SAMSUNG

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®

Cleaning sinks & bowls

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 70 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.

√ **MATTE 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 Matte 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 Matte/Satin Finish. Therefore, be sure not to apply the same method or process recommended for a Matte/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.

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.

STARON®

The information contained herein is provided by Cheil Industries, Inc. 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 Solid colors Patterened colors	 1.72 1.69	ASTM D 792
Water absorption	0.04% (1/2",24hrs) 0.11% (1/8",24hrs)	ASTM D 570
Flammability Flame spread Smoke density	Class A / Class 1 10 10	UBC 8-1 ASTM E 84 ASTM E 84
Radiant heat resistance	No visual effect	NEMA LD-3
Toxicity	84.4g (Solid Color) 81.8g (Patterned Color)	Pittsburgh Test Protocol (LC50 Test)

TEMPEST®

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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 preparat ion 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
- Rat ing : 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 30ºC and increasing at a rate of 20ºC/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 realtionship, 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 atmo sphere.

- 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 300ºC (572ºF), 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		ºC	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 concentrat ions 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%)
- Ammonia
- Amyl acetate
- Ball point pen
- Bleach (household type)
- B-4 body conditioner
- Carbon disulfide
- Citric acid (10%)
- Cigarette (nicotine and tar)
- Cooking oils
- Cupra ammonia
- Ethanol
- Ethyl ether
- Gasoline
- 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 (5,10,25,40%)
- Sodium sulfate
- Sugar (sucrose)
- Sulfuric acid (25,33,60%)
- Tetrahydrofuran
- 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
- Formaldehde
- Gentian violet
- Hair dyes
- Hydrochloric acid (20,30,37%)
- Iodine (1%)
- Lemon juice
- Mercurochrome (2%)
- Methyl ethyl ketone
- Methyl red (1%)
- Mustard
- Naphthalene
- Olive oil
- Perchloric acid
- Shoe polish
- Sodium bisulfate
- Soy sauce
- Sulfuric acid (25,33,60%)
- Tea
- Toluene
- Urea (6%)
- Vinegar
- Wine
- 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%)
- Acid drain cleansers
- Chlorobenzene
- Chloroform (100%)
- Chromic trioxide acid
- Cresol
- Dioxane
- Ethyl acetate
- Equalizing mix (50/50)
- Film developer
- Formic acid (50,90%)
- Furfural
- Glacial acetic acid
- Hydrofluoric acid (48%)
- Luralite mix (50/50)
- Methylene chloride based products such as paint removers, brush cleansers and some metal cleansers
- Nitric acid (25,30,70%)
- Phenol (40,85%)
- Phosphoric acid (75,90%)
- Sulfuric acid (77,96%)
- Trichloroacetic acid (10,50%)
- 3M Avagard™ D

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.

GREENGUARD Indoor Air Quality Certified

September 18, 2007	*90043*	*Carl E. Smith*
CERTIFICATION DATE	CERTIFICATION NUMBER	EXECUTIVE DIRECTOR

FOR DISPLAY PURPOSES ONLY

STARON® accreditation

GREENGUARD Indoor Air Quality Certified

Certificate of Compliance

Certification Details:
Certificate No: 4109-410
Status: Certified
Period: 09/2007 - 09/2013
Restrictions: NONE

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 Furnishings
Product Type: Furniture Components/Materials, Seating, and Free Standing Furniture and Furnishing Units

Criteria	Allowable Limits
TVOC[1]	≤ 0.25 mg/m³
Formaldehyde	≤ 0.025 ppm
Total Aldehydes[2]	≤ 0.05 ppm
Individual VOC's[3]	≤ 0.1 TLV
4-phenylcyclohexene	≤ 0.0013 mg/m³

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 (U.S. EPA, 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_6-C_{16} range, with responses calibrated to a toluene surrogate.

[2] Defined to be the total response of a target list of aldehydes (2-butenal; acetaldehyde; benzaldehyde; 2, 5-dimethylbenzaldehyde, 2-methylbenzaldehyde; 3-and/or 4-methylbenzaldehyde; butanal; 3-methylbutanal; formaldehyde; hexanal; pentanal; propanal), 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 e3-2011e Credit 7.6.1. Seating has been evaluated and shows compliance in the ANSI/BIFMA seating environment.

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.

 GGPC.001D

Children & Schools GREENGUARD Indoor Air Quality Certified

Certificate of Compliance

Certification Details:
Certificate No: 4109-420
Status: Certified
Period: 09/2007 - 09/2013
Restrictions: NONE

Staron® solid surface sheets
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/m²).

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

Criteria	Allowable Limits
Individual VOCs[1,2]	≤ 1/100 TLV and ≤ ½ CA CREL (Office Seating ≤ 1/100 TLV and ≤ ¼ CA CREL)
Formaldehyde	≤ 0.0135 ppm /13.5 ppb (Office Seating ≤ 0.00675 ppm / 6.75 ppb)
TVOC[3]	≤ 0.22 mg/m³
Total Aldehydes	≤ 0.043 ppm /43 ppb
Total Phthalates	≤ 0.01 mg/m³
Total Particles[4]	≤ 0.02 mg/m²

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 Glenway, Building D-7, Cincinnati, Ohio 45211-4438) and no greater than ½ the CA Chronic Reference Exposure Level (CREL) http://www.oehha.ca.gov/air/chronic_rels/AllChrels.html (Adopted by the State of California Office of Environmental Health Hazard Assessment (OEHHA), December 2008).

[2] 1-Methyl-2-Pyrrolidinone 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_6-C_{16} 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 Casegood Systems comply with ANSI/BIFMA e3-2011e Credit 7.6.2. Workstations have been evaluated and show compliance in the the Open Plan and Private Office Environments. Casegood systems have been evaluated and show compliance in the Private Office Environment. Seating shows compliance in the BIFMA seating environment for office chairs and the CDPH classroom for student seating. Educational furniture is evaluated in the CDPH 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.

 GGPC.002

STARON® accreditation

Certificate of Compliance

Staron® Tempest™
Samsung Staron

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

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

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

Criteria	Allowable Limits
TVOC[1]	≤ 0.25 mg/m³
Formaldehyde	≤ 0.025 ppm
Total Aldehydes[2]	≤ 0.05 ppm
Individual VOCs[3]	≤ 0.1 TLV
4-phenylcyclohexene	≤ 0.0033 mg/m³
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 (U.S. EPA, 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_6-C_{16} range, with responses calibrated to a toluene surrogate.

[2] Defined to be the total response of a target list of aldehydes (2-butenal; acetaldehyde; benzaldehyde; 2, 5-dimethylbenzaldehyde, 2-methylbenzaldehyde; 3-and/or 4-methylbenzaldehyde; butanal; 3-methylbutanal; formaldehyde; hexanal; pentanal; propanal), 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 e3-2011e Credit 7.6.1. Seating has been evaluated and shows compliance in the ANSI/BIFMA seating environment.

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.

 GGPC.001D

Certificate of Compliance

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/m²).

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

Reference Standard: GCPS.002 GREENGUARD Children & Schools™ Standard
Product Type: All Products

Criteria	Allowable Limits
Individual VOCs[1,2]	≤ 1/100 TLV and ≤ ½ CA CREL (Office Seating ≤ 1/100 TLV and ≤ ¼ CA CREL)
Formaldehyde	≤ 0.0135 ppm /13.5 ppb (Office Seating ≤ 0.00675 ppm / 6.75 ppb)
TVOC[1]	≤ 0.22 mg/m³
Total Aldehydes	≤ 0.043 ppm /43 ppb
Total Phthalates	≤ 0.01 mg/m³
Total Particles[4]	≤ 0.02 mg/m³

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 Glenway, Building D-7, Cincinnati, Ohio 45211-4438) and no greater than TI the CA Chronic Reference Exposure Level (CREL) http://www.oehha.ca.gov/air/chronic_rels/AllChrels.html (Adopted by the State of California Office of Environmental Health Hazard Assessment (ODEHA), December 2008).

[2] 1-Methyl-2-Pyrrolidinone 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_6-C_{16} 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 Casegood Systems comply with ANSI/BIFMA e3-2011e Credit 7.6.2. Workstations have been evaluated and show compliance in the the Open Plan and Private Office Environments. Casegood systems have been evaluated and show compliance in the Private Office Environment. Seating shows compliance in the BIFMA seating environment for office chairs and the CDPH classroom for student seating. Educational furniture is evaluated in the CDPH 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.

 GGPC.002

STARON® accreditation

Certificate of Compliance

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

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

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

Criteria	Allowable Limits
TVOC[1]	≤ 0.25 mg/m³
Formaldehyde	≤ 0.025 ppm
Total Aldehydes[2]	≤ 0.05 ppm
Individual VOCs[3]	≤ 0.1 TLV
4-phenylcyclohexene	≤ 0.0033 mg/m³
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 (U.S. EPA, 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_6-C_{16} range, with responses calibrated to a toluene surrogate.

[2] Defined to be the total response of a target list of aldehydes (2-butenal; acetaldehyde; benzaldehyde; 2, 5-dimethylbenzaldehyde, 2-methylbenzaldehyde; 3-and/or 4-methylbenzaldehyde; butanal; 3-methylbutanal; formaldehyde; hexanal; pentanal; propanal), 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 e3-2011e Credit 7.6.1. Seating has been evaluated and shows compliance in the ANSI/BIFMA seating environment.

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.

 GGPC.001D

Certificate of Compliance

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/m²).

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

Reference Standard: GCPS.002 GREENGUARD Children & Schools™ Standard
Product Type: All Products

Criteria	Allowable Limits
Individual VOCs[1,2]	≤ 1/100 TLV and ≤ ½ CA CREL (Office Seating ≤ 1/100 TLV and ≤ ¼ CA CREL)
Formaldehyde	≤ 0.0135 ppm /13.5 ppb (Office Seating ≤ 0.00675 ppm / 6.75 ppb)
TVOC[1]	≤ 0.22 mg/m³
Total Aldehydes	≤ 0.043 ppm /43 ppb
Total Phthalates	≤ 0.01 mg/m³
Total Particles[4]	≤ 0.02 mg/m³

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 Glenway, Building D-7, Cincinnati, Ohio 45211-4438) and no greater than TI the CA Chronic Reference Exposure Level (CREL) http://www.oehha.ca.gov/air/chronic_rels/AllChrels.html (Adopted by the State of California Office of Environmental Health Hazard Assessment (ODEHA), December 2008).

[2] 1-Methyl-2-Pyrrolidinone 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_6-C_{16} 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 Casegood Systems comply with ANSI/BIFMA e3-2011e Credit 7.6.2. Workstations have been evaluated and show compliance in the the Open Plan and Private Office Environments. Casegood systems have been evaluated and show compliance in the Private Office Environment. Seating shows compliance in the BIFMA seating environment for office chairs and the CDPH classroom for student seating. Educational furniture is evaluated in the CDPH 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.

 GGPC.002

STARON® accreditation

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

Samsung Cheil Industries Inc.

332-2 Gocheon-Dong, Uiwang-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

SCScertified. MINIMUM 3% RECYCLED CONTENT PRE-CONSUMER

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

SCSglobal SERVICES

Robert J. Hrubes, 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.

NSF®

Certification Program Accredited by the American National Standards Institute

Certification Program Accredited by SCC, Standards Council for Accreditation

Certification Program Accredited by the Standards Council of Canada

This certificate is the property of NSF International and must be returned upon request. To verify certification, call 800 NSF-MARK or (1) 734 769-8010.

September 28, 2000
Certificate #33690f33690C

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

ANSI Accredited Program PRODUCT CERTIFICATION ANSI

IAPMO R&T

ISO Accredited ISO/IEC 17065 IAPMO Accredited ISO/IEC 17025

UPC

CERTIFICATE OF LISTING

IAPMO Research and Testing, Inc. is a product certification body which tests and inspects samples taken from the supplier's stock or from the market or a combination of both to verify compliance to the requirements of applicable codes and standards. This activity is coupled with periodic surveillance of the supplier's factory and warehouses as well as the assessment of the supplier's Quality Assurance System. This listing is subject to the conditions set forth in this certificate and IAPMO R&T's Terms and Conditions. Nothing contained as any recommendation, assurance or guarantee by IAPMO Research and Testing, Inc. of the product acceptance by Authorities Having Jurisdiction.

Effective Date:	December 2011 — Void After: December 2012
Product:	Lavatories (Plastic) — File No. 4536
Issued To:	Cheil Industries Inc./samsung 332-2 Gochun-dong Eulwang-shi, GYOUNGKI-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 Z124-2011. Products listed on this certificate have been tested by an IAPMO R&T recognized laboratory. This recognition has been granted based upon the

Chairman, Product Certification Committee

CEO, The IAPMO Group

For the most accurate and updated information please visit http://pid.iapmo.org/4536

This listing period is based upon the last date of the month indicated on the Effective Date and Void After Date shown above. Any change in material, manufacturing process, marking or design without having first obtained the approval of the Product Certification Committee, or any evidence of non-compliance with applicable codes and standards or of inferior workmanship, may be deemed sufficient cause for revocation of this listing. Production of or reference to this form for advertising purposes may be made only by specific written permission of IAPMO Research and Testing, Inc. Any alteration of this certificate could be grounds for revocation of the listing.

IAPMO RESEARCH AND TESTING, INC.

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

ANSI Accredited Program PRODUCT CERTIFICATION ANSI

IAPMO R&T

ISO Accredited ISO/IEC 17065 IAPMO Accredited ISO/IEC 17025

UPC

CERTIFICATE OF LISTING

IAPMO Research and Testing, Inc. is a product certification body which tests and inspects samples taken from the supplier's stock or from the market or a combination of both to verify compliance to the requirements of applicable codes and standards. This activity is coupled with periodic surveillance of the supplier's factory and warehouses as well as the assessment of the supplier's Quality Assurance System. This listing is subject to the conditions set forth in this certificate and IAPMO R&T's Terms and Conditions. Nothing contained as any recommendation, assurance or guarantee by IAPMO Research and Testing, Inc. of the product acceptance by Authorities Having Jurisdiction.

Effective Date:	October 2011 — Void After: October 2012
Product:	Sinks (Plastic) — File No. 4519
Issued To:	Cheil Industries Inc./samsung 332-2 Gochun-dong Eulwang-shi, GYOUNGKI-DO 437-711 Korea
IDENTIFICATION:	Manufacturer's name or trademark, or both and 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:	Kitchen, 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 Z124-2011. Products listed on this certificate have been tested by an IAPMO R&T recognized laboratory. This recognition has been granted based upon the laboratory's compliance to the applicable requirements of ISO/IEC 17025.

Chairman, Product Certification Committee

CEO, The IAPMO Group

For the most accurate and updated information please visit http://pid.iapmo.org/4519

This listing period is based upon the last date of the month indicated on the Effective Date and Void After Date shown above. Any change in material, manufacturing process, marking or design without having first obtained the approval of the Product Certification Committee, or any evidence of non-compliance with applicable codes and standards or of inferior workmanship, may be deemed sufficient cause for revocation of this listing. Production of or reference to this form for advertising purposes may be made only by specific written permission of IAPMO Research and Testing, Inc. Any alteration of this certificate could be grounds for revocation of the listing.

STARON® accreditation

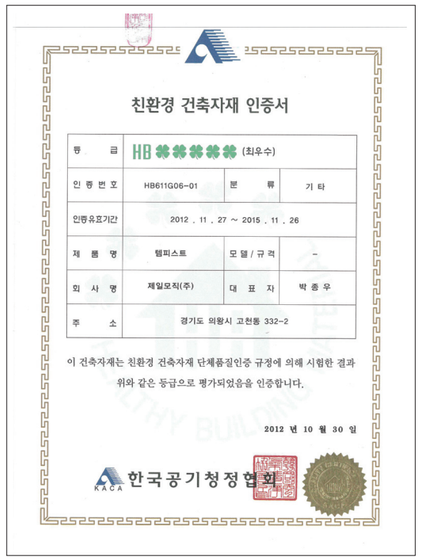
친환경 건축자재 인증서

등 급	HB ♣♣♣♣♣ (최우수)		
인 증 번 호	HB075G04-01	분 류	기 타
인증유효기간	2010 . 11 . 04 ~ 2013 . 11 . 03		
제 품 명	스타론	모델 / 규 격	-
회 사 명	제일모직(주)	대 표 자	황 백
주 소	경기도 의왕시 고천동 332-2		

이 건축자재는 친환경 건축자재 단체품질인증 규정에 의해 시험한 결과 위와 같은 등급으로 평가되었음을 인증합니다.

2010 년 10 월 27 일

KACA 한국공기청정협회



친환경 건축자재 인증서

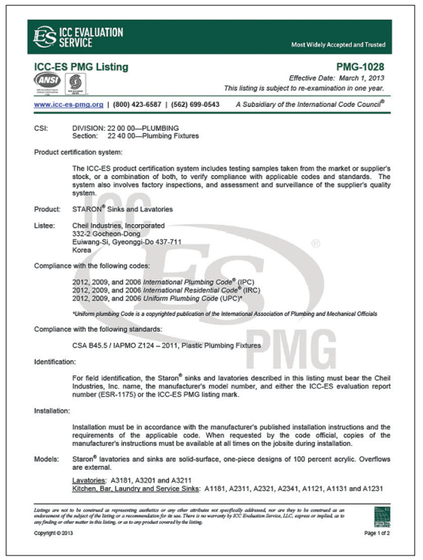
등 급	HB ♣♣♣♣♣ (최우수)		
인 증 번 호	HB611G06-01	분 류	기 타
인증유효기간	2012 . 11 . 27 ~ 2015 . 11 . 26		
제 품 명	텔피스트	모델 / 규 격	-
회 사 명	제일모직(주)	대 표 자	박 종 우
주 소	경기도 의왕시 고천동 332-2		

이 건축자재는 친환경 건축자재 단체품질인증 규정에 의해 시험한 결과 위와 같은 등급으로 평가되었음을 인증합니다.

2012 년 10 월 30 일

KACA 한국공기청정협회

STARON® accreditation



ICC EVALUATION SERVICE — Most Widely Accepted and Trusted

ICC-ES PMG Listing **PMG-1028**

Effective Date: March 1, 2013

This listing is subject to re-examination in one year.

www.icc-es-pmg.org | (800) 423-6587 | (562) 699-0543 *A Subsidiary of the International Code Council®*

CSI: DIVISION: 22 00 00—PLUMBING
Section: 22 40 00—Plumbing Fixtures

Product certification system:

The ICC-ES product certification system includes testing samples taken from the market or supplier's stock, or a combination of both, to verify compliance with applicable codes and standards. The system also involves factory inspections, and assessment and surveillance of the supplier's quality system.

Product: STARON® Sinks and Lavatories

Listee: Cheil Industries, Incorporated
332-2 Gocheon-Dong
Euiwang-Si, Gyeonggi-Do 437-711
Korea

Compliance with the following codes:

2012, 2009, and 2006 *International Plumbing Code®* (IPC)
2012, 2009, and 2006 *International Residential Code®* (IRC)
2012, 2009, and 2006 *Uniform Plumbing Code* (UPC)*

**Uniform plumbing Code is a copyrighted publication of the International Association of Plumbing and Mechanical Officials*

Compliance with the following standards:

CSA B45.5 / IAPMO Z124 – 2011, Plastic Plumbing Fixtures

Identification:

For field identification, the Staron® sinks and lavatories described in this listing must bear the Cheil Industries, Inc. name, the manufacturer's model number, and either the ICC-ES evaluation report number (ESR-1175) or the ICC-ES PMG listing mark.

Installation:

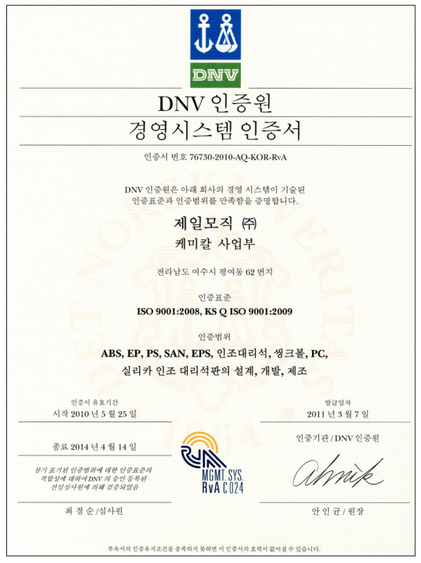
Installation must be in accordance with the manufacturer's published installation instructions and the requirements of the applicable code. When requested by the code official, copies of the manufacturer's instructions must be available at all times on the jobsite during installation.

Models: Staron® lavatories and sinks are solid-surface, one-piece designs of 100 percent acrylic. Overflows are external.

Lavatories: A3181, A3201 and A3211
Kitchen, Bar, Laundry and Service Sinks: A1181, A2311, A2321, A2341, A1121, A1131 and A1231

Listings are not to be construed as representing aesthetics or any other attributes not specifically addressed, nor are they to be construed as an endorsement of the subject of the listing or a recommendation for its use. There is no warranty by ICC Evaluation Service, LLC, express or implied, as to any finding or other matter in this listing, or as to any product covered by the listing.

STARON® accreditation



DNV 인증원
경영시스템 인증서

인증서 번호 76730-2010-AQ-KOR-RvA

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

제일모직 ㈜
케미칼 사업부

전라남도 여수시 평여동 62 번지

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

인증범위
ABS, EP, PS, SAN, EPS, 인조대리석, 씽크볼, PC,
실리카 인조 대리석판의 설계, 개발, 제조

인증서 유효기간
시작 2010 년 5 월 25 일
종료 2014 년 4 월 14 일

발급일자
2011 년 3 월 7 일

인증기관 / DNV 인증원

최 정 순 /심사원

안 인 균 / 원장

부속서의 인증유지조건을 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, Pyeongyeo-dong, Yeosu-si, Jeollanam-do, Korea

has been found to conform to the Management System Standard:
ISO 14001:2004, KS I 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
This Certificate is valid until: July 28th, 2013
Compliance to the Standard in respect to the indicated scope is verified by the DNV approved registered Team Leader
Hun-Hee Lee
Lead Auditor

Place and date: Seoul, July 28th, 2010
for the Accredited Unit: DNV CERTIFICATION B.V., THE NETHERLANDS
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. Zwolseweg 1, 7994 LB Barrendrecht, The Netherlands

STARON® accreditation

Korean Standards Association

CERTIFICATE OF APPROVAL

CHEIL INDUSTRIES INC.

62, PYEONGYEO-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(Acrylonitrile Butadiene 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

Kaphong Chin
THE CHAIRMAN OF KSA

Date of Issue : 28 February, 2011

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

Accredited by Member of the IAF MLA for QMS The Accreditation Mark (KAB) indicates accreditation in respect of those activities covered by the Accreditation Certification Number KAB-QC-30

KSA KAB IAF

Certificate
Korean Industrial Standards

KS CERTIFICATE

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

Cheil Industries INC.
62, Pyeongyeo-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 Kaphong Chin
President

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

STARON® accreditation

CSA INTERNATIONAL

Certificate of Compliance

Certificate: 1434925 (LR 107761) Master Contract: 180559
Project: 1934779 Date Issued: 2007/09/13
Issued to: Cheil Industries Incorporated
Chemicals Division
332-2, Gochun-Dong
Euiwang-Shi
Kyunggi-Do, 437-010
South Korea
Attention: Hyunae Baek

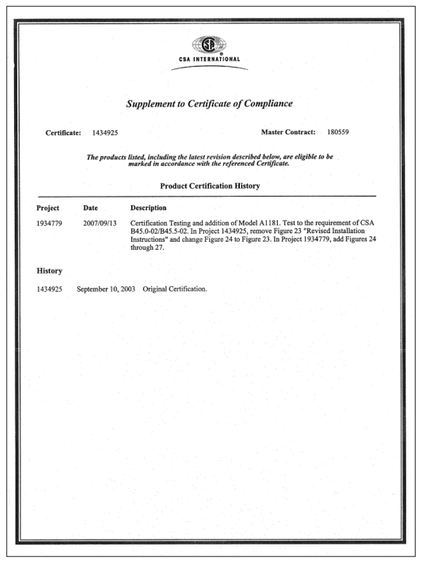
The products listed below are eligible to bear the CSA Mark shown

Issued by: Gary Liljenberg

Authorized by: Nick Alfano, Operations Manager

PRODUCTS
CLASS 6915 01 - PLUMBING FIXTURES - Thermosetting Plastics
Model Numbers A1121, A1131, A1231, A2311, A2321, A2341, A1181 (With Suffix T or C) (Sinks)
Model Numbers A3201, A3211, A3181 (With Suffix T or C) (Lavatories)
APPLICABLE REQUIREMENTS
CSA B45.0-02 Plumbing Fixtures
CSA B45.5-02 Plastic Plumbing Fixtures

DQD 507 Rev. 2004-06-10



CSA INTERNATIONAL

Supplement to Certificate of Compliance

Certificate: 1434925 Master Contract: 180559

The products listed, including the latest revision described below, are eligible to be marked in accordance with the referenced Certificate.

Product Certification History

Project	Date	Description
1934779	2007/09/13	Certification Testing and addition of Model A1181. Test to the requirement of CSA B45.0-02/B45.5-02. In Project 1434925, remove Figure 23 "Revised Installation Instructions" and change Figure 24 to Figure 23. In Project 1934779, add Figures 24 through 27.

History

1434925 September 10, 2003 Original Certification.

Material safety data sheet

1. Product and company identification

PRODUCT NAME	Staron® solid surfaces sheet
COMPANY	Cheil Industries Inc.
EMERGENCY TELEPHONE	82-61-689-1531
ADDRESS	Yeusu Plant, Chemicals Division, CHEIL INDUSTRIES INC. 62, Pyong Yo-Dong, Yeusu-Shi, 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

THERMAL 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 Cheil Industries in accordance with ISO-14001 standards.

13. Disposal considerations

Can be landefilled 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: Cheil Industries Inc. / DEC. 2006

Staron® solid surfaces
CHEIL INDUSTRIES INC.

1. Product and company identification

PRODUCT NAME	Staron® Tempest® Sheet
COMPANY	Cheil Industries Inc.
EMERGENCY TELEPHONE	82-61-689-1531
ADDRESS	Yeusu Plant, Chemicals Division, CHEIL INDUSTRIES INC. 62, Pyong Yo-Dong, Yeusu-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.

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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® Tempes® 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

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Carbon monoxide, methyl methacrylate monomer, smoke

HAZARDOUS REATION None

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12. Ecological information

Staron® Tempest® sheet is manufactured by Cheil Industries in accordance with ISO-14001 standards.

13. Disposal considerations

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

14. Transport information

Not classified as dangerous in the meaning of transport regulations.

www.staron.com

SAMSUNG CHEMICAL (USA), INC.

14251 E. Firestone Blvd. La Mirada, CA 90638 U.S.A.
Tel : +1-562-926-5520, Fax : +1-562-926-9930
+1-800-795-7177

SAMSUNG CHEMICAL EUROPE GMBH

Am Kronberger Hang 6, Samsung House D-65824,
Schwalbach/Ts., Germany
Tel : +49-6196-667-403, Fax : +49-6196-667-467
Free Hotline in Germany : 0800-1-782766

DUBAI OFFICE

Samsung Chemical Europe Gmbh Dubai Rep. PO Box 48969
Flat No 2403, Al Shafar Tower 1, Tecom, Greens, Dubai, U.A.E.
Tel : +971-4-447-3411, Fax : +971-4-447-3412

SHANGHAI OFFICE

Rm2701, Shanghai International Trade Center,
2201 West Yan an Rd, Shanghai, China, 200336
Tel : +86-21-62703000-856, Fax : +86-21-62756882

SAMSUNG CHEMICAL (THAILAND) Co., Ltd.

16th Floor, Empire Tower, Unit 1602~1603, 195 South Sathorn Road,
Yannawa, Sathorn, Bangkok 10120, Thailand
Tel : +66-2-624-6737, Fax : +66-2-624-6780

HEAD OFFICE

332-2, Gocheon-Dong, Uiwang-Si,
Gyeonggi-Do, Korea, 437-711
Tel : +82-31-596-3856, Fax : +82-31-596-3882