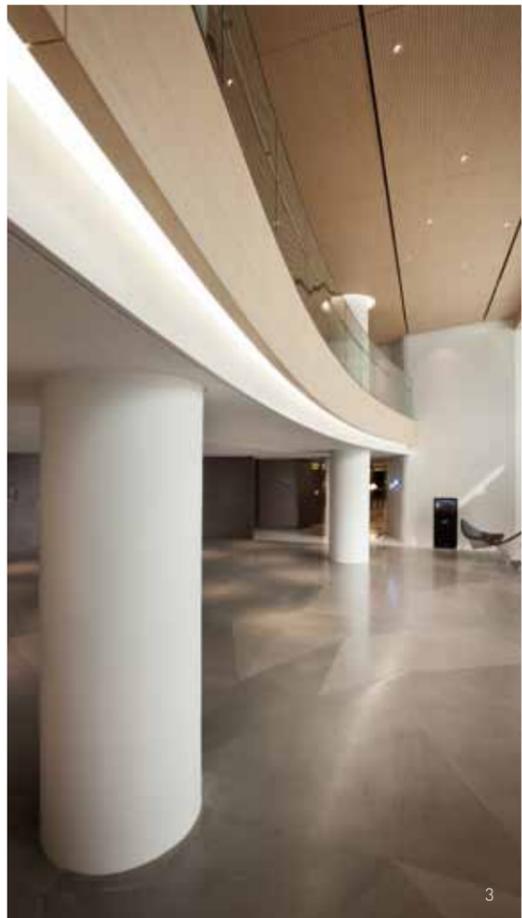
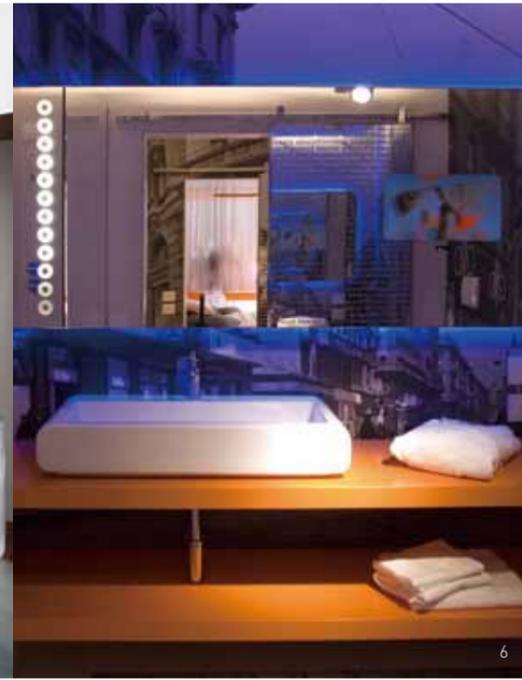
Exceed Beyond the Original Standard

- Easy to restore--keeping the surface completely new
- Resistant to hard impacts and scratches
- Staron® can be thermoformed to accomodate unique space offerings
- Resistant to high temperatures

Warm Ambience

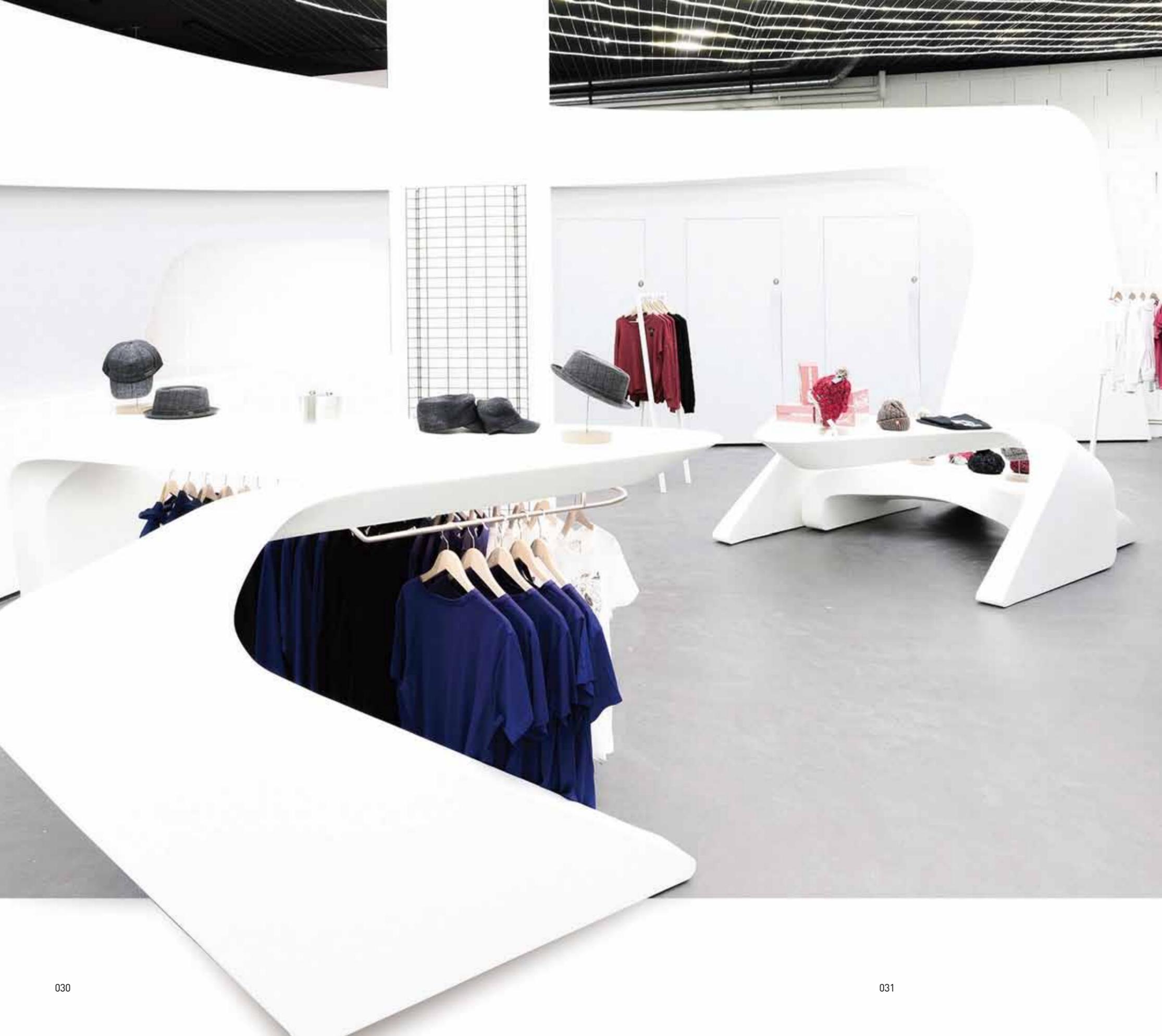
- Make an unforgettable impression to prospective clients
- Accentuates the existing space





1, 2, 3 Samsung Human Resource Development Institute
4, 5, 6, 7, 8 Town House, Milan, Italy (Designed by Simone Micheli)

9 Hotel Bar, Switzerland



RETAIL



—
Establish unique identity

—
Durable solution

—
Thermoformable



Distinction

- Showcase the items in a chic fashion to appeal to greater number of clients
- Depending on the use of color, it allows products to stand out. Or if only displaying one product, it creates a sleek space to highlight the product.
- Inspiring designs can further enhance corporate identity

Durable Solution

- Due to homogeneous color offerings, merchandising area can be easily restored
- Withstands against scratches

Thermoformable

- Apply conceptual designs into real-applications
- Incorporate unique shapes and design

1	4	1, 2, 3 Showroom, Samsung Human Resource Development Institute
2	3	
	5	4 Shoes Shop, Display Stand, Wall Deco, Stewart Weitzman Shoes Shop, Greece
		5 Signage, Gallery Cafe at Westfield, Chermside, Queensland, Australia (Designed by NOSUCHstudio Collective)



1, 2 Kuho Fashion Showroom, Jeju, Korea
3 Samsung D'light Showroom
4 Heidi.com Showroom, London 100% Design 2013, UK (Designed by Zaha Hadid)

5 Beauty Salon, Luzern, Switzerland
6, 7, 8 Mocchi Kiosk, Sydney, Australia (Designed by Mima Design Pty Ltd.)
9 Heidi.com Showroom, London 100% Design 2013, UK (Designed by Zaha Hadid)



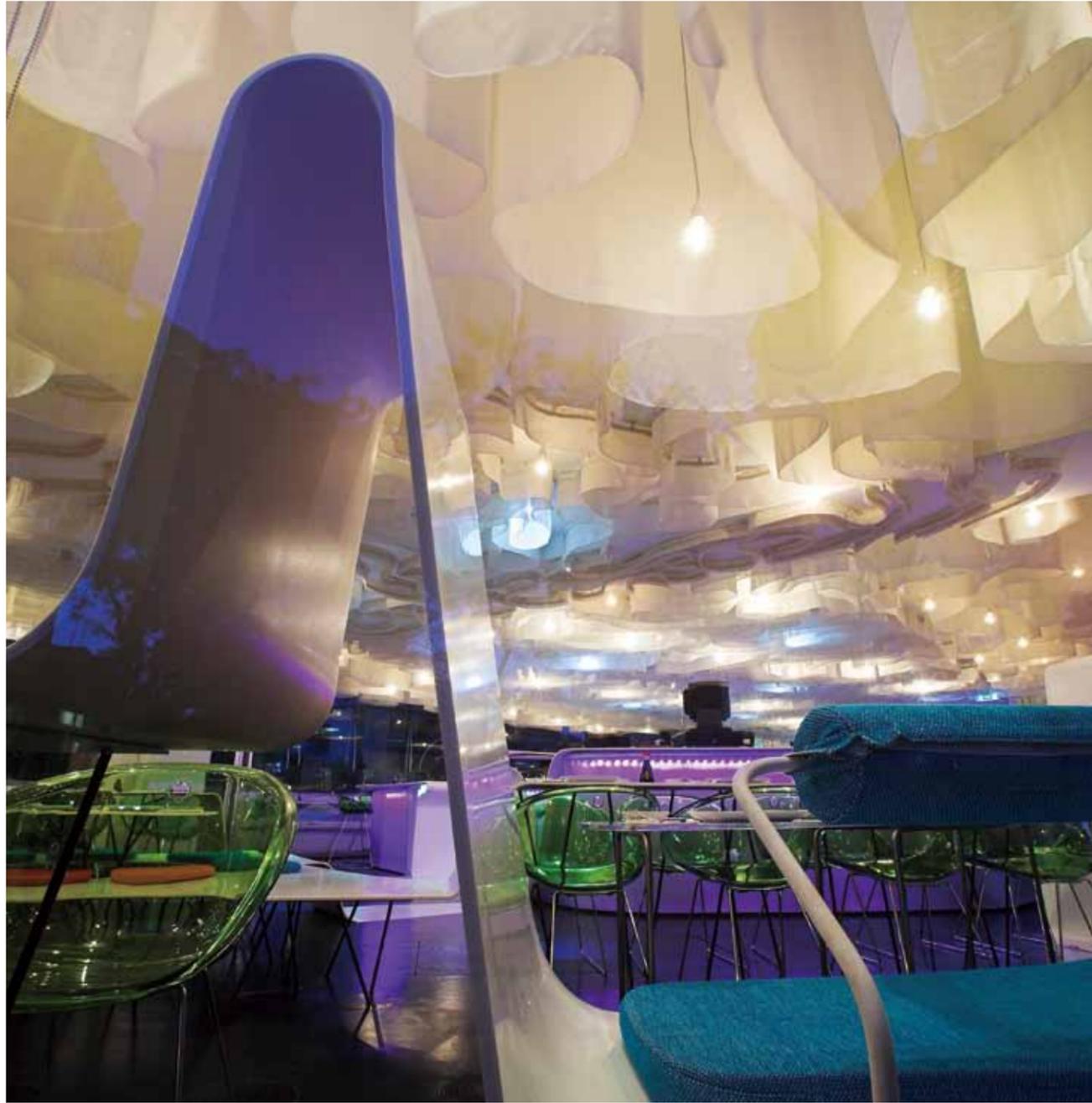
RESTAURANTS



Spice up the dining room area with assortment of 140 color offerings

Designed with end-users in mind, Staron® is NSF 51 certified

Dependable solution



Plateful of Colors

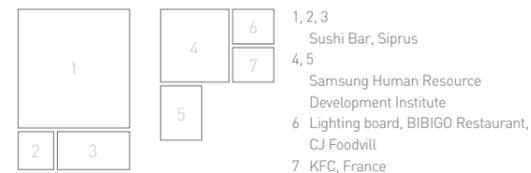
- From light to dark tone hues, Staron® can match with existing decor space and theme
- Deliver a modern approach to enhance the social and dining environment

Meeting the Highest Standard

- NSF 51 certified
- Class a fire rating certified
- SCS certified

Dependable Solution

- Non-porous surfacing material eliminates the growth of bacteria, fungi or mold
- Resistant to harsh chemicals
- Non-toxic material





1, 2 Cafeteria, Raemian Gallery, Samsung C&T
3 Food Court, The University of Edinburgh, UK
4 Beluga Bar

5 Cafeteria, Samsung Electronics R5
6, 7 Sushi Bar, EURŌSTA & Yo Sushi, London, UK
8 Bar, Au Petit Grillon Corpataux



WORKSPACE & EDUCATION



- Innovative design meets inspiring ideas
- Dependable solution
- Seamless integration



Innovative Design Meets Inspiring Ideas

- Provide a pleasant working environment

Dependable Solution

- Resistant to scratches

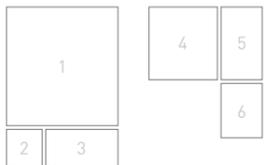
- Each work station or desk area will have exact matching color, providing uniform design and color tone

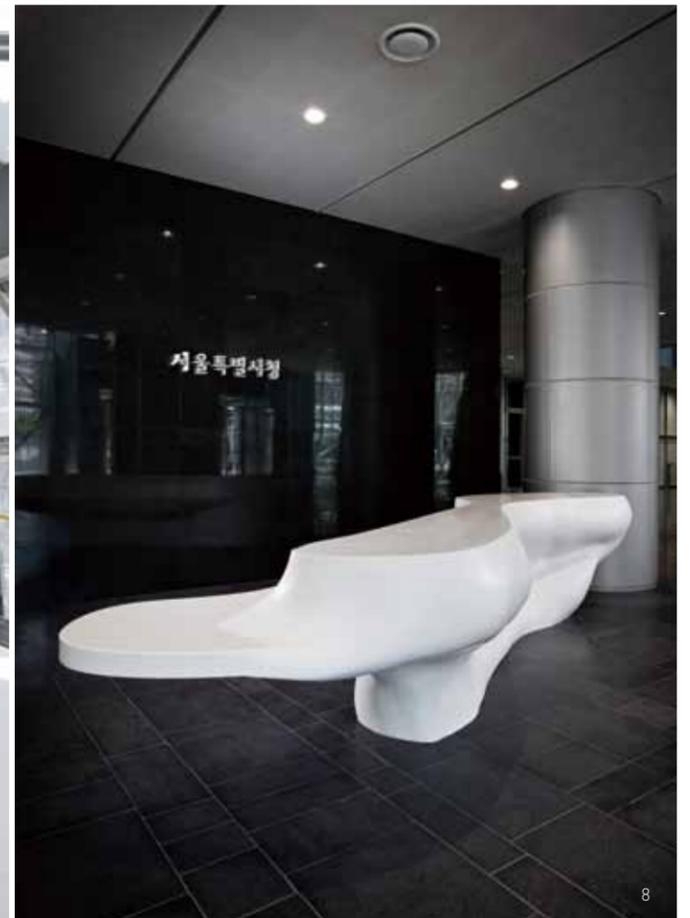
Seamless Integration

- Conference room tables can be easily seamed together without inconspicuous joints



- 1 Dongdaemun Design Plaza & Park (Designed by Zaha Hadid)
- 2,3 Schaffhauser Kantonalbank, Thayngen, Switzerland (Designed by Gehri Architects)
- 4 Sky Lounge, Dongdaemun Design Plaza & Park (Designed by Zaha Hadid)
- 5 Sunshine Hospital, Australia
- 6 DP9 Office, London, UK (Designed by dMFK Architects)





1, 2 Meeting Area, Australia (Designed by Craig Yelland, Plus Architecture)
3 Information counter, Library & Learning Centre, New Vienna University of Economics, Austria (Designed by Zaha Hadid Architects)
4 Lobby, Meeting Area, Samsung Electronics R5

5 Lamkli Architecture Office, Switzerland
6 Money Exchange, Eurostar, London, UK
7, 8 Hall, Seoul City Hall



WALL-CLADDING



-
Versatile solution

-
Make an impression with stylish interior design

-
Push beyond the boundaries



Versatile Solution

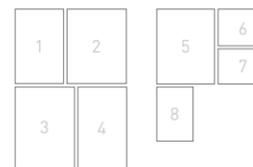
- Staron® is also available in (1/4") thickness for interior wall-cladding applications
- Resistant to scratches and harsh chemicals

Make an Impression with Stylish Interior Design

- Incorporate 2D/3D designs
- Panels may be thermoformed to accommodate curved walls or to wrap interior columns

Push Beyond the Boundaries

- Staron® solid-surface material can create unlimited design possibilities



- 1 Library & Learning Centre, New Vienna University of Economics, Austria [Designed by Zaha Hadid Architects]
- 2 Seats Cubes, Milestone Student Hall, Vienna, Austria
- 3 Dongdaemun Design Plaza & Park [Designed by Zaha Hadid]
- 4 Seoul City Hall
- 5 Samsung Human Resource Development Institute
- 6 L'Archivolto Staron Gallery, Milan, Italy [Designed by Simone Micheli]
- 7 KUHO Fashion Shop
- 8 Deco Frame, Noon Square Myungdong



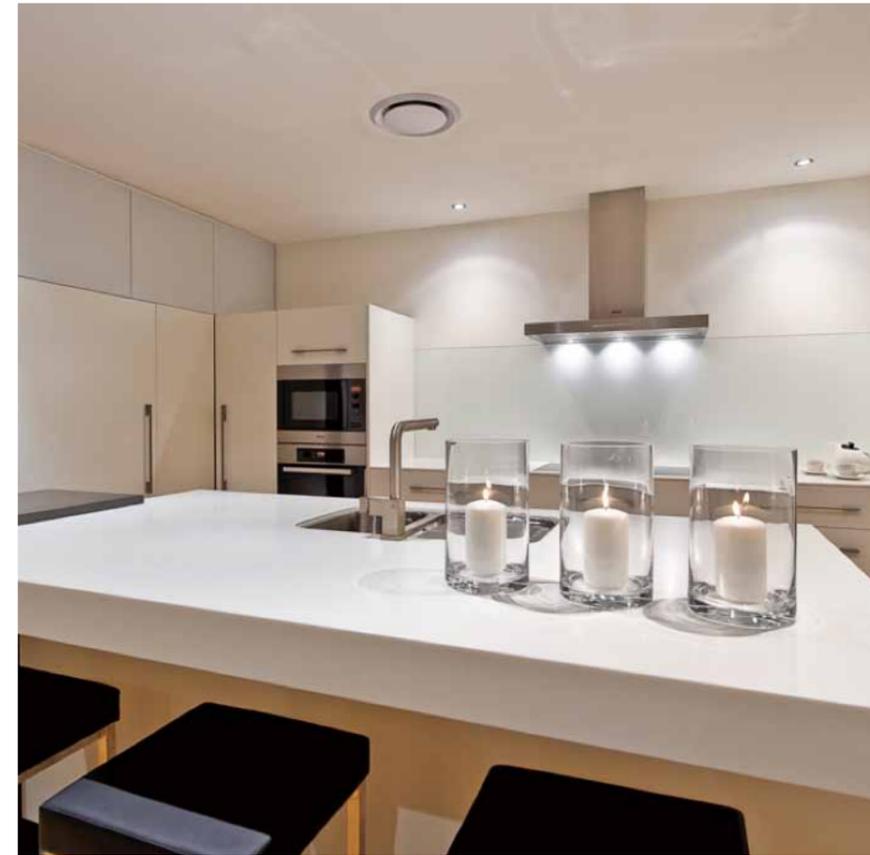
KITCHEN & BATH



Enhance the focal point of the social gathering area

Non-porous material

Timeless design



Safe

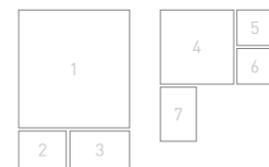
- Non-porous material that deters bacteria growth
- Easy to maintain a clean space

Solid

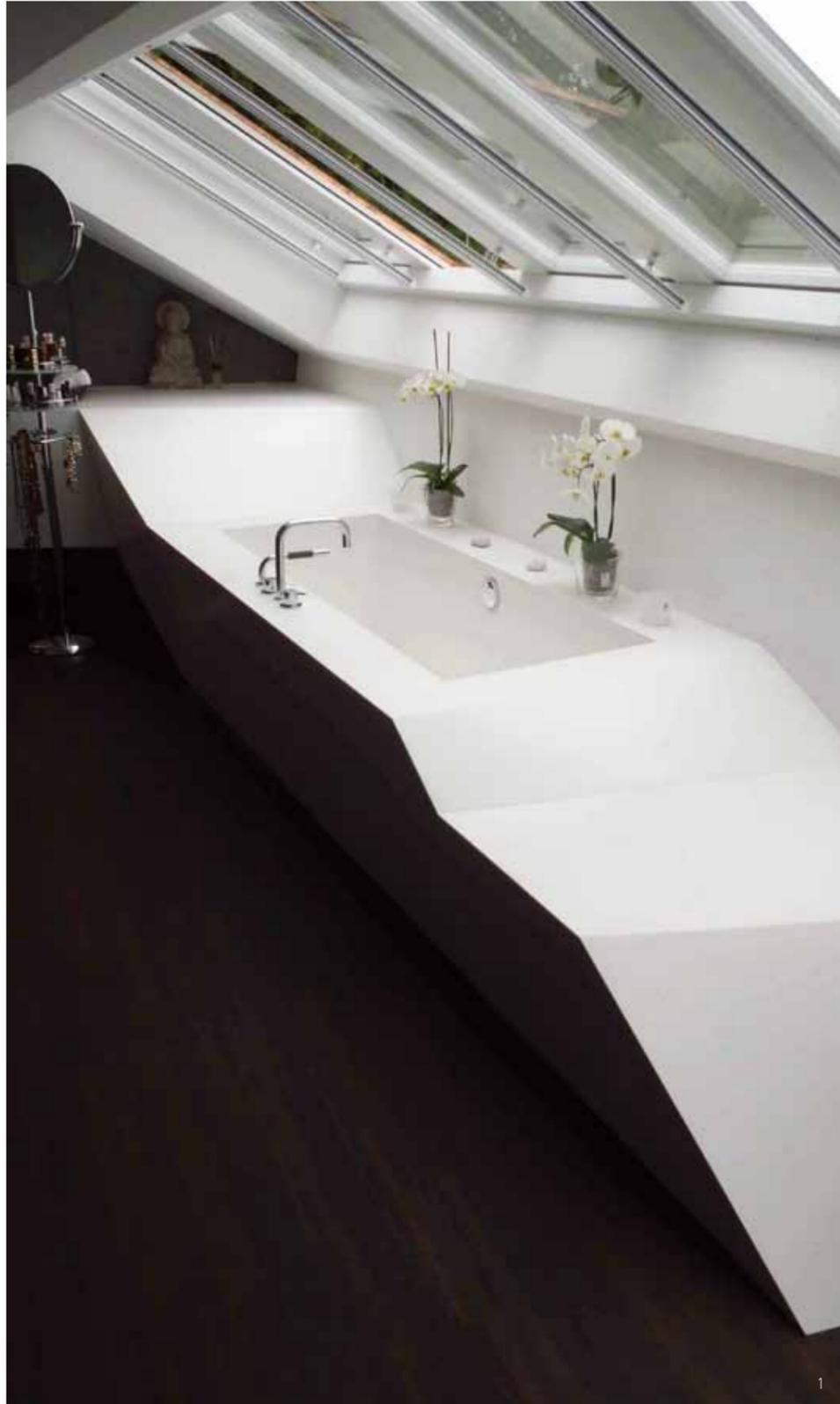
- Strong material that is not affected by temperature changes
- Easy surface restoration option that keeps the surface feeling "new"

Diverse

- Endless variety of styling forms
- Smooth seamless surface detailing of styled forms
- Beautiful color and patterns for assortment of design choices



1, 2
Kitchen Countertop, Australia
[Designed by Lenka Jankovocova,
Find & Design]
3 Town House, Milan, Italy
[Designed by Simone Micheli]
4 Kitchen Countertop, Australia
[Designed by Lenka Jankovocova,
Find & Design]
5, 6, 7
Kitchen Countertop, Sink, Salone
Internazionale del Mobile 2010, Milan, Italy



1 Wash Bowl, Countertop, Oesch Bad, Interlaken, Switzerland
 2, 3 Wash Bow, Bathtub Dealim Bath
 4 Bathtub, Wash Bowl, Sheraton Grande Walkerhill Hotel

5 HD Expo 2013, Las Vegas, USA
 6 Wash Bowl, Switzerland (Designed by Stuber Team)
 7 Shower Booth, Town House, Milan, Italy (Designed by Simone Micheli)



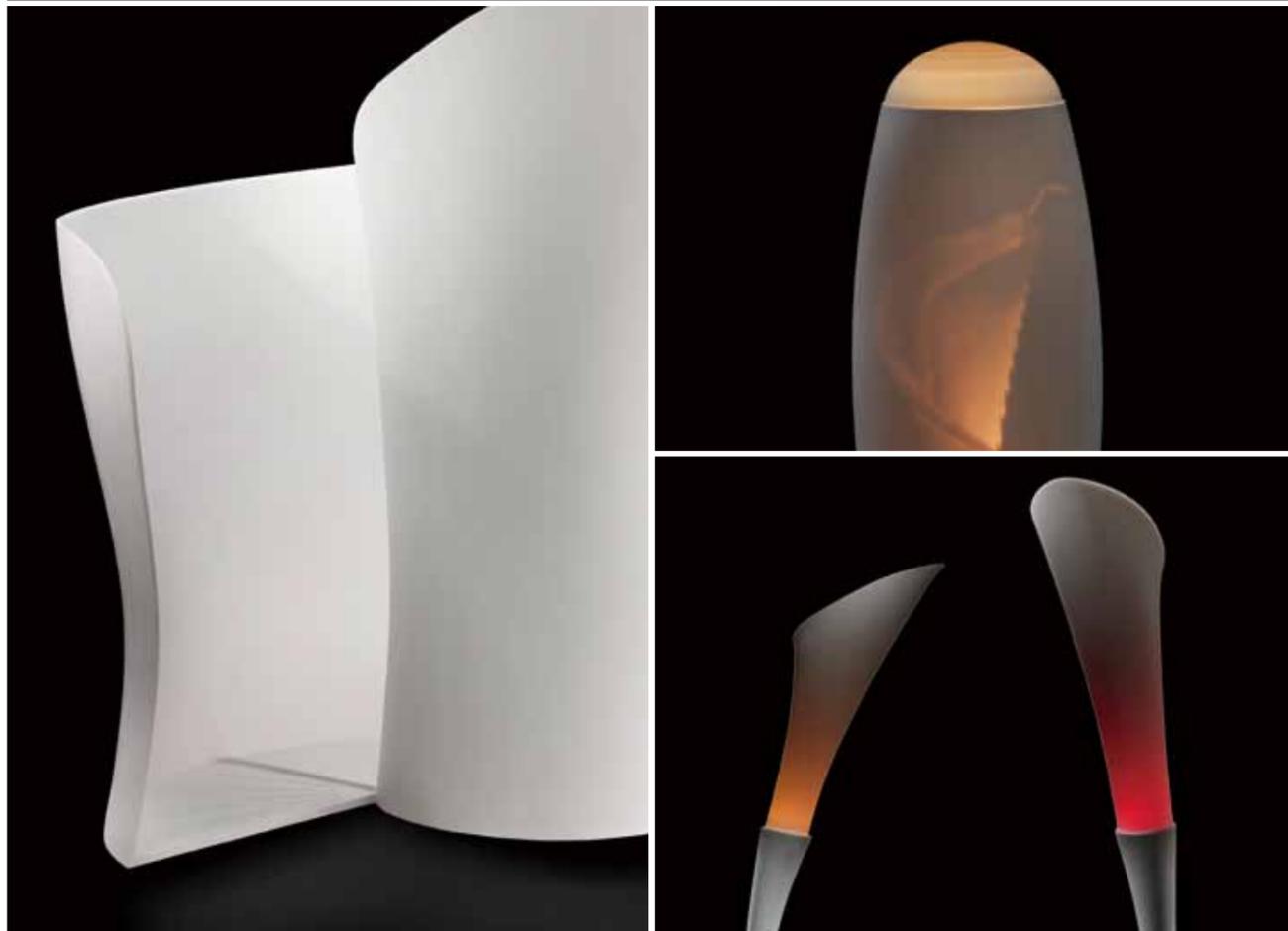
CREATIVE WORK



—
Color range that is not limited by the times

—
Design that is not limited in its form

—
Distinctive designs utilizing light



Color

- Infinite color range

Design

- CNC, thermoforming, seamless

Light

- Using light transmissions and its excellent processability, it is possible to express with a variety of texts and images



- 1, 2, 3, 4
HD Expo 2013, Las Vegas, USA
- 5 Milan Design Week 2013, Milan, Italy
[Designed by Mac Stopal]
- 6 Milan Design Week 2012, Milan, Italy
[Designed by Przemyslaw Mac Stopal]
- 7 Lounge Furniture, Milan Design Week 2013,
Milan, Italy
[Designed by GLAD Ltd.]



1



3



4



2



5

2014 London Design Award
Silver Winner

2014 London Design Award
Silver Winner

1 Zebra Sofa, HD Expo 2014, Las Vegas, USA
2 Armadillo Bathtub, 2014, London 100% Design
3 Hedgehog Sofa, 2014, London 100% Design

4 Humpback Whale Island Kitchen, 2014, London 100% Design
5 Owl Speaker, 2014, London 100% Design

TECHNICAL DATA

Sheet Dimension

Pattern	Thickness		Width		Length	
	mm	in	mm	in	mm	in
Solid, Sanded, Aspen	6	1/4	760	30	2,500	98
	12	1/2	760		3,680	145
Pebble, Metallic, Quarry, Mosaic, Cristal, Supreme, Tempest	12	1/2	760	30	3,680	145

Certification

Staron®, a brand recognized for top quality and technology

- NSF 51 for Food Zone Sanitation Certification
- GREENGUARD Eco-certification
- HB Eco-certification
- ASTM E84 Certification
- ISO 9001 System Certification
- ISO 14001 System Certification
- NAHB for Sinks and Lavatories Certification
- IAPMO for Sinks and Lavatories Certification
- CSA for Sinks and Lavatories Certification



Comparing Staron® to Other Products

Staron® is durable but also easy to work with. The differentiating advantages are its reliable quality.

Attributes	Staron® Solid Surface	Polyester Solid Surface	Engineered Stone	Granite	Stainless Steel
Ease of maintenance/Cleanability and repair	3	3	2	1	2
Does not support microbial growth	3	3	3	1	3
Non-porous smooth	3	3	3	1	3
Low flammability	3	2	3	3	3
Durable	3	3	3	3	3
Low VOC	3	3	3	3	3
Low smoke toxicity	3	1	3	3	3
Initial and life cycle cost effectiveness	3	3	3	1	2
Slip resistance-appropriate coefficient of friction	3	3	3	3	2
Ease of installation, demolition, replacement	3	3	1	1	2
Seamless appearance	3	3	1	1	3
Control of reflectivity	3	3	2	2	2
Option for color, pattern	3	3	3	2	2
Nontoxic, non-allergenic	3	3	3	3	3

Chemical Testing Results

We conducted chemical tests on various surface contaminations prone to exist. These contaminants were dropped onto the surface and covered with glass plates for 16 hours. Surfaces of these areas were then scrubbed with damp pads with detergent and tested for the results.

Contaminants

- | | | |
|--------------------------------|--|-----------------------------------|
| - Acetic acid (10%) | - Soapless detergents | - Hydrochloric acid (20, 30, 37%) |
| - Ammonia | - Sodium hydroxide solution (5, 10, 25, 40%) | - Iodine (1%) |
| - Amyl acetate | - Sodium sulfate | - Lemon juice |
| - Ball point pen | - Sugar (sucrose) | - Mercurochrome (2%) |
| - Bleach (household type) | - Sulfuric acid (25, 33, 60%) | - Methyl ethyl ketone |
| - B-4 body conditioner | - Tetrahydrofuran | - Methyl red (1%) |
| - Carbon disulfide | - Tomato juice | - Mustard |
| - Citric acid (10%) | - Uric acid | - Naphthalene |
| - Cigarette (nicotine and tar) | - Washable inks | - Olive oil |
| - Cooking oils | - Xylene | - Perchloric acid |
| - Cupra ammonia | - Acetone | - Shoe polish |
| - Ethanol | - Ammonium hydroxide (5, 28%) | - Sodium bisulfate |
| - Ethyl ether | - Amyl alcohol | - Soy sauce |
| - Gasoline | - Benzene | - Sulfuric acid (25, 33, 60%) |
| - Grape juice | - Blood | - Tea |
| - Household soaps | - Butyl alcohol | - Toluene |
| - Hydrogen peroxide | - Carbon tetrachloride | - Urea (6%) |
| - Ketchup | - Calcium thiocyanate (78%) | - Vinegar |
| - Lipstick | - Coffee | - Wine |
| - Methanol | - Cottonseed oil | - Zinc chloride |
| - Methyl orange (1%) | - Dishwashing liquid/powders | |
| - Mineral oil | - Ethyl acetate | |
| - Nail polish | - Formaldehyde | |
| - N-hexane | - Gentian violet | |
| - Pencil lead | - Hair dyes | |
| - Permanent marker pen | | |



Results

Most pollutants can be easily removed from the surface with damp pad with neutral detergent.

Flame/Smoke Testing Results

Staron® was tested for fire/flammability which yielded the following results: 10 for flame spread, 10 for smoke density. Compared to other materials such as gypsum boards, laminates, and hardboards. Staron® has low flammability and safe for families and suitable. In addition, the smoke density is lower than most materials and responds quickly to fire retardants.

- **Testing method**

- ASTM E84 (Surface burning characteristics of building materials)

- **Staron® results**

- Class A (Flame spread 10, Smoke density 10)

- **Other test results**

Item	Flame Spread	Smoke Density
Drywall (Gypsum board)	15	0
Wood particle board	155	200
Staron®	10	10
Glass fiber panels	70	500+
Laminates, plastics	70	35
Hard board	150	400

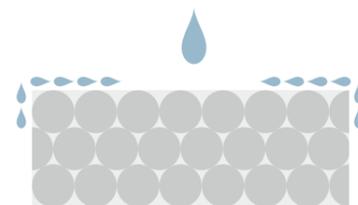
Key Feature

Hygienically safe material

Unlike natural stones, Staron®'s non-porous surfaces prevent bacteria or fungi growth, and has low moisture absorption rate.



Natural Marble



Staron®

Bacterial Growth Testing Results

A common bacteria, pseudomonas aeruginosa, was applied to the surface of Staron® acrylic solid-surface and left untouched. After 4 weeks, the area was tested for bacterial growth; the results showed no bacterial proliferation.

- **Testing method**

- ASTM G 22 (Determining resistance of plastics to bacteria)
- Strains: Pseudomonas Aeruginosa (ATCC 13388)
- Culture condition: 96.8 +/- 1.8°F (36 +/- 1°C), 90%RH, 21 days

- **Staron® results**

- Zero traces of growth

Culture Time	0 Week	1 Week	2 Week	3Week
Result	0	0	0	0

Fungi Growth Testing Results

- **Testing method**

- ASTM G 21 (Determining resistance of synthetic polymeric materials of fungi)
- Strains: Aspergillus Niger (ATCC 9642)
 Penicillium Pinophilum (ATCC 11797)
 Chaetomium Globosum (ATCC 6205)
 Gliocladium Virens (ATCC 9645)
 Aureobasidium Pullulans (ATCC 15233)
- Culture condition: 84.2 +/- 1.8°F (29 +/- 1°C), 90%RH, 21 days

- **Staron® results**

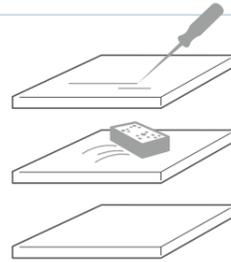
- Zero traces of growth

Culture Time	0 Week	1 Week	2 Week	3Week
Result	0	0	0	0

Technical Solution

Smart easy restoration material

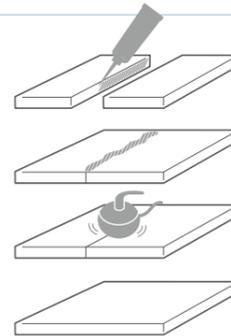
You can prolong the newness of your product over a long period of time with easy maintenance that will keep seamlessly.



Invisible joints

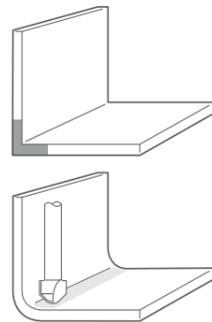
Use the adhesive Methacrylate to adhere the joints and sand the surface for visibly seamless completion of the construction.

When a color matched adhesive is used, seamless joints can be created with sanding.



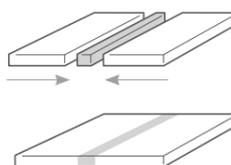
Easy cutting edges

Staron® is easy to handle even on difficult, narrow or curved edges where wood working tools can be used to cut edges.



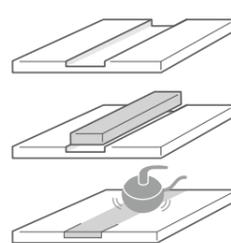
Various processing methods 1

Staron® solid surface allows you to seamlessly integrate multiple colors that can be bonded together to create a new design pattern.



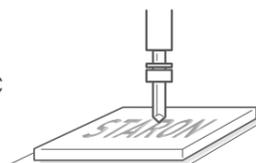
Various processing methods 2

When adding letters or patterns, use an inlay technique by cutting out a similar shape on a board and place a different colored plate.



Various processing methods 3

Staron® has a lower hardness than natural stone so you are able to use a wood working CNC to create precise grooves (Mohs hardness: 2-3).

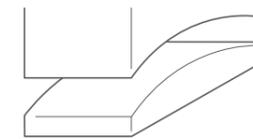


You are able to create an interior that embodies what the designer wants.

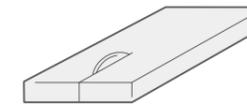
CNC: Computer processed cost calculations of alterations

Thermoforming process

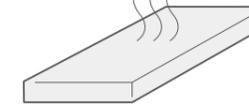
1. Mold



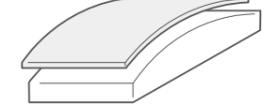
2. Cutting



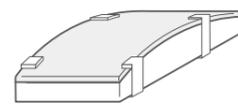
3. Heating (Using oven) (Heating at 145-165°C)



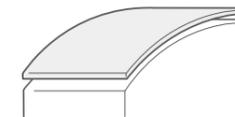
4. Forming



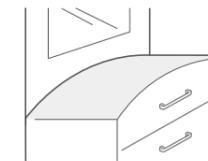
5. Fixing & Cooling



6. Installation 1



7. Installation 2



Recommended minimum inside radius value versus material thickness and color

Staron® Solid Surfaces Thickness	Min. Inside Radius(R)	Staron® Solid Surfaces Color Group
1/4" (6mm)	1" (25mm)	Solid, Sanded Aspen, Pebble
	4" (102mm)	
1/2" (12mm)	3" (76mm)	Solid, Sanded Aspen, Pebble
	5" (127mm)	
	8" (203mm)	

* Quarry, Metallic and Tempest are not recommended for thermoforming

Various edge designs



Straight



5, 10mm Bevel



5mm Round



5mm Round T&B



Half Bullnose



Full Bullnose



Demi Bullnose



Ogee



Cove Ogee



Stair Thread

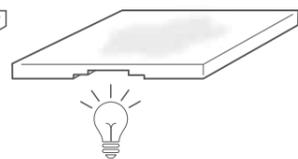
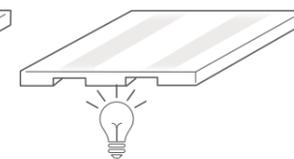
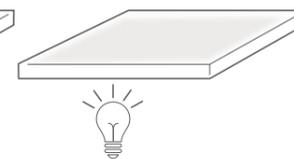
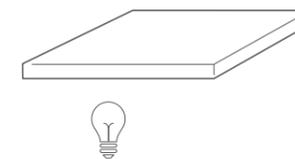


Walefall



Single Imperial

Transparent



Performance Properties

Staron®

Properties	Typical Results	Test Procedure
Tensile strength	6,000 psi	ASTM D 638
Tensile modulus	600,000 psi	ASTM D 638
Flexural strength	10,000 psi	ASTM D 790
Flexural modulus	1,000,000 psi	ASTM D 790
Elongation	0.50%	ASTM D 638
Hardness	92 Rockwell "M" Scale 65 Barcol Impressor	ASTM D 785 ASTM D 2583
Thermal expansion	2.0×10^{-5} in/in F°	ASTM D 696
Gloss (60 Gardner)	Between 5–20	NEMA LD-3
Color stability	No change-200hrs	NEMA LD-3
Stain resistance	Pass Rating 41	ANSI Z 124
Abrasion resistance	Pass	ANSI Z 124
Boiling water surface resistance	No effect	NEMA LD-3
High temperature resistance	No effect	NEMA LD-3
IZOD impact resistance (notched)	0.28 ft.lbf/in	ASTM D 256
Ball drop 1/2" (12.3 mm) sheet	144" w/ 1/2 lb ball, No failure	NEMA LD-3
Fungi and bacterial resistance	No growth	ASTM G 21, G22
Specific gravity	1.72	ASTM D 792
Solid colors	1.69	
Patterened colors		
Water absorption	0.04%, (1/2", 24hrs) 0.11%, (1/8", 24hrs)	ASTM D 570
Flammability	Class A / Class 1	UBC 8-1
Flame spread	10	ASTM E 84
Smoke density	10	ASTM E 84
Radiant heat resistance	No visual effect	NEMA LD-3
Toxicity	84.4g (Solid Color) 81.8g (Patterned Color)	Pittsburgh Test Protocol (LC50 Test)

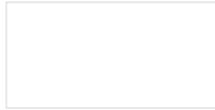
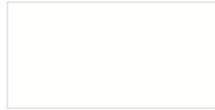
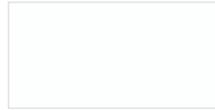
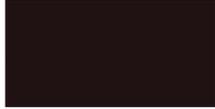
Tempest®

Properties	Typical Results	Test Procedure
Tensile strength	3,500 psi	ASTM D 638
Tensile modulus	786,000 psi	ASTM D 638
Flexural strength	6,500 psi	ASTM D 790
Flexural modulus	950,000 psi	ASTM D 790
Elongation	0.5%	ASTM D 638
Hardness	88 Rockwell "M" Scale 54 Barcol Impressor	ASTM D 785 ASTM D 2583
Thermal expansion	2.3×10^{-5} in/in F° 3.6×10^{-5} m/m °C	ASTM D 696
Gloss (60 Gardner)	Between 10–75	NEMA LD-3
Color stability	Pass	NEMA LD-3
Stain resistance	Pass	ANSI Z 124
Cleanability & Wear	Pass	ANSI Z 124
Boiling water surface resistance	No effect	NEMA LD-3
High temperature resistance	No effect	NEMA LD-3
IZOD impact resistance (notched)	0.28 ft.lbf/in	ASTM D 256
Ball drop 1/2" (12.3 mm) sheet	1/2 lb ball No failure, 93+	NEMA LD-3
Fungi and bacterial resistance	No growth	ASTM G 21, G22
Specific gravity	1.6	ASTM D 792
Water absorption	0.04%, (1/2", 24hrs)	ASTM D 570
Flammability	Class A / Class 1	ASTM E 84 / UBC 8-1
Food equipment materials	Approved	NSF/ANSI 51 (Food Zone)

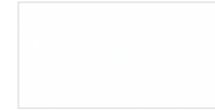
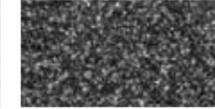
* The information contained herein is provided by LOTTE ADVANCED MATERIALS Co.Ltd. and its subsidiaries and affiliates (collectively referred to as "LOTTE ADVANCED MATERIALS Co.Ltd.") for information purposes only and should be used by individuals with technical experience and knowledge in the area. LOTTE ADVANCED MATERIALS Co.Ltd. does not make any representation or warranties of the usefulness or expected result of the information, and does not assume any responsibility whatsoever related to the use of the information. Exclusion of the implied warranties may not apply in certain jurisdictions.

Staron® Colors Chart

Solid

			
Quasar White SQ019	Pure White SP016	Bright White BW010	Dazzling White SD001
			
Pearl SP011	Natural SV041	Tusk ST015	Ivory SI040
			
Fog SF020	Blonde SB043	Cool Mint SC063	Powder Blue SP063
			
Mist SM022	Placid SP062	Bliss SB022	Serene SS023
			
Sunflower(N) SS042	California Poppy(N) SC052	Univers(N) SU053	Eggplant SV037
			
Iris SI056	Steel ST023	Onyx ON095	

Sanded

			
Sanded Icicle SI414	Sanded Birch SB412	Sanded Stratus SS418	Sanded Linen SL443
			
Sanded Cornhusk SC443	Sanded Dover SD413	Sanded White Pepper WP410	Sanded Cream SM421
			
Sanded Sahara SS440	Sanded Gold Dust SG441	Sanded Cornmeal SC433	Sanded Papyrus SP474
			
Sanded Oatmeal SO446	Sanded Vermillion SV430	Sanded Grey SG420	Sanded Tundra ST482
			
Sanded Mocha SM453	Sanded Clay SC475	Sanded Heron SH428	Sanded Dark Nebula DN421
			
Sanded Onyx SO423			

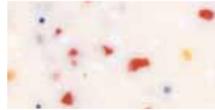
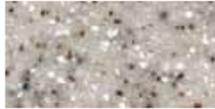
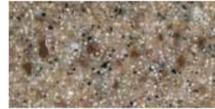
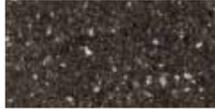
Metallic

			
Metallic Yukon EY510	Metallic Beach EB545	Metallic Satingold ES558	Metallic Sleeksilver ES581
			
Metallic Galaxy EG595	Metallic Cosmos EC596		

 Staron® recycled content series

Printed representation of colors may vary from actual samples:
Please view actual sample prior to selection.

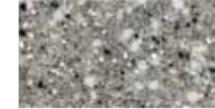
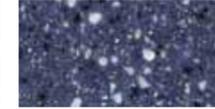
Aspen

			
Aspen Glacier AG612	Aspen Glow AG636	Aspen Gold Rush AG614	Aspen Snow AS610
			
Aspen Lily AL645	Aspen Stucco AS644	Aspen Fiesta AF611	Aspen Grey AG620
			
Aspen Pepper AP640	Aspen Lava AL650	Aspen Sky AS670	Aspen Brown AB632
			
Aspen Mine AM633			

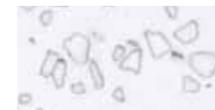
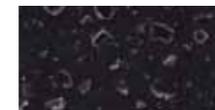
Quarry

			
Quarry Rocksalt TR305	Quarry Oyster T0310	Quarry Esker QE240	Quarry Bluff QB244
			
Quarry Mesa QM242	Quarry Stoneware BS500	Earthen Bark QL257	Earthen Stratum QL287
			
Quarry Starred QS287	Quarry Minette QM289		

Pebble

			
Pebble Ice PI811	Pebble Swan PS813	Pebble Frost PF812	Pebble Coral PC817
			
Pebble Tea Rose PT845	Pebble Saratoga PS820	Pebble Moon PM832	Pebble Lagoon PL814
			
Pebble Chiffon PC842	Pebble Gold PG840	Pebble Fresco PF844	Pebble Caper PC821
			
Pebble Seastar PS843	Pebble Grey PG810	Pebble Spinel PS854	Pebble Aqua PA860
			
Pebble Copper PC851	Pebble Blue PB870	Pebble Terrain PT857	Pebble Chocolate PC855
			
Pebble Ebony PE814			

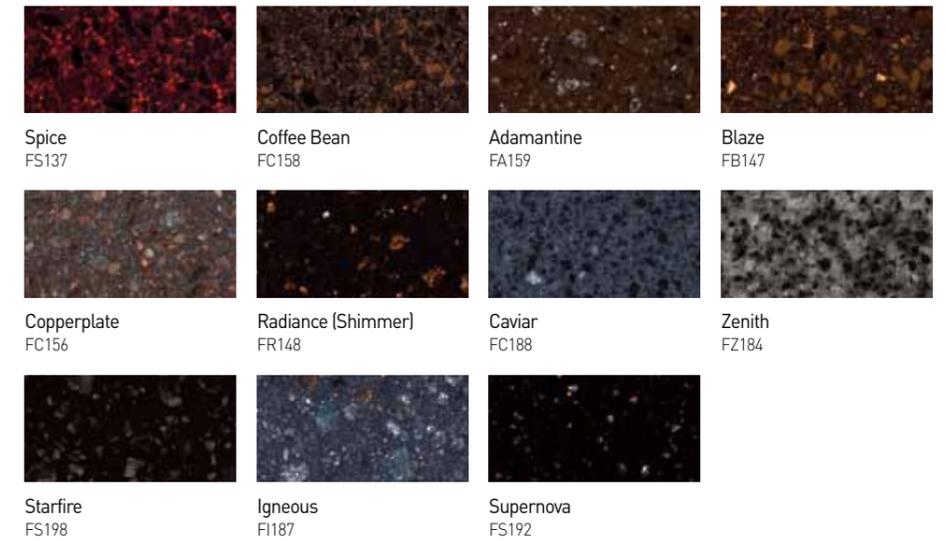
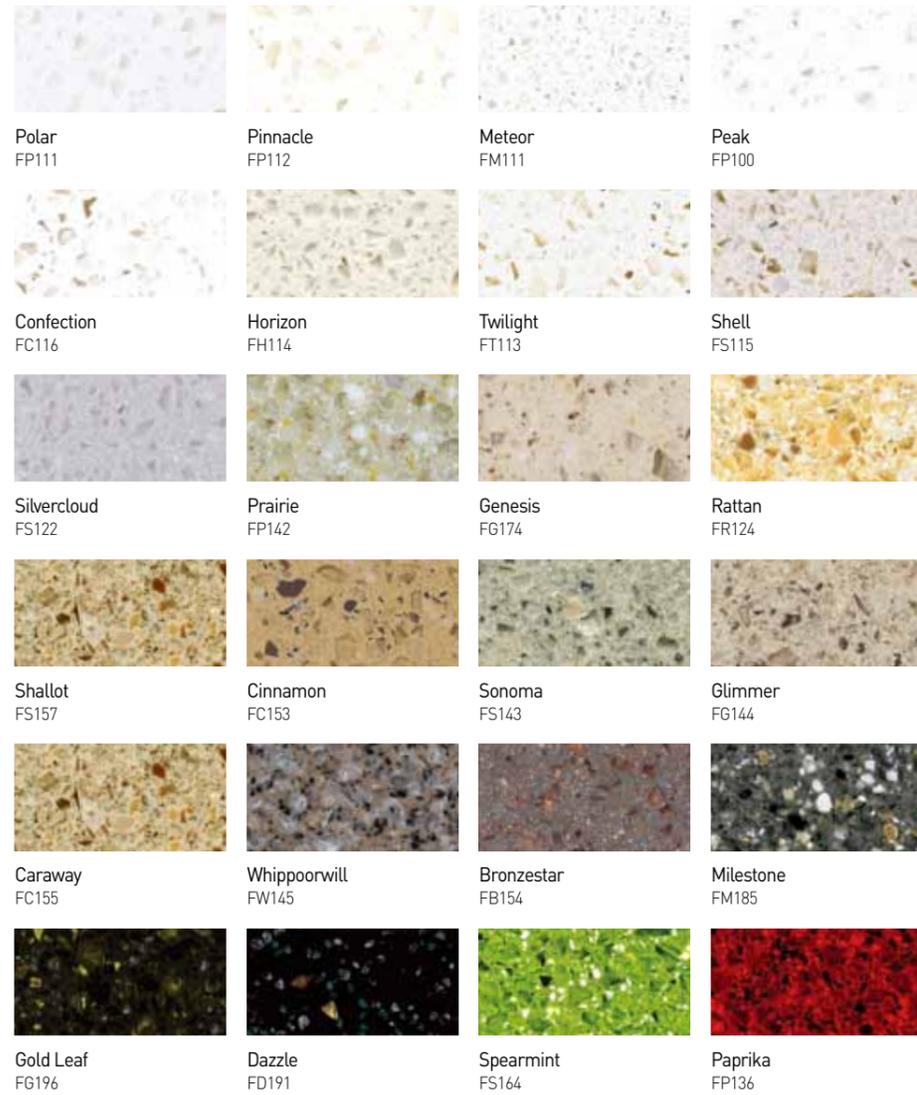
Mosaic

		
Mosaic Dalmatian QD212	Mosaic Nimbus QN287	Mosaic Blackbean QB299

Crystal

	
Crystal Pacific NP932	Crystal Sundance NS955

Tempest® Colors Chart



Printed representation of colors may vary from actual samples:
Please view actual sample prior to selection.

Radianz®

Quartz Surfaces

Keep Strong, Just Believe

Radianz® High-quality Engineered Stone

Radianz® is made with natural quartz, unsaturated polyester resins and mineral pigments. It is fused together by a compression molding process to create a high-quality building material. Radianz® has natural quartz purity of 99.9% as the main ingredient which makes the product non-porous, scratch resistant, durable, and eco-friendly as an interior material. It is excellent for counters, sinks, kitchen systems (kitchen furniture), and interior finishes such as countertops. The luxurious natural transparent textures add sophistication and considered the ideal premium material for high-quality interior spaces.

-  MAINTAINING A HEALTHY ENVIRONMENT
-  ECO-FRIENDLY SOLUTION
-  COLOR UNIFORMITY
-  HIGHLY DURABLE
-  GLOBAL NETWORK

Maintaining a Healthy Environment

Non-porous material
NSF certified
Easy to clean

Eco-Friendly Solution

SCS, green-guard, LEED certified
Utilizes recycled contents
Efficient wide slabs

MAINTAINING A HEALTHY
ENVIRONMENT &
ECO-FRIENDLY SOLUTION



COLOR UNIFORMITY &
HIGHLY DURABLE

Color Uniformity

Timeless color uniformity
Solid & Vivid color
Gem look 'Noble collection'

Highly Durable

Class a fire rating certified
Scratch resistant
Withstands hard physical impacts
15 years warranty



RADIANZ[®] BENEFITS



MAINTAINING A HEALTHY ENVIRONMENT

- Non-porous material
- NSF certified
- Easy to clean



ECO-FRIENDLY SOLUTION

- SCS, green-guard, LEED certified
- Utilizes recycled contents
- Efficient wide slabs



COLOR UNIFORMITY

- Timeless color uniformity
- Solid & Vivid color
- Gem look 'Noble collection'



HIGHLY DURABLE

- Class a fire rating certified
- Scratch resistant
- Withstands hard physical impacts
- 15 years warranty



GLOBAL NETWORK

- Operating regional branch offices around the world in addition to global distribution networks

CASE STUDY



Restaurants



Hospitality



Work Space



Kitchen & Bath



RESTAURANTS

Meeting the Highest Standard

- NSF 51 certified
- Class a fire rating certified
- SCS certified

Dependable Solution

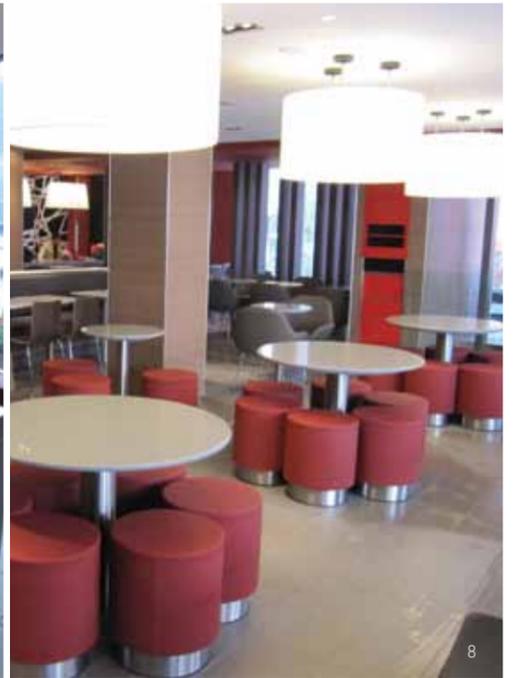
- Non-porous surfacing material eliminates the growth of bacteria, fungi or mold
- Resistant to harsh chemicals
- Non-toxic material

Diverse Execution of Interior Concept Styling

- Beautiful color and patterns for assortment of design choices
- Timeless color uniformity



1, 2, 3, 4
Countertop, Parkview Restaurant,
Shilla Hotel



1, 2, 3, 4, 5 Countertop, Floor, Samsung Life HQ Office

6, 7, 8 Table top, McDonalds, China
9, 10, 11, 12 Wine Bar, USA

HOSPITALITY



Various Concept Styling Choices for Hotel Interiors

- Diverse choices in beautiful color and pattern design
- Timeless color uniformity

Exceed Beyond the Original Standard

- Resistant to hard impacts and scratches
- Resistant to high temperatures

Warm Ambience

- Make an unforgettable impression to prospective clients
- Accentuates the existing space



1, 2
Sheraton Grand Walkerhill
Hotel



1, 2, 3 Furniture, Parkview Restaurant, Shilla Hotel
4, 5 Floor, Daerim Apartment

6 Giraffe Bar Table, HD Expo 2014, Las Vegas, USA
7 Cafeteria, Floor, Samsung Life HQ
8 Acroriver Park, Daerim Apartment



WORKSPACE

Innovative Design Meets Inspiring Ideas

- Provide a pleasant working environment

Dependable Solution

- Resistant to scratches
- Each work station or desk area will have exact matching color, providing uniform design and color tone

Safe Material

- Eco-friendly material with excellent chemical resistance _ SCS, green-guard, LEED certified
- Safe material that is heat resistant in case of fires



1, 2, 3, 4, 5
Floor, Stairs, Seoul City Hall



1, 2, 3, 4 Floor, National Eco Plex
5, 6 Floor, 2012 Yeosu Expo

7, 8, 9, 10 Floor, Samsung Life HQ
11, 12, 13 Floor, Samsung Electronics R5



KITCHEN & BATH



Food Contact Compliant and Safe Surface Material

- Non-porous material that deters bacteria growth
- Easy to maintain a clean space
- NSF certified

Solid Material That is Easy to Maintain

- Strong material that is not affected by temperature changes
- Easy maintenance and management

Safe Material

- Eco-friendly material with excellent chemical resistance



1, 2
Kitchen Countertop,
Samsung Electronics &
Bulthaup Showroom
3 Chefs Collection, Samsung
Primium House



1, 2 Kitchen Countertops, Kuschand Showroom
3, 4 Chefs Collection, Samsung Premium House

5, 6, 7 Kitchen Countertops, Acroriver Park, Daerim Apartment
8, 9, 10 Kitchen Countertops, Hillstate Apartment, Hyundai E&C
11 Kitchen Countertops, Ruvo K-binnet Showroom, USA



1 Bathtub, Countertop, Wall, Lotte Apartment
2 Bathroom, 2012 Yeosu Expo
3 Wall Covering, Samsung SDI HQ

4, 5 Bathroom, Raemian Gallery, Samsung C&T
6, 7, 8, 9 Bathroom, Dealim Apartment

TECHNICAL DATA

Radianz® Product Usage and Specifications

- Residential: Kitchen furniture, counter tops, vanity tops, porches, floors, and other interior finishings
- Commercial: Countertops, tables tops, bars, public halls floors, walls, stairs, and other interior finishings

Thickness (mm)	Width (mm)	Length (mm)	Weight (kg)
12	1,520	3,100	148
20	1,520	3,100	235
30	1,520	3,100	353

Certification

Radianz®, a brand recognized for top quality and technology

- GREENGUARD Eco-Certification
- HB Environmental Certification
- OHSAS 18001 Occupational Health and Safety Management System Certification
- American Sanitary NSF 51 Certification
- ISO 9001 Quality Management System Certification
- ISO 14001 Environmental Management System Certification
- KS Mark Product Certification



Comparison of Radianz® and Other Natural Stone

Radianz® retains the colors and textures of natural quartz.

It is also an improved product quality with technical know-how, and enhances an interior space.

Distinction	Radianz®	Granite	Marble
Contamination resistant	★ ★ ★	★ ★	★
Wear resistant	★ ★ ★	★ ★ ★	★
Chemical resistance	★ ★ ★	★ ★	★
Non-porous (particle gaps)	★ ★ ★	★	★
Flexural strength	★ ★ ★	★ ★	★
Color consistency	★ ★ ★	★ ★	★
Crack-free sheet condition	★ ★ ★	★ ★ ★	★
Easy to maintain	★ ★ ★	★ ★	★

★★★ Excellent ★★ Good ★ Fair

Maintaining Radianz®

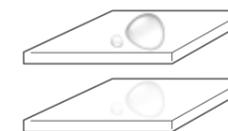


• How to remove contaminants

- Use non-abrasive household cleaners to wash off contaminants.
- Do not use abrasive cleaners or wax on the surface of Radianz®. Otherwise, you may reduce the gloss on the surface.

Cleaners that should not be used:

Cleaners for removing floor coatings, thinners, alkaline detergents, cleaners and waxes containing abrasives and strong chemicals (hydrochloric acid, sodium hydroxide, potassium hydroxide, etc) should not be used. If the mentioned items are found on this product, wash it off immediately with water.



• How to remove water stains

- Use a soft cloth and household detergent to wipe the stains to get a clean.
- If the above method does not work, use a lime scale remover to clear the surface.
- Be cautious when rubbing the surface or wiping it with a heavily abrasive cloth. Scratches can occur or you can affect the gloss.



• Prevent thermal shock

- Radianz® quartz has excellent heat resistance and does not affect the material if there is no direct heat applied to the surface (Heat at 150°C or less). However, instantaneous and direct heat, similar to natural stone products, can damage the surface. Keep flames from the stove away from the product, as well as, hot pots, clay pots and heated pedestals of cookware. Use placemats underneath hot cookware.



• Scratch protection

- Radianz® quartz has harder surface than natural granite and does not scratch easily. But keep knives, iron sponges and rigid materials off the surface. When using a knife, use a chopping board.

Bacterial Growth Testing Results

Even after exposing Radianz® to bacteria over a long period of time, tests confirm there is no proliferation.

• Testing method

- ASTM G 22 (Standard practice for determining resistance of plastics to bacteria)
- Strains: Pseudomonas Aeruginosa (ATCC 13388)
- Culture condition: 36 +/- 1°C, 85%RH, 21days

• Radianz® results

- Zero traces of growth

Culture Time	0 Week	1 Week	2 Week	3Week
Result	0	0	0	0

Compressive Strength and Durability

The high compressive strength and durability of Radianz® will further enhance the stability of the kitchen. Radianz® quartz can sustain external impact from heavy or hot cookware and pressure, sharp utensils, knives, etc. It has strong resistance to scratches and will keep your kitchen intact. Compared to natural stone and marble kitchen countertops, Radianz® is a superior material.

• Endurance

Radianz®		500
Granite		150
Marble		140

• Compressive strength (hardness)

Radianz®		1,800
Granite		1,500
Marble		1,250

• Comparison of surface expansion

Radianz®, when compared to a typical granite surfaces, is uniform and dense which helps to resist contamination and scratches



• Water absorption

Radianz®		0.05
Granite		0.3
Marble		0.3

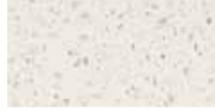
Performance Properties

Radianz®

Properties	Typical Results	Test Procedure	Remarks
Specific gravity	2.41	ASTM D792-08	
Water absorption	0.03%	ASTM C373-06	
Coefficient of linear thermal expansion	1.35 x 10 ⁻⁵ /°C	ASTM D696-03	
Flexural strength	53.6 Mpa	ASTM D790-07	
Flexural modulus	11.9 Gpa	ASTM D790-07	
Boiling water resistance	No effect	NEMA LD3 2000 3.5	
High temperature	No effect	NEMA LD3 2000 3.6	
Moh's hardness	7	MOHS Hardness Scale	
Slip resistance - coefficient of friction (Received: Dry/Wet)	0.91 / 0.49	ASTM C1028-07	Neolite Leather Rubber
	0.45 / 0.57		
	1.03 / 0.49		
Slip resistance - coefficient of friction (Renovated: Dry/Wet)	0.89 / 0.48	ASTM C1028-07	Neolite Leather Rubber
	0.40 / 0.58		
	0.92 / 0.50		
Compressive strength	DRY: 213.74 Mpa WET: 251.16 Mpa	ASTM C170-09	
Stain resistance	Passes	ANSI Z124.6-07	
Cigarette test	Passes	ANSI Z124.6-07	
Chemical resistance	Passes	ANSI Z124.6-07	
Impact tests	Passes	ANSI Z124.6-07	
Fungal resistance	No effect	ASTM G21-96	
Bacteria resistance	No effect	ASTM G22-96	
Rockwell hardness	114	ASTM D785-03	
Abrasion resistance	606mg	ASTM D4060-07	Taber abrasion
Flammability	Class A	ASTM E84-09	

* The information contained herein is provided by LOTTE ADVANCED MATERIALS Co.Ltd. and its subsidiaries and affiliates (collectively referred to as "LOTTE ADVANCED MATERIALS Co.Ltd.") for information purposes only and should be used by individuals with technical experience and knowledge in the area. LOTTE ADVANCED MATERIALS Co.Ltd. does not make any representation or warranties of the usefulness or expected result of the information, and does not assume any responsibility whatsoever related to the use of the information. Exclusion of the implied warranties may not apply in certain jurisdictions.

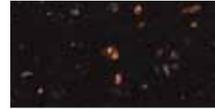
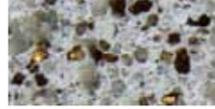
Radianz® Colors Chart

 Diamond White DW105	 Everest White EW120	 Aleutian White AW130	 Mont Blanc Snow MS141
 Gentle Gray GG900	 Kauai Cream KC213	 Teton Beige TE215	 Luna Verde LV225
 Matala Tan MT220	 Antigua Beach AN230	 Bristol Beige BB227	 Toluca Sand TS495
 Cumberland Flax CF350	 Shasta Brown SA497	 Sechura Mocha SM499	 Alpine Umber AE498
 Columbia Gray CG910	 Ural Gray UG950	 Palau Java PJ475	 Mauna Loa Black MB990
 Kunlun Ink KI992	 Rangoon Black RG994	 Adirondack Birch AB144	

Coastal Collection

 St. Helens White SH145	 Bora Bora Beige B0214	 Mykonos Beige CK230	 Acadia Brown AC495
--	---	---	--

Noble Collection

 Imperial Gray IG910	 Saltoro Cliff SC235	 Mariposa Buff MU410	 Gold Canyon Gray GG950
 Midnight Sapphire MS980	 Mirama Bronze MI780	 Ferio Black FB991	 Venetian Bronze VB450
 Whistler Mocha Gray WM610			

 Radianz® recycled content series

Printed representation of colors may vary from actual samples:
Please view actual sample prior to selection.

Global Network

LOTTE ADVANCED MATERIALS, HEAD OFFICE

56, Gosan-ro, Uiwang-si, Gyeonggi-do, Korea. 437-711
Tel. +82-31-596-3831, 3832

LOTTE ADVANCED MATERIALS USA INC.

6 Centerpointe Dr. Suite 100 La Palma, CA 90623, U.S.A.
Tel. +1-800-795-7177

LOTTE ADVANCED MATERIALS EUROPE GMBH

Kölner Str. 12,
65760 Eschborn, Germany
Tel. +49 (0) 6196-77 27 275

LOTTE ADVANCED MATERIALS THAILAND CO., LTD.

16th Floor, Empire Tower, Unit 1602-1603,
1 South Sathorn RD, Yannawa, Bangkok, Thailand. 10120
Tel. +66-2-624-6737

LOTTE ADVANCED MATERIALS, DUBAI OFFICE

Flat No 1702, Arenco Tower, Media City, Dubai, UAE. 48969
Tel. +971-4-270-7300

LOTTE ADVANCED MATERIALS, SHANGHAI OFFICE

Rm2701, Shanghai International Trade Center,
2201 West Yan An Rd, Shanghai, China. 200336
Tel. +86-21-62703000-856

LOTTE ADVANCED MATERIALS

www.staron.com