

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. Kasei Co., Ltd.

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. Urushi series (SG), CM, FM and Silky Suede series (MT) cannot be stretched.

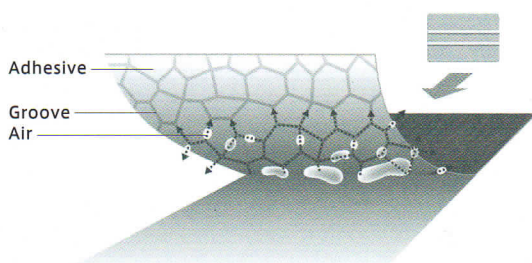
Pressure Sensitive Adhesive System

☐ 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.

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.

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	Classification	Applicable Category
UL-723(ASTM E-84)	Class A (Class 1)	A, BC, BR, C, CM, CO, CY, DA, EA, EK, ES, EW, F, FM, K, MA, NC, PR, S, SA, SW, W, WA, WB
CE mark	1121-CPD-KA0045	A, BR, C, CO, CY, DA, F, K, MA, S, SA, SW, W, WA, WB
	1121-CPD-KA0046	BC, NC, PR
	1121-CPD-KA0047	EA, EK, ES, EW
	1121-CPD-KA0048	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)

Exterior Application

☐ EA, EK, 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.

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.

Custom Color Matching

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

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 ☀️ or ☀️ 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).
- BELBIEN with ☀️ mark : Can be used for exterior and interior installation which requires cares against sunshine coming through from outside. When used for vertical applications, expected durability in terms of color-fastness is approximately 3-5 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.

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,ES,EK,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. KASEI CO., LTD. ("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.

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) SS

- The matte coating of this series provides less resistance against stains than other series. 3D applications are prohibited.

SG (Urushi series)

- This series has a lacquer-like surface and any imperfection in the substrate will be telegraphed. For this reason, install this series on a very smooth metal or high-pressure laminate. Extensive stretching will crack the surface coating; therefore, 3D applications are prohibited. A protective film on the surface helps to prevent scratching during the installation.

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, EK, 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, EK, 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
Change on surface	10% NaOH
	Toluene
	Ethyl Acetate
	Methyl Ethyl Ketone

* EA, EK, 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)

Certification For Shipbuilding Interior Use

CE mark	MED-B-5986	A, BC, BR, C, CO, CY, DA, F, K, MA, NC, PR, S, SA, SW, W, WA, WB
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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.