AIR WATER ECOROCA INC.

ECOROCA®
EXCELLENT WOOD-PLASTIC COMPOSITES

Air Louver

Hybrid Pipe

Light Flexible
Blends with the landscape
As light as air

ECOROCA is a coined compound of ecology and pororoca, a tidal bore that travels up the Amazon River from the sea during the flood tide, to conjure up an image of cycles of nature.

Unification of aluminum material and ECOROCA.

38 percent weight reduction

A 38 percent reduction in weight has been achieved since our previous product [Artificial recycled wood + Aluminum reinforced core].
※Comparison of [Hybrid 93 × 43] and [Artificial recycled wood 93 × 43 + aluminum reinforced core 30 × 20 × 2].

Beautiful and strong structure

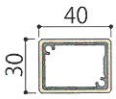
Preserving the feel of natural wood while securing the equal strength of aluminum.

Speedy construction and cost reduction

Conventional processing to reinforce core installation is unnecessary. Moreover, the lighter weight enables shortened lead times. Compared with the previous product, a total cost reduction including rough-in construction, installation costs can be achieved.

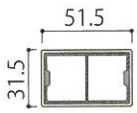
It is possible to meet flexibly to various design plans with rich variation.

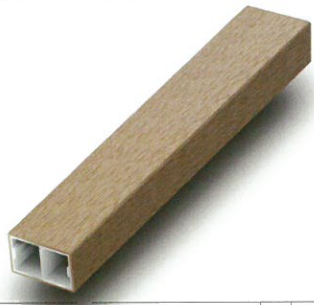
40×30 P/No. HB-0403 CAP



weight(Kg/m)	0.75	moment of inertia of area(cm⁴)	Ix	1.887
size(mm)	40×30		Iy	3.4436
standard length(mm)	2000・3000	section modulus(cm³)	Zx	1.4512
cross sectional area of core(mm²)	182.08		Zy	1.9874
cross sectional area of surface layer(mm²)	262.86			

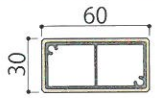
52×32 P/No. HB-0503 CAP

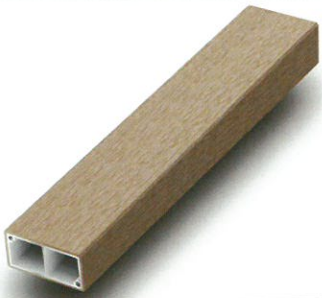




weight(Kg/m)	0.8	moment of inertia of area(cm⁴)	Ix	2.5383
size(mm)	51.5×31.5		Iy	6.977
standard length(mm)	2000・3000	section modulus(cm³)	Zx	1.775
cross sectional area of core(mm²)	233.67		Zy	2.8712
cross sectional area of surface layer(mm²)	232.19			

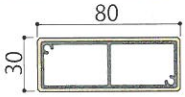
60×30 P/No. HB-0603 CAP

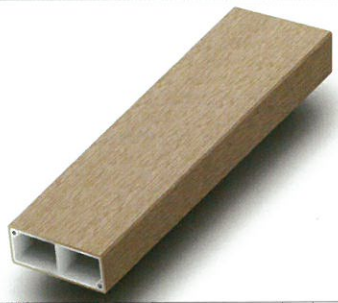




weight(Kg/m)	1.1	moment of inertia of area(cm⁴)	Ix	10.4254
size(mm)	60×30		Iy	3.0801
standard length(mm)	2000・3000	section modulus(cm³)	Zx	2.3686
cross sectional area of core(mm²)	280.7936		Zy	3.7213
cross sectional area of surface layer(mm²)	341.9314			

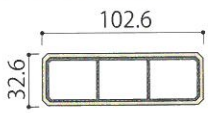
80×30 P/No. HB-0803 CAP





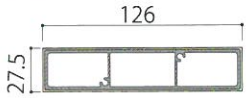
weight(Kg/m)	1.25	moment of inertia of area(cm⁴)	Ix	3.9816
size(mm)	80×30		Iy	22.382
standard length(mm)	2000・3000	section modulus(cm³)	Zx	3.062
cross sectional area of core(mm²)	340.79		Zy	5.886
cross sectional area of surface layer(mm²)	421.93			

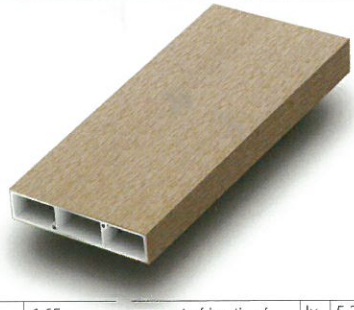
103×33 P/No. HB-1003 CAP



weight(Kg/m)	1.35	moment of inertia of area(cm⁴)	Ix	5.3771
size(mm)	102.6×32.6		Iy	36.8102
standard length(mm)	2000・3000	section modulus(cm³)	Zx	3.7602
cross sectional area of core(mm²)	379.9		Zy	7.4666
cross sectional area of surface layer(mm²)	439.46			

126×27.5 P/No. HB-1303 CAP



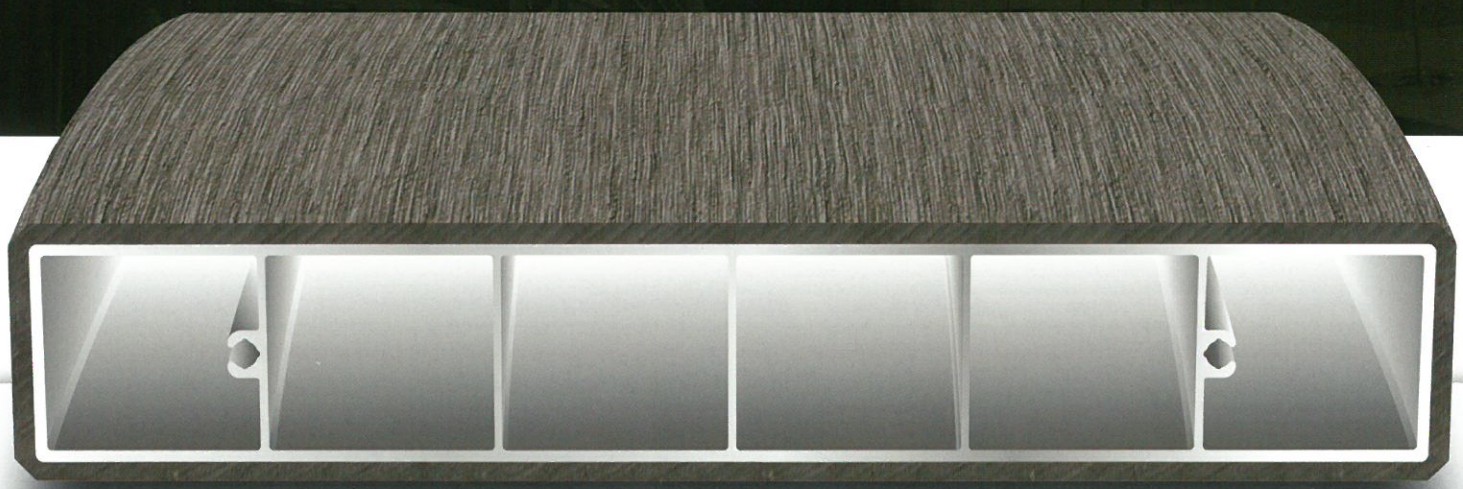


weight(Kg/m)	1.65	moment of inertia of area(cm⁴)	Ix	5.334
size(mm)	126×27.5		Iy	72.603
standard length(mm)	2000・3000	section modulus(cm³)	Zx	4.354
cross sectional area of core(mm²)	513.1		Zy	11.805
cross sectional area of surface layer(mm²)	451.72			

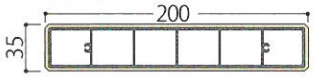
①The product is not for structure. It should not be used as a corbel for louver. ②The allowable support span of louver is different depending on region or installation place (height etc). ③The maximum leng

ECOROCA Air Louver has the lightweight and resilient properties of natural wood.

Air Louver

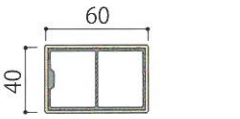


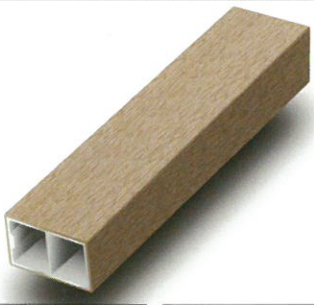
200×35 P/No. HB-2003 CAP



weight(Kg/m)	3.3	moment of inertia of area(cm⁴)	Ix	13.3871
size(mm)	200×35		Iy	309.4787
standard length(mm)	2000·3000	section modulus(cm³)	Zx	8.9195
cross sectional area of core(mm²)	858.7934		Zy	31.7414
cross sectional area of surface layer(mm²)	1142.86			

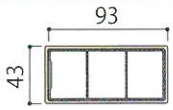
60×40 P/No. HB-0604 CAP

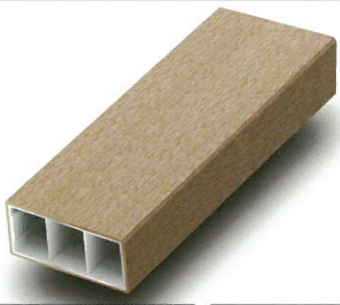




weight(Kg/m)	1.1	moment of inertia of area(cm⁴)	Ix	5.2114
size(mm)	60×40		Iy	11.1842
standard length(mm)	2000·3000	section modulus(cm³)	Zx	2.9151
cross sectional area of core(mm²)	276.82		Zy	4.2016
cross sectional area of surface layer(mm²)	380.72			

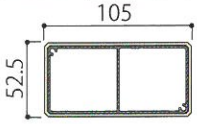
93×43 P/No. HB-0904 CAP





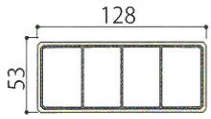
weight(Kg/m)	1.65	moment of inertia of area(cm⁴)	Ix	10.377
size(mm)	93×43		Iy	40.345
standard length(mm)	2000·3000	section modulus(cm³)	Zx	5.321
cross sectional area of core(mm²)	441.57		Zy	9.507
cross sectional area of surface layer(mm²)	520.86			

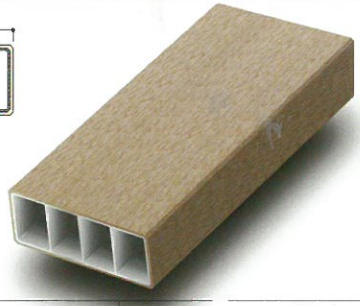
105×53 P/No. HB-1005 CAP



weight(Kg/m)	1.9	moment of inertia of area(cm⁴)	Ix	20.57
size(mm)	105×52.5		Iy	62.44
standard length(mm)	2000·3000	section modulus(cm³)	Zx	8.482
cross sectional area of core(mm²)	508.2		Zy	12.364
cross sectional area of surface layer(mm²)	605.02			

128×53 P/No. HB-1305 CAP





weight(Kg/m)	2.45	moment of inertia of area(cm⁴)	Ix	24.612
size(mm)	128×53		Iy	101.531
standard length(mm)	2000·3000	section modulus(cm³)	Zx	10.128
cross sectional area of core(mm²)	662.1		Zy	16.429
cross sectional area of surface layer(mm²)	767.04			

of the product is by 4,400mm. However, it will be build-to-order by specific delivery term and quantity, please inquire to us. ○There is an incombustible grade which complied with JIS K 6911, it is available to order. ※T

Demonstrated with numerous durability tests. Safety design without peeling off between recycled wood layer and aluminum layer.

Durability performance, depending on various tests as drying after dipping into hot water, thermal cycle test, heated water test and so on, equivalent to 20 years to 30 years has been proven that peeling off, clack and local blister between recycled wood layer and aluminum layer didn't occur.
When installing on large scale and high place site, remaining beautiful appearance for long term without risk to falling by peeling recycled wood layer.

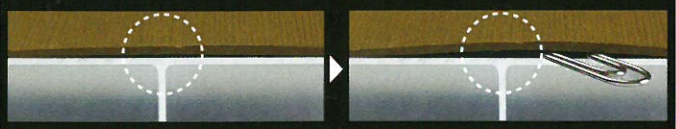
Durability test : Standard of judgment／No peeling, clack and local blister

Beware of imitations like "Air louver"!

When adhesion between recycled wood layer and aluminum layer is insufficient, problems on safety or appearance of products would occur.

Example for peeling problem.

Due not to adhere completely between recycled wood layer and aluminum layer, the gap occur as below pictures.
If the gap occurs, water tends to invade or blister and clack on surface of Louver would occur depending on change in the outside air temperature.

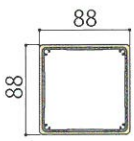


CAP There is a dedicated end cap.

120×30 P/No. HB-1203 CAP

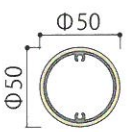
weight(Kg/m)	1.9	moment of inertia of area(cm⁴)	Ix	4.83
size(mm)	120×30		Iy	42.75
standard length(mm)	2000・3000	section modulus(cm³)	Zx	3.72
cross sectional area of core(mm²)	447.4		Zy	7.67
cross sectional area of surface layer(mm²)	522.39			

88×88 P/No. HB-0909 CAP



weight(Kg/m)	2.7	moment of inertia of area(cm⁴)	Ix	81.736
size(mm)	88×88		Iy	81.736
standard length(mm)	2000・3000	section modulus(cm³)	Zx	19.554
cross sectional area of core(mm²)	751.48		Zy	19.554
cross sectional area of surface layer(mm²)	758.5			

φ50 P/No. HB-0005

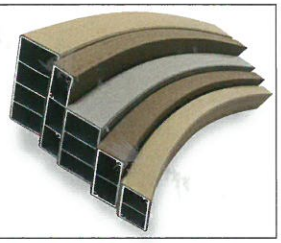


weight(Kg/m)	1.0	moment of inertia of area(cm⁴)	Ix	5.233
size(mm)	Φ50		Iy	7.008
standard length(mm)	2000・3000	section modulus(cm³)	Zx	3.047
cross sectional area of core(mm²)	259.597		Zy	2.275
cross sectional area of surface layer(mm²)	301.592			

color might be different on batch-by-batch, because the product is used recycled wood material.

Giving a sense of peace to people in the elegant space with Japanese tastes "WA(和)".

Flexure is now possible



- The recycled wood used in our previous product was not conducive to flexure, but is now simple with Air Louver!
- Please consult with us regarding bend radius when you commence your design and planning.

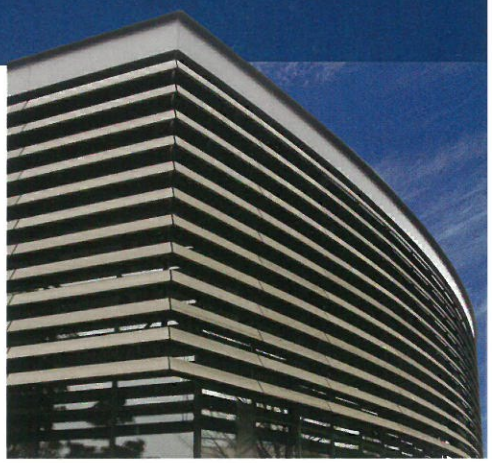
Color variation

※The product uses recycled materials for manufacturing and the color tone may differ depending on the lots.

Brown　Sandy Brown　Gray　Deep gray

Beautiful, Lightweight and Toughness

Creating exterior and space freely.



It is reliable to install on any sites as demanding higher durability, weather resistance and workability.

It is possible to design boldly as wrapping the whole building or installing to the top floor on the building, these are depending on features of Air Louver as lightweight and tough material.

Features

●Weather resistance : ECOROCA is highly weather resistant against the aging degradation that comes from outdoor use. The surface of the aluminum die cast is molded witha single coating to ensure a long-term aesthetic effect. Unlike sheet wrapping products, peeling will not occur due to the absence of seams.

●Processability : On-site installation processes such as cutting, boring holes, fastening with bolts are facilitated due to the use of the lightweight, corrosion-resistant, dimensionally stable aluminum mold used for the core. Its combined high mechanical strength will also enable achieving total cost reduction through realization of a more efficient construction work process, ability to meet multiple design requirements, and shortening of lead times, etc.

●Workability : Air Louver provides a safe and secure design by using SUS304 plate nuts and bolts to secure the core aluminum mold, and delivers a reliable execution of construction that meets all the severe terms and conditions pertaining to working at height.

●Design : A soft wood-like appearance is achieved through ECOROCA's reputable surface-finish material made of wood-plastic composite.

●High functionality : **[Light shielding and energy conservation]**
Selecting from our wide range of available cross-sections to suit the purpose will achieve optimum light shielding and energy conservation.
[Excellent resistance to wind-blown sand versus paint]
ECOROCA's surface is coated with a thin film of 1.5 to 2.0 mm, which has exhibited excellent resistance even in seacoast areas that are adversely affected by wind-blown sand.
[Thermal cycling performance]
A thermal cycling test has also yielded reliable test results that show no abnormalities such as misalignment between the aluminum core and ECOROCA, peeling or cracks.
[Water resistance]
Results of a 30-day water immersion test showed an absorption rate of less than 0.1 percent. Furthermore, the test proved excellent water resistance in which no misalignment between the aluminum core and ECOROCA, no peeling or cracks were detected.

●Safety : Thorns and burrs will not occur on the surface finish of ECOROCA, and thus will not harm skin or damage clothing. Made from raw materials of wood flour and olefin resin, ECOROCA is an environmentally friendly material that does not emit toxic substances such as dioxin even when burned.

Precautions ⚠

Cautionary notes on Air Louver

①Please do not use Air Louver for anything other than its intended purpose as it is very dangerous.

②Standardized Air Louver products are not non-inflammable. Please take this into account for places where a restriction on its use is in effect.
Please consult our sales representative for a non-inflammable spec product, which is available separately.

③The surface layer of Air Louver is manufactured from recycled materials. Although no effort has been spared to ensure quality, please note beforehand that there are some small color variances between same-color products and some deformation in shape only to an extent where performance is not affected.

④Please do not use Air Louver in areas where heat or fire is in use. Again, please do not place lighted cigarettes on the product, nor allow them near it, as there is the risk of deformation, discoloration and damage.

⑤Conditions such as installation span pertaining to the installation of the Air Louver will differ according to region and environment. Please ensure safety by calculatingstrengthwhen installing.
Please ensure to secure the appropriate clearance by taking into account the stretch of the Air Louver with respect to its joints and the areas that interconnect with the building.
(Standard condition would require securing a clearance of 10mm.)

⑥Please refrain from finishing the joints of the material with only nails or adhesive.

⑦The surface finish of the Air Louver may generate powder as a result of changes in temperature or humidity; exposure to ultraviolet rays; or from usage that generate friction. Please take care not to rub the powder against fabric such as clothing as there is the risk of color transfer.

⑧Please take care to avoid contact with Air Louver during the summer season when the surface will become hot under direct sunlight.

⑨We ask for your understanding that due to the resin in the Air Louver's surface finish, friction may cause static electricity to be charged.

⑩When installing Air Louver in a snow zone or an environment that exposes it to corrosive gas, sea water or dust, please conduct a thorough research on the environment prior to installation.

⑪Please do not drop heavy objects on the Air Louver, or poke with a pointed object such as an umbrella as this will cause cracks, dents or scratches on the surface finish.

⑫When storing the Air Louver, please store indoor on a flat surface.

⑬When the Air Louver is soiled, please wipe off using a diluted mild detergent. Please ensure to rinse off all residual detergent with fresh water. (Please do not use solvents such as paint thinner.)

of the produc

■Basic Properties of ECOROCA Air Louver Material

(integrally molded aluminum and resin incorporated with wood flour)

Assessment items			ECOROCA Air Louver	Previous product	
Linear expansion coefficient	$\times 10^{-5}$ 1/°C Compliant with the JIS-K6911		2.3	4.1	JIS-K7197
Flexural strength	Flexural ※1 Compliant with the JIS-K7209	Stress (MPa)	340	25.2	JIS-K7181
		Elasticity rat (MPa)	57,000	3,300	JIS-K7113
Water absorption rate	Water absorption rate Compliant with the JIS-K7209	1 day later 30 days later	0.5% or less	0.6%	JIS A5905
	Width expansion rate	1 day later 30 days later	0.1% or less	0.1% or less JIS A5905	
	Height expansion rate	1 day later 30 days later			
Durability test	Hot water drying test ※2 60°C hot water 5D, 80°C hot water 5D→15 CYC	No abnormalities (No cracks, peeling, or swelling)			

※1 Please calculate only the strength of the aluminum portion when conducting the strength calculation. Aluminum strength (flexural strength: 107 MPa, flexural modulus: 68,000 MPa)

※2 The hot water drying test conditions are equivalent to two years of natural exposure.

■Air Louver Support Beam Span Chart

	Product code	Section size	Upright paneling		Side paneling	
			Span between support beams	Cantilever length	Span between support beams	Cantilever length
30	HB-0403	40×30	1,500	300	1,500	300
	HB-0503	52×32	2,000	300	2,000	300
	HB-0603	60×30	2,200	400	2,100	400
	HB-0803	80×30	2,800	500	2,100	400
	HB-1003	103×33	3,000	500	2,000	400
	HB-2003	200×35	3,000	500	2,000	400
40・50	HB-0604	60×40	2,100	400	2,100	400
	HB-0904	93×43	3,000	500	2,500	500
	HB-1305	128×53	3,000	500	2,800	500
Regular quadrilateral and circle	HB-0005	Φ50	1,600	400	1,600	400
	HB-0909	88×88	3,000	500	3,000	500

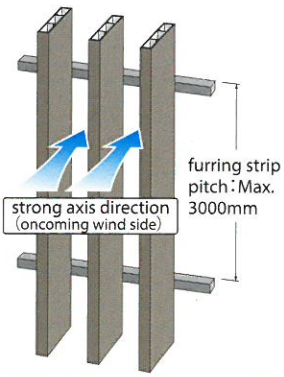
※This table is a reference value considering only the wind in the strong axis direction.

◆Calculation condition of span table for support beams.

- Direction of oncoming wind is only strong axis direction. (refer to right figure)
- Building height (height of installing louver) : 35m
- Standard wind speed : 34m/s〔Tokyo excluding islands〕
- Classification of ground roughness : II (Region within 500m distance to coastline or shoreline.)
- Designed wind pressure : 4256N/m²

◆Notes

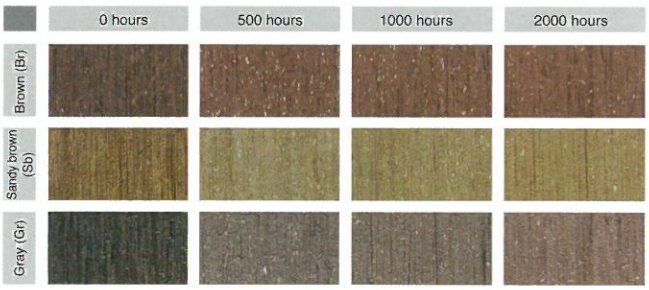
- Regardless of the results of the strength calculation, furring strip pitch should be limited by max. 3000mm.
- Fixing louver is recommended as three points as possible, considering fall prevention.
- When considering span of support beam of louver, it should be decided by attached table of Air Louver supporting span according to actual installation condition.
- When there is excessive human load or concentrated load as using handrail or guard fence, it should be confirmed supporting span by strength calculation separately.
- When using in snow-covered region, it should be confirmed supporting span by strength calculation separately.



▲Calculation model of span table for support beams

■Weather resistance(SWOM test)

It can be remained beautiful color of ECOROCA over the long term.



AIR WATER ECOROCA INC.

Air Water Inc.
ECOROCA Division

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