

We at WISE BRIDGE Corporation are dedicated to
“Partner for home appliance manufacturer”

■ About Wise Bridge

- Established in 2008 in Seoul, Korea
- Export Amount in annual average : U\$ 43 Mil
- Specialized in steel, plastic, component for home appliances

■ President

- Mr. Tony Jung

■ Awards

- *Export Achievement Award of USD 30 Mil by President of Korea, 2018*
- Export Achievement Award of USD 20 Mil by President of Korea, 2017
- Industrial Service Medal by President of Korea, 2017
- Export Achievement Award of USD 10 Mil by President of Korea, 2010

■ Product Application



Clients



Suppliers



Introduction on Wise Bridge

- Established for purpose of being **“Solution Provider” and reliable sourcing partner for home appliances manufacturers.**
- More than 20 years experience and accumulation with very professional knowledge.
- Current market leader of sourcing and exporting raw materials & components for Home Appliance manufacturing.
- Very close relationship with the suppliers (factories) of **Samsung, LG, Daewoo, and also other major home appliance manufacturers.**
- Efficient communication and prompt reply with customers & factories.

Introduction on Wise Bridge

Introduction to our Company and CEO

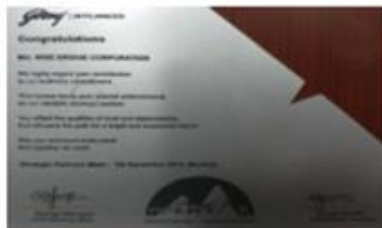


- CEO: Mr. Jung Nam Kyo
- 1998 Graduated from HUFS Univ.
- 1988 One of Founders of P&A
- 2004 Minister's Award of International Trade
- 2008 Founder of Wise Bridge
- 2017 President's Award of Industry
- Total 21 years of Career

Company	Wise Bridge Corporation
CEO	Mr. Jung Nam Kyo
Foundation	Aug. 29 th , 2008
Sales	USD 36,502,399
Business	Developing Software and Export
Employees	9
Location	27, Seosomun-ro, Seodaemun-gu, Seoul
Main Customer	Middle East, Africa, Southwestern Asia

Introduction on Wise Bridge

Summary of History



2008 - Foundation of Wise Bridge

2009 - Accomplishment of \$12 million of Sales

- Day of Global Trade \$5 million Award

2010 - Day of Global Trade \$10 million Award

2017 - Day of Global Trade \$20 million Award

- President's Award of Industry

- Minister's Award of Trade, Industry and Energy

2018 - Day of Global Trade \$30 million Award

- Egypt El-ARABY Home Appliance

- Best Supplier Award

- Launch of PCB Control Board Development

2019 - PCB Control Board \$1.5 million Supply Contract

- Progressing Southwestern Asia

- Home Appliance Development

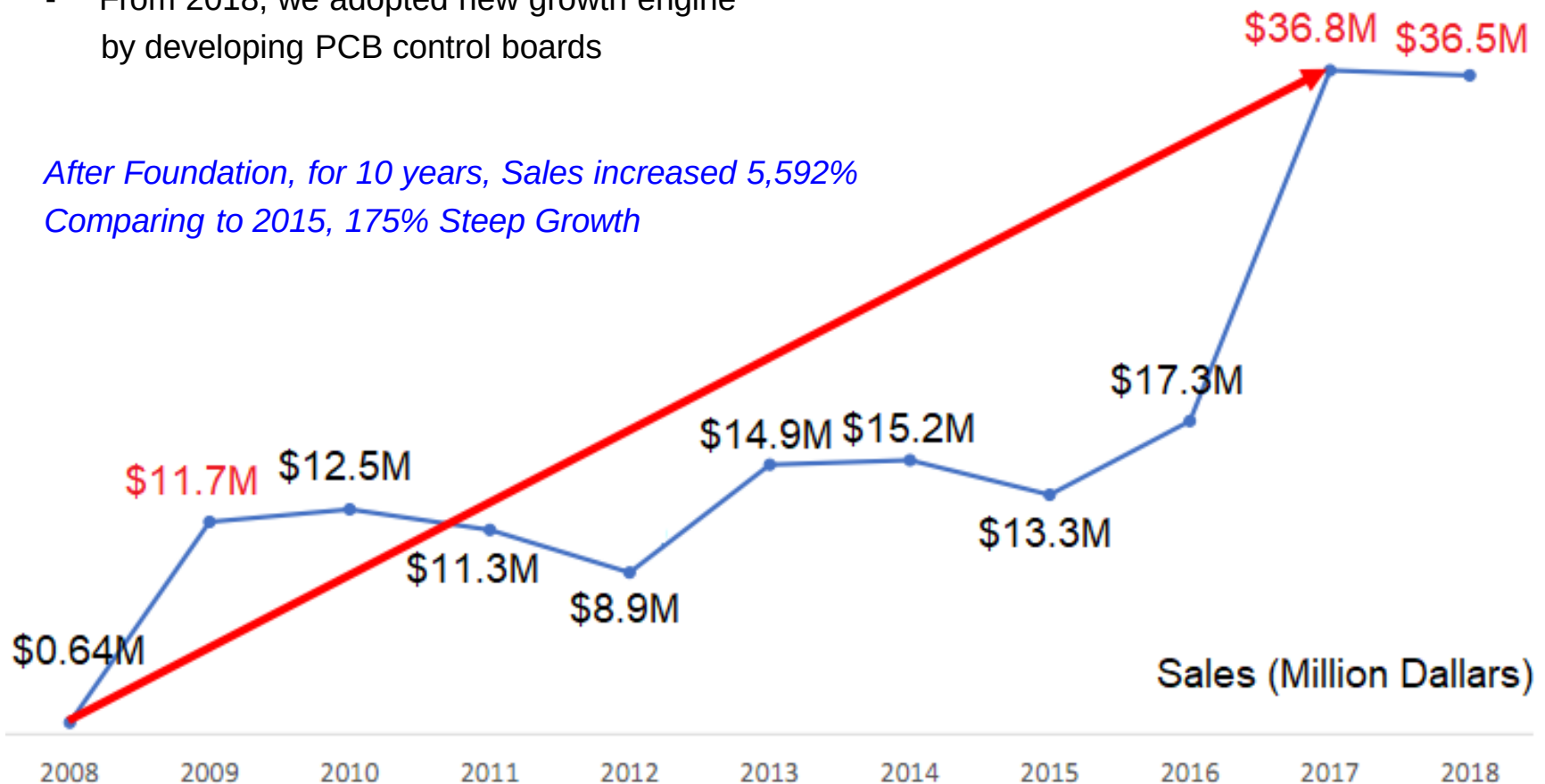
Introduction on Wise Bridge

The Story of Growth

After foundation in 08, we have exported raw material to home appliances companies in Middle East and Africa

- From 2018, we adopted new growth engine by developing PCB control boards

*After Foundation, for 10 years, Sales increased 5,592%
Comparing to 2015, 175% Steep Growth*



Advantage of sourcing through Wise Bridge.



- Package Supply

Package supplying is available (more than 100 kinds of components for home appliances including plastics, steel, and components)

- Providing high level of Real Time Information & Technique.

Reliable information with latest trend (also expectation) & price comparison

- Operating stock by program trading. (Timing orders)

- Systemized production guide and consulting for suppliers.

- Total Solution Provider

Through our knowledge & experience of being solution provider for many home appliances manufacturers in Middle East & Far East & Europe, We can introduce new technology and best alternative products with reasonable price & utmost service from Korea and China.

Cold Rolled Steel & Hot Dip Galvanized Steel

Prepainted / Printed Steel & Laminated Steel

Aluminum-coated Steel & Stainless Steel

Aluminum Sheet & Coil (Plain & Embossed)

Cold Rolled Steel & Hot Dip Galvanized Steel

Cold-Rolled Steel	
Thickness	For Coil : 0.15 mm ~ 3.60mm
Width	500 mm ~ 1270 mm
Length	600 mm ~ 5000 mm
Both Cross Section & Finishing	Mill Edge / Slit Edge & Dull Finish / Bright Finish
Quality Availability	CQ (SPCC), DQ (SPCD), DDQ (SPCE), DDQ-N (Stabilized Drawing Quality SPCEEN)
Standard	JIS G3141 or EN 10130
Application	For powder coating usage of refrigerator door /cabinet and Automobile.

Hot Dip Galvanized Steel	
Thickness	0.35 mm ~ 2.3 mm (Sheet & Coil)
Width	600 mm ~ 1,380 mm
Length	600mm ~ 5,000 mm
Coating Mass	80 ~ 650/m ²
Quality Availability	CQ, Lock Foaming, DQ, DDQ (JIS Standard)
Standard	JIS G3302 or EN 10142 (Zero Spangle)
Application	For powder coating usage of refrigerator door /cabinet. For bottom plate of freezer / show case

Prepainted / Printed Steel & Laminated Steel

Prepainted / Printed Steel

Thickness	0.35 mm ~ 2.3 mm (Sheet & Coil)
Width	500 mm ~ 1270 mm
Length	600 mm ~ 5000 mm
Slitting	Mill Edge / Slit Edge
Quality Availability	CQ, LFQ, DQ, DDQ
Standard	JIS G3312/3313
Application	Painted or Printed Steel which is normally being used for Refrigerator Door & Cabinet.

Laminated Steel (PVC & PET & ALF)

Thickness	0.35 mm ~ 2.3 mm (Sheet & Coil)
Width	600 mm ~ 1,380 mm
Length	600mm ~ 5,000 mm
Slitting	Mill Edge / Slit Edge
Quality Availability	CQ, LFQ, DQ, DDQ
Standard	JIS G3312/3313
Application	Film Laminated Steel which is normally being used for Refrigerator Door (for Luxurious models)

Prepainted / Printed Steel & Laminated Steel

PRODUCT LINE-UP

Coated Steel



ALCOSTA



ALZASTA

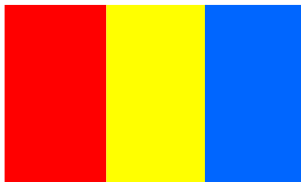


AL - STS



AL - HPF

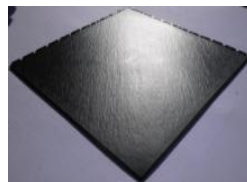
Color Steel



POS-COLOR



POS-PRINT



PVC SOL



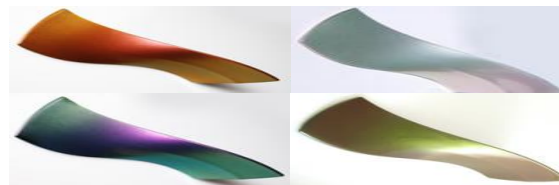
POS-LAMI



STS Cear/Black



MULTI - COLOR



PVDF - Chameleon

Prepainted / Printed Steel & Laminated Steel



Aluminum-coated Steel

HOT DIP ALUMINUM COATED STEEL (Al : 87.6%, Si : 10%, Others : 2.4%) ASTM A525 (ASTM A463 CQ), EN10143, KS D 3544, JIS G3314 SGCC (CD)	<table><tr><th>Classification</th><th>AL Coated Steel</th><th>GI</th></tr><tr><td>100℃×24hr</td><td>80%</td><td>80%</td></tr><tr><td>450℃×24hr</td><td>80%</td><td>15%</td></tr></table> 	Classification	AL Coated Steel	GI	100℃×24hr	80%	80%	450℃×24hr	80%	15%
Classification	AL Coated Steel	GI								
100℃×24hr	80%	80%								
450℃×24hr	80%	15%								
Special Feature	Applied items									
Hot-dip aluminum coated steel sheet combines the mechanical properties of cold Rolled steel sheet with aluminum's high resistance retention, heat reflection and superior rust resistance	- Automotive components : muffler, exhaust pipes, fuel tanks - Heating equipment : heat exchanger, stovepipe, pre-heater, dryer, duct. - Construction : Walls and roofs of chemical factories, fireproof wall - Home Electrical Appliances : Electric stove, gas range, bread machine, electric stove, toaster, frying pan, dryer Others : Steam cover, other chemical equipment									

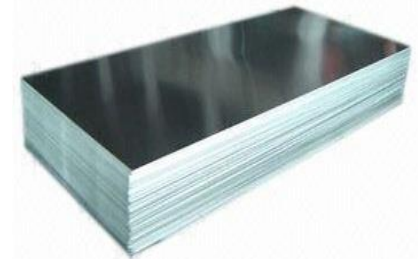
Stainless Steel

	Classification		Possible Production Scope	
	Type of Steel		301(L), 304(L), 304J1, 316(L), 321 409L,410, 420J1(J2), 430, 430J1L(CuN), 434, 436L, 444, 445M2	
	Surface		BA Finish	BB Finish
	Dimension (mm)	T	0.1~1.5mm	0.2~1.5
		W	Max. 805mm	Max. 1145mm
		L	Min. 270mm ~ Max. 5000mm (Sheet)	

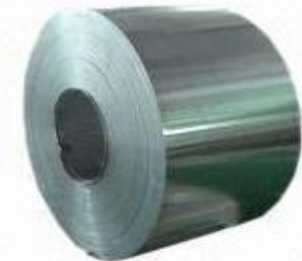
Aluminum Sheet & Coil and Embossed

Aluminum Sheet & Coil

Product	Alloy	Temper	Thickness mm	Width mm	Length mm	Remark
Aluminium Sheet	1145 1235	H18 H16	0.2-4.0	600-1200	1000-3000	
	1035 1100					
	1200 3A21	H14 H24				
	3003 3103					
	1050 1060	H22 O				



Product	Alloy				Temper		Thickness mm	Width mm	I.D mm	Re
Aluminium Coil	1070	1060	1050	1145	H18	H24	0.1-6.0	600-1700	Φ500 Φ600	Without edge sheared
	1235	1035	1100	1200						
	3A21	3003	3103	8011	H14	H24				
	DS-1 DS-2 DS-3									



Aluminum Embossed

Alloy	Temper	Specification (mm)			
		Base material thickness	Width	Length	Embossed depth
1070 1060 1050 1200 3A21	H14	0.30-1.5	≤1300	depending on the user's demands	0.08-0.25

Re : Customer's requirements about Alloy Temper specification is available



Plastics for Refrigerator & Other Home Appliances

Extrusion ABS & Extrusion HIPS

High impact strength GPPS

SAN / EPS / PC / P.P / PBT / MPPE

PolyAcetal (POM)

PVC Compounds

Foam Materials (Cyclopentane / Polyol System / MDI)

PE compound – XLPE / Adhesive resin

Plastics for Refrigerator

- Refrigerator

“WATER DISPENSER”
FX-0760, XP-4240(ABS)
(Thermal conductive,
Good Process ability)

“HANDLE”
GR-4020(ABS)
(Extrusion ability,
Good appearance)

“HANDLE Supporter”
HG-0760H(ABS)
SD-0150(ABS)
FX-0760(ABS)
(Metallic color,
Good appearance)

“DOOR CAP”
HG-0760GP(ABS)
(High Impact strength,
High Gloss)
HG-0760H(ABS)



❑ Inside applications

HG-0760H (ABS)
(High Flow, High Impact,
Transparency)
AS-0151(ABS)
(Anti-static, High impact strength)



❑ Outside applications

“LINER”
EM-0181(ABS)
(High Gloss,
Good process ability,
Down gauging)
SV-0157(ABS)
QU-0191S(ABS)

“COVER DUCT”
“GUARD DAIRY”
HG-1760FS(HIPS)
HR-1360H(HIPS)

“TR CASE”
HF-5661(SAN)
(Excellent Transparency,
Good surface)

“DRAWER COVER”
AS-0151(ABS)
(Anti-static,
High impact strength)

Plastics for Other Home Appliances

- Washing Machine

"TOP COVER"

SR-0320(ABS)

(High temperature
& Good UV resistance)

HP-1001(ABS)

(Good chemical
resistance, Good
dimensional stability)

“ ”

AB-0760H(ABS)

NA-0760(ABS)

(High gloss,
Anti bacterial)

"DOOR"

MP-0670(ABS)

(High impact resistance
& strength,
Easy etching)

"DOOR COVER"

"CONTROL PANEL"

HG-0760GP(ABS)

(High temperature
& Good UV resistance)



"CONTROL PANEL"

HG-0760GP(ABS)

(High temperature
& Good UV resistance)

UT-0510T(T-ABS)

(Excellent transparency,
Good surface,
Good coloring property)

- Air Conditioner



"BACK PANEL"

HR-1360(HIPS)

(Heat resistance,
High impact strength)

"CONTROL PANEL"

VH-0815(FR-ABS)

(Flame retardant,
High thermal resistance)

"FRONT PANEL"

"GUIDE FILTER"

HF-06601(ABS)

(High melt flow index
:3.7 at 200°C/5kg,
High impact strength
> Filter insert molding)

HG-1760SF(HIPS)

(High gloss,
Good process ability)

- Vacuum Cleaner



"HOUSING"

AS-0151(ABS)

(High temperature
resistance, Anti static)

FX-0760(ABS)

(Metallic color,
Good appearance)

- Bidet



"COVER"

VE-0856AB(ABS)

(Flame retardant)

- Air Cleaner



"HOUSING"

HG-0760GP(ABS)

(High gloss,
UV stability)

VE-0812(ABS)

(Flame retardant)

ABS / HIPS / SAN Material Line up

Starex	Type	Grade	Properties / Applications
Injection ABS	Standard	SD-0150W	High impact Resistance
		SD-0170	Ultra high impact (Air conditioner, Shoe hill)
	High Flow	HF-0660IW	Good Flow (Vacuum cleaner, Phone receiver)
	High Gloss	HG-0760H	High impact Resistance (Door handle, Cover, Homebar dispenser, Vegetable box)
		HG-0760GP	High impact Resistance, High Flexural Strength (Housing for Home appliances)
	Metal Plating	MP-0160R	Impact Resistance, High Flexural Strength (Lamp housing, Handle of home appliances)
	Transparent	UT-0510T	Cover slide basket
Extrusion ABS	Sheet for Liner using Cyclopentane , HFC134A	ST-series	Down gauging effect
		QT-series	Down gauging effect, Chemical Resistance
		QU-series	Down gauging effect, High TS
		EM-series	Down gauging effect , Crack free effect, Easy molding effect
	For HCFC141B	ES-series	Chemical Resistance
	For HFC245FA	EM-0181F	Chemical Resistance
HIPS & SAN	HIPS	HG-1760FS, HR-1360	Trim guard, Cover guide, Guard dairy, Cover guide, Case lamp, Cover duct Ref (High gloss)
	SAN	HR-5330, HF-5661	Vegetable box cover, Cover slide basket

□ Characteristic of Extrusion ABS

★ Excellent Vacuum Forming

- Sheet thickness down, decrease rejection ratio during thermoforming

★ High Chemical Resistance

- Prevent crack caused by foaming agent

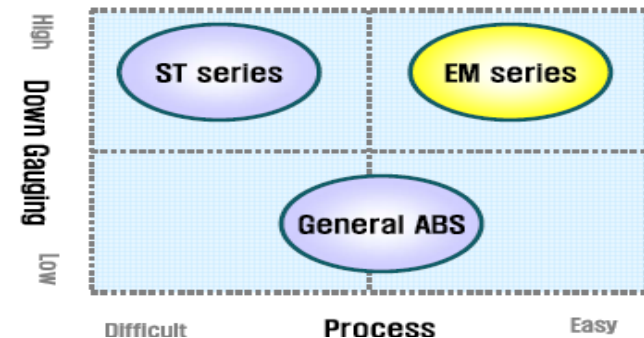
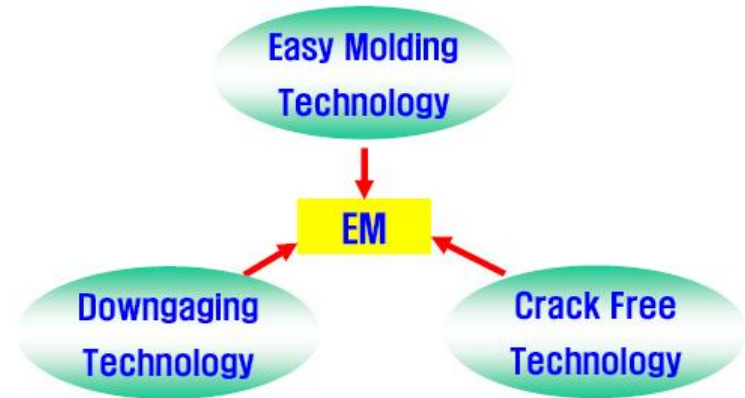
★ Well-balanced Mechanical Properties

- Prevent crack caused by mechanical force

★ Uniform Extrusion

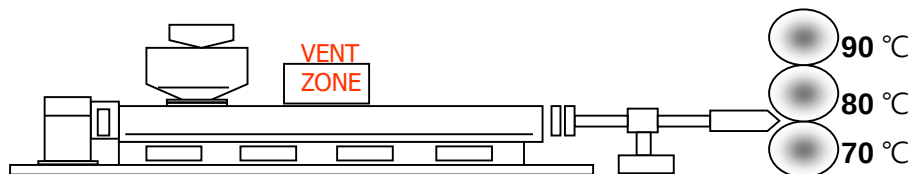
- Decrease the rejection ratio during both extrusion and thermoforming

★ Recycle & Non-Toxic



□ Extrusion Condition

UNION 100 Ø- L/D 35



EM-0181 : 250°C, 6min

In spite of reduced pre-heating time, EM-0181 shows similar thickness. It makes the cycle time reduction possible

Extrusion HIPS (H-835) SOLARENE®

We have tried to supply more benefit to your business with improved performance for many years. Now we introduce H 835 with improved stress crack resistance, rheological properties and processability required by the refrigerator liners.

Have an experience to meet the improved performance with Solarene® H 835

Better stress cracking resistance processability result in cost saving through downgauging less raw material, thinner liners. Also, H 835 have good adhesion with PUR foam used in refrigerator insulation

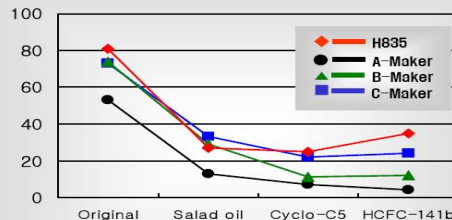


H835 shows excellent anti-blowing agents properties. It means that you can reduce the thickness of sheet and allow the durability in a refrigerator liner concerning the attack of the aggressive blowing agents. The change of appearance after immersing in the blowing agents assures you why to use H 835.

Change of appearance



Elongation(%)



Test condition :
• at 23°C, 48hours
• immersed in oil
• released by C5 & 141b

Comparison of Properties

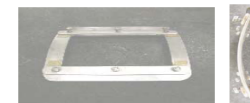
Items	Unit	H835	A-Maker	B-Maker	C-Maker
Tensile st.	kg f/cm ²	240	240	260	300
Elongation	%	75	55	80	80
Flexural st.	kg f/cm ²	380	420	370	440
Flexural Modulus	kg f/cm ²	18,200	19,000	19,700	18,300
Hardness (Rockwell)	L-Scale	50	55	50	65
Izod Impact st.	kg cm/cm	17	11	12	10
FDI	Joule	9	5	9	10
MFI (200°C, 5kg)	g/10min	3.4	3.6	3.6	2.2
VST (B/50)	°C	99	99.5	100	102

Tensile Elongation Retention Ratio

Chemicals & Conditions

Corn Salad Oil
: 50 min. Immersion at 23°C
Cyclo C5, HCFC 141b
: 50 min. Atmosphere(0.5 bar vapor pressure)

Test bars are exposed to chemicals as fixed on a constant stress jig.



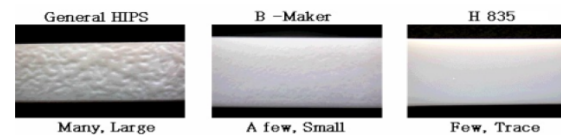
Procedures & Evaluation

- Tensile dumbbell specimens are prepared by injection molding.
- According to ASTM D 638 test method, the tensile elongation is measured for both specimen group exposed to chemicals and not.
- The tensile elongation retention ratio is calculated as follows:

$$ER \text{ ratio} = \frac{\text{Average elongation of specimens exposed to chemicals}}{\text{Average elongation of specimens not exposed to chemicals}} \times 100(\%)$$

Average elongation and tensile strength of specimens exposed to chemicals is also considered as a absolute ESCR index.

Surface Blister



Like above tensile, specimens are immersed in HCFC 141b, CFC 11, and cyclopentane fixed on a constant stress jig for 10 sec. and are inspected after drying.

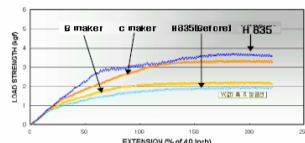
Sheet extrusion

ITEMS		Temperature
Cylinder	C1	170 ~ 190°C
	C2	180 ~ 200°C
	C3	180 ~ 200°C
Adapter		180 ~ 200°C
Die		180 ~ 200°C
Chill roll	Top	40 ~ 80°C
	Middle	40 ~ 70°C
	Bottom	40 ~ 60°C

Thermoforming

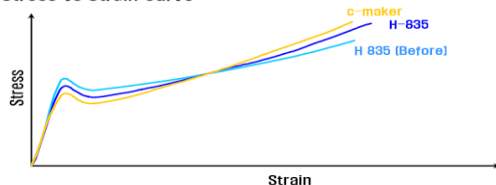
Heater Temp. (°C)	Heating Time (sec)	Sheet Temp. (°C)	Blowing Time (sec)	Mold Temp. (°C)
350~500	20~60	130~160	1~5	40~60

Hot Tensile Test (@130°C)



Through hot tensile test, the rheological characteristics(melt strength, elastic & plastic transformation) and thermoformability of the resin are able to be predicted.

Stress vs Strain Curve



The HIPS material with higher tensile break strength (larger difference between yield strength and break strength) more tenacious and resists chemicals. This enables the liner to be more uniformly thermoformed and reduced in thickness.

High Impact Strength GPPS SOLARPOL®

DONGBU SOLARENE® High Strength PS G-116 HV series are high molecular, heat resistant, crystal polystyrene used where high strength is required. SOLARENE G-116 HV is designed to give enhanced fracture resistance as well as high strength, improved moldability over conventional crystals.

Characteristics:

- High mol. weight
- High heat resistance
- Good moldability
- Enhanced toughness
- Excellent clarity
- Low volatiles

Processing:

- Extrusion
- Molding

Applications:

- Extrusion sheets (Light diffusion plate)
- XPS insulation board, Foamed trays, OPS
- Refrigerator trays
- Alternative to a SAN.

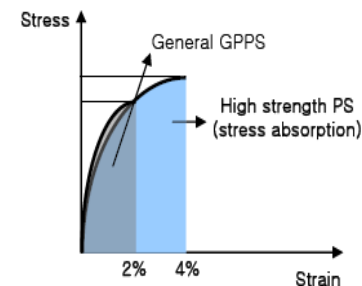
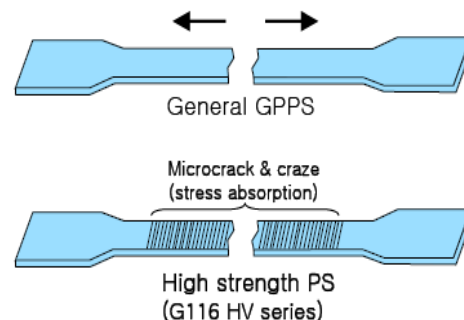
Typical properties of SOLARENE G-116 series:

Properties	Conditions	Unit	Test method	G-116 series	
				G-1160 HV	G-1161 HV
Rheological					
Melt Flow Index	200℃, 5kg	g/10min.	ASTM D 1238	1.3	2.0
Optical					
Transparency	3mmt	%	Dongbu method	90	90
Haze	3mmt	%	Dongbu method	0.5	0.5
Thermal					
Vicat Softening Point	B/50	℃	ASTM D 1525	105	101
HDT (Unannealed)	1.8 MPa	℃	ASTM D 648	85	80
Mechanical					
Tensile Strength	50mm/min.	kg/cm ²	ASTM D 638	580	570
Elongation	50mm/min.	%	ASTM D 638	3	3
Flexural Strength	3.2mm	kg/cm ²	ASTM D 790	1,100	1,000
Flexural Modulus	3.2mm	kg/cm ²	ASTM D 790	33,000	33,000
Izod Impact Strength	Notched	kg·cm/cm	ASTM D 256	2.0	2.0
Rockwell Harness	L scale	-	ASTM D 785	102	101
Flammability					
Flammability	1.6 mm	-	UL 94	HB	HB
Processing Conditions					
Melt temp. (Injection)	-	℃	-	180 ~ 260	
Mold temp. (Injection)	-	℃	-	10 ~ 60	
Melt temp. (Flat film)	-	℃	-	210 ~ 240	

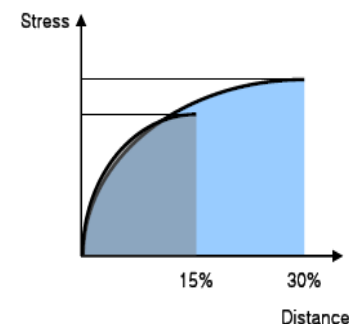
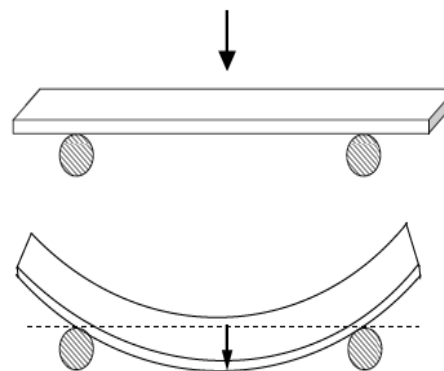
* Above data are typical values and intended to serve as guide only, not as specification limits.

DONGBU SOLARENE G-116 HV series have enhanced fracture resistance (high stiffness & toughness), which enables the grade to be applied to electronic components such as light diffusion plate, refrigerator parts, etc and alternatives to some SAN resins.

Tensile test



Flexural test

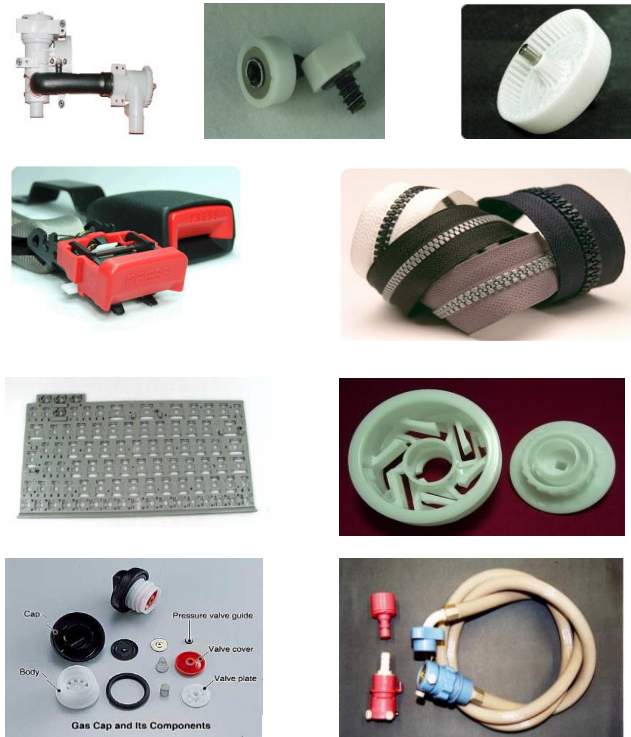


The high stress & shock absorption characteristics of DONGBU SOLARENE G-116 HV series allows parts produced with this resin to be durable (dimensional stability).

<u>SAN</u> 	<u>EPS</u> 	<u>P.P</u> 
The SAN resin is copolymer of Acrylonitrile(AN) having chemical resistance and Styrene(SM) of processability, and shows excellent tensile strength, flexural strength, impact resistance, creep resistance, wear resistance, and chemical resistance compared with GPPS. And it is used for electric and electronic parts, automobile, and industrial machinery, etc SAN, SAN/GF	The EPS resin, produced by suspension polymerization, is divided into flame retardant, general-purpose and low foaming products by purpose. EPS products are manufactured through a processing procedure that includes preliminary foaming, digestion and molding, and it is lightweight, retentive of warmth, impact-resistant and of good processability. It is widely used in adiabatic materials, impact-absorbing packaging materials, fishery box, Robot tray and special. Flame Retardant, General, Low Pentane and Other Categories.	It has properties such as hardness, slippery, softness, flexibility, non-rusting, easy to shape and color, etc. HOMOPOLYMER -Injection - households, crate, syringe, outdoor chair, etc - Yarn - woven bag, rope, fishing net, etc - Extrusion - packaging film, pipe, etc - Fiber - carpet, diaper, non-woven fabric, etc BLOCK COPOLYMER -battery case, outdoor chair, pail drum, etc RANDOM COPOLYMER - food container, sheet, stationery file, hot water pipe, etc
<u>PC</u> 	<u>PBT</u> 	<u>MPPE</u> 
The PC is a Polycarbonate resin with excellent impact strength, heat-resistance and dimensional stability, that is widely used in electric and electronic products, precision equipments, automobile, medical instruments and household.	Among various engineering plastics, PBT (Polybutylenterephthalate) resin is a crystalline resin with particularly excellent heat-resistance, chemical-resistance and electrical characteristics in combination with a fast crystallization speed. Thus it is known as the most balanced resin of good material property for a short molding cycle, weatherability, friction resistance, wear-resistance, dimensional stability and heat-resisting aging and economic evaluation.	Modified polyphenylene ether(MPPE) is an alloy of high impact polystyrene(HIPS) and polyphenylene ether(PPE) which is also called as polyphenylene oxide(PPO). staren MPPE(modified Poyl(phenylene ether)) is available in general heat resistant, flame retardant and heat resistant, general glass fiber reinforced, and flame retardant glass fiber reinforced grades.

PolyAcetal (POM)

Poly- Acetal (POM)



The resin is highly crystalline, and has a great combination of toughness and rigidity. It is also resistant to fatigue, creep, and to abrasion thanks to its property of self-lubrication..

Automotive	Engine/Fuel parts	Radiator drain cock Water valve body Fuel tank cap Carburetor parts Gas control valve
	Electric parts	Heater fan Heater control lever Air controller valve
	Interior parts	Door handle Door lock Sun visor bracket Seat belt parts
	Exterior parts	Out door handle Door lock
	Other parts	Oil tank check valve Speed meter parts Fastener, Clip Ball joints
Electronic		Tape recorder VTR Cassette tape player Personal computer parts Facsimile
Machinery		Vending machine Bicycle Clock Camera Optical machine
Misc.		Lighter case Spray nozzle Pencil cap Fastener Toy parts Pipe binding Fluid gage

PVC Compounds

Soft PVC



- **G series** apply in refrigerator gaskets that are suitable for refrigerator interior liners.
- **SG series** apply in general gaskets that are suitable for sealing glasses in the window frames and for preventing outside air from inflowing.

Product			G Series			SG Series	
Test items	Test method (ASTM)	Unit	105	107	112	101	103
1. Specific gravity	D792	-	1.22	1.24	1.26	1.26	1.26
2. Hardness	D2240	Shore A	61	67	70	67	68
3. Tensile strength	D638	kg/cm ²	100	145	150	120	140
4. Elongation	D638	%	290	330	355	290	330
5. Brittleness temperature	D746	°C	-35	-28	-28	-32	-34

Rigid PVC



- **PR series** for general rigid extrusion molding products are used for a furniture panel, photo frame, refrigerator door frame, and outdoor building materials.
- **SH series** for air conditioner curtains seal spaces.

Product			PR Series			SH Series	
Test items	Test method (ASTM)	Unit	123	130	151R	131R	130
1. Specific gravity	D792	-	1.43	1.44	1.48	1.49	1.27
2. Hardness	D2240	Shore D	80	76	80	82	-
		Shore A	-	-	-	-	68
3. Tensile strength	D638	kg/cm ²	450	440	465	470	130
4. Elongation	D638	%	130	95	50	70	310
5. Flexural strength	D790	kg/cm ²	750	710	760	860	770
6. Flexural modulus	D790	kg/cm ²	32,900	30,500	34,500	36,100	-
7. Izod impact strength	D256	kg·cm/cm	10	90	10	5	-
8. V.S.P.(1kg load)	D1525	°C	92	90	90	89	-

WISE BRIDGE
Solution Provider

Material	SPECS	Packing																																												
Cyclopen tane	Description Cyclopentane is a volatile liquid. As it has low reactivity and low boiling point, it is used as blowing agent. HS Code : 2902-19-0000 Specification <table><tr><th>Item</th><th>Specification</th><th>Unit</th><th>Test Method</th></tr><tr><td>Specific Gravity, 15.56/15.56°C</td><td>0.738~0.758</td><td></td><td>ASTM D4052</td></tr><tr><td>Appearance</td><td>Colorless</td><td></td><td>Visual</td></tr><tr><td>Odor</td><td>Like a Gasoline</td><td></td><td></td></tr><tr><td>Aromatic Content</td><td>Max. 5</td><td>vol-%</td><td>G.C</td></tr><tr><td>Purity</td><td>Min. 95</td><td>wt-%</td><td>G.C</td></tr></table>	Item	Specification	Unit	Test Method	Specific Gravity, 15.56/15.56°C	0.738~0.758		ASTM D4052	Appearance	Colorless		Visual	Odor	Like a Gasoline			Aromatic Content	Max. 5	vol-%	G.C	Purity	Min. 95	wt-%	G.C	16.7 Tons ISO Tank or 148kgs Steel Drum																				
	Item	Specification	Unit	Test Method																																										
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	Purity	Min. 95	wt-%	G.C																																										
Polyol System	Rigid PU foam is used for refrigerator, reefer container, insulation materials, tank insulation, insulation double pipe, cool air warehouse because it has strength in heat-insulation, magnetic, light weight, simplicity of production and diversity comparing to other heat-insulation materials.	200kgs Drum																																												
	<table><tr><th>Series</th><th>Usage</th><th>Density (kg/m³)</th><th>Property</th><th>System Name</th><th>TDS</th><th>MSDS</th></tr><tr><td>KIF-3000</td><td>System for refrigerator</td><td>22~24</td><td>c-Pentane system</td><td>KIF-3023CF</td><td></td><td></td></tr><tr><td>KIF-3600</td><td>SHOW CASE</td><td>22~23</td><td>HCFC-141b</td><td>KIF-3601</td><td></td><td></td></tr><tr><td></td><td></td><td>25~26</td><td>system</td><td>KIF-3602</td><td></td><td></td></tr></table>		Series	Usage	Density (kg/m³)	Property	System Name	TDS	MSDS	KIF-3000	System for refrigerator	22~24	c-Pentane system	KIF-3023CF			KIF-3600	SHOW CASE	22~23	HCFC-141b	KIF-3601					25~26	system	KIF-3602																		
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		25~26	system	KIF-3602																																										
Crude MDI (Isocyanate)	<table><tr><td>Appearance</td><td colspan="4">Brown liquid</td></tr><tr><td>NCO content</td><td>31 ± 0.5</td><td>wt. %</td><td colspan="2">ASTM D 1638-74</td></tr><tr><td>Viscosity at 25 °C</td><td>200 ± 30</td><td>cps</td><td colspan="2">DIN 51 550</td></tr><tr><td>Density at 25 °C</td><td>1.23</td><td>g/cm³</td><td colspan="2">DIN 51 757</td></tr><tr><td>Acidity as HCl</td><td>less than</td><td>0.1</td><td>wt.%</td><td colspan="2">ASTM D 1638-74</td></tr><tr><td>Total chlorine</td><td>less than</td><td>0.5</td><td>wt.%</td><td colspan="2">ASTM D 1638-74</td></tr><tr><td>Vapor pressure at 25 °C</td><td>less than</td><td>10⁻⁴</td><td>mbar</td><td colspan="2">-</td></tr><tr><td>Flash point</td><td>Above</td><td>200</td><td>°C</td><td colspan="2">DIN ISO 2588</td></tr></table>	Appearance	Brown liquid				NCO content	31 ± 0.5	wt. %	ASTM D 1638-74		Viscosity at 25 °C	200 ± 30	cps	DIN 51 550		Density at 25 °C	1.23	g/cm³	DIN 51 757		Acidity as HCl	less than	0.1	wt.%	ASTM D 1638-74		Total chlorine	less than	0.5	wt.%	ASTM D 1638-74		Vapor pressure at 25 °C	less than	10 ⁻⁴	mbar	-		Flash point	Above	200	°C	DIN ISO 2588		250kgs Drum
	Appearance	Brown liquid																																												
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Flash point	Above	200	°C	DIN ISO 2588																																										

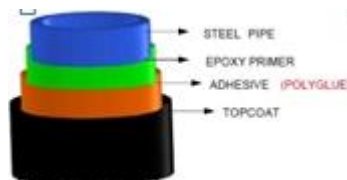
PE compound - Adhesive Polyolefin

Application of POLYGLUE

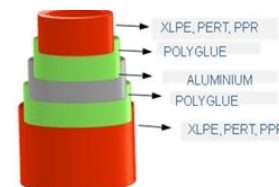


Steel Pipe Coating (PP & PE)

Structure
Steel / Epoxy / Polyglue / Top coat (PE or PP)
Grade
LE149V / LE200T / LE851P / RE340B
Application
Anti-corrosion steel pipe for oil & gas transportation

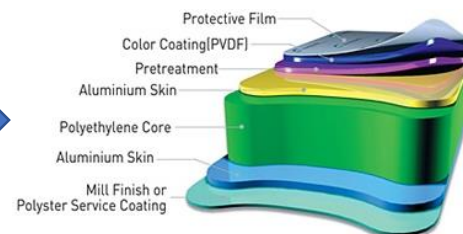


For PPR pipe



Aluminum Composite Panel

Structure
Aluminum / Polyglue / PE/Polyglue / Aluminum
Grade
LE102T / LE149V / GE310PL / GE300N / VE750S
Application
Interior & exterior decoration panel for construction



Aluminum Composite Pipe

Structure
PE or PP / Polyglue / AL / Polyglue / PE or PP
Grade
LE102T / LE200T / RE160 / GP420P etc.
Application
Hot & cold water pipe for drinking or heating

Multi-layer Film & Bottle etc.

Structure
PE or PP / Polyglue / Nylon or EVOH etc.
Grade
LE320V / RE340B / HB530
Application
Food packaging / Agrochemical bottle / Cosmetics tube & etc.



Coupling Agent

Grade
GE200C / GP820M / GN210M / GV230C
Application
Coupling agent (FR / Mineral Filler / Wood composite)

PE compound - Crosslinkable PE – PEX-B

Polylink® - Crosslinkable PE(Pipe)

Drinking water pipe, floor heating pipe,
Aluminum composite pipe



The advantage of POLYLINK®

We developed various kinds of POLYLINK which have different Melt flow index and density to satisfy customer' demands (gloss, flexibility, surface smoothness, processability, etc.)

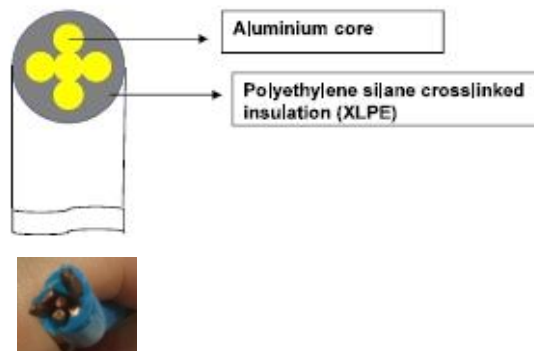
Applications

- >XP650 : Aluminum composite pipe, floor heating and drinking water pipe
- >XP460 : Improved flexibility from XP670
- >XP690 : Improved surface quality from XP670 (More gloss)
- >XL120 : Low voltage wire/cable insulation
- >XL120R : Increased line speed from XL120 (High flow)

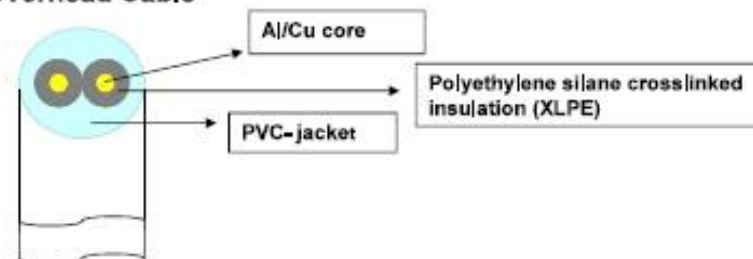
Crosslinkable PE(Cable)

Application - Cable Elements

For below 1 KV (Low Voltage Cable)



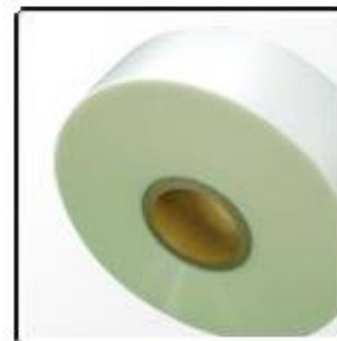
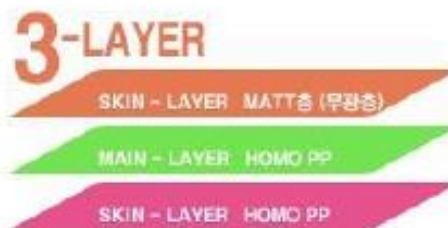
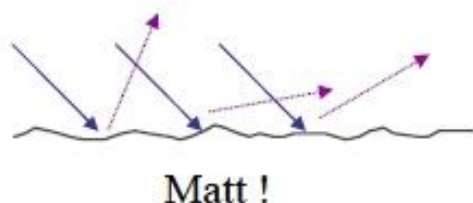
For insulated Overhead Cable



PE compound - Matt Composite

i-Lux[®] - Matt composite -

Matt surface is created through a scattered reflection on a rough surface



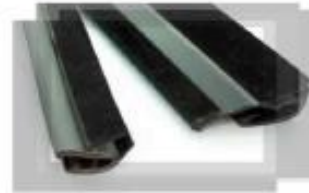
Main Use

- Covers of publications (Books, Magazines, Catalogues)
- Packaging-related Product (Food, Candy, Medicine, Toy, CD, Cosmetics, Shopping bags)
- Commercial Prints (posters, Calendars, Catalogues)
- Matt Transcription, Synthetic Paper Skin



Plasmer® for Automobile application

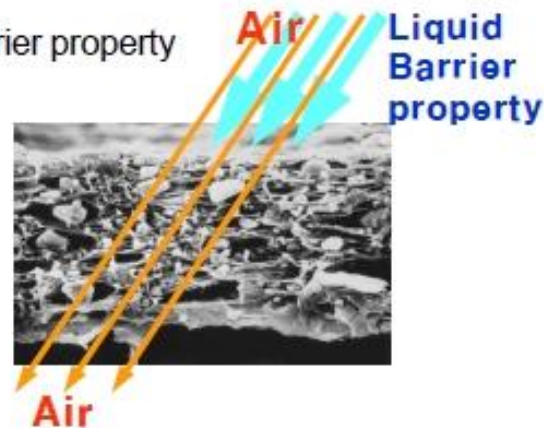
- | | |
|-------------------|-----------------------|
| ● Air bag cover | ● Interior Skin Sheet |
| ● Air intake hose | ● Glass run |
| ● Dust cover | ● Cowl top strip |
| ● Bus mold cover | ● Cable protector |



Brespol® - Breathable Compound -

Baby diapers, surgical gowns, etc

Soft touch, Barrier property
Against liquid



Components

Compressor

Control Board

Copper & Steel Tubes

Evaporator & Condenser

Heater / Bimetal & Thermal fuse

Fan motor & Blade

Thermostat & Damper & Defrost timer

Compressor

H Series

Ultra-efficient, low noise, low vibration and wide cooling capacity range, good matching. Using refrigerant R600a, R134a and R290, the cooling capacity range is from 80W to 410W.

C Series

Ultra-small installation space, cost-effective, low noise and low vibration. Using refrigerant R600a and R134a, the cooling capacity range is from 50W to 140W.



E Series

Reliable structure, easy starting and wide voltage operation. Using refrigerant R600a, R134a and R290, the cooling capacity range is from 50W to 210W.

X Series

Ultra-small form factor, wider speed range, low noise and low vibration. Using refrigerant R600a, the cooling capacity range is from 40W to 220W.

Light Weight Series

Ultra-high cooling capacity, good overload capability, suitable for light commercial product. the cooling capacity range is from 480W to 2000W.



F Series

Medium efficiency, economy high efficiency, low noise and low vibration. Using refrigerant R600a, the cooling capacity range is from 50W to 140W.

V Series

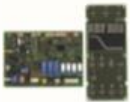
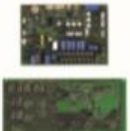
Ultra-efficient, low noise, low vibration, good overload capability and ultra-low installation height. Using refrigerant R600a and R290, the cooling capacity range is from 40W to 280W.

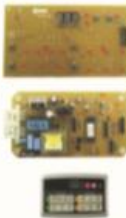
Y Series

Low installation space, cost-effective, low noise and low vibration. Using refrigerant R600a, the cooling capacity range is from 50W to 96W.

Control Board

System Controller for Commercial Refrigerator of Special Purpose

System Controller	Item	Spec (Dimension)	Product
	Blast Chiller	Main : 200×139 Display : 241×102	
	Dough Conditioner	Main : 200×140 Display : 281×127	
	Extreme Low Temperature / Medical Purpose	Main : 235×150 Display : 149×55	

System Controller	Item	Spec (Dimension)	Product
	Kimchi	Main : 180×100 Display : 168×95	
	Ice Cream / Bakery	Main : 180×130 Display : 151×47	
	Chocolate	Main : 138×115 Display : 106×49	

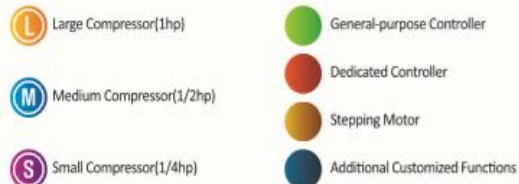
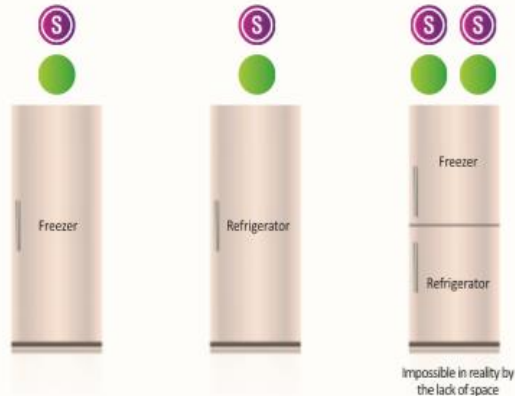
Control Board

System Controller	Item	Spec (Dimension)	Product
 	Tuna / Multi-purpose	Main : 171×52 DISPLAY : 179×59	
  	Meat Broth	Main : 180×78 Display : 190×60	
 	Slushie	Main : 220×70 Display : 170×65	

System Controller	Item	Spec (Dimension)	Product
 	Backbar	Main : 185×80 Display : 105×30	
 	Ice Maker	Main : 140×120 Display : 130×40	

Control Board

System(500L) Applied with General-purpose Controller [One Controller, One Compressor]



Compressor Price(USD) for Each Capability(hp)					Necessary Capability(hp) by Each Size of Refrigerator		
hp	1/8	1/4	1/2	1		500L	1100L
Price	15	20	30	200	Freezer	1/3	2/3
					refrigerator	1/4	1/2

System(500L) Applied with Dedicated Controller (One Controller, Multi Compressors)



Comparison of Total Cost(USD, EA)

Parts	General-purpose Controller			Dedicated Controller		
	Unit Price	Quantity	Total	Unit Price	Quantity	Total
Small Compressor	20	2	40	20	1	20
General-purpose Controller	20	2	40			
Dedicated Controller				30	1	30
Stepping		0		20	1	20
The Other Key Parts for Cooling Cycle	50	2	100	50	1	50
Additional Function	-	-	-	0~∞	1	0~∞
Total			180			120~∞

Control Board

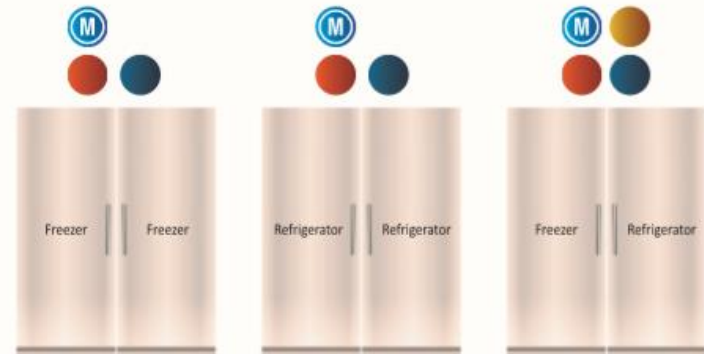
System(1100L) Applied with General-purpose Controller
(One Controller, One Compressor)



Comparison of Total Cost(USD, EA)

Parts	General-purpose Controller		
	Unit Price	Quantity	Total
Small Compressor	20	2	40
General-purpose Controller	20	2	40
Stepping		0	
The Other Key Parts for Cooling Cycle	50	2	100
Additional Function	-	-	-
Total			180

System(1100L) Applied with Dedicated Controller
(One Controller, Multi Compressors)

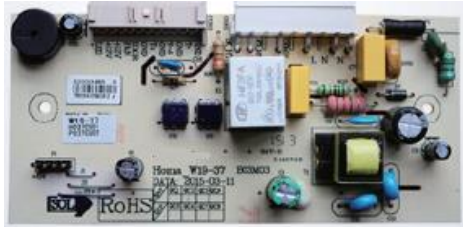


Comparison of Total Cost(USD, EA)

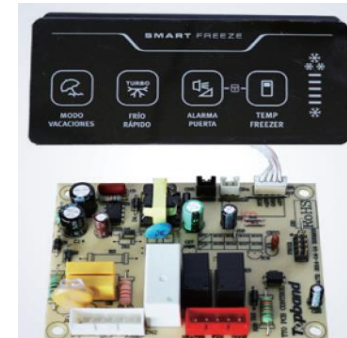
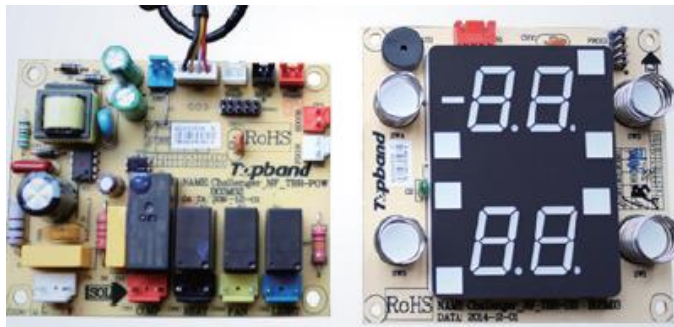
Parts	Dedicated Controller		
	Unit Price	Quantity	Total
Medium Compressor	30	1	30
Dedicated Controller	30	1	30
Stepping	20	1	20
The Other Key Parts for Cooling Cycle	70	1	70
Additional Function	0~∞	1	0~∞
Total			150~∞

Refrigerator controller

E- thermostat for refrigerator



- Our customers score top ratings in energy labeling using energy saving controls with integrated defrost functions controlled by time and temperature.

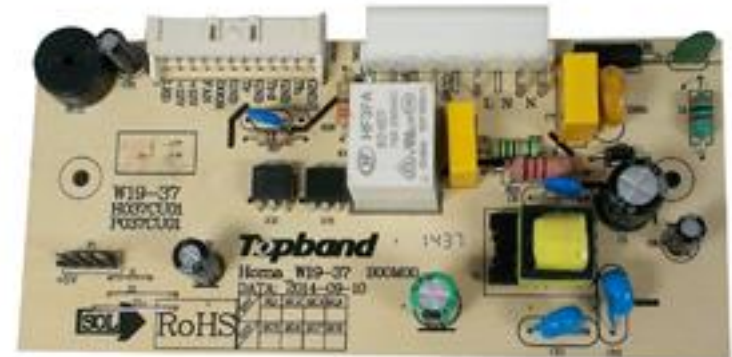


Controller

Refrigerator controller with single cycle and single system

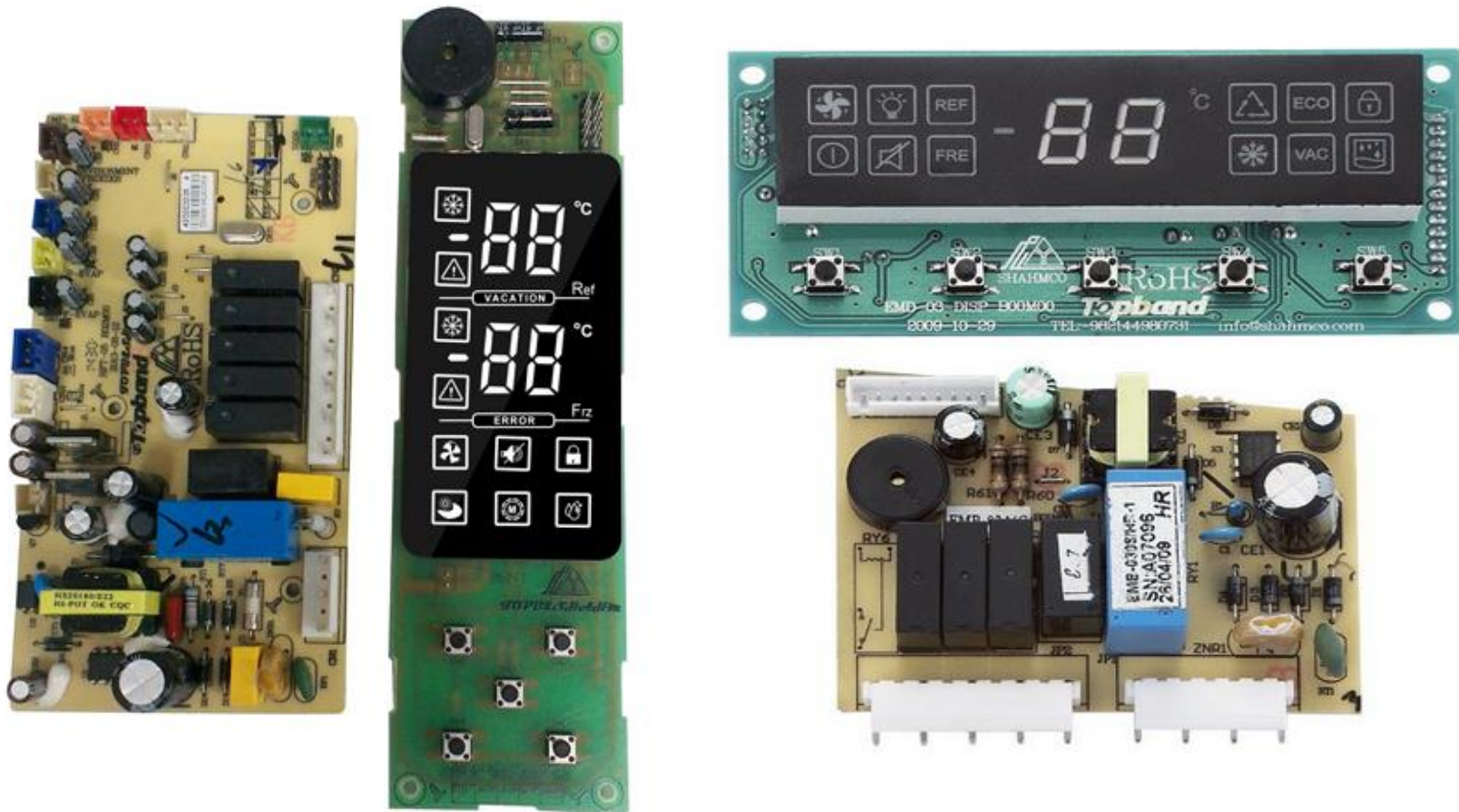


Non-frost three door/ four door refrigerator controller

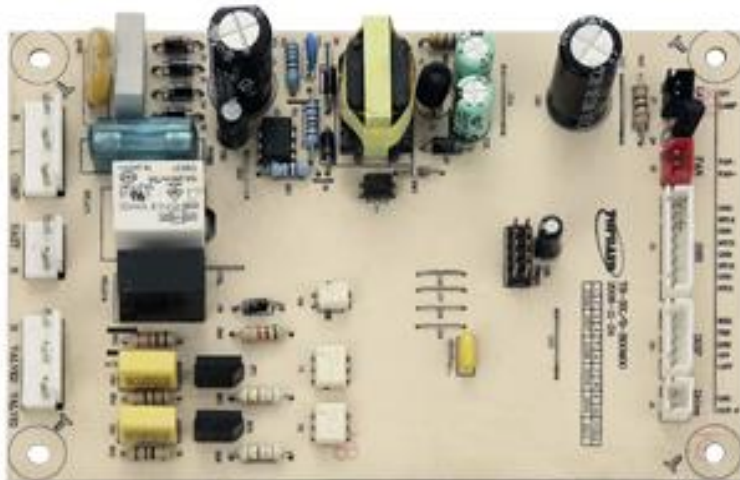


Controller

LED display Refrigerator controller of multi cycle control system



TN Segment LCD display controller



Controller

Blue light LED Multi door frost free refrigerator controller



White light LED Multi door frost free refrigerator controller



Copper & Steel Tubes

Copper Tube

Capillary Tube

Connector Tube

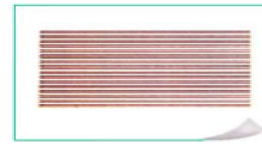
Single/Double Wall Steel Tube

Electric Welded Steel Tube

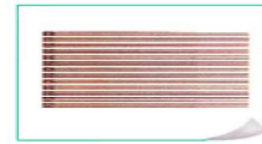
Continuous Zinc and PVF Coating

Suction pipe

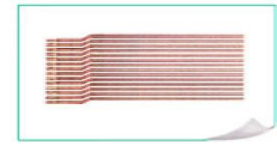
Heat exchanger



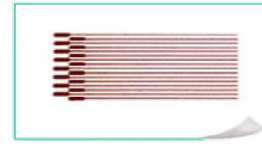
Cut Ends



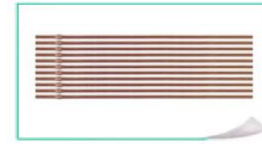
Punch Sealed Ends



Caulked and Pinch Sealed Ends



Cap Sealed Ends



Beaded Ends



Level Wound Coil



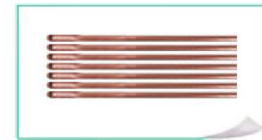
Pancake Copper Tube



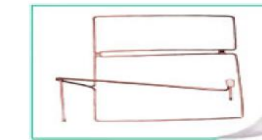
Capillary Tube (L/W)



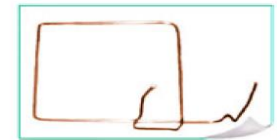
Tin - Plated Capillary Tube (Thermostat)



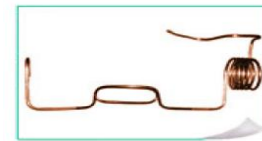
Expand pipe



HOT PIPE



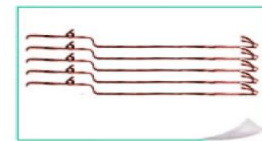
HOT PIPE



Connect pipe



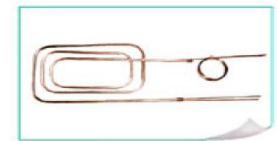
Connect pipe



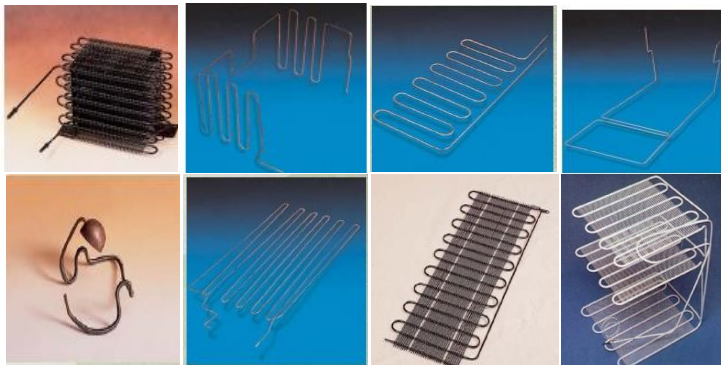
Suction ASS'Y



Suction ASS'Y



Suction ASS'Y



Evaporator & Condenser

Fin type Evaporator

Roll bond type Evaporator

Condenser

Condenser



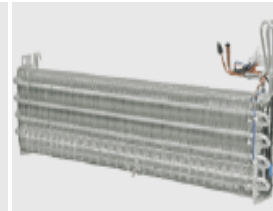
Fin Cross type



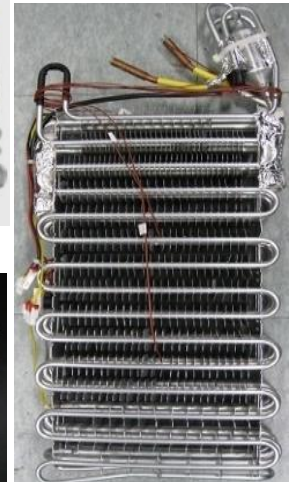
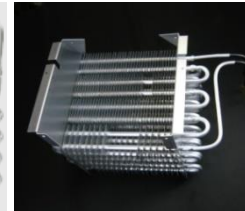
Side by Side type



Canted type



Top mount type Bottom freezer type



1) General Introduction

The latest model Fin Evaporator with high efficiency. Super Cleanness for R134a Refrigerant. Acknowledged of ISO-9001 in Evaporator

2) Characteristics (Super Clean Evaporator)

With independent fins adopted, the high efficient heat capacity is achieved. With tube expansion system adopted, more tight contact between fins and tubes for higher efficiency is achieved. Pitches of fins can be freely engineered

Roll Bond type



Heater and Bimetal & Thermal Fuse

Heater

AL-TUBE HEATER

AL-Tube is included the silicon heater,
External appearance is solid and made freezer's ice and frost
to liquidizing for optimum cooling efficiency.
Application : Heater for removing frost



GLASS TUBE HEATER

Heat thermal efficiency, heat proof is very good
to use for electric heater and refrigerator's defrost heater
because glass heater has quick response of heat generation



PVC HEATER

PVC Cord Heater to Al-Foil by heating process, welded.
Application : Refrigerator, Automobile seat etc.



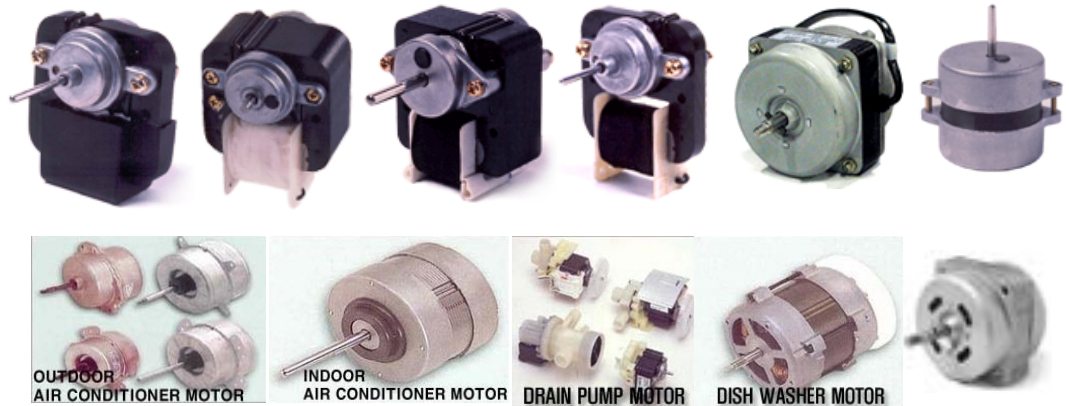
Bimetal & Thermal Fuse



Fan Motor & Blade

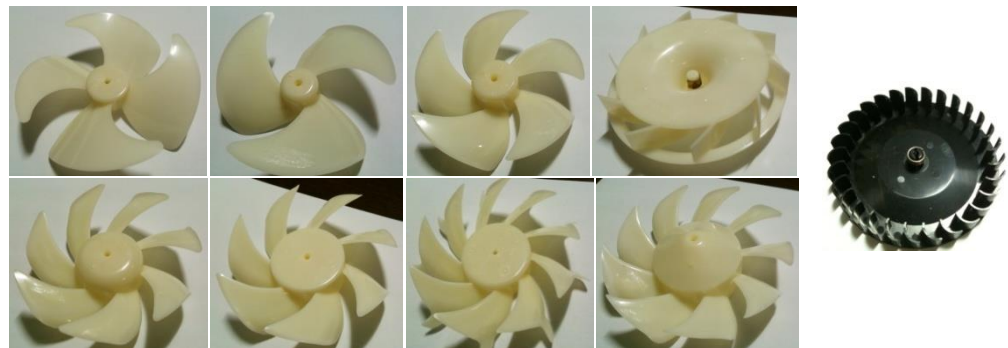
Refrigerator motor
for Evaporation
Refrigerator motor
for condenser cooling
Air conditioner motor
Drain pump motor
Vacuum cleaner motor
Dish washer motor
Air cleaner motor

AC Motors



Ø90, CW, 4wings
Ø90, CCW, 5wings
Ø95, CW, 29wings
Ø100, CW, 4wings
Ø100, CCW, 7wings
Ø110, CCW, 3wings
Ø110, CCW, 4wings
Ø110, CCW, 7wings
Ø110, CCW, 9wings
Ø110, CCW, 10wings
Ø146, CCW, 3wings
Ø150, CCW, 5wings

Blades



Thermostat & Damper & Defrost timer

- Thermostat
- Push buttonThermostat
- CCI Thermostat
- Damper Thermostat
- Defrost timer

Thermostats



Defrost Timer



SWITCH : 250VAC 5A COSØ=0.5-1

MOTOR : 220-240VAC 50/60Hz

CYCLE TIME

- 6 HOURS 35 MIN ± 10 MIN (60Hz)

- 7 HOURS 54 MIN ± 12 MIN (50Hz)

DEFROST TIME

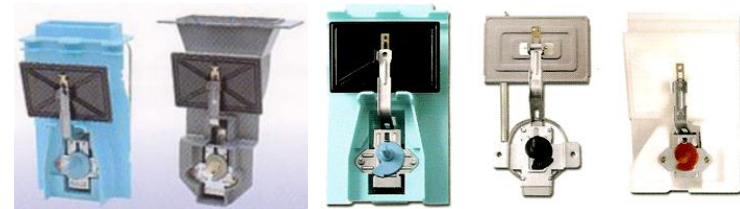
- 5 MIN 50 SEC ± 2 MIN (60Hz)

- 7 MIN ± 2 MIN 24SEC (50Hz)



Damper Thermostats

- Application : Refrigerator
- Feature : 1) Temp. : -20°C ~ +15°C
2) Cold control by opening and shutting the flow of cold air in refrigerator without electrical characteristic only by mechanical operation



Specification

Model	Operating Temperature (°C)							
	Cold		Normal		Warm		Warm1	
	Close	Open	Close	Open	Close	Open	Close	Open
SEC-D101G	-7	1	-3±1.5	5±1.5	1	9	—	—
SEC-301G	-6.5	3	-3±1.5	6.5±1.5	1	10.5	—	—
SEC-501G	-8.8	-2	-4±1.5	2±1.5	-0.5	5.3	—	—
SEC-D501T	-14	-6	-6.5±1.5	-0.5	0.5	6	—	—
SEC-D601L	-18	-5	-7.5±1.5	6.5	0.5	13.5	—	—

Special Components

AC-Input Fan BLDC motor for Refrigerator

DC-Input Fan BLDC motor for Refrigerator

LED Lamp

Air Filter

Name Plate

Package (Polpack)

Molds

AC-Input Fan BLDC motor for Refrigerator

As we recently received all responsibility to promote & develop the export sales of AC - BLDC Motor from our Korean manufacturer, In order for your any consideration on AC - BLDC motor, we'd like to explain our AC - BLDC motor more in details as follows :

(a). History of Our AC-BLDC Motor :

- Our AC - BLDC motor was originally developed by LG Electronics by themselves for LG own refrigerator.
- Two years ago, our current Korean mill took over all production line and also license & sales from LG Electronics.
- Our current Korean mill is now only supplying their AC/ BLDC motor for LG refrigerator with annual q'ty 1,000,000 set.
- Our current Korean mill have never supplied their AC / BLDC motor to other refrigerator mills than LG due to our mill's full production capacity to LG only.
- As we achieved the 1st order (annual consumption 300,000pcs) from overseas major refrigerator maker who wanted to adapt LG's new technology,

(b). Characteristics of Our AC / BLDC Motor :

Referring to our SPECS Sheet including drawing and picture of our AC / BLDC motor as attached, Most refrigerator makers want to use BLDC motor for energy saving (to reduce power consumption). However, in order to use BLDC motor, refrigerator must equip control board or any convertor inside refrigerator to use BLDC motor. LG just developed new AC - BLDC motor to be used for refrigerator without any installation of control board or convertor Our AC - BLDC motor has PCB to change AC input into DC by itself. T'fore, our AC - BLDC motor can be used for any refrigerator aiming & achieving lower power consumption as under :

- AC Motor used by most refrigeretator mills : Input Power - from 5 watt ~ 8 watt.
- **Our AC - BLDC motor : Input Power - 2.25 watt.**

Even though the price of AC - BLDC motor is much higher than AC motor, conidering of life cycle of refrigerator, innitial cost to purchase our AC - BLDC motor than AC motor can be covered by lower power consumption

AC-Input Fan BLDC motor for Refrigerator

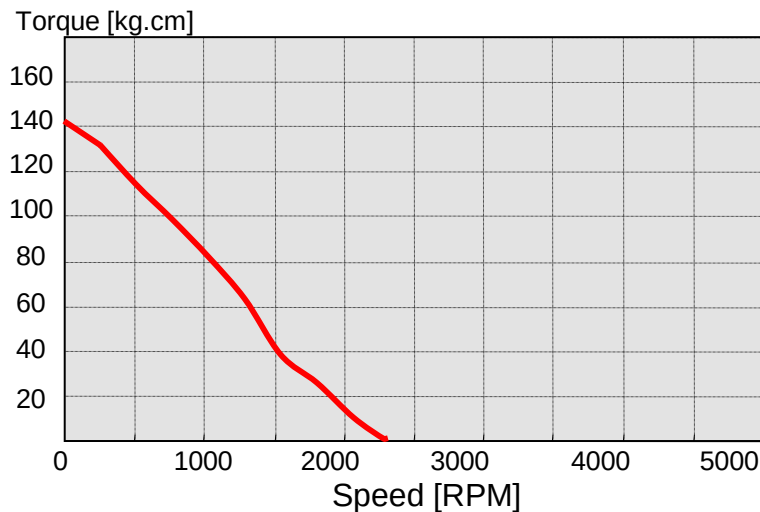
Figure



Performance

Item	Circular Type
Input Voltage	AC 115V
Input Power (at rated, $\Phi 168$ Fan)	3.0 W
Noise	30 dB

Speed - Torque Curve



Features

- *No need additional circuits
(Only AC 115V ~ 230V required)*
- *Motor Drive Method : 2 Phase Unipolar*
- *Sealing : Dust Protected Structure*
- *Water Proof for Evaporator (Urethane)*
- *Included Motor Drive Circuit*

A white, octagonal-shaped electronic device, possibly a cigarette warmer, with a cigarette inserted into a central hole. A green label on the front reads "IG Electronics" and "WILL ROYCE". The device is shown against a white background.

Item	New type BLDC Motor
Input Voltage	DC 6 ~ 15V
Input Power (at rated, Φ150 Fan)	1.5~4.0 W
Noise (at no load)	27 dB

A line graph showing the relationship between Torque [kg.cm] and Speed [RPM]. The y-axis ranges from 0 to 400 kg.cm with major grid lines every 50 units. The x-axis ranges from 0 to 2500 RPM with major grid lines every 250 units. A thick green curve starts at approximately (0, 235) and decreases as speed increases, passing through points like (500, 190), (1000, 145), (1500, 80), and ending near (2400, 10).

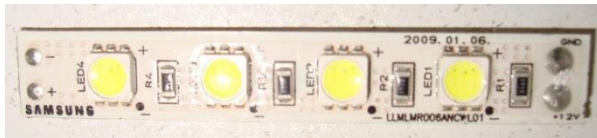
Speed [RPM]	Torque [kg.cm]
0	235
250	215
500	190
750	165
1000	145
1250	120
1500	80
1750	50
2000	30
2250	15
2400	10

- *Speed control by varying input voltage*
- *High efficiency by permanent magnet rotor*
- *Motor Drive : 3 Phase Bi-Directional*
- *Included Motor Drive Circuit*
- *Water Proof (Urethane)*

LED Lamp

To make the food look more fresh & To make mild light, the most of home appliance manufacturers are now using LED LAMP. and the LED technology has been recognised and widely applauded. T'fore, we'd like to have your kind attention on our proposal of LED lamp.

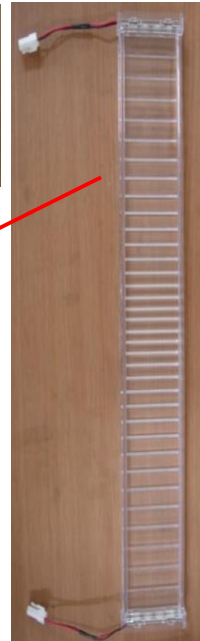
1.SMD Bar type LED lamp for SBS Refrigerator



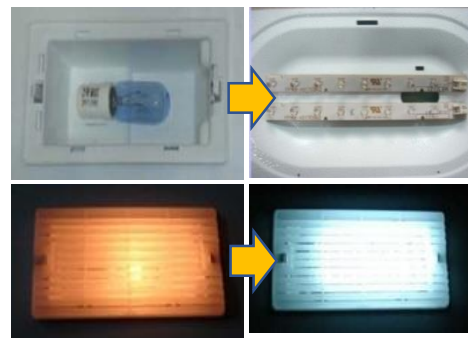
SMD Bar type LED lamp



Installation



Case



2.Base type LED Lamp for Normal Refrigerator



There are only a few manufacturers for LED lamp in the world. Our Korean factory is No. 1 and the next one is "Philips".



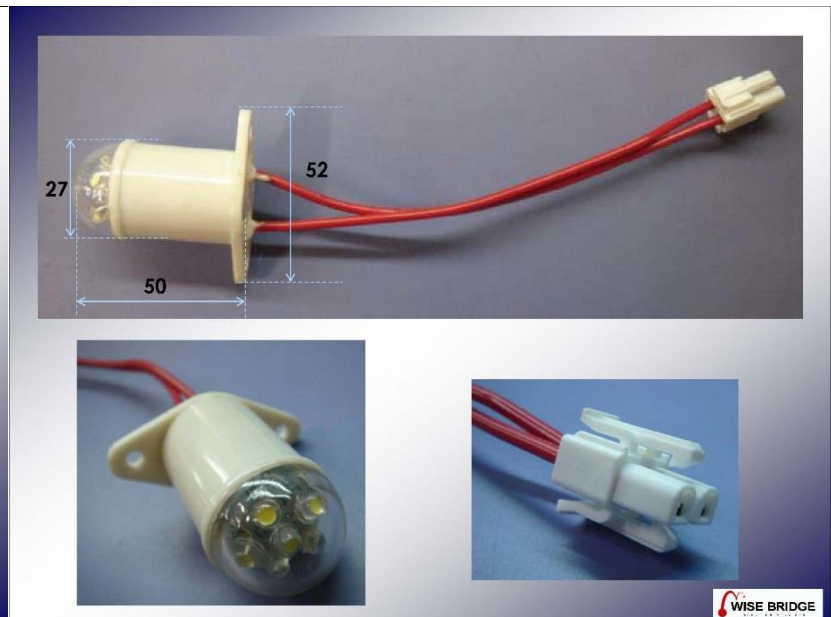
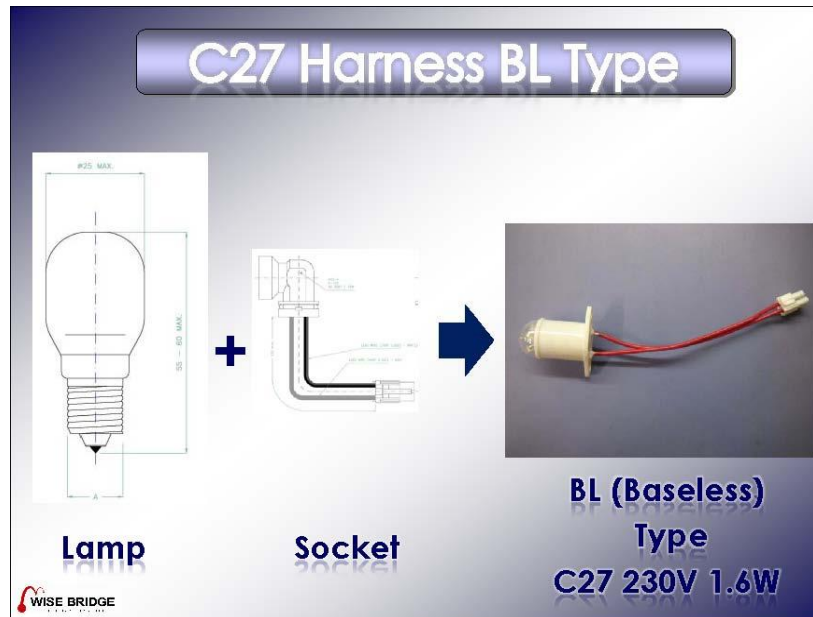
Our Korean mill is No. 1 market share for LED lamp especially for Refrigerator and other LED manufacturer can not compete with our quality due to our company's patents on key function & mechanism of LED lamp.

Currently our factory is main supplier of LED lamp for Whirlpool & Electrolux & Samsung & LG.

LED Lamp



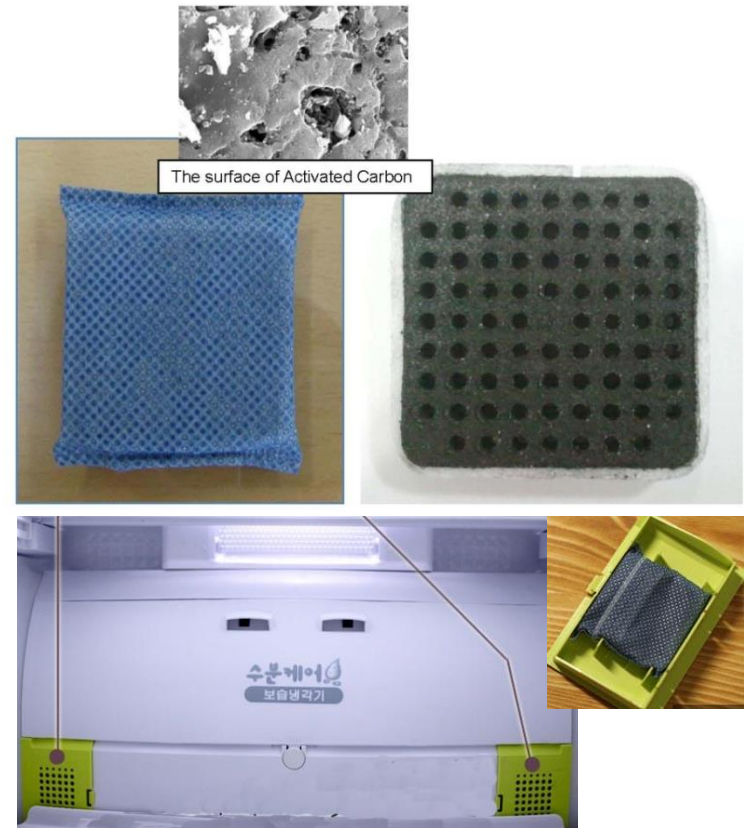
Item	SPECS	Remarks
Led lamp	C40 E14/2 230V 2.3W	2.3W is our standard which is improved from 2.1W
	C27B E14/2 230V 1.6W	It is equivalent model for E14/2 to be made with Korean origin
Led lamp + Socket	C27 Harness BL type 230V 1.6W (Lamp + socket)	It is advance model which contains socket, without base (baseless type lamp + socket)



Our NEW item, Air filter is new & environment-friendly item which was developed with high-end technology with photo-rainy catalyst. Generally, Deodorization function is proceeded through the presence of a catalyst of air filter. All of normal photo-catalyst must have a mininum light (more than 380nm's UV) for operating deodorization. However, Our Photo-Rainy catalyst air filter can activate not only infrared ray but also ultraviolet & visible ray. This can be made your internal refrigerator deodorization performance better compare with normal deodorization.

▷ Characteristic & Merit

Part	Characteristic & Merit
Function	<u>No need any light</u> It have deodorization & sterilization effective without any light inside of Refrigerator
Deodorization	<u>Power Deodorization</u> It can be easily remove the strong smell of food through Methyl mercaptane, Trimethylamine & Ammonia which coated with Photo-Rainy catalyst
Sterilizing & Antibacterial	<u>Best Bactericidal effect</u> It is the best to remove bacteria such as colon bacillus, staphylococcu when dark too.
Material	<u>Activated Carbon protection</u> It can minimize the damage of Carbon's specific surface area because of coated with Photo-Rainy catalyst
Life time	<u>Semi-permanent</u> Photo-Rainy catalyst Air filter can be used semipermanently



* The Performance of Deodorization : More than 95% (Max. 99%).

Our factory is No.1 supplier in Korea who is supplying many kinds of current world major home appliances manufacturer's name plate (Electrolux, Samsung etc). The quality is proven by world customers as you see our name plate list. We can make the name plate as your customised size & design and it can make better impact on your current precious name plate. If you need more effect on name plate, our product is the best choice on you.

▷ Characteristic & Merit

Contents	Our Available Pattern
Design	We can design for your any request
Size	We can matching your prefer size (Price can be adjusted by your size)
Type & Color	Please select which type & color is eligible for you (Press, Plating press, 3DG, Inret, Color)
Material	Please advise us your choice of materials (Aluminum, Urethane, Copper)

3DG / URETHANE



PRESS / ALUMINUM



INRET / COPPER



What is Smart air pack



New concept of packing solution (protective material) which consist of specially designed material (Air + LLDPE (Linear Low Density Polyethylene) + Nylon)

Eco- friendly solution . By using air to from specially designed tube, Smart air pack can save from Breakage and damage during transportation and save resource based material needed vs. molded pulp and form related material.

The smart air pack product line is an innovative and efficient inflatable packaging solution.

This unique design keeps a series of adjoining tubes securely inflated to cushion and protect products during shipment.

The air tubes are connected via a series of patented one-way valves – if one air chamber is punctured, the others remain inflated.

Smart air pack

Rohs – Rohs free

No need special mold

No need big ware house – smaller ware house space

Diverse application regardless of size and shape of a product

Eco friendly material

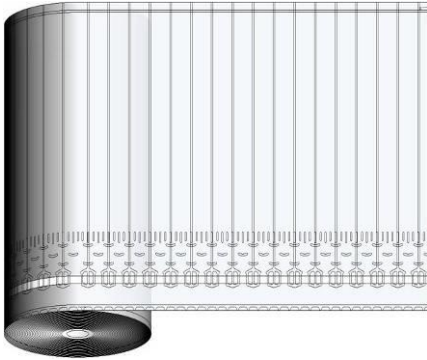
Easy disposal / EPS : Smart air pack = 95:1)

Easy operation – special tool for inflation – working process simplification

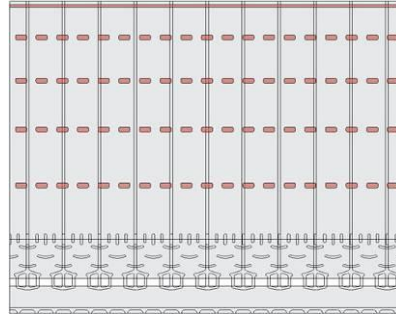
Shorten packing process

Package (Polpack)

A Process 2 Layer “-” type Design



[1process(Assemble 2films)]

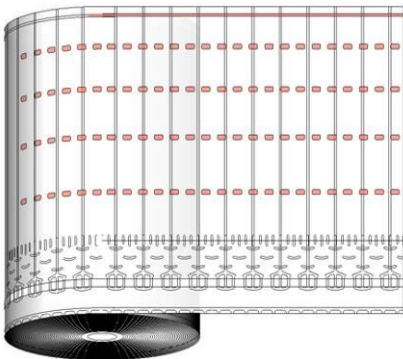


[Point (folding) Sealing process]

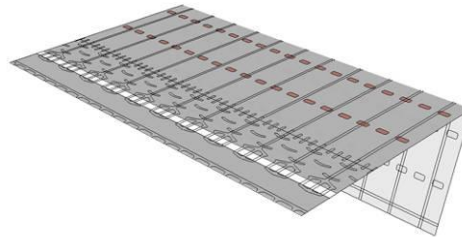


[Application]

C Process 3 Layer : “Bag” type Design



[A]



[Folding process and side sealing Process]



[Application]

Package (Polpack)

Packing process simplification

Item	Before	Packing	End	
Smart air Pack				Worker : Need 1.2 worker
Pulp Pad				Worker : 3 Workers
Time	Smart air pack : 3 second Pulp Pad : 20 second	Smart air pack : 7 second Pulp Pad : 5 second	Total - Smart air pack : 10 second Pulp Pad : 25 second	Time
Worker	Smart air pack : 1.2 worker Pulp Pad : 3.0 workers			

Package (Polpack)

Stock Space – Smaller ware house

	Product	Application	Ware house	Ref
EPS				5t Truck 1 :1,000 Set :1 Day Capa EVERY DAY
Smart air pack				Pallet 1ea :5,000 Set :5 Day Capa 5t Truck 50,000 Set 分 6TIEMS/1YEAR



- Benefit :** -. No need of big ware house for packing
-. No need to sort out packing component
-. Reduce unnecessary movement before and during packing

Package (Polpack) – Waterpurifier



Package (Polpack) - Application

CAR AUDIO



+ 1DIN



+ 2DIN



+ OEM

TONER



+ L/R Type



+ U Bag



+ L Type

Package (Polpack) - Application

CCTV



+ Dome Camera



+ Bullet Camera



+ Camera Lens

PLAYER



+ DVD



+ DVR



+ BDP

Package (Polpack) – Air Pump

Air Inflation Equipment



Air Compressor : 1.0[Hp]/10l Electricity 220V

+



[Air Inflation Tool: Manual]



[AIR FOOT S/W Pedal]

+

[Air Inflation Tool: Semi-auto]



Solution for Molding



Inner door V/F



Inner liner V/F



Door foam



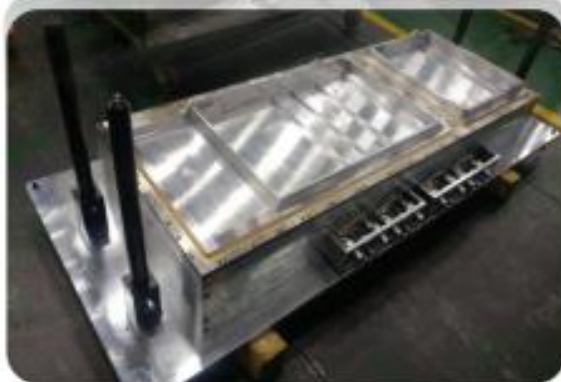
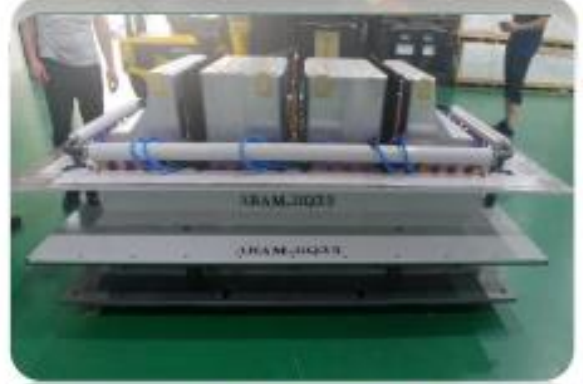
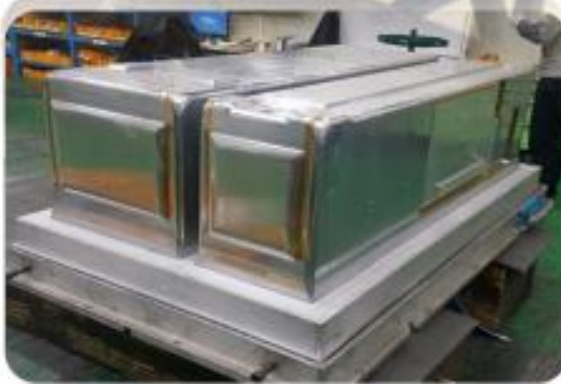
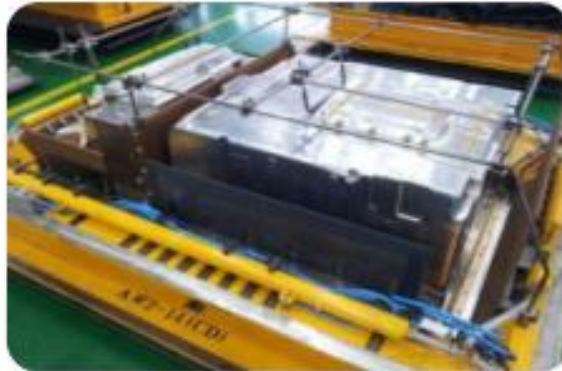
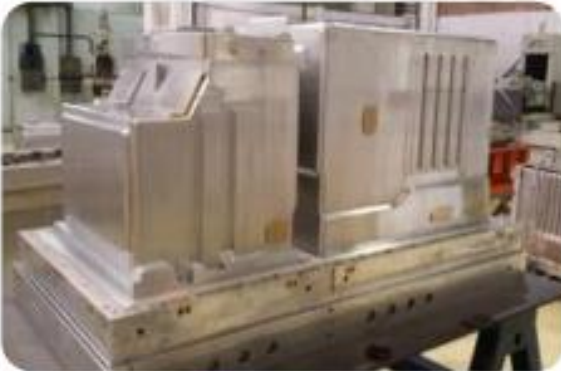
Door plate



Cabinet foam

Thermoforming / Vacuum forming molds

For Inner Doors and Liners



P/U forming molds

For Doors and Cabinets



Piercing & Trimming Tool and Machine

For Doors and Cabinets



Stamping Parts

Refrigerator Outer Door Tandem Die

Part Image



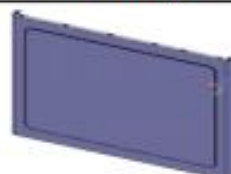
Tool Image



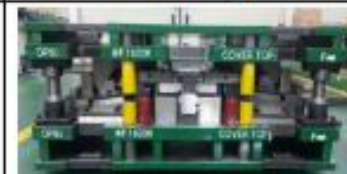
- Material : PCM/SUS Material
- Feature : 3D Bending

Washing Machine Cover Top Tandem Die

Part Image



Tool Image



- Material : VCM / PCM Material
- Feature : Double Cam Bending

Refrigerator Chassis Comp Progressive Die

Part Image



Tool Image



- Material : GI Material
- Feature : 10Stage

Dish Washer Tub Bottom Tandem Die

Part Image



Tool Image



- Material: STS430 Material
- Feature : Hydraulic Press / Die Cushion

Washing Machine Frame Tandem Die

Part Image



Tool Image



- Material : PCM Material
- Feature : Draw / Pier / Bend

Dish Washer Door Front Tandem Die

Part Image



Tool Image



- Material : STS430 / DY01 Material
- Feature : 3D Bending



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