



SAMSUNG SDI

Technical Information

Architectural Manual

staron[®]
Solid Surfaces



TECHNICAL INFORMATION

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.

Tempest® combines the elegant patterns of natural stone and the excellent durability and workability of solid surface. It enriches the space with the splendor of precious metals, and creates diamond-like transparencies that heighten the elegance.

staron® | tempest®

Care & Maintenance

Staron® and Tempest® is a durable and repairable product that will last for many years with simple care. Follow these instructions to preserve your Staron® and Tempest® solid surface products.

1. Everyday care

General cleaning of your Staron® and Tempest® solid surfaces can be done by wiping the surface with a damp cloth or sponge, then dry with soft cloth or paper towels to prevent spotting; especially in areas with hard water.

2. Basic stains

Clean with an ammonia-based product such as household glass cleaner or commercially available non-abrasive spray-on cleaners for solid surface products. Wipe dry with a soft cloth or paper towels to prevent spotting.

3. Stubborn stains and minor scratches

There are over 140 colors available in Staron® and Tempest® products and each color can be supplied with a different type of finish by a Staron® certified fabricator/installer.

Dark colors in countertop surfaces and particularly dark colors that have been finished to a gloss, like anything else, will potentially show signs of use, such as scratches and soap residue, more readily than light colored solid surface materials.

Therefore, a gloss finish generally requires additional maintenance and care to retain its original luster.

Different cleaning techniques are required to remove stubborn stains and minor scratches depending on the type of finish and color as detailed in the following instructions

Note: Please contact your certified fabricator/installer if you are uncertain which type of finish is applied to your Staron® solid surfaces.

DO NOT attempt to repair deep scratches, chips or burns, contact a certified Staron® fabricator/installer.



✓ **MATT FINISH** is the standard finish delivered by your certified fabricator/installer. It is a low or no-sheen finish and is recommended in all high-use areas.

Scrub in a small circular motion with a wet sponge and an abrasive cleanser such as Soft Scrub®. Darker colors tend to require more attention than lighter colors.

✓ **SATIN FINISH** has a slightly higher sheen than matt and requires more attention depending on frequency of use and area of application.

Lightly scrub surface in a small circular motion with a wet sponge and an abrasive cleanser such as Soft Scrub® over stain or scratch.

Darker color

Darker colors tend to require more attention than lighter colors. Scrubbing too aggressively may actually reduce the gloss level.

✓ **GLOSS FINISH** is a higher and reflective sheen that requires additional care and maintenance. It is important to note that a gloss finish, especially on a dark color, will require more care than a matt/satin finish. Therefore, be sure not to apply the same method or process recommended for a matt/satin finish when caring for a gloss finish. Repeat the procedure shown below - If stain persists, contact your certified fabricator/installer for assistance.

DO NOT USE ABRASIVE CLEANSERS AND PADS OF ANY TYPE ON A GLOSS FINISH; PLEASE CONTACT YOUR STARON® RETAILER/DEALER FOR MORE INFORMATION.

Spray a non-abrasive product such as Formula 409® over stain and wait for a couple of minutes. Then, scrub in a small circular motion with a wet sponge.

Darker color

Darker colors tend to require more attention than lighter colors. Scrubbing too aggressively may actually reduce the gloss level. Do not use abrasive cleansers, pads or steel wool...

After completing the above procedure, rinse with clear water and wipe dry with a soft cloth or paper towels to prevent spotting. To enhance the visual color clarity and hide minor scuffs, apply Countertop Magic® cleanser (available at any hardware store or supermarket) and wipe away excess with a soft cloth.

4. Preventing damage

Minor damage that may accidentally occur is most often repairable by a Staron® certificated fabricator/installer or repair expert. However, be sure to follow these guidelines to prevent damage to your Staron® and Tempest® surface:

✓ **HEAT** : Staron® and Tempest® Solid Surfaces have excellent heat resistant properties compared to other countertop materials. However, placing hot pans, as well as some heat-generating appliances such as electric grills or deep-fryers, can damage the surface.

Always use a hot pad or a trivet with rubber feet to protect Staron® and Tempest®.

Avoid subjecting Staron® and Tempest® Solid Surfaces to extreme hot temperatures.

✓ **CHEMICALS** : Avoid exposing Staron® and Tempest® Solid Surfaces to strong chemicals such as paint removers, acetone, and oven cleaners.

Surfaces exposed to these chemicals should be promptly flushed with water;

contact may cause spots that may require extensive repairs.

Remove nail polish with a non-acetone-based nail polish remover and flush with water.

✓ **SCRATCHES** : Never cut or chop directly on a Staron® and Tempest® Solid Surfaces surface, always use a cutting/chopping board.

✓ **FRACTURES** : Avoid standing on countertops or dropping heavy objects on the surface.

NOTE: Gloss reduction, scratching, and staining on solid surfaces incurred over time due to use is NOT a manufacturing defect but is considered normal wear and tear – The forgoing is NOT covered under the Staron® Limited Warranty.

If your Staron® and Tempest® product is accidentally nicked or deeply scratched, please contact your retailer/dealer or Staron® certified fabricator/installer for advice about the most effective method of repair – most repairs are relatively quick and simple when performed by an experienced professional (service charge may apply).

For more detailed information, please contact your Staron® dealer or visit us at www.staron.com

Use of certain names is intended only to show a type of cleaning product.

This does not constitute an endorsement or support for that product.

Nor does the exclusion of any certain name product imply its insufficiency.

Cleaning sinks & bowls

Staron® sinks and bowls are highly resistant to common stains by household foods, liquids, and cosmetics. However, leaving food residue and chemicals on the surface to air dry can result in a stubborn stain unless rinsed immediately with water.

1. Everyday care and basic stains

Clean regularly with Soft Scrub® or a mild detergent such as those used for hand dishwashing.

2. Stubborn stains and minor scratches

Apply a mild abrasives cleanser such as Bon-ami®, Comet® or Soft Scrub® on the area and buff in a circular motion with a green Scotch-Brite® pad. Buff over the entire sink to blend the finish. And then rinse – solid color of Staron® product is evident all the way through the same.

3. Disinfecting

To keep sinks bright and clean, occasionally apply liquid bleach and water using the following steps.

- Fill sink 1/4 full with water and add 1 to 2 cups of bleach.

- Carefully (without splashing) scrub the entire surface with a green Scotch-Brite® pad and sponge.

- Allow to stand for 15 minutes. Then, drain and rinse.

4. Preventing damage

Staron® sinks and bowls are highly durable. However, be sure to follow these guidelines:

✓ Allow heated cookware to cool before placing in sink

✓ Always run cold water when pouring boiled water or hot liquids into sink

✓ Do not expose the surface to harsh chemicals, such as paint remover, turpentine, nail polish remover (acetone) or drain, stove and toilet cleaning products. If the chemicals come in contact with the surface, immediately wash them off with water, using appropriate safety measures to avoid injury.

✓ Avoid dropping heavy objects on the surface.

For more detailed information, please contact your Staron® dealer or visit us at www.staron.com.

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This does not constitute an endorsement or support for that product.

Nor does the exclusion of any certain name product imply its insufficiency.

STARON®

The information contained herein is provided by Samsung SDI Chemical and its subsidiaries and affiliates (collectively referred to as "Samsung") for information purposes only and should be used by individuals with technical experience and knowledge in the area. Samsung 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.

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	0.5%	ASTM D 638
Hardness	92 Rockwell "M" Scale 65 Barcol Impressor	ASTM D 785 ASTM D 2583
Thermal expansion	2.0 x 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, G 22
Specific gravity	1.72	
Solid colors	1.69	ASTM D 792
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 (Patterened Color)	Pittsburgh Test Protocol (LC50 Test)

TEMPEST®

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Exclusion of the implied warranties may not apply in certain jurisdictions.

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 x 10 ⁻⁵ in/in F° 3.6 x 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, G 22
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]

(visual rating of fungus growth)

1. Test 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

- Limitation

OBSERVED GROWTH ON SPECIMEN	RATING
None	0
Traces of growth (Less than 10%)	1
Light Growth (10-30%)	2
Medium Growth (30-60%)	3
Heavy Growth (60%-Complete coverage)	4

2. Test result

- Zero traces of growth

CULTURE TIME	0WEEK	1WEEK	2WEEK	3WEEK
Result	0	0	0	0

(visual rating of fungus growth)

1. Test 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

- Limitation

OBSERVED GROWTH ON SPECIMEN	RATING
None	0
Traces of growth (Less than 10%)	1
Light Growth (10-30%)	2
Medium Growth (30-60%)	3
Heavy Growth (60%-Complete coverage)	4

2. Test result

- Zero traces of growth

CULTURE TIME	0WEEK	1WEEK	2WEEK	3WEEK
Result	0	0	0	0

1. Test method

- ASTM E 84

(Surface Burning Characteristics of Building Materials)

- Sample preparation and conditioning

Three(3) panels (1/2" thick measuring 2' x 8') were fitted end-to-end to form a 24" x 24'0" sample. Because the sample was self-supporting, no further preparation was necessary. The sample was conditioned at 73 +/- 5°F and 50% RH.

- Test procedure

The tunnel was thoroughly pre-heated, using natural gas. When the brick temperature, sensed by a floor thermocouple, had reached the prescribed 105 +/- 5°F level, the sample was inserted into the tunnel and the test conducted in accordance with the standard ASTM E 84 procedures. The operation of the tunnel was checked by performing 10 minute test with inorganic board on the day of the test.

- Rating

The National Fire Protection Association Life Safety Code 101, Section 6-5.3, "Interior Wall and Ceiling Finish Classification," has means of classifying materials with respect to Flame Spread and Smoke Developed when tested in accordance with NFPA 255, "Method of Test of Surface Burning Characteristics of Building Materials," (ASTM E 84).

FLAME SPREAD	SMOKE DEVELOPED	RATING
0 - 25	0 - 450	CLASS A
26 - 75	0 - 450	CLASS B
76 - 200	0 - 450	CLASS C

2. Test result

- Flame Spread: 10

- Smoke Developed : 10

- Rating : Class A / Class 1

- Reference

ITEM	FLAME SPREAD	SMOKE DEVELOPED
Wallboard, Gypsum	15	0
Wood particle board	155	200
Fiberglass reinforced panels	70	500+
Laminates, Plastic	70	35
Wall covering, Interior	25	15
Hardboard	150	400

1. Test method

- The University of pittsburgh test protocol (Upitt)

For Measurement of Acute Lethality of Thermal Decomposition Products of Specimens

The major function of the UPitt laboratory test method is to provide a means of evaluating the lethal toxic potency of thermal decomposition products of test materials.

- Test procedure:

The test protocol call for samples to be subjected to continuously changing temperature conditions starting at 30°C and increasing at a rate of 20°C/min.

The test system generates decomposition products that continuously change in chemical composition as the temperature increases.

Animals are exposed to the decomposition products starting when the test sample loses one percent of its initial weight and continues for 30 min.

The UPitt protocol utilizes rodent (mouse) lethality as the primary source in evaluating the toxicity of combustion atmosphere produced by a material.

Groups of four animals at a time are exposed to the combustion gases generated from different initial quantities of the test material.

This establishes a concentration-response relationship.

From this relationship, the concentration estimated to produce lethality in 50 percent of the animals within the specified time is obtained by interpolation.

This concentration, commonly termed the LC50, is a measure of the toxic potency of combustion atmosphere.

- Evaluat ion:

The Building Code of the City of New York requires the materials to be "not more toxic than wood," which requires a passing LC50 value of greater than or equal to 19.7g

2. Test result

TEST SAMPLE	LC ₅₀ value
Solid Color	84.4G
Patterned Color	81.8G

Thermal decomposition of Staron® Solid Surfaces was measured at a temperature greater than 300°C (572°F), which is most likely in case of fire. Staron® Solid Surfaces meet the requirements for interior finish material as defined by Title 27, Chapter 1, Subchapter 5, Article 5, of the Building Code of the City of New York.

(Total Volatile Organic Compounds)

1. Test method

- ASTM D5116-97

Standard Guide for Small-Scale Environmental Chamber Determinations of Organic Emissions from Indoor Materials/Products.

- Test sample

Sample selected for testing is representative of the product manufactured and produced under typical operating conditions.

- Test procedure

The principle of the test is to determine the specific emission rate of VOCs emitted from prepared specimens of building products.

The test is conducted in a small-scale environmental chamber at specified constant conditions of temperature, relative humidity, ventilation rate, and product loading factor.

- Chamber conditions for test period

PARAMETER	SYMBOL	UNITS	VALUE
Product exposed area	AC	M2	0.0316
Chamber volume	VC	M3	0.067
Loading ratio	LC	M2 M-3	0.47
Inlet air flow rate	Q	M3 M-1	0.067
Ventilation rate	ac	h-1	1.0
Temperature		°C	23.3
Relative humidity		%	48.6

- Analytical methods

TVOC (Total Volatile Organic Compounds): quantified by GC/MS TIC method using toluene as calibration reference.

Formaldehyde and acetaldehyde: volatile aldehydes were quantified by HPLC following ASTM Method D 5197-97.

Individual VOCs, other than formaldehyde and acetaldehyde, were quantified by thermal desorption GC/MS following EPA Methods TO-1 and TO-17. Compounds are quantified using multipoint calibrations prepared with pure substances.

2. Test result

- Emission Test results for individual VOCs

SUBSTANCE	CAS	CHAMBER CONCENTRATION (µg m-3)	EMISSION FACTOR (µg m-2 h-1)
24 hour Test Period			
Methyl Methacrylate	80-62-6	6.6	14.0

- TOVC Chamber concentrations and emission factors

TEST DURATION	CHAMBER CONCENTRATION (µg m-3)	EMISSION FACTOR (µg m-2 h-1)
24 hours	LQ	NOT APPLICABLE

"LQ" indicates calculated value is below quantitation base on concentration LOQ(Lower Limit of quantitation). LOQ for TVOC is 20 µg m-3. Most standards and guidelines (Ex: EPA, OSHA, etc.) consider 200-500 µg m-3 TVOC an acceptable level in buildings. Levels higher than this may result in irritation to some occupants.

Chemical resistance

1. Test method

- Apply 3 drops of each chemical reagent on the surface of staron® Solid Surfaces
- Expose the sample for 16 hours; covered with glass plate and uncovered
- Check the surface and scrub the surface with a wet Scotch-Brite® Pad and bleaching cleanser such as Ajax®

2. Test result

The residue from the following chemical reagents can be removed with a wet Scotch-Brite® pad and bleaching cleanser.

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

The following chemical reagents may affect the surface with more serious damage, requiring sanding for complete removal. Frequent and/or prolonged exposure to these reagents should be avoided.

- | | |
|--------------------------|--|
| - Acetic acid (90,98%) | - Glacial acetic acid |
| - Acid drain cleansers | - Hydrofluoric acid (48%) |
| - Chlorobenzene | - Luralite mix (50/50) |
| - Chloroform (100%) | - Methylene chloride based products such as paint removers, brush cleansers and some metal cleansers |
| - Chromic trioxide acid | - Nitric acid (25,30,70%) |
| - Cresol | - Phenol (40,85%) |
| - Dioxane | - Phosphoric acid (75,90%) |
| - Ethyl acetate | - Sulfuric acid (77,96%) |
| - Equalizing mix (50/50) | - Trichloroacetic acid (10,50%) |
| - Film developer | - 3M Avagard™ D |
| - Formic acid (50,90%) | |
| - Furfural | |



STARON® accreditation

GREENGUARD ENVIRONMENTAL INSTITUTE
CONGRATULATES
Samsung Cheil Industries, Inc.
FOR ACHIEVING GREENGUARD CERTIFICATION
FOR LOW EMITTING PRODUCTS AND MATERIALS
UNDER THE STANDARDS OF THE INSTITUTE.



September 18, 2007

CERTIFICATION DATE

90043

CERTIFICATION NUMBER



EXECUTIVE DIRECTOR

FOR DISPLAY PURPOSES ONLY

STARON® accreditation



Certificate of Compliance

Staron® solid surface sheets
Samsung Staron

This product has been certified according to the GREENGUARD Indoor Air Quality (IAQ) Certification Program for Low Emitting Products.

Reference Standard: GGPS-001 GREENGUARD IAQ Standard for Building Materials, Finishes, and Furnishings
Product Type: Furniture Components/Materials, Seating, and Free Standing Furniture and Furnishing Units

Criteria	Allowable Limits
TVOC ¹	≤ 0.25 mg/m ³
Formaldehyde	≤ 0.025 ppm
Total Aldehydes ²	≤ 0.05 ppm
Individual VOCs ³	≤ 0.1 TLV
4-phencyclohexene	≤ 0.0033 mg/m ³

¹ Defined to be the total response of measured VOCs falling within the C₁₀-C₁₅ range, with responses calibrated to a toluene surrogate.
² Defined to be the total response of a target list of aldehydes (2-formal, acetaldehyde, benzaldehyde, 2,5-dimethylbenzaldehyde, 2-methylbenzaldehyde, 3-methylbenzaldehyde, hexanal, 2-methylbutanal, formaldehyde, hexanal, pentanal, propenal), with each individually calibrated to a compound specific standard.
³ Any pollutant not listed must produce an air concentration level no greater than 1/10 the Threshold Limit Value (TLV) industrial work place standard (Reference: American Conference of Government Industrial Hygienists, 6500 Glenway, Building D-7, Cincinnati, Ohio 45211-4438). Seating complies with ANSI/BIFMA X7.1-2011, ANSI/BIFMA M7.1-2011, and ANSI/BIFMA e3-2011a Credit 7.6.1. Seating has been evaluated and shown compliance to the ANSI/BIFMA testing requirements.

GREENGUARD Certification affirms that representative samples of the products tested meet the criteria of the referenced standards and the requirements of the specific certification program. Certification testing is conducted according to a consistent, defined protocol. It does not measure emissions under usage conditions other than those defined in the protocol and does not address potential environmental impact other than chemical emissions.

The GREENGUARD Environmental Institute (GCI) is an industry independent, third-party certification organization that qualifies products for low chemical emissions. GREENGUARD Certification programs use defined product standards, test methodologies, product sample collection and handling procedures, program application processes and on-going verification procedures. GREENGUARD standards, methods, and procedures are available at www.GREENGUARD.org.

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GGPC-001D



Certificate of Compliance

Staron® solid surface sheets
Samsung Staron

In addition to meeting the GREENGUARD Children & Schools Certification Criteria, this product complies with CA Section 01320, Version 1.1, including the 2012 update for formaldehyde at 9 µg/m³ (office seating ≤ 4.5 µg/m³).

Reference Standard: GGPS-002 GREENGUARD Children & Schools™ Standard
Product Type: All Products

Criteria	Allowable Limits
Individual VOCs ¹	≤ 1/100 TLV and ≤ 1/4 CA CREL (Office Seating ≤ 1/100 TLV and ≤ 1/4 CA CREL)
Formaldehyde	≤ 0.0135 ppm / 13.5 ppb (Office Seating ≤ 0.00675 ppm / 6.75 ppb)
TVOC ²	≤ 0.22 mg/m ³
Total Aldehydes	≤ 0.043 ppm / 43 ppb
Total Phthalates	≤ 0.01 mg/m ³
Total Particles ³	≤ 0.02 mg/m ³

¹ Any VOC not listed must produce an air concentration level no greater than 1/100 the Threshold Limit Value (TLV) industrial work place standard (Reference: American Conference of Government Industrial Hygienists, 6500 Glenway, Building D-7, Cincinnati, Ohio 45211-4438) and no greater than 1/4 the CA Chronic Reference Exposure Level (CREL) (<http://www.cdph.ca.gov/Programs/OPA/Pages/NR090301.aspx>) (Adopted by the State of California Office of Environmental Health Hazard Assessment (OEHHA), December 2008).
² 1-Methyl-2-Pyrrolidone must be ≤ 0.08 mg/m³ for office seating and ≤ 0.16 mg/m³ for all other product types.
³ Defined to be the total response of measured VOCs falling within the C₁₀-C₁₅ range, with responses calibrated to a toluene surrogate.

⁴ Particles are only applicable to fibrous, particle-releasing products with exposed surface area in air streams.
Seating, Workstations and Caseload Systems comply with ANSI/BIFMA e3-2011a Credit 7.6.2. Workstations have been evaluated and show compliance to the Open Plan and Private Office Environments. Caseload systems have been evaluated and show compliance to the Private Office Environment. Seating shows compliance to the BIFMA seating environment for office chairs and the CPDH classroom for student seating. Educational furniture is evaluated to the CPDH classroom environment.
Complies with California Department of Public Health "Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions from Indoor Sources Using Environmental Chambers," Version 1.1," (CA Section 01320).

GREENGUARD Certification affirms that representative samples of the products tested meet the criteria of the referenced standards and the requirements of the specific certification program. Certification testing is conducted according to a consistent, defined protocol. It does not measure emissions under usage conditions other than those defined in the protocol and does not address potential environmental impact other than chemical emissions.

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GGPC-002

STARON® accreditation

GREENGUARD
Indoor Air Quality Certified

Certificate of Compliance

Certification Details:

Certificate No: 4110-410
Status: Certified
Period: 09/2007 - 09/2013
Restrictions: NONE

Staron® Tempest™
Samsung Staron

This product has been certified according to the GREENGUARD Indoor Air Quality (IAQ) Certification Program for Low Emitting Products

Reference Standard: GGPS-001 GREENGUARD IAQ Standard for Building Materials, Finishes, and Furnishings
Product Type: Furniture Components/Materials, Seating, and Free Standing Furniture and Furnishings Units

Criteria	Allowable Limits
TVOC ¹	≤ 0.25 mg/m ³
Formaldehyde	≤ 0.025 ppm
Total Aldehydes ²	≤ 0.05 ppm
Individual VOCs ³	≤ 0.1 TLV
4-phencyclohexene	≤ 0.0033 mg/m ³

Listing of measured carcinogens and reproductive toxins as identified by California Proposition 65, the U.S. National Toxicology Program (NTP), and the International Agency on Research on Cancer (IARC) must be provided.

Any pollutant regulated as a primary or secondary outdoor air pollutant must meet a concentration that will not generate an air concentration greater than that promulgated by the National Ambient Air Quality Standard (NAAQS), code of Federal Regulations, Title 40, Part 50.

See referenced standard for a complete technical explanation.

¹ Defined to be the total response of measured VOCs falling within the C-C₁₀ range, with responses calibrated to a toluene surrogate.

² Defined to be the total response of a target list of aldehydes (2-hexenal, acrolein, benzaldehyde, C-3 dimethylacetaldehyde, 2-methylbutanaldehyde, 2 and/or 4-methylpentanaldehyde, hexanal, 3-methylbutanal, formaldehyde, hexanal, pentanal, propenal), with each individually calibrated to a compound specific standard.

³ Any pollutant not listed must produce an air concentration level no greater than 1/10 the Threshold Limit Value (TLV) industrial work place standard (Reference: American Conference of Government Industrial Hygienists, 6500 Chemsy, Building D-7, Cincinnati, Ohio 45211-4438). Seating complies with ANSI/BIFMA X7.1-2011, ANSI/BIFMA X7.3-2011, and ANSI/BIFMA e3-2011a Credit 7.6.1. Seating has been evaluated and shown compliance to the ANSI/BIFMA seating requirements.

GREENGUARD Certification affirms that representative samples of the products tested meet the criteria of the referenced standards and the requirements of the specific certification program. Certification testing is conducted according to a consistent, defined protocol. It does not measure emissions under usage conditions other than those defined in the protocol and does not address potential environmental impact other than chemical emissions.

The GREENGUARD Environmental Institute (GEI) is an industry independent, third-party certification organization that qualifies products for low chemical emissions. GREENGUARD Certification programs use defined product standards, test methodologies, product sample collection and handling procedures, program application processes and on-going verification procedures. GREENGUARD standards, methods, and procedures are available at www.GREENGUARD.org.

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GREENGUARD
Children & Schools
Indoor Air Quality Certified

Certificate of Compliance

Certification Details:

Certificate No: 4110-420
Status: Certified
Period: 09/2007 - 09/2013
Restrictions: NONE

Staron® Tempest™
Samsung Staron

In addition to meeting the GREENGUARD Children & Schools Certification Criteria, this product complies with CA Section 01350 Version 1.1, including the 2012 update for formaldehyde at 9 µg/m³ (office seating ≤ 4.5 µg/m³).

Reference Standard: GGPS-002 GREENGUARD Children & Schools™ Standard
Product Type: All Products

Criteria	Allowable Limits
Individual VOCs ¹	≤ 1/100 TLV and ≤ 1/4 CA CREL (Office Seating ≤ 1/100 TLV and ≤ 1/4 CA CREL)
Formaldehyde	≤ 0.0135 ppm /13.5 ppb (Office Seating ≤ 0.00675 ppm / 6.75 ppb)
TVOC ²	≤ 0.22 mg/m ³
Total Aldehydes ³	≤ 0.043 ppm /43 ppb
Total Phthalates	≤ 0.01 mg/m ³
Total Particles ⁴	≤ 0.02 mg/m ³

See referenced standard for a complete technical explanation.

¹ Any VOC not listed must produce an air concentration level no greater than 1/100 the Threshold Limit Value (TLV) industrial work place standard (Reference: American Conference of Government Industrial Hygienists, 6500 Chemsy, Building D-7, Cincinnati, Ohio 45211-4438) and no greater than 1/4 the CA Chronic Reference Exposure Level (CREL). (<http://www.cedrs.org/CA-CRELs.pdf>) (Adopted by the State of California Office of Environmental Health Hazard Assessment (OEHHA), December 2008).

² Methyl-2-Pyrrolidone must be ≤ 0.08 mg/m³ for office seating and ≤ 0.16 mg/m³ for all other product types.

³ Defined to be the total response of measured VOCs falling within the C-C₁₀ range, with responses calibrated to a toluene surrogate.

⁴ Particles are only applicable to fibrous, particle-releasing products with exposed surface area in air streams.

Seating, Workstations and Caseload Systems comply with ANSI/BIFMA e3-2011a Credit 7.6.2. Workstations have been evaluated and show compliance to the Open Plan and Private Office Environments. Caseload systems have been evaluated and show compliance to the Private Office Environment. Seating shows compliance in the BIFMA seating environment for office chairs and the CPFH classroom for student seating. Educational furniture is evaluated in the CPFH classroom environment.

Complies with California Department of Public Health "Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions from Indoor Sources Using Environmental Chambers," Version 1.1," (CA Section 01350).

GREENGUARD Certification affirms that representative samples of the products tested meet the criteria of the referenced standards and the requirements of the specific certification program. Certification testing is conducted according to a consistent, defined protocol. It does not measure emissions under usage conditions other than those defined in the protocol and does not address potential environmental impact other than chemical emissions.

The GREENGUARD Environmental Institute (GEI) is an independent, third-party certification organization that qualifies products for low chemical emissions. GREENGUARD certification programs use defined product standards, test methodologies, product sample collection and handling procedures, testing types and frequencies, program application processes, and on-going verification procedures. GREENGUARD standards, methods, and procedures are available at www.GREENGUARD.org.

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STARON® accreditation

GREENGUARD
Indoor Air Quality Certified

Certificate of Compliance

Certification Details:

Certificate No: 4112-410
Status: Certified
Period: 09/2007 - 09/2013
Restrictions: NONE

Staron® solid surface Sinks and Bowls
Samsung Staron

This product has been certified according to the GREENGUARD Indoor Air Quality (IAQ) Certification Program for Low Emitting Products

Reference Standard: GGPS-001 GREENGUARD IAQ Standard for Building Materials, Finishes, and Furnishings
Product Type: Furniture Components/Materials, Seating, and Free Standing Furniture and Furnishings Units

Criteria	Allowable Limits
TVOC ¹	≤ 0.25 mg/m ³
Formaldehyde	≤ 0.025 ppm
Total Aldehydes ²	≤ 0.05 ppm
Individual VOCs ³	≤ 0.1 TLV
4-phencyclohexene	≤ 0.0033 mg/m ³

Listing of measured carcinogens and reproductive toxins as identified by California Proposition 65, the U.S. National Toxicology Program (NTP), and the International Agency on Research on Cancer (IARC) must be provided.

Any pollutant regulated as a primary or secondary outdoor air pollutant that will not generate an air concentration greater than that promulgated by the National Ambient Air Quality Standard (NAAQS), code of Federal Regulations, Title 40, Part 50.

See referenced standard for a complete technical explanation.

¹ Defined to be the total response of measured VOCs falling within the C-C₁₀ range, with responses calibrated to a toluene surrogate.

² Defined to be the total response of a target list of aldehydes (2-hexenal, acrolein, benzaldehyde, C-3 dimethylacetaldehyde, 2-methylbutanaldehyde, 2 and/or 4-methylpentanaldehyde, hexanal, 3-methylbutanal, formaldehyde, hexanal, pentanal, propenal), with each individually calibrated to a compound specific standard.

³ Any pollutant not listed must produce an air concentration level no greater than 1/10 the Threshold Limit Value (TLV) industrial work place standard (Reference: American Conference of Government Industrial Hygienists, 6500 Chemsy, Building D-7, Cincinnati, Ohio 45211-4438). Seating complies with ANSI/BIFMA X7.1-2011, ANSI/BIFMA X7.3-2011, and ANSI/BIFMA e3-2011a Credit 7.6.1. Seating has been evaluated and shown compliance to the ANSI/BIFMA seating requirements.

GREENGUARD Certification affirms that representative samples of the products tested meet the criteria of the referenced standards and the requirements of the specific certification program. Certification testing is conducted according to a consistent, defined protocol. It does not measure emissions under usage conditions other than those defined in the protocol and does not address potential environmental impact other than chemical emissions.

The GREENGUARD Environmental Institute (GEI) is an industry independent, third-party certification organization that qualifies products for low chemical emissions. GREENGUARD Certification programs use defined product standards, test methodologies, product sample collection and handling procedures, program application processes and on-going verification procedures. GREENGUARD standards, methods, and procedures are available at www.GREENGUARD.org.

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GREENGUARD
Children & Schools
Indoor Air Quality Certified

Certificate of Compliance

Certification Details:

Certificate No: 4112-420
Status: Certified
Period: 09/2007 - 09/2013
Restrictions: NONE

Staron® solid surface Sinks and Bowls
Samsung Staron

In addition to meeting the GREENGUARD Children & Schools Certification Criteria, this product complies with CA Section 01350 Version 1.1, including the 2012 update for formaldehyde at 9 µg/m³ (office seating ≤ 4.5 µg/m³).

Reference Standard: GGPS-002 GREENGUARD Children & Schools™ Standard
Product Type: All Products

Criteria	Allowable Limits
Individual VOCs ¹	≤ 1/100 TLV and ≤ 1/4 CA CREL (Office Seating ≤ 1/100 TLV and ≤ 1/4 CA CREL)
Formaldehyde	≤ 0.0135 ppm /13.5 ppb (Office Seating ≤ 0.00675 ppm / 6.75 ppb)
TVOC ²	≤ 0.22 mg/m ³
Total Aldehydes ³	≤ 0.043 ppm /43 ppb
Total Phthalates	≤ 0.01 mg/m ³
Total Particles ⁴	≤ 0.02 mg/m ³

See referenced standard for a complete technical explanation.

¹ Any VOC not listed must produce an air concentration level no greater than 1/100 the Threshold Limit Value (TLV) industrial work place standard (Reference: American Conference of Government Industrial Hygienists, 6500 Chemsy, Building D-7, Cincinnati, Ohio 45211-4438) and no greater than 1/4 the CA Chronic Reference Exposure Level (CREL). (<http://www.cedrs.org/CA-CRELs.pdf>) (Adopted by the State of California Office of Environmental Health Hazard Assessment (OEHHA), December 2008).

² Methyl-2-Pyrrolidone must be ≤ 0.08 mg/m³ for office seating and ≤ 0.16 mg/m³ for all other product types.

³ Defined to be the total response of measured VOCs falling within the C-C₁₀ range, with responses calibrated to a toluene surrogate.

⁴ Particles are only applicable to fibrous, particle-releasing products with exposed surface area in air streams.

Seating, Workstations and Caseload Systems comply with ANSI/BIFMA e3-2011a Credit 7.6.2. Workstations have been evaluated and show compliance to the Open Plan and Private Office Environments. Caseload systems have been evaluated and show compliance to the Private Office Environment. Seating shows compliance in the BIFMA seating environment for office chairs and the CPFH classroom for student seating. Educational furniture is evaluated in the CPFH classroom environment.

Complies with California Department of Public Health "Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions from Indoor Sources Using Environmental Chambers," Version 1.1," (CA Section 01350).

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STARON® accreditation

SCS Global Services does hereby certify that an independent assessment has been conducted on behalf of:

Samsung Cheil Industries Inc.

332-2 Gochon-Dong, Ulsang-Si, Gyeonggi-Do, Korea

For the following product(s):

Staron: Sanded Cream, Sanded Dark Nebula, Sanded Gold Dust, Sanded Grey, Sanded Mocha, Sanded Onyx, Sanded Sahara, Sanded Vermillion, Aspen Brown, Aspen Mine, Aspen Pepper, Aspen Snow, Pebble Blue, Pebble Copper, Pebble Ebony, Pebble Frost, Pebble Gold, Pebble Grey, Pebble Saratoga, Pebble Seastar, Pebble Sienna, Quarry Bluff, Quarry Mesa, Quarry Oyster



This product meets all of the necessary qualifications to be certified for the following claim:
Minimum 3% Pre-consumer Recycled Resin and Chip Content
 Conforms to the SCS Recycled Content Standard V6-0
 Registration # SCS-MC-01956
 Valid from: August 1, 2012 to July 31, 2013



Robert J. Hrabes, Ph.D., Executive Vice President
 SCS Global Services
 2000 Powell Street, Ste. 600, Emeryville, CA 94608 USA

NSF International

RECOGNIZES

SAMSUNG CHEIL INDUSTRIES INC.
KOREA

AS COMPLYING WITH ANSI/NSF 51,
 PRODUCTS APPEARING IN THE NSF OFFICIAL LISTING ARE
 AUTHORIZED TO BEAR THE NSF MARK.






This certificate is the property of NSF International and must be returned upon request. To verify certification, call 800-NSF-MARK or (1) 724-769-8000.

September 28, 2000
 Certificate #3369033690C

Joseph L. Phillips, General Manager
 Food Equipment

STARON® accreditation

IAPMO RESEARCH AND TESTING, INC.
 5001 East Philadelphia Street, Ontario, California 91761-2816 • (909) 472-4100 Fax (909) 472-4244 • www.iapmo.org






CERTIFICATE OF LISTING

Effective Date: December 2011 Void After: December 2012
 Product: Lavatories (Plastic) File No. 4316
 Issued To: Cheil Industries Inc./Samsung
 332-2 Gochon-Dong
 Bilsong-Si, GYONGGI-DO 437-711
 Korea

IDENTIFICATION: Each fixture or fixture component shall be marked with the manufacturer's name or registered trademark. This mark shall be legible, readily identified, and applied so as to be permanent. The mark shall be located so as to be visible after the fixture is installed except for fixtures built into or for a counter or cabinet. The product shall also bear UPC certification mark.

CHARACTERISTICS: Lavatories manufactured from plastic materials to be installed in accordance with the manufacturer's instructions and the requirements of the latest edition of the Uniform Plumbing Code. Available in various styles and colors and with or without overflows.

Products comply with the applicable sections of the latest edition of the Uniform Plumbing Code and the International Plumbing Code. Manufactured in compliance with IAPMO/ANSI 214-2011.

Products listed on this certificate have been tested by an IAPMO RAT recognized laboratory. This recognition has been granted based upon the

Robert P. Simeone, Chairman, Product Certification Committee Peter Cheney, CEO, The IAPMO Group



IAPMO RESEARCH AND TESTING, INC.
 5001 East Philadelphia Street, Ontario, California 91761-2816 • (909) 472-4100 Fax (909) 472-4244 • www.iapmo.org






CERTIFICATE OF LISTING

Effective Date: October 2011 Void After: October 2012
 Product: Sinks (Plastic) File No. 4319
 Issued To: Cheil Industries Inc./Samsung
 332-2 Gochon-Dong
 Bilsong-Si, GYONGGI-DO 437-711
 Korea

IDENTIFICATION: Manufacturer's name or trademark, or both shall be permanently and legibly marked on the unit so as to be visible after installation. The product shall also bear the UPC certification mark.

CHARACTERISTICS: Sinks, bar, laundry and/or service sinks manufactured from plastic materials to be installed in accordance with the manufacturer's instructions and the requirements of the latest edition of the Uniform Plumbing Code.

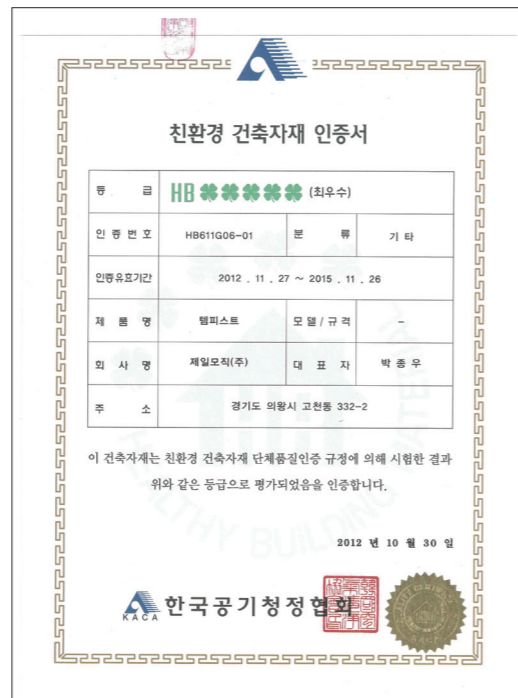
Products comply with the applicable sections of the latest edition of the Uniform Plumbing Code and the International Plumbing Code. Manufactured in compliance with IAPMO/ANSI 214-2011.

Products listed on this certificate have been tested by an IAPMO RAT recognized laboratory. This recognition has been granted based upon the laboratory's compliance to the applicable requirements of ISO/IEC 17025.

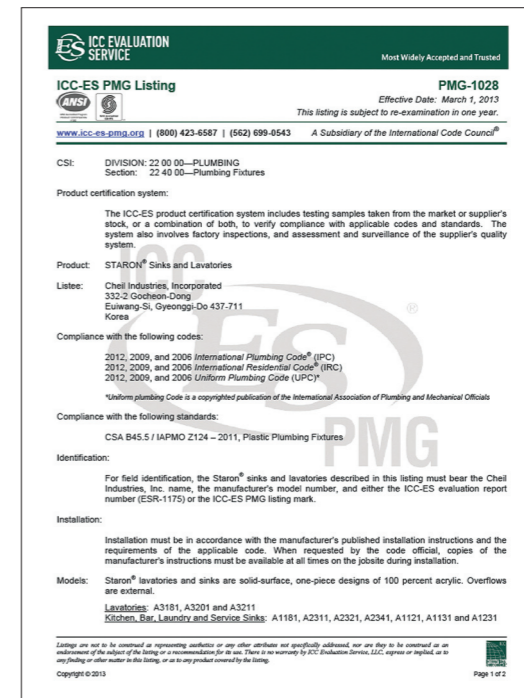
Robert P. Simeone, Chairman, Product Certification Committee Peter Cheney, CEO, The IAPMO Group




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DNV 인증서
경영시스템 인증서

인증서 번호 76730-2010-AQ-KOR-RvA

DNV 인증원은 아래 회사의 경영 시스템이 기술된 인증표준과 인증범위를 만족함을 증명합니다.

제일모직 (주)
케미칼 사업부

권라남도 여수시 평어동 62번지

인증표준
ISO 9001:2008, KS Q ISO 9001:2009

인증범위
ABS, EP, PS, SAN, EPS, 인조대리석, 생크롬, PC, 실리콘 인조 대리석판의 설계, 개발, 제조

인증서 유효기간
시작 2010년 5월 25일

발급일자
2011년 3월 7일

종료 2014년 4월 14일

인증기관 / DNV 인증원

최 경 순 / 심사원

안 인 규 / 원장

부속서의 인증유효기간을 충족하지 못하면 이 인증서의 효력이 없어질 수 있습니다.



DET NORSKE VERITAS
MANAGEMENT SYSTEM CERTIFICATE

Certificate No. 82186CC2-2010-AE-KOR-RvA

This is to certify that the Management System of

CHEIL INDUSTRIES INC.

62, Pyeongseo-dong, Yeosu-si, Jeollanam-do, Korea

has been found to conform to the Management System Standard:
ISO 14001:2004, KS 1 ISO 14001:2009

This Certificate is valid for the following product or service ranges:
Design & Development, Production and Servicing of ABS(Acrylonitrile Butadiene Styrene), PS(Poly Styrene), SAN(Styrene Acrylonitrile), EPS(Expandable Poly Styrene), LD(Light Diffuser), EP(Engineering Plastics), SS(Solid Surface), DP(Diffusion Plate), S&B(Sink & Bowl), PC(Poly Carbonate) and QS(Quartz Surface)

Original Certification date: March 19th, 2002

Place and date: Seoul, July 28th, 2010

This Certificate is valid until: July 28th, 2013

for the Accredited Unit: DNV CERTIFICATION B.V., THE NETHERLANDS

Compliance to the Standard in respect to the indicated scope is verified by the DNV approved registered Team Leader

Hun-Hee Lee
Lead Auditor

In-Kyoon Ahn
Management Representative

Lack of fulfillment of conditions as set out in the Appendix may render this Certificate invalid.
DNV CERTIFICATION B.V. Doekweg 1, 3991 LB Baarn/Netherlands, The Netherlands

STARON® accreditation

CERTIFICATE OF APPROVAL

CHEIL INDUSTRIES INC.

62, PYONGSEO-DONG, YEOSU-SI, JEOLLANAM-DO, KOREA

Korean Standards Association hereby certifies that the Quality Management System of the above organization has been assessed and found to meet the requirements of the standard and scope of certification detailed below:

CERTIFICATION No. QMS-3257

STANDARD KS Q ISO 9001:2009/ISO 9001:2008

SCOPE OF CERTIFICATION DESIGN, DEVELOPMENT, PRODUCTION AND SERVICING OF ABS(AcrylonitrileButadiene Styrene), PS(Poly Styrene), SAN(Styrene Acrylonitrile), EP(Engineering Plastics), EPS(Expandable Poly Styrene), SS(Solid Surface), S&B(Sink&Bowl), PC(Poly Carbonate) AND QS(Quartz Surface)

VALID FROM 15 April, 2011

VALID UNTIL 14 April, 2014

Original Certification Date : 25 March, 2002

Date of Issue : 28 February, 2011

Kaphay Chon
THE CHAIRMAN OF KSA

KOREAN STANDARDS ASSOCIATION
701-7, Yeoksam-Dong, Gangnam-Gu, Seoul, Korea

Accredited by Member of the IAF (No. 048) The Accreditation Mark (NS mark) indicates accreditation in respect of those activities covered by the Accreditation Certificate Number KSAQ-10

KSA **UKAS** **IAF**



KS CERTIFICATE

This is to certify that the Korean Industrial Standard Mark(KS mark) of:

Cheil Industries INC.
62, Pyeongseo-dong, Yeosu-si, Jeollanam-do, Korea
Baek, Hwang

has been approved by Korean Standards Association to the following Korean Industrial Standard:

KSF4739
Artificial silica marble panel

in accordance with the Korean Industrial Standardization Act.

Certificate Number : 10-0042

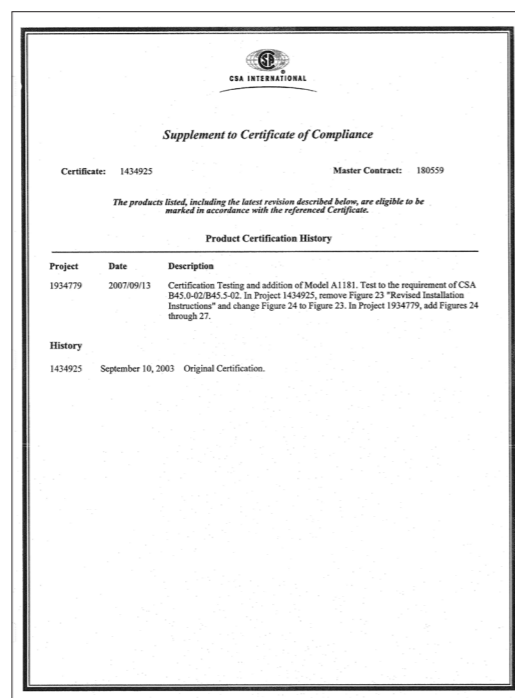
Certification Date : 27-Jan-2010

Current Certificate : 26-Feb-2010

Certified by *Kaphay Chon*
President

Korean Standards Association
Korea Technology Center, 701-7, Yeoksam-dong, Gangnam-gu, Seoul, Korea

STARON® accreditation



Material safety data sheet

1. Product and company identification

PRODUCT NAME	Staron® solid surfaces sheet
COMPANY	Samsung SDI Chemical
EMERGENCY TELEPHONE	82-61-689-1531
ADDRESS	Yeosu Plant 62, Pyong Yo-Dong, Yeosu-Si, Cheon Nam, Korea

2. Composition/Information on ingredients

INGREDIENT:	Acrylic Polymer
INGREDIENT SEQUENCE NUMBER :	01
PERCENT	40 ~ 45
CAS NUMBER	9011 - 14 - 7
INGREDIENT	Hydrated Alumina, Aluminum Hydroxide, Aluminum Trihydroxide
INGREDIENT SEQUENCE NUMBER	02
PERCENT	55 ~ 60
NIOSH(RTECS) NUMBER	BD094000
CAS NUMBER	21645 - 51 - 2

3. Hazards identification

Staron® solid surfaces sheet is not hazardous when shipped. However, operations such as sawing, routing, drilling and sanding can generate dust. High concentrations of dust can irritate eyes, nose and respiratory passages and cause coughing and sneezing. Even though there are no exposure limits established for dust from Staron® solid surfaces sheet, avoid breathing dust. (See details in the Exposure Controls/Personal Protection section of this MSDS)

Staron® solid surfaces sheet does not off-gas at room temperature. At higher temperature, a small amount of methyl methacrylate can be released. The amount depends on temperature, time and other variables. Methyl methacrylate vapors can irritate eyes, skin, nose and throat and can cause allergic skin rashes. Over exposure to methyl methacrylate vapors can cause headaches, nausea, weakness, lung irritation and shortness of breath. Individuals with pre-existing lung or skin problems may be more susceptible to the effects of over exposure to methyl methacrylate.

4. First aid measures

INHALATION	Move to fresh air
EYE CONTACT	Not applicable
SKIN CONTACT	Not applicable

5. Fire fighting measures

AFTER SPILLAGE/LEAKAGE/GAS LEAKAGE

Keep away from all of ignition sources. Ensure adequate ventilation. Use personal protective equipment. Soak up with inert absorbent material. Clean with detergents. Avoid solvents.

EXTINGUISHING MEDIA

Dry powder, foam, carbon dioxide, water spray

6. Accidental release measures

Review FIRE FIGHTING MEASURES and HANDLING AND STORAGE sections before proceeding with clean-up. Use appropriate personal protective equipment during clean-up.

7. Handling and storage

HANDLING

Staron® solid surfaces sheet should be unloaded with a forklift or other lifting device capable of handling pallets safely. If a lifting device is not available, always carry single sheet in the vertical position, and wear heavy-duty protective gloves and proper safety shoes. Carrying should be done by two people facing each other on short sides with one hand under to support and the other hand on top to control the sheet.

STORAGE

Keep capable of handling sheet flat and evenly supported at temperatures between 15° ~ 23°C [59° ~ 73°F], in a dry and well-ventilated indoor area.

8. Exposure controls/Personal protection

TECHNICAL PROTECTIVE MEASURES

Provide for appropriate exhaust ventilation and dust collection at machinery.

PERSONAL PROTECTIVE EQUIPMENT

RESPIRATION (DURING MACHINING OPERATION): In case of insufficient ventilation, wear appropriate respiratory equipment in compliance with local regulations.

EYES (DURING MACHINING OPERATION): Use tightly fitting safety goggles or face-shield.

HANDS (DURING MACHINING PERATION): Wear protective gloves.

OTHERS (DURING MACHINING OPERATION): Use ear protection, safety shoes.

Those who are highly sensitivity should take precautions due to possible eye, nose or throat irritation from Staron® solid surfaces dust and fumes.

9. Physical and chemical properties

FORM	Solid sheet
COLOR	Various
ODOR	None
BOILING POINT	Not Applicable
MELTING POINT	Not Applicable
SPECIFIC GRAVITY (WATER = 1)	1.6 ~ 1.8
VAPOR PRESSURE (mmHg)	Not Applicable
VAPOR DENSITY (Air = 1)	Not Applicable
SOLUBILITY IN WATER	Insoluble
pH	Not Applicable
FLASH POINT	Not Applicable
IGNITION TEMPERATURE	Not Applicable
EXPLOSION LIMITS	Lower = Not Applicable Upper = Not Applicable

10. Stability and reactivity

THEMAL DECOMPOSITION PRODUCT

Frictional heat generated from sawing and routing Staron® solid surfaces sheet can reach or exceed a temperature of 300°C. This is high enough to release a small amount of methyl methacrylate vapor.

HAZARDOUS DECOMPOSITION PRODUCT

Carbon monoxide, methyl methacrylate monomer, smoke

HAZARDOUS REATION

None

FURTHER INFORMATION

Sprayed mist may be flammable at temperature below the flash point.

11. Toxicological information

METHYL METHACRYLATE

TLV-TWA = 100 ppm = 410 mg/m³; ACGIH (1991-2)

LD50/oral/rat = 7872 mg/kg; RTECS, 47796

Methyl methacrylate can be present on the cutting tool face at a concentration exceeding the TLV of 100 ppm. However, it dissipates to very low levels with good ventilation.

12. Ecological information

Staron® solid surfaces sheet is manufactured by Samsung SDI Chemical. in accordance with ISO-14001 standards.

13. Disposal considerations

Can be landfilled or incinerated, when in compliance with local regulations.

14. Transport information

Not classified as dangerous in the meaning of transport regulations.

15. Regulatory information

U.S. FEDERAL REGULATIONS

TSCA Inventory Status: In compliance with TSCA Inventory requirements for commercial purposes.

16. Other information

ADDITIONAL INFORMATION

Do not use in medical applications involving permanent implantation in the human body.

We hereby certify that the above statements are accurate.

Signature/Issued Date: Samsung SDI Chemical. / DEC. 2006

Staron® solid surfaces
Samsung SDI Chemical

1. Product and company identification

PRODUCT NAME	Staron® Tempest® Sheet
COMPANY	Samsung SDI Chemical.
EMERGENCY TELEPHONE	82-61-689-1531
ADDRESS	Yeosu Plant 62, Pyong Yo-Dong, Yeosu-Shi, Cheon Nam, Korea

2. Composition/Information on ingredients

INGREDIENT:	Acrylic Polymer
INGREDIENT SEQUENCE NUMBER :	01
PERCENT	35 ~ 40
CAS NUMBER	9011 - 14 - 7
INGREDIENT	Hydrated Alumina, Aluminum Hydroxide, Aluminum Trihydroxide
INGREDIENT SEQUENCE NUMBER	02
PERCENT	40 ~ 50
NIOSH(RTECS) NUMBER	BD094000
CAS NUMBER	21645 - 51 - 2
INGREDIENT:	Trade secret
INGREDIENT SEQUENCE NUMBER :	03
PERCENT	10 ~ 25
CAS NUMBER	Trade secret

3. Hazards identification

Staron® Tempest® sheet is not hazardous when shipped. However, operations such as sawing, routing, drilling and sanding can generate dust. High concentrations of dust can irritate eyes, nose and respiratory passages and cause coughing and sneezing. Even though there are no exposure limits established for dust from Staron® Tempest® sheet, avoid breathing dust. [See details in the Exposure Controls/Personal Protection section of this MSDS]

Staron® Tempest® sheet does not off-gas at room temperature. At higher temperature, a small amount of methyl methacrylate can be released. The amount depends on temperature, time and other variables. Methyl methacrylate vapors can irritate eyes, skin, nose and throat and can cause allergic skin rashes. Over exposure to methyl methacrylate vapors can cause headaches, nausea, weakness, lung irritation and shortness of breath. Individuals with pre-existing lung or skin problems may be more susceptible to the effects of over exposure to methyl methacrylate.

4. First aid measures

INHALATION	Move to fresh air
EYE CONTACT	Not applicable
SKIN CONTACT	Not applicable
INGESTION	Not applicable

5. Fire fighting measures

AFTER SPILLAGE/LEAKAGE/GAS LEAKAGE

Keep away from all of ignition sources. Ensure adequate ventilation. Use personal protective equipment. Soak up with inert absorbent material. Clean with detergents. Avoid solvents.

EXTINGUISHING MEDIA

Dry powder, foam, carbon dioxide, water spray

6. Accidental release measures

Review FIRE FIGHTING MEASURES and HANDLING AND STORAGE sections before proceeding with clean-up. Use appropriate personal protective equipment during clean-up.

7. Handling and storage

HANDLING:

Staron® Tempest® sheet should be unloaded with a forklift or other lifting device capable of handling pallets safely. If a lifting device is not available, always carry single sheet in the vertical position, and wear heavy-duty protective gloves and proper safety shoes. Carrying should be done by two people facing each other on short sides with one hand under to support and the other hand on top to control the sheet.

STORAGE

Keep capable of handling sheet flat and evenly supported at temperatures between 15° ~ 23°C (59° ~ 73°F), in a dry and well-ventilated indoor area.

8. Exposure controls/Personal protection

TECHNICAL PROTECTIVE MEASURES

Provide for appropriate exhaust ventilation and dust collection at machinery.

PERSONAL PROTECTIVE EQUIPMENT

RESPIRATION (DURING MACHINING OPERATION): In case of insufficient ventilation, wear appropriate respiratory equipment in compliance with local regulations.

EYES (DURING MACHINING OPERATION): Use tightly fitting safety goggles or face-shield.

HANDS (DURING MACHINING OPERATION): Wear protective gloves.

OTHERS (DURING MACHINING OPERATION): Use ear protection, safety shoes.

Those who are highly sensitivity should take precautions due to possible eye, nose or throat irritation from Staron® Tempest® dust and fumes.

9. Physical and chemical properties

FORM	Solid sheet
COLOR	Various
ODOR	None
BOILING POINT	Not Applicable
MELTING POINT	Not Applicable
SPECIFIC GRAVITY (WATER = 1)	1.6 ~ 1.8
VAPOR PRESSURE (mmHg)	Not Applicable
VAPOR DENSITY (Air = 1)	Not Applicable
SOLUBILITY IN WATER	Insoluble
pH	Not Applicable
FLASH POINT	Not Applicable
IGNITION TEMPERATURE	Not Applicable
EXPLOSION LIMITS	Lower = Not Applicable Upper = Not Applicable

10. Stability and reactivity

THERMAL DECOMPOSITION PRODUCT

Frictional heat generated from sawing and routing Staron® Tempest® sheet can reach or exceed a temperature of 300°C. This is high enough to release a small amount of methyl methacrylate vapor.

HAZARDOUS DECOMPOSITION PRODUCT

Carbon monoxide, methyl methacrylate monomer, smoke

HAZARDOUS REACTION None

FURTHER INFORMATION

Sprayed mist may be flammable at temperature below the flash point.

11. Toxicological information

METHYL METHACRYLATE

TLV-TWA = 100 ppm = 410 mg/m³; ACGIH (1991-2)

LD50/oral/rat = 7872 mg/kg; RTECS, 47796

Methyl methacrylate can be present on the cutting tool face at a concentration exceeding the TLV of 100 ppm. However, it dissipates to very low levels with good ventilation.

12. Ecological information

Staron® Tempest® sheet is manufactured by Samsung SDI Chemical. in accordance with ISO-14001 standards.

13. Disposal considerations

Can be landfilled or incinerated, when in compliance with local regulations.

14. Transport information

Not classified as dangerous in the meaning of transport regulations.

www.staron.com

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