

belbien

Technical Data

2021-22
Ver.01

Belbien is the incombustible rated decorative film with pressure sensitive adhesive suitable for field application

Belbien can be placed on the various kinds of substrates cleanly and quickly owing to the high performance pressure sensitive adhesive and improves the efficiency of finishing work. In addition to the interior and exterior finishing, Belbien has been used in a variety of application fields, such as furniture, signature, and the fitting of the vessels, and its reliability is highly rated by customers. Belbien can be placed on the 3D curved surface of the substrate in the field and greatly enhances the flexibility of the design. The varieties of texture of the surface of Belbien are available, such as wood, stone, solid color, metallic, and an abstract pattern. Belbien is manufactured and sold by the integrated system under the responsibility of C.I. Takiron Corporation using the advanced processing technology of the plastics.

Efforts to reduce VOC

Formaldehyde and chlorpyrifos free. Free of toluene, xylene, ethylbenzene, and styrene. Toluene, xylene, ethylbenzene, styrene are not used as raw materials.

The data in this document are not guaranteed values.

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BELBIEN Composition and Benefits

BELBIEN is best characterized as an architectural design film, and is made primarily from PVC (Polyvinyl Chloride). It is sometimes referred to as a cladding or a vinyl laminate. Following are some of the many benefits that make BELBIEN the perfect solution to many decorative problems.

Pattern Selection

☐ Hundreds of patterns are available within the BELBIEN series, each of which is stocked by C.I. TAKIRON Corporation.

Weight

☐ BELBIEN is lighter than most decorative products available in the market today weighting less than 370 grams per linear meter (11.7 ounces per linear yard). This is critical for projects where weight is major factor such as elevators, movable partitions, office dividers, etc.

Thickness

☐ Each of the BELBIEN series is only about 0.2mm (0.008") thick excluding the release paper. Because the thickness of BELBIEN is comparable to a good coat of paint, BELBIEN can be used for such renovations as store fixtures, doors and frames, cabinets, elevator doors, etc.

Width and Length

☐ BELBIEN is packaged in rolls, 1.2 meters (48") wide and 50 meters (54 yards) long. This enables BELBIEN to be applied to most doors and partitions without creating seams.

Flexibility and Conformability

☐ BELBIEN can be applied to many two-dimensional decorative surfaces and tailored to a 90 to 180 degrees angle for such uses as doorframes, moldings, handrails, cabinet doors, store fixtures and panel projects. Many of the BELBIEN patterns can also be stretched to conform to three-dimensional surfaces by Certified Installers. This allows BELBIEN to be applied to many decorative surfaces with bull-nose edges as well as concave and convex surfaces. CM, FM and Silky Suede series (MT) cannot be stretched.

Pressure Sensitive Adhesive System

☐ BELBIEN's adhesive system is one of the most remarkable features of the project. It will cure to its optimum bonding strength in just 8-12 hours following the application at 23°C(72°F). This strong adhesive system also allows BELBIEN to be installed in high-risk areas such as subways, shopping malls, bathroom partitions, etc.

Fire and Smoke Ratings

☐ BELBIEN meets very high standards and carries Class A (Class 1) fire and smoke ratings. As such, BELBIEN can be installed in high-risk areas such as elevators, public transportation, health care facilities, airports, restaurants, office complexes, cruise and marine, etc. Actual fire ratings include UL-723 (ASTM-E84).

☐ Certification For Shipbuilding Interior Use

CE marking (DNV GL)	EC-TYPE Examination Certificate (Module B)	MEDB00002YM Rev.2	Surface Materials and Floor Coverings with Low Flame-Spread Characteristics:- Decorative Veneers.	Applicable Category
	QS-Certificate of Assessment-EC (Module D)	MEDD00000XH Rev.3	Quality System for the Products.	Excluding BWH,CM,EA,EC,EF,EM,ES,EW,FM,GC,MT

☐ Certification For Shipbuilding Interior Use

		Certification		Classification	Applicable Category
UL (Underwriters Laboratories Inc.)	Wall Coverings	UL723 (ASTM E-84)	Surface Burning Characteristics for Building Materials.	Class A (Class 1) Only cement board substrate.	A,BC,BR,BWH,C,CM,CO,CY,DA,EA,EC,EF,EM,ES,EW,F,FM,K,MA,NC,PR,S,SA,SW,TX,W,WA,WB,WR
	Cladding Materials for Fire Doors and Frames	ANSI/UL 10C	Standard for Positive Pressure Fire Tests of Door Assemblies.	Wood/Metal Composite : 1hrs	A,BR,C,CO,CY,MA,S,W,WR Some of BC,F,NC,PR,K,TX
	Cladding Materials for Fire Doors and Frames	ANSI/UL 10B	Standard for Fire Tests of Door Assemblies.	Wood/Metal Composite : 1hrs	
CE marking (Warringtonfire)	Wall Coverings	EN15102:2007 +A1:2011	Classification B-s1,d 0*	1121-CPD-KA0045 1121-CPD-KA0046 1121-CPD-KA0047 1121-CPD-KA0048	A,BC,BR,C,CO,CY,DA,F,K,MA,NC,PR,S,SA,SW,W,WA,WB BC,NC,PR EA,EK,ES,EW CM,FM

* Only cement board substrate.

Stain Resistance

☐ BELBIEN offers excellent stain resistance to many substances as included in the Technical Data. In most cases, stains can be easily removed using a soft cloth and household cleaner such as dishwashing liquid. In other cases, a solution of denatured alcohol will generally remove the stain. (See P14)

Reparability

☐ One of the greatest advantages of BELBIEN is that damages can be easily repaired. Further, a minimal down-time is required for renovation projects such as elevators, shopping malls, airports, etc. Often, this is the greatest benefit of all as the cost of down-time can be a large part of any renovation.

Exterior Application

☐ EA,EF,EM,ES,EW (BELBIEN EX*) can be applied to exterior surfaces that are made of metals that remain stable during climate changes, but is not recommended for wood surfaces in an exterior environment. Common exterior uses are metal signs, columns, doors and store facades.

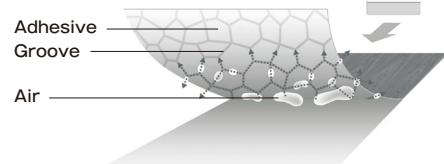
Custom Color Matching

☐ Because of their many printing cylinders, C.I. TAKIRON Corporation is able to provide custom color matching. Though there are minimum production requirements, this gives customers great flexibility for customized projects.

Hybrid Type Adhesive

- Many of the BELBIEN patterns are using the hybrid type adhesive. This adhesive system simplifies the removal of air during the application as compared to the flat type adhesive. Although ordinary pressure must still be applied to the hybrid type adhesive, the air left between BELBIEN and the substrate is less appreciable than in the case of the flat type adhesive.

How the Hybrid Type Adhesive Works



Air trapped between the BELBIEN and the substrate exits through specially designed narrow grooves as pressure is applied with the squeegee.

The measure for VOC reduction

- Formaldehyde and chlorpyrifos are not used.
- Toluene, xylene, ethyl benzene, and styrene are not used as raw material.

BELBIEN Series Selection

Carefully choose the right series of BELBIEN for your application. Depending on the application and substrate, the finished appearance may be affected. Specify your choice of colors and patterns after reviewing the characteristics below : Notwithstanding the availability of the below specific series applicable for exterior or "interior plus" use, Belbien is basically designed and manufactured for interior use.

Heat and Sunlight

- Because BELBIEN is made of plastics, do not install places where the temperature exceeds 50°C(110°F) or falls below -10°C(14°F) continuously. For exterior installation, choose from Belbien with ☀ mark. Even when it is for interior installation, cautions against sunlight must be used for such opening areas as windows. Be sure to choose from Belbien with ☀ mark. Cares are also needed against UV emitted from such source as lighting apparatus.
- BELBIEN with ☀ mark : Can be used both for exterior and interior installation. When used for vertical applications, expected durability in terms of color-fastness is approximately 10 years (this is based upon representative values obtained from representing actual installations in Japan, not the value for any warranty purposes).
- The expected durability in terms of color-fastness may vary when used out of perpendicular or horizontally. Environmental factors such as hours of sunlight, climates and locations of sites may affect as well.

Water and Moisture

- Although BELBIEN provides sufficient durability against water, substrates affected by deterioration such as rust may cause delamination of BELBIEN or other problems. Adequate waterproofing primers should be used on the substrate as well as the overlap bonding technique for seaming.

Durability

- BELBIEN's durability is unmatched by many other decorative products; however, BELBIEN should not be used in areas of abuse by sharp objects such as keys, knives, belt buckles etc. BELBIEN can be scratched or scored just as most other decorative materials including marble, stone, stainless steel, high pressure laminates and glass.

Substrate Color and texture

- Because some BELBIEN have low opacity, confirm that the color of the substrate will not alter the appearance of the finished project. Uneven or textured substrates also may affect the finish of glossy or smooth finish patterns. A trial installation should be performed to confirm the result.

PVC Mark

- By Japanese law, a PVC mark is lightly printed on the reverse of the BELBIEN. This mark may be visible if BELBIEN is back-lit.

BR,CO,CY,MA

- Depending upon the lighting angle, strips of BELBIEN may appear to look different with each other in color. Avoid reversing strips during the installation to minimize the change in pattern and/or texture direction. Detailed surface preparation makes the reflection from lighting on the BELBIEN surface less appreciable. (Notes for Urushi series also apply.)

CM,FM

- Due to the metallic layer, these series are not suitable for 3D applications. Avoid storing where relative humidity is more than 80%. (Notes for Urushi series also apply.)

MT (Silky Suede series) SF

- Due to the metallic layer, these series are not suitable for 3D applications. Avoid storing where relative humidity is more than 80%. (Notes for Urushi series also apply.)

Maintenance

- Use a soft cloth with a light neutral detergent such as dishwashing detergent to clean the surface of BELBIEN. Rinse the detergent from the surface using clean water. Do NOT use any detergent with abrasives. Also, avoid using solvents such as thinner or toluene. When stains are difficult to remove, wipe using a soft cloth with petroleum benzene or denatured alcohol. BELBIEN EX ☀ series (EA,EF,EM,ES,EW) can be cleaned with solvents such as lacquer thinner or acetone in some cases when used sparingly.

IMPORTANT : It is always recommended that a test area be cleaned first when using any strong solvent to make sure that there is no adverse reaction.

Products Warranty

- C.I. TAKIRON Corporation ("MANUFACTURER") warrants that Belbien ("PRODUCT") will be manufactured free from defects and will remain free from defects for a period of 2 years from the date of receipt of PRODUCT, unless exposed to excessive abuse, or abnormal conditions such as floods, fire, or other acts of God. Such warranted defects include: reduced gloss, developed texture, decomposition, swelling, clouding, tackiness, crazing, bubbling, and cracking of PRODUCT.
- THIS WARRANTY IS IN LIEU OF ALL OTHER WARRANTIES, EXPRESSED, OR IMPLIED, WRITTEN OR ORAL, AND SHALL CONSTITUTE THE SOLE AND EXCLUSIVE REMEDY OF PURCHASER AND LIMIT OF MANUFACTURER'S LIABILITY FOR ANY AND ALL CLAIMS, LOSSES, DAMAGES, OR EXPENSES OF PURCHASERS. BECAUSE OF THE STRONG ADHESIVES REQUIRED TO INSTALL PRODUCT, REMOVAL OF PRODUCT MAY CAUSE DAMAGE TO THE ORIGINAL SUBSTRATE.

Product Size

Width : 1220mm (48inches)
 Length : 50m/roll (54yards/roll)
 Thickness : ca.0.2mm (ca.0.008inches)

Adhesion Durability After Heating

No adhesion degradation after being left in an atmosphere at 70°C(158°F) for 1 month.

Color Fastness

EA,EF,EM,ES,EW(BELBIEN EX ☀) No appreciable change after 5000hrs.The other BELBIEN No appreciable change after 300hrs.
Sunshine Carbon Arc Weathering Test (ISO 4892-4)

Stain Resistance

Stain can be removed with neutral detergent or ethyl alcohol after direct contact with the following substances for 24 hrs.

- | | |
|---|---|
| <input type="checkbox"/> Coca- Cola | <input type="checkbox"/> Facial Soap Diluted Water (1%) |
| <input type="checkbox"/> Wine | <input type="checkbox"/> Body Soap Diluted Water (1%) |
| <input type="checkbox"/> Ketchup | <input type="checkbox"/> House-Use Ammonia |
| <input type="checkbox"/> Vinegar | <input type="checkbox"/> 10% HCL |
| <input type="checkbox"/> Soy Sauce | <input type="checkbox"/> Formalin |
| <input type="checkbox"/> Water-Ink Marker (Black) | <input type="checkbox"/> Oxygenated Water |

Residue of Oil-Ink Marker and Shoe Polish can be removed from EA,EF,EM,ES,EW(BELBIEN EX) with neutral detergent or ethyl alcohol.

Chemical / Solvent Resistance

Test Result	Type of Chemicals / Solvent	
No change	Petroleum Benzene	
	Ethyl Alcohol	
	Heptane	
	N-hexane	
	Ammonia Water	
	10% HCL	
	10% NaOH	
	Change on surface	Toluene
		Ethyl Acetate
		Methyl Ethyl Ketone

* EA,EF,EM,ES,EW(BELBIEN EX) is not damaged by all of the above-mentioned chemicals/solvents.

Drop the above-mentioned chemicals on BELBIEN and leave it on a watch dish for 6 hrs. before flushing the surface with water for final evaluation. (ISO 4586-2)

Dimensional Stability

The cut width expansion is within 0.3mm (0.012")
Install BELBIEN on an aluminum plate with cut in the center in the size of 200mm×200mm(7.874"×7.874"). The plate is put in an oven for 2 hrs. at 100°C(212°F). (ISO 11501)

Adhesion Stability Under Moisture

No adhesion degradation after being left in an atmosphere at 45°C(113°F) and RH at 95% for 1 month.

Abrasion Resistance

Abrasion ends at 7000 cycles.
Taber Abrasion Test
 CS-17 wheel loaded with 1kg (2.2 pounds) weights

Heat Cycle Durability

Neither delamination or color change is observed.
Install BELBIEN in the size of 120mm×120mm(4.724"×4.724") on an aluminum plate.
 Left them for 2 hrs. at -20°C(-4°F)and 70°C(158°F) ten times. Then check the adhesion and color change.

Anti-crack Under Low Temperature

No crack observed after being left in an atmosphere at 0°C(32°F) for 24 hrs.

Anti-mold properties

Anti-mold properties testing (by JIS Z 2911 : 2010)
No growth of molds is observed visibly and under microscope.

Bonding Strength

	With Primer	No Primer
Plywood (Lauan)	40.18	-
Plywood (Basswood)	45.25	-
Plaster Board	5.33 *1	-
Silicate Calcium Board	46.08	-
Galvanized Steel	47.04	38.22
Aluminium Plate	-	29.40
Stainless Steel	-	31.36
Acrylic Board	-	32.34

After 24 hrs. of adhesion onto each of the above-mentioned substrate, peel BELBIEN off the substrate at 180° angle (N/25mm wide). *2

* 1. Destroy the substrate.
 * 2. Those value is of BELBIEN W-216.
 Each value slightly differs according to the type of BELBIEN.

BELBIEN is produced under very strict quality control, however color and glossness may vary slightly on each product lot. Above data are based on measured values and not guaranteed values.

Product dimension

Width	: 1220mm	(48inches
Length	: 50m/roll	54yards/roll
Thickness	: ca.0.2mm	ca.0.008inches

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Processing characteristics chart

Base material (metal)	Flat surface	2D curved surface	3D curved surface
	Pattern Number		
BWH (belbien White Board Sheet)	○	△	×

○: Good, △: Caution required, ×: Inadaptable

Bonding Strength

	No Primer
Aluminium Plate	over 19
Stainless Steel	over 30

After 24 hrs. of adhesion onto each of the above-mentioned substrate, peel BELBIEN off the substrate at 180° angle (N/25mm wide).

Chemical / Solvent Resistance

Test Result	Type of Chemicals / Solvent
No change	Petroleum Benzene
	Ethyl Alcohol
	Toluene

Testing by JIS K 6902

Composition and Benefits

- The production lot number of each product is displayed on the paper core and on the side of the cardboard carton. Please note the number before starting to work with the product. If problem occurs, please let us know the lot number.
- The product appearance can be slightly different between production lots. Please avoid applying products from different lots on the same surface.
- Do not use or store products outdoors or in any place exposed to direct sunlight, fire, heat source, direct air blow from an air-conditioner.
- Do not use the products near any heat-producing object such as a pan, kettle, or steam iron: it may result in the deterioration of the sheet.
- Some types of lighting fixtures (e.g., three-band fluorescent lamps), if combined with belbien whiteboard sheet, can cause a rainbow to appear.
- Note that if adhesive or curing tape is left affixed to the surface of a belbien whiteboard sheet for a long time, it may become sticky and difficult to remove.
- Before installing film, check compatibility between color of substrate and belbien. If the color compatibility is poor, the finish may be different from what you had expected.
- When choosing from the same pattern, the gloss and embossing may be different, so please order a sample and confirm the appearance.

Installation

Installation environment

- The temperature of installation environment needs to be from 10 to 35° C (50° -95° F).
- If the ambient temperature is below 10° C, the film adhesive is does not activate well. This causes poor contact, resulting in film bulging or separation. In this case, raise the ambient temperature and the temperature of the substrate.
- The substrate must be sufficiently pretreated to ensure that the surface is smooth.
- A film surface will be unrepairable if it is scratched by a thumbtack, ballpoint pen, nail, or other pointing objects.
- Each film is ruled into approx. 50-mm squares, which you can use as a guideline in cutting the film.
- Before cutting or rewinding a belbien product, place on the floor or workbench a sufficiently cleaned sheet-cutting underlay to prevent the film from being scratched or causing static electricity to attract dust and dirt onto the surface.
- Please note that when a sheet in roll form is unwound into a flat state, the separator (release paper) may be separated from the sheet.
- If a cut remainder must be temporarily stored, wind it with the separator facing inward, tape the edge with masking tape, and then keep it standing. Avoid laying it down to prevent it from being flawed or creased.

- To apply a film, use a belbien squeegee with a soft cloth wound around it (rubbing surface with a hard object will scratch the surface, making marker hard to erase).
- When a film must be bent, curled, or overlapped on an existing film, coat the substrate thoroughly with a primer to ensure that the film will adhere to the material firmly (corners to which the film is applied should desirably have a radius of at least 2R. If a belbien film is applied by overlapping on an existing decorative film, it is not regarded as fire-safety certified).
- The sheet is sturdy. Ensure that it is in firm contact with the existing film.
- Do not use a dryer or a similar tool. If the film must be bent, however, you may want to use a dryer to heat the film while bending it or after you have applied the film since if strong force is applied, bented part will become white. (note that overheating may deform the film or result in poor contact).
- If two belbien films are connected to each other, provide a gap at the joint between the films.
- If two films are connected to each other, marker ink stains stay at the joint, which will not be removable.
- Two films of the same pattern can look slightly different from each other in color or gloss level if they are from different production lot. If you want to apply two same patterns from different production lot, please pay particular attention. To prevent a possible problem, we recommend you provide a gap between two films for the joint.
- Even a solid-color film has a correct orientation. If the orientation is different between two films in the same color, they look different. When applying films, please make sure that the orientation of the logo printed on the separator looks correct.
- Depending on the light source, environment, and viewing angle, the texture difference on the joint may become conspicuous.

Application

- Please be careful not to get a hand or any other part of your body cut by the edge of the sheet.
- For perfect adhesive performance, make sure that the film is in full contact with the substrate. Even if the film seems to be adhered enough, a trace amount of air may be left between the film and base material. The air may expand as the ambient temperature increases, creating bulges on the surface.
- The adhesive on the backside is designed to increase the adhesion with the substrate over time.
- Please prepare surface thoroughly before application (ex. degreasing and sanding), and apply primer so that it is firmly adhered to the surface.

Overlapping installation

- Please note that if a belbien is applied on some sorts of decorative film which already exist on the substrate, and if it is where fire-certification is required, belbien is not going to be considered as a fire-rated.
- Before applying a belbien film on an existing film, apply the belbien primer and wait until it dries. And please pay attention not to allow the primer to be extruded.

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In using belbien white board sheet

Note

- To write something, please use a marker designed for whiteboards.
- Compatibility between whiteboard belbien and markers might depend on types of markers and suppliers.
- The whiteboard belbien may reject the inks of some markers. In this case, please repeat writing and erasing several times so that whiteboard belbien and markers can become compatible.
- In the case it is difficult to erase markers in early stage of use, please repeat writing and erasing several times so that whiteboard belbien and markers can become compatible.
- Please note that ink on a joint part is likely to remain and difficult to erase.
- After a certain period of use, marker ink may become difficult to erase. Ink left for a long time is also difficult to erase.
- Markers whose quality assurance period has expired or that are nearly exhausted, ink may be also difficult to erase.
- A stained eraser may degrade in erasing performance. Please clean periodically or replace the eraser if it is stained badly.
- When a projector is used to project something on a whiteboard belbien, it may reflect the light source (create a hot spot) and give you strong impression.
- When a belbien film is bent to an external corner, ink may be difficult to erase on the bent part.
- A film surface scratched with a thumbtack, ballpoint pen, nail, or other pointed objects are unrepairable.

Maintenance

- Do not use an abrasive cleaner, boiling water, solvent such as thinner or toluene, or acid or alkaline detergent.
- Wipe general stains off the film surface with a clean wet cloth, and completely wipe water with a clean, dry cloth.
- If the surface is stained badly, wipe it with a clean cloth wrung out of neutral detergent which is diluted with water. Then, completely wipe water with a clean, dry cloth.

Store

- The belbien film is sturdy and likely to cause air gaps between the film and separator. Please wind it around the paper core tightly and tape the entire width to store the rest of belbien.
- To store a belbien film, wind it around the paper core with the separator side inside. Then, place it into a plastic bag and hang it by using end caps. Then please put into the carton and store it in a dark place with a low temperature and humidity.
- Please avoid storing or leaving belbien for a long time in a place exposed to high temperature such as 40°C, it will cause less adhesive, resulting in poor adhesion.

Transport

- The products are packaged in a courteous manner.
- During shipment, full rolls (30 m) must be kept in packing cartons and cutmeterb rolls have to be kept as specified.

Marker and eraser

Recommended products

- Marker: Alcohol-based ones are recommended.
 - Eraser: Melamine foam ones are not recommended.
- Please kindly contact us for more information.

Precautions in installation



Do not leave separators or remainder on the floor. It may cause you to fall down when stepping on them. The weight of full rolls of belbien white board sheet (30 m) is heavier than 10kg. Please pay extra attention in handling for your safety.



When using a primer or sealer that contains an organic solvent, ensure sufficient ventilation and keep flames away to prevent fire.

Precautions in installation



In disposing of belbien, it will cause the hazardous gas such as hydrogen chloride. Disposal must be carried out under an authorized industrial waste disposer.

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BELBIEN TECHNICAL DATA

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Personal information provided by customers is handled appropriately in accordance with the related Japanese laws and the company's own policies. For details on the company's own policies, please refer to "Policy on Protection of Personal Information" in www.belbien.com.