

STARFON™

PRODUCT DATA SHEET

Trade Name

Starfon™ Marble Range
Starfon™ Marble Glass Range

Manufacturer

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Summary

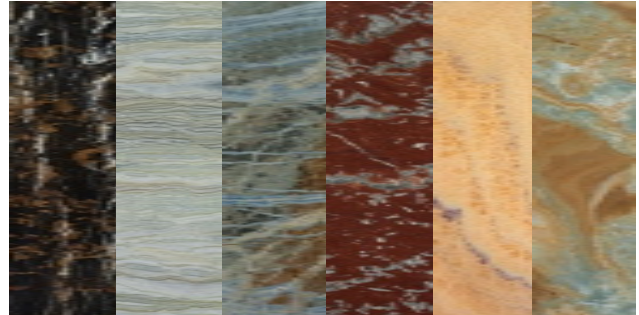
With an image library that documents a variety of stylish marble stones, a printing technology of 1200 dpi and photo imaging technologies, we could produce an authentic looking marble. Images could be printed on our Starfon™ substrate or glass. Our glass range comes as laminated glass and single glass piece. All of our products comply with all relevant standards that ensure our products are of the highest quality.

Detailed Description

Starfon™ Marble Range

Our marble range generates no scraps in contrast to the traditional way of mining and cutting raw marbles.

With an aid of high technology 1200dpi printer, our specialized team can print a marble image at 300dpi to look more sharpness and details. The explanation is that high resolution of printer can layer the dots by passing the same part of page multiple times and putting several dots of different colors in one place. The more dots squeeze into that place and further extend 300 same dots to one square inch, the sharper the resulting marble image will be.



Using our stone-cold cement board substrate, marble images are printed and finished with a layer of highly reflective coating. The result of these is an almost authentic looking marble.

Despite looking similar to real marble, our marble range has more advantages over real marble. We can tailor our substrate even up to the size of 2.4x1.2 per meter square. Looking from afar, all Starfon™ panels are conjoined and resulted in creating an astounding and impressive look of a single piece marble.

Our specialized team could also generate customized marbles according to customer's demand.

We have an image library that documents a variety of marble images. Our specialized team could generate customized (merge/extend) marbles according to customer's demand.

Customized pattern:

We can match and extend lines and grains accordingly to achieve continuousness in joints.

Customized color:

We can change the marble color in whole, in part or even a specific area.

Unique grains:

Our products are highly customizable.

Conjoint marbles:

We can combine different types of marble together to form a specific pattern.

Starfon™ Marble Glass Range

Starfon™ Marble Glass Range available in laminated glass and single glass either transparent or with white backing.

- 1) Single glass with white backing gives real and clear images usually fixed or installed to wall.
- 2) Translucent single glass gives a faintly discernible effect usually fixed or installed to wall.
- 3) Translucent laminate glass gives a faintly discernible effect usually for partitioning.
- 4) Double-side printed laminate glass provides real and clear image on both sides, usually for partitioning.

In addition application of iridescence creates a shimmering effect to the product.

Technical Data

Below is the list of standard for the substrate.

BS EN 12467:2004

Dimension Variations

Density

Bending Strength

Water Impermeability

Water Permeability

Warm Water

Soak-dry

Freeze-thaw

Heat Rain

Reaction to Fire

Release of Dangerous Substance

ASTM C1185-08

Flexural Strength (Section 5)

Density (Section 6)

Dimension and Tolerances (Section 7)

Moisture Movement (Section 8)

Water Absorption (Section 9)

Moisture Content (Section 10)

Water Tightness (Section 11)

Warm Water Resistance (Section 13)

Heat/Rain Resistance (Section 14)

Refer to the following standards for the coating tests on **Starfon™ Board**.

BS 3900: Part E6: 1992 Cross-cut Test of Paints

ASTM D 3363 – 05 Determination of Film

Hardness by Pencil Test

BS EN ISO 2813: 2000 Determination of Specular Gloss of Paints

BS EN ISO 11507:2007 & BS3900-F16:2007

Accelerated Weathering Test of Paints

JIS K 5400-1900 clause 8.19 Water Resistance

Test of Paint

JIS K 5400-1900 clause 8.22 Acid Resistance Test of Paints

JIS K 5400-1900 clause 8.21 Alkali Resistance Test of Paints

BS EN ISO 4628-2: 2003 & BS 3900-H2: 2003

Examination of Degree of Blistering of Paint Film

BS EN ISO 4628-4: 2003 & BS 3900-H4: 2003

Examination of Degree of Cracking of Paint Film

BS EN ISO 4628-5: 2003 & BS 3900-H5: 2003

Examination of Degree of Flaking of Paint Film

BS EN ISO 4628-8: 2005 & BS 3900-H8: 2005

Degree of Delamination and Corrosion

ASTM D2486 – 96 Determination of Scrub

Resistance of Paints

ASTM D4060-10 Abrasion Resistance of Organic Coatings by the Taber Abraser

ASTM C1028-07 Determining the Static

Coefficient of Friction of Ceramic Tile and Other

Like Surfaces by the Horizontal Dynamometer

Pull-Meter Method

Refer to the following standards for the coating tests on **Starfon™ Glass**.

ASTM D 3363 – 05 Film Hardness

BS EN ISO 11507:2007 & BS3900-F16:2007

Accelerated Weathering Test of Paints

JIS K 5400-1900 clause 8.19 Water Resistance

Test of Paint

JIS K 5400-1900 clause 8.22 Acid Resistance Test of Paints

JIS K 5400-1900 clause 8.21 Alkali Resistance Test of Paints

BS EN ISO 4628-2: 2003 & BS 3900-H2: 2003

Examination of Degree of Blistering of Paint Film

BS EN ISO 4628-4: 2003 & BS 3900-H4: 2003

Examination of Degree of Cracking of Paint Film

BS EN ISO 4628-5: 2003 & BS 3900-H5: 2003
Examination of Degree of Flaking of Paint Film
BS EN ISO 4628-8: 2005 & BS 3900-H8: 2005
Degree of Delamination and Corrosion

Physical and Mechanical Properties

Printed Starfon™ is a composite of high strength cement reinforced with hardwood fiber and PVA fiber. The substrate is compliance with ASTM and BS EN standard. The printed marble is protected by colorless coating to ensure proper aging characteristics. In addition, it is precision ground to ensure optimum product size and color. Throughout the manufacturing process, our products are subjected to strict inspections and testing to guarantee its high level of quality.

Category	Floor/Wall
Product Code:	SF-01 (P)
Density:	1850 -1890kg/m ³
Length:	300-2400mm
Dimension:	300-2400mm
Thickness:	12-25mm
Gloss	High Gloss/ Matt
Finish	Anti-scratch top coat

Testing Results of Substrate BS EN 12467:2004

Standard	Results
Dimension Variations	Within the tolerances
Density	1.85 g/cm ³
Bending Strength	18MPa [Class 4]
Water Impermeability	No visual formation
Warm Water	R _L = 0.86
Soak-Dry	R _L = 0.86
Freeze-thaw	Complied
Heat Rain	-No visual cracks , delamination, warping, bowing or other defects - No visual formation
Reaction to fire	A1
Release of dangerous substance	SVHC ≤ 0.1 %

Testing Results of Substrate ASTM C1185-08

Standard	Results
Flexural Strength (Section 5)	24.5MPa [Grade IV]
Density (Section 6)	1.89g/cm ²
Dimension and Tolerances (Section 7)	Within the tolerances
Moisture Movement (Section 8)	0%
Water Absorption (Section 9)	0.2%
Moisture Content (Section 10)	0.77%
Water Tightness (Section 11)	No visual formation of water droplets
Warm Water Resistance (Section 13)	No visual cracks or structural alternation
Heat Rain Resistance (Section 14)	No visual cracks or structural alternation and frame assembly

Testing Results of Coating on Starfon™ Board

Standard	Results
Cross-cut Test of Paints	≤ 15%
Film Hardness (1B – 6H)	>6H
Specular Gloss	GU(60°) = 33.7
Accelerated Weathering Test of Paints	No cracking or blistering of paint film
Water Resistance Test of Paints	No observable change
Acid Resistance Test of Paints	No observable change
Alkali Resistance Test of Paints	No observable change
Examination of Degree of Blistering of Paint Film	Degree of Blistering 2 (S2)
Examination of Degree of Cracking of Paint Film	Degree of Cracking 0 (S0)
Examination of Degree of Flaking of Paint Film	Degree of Flaking 0 (S0)
Degree of Delamination and Corrosion	Degree of Delamination (1) Corrosion (1)
Determination of Scrub Resistance of Paints	No defects after 1500 cycles
Abrasion Resistance of Organic Coatings by the Taber Abraser	No observable changes after 1000 cycles
The Determination of The Static Coefficient of Friction for Ceramic Tiles and Other Flooring Surfaces	Dry Condition: 0.87 Wet Condition: 0.83

Testing Results of Coating **Starfon™ Glass**

Standard	Results
Film Hardness (1B – 6H)	>6H
Accelerated Weathering Test of Paints	1. Without yellowing 2. No peeling off of coating
Water Resistance Test of Paints	No observable change
Acid Resistance Test of Paints	No observable change
Alkali Resistance Test of Paints	No observable change
Examination of Degree of Blistering of Paint Film	Degree of Blistering 2 (S2)
Examination of Degree of Cracking of Paint Film	Degree of Cracking 0 (S0)
Examination of Degree of Flaking of Paint Film	Degree of Flaking 0 (S0)
Degree of Delamination and Corrosion	Degree of Delamination (1) Corrosion (1)

Classification and Approval

In accordance to BS EN 12467:2004, ASTM C1185-08 and all coating tests, our products prove that they have good mechanical properties, good durability, resistance to fire, chemical and dangerous substance.

Mechanical Properties:

Conducting flexural/bending test is to ensure the integrity and safety of our products. In addition, our products scores at highest in the film hardness by pencil test. Scratch hardness is used for measuring how resistant of our products are to fracture due to friction from different sharpness of pencils. Except scratch, scrub and abrasion are another important undesirable effect for normal use. Scrub test and abrasive test are respectively used to examine any properties that affect the stain resistance of coatings and measure the wear resistance of a material from sliding contact. After the tests, there are no defects and changes on coating surface.

Resistance to Chemical and Dangerous Substances:

Our products are controlled and pose no threat to human life and the environment.

Resistance to Fire:

Testing the fire resistance of a building element involves determining its behavior when exposed to a particular temperature. Starfon™ is classified as “A1” in accordance to the European Standard EN 13501-1. A1 is the highest classification that it is non-combustible material. Starfon™ will not contribute in any stage of the fire including the fully developed fire.

Durability Test:

Our products scores at highest in the cross-cut test, best rated in degree of blistering, cracking and flaking examination and proven be to water, acid, alkaline and corrosion resistance without visual changes before and after tests. After exposed to UV light for 500 hours, mean values of specular gloss reading was 24.3. It retains average of 99% of gloss.

Accelerated weather test uses aggravated conditions of heat, oxygen, sunlight and condensation in order to speed up the normal aging processes of our products. This test is used to help determine the long term effects of expected levels of color and outcomes within a shorter period.

In addition, our products are put into environmental chambers, such as conducting heat-rain, soak-dry and freeze-thaw tests. These tests are mainly demonstrated the extreme weather at outdoor environment. After conducting these cycling tests, flexural test is carried out for further analysis. It results in ensuring the products still have good mechanical properties even putting at extreme weathering in a period of times.

Delivery, Storage and Handling

Although the printed Starfon™ boards are impact resistance, handle with care is highly recommended. Do not apply excessive weight on the top or impact force to the side of packing. If any damaged on the packaging is spotted, inspect immediately and further contact our sales representative.

The printed Starfon™ boards shall be protected from direct hail, tornado and job site damage. It also recommended keep the wrapping on and store in a clean and dry environment until installation.

Preparatory Work

Site conditions:

Review the site conditions before installation. Any unsatisfactory conditions must be correct prior to installation, such as no hidden electrical wires and no gas/electric pipelines.

Field measurements are to be taken to verify the images and dimensions.

Substrates:

The wall structure must sufficient to handle the printed starfon™ boards and supporting structure's weight and thick enough for theirs expanding bolts. The wall should be flat and no moisture/debris trap between substrates and supporting structure.

Installation

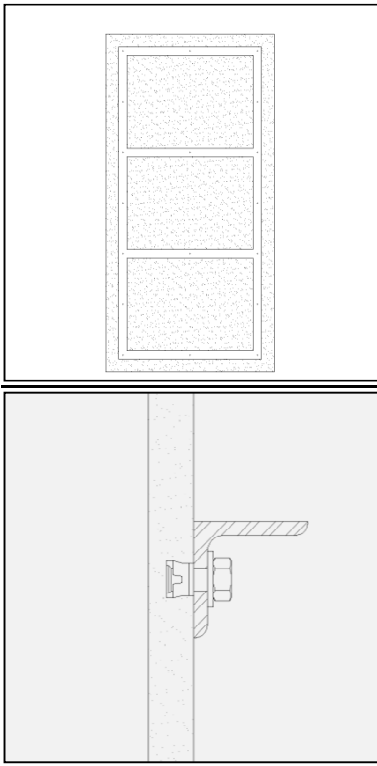
Starfon™ Substrate

A. Wet Fix – Contact Adhesive Method

- A continuous 4-5mm diameter "zig-zag" bead of Liquid Nails™ is applied along the length of the framing member.
- -Surfaces are immediately pressed together to ensure adequate "wetting out" or spreading of the adhesive.
- The two surfaces are then pulled apart and held apart for 2-5 minutes to allow the adhesive to become tacky.
- The joint will continue to gain strength for a further 2-3 days and must not be stressed until after this time.

B. Dry Fix – Undercut Anchor

- Drill hole on the rear face of Starfon™ for undercut anchor by drilling machine
- Undercut anchor is inserted into the hole
- Place and align the backing frame onto Starfon™
- Starfon™ is fixed onto the backing frame by tightening the undercut anchor to a positive fit using a screw



Glass Substrate

C. Glazing Method for Alum. Window

- All the glass will be checked to ensure no damage prior to installation.
- Make sure the window is in close position and locked.
- Take off aluminum glazing bead and place the cut size glass into the window, then clip-in back the glazing bead.
- Using rubber setting blocks and distance pieces to adjust the glass in right position and point the perimeter of glass with the approved glazing sealant.
- Leave the window un-touch after glazed for at least 8 hours to let skin drv.

D. Glazing Method for Curtain Wall (Stick System)

- Clean the surface of the aluminum members and make sure it is free of dirt and grease.
- Place the cut size glass panes onto position by double side adhesion tape.
- Fix the pressure bar into position.
- Ensure no contact is found between the aluminum members and the glass panes.
- Place the gasket properly to position along the perimeter of glass.
- Install the aluminum capping into position.

E. Installation of Door Sash and Glazing

- After the completion of the wet trades of the builder, coordinate with the builder the installation of the sliding door sash.
- Clean and remove all the dirt and debris inside the door tracks.
- Put the sliding door sash into position and check the smoothness of the operation of the sliding door.
- Take off aluminum glazing beads and place the cut size glass pane on the setting block.
- Using setting block to adjust the glass pane in right position.
- Ensure no contact is found between the aluminum frame and the glass pane. Then clip-in back the glazing bead.
- Place the gasket properly in position along the perimeter of glass.

Applications

Starfon™ Marble Range / Starfon™ Marble Glass Range applications



Samples Available

Samples can be requested by e-mail to either your local Starfon™ representative.