For
Architect &
Designer

LOTTE
ADVANCED
MATERIALS

Staron &
Radianz
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.
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
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

* 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
SEAMLESS & ILLUMINATING THE ENVIRONMENT

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

* 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

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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

018 019

Staron® Case Study

www.staron.com
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

www.staron.com

1. Samsung Medical Center
2. Operation Room, Taiwan
3. Reception, St. Joe Healthcare, USA
1. 2. Samsung Medical Center  3. 4. Wash, Wash Bowl, Mary 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. 9. Wash, Wash Bowl, Geneva University Hospital, Geneva, Switzerland  10. Wall, 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 accommodate unique space offerings
- Resistant to high temperatures

Warm Ambience
- Make an unforgettable impression to prospective clients
- Accentuates the existing space
1-2. Samsung Human Resource Development Institute
3. Town House, Milan, Italy (Designed by Simone Michel)
4-5. 6. 7. 8. 9. Hotel Bar, Switzerland
Retail – establish unique identity – Durable solution – thermoformable

Staron® Case Study

www.staron.com
Distinction
- Showcase the items in a chic fashion to appeal to a 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. Auto Fashion Showroom, Jeju, Korea
2. Samsung D’Light Showroom
3. Heidi.com Showroom, London 100% Design 2013, UK Designed by Zaha Hadid
4. Beauty Salon, Luzern, Switzerland
5. Moochi Kiosk, Sydney, Australia Designed by Mima Design Pty Ltd
6. Heidi.com Showroom, London 100% Design 2013, UK Designed by Zaha Hadid
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
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

045 Staron® Case Study

1. Dongdaemun Design Plaza & Park (Designed by Zaha Hadid)
2. Schaffhauser Kantonalbank, Thurgau, Switzerland (Designed by Gehry Partners)
3. Sky Lounge, Dongdaemun Design Plaza & Park (Designed by Zaha Hadid)
4. Sunshine Hospital, Australia (Designed by DFK Architects)
5. DPF Office, London, UK (Designed by DFK 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 R&D
5 Lammi 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

Staron® Case Study
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 Samsung Human Resource Development Institute (Designed by Simone Micheli)
5 L’archivolto Staron Gallery, Milan, Italy (Designed by Simone Micheli)
6 Kuho Fashion Shop
7 Deco Frame, Noon Square Myeongdong
8 www.staron.com
K I T C H E N & B A T H

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)

5-7  Kitchen Countertop, Salone Internazionale del Mobile 2010, Milan, Italy

www.staron.com
1. Wash bowl, countertop, Oesch Bad Interlaken, Switzerland
2. 3. Wash bowl, bathtub, Dealim bath
4. Bathtub, wash bowl, Sheraton Grande Walkerhill Hotel
5. ID Expo 2013, Las Vegas, USA
6. Wash bowl, Switzerland (Designed by Stuber Trend)
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. Zebra Sofa, HD expo 2014, Las Vegas, USA
2. Armadillo Bathtub, 2014, London 100% Design
3. Hedgehog Sofa, 2014, London 100% Design
5. Owl Speaker, 2014, London 100% Design
Sheet Dimension

<table>
<thead>
<tr>
<th>Pattern</th>
<th>Thickness</th>
<th>Width</th>
<th>Length</th>
</tr>
</thead>
<tbody>
<tr>
<td>Solid, Sanded, Aspen</td>
<td>6</td>
<td>1/4</td>
<td>760</td>
</tr>
<tr>
<td></td>
<td>12</td>
<td>1/2</td>
<td>760</td>
</tr>
<tr>
<td>Pebble, Metallic, Quarry, Mosaic, Cristal, Supreme, Tempest</td>
<td>12</td>
<td>1/2</td>
<td>760</td>
</tr>
</tbody>
</table>

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.

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

Chemical Testing Results

We conducted chemical tests on various surface contaminations prone to exist. These contaminations 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%)  
- Ammonia  
- Ammonium acetate  
- Bleach (household type)  
- B-4 body conditioner  
- Carbon disulfide  
- Citric acid (10%)  
- Cigarette (nicotine and tar)  
- Cooking oils  
- Cupra ammonia  
- Ethanol  
- Ethyl ether  
- Goldline  
- Grape juice  
- Household soaps  
- Hydrogen peroxide  
- Ketchup  
- Lipstick  
- Methanol  
- Methyl orange (1%)  
- Mineral oil  
- Nail polish  
- N-hexane  
- Pencil lead  
- Permanent marker pen  
- Soapless detergents  
- Sodium hydroxide solution  
- Sodium sulfate  
- Sugar (sucrose)  
- Sulfuric acid (25, 33, 60%)  
- Tomato juice  
- Uric acid  
- Washable inks  
- Xylene  
- Acetone  
- Ammonium hydroxide (5, 28%)  
- Amyl alcohol  
- Benzene  
- Blood  
- Butyl alcohol  
- Carbon tetrachloride  
- Calcium thiocyanate (78%)  
- Coffee  
- Cottonseed oil  
- Dishwashing liquid/powders  
- Ethyl acetate  
- Ethyl alcohol  
- Formaldehyde  
- Gentian violet  
- Hair dyes  
- Hydrochloric acid (30, 30, 37%)  
- Inulin (1%)  
- Lemon juice  
- Mecunochrome (2%)  
- Methyl ethyl ketone  
- Methyl red (1%)  
- Mustard  
- Naphthalene  
- Oil  
- Phenolic acid  
- Shoe polish  
- Sodium bisulfate  
- Soy sauce  
- Sulfuric acid (25, 33, 60%)  
- Tea  
- Toluen  
- Urea (16%)  
- Vinegar  
- Wire  
- Zinc chloride

### 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 bards, 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

<table>
<thead>
<tr>
<th>Item</th>
<th>Flame Spread</th>
<th>Smoke Density</th>
</tr>
</thead>
<tbody>
<tr>
<td>Drywall (gypsum board)</td>
<td>15</td>
<td>0</td>
</tr>
<tr>
<td>Wood particle board</td>
<td>150</td>
<td>200</td>
</tr>
<tr>
<td>Staron®</td>
<td>10</td>
<td>10</td>
</tr>
<tr>
<td>Glass fiber panels</td>
<td>70</td>
<td>500+</td>
</tr>
<tr>
<td>Laminates, plastics</td>
<td>70</td>
<td>35</td>
</tr>
<tr>
<td>Hard board</td>
<td>150</td>
<td>600</td>
</tr>
</tbody>
</table>

Key Feature

Hygienically safe material

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

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: 98.8 +/- 2.8°F (36 +/- 1°C), 99%RH, 21 days

• Staron® results
  - Zero traces of growth

Fungi Growth Testing Results

• Testing method
  - ASTM G 21 (Determining resistance of synthetic polymeric materials of fungi)
    - Strains: Aspergillus Nigri (ATCC 9422)
      Penicillus Pinophilum (ATCC 11979)
      Chaetomium Globosum (ATCC 6230)
      Gloeobadium Viridis (ATCC 1946)
      Aureobasidium Pullulans (ATCC 15233)
    - Culture condition: 84.2 +/- 1.8°F (29 +/- 1°C), 90%RH, 21 days

• Staron® results
  - Zero traces of growth
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 woodworking 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.

Thermoforming process

1. Mold
2. Cutting
3. Heating (Sizing 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

<table>
<thead>
<tr>
<th>Staron® Solid Surfaces Thickness</th>
<th>Min. Inside Radius(R)</th>
<th>Staron® Solid Surfaces Color Group</th>
</tr>
</thead>
<tbody>
<tr>
<td>1/4” (6mm)</td>
<td>1” (25mm)</td>
<td>Solid, Sanded Aspen, Pebble</td>
</tr>
<tr>
<td></td>
<td>4” (102mm)</td>
<td></td>
</tr>
<tr>
<td>1/2” (12mm)</td>
<td>3” (76mm)</td>
<td>Solid, Sanded Aspen, Pebble</td>
</tr>
<tr>
<td></td>
<td>5” (127mm)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>8” (203mm)</td>
<td></td>
</tr>
</tbody>
</table>

* 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
- Deriv Bullnose
- Edge
- Cove Edge
- Star Thread
- Wok
- Single Imperial

Transparent
### Performance Properties

**Staron®**

<table>
<thead>
<tr>
<th>Properties</th>
<th>Typical Results</th>
<th>Test Procedure</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tensile strength</td>
<td>6,000 psi</td>
<td>ASTM D 638</td>
</tr>
<tr>
<td>Tensile modulus</td>
<td>600,000 psi</td>
<td>ASTM D 638</td>
</tr>
<tr>
<td>Flexural strength</td>
<td>10,000 psi</td>
<td>ASTM D 790</td>
</tr>
<tr>
<td>Flexural modulus</td>
<td>1,000,000 psi</td>
<td>ASTM D 790</td>
</tr>
<tr>
<td>Elongation</td>
<td>0.30%</td>
<td>ASTM D 638</td>
</tr>
<tr>
<td>Hardness</td>
<td>92 Rockwell “M” Scale 65 Barcol Impressor</td>
<td>ASTM D 785</td>
</tr>
<tr>
<td>Thermal expansion</td>
<td>2.0 x 10^-5 in/in°F</td>
<td>ASTM D 696</td>
</tr>
<tr>
<td>Gloss (60 Gardner)</td>
<td>Between 5~20</td>
<td>NEMA LD-3</td>
</tr>
<tr>
<td>Color stability</td>
<td>No change in 200hrs</td>
<td>NEMA LD-3</td>
</tr>
<tr>
<td>Stain resistance</td>
<td>Pass Rating 6,1</td>
<td>ANSI Z 126</td>
</tr>
<tr>
<td>Abrasion resistance</td>
<td>Pass</td>
<td>ANSI Z 126</td>
</tr>
<tr>
<td>Boiling water surface resistance</td>
<td>No effect</td>
<td>NEMA LD-3</td>
</tr>
<tr>
<td>High temperature resistance</td>
<td>No effect</td>
<td>NEMA LD-3</td>
</tr>
<tr>
<td>IZOD impact resistance (notched)</td>
<td>0.28 ft.lbf/in</td>
<td>ASTM D 256</td>
</tr>
<tr>
<td>Ball drop 1/2” (12.7 mm sheet)</td>
<td>16” w/ 1/2 lb ball, No failure</td>
<td>NEMA LD-3</td>
</tr>
<tr>
<td>Fungi and bacterial resistance</td>
<td>No growth</td>
<td>ASTM D 21, 022</td>
</tr>
<tr>
<td>Specific gravity</td>
<td>1.72</td>
<td>ASTM D 792</td>
</tr>
<tr>
<td>Solid colors</td>
<td>1.69</td>
<td></td>
</tr>
<tr>
<td>Patterned colors</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Water absorption</td>
<td>0.06%, (1/2”, 24hrs)</td>
<td>ASTM D 570</td>
</tr>
<tr>
<td>Flammability</td>
<td>Class A / Class 1</td>
<td>UBC 8-1</td>
</tr>
<tr>
<td>Flame spread</td>
<td>10</td>
<td>ASTM E 84</td>
</tr>
<tr>
<td>Smoke density</td>
<td>10</td>
<td>ASTM E 85</td>
</tr>
<tr>
<td>Radiant heat resistance</td>
<td>No visual effect</td>
<td>NEMA LD-3</td>
</tr>
<tr>
<td>Toxicity</td>
<td>86.4g (Solid Color)</td>
<td>Pittsburgh Test Protocol [LD50 Test]</td>
</tr>
</tbody>
</table>

**Tempest®**

<table>
<thead>
<tr>
<th>Properties</th>
<th>Typical Results</th>
<th>Test Procedure</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tensile strength</td>
<td>3,500 psi</td>
<td>ASTM D 638</td>
</tr>
<tr>
<td>Tensile modulus</td>
<td>786,000 psi</td>
<td>ASTM D 638</td>
</tr>
<tr>
<td>Flexural strength</td>
<td>4,500 psi</td>
<td>ASTM D 790</td>
</tr>
<tr>
<td>Flexural modulus</td>
<td>950,000 psi</td>
<td>ASTM D 790</td>
</tr>
<tr>
<td>Elongation</td>
<td>0.5%</td>
<td>ASTM D 638</td>
</tr>
<tr>
<td>Hardness</td>
<td>88 Rockwell “M” Scale 56 Barcol Impressor</td>
<td>ASTM D 785</td>
</tr>
<tr>
<td>Thermal expansion</td>
<td>2.3 x 10^-5 in/in°F</td>
<td>ASTM D 2583</td>
</tr>
<tr>
<td>Gloss (60 Gardner)</td>
<td>Between 10~75</td>
<td>NEMA LD-3</td>
</tr>
<tr>
<td>Color stability</td>
<td>Pass</td>
<td>NEMA LD-3</td>
</tr>
<tr>
<td>Stain resistance</td>
<td>Pass</td>
<td>ANSI Z 126</td>
</tr>
<tr>
<td>Cleanability &amp; Wear</td>
<td>Pass</td>
<td>NEMA LD-3</td>
</tr>
<tr>
<td>Boiling water surface resistance</td>
<td>No effect</td>
<td>NEMA LD-3</td>
</tr>
<tr>
<td>High temperature resistance</td>
<td>No effect</td>
<td>NEMA LD-3</td>
</tr>
<tr>
<td>IZOD impact resistance (notched)</td>
<td>0.28 ft.lbf/in</td>
<td>ASTM D 256</td>
</tr>
<tr>
<td>Ball drop 1/2” (12.7 mm sheet)</td>
<td>1/2 lb ball, No failure</td>
<td>NEMA LD-3</td>
</tr>
<tr>
<td>Fungi and bacterial resistance</td>
<td>No growth</td>
<td>ASTM D 21, 022</td>
</tr>
<tr>
<td>Specific gravity</td>
<td>1.6</td>
<td></td>
</tr>
<tr>
<td>Water absorption</td>
<td>0.06%, (1/2”, 24hrs)</td>
<td>ASTM D 570</td>
</tr>
<tr>
<td>Flammability</td>
<td>Class A / Class 1</td>
<td>UBC 8-1</td>
</tr>
<tr>
<td>Flame spread</td>
<td>10</td>
<td>ASTM E 84</td>
</tr>
<tr>
<td>Smoke density</td>
<td>10</td>
<td>ASTM E 85</td>
</tr>
<tr>
<td>Radiant heat resistance</td>
<td>No visual effect</td>
<td>NEMA LD-3</td>
</tr>
<tr>
<td>Toxicity</td>
<td>81.8g (Patterned Color)</td>
<td>Pittsburgh Test Protocol [LD50 Test]</td>
</tr>
</tbody>
</table>

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Staron® Colors Chart

Solid

<table>
<thead>
<tr>
<th>Name</th>
<th>Color Code</th>
</tr>
</thead>
<tbody>
<tr>
<td>Quasar White</td>
<td>SQ019</td>
</tr>
<tr>
<td>Pure White</td>
<td>SP014</td>
</tr>
<tr>
<td>Bright White</td>
<td>BB013</td>
</tr>
<tr>
<td>Dazzling White</td>
<td>SC001</td>
</tr>
<tr>
<td>Pearl</td>
<td>SP011</td>
</tr>
<tr>
<td>Natural</td>
<td>SV067</td>
</tr>
<tr>
<td>Tusk</td>
<td>ST015</td>
</tr>
<tr>
<td>Ivory</td>
<td>SB060</td>
</tr>
<tr>
<td>Fog</td>
<td>SF000</td>
</tr>
<tr>
<td>Blende</td>
<td>SB063</td>
</tr>
<tr>
<td>Cool Mint</td>
<td>SC063</td>
</tr>
<tr>
<td>Powder Blue</td>
<td>SP013</td>
</tr>
<tr>
<td>Mist</td>
<td>SM022</td>
</tr>
<tr>
<td>Placid</td>
<td>SP042</td>
</tr>
<tr>
<td>Blize</td>
<td>SB022</td>
</tr>
<tr>
<td>Sorone</td>
<td>SB023</td>
</tr>
<tr>
<td>Sunflower(N)</td>
<td>SN042</td>
</tr>
<tr>
<td>California Poppy(N)</td>
<td>SC082</td>
</tr>
<tr>
<td>Universe(N)</td>
<td>SU083</td>
</tr>
<tr>
<td>Eggplant</td>
<td>SB067</td>
</tr>
<tr>
<td>Iris</td>
<td>SB036</td>
</tr>
<tr>
<td>Slavic</td>
<td>ST023</td>
</tr>
<tr>
<td>Onyx</td>
<td>ON095</td>
</tr>
</tbody>
</table>

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

Metallic

<table>
<thead>
<tr>
<th>Name</th>
<th>Color Code</th>
</tr>
</thead>
<tbody>
<tr>
<td>Metallic Yukon</td>
<td>ES010</td>
</tr>
<tr>
<td>Metallic Beach</td>
<td>ES015</td>
</tr>
<tr>
<td>Metallic Satin Gold</td>
<td>ES020</td>
</tr>
<tr>
<td>Metallic Steelcooler</td>
<td>ES019</td>
</tr>
<tr>
<td>Metallic Galaxy</td>
<td>ES015</td>
</tr>
<tr>
<td>Metallic Cosmos</td>
<td>ES019</td>
</tr>
</tbody>
</table>

Sanded

<table>
<thead>
<tr>
<th>Name</th>
<th>Color Code</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sanded Iceide</td>
<td>SI414</td>
</tr>
<tr>
<td>Sanded Birch</td>
<td>SI412</td>
</tr>
<tr>
<td>Sanded Stratus</td>
<td>SI410</td>
</tr>
<tr>
<td>Sanded Linen</td>
<td>SI419</td>
</tr>
<tr>
<td>Sanded Cornhusk</td>
<td>SC443</td>
</tr>
<tr>
<td>Sanded Dover</td>
<td>SD413</td>
</tr>
<tr>
<td>Sanded White Pepper</td>
<td>WP410</td>
</tr>
<tr>
<td>Sanded Cream</td>
<td>SC421</td>
</tr>
<tr>
<td>Sanded Sahara</td>
<td>SS440</td>
</tr>
<tr>
<td>Sanded Gold Dust</td>
<td>SC416</td>
</tr>
<tr>
<td>Sanded Cornmeal</td>
<td>SC420</td>
</tr>
<tr>
<td>Sanded Papyrus</td>
<td>SC474</td>
</tr>
<tr>
<td>Sanded Oatmeal</td>
<td>SI444</td>
</tr>
<tr>
<td>Sanded Vermilion</td>
<td>SV420</td>
</tr>
<tr>
<td>Sanded Grey</td>
<td>SI419</td>
</tr>
<tr>
<td>Sanded Tundra</td>
<td>SI421</td>
</tr>
<tr>
<td>Sanded Mocha</td>
<td>SM453</td>
</tr>
<tr>
<td>Sanded Clay</td>
<td>SC425</td>
</tr>
<tr>
<td>Sanded Henen</td>
<td>SH428</td>
</tr>
<tr>
<td>Sanded Dark Nebula</td>
<td>DO421</td>
</tr>
<tr>
<td>Sanded Onyx</td>
<td>SO423</td>
</tr>
</tbody>
</table>

Staron® recycled content series

Printed representation of colors may vary from actual samples. Please view actual sample prior to selection.
Tempest® Colors Chart

Printed representation of colors may vary from actual samples. Please view actual sample prior to selection.
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.
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
RADIANTZ® 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 uniformly
- 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
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
radianz®
case Study
www.staron.com
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
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
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 Countertops, Kusshand Showroom
3, 4. Chiff Collection, Samsung Prime House
5, 6, 7. Kitchen Countertops, Acroriver Park, Daerim Apartment
8, 9, 10. Kitchen Countertops, Hillstate Apartment, Hyundai E&C
11. Kitchen Countertops, Ruo K-binet Showroom, USA
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

<table>
<thead>
<tr>
<th>Thickness (mm)</th>
<th>Width (mm)</th>
<th>Length (mm)</th>
<th>Weight (kg)</th>
</tr>
</thead>
<tbody>
<tr>
<td>12</td>
<td>1,520</td>
<td>3,100</td>
<td>148</td>
</tr>
<tr>
<td>20</td>
<td>1,520</td>
<td>3,100</td>
<td>235</td>
</tr>
<tr>
<td>30</td>
<td>1,520</td>
<td>3,100</td>
<td>393</td>
</tr>
</tbody>
</table>

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.

<table>
<thead>
<tr>
<th>Distinction</th>
<th>Radianz®</th>
<th>Granite</th>
<th>Marble</th>
</tr>
</thead>
<tbody>
<tr>
<td>Contamination resistant</td>
<td>★ ★ ★</td>
<td>★ ★</td>
<td>★</td>
</tr>
<tr>
<td>Wear resistant</td>
<td>★ ★ ★</td>
<td>★ ★ ★</td>
<td>★</td>
</tr>
<tr>
<td>Chemical resistance</td>
<td>★ ★ ★</td>
<td>★ ★</td>
<td>★</td>
</tr>
<tr>
<td>Non-porous (particle gaps)</td>
<td>★ ★ ★</td>
<td>★</td>
<td>★</td>
</tr>
<tr>
<td>Flexural strength</td>
<td>★ ★ ★</td>
<td>★</td>
<td>★</td>
</tr>
<tr>
<td>Color consistency</td>
<td>★ ★ ★</td>
<td>★</td>
<td>★</td>
</tr>
<tr>
<td>Crack-free sheet condition</td>
<td>★ ★ ★</td>
<td>★</td>
<td>★</td>
</tr>
<tr>
<td>Easy to maintain</td>
<td>★ ★ ★</td>
<td>★</td>
<td>★</td>
</tr>
</tbody>
</table>

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 bacterial)
  - Strain: Pseudomonas Aeruginosa (ATCC 13388)
  - Culture condition: 36 +/- 1°C, 85%RH, 21 days

- Radianz® results
  - Zero traces of growth

<table>
<thead>
<tr>
<th>Culture Time</th>
<th>0 Week</th>
<th>1 Week</th>
<th>2 Week</th>
<th>3 Week</th>
</tr>
</thead>
<tbody>
<tr>
<td>Result</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

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
- Compression strength (hardness)

<table>
<thead>
<tr>
<th></th>
<th>Radianz®</th>
<th>Granite</th>
<th>Marble</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1,800</td>
<td>1,300</td>
<td>1,250</td>
</tr>
</tbody>
</table>

- Water absorption

<table>
<thead>
<tr>
<th></th>
<th>Radianz®</th>
<th>Granite</th>
<th>Marble</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>0.05</td>
<td>0.3</td>
<td>0.3</td>
</tr>
</tbody>
</table>

Performance Properties

Radianz®

<table>
<thead>
<tr>
<th>Properties</th>
<th>Typical Results</th>
<th>Test Procedure</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Specific gravity</td>
<td>2.61</td>
<td>ASTM D792-08</td>
<td></td>
</tr>
<tr>
<td>Water absorption</td>
<td>0.03%</td>
<td>ASTM C273-04</td>
<td></td>
</tr>
<tr>
<td>Coefficient of linear thermal expansion</td>
<td>1.36 x 10^-5 /°C</td>
<td>ASTM D696-03</td>
<td></td>
</tr>
<tr>
<td>Flexural strength</td>
<td>53.6 Mpa</td>
<td>ASTM D790-07</td>
<td></td>
</tr>
<tr>
<td>Flexural modulus</td>
<td>11.9 Gpa</td>
<td>ASTM D790-07</td>
<td></td>
</tr>
<tr>
<td>Boiling water resistance</td>
<td>No effect</td>
<td>NEMA LO3 2000 3.5</td>
<td></td>
</tr>
<tr>
<td>High temperature</td>
<td>No effect</td>
<td>NEMA LO3 2000 3.4</td>
<td></td>
</tr>
<tr>
<td>Mohs hardness</td>
<td>7</td>
<td>MOHS Hardness Scale</td>
<td></td>
</tr>
<tr>
<td>Slip resistance - coefficient of friction (Recovered: Dry/Wet)</td>
<td>0.91 / 0.69</td>
<td>ASTM C1028-07</td>
<td>Neolite/Leather/Rubber</td>
</tr>
<tr>
<td>Slip resistance - coefficient of friction (Reverted: Dry/Wet)</td>
<td>0.46 / 0.58</td>
<td>ASTM C1028-07</td>
<td>Neolite/Leather/Rubber</td>
</tr>
<tr>
<td>Compressive strength</td>
<td>DRY: 213.74 Mpa WET: 201.16 Mpa</td>
<td>ASTM C170-09</td>
<td></td>
</tr>
<tr>
<td>Stain resistance</td>
<td>Passes</td>
<td>ANSI Z214.6-07</td>
<td></td>
</tr>
<tr>
<td>Cigarette test</td>
<td>Passes</td>
<td>ANSI Z214.6-07</td>
<td></td>
</tr>
<tr>
<td>Chemical resistance</td>
<td>Passes</td>
<td>ANSI Z214.6-07</td>
<td></td>
</tr>
<tr>
<td>Impact tests</td>
<td>Passes</td>
<td>ANSI Z214.6-07</td>
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<tr>
<td>Fungi resistance</td>
<td>No effect</td>
<td>ASTM D21-94</td>
<td></td>
</tr>
<tr>
<td>Bacteria resistance</td>
<td>No effect</td>
<td>ASTM D22-94</td>
<td></td>
</tr>
<tr>
<td>Rockwell hardness</td>
<td>11.6</td>
<td>ASTM D785-07</td>
<td></td>
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<tr>
<td>Abrasion resistance</td>
<td>60mg</td>
<td>ASTM D4060-07</td>
<td>Taber abrasion</td>
</tr>
<tr>
<td>Flammability</td>
<td>Class A</td>
<td>ASTM E86-09</td>
<td></td>
</tr>
</tbody>
</table>

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Radianz® Colors Chart

Coastal Collection

St. Helena White SH120
Bora Bora Beige BR214
Mykonos Beige MK30
A-cadia Brown AC295

Noble Collection

Imperial Gray IM110
Sabroo Cliff SC225
Mariposa Buff MB280
Gold Canyon Gray GC210

Radianz® recycled content series
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Global Network

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