

STARFON™

PRODUCT DATA SHEET

Trade Name

Starfon™ Image Range
Starfon™ Image Glass Range

Manufacturer

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Summary

With an image library that documents stylish images that could be printed with 1200 dpi and various photo imaging technologies, our Starfon™ products bear a similar appearance and texture to oil paint. We could replicate any art effects that satisfy customers. 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

With an aid of high technology 1200dpi printer, our specialized team can print an image at 300dpi with the size up to 2.4x1.2 per meter square and 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 image will be.



Equipped with our capabilities of printing technologies, we take design to another level by creating unique customized printed Starfon™. Our substrate is available in various sizes, so the tailor-made images can be used in different fields. Such as, 1) art piece/ornament, 2) wall tiles/floor tiles, 3) partitions. Use of our Starfon™ can transform any area in your office, living rooms, and kitchens into a true work of art.

Starfon™ Image Range

We have an image library that documents a variety of images. Our specialized team could generate customized images according to customer's demands. They could provide us specific stone samples of their preferred veins and pattern. Then, our professional photographer can capture the images and further fine tune the colors, vein and even some patterns in order to provide exact feelings of the real stones.

Besides the specific images, we can also add some glitters on top of the Starfon™ to achieve a shimmering look.

On the other hand, customers could also provide some old photos, such as history of some particular events and development. We can alter and adjust the resolution of the old images so as to print the images in the largest size and fix on the large wall.

The matt finish carries appearance and texture to oil paint. We could replicate a wide range of art effects such as pop art, splash ink, crayon art, canvas prints and so on. Therefore, our products

Starfon™ Image Glass Range

Starfon™ Image 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.

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Technical Data

Below is the list of standard for **Starfon™ Board**.

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 (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

Starfon™ Image is a composite of high strength cement reinforced with hardwood fiber and PVA fiber. The substrate of Starfon™ board is compliance with ASTM and BS EN standard. The printed images are 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 (B/G) ,SW-01 (B/G)
Density:	1850 -1890kg/m ³
Length:	300-1200mm
Width	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 of water droplets
Water Permeability	No presence of water droplets
Warm Water	R _L = 0.86
Soak-Dry	R _L = 0.86
Freeze-thaw	R _L = 0.79
Heat Rain	- No visual cracks , delamination, warping, bowing or other defects - No visual formation of water drops
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)	1.93 g/cm ³
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)	R _L = 0.92
Heat Rain Resistance (Section 14)	- No visual cracks , delaminating, warping, bowing or other defects - No visual formation of water droplets

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

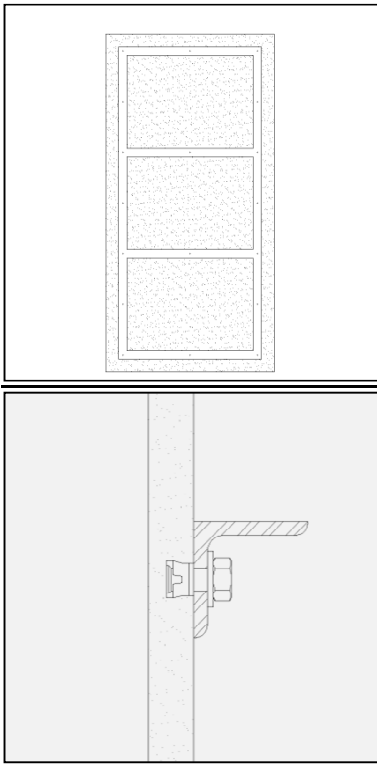
Starfon™ Substrate

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™ Image Range / Starfon™ Image Glass Range applications:



Samples Available

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