



Our company has passed the certification of ISO9001: 2000 quality management system  
We have passed the certification of green building materials National Customer Assurance Brand  
We are an AAA enterprise in terms of quality, service and reputation

# tonish

*Tonish Profile*

*Build a Beautiful Home Welcome Low-Carbon Life*



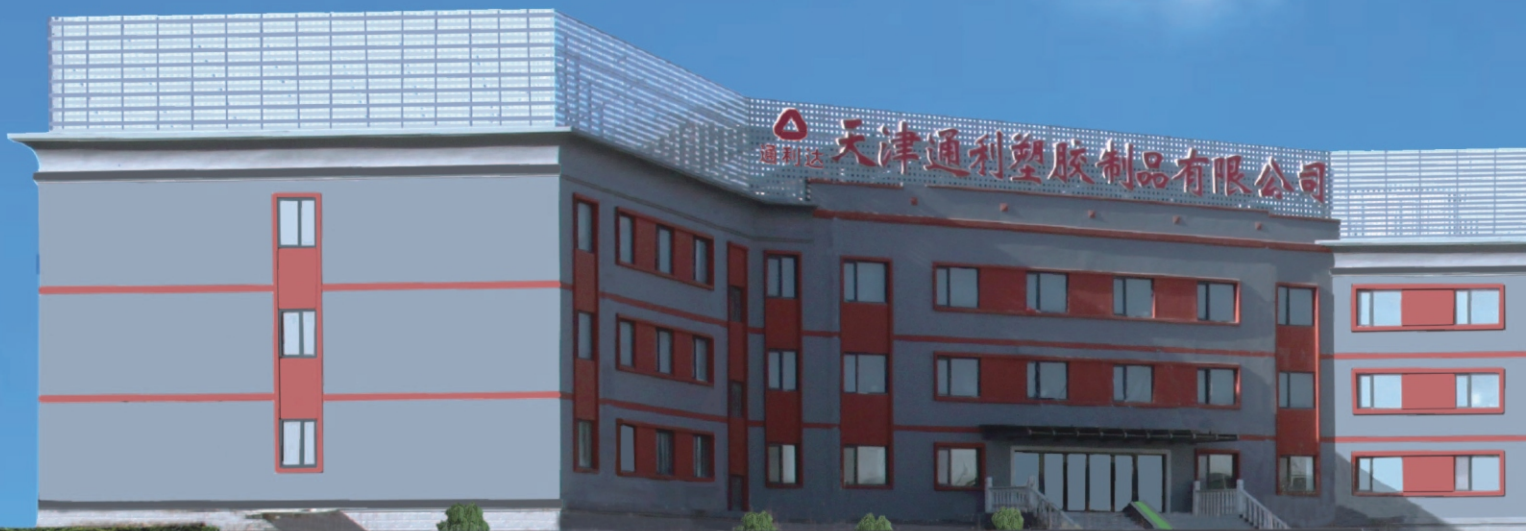
Tianjin Tongli Plastic Product Co., Ltd

# Honest, Win-win, Practical, Innovative

We strive to win customers' trust with our honesty and further develop ourselves based on our reputation; we provide high-quality services so that customers can be satisfied with our services and we aim at the win-win results with their satisfaction.

We make steady progress through working in a down-to-earth way; we pursue innovation by being practical and seek for development by being innovative.

Our eternal belief is to realize the common, lasting and sound development of the Company and our customers.



天津通利塑胶制品有限公司  
Tianjin Tong li Plastic Product Co.,Ltd.



Customers' demands are goals we always pursue.  
Producing high-quality products is our permanent commitment.



# Company Profile

Tianjin Tongli Plastic Product Co., Ltd specializes in R&D and production of PVC-U plastics-steel door & window profiles. Our company covers an area of 60,000 square meters, with the yearly production capacity of 100,000 tons. Our company enjoys superior geographical position and convenient traffic. It is located in National-level High and New Technology Development Zone in Wuqing, Tianjin, which is situated between Beijing and Tianjin.

At present, our company has 110 extrusion production lines of the first class both at home and abroad and more than 1,000 sets of precise extrusion moulds. In 2013, our company independently developed full-automatic profile packaging lines, thus improving quality of packaging finished profiles. Our company has self-contained testing and detecting instruments, so we are capable of detecting raw materials and profiles.

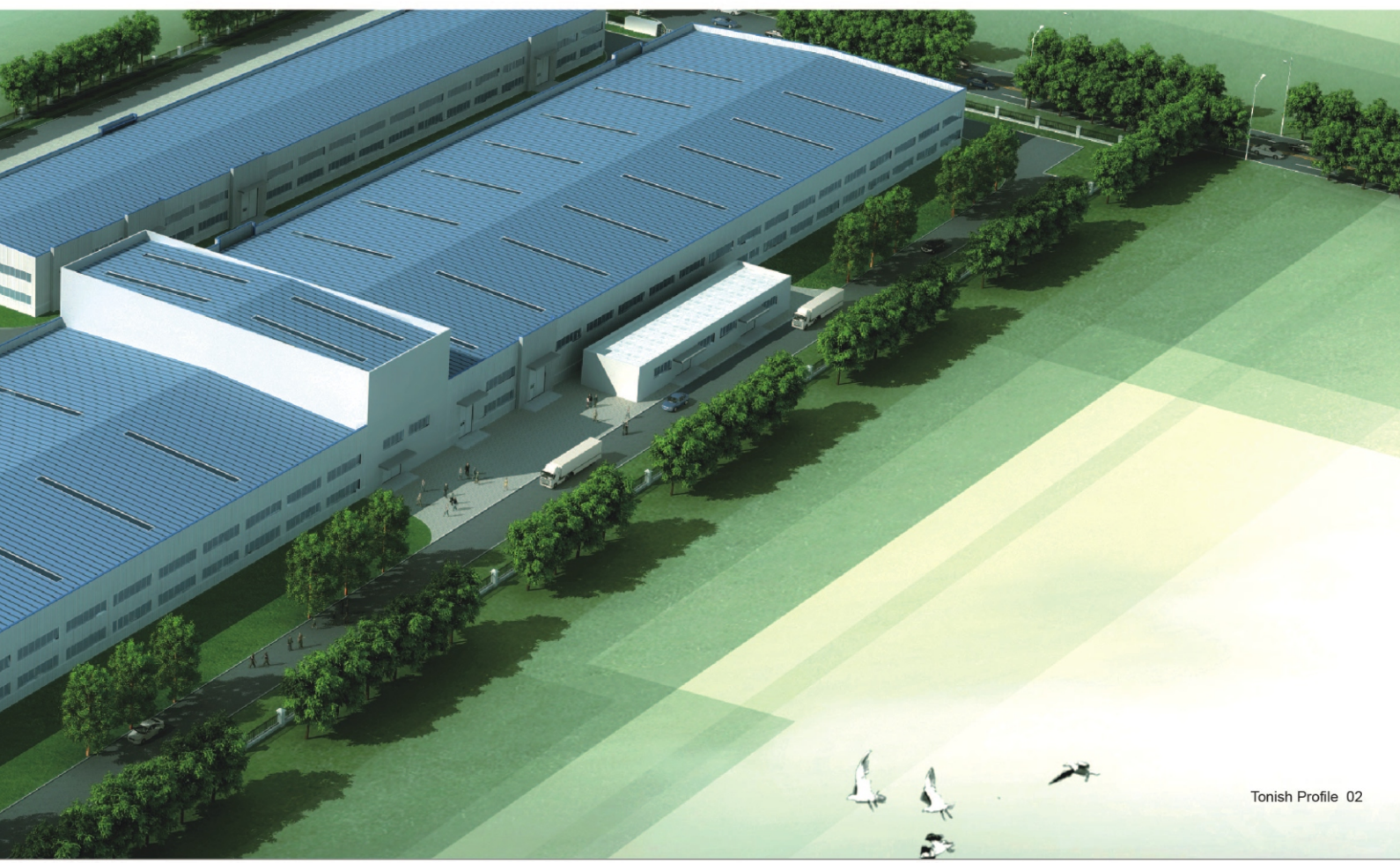
Our company attaches great importance to product quality management. We have passed the Certification of ISO9001:2000 quality management system. We have always strictly followed quality management procedures to conduct process control from the selection of raw material suppliers, incoming inspection of raw materials, control of production process, delivery inspection of finished products to after-sales services. In order to make sure that the quality of each batch of delivered product can meet requirements stated in the Contract, our company perfect three-level system for inspecting delivered finished products; customize and develop software for controlling and managing production process by combining network technology, coding technology and data analysis technology; and conduct control and management of whole production process by means of video technology, so as to make permanent records on quality of each delivered product in the computer. All technical indicators of products of our company have met or exceeded requirements of national standards in several spot checks conducted by National Test Center of Chemical Building Material, Tianjin Product Quality Inspection Station and local quality monitoring units at all levels.

An aerial view of plants



Our company pays much attention to research and development of new products and new technologies. Our company has successively developed whole imitation wood grain profiles, whole color profiles, two-color extrusion profiles, plastics-rubber profiles, relief and grain profiles, colorful coating profiles and highly uvio-resistant profiles. At present, we can produce products with more than 100 colors and more than 10 textures for selection. Our products are diverse, which can meet personalized demands of customers. Application of new technologies helps enhance our products' competitiveness in the market.

By sticking to the management concept of “honest, win-win, practical and innovative”, our company keeps releasing high-quality products in the market while providing perfect after-sales services for customers.



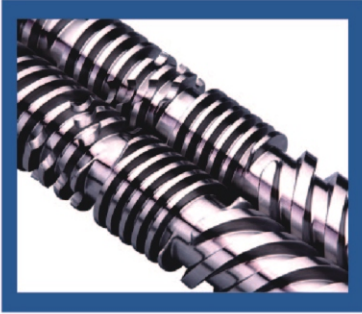


## Advanced production equipment

We have first-class equipment and advanced process. Tonish profiles have perfect quality. All equipment of our company is manufactured by first-class manufacturer both at home and abroad.

We adopt advanced processes including twin screw, dual-cavity co-extrusion, compound extrusion and soft-hard co-extrusion. The process parameters of extrusion of profiles are monitored by process microcomputer. The advancement of equipment and technology guarantees quality of products.





Material-mixing workshop





## Advanced testing equipment

We have complete sets of instruments and inspection instrument.  
Tonish profiles have perfect quality.

We evaluate more than ten domestic raw material manufacturers to choose the superior one, and conduct dynamic management. We test each batch of incoming raw materials and strictly check them so as to guarantee their quality.

Tonish Inspection Center has a complete set of PVC profile and production testing and inspecting equipment including advanced weathering testing chamber, rheometer, imported colorimeter, low temperature drop tester, angle strength testing machine, which can inspect finished profiles and raw materials in an all-round way.





Chamber electric furnace



Digital electronic balance



Torque rheometer



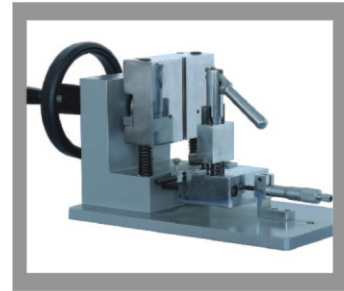
Digital brightness meter



Charpy impact tester



Notching machine



Fillet angle strength tester



Drying moisture determination meter



Vicat temperature tester of softening point



R&D center



# Systematic Management

We combine computer network technology with production management system

The computer information management system of our company adopts network technology, coding technology and data analysis technology; and conduct control and management of whole production process by means of video technology, so as to make permanent records on quality of each delivered product in the computer. In addition, we use computer to manage reception of orders, compilation of production plans, management of goods delivery and financial management.



# Advanced Technology

R&D Center of our company keeps tracking, researching, developing and applying advanced compound designs and production technologies at home and abroad to keep intrinsic quality of products.



Interface of software for controlling and managing production process



# Perfect quality assurance system

Perfect quality assurance system=Complete inspection equipment+ Clear responsibility+ Flow management +Standard files

## Quality principle

Quality Priority, Customer Orientation, Scientific Management and Continuous

## Quality goal

1. Ex-factory qualification rate is 100%
2. Contract execution rate is 100%
3. Customer satisfaction is over 95% and rate of timely-processing feedbacks of customers

## Features of Company's quality management system

Process management covers the whole process from incoming of raw materials to delivery of finished products.

We track and analyze quality records for many years and set up key quality control points.

Three-level seamless inspection system of our company helps strictly control quality control points.

We adopt computer to conduct information management and to make sure that each batch of



# Features of plastics-steel doors and windows

Main raw material of plastics-steel doors & windows is PVC resin. The plastics-steel doors & windows are made according to the following procedure: adding a certain proportion of stabilizer, colorant, filler and ultraviolet absorber into PVC resin for extrusion molding; then cutting, welding or screwing them to make the frame of doors and windows; next installing sealing rubber strips, wool tops and hardware to them. Besides, steel liner shall be added to in the cavity of the profile for strengthening rigidity of profiles. Finally, plastics-steel doors & windows will be made.

## 1. Heat preservation and energy saving features

Plastics-steel doors and windows is of multi-cavity structure, so it has good heat-insulating property. Heat transferred by it is of small amount which is only 1/357 that of steel and 1/1250 of aluminum material. We can see from this that heat insulation and preservation effects of Plastics-steel doors and windows are obvious, and it is more suitable for modern buildings installed with heaters and air conditioners. The room temperature of house in winter with plastics-steel doors & windows is 4-5 degrees higher than that of the house with aluminum windows. In the northern regions, heat insulation and preservation effects of Plastics-steel doors and windows are better if the house is installed two or three layers of glasses.

According to the test, heat transfer coefficient of aluminum windows with one layer of glass is 64W/square K; that of Plastics-steel doors and windows with one layer of glass is 47 W/square K; that of aluminum window with two layers of ordinary glass is 3.7 W/square K; while that of Plastics-steel doors and windows with two layers of glass is 2.5 W/square K. Windows account for 30% of areas of exterior surrounding structure of building and heat released by them accounts for 49% of heat released by the building. Therefore, we can know plastics-steel doors & windows have good energy-saving efficiency.

## 2. Air tightness

All gaps are filled with rubber sealing strips and wood tops when plastics-steel doors and windows are installed, so their air tightness is better than that of aluminum windows. In general, air tightness of side-hung windows can reach the fourth level and that of sliding windows can reach the third level.

## 3. Water tightness

Plastics profiles have unique multi-cavity structure and independent water drain cavity, so water in the frame and sash can be effectively discharged. In general, water tightness of casement window can reach the fifth level and that of sliding window can reach the third or fourth level.

## 4. Wind pressure resistance

The steel liner with the thickness of 1.5-3mm can be added in the independent cavity. The thickness of steel liner and profiles can be selected according to local wind pressure, height of the building, size of the hole and design of window shape, so as to make sure that windows can meet the requirements.

## 5. Sound insulation

Plastics profiles have good sound insulation effect. If two-layer glass structure is adopted, their sound insulation effect is more ideal and they are especially suitable for places with severe noise problems, like hospitals, schools, hotels and office buildings.

## 6. Anti-corrosion

Plastics profiles have unique compounds and good corrosion resistance. Their service life is 10 times of that of aluminum window.

## 7. Weather resistance

Plastics profiles have special compounds. They are added with ultraviolet absorber and low temperature resistant impact modifier, which can improve the weather resistance capacity of Plastics-steel doors and windows. They will not change colors and quality, aging or embrittling when they are used for a long time under the temperature of -50~70 degrees and under hot sun, rainstorm or in dry or moisture environment. The plastics-steel doors and windows, which have been used in Western Europe for 40 years, are still intact.

## 8. Fire retardancy

Plastics-steel doors and windows will neither have spontaneous combustion nor support combustion and they can extinguish themselves right after being deviated from fire, so they are safe, reliable and can meet fire-proofing requirements. This property helps enlarge using scope of plastics-steel doors and windows.

## 9. Insulativity

Plastic materials have excellent insulation property. They will not conduct electricity, so they have high safety coefficient.

## 10. The finished products have high accuracy in terms of their sizes. They will not be deformed and they have good appearance.

Plastic profiles are even and smooth, so they don't need to go through special treatment on the surface. They are easy to be processed and cut. After welding and processing, the tolerances of length, width and diagonal line of finished product can be all controlled within 2mm. They have high processing accuracy and their welding fillet strength can be over 3000N. Weld beading at the welding joint can be cleared away by chamfer angle tools, thus the welding joints of materials are smooth and beautiful. They can fit requirements of indoor decoration effect and are more comfortable than metals when people touch them.

## 11. Easy maintenance

Plastics-steel doors and windows are corrosion-resistant, so it will not become yellow or fade colors. It will not be affected by dust, cement or adhesion agent, so it doesn't need maintenance. When it becomes dirty, any detergent can make it as clean as before.

## 12. Good security

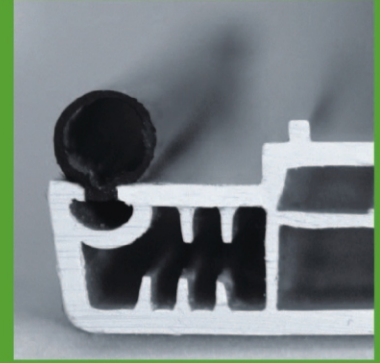
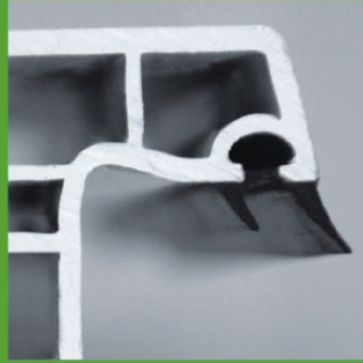
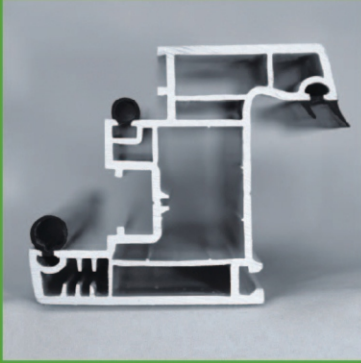
The glazing beads of plastics-steel doors and windows are directed towards the indoor space. In addition, plastic materials have high strength and toughness and they are not easy to be damaged, so they have good security.

## 13. Economical efficiency

Compared with prices of aluminum window, wood window and steel window, those of plastics-steel doors and windows are economical and affordable.



# Rubber-plastics profiles




Unique patented technology has the following features

Convenient process of door & window processing plant—save procedure, lower cost and improve efficiency

Green doors and windows of users—better waterproofness, heat insulation, heat preservation and sound insulation capacity

Sealing strip of higher level—good lightness, better toughness, long service life, no taste, no color change, no oil leakage





Buildings are expressions of a city  
Windows are expressions of a house  
Tonish Colorful profiles  
Endow life with different expressions

# Colorful co-extrusion profiles, embossment and grain color profiles

Emerald stands for quietness, crystal grey, elegance; gold, luxury; Artemisia argyi green, freshness; amber, warmth; rosy, dignity; gem grey, profoundness; Chinese red, enthusiasm...

Show life taste with details

## Unique compounds of Tonish colorful co-extrusion profiles

Our company introduces ASA/PMMA technology which has superior weather resistance applied in vehicle field into PVC profiles. Each color raw material for co-extrusion has undergone aging test, so its aging property can reach or exceed requirements of national standards. This kind of materials has unique process, which solves the puzzle of coloring materials and improves their weather resistance capacity. Our colorful co-extrusion materials will not easily age even when they are under bad weather condition.

## Features of colorful co-extrusion Tonish profiles

Unique compounds and technology truly embody that our products are weather-resistant and they will not fade.

Superior molecule nuclear structure endows our products with high toughness and slipping can thus be avoided.

Advanced antistatic technology makes our products have self-cleaning function and they will not stick dust.

Special processing method of welding fillet makes our products integrated.



## Highly uvioresistant white profiles

White profiles may have thermal light oxidation reaction after being used for a long time in places with highly-intensive ultraviolet. Polymer macromolecule will degrade under the influence of sunlight, rain, air, ultraviolet, acid and alkali. The most obvious result brought by the degradation is that the white material will become yellow; it will lost luster gradually; and it will even become grey.

Our company adopts sealing and shadowing technology to improve module and extrusion process. Weather resistant capability of highly uvioresistant white profiles produced by us is 3 times better than ordinary profiles, thus getting rid of the trouble that white materials will easily change color in places with highly-intensive ultraviolet.



① Tianjin Beimaji Settlement Houses

# PROJECTS

② Shanghai Greenland Shanghai Malu Marina Bay Sands







- ① Tianjin. Shuanggang New Home
- ② Beijing. Shangshang Ideal City
- ③ Shanghai Jiading urban construction investment. Liuhu Jingting
- ④ Tianjin. Shuangqing New Home



- ① Liaoning. Suizhong. Bohai Yuyuan
- ② Jilin. Changchun. Meijing Tiancheng
- ③ Heilongjiang. Tsitsihar. Lvxi Taoyuan
- ④ Liaoning. Shenyang. Taihu International

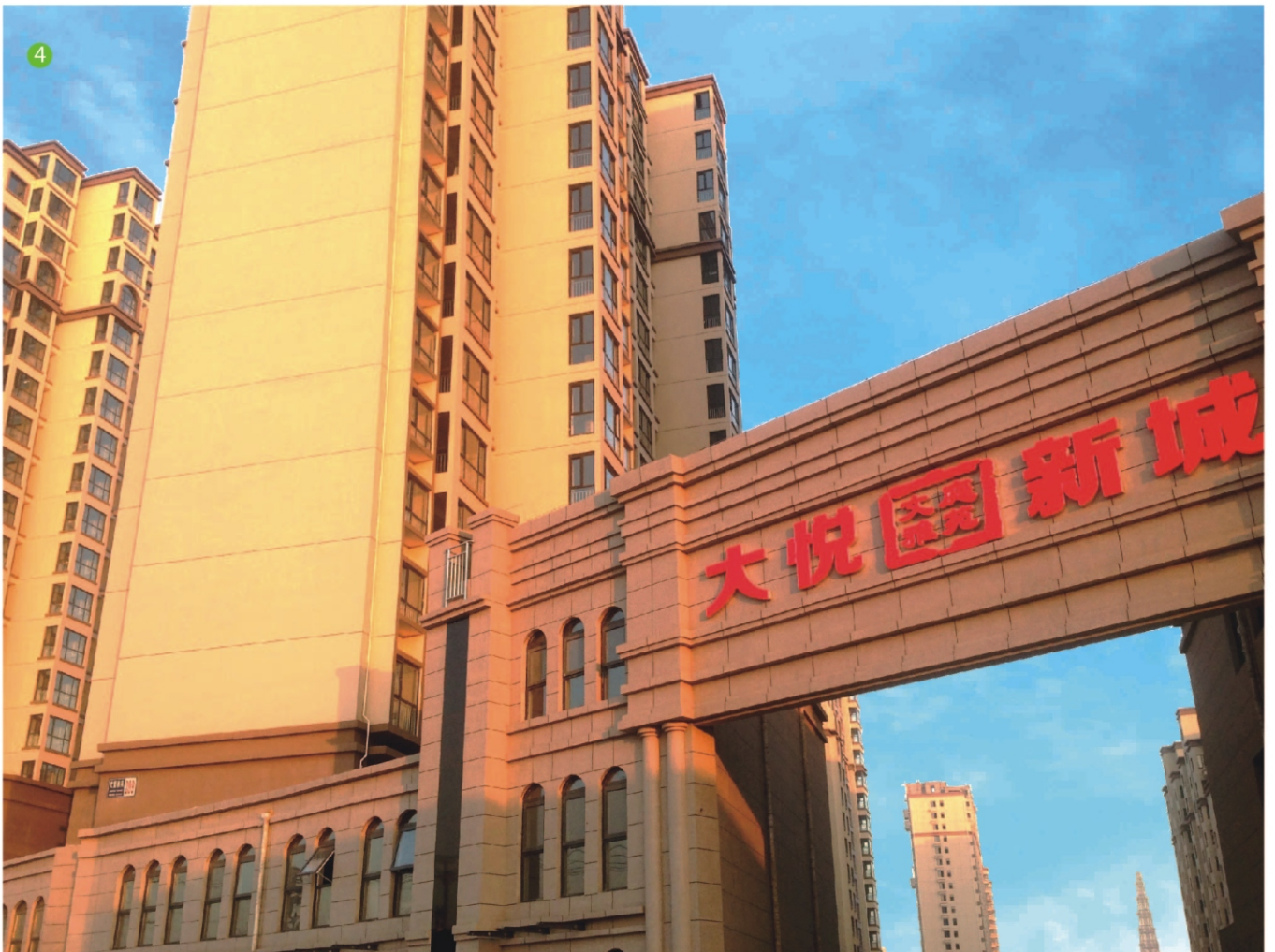


- ① Henan. Puyang. Longcheng Garden
- ② Henan. Luoyang. Yawei Jindi Garden
- ③ Henan. Zhengzhou. Spring of West Lake
- ④ Henan. Hebi. Huafu Tianxia
- ⑤ Henan. Nanyang. Yellow River No.1Building





- ① Inner Mongolia. Chifeng. Lishui Lakeside
- ② Shanxi. Taiyuan. Xian Community
- ③ Inner Mongolia. Tongliao. Red Star Community
- ④ Hebei. Tangshan. Dayue New City





- ① Shandong. Yanzhou. Kuixing Garden
- ② Shandong. Weifang. Mashaoying Community
- ③ Hebei. Shijiazhuang. Time International
- ④ Hebei. Cangzhou. Celebrity West Garden
- ⑤ Hebei. Qinhuangdao. Shanqiao Home

# Quality Certificate (Test Report)

**Polytest**  
国家高分子材料与制品质量监督检验中心

MA, IMA, CAS, IMA

## 检验报告

报告编号: 2014ZC36062

样品名称: PVC-U 门窗型材

委托单位: 天津普利材料制品有限公司

检验类别: 出厂检验

国家高分子材料与制品质量监督检验中心

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国家高分子材料与制品质量监督检验中心

报告编号: 2014ZC36062 共3页第1页

委托单位	天津普利材料制品有限公司	检验类别	出厂检验
生产单位	天津普利材料制品有限公司	生产日期	2014年
样品名称	PVC-U 门窗型材	规格型号	见附图
样品数量	60 个	检验项目	力学性能
检验依据	GB 8814-2004	产品名称	见附图
检验方法	GB 8814-2004 附录 A	委托日期	2014.06.09
检验地点	国家高分子材料与制品质量监督检验中心	检验日期	2014.06.09

依据 GB 8814-2004 "1. 适用范围" 条款 (PVC-U) 型材" 进行检验, 检验项目见下表。

日期: 2014年6月23日

检验员: 李海英 审核员: 李海英

**Polytest**  
国家高分子材料与制品质量监督检验中心

报告编号: 2014ZC36062 共3页第2页

序号	检验项目	技术要求	检测结果	判定
1	外观	颜色均匀, 表面无裂纹, 气泡, 杂质等缺陷。	合格	合格
2	尺寸偏差 (%)	±0.5	-0.10	合格
3	冲击强度 (kJ/m²)	≥1.5	1.80	合格
4	拉伸强度 (MPa)	≥40	40.0	合格
5	断裂伸长率 (%)	≥100	100	合格
6	维卡软化温度 (°C)	≥130	130	合格
7	热变形温度 (°C)	≥110	110	合格

注: 孙海 孙海文 李海英 杨博

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报告编号: 2014ZC36062 共3页第3页

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8	熔体流动速率 (MFR)	2.0-3.0	2.50	合格
9	维卡软化温度 (°C)	≥130	130	合格
10	冲击强度 (kJ/m²)	≥1.5	1.80	合格
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MA, IMA, CAS, IMA

## 检验报告

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委托单位: 天津普利材料制品有限公司

检验类别: 出厂检验

国家高分子材料与制品质量监督检验中心

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# Quality Certificate (Test Report)



### 检验报告

报告编号: 2014ZC200665  
 样品名称: PVC-U门帘型材  
 委托单位: 天津源利源新材料有限公司  
 检验类别: 委托检验  
 国家高分子材料与制品质量监督检验中心

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 样品名称: PVC-U门帘型材  
 委托单位: 天津源利源新材料有限公司  
 检验类别: 委托检验  
 国家高分子材料与制品质量监督检验中心

### 检验报告

报告编号: 2014ZC200667  
 样品名称: PVC-U门帘型材  
 委托单位: 天津源利源新材料有限公司  
 检验类别: 委托检验  
 国家高分子材料与制品质量监督检验中心

### 检验报告

报告编号: 2014ZC200668  
 样品名称: PVC-U门帘型材  
 委托单位: 天津源利源新材料有限公司  
 检验类别: 委托检验  
 国家高分子材料与制品质量监督检验中心



### 检验报告

报告编号: 2014ZC200669  
 样品名称: ASA/PVC彩色挤出型材  
 委托单位: 天津源利源新材料有限公司  
 检验类别: 委托检验  
 国家高分子材料与制品质量监督检验中心

### 检验报告

报告编号: 2014ZC200670  
 样品名称: ASA/PVC彩色挤出型材  
 委托单位: 天津源利源新材料有限公司  
 检验类别: 委托检验  
 国家高分子材料与制品质量监督检验中心

### 检验报告

报告编号: 2014ZC200671  
 样品名称: ASA/PVC彩色挤出型材  
 委托单位: 天津源利源新材料有限公司  
 检验类别: 委托检验  
 国家高分子材料与制品质量监督检验中心

### 检验报告

报告编号: 2014ZC200672  
 样品名称: ASA/PVC彩色挤出型材  
 委托单位: 天津源利源新材料有限公司  
 检验类别: 委托检验  
 国家高分子材料与制品质量监督检验中心



### 检验报告

报告编号: 2014ZC200673  
 样品名称: ASA/PVC彩色挤出型材  
 委托单位: 天津源利源新材料有限公司  
 检验类别: 委托检验  
 国家高分子材料与制品质量监督检验中心

### 检验报告

报告编号: 2014ZC200674  
 样品名称: ASA/PVC彩色挤出型材  
 委托单位: 天津源利源新材料有限公司  
 检验类别: 委托检验  
 国家高分子材料与制品质量监督检验中心

### 检验报告

报告编号: 2014ZC200675  
 样品名称: ASA/PVC彩色挤出型材  
 委托单位: 天津源利源新材料有限公司  
 检验类别: 委托检验  
 国家高分子材料与制品质量监督检验中心

### 检验报告

报告编号: 2014ZC200676  
 样品名称: ASA/PVC彩色挤出型材  
 委托单位: 天津源利源新材料有限公司  
 检验类别: 委托检验  
 国家高分子材料与制品质量监督检验中心

# Quality Certificate (Test Report)

**Polytest**  
 国家高分子材料与制品质量监督检验中心  
 国家认证认可监督管理委员会 批准 编号: 2007 0101 0101 0101  
 地址: 天津市河西区大沽路10号 邮编: 300072 电话: 022-2338 8888  
 网址: www.polytest.com.cn

**检验报告**

报告编号: 2014ZC38003

样品名称: ANA PVC 彩色片原料

委托单位: 天津德利隆新材料有限公司

检验类别: 材料检验

国家高分子材料与制品质量监督检验中心

**Polytest**  
 国家高分子材料与制品质量监督检验中心  
 国家认证认可监督管理委员会 批准 编号: 2007 0101 0101 0101  
 地址: 天津市河西区大沽路10号 邮编: 300072 电话: 022-2338 8888  
 网址: www.polytest.com.cn

**检验报告**

报告编号: 2014ZC38008

产品名称: 天津德利隆新材料有限公司 检验类别: 材料检验

生产单位: 天津德利隆新材料有限公司 生产日期: 2014.09

样品名称: ANA PVC 彩色片原料 检验类别: 材料检验

委托单位: 天津德利隆新材料有限公司 生产单位: 天津德利隆新材料有限公司

检验类别: 材料检验

国家高分子材料与制品质量监督检验中心

**Polytest**  
 国家高分子材料与制品质量监督检验中心  
 国家认证认可监督管理委员会 批准 编号: 2007 0101 0101 0101  
 地址: 天津市河西区大沽路10号 邮编: 300072 电话: 022-2338 8888  
 网址: www.polytest.com.cn

**检验报告**

报告编号: 2014ZC38008

产品名称: 天津德利隆新材料有限公司 检验类别: 材料检验

生产单位: 天津德利隆新材料有限公司 生产日期: 2014.09

样品名称: ANA PVC 彩色片原料 检验类别: 材料检验

委托单位: 天津德利隆新材料有限公司 生产单位: 天津德利隆新材料有限公司

检验类别: 材料检验

国家高分子材料与制品质量监督检验中心

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 国家高分子材料与制品质量监督检验中心  
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 地址: 天津市河西区大沽路10号 邮编: 300072 电话: 022-2338 8888  
 网址: www.polytest.com.cn

**检验报告**

报告编号: 2014ZC38008

产品名称: 天津德利隆新材料有限公司 检验类别: 材料检验

生产单位: 天津德利隆新材料有限公司 生产日期: 2014.09

样品名称: ANA PVC 彩色片原料 检验类别: 材料检验

委托单位: 天津德利隆新材料有限公司 生产单位: 天津德利隆新材料有限公司

检验类别: 材料检验

国家高分子材料与制品质量监督检验中心

**MA** **AL**  
 100307010000 **MA** **AL**  
 0303101010101

**检验报告**

报告编号: No. 200901-016

产品名称: 天津德利隆新材料有限公司 检验类别: 材料检验

生产单位: 天津德利隆新材料有限公司 生产日期: 2009.01.17

样品名称: ANA PVC 彩色片原料 检验类别: 材料检验

委托单位: 天津德利隆新材料有限公司 生产单位: 天津德利隆新材料有限公司

检验类别: 材料检验

天津市质量监督检验站

天津市质量监督检验站第二十四站  
 检验报告

报告编号: No. 200901-016

产品名称: 天津德利隆新材料有限公司 检验类别: 材料检验

生产单位: 天津德利隆新材料有限公司 生产日期: 2009.01.17

样品名称: ANA PVC 彩色片原料 检验类别: 材料检验

委托单位: 天津德利隆新材料有限公司 生产单位: 天津德利隆新材料有限公司

检验类别: 材料检验

天津市质量监督检验站

**MA** **AL**  
 100307010000 **MA** **AL**  
 0303101010101

**检验报告**

报告编号: No. 200901-016

产品名称: 天津德利隆新材料有限公司 检验类别: 材料检验

生产单位: 天津德利隆新材料有限公司 生产日期: 2009.01.17

样品名称: ANA PVC 彩色片原料 检验类别: 材料检验

委托单位: 天津德利隆新材料有限公司 生产单位: 天津德利隆新材料有限公司

检验类别: 材料检验

天津市质量监督检验站

**MA** **AL**  
 100307010000 **MA** **AL**  
 0303101010101

**检验报告**

报告编号: No. 200901-016

产品名称: 天津德利隆新材料有限公司 检验类别: 材料检验

生产单位: 天津德利隆新材料有限公司 生产日期: 2009.01.17

样品名称: ANA PVC 彩色片原料 检验类别: 材料检验

委托单位: 天津德利隆新材料有限公司 生产单位: 天津德利隆新材料有限公司

检验类别: 材料检验

天津市质量监督检验站

**MA** **AL** **SVAS** **CTA**

**检验报告**

报告编号: 冀检(质)字(2008)第2238号

产品名称: 天津德利隆新材料有限公司 检验类别: 材料检验

生产单位: 天津德利隆新材料有限公司 生产日期: 2008.09.24

样品名称: ANA PVC 彩色片原料 检验类别: 材料检验

委托单位: 天津德利隆新材料有限公司 生产单位: 天津德利隆新材料有限公司

检验类别: 材料检验

河北省产品质量监督检验院

河北省产品质量监督检验院  
 检验报告

报告编号: 冀检(质)字(2008)第2238号

产品名称: 天津德利隆新材料有限公司 检验类别: 材料检验

生产单位: 天津德利隆新材料有限公司 生产日期: 2008.09.24

样品名称: ANA PVC 彩色片原料 检验类别: 材料检验

委托单位: 天津德利隆新材料有限公司 生产单位: 天津德利隆新材料有限公司

检验类别: 材料检验

河北省产品质量监督检验院

**MA** **AL** **SVAS** **CTA**

**检验报告**

报告编号: 冀检(质)字(2008)第2238号

产品名称: 天津德利隆新材料有限公司 检验类别: 材料检验

生产单位: 天津德利隆新材料有限公司 生产日期: 2008.09.24

样品名称: ANA PVC 彩色片原料 检验类别: 材料检验

委托单位: 天津德利隆新材料有限公司 生产单位: 天津德利隆新材料有限公司

检验类别: 材料检验

河北省产品质量监督检验院

河北省产品质量监督检验院  
 检验报告

报告编号: 冀检(质)字(2008)第2238号

产品名称: 天津德利隆新材料有限公司 检验类别: 材料检验

生产单位: 天津德利隆新材料有限公司 生产日期: 2008.09.24

样品名称: ANA PVC 彩色片原料 检验类别: 材料检验

委托单位: 天津德利隆新材料有限公司 生产单位: 天津德利隆新材料有限公司

检验类别: 材料检验

河北省产品质量监督检验院



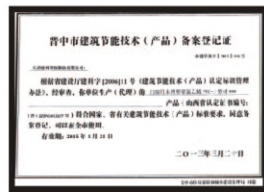
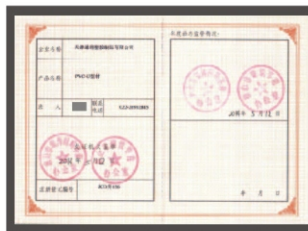
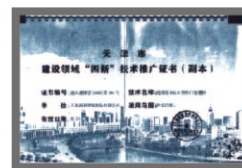
# Corporation Honor and Certificate



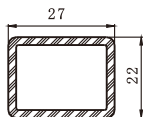
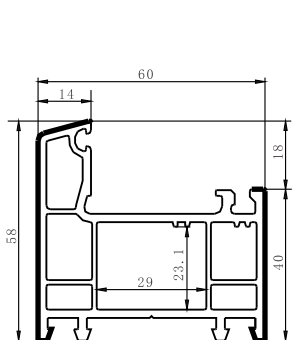
The collage features several certificates and plaques:

- Top Row (Certificates):**
  - Left: Certificate for "新技术新产品推广" (New Technology and New Product Promotion).
  - Middle: Certificate for "全国用户放心品牌" (National User Confidence Brand).
  - Right: Certificate for "质量服务信誉AAA级企业" (Quality, Service, and Reputation AAA Level Enterprise).
- Second Row (Plaques):**
  - Left: Red plaque for "会员单位" (Member Unit) from the China Plastics Processing Industry Association.
  - Middle: Yellow plaque for "知名品牌" (Famous Brand) from ISES.
  - Right: Yellow plaque for "诚信经营单位" (Honest and Creditworthy Business Unit) from ISES.
- Bottom Row (Certificates):**
  - Left: Certificate for "绿色建材产品" (Green Building Material Product).
  - Right: Yellow plaque for "AAA级信用企业" (AAA Credit Enterprise) from the Agricultural Bank of China, Tianjin Branch, valid from July 2005 to July 2008.

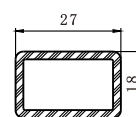
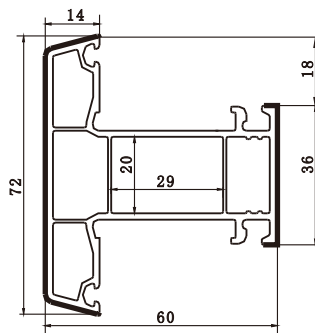
# Corporation Qualification



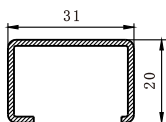
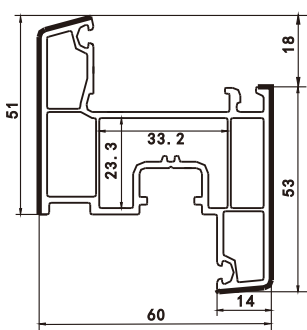
**60 CASEMENT SYSTEM** Thickness 2.0mm



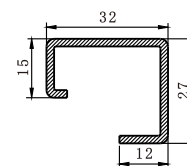
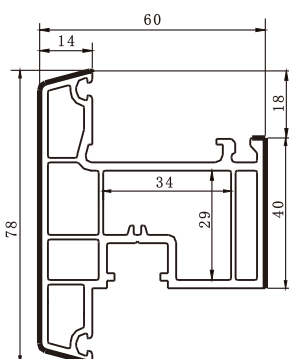
**frame**  
 P60A-052  
 Meter weight: 1Kg  
 Rubber: 1.034Kg  
 Package: 6 pieces/bag



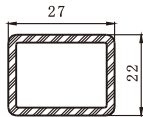
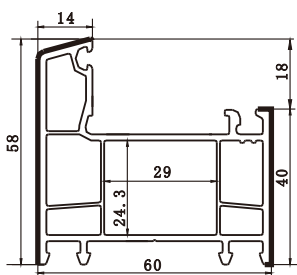
**mullion**  
 Code: P60I-178  
 Meter weight: 1Kg  
 Rubber: 1.067Kg  
 Package: 6 pieces/bag



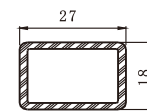
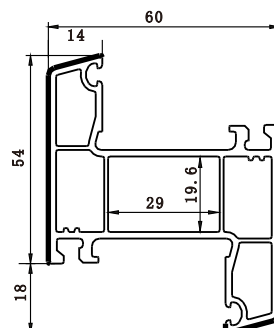
**inward window sash**  
 Code: P60I-179  
 Meter weight: 1Kg  
 Rubber: 1.067Kg  
 Package: 6 pieces/bag



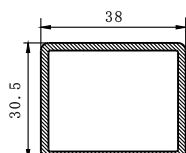
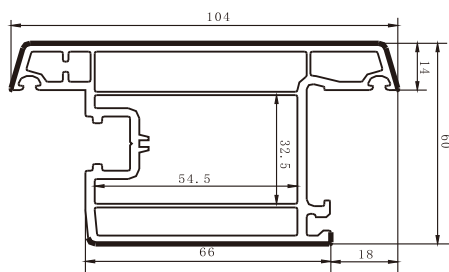
**outward window sash**  
 Code: P60A-056  
 Meter weight: 1.15Kg  
 Rubber: 1.217Kg  
 Package: 6 pieces/bag



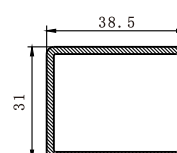
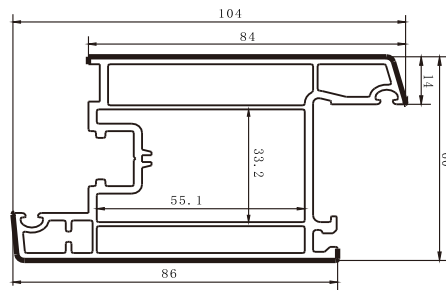
**frame (1.5mm)**  
 P60J-186  
 Meter weight: 0.8Kg  
 Rubber: 0.834Kg  
 Package: 6 pieces/bag



**Z mullion**  
 Code: P60-610  
 Meter weight: 1Kg  
 Rubber: 1.067Kg  
 Package: 6 pieces/bag



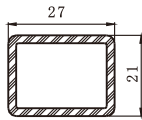
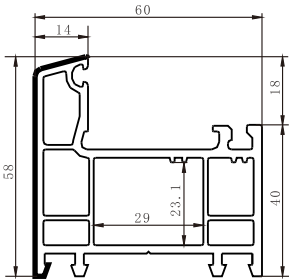
**outward door sash**  
 Code: P60A-057  
 Meter weight: 1.53Kg  
 Rubber: 1.597Kg  
 Package: 4 pieces/bag



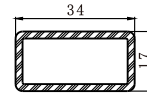
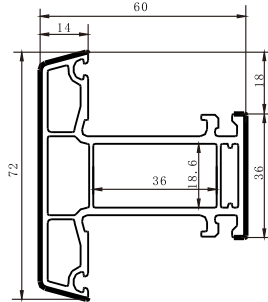
**inward door sash**  
 Code: P60A-111  
 Meter weight: 1.44Kg  
 Rubber: 1.507Kg  
 Package: 4 pieces/bag

We reserve the right for technical improvement

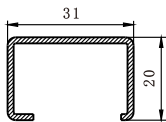
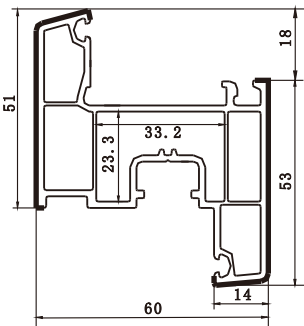
**60B CASEMENT SYSTEM** Thickness 2.5mm



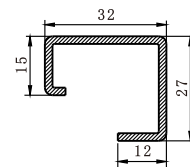
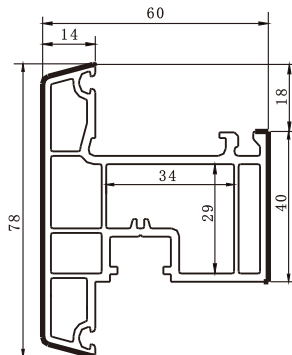
**frame**  
 P60A-052  
 Meter weight: 1.09Kg  
 Rubber: 1.124Kg  
 Package:6 pieces/bag



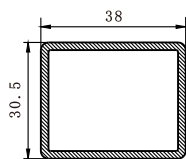
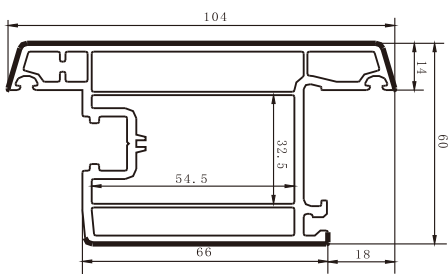
**mullion**  
 Code:P60B-063  
 Meter weight: 1.13Kg  
 Rubber: 1.197Kg  
 Package:6 pieces/bag



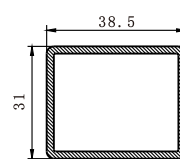
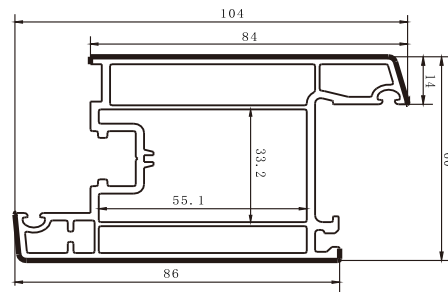
**inward window sash**  
 Code:P60B-064  
 Meter weight: 1.18Kg  
 Rubber: 1.247Kg  
 Package:6 pieces/bag



**outward window sash**  
 Code:P60B-076  
 Meter weight: 1.25Kg  
 Rubber: 1.317Kg  
 Package:6pieces/bag



**outward door sash**  
 Code:P60B-101  
 Meter weight: 1.75Kg  
 Rubber: 1.817Kg  
 Package:4 pieces/bag



**inward door sash**  
 Code:P60B-102  
 Meter weight: 1.59Kg  
 Rubber: 1.657Kg  
 Package:4 pieces/bag

We reserve the right for technical improvement.

**60/60B CASEMENT SYSTEM GB** Thickness 1.5-1.7mm

4-6mm glass

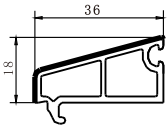
10-12mm glass

19-21mm glass

22-24mm glass

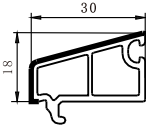
24-26mm glass

29mm glass



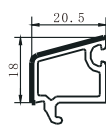
**GB36mm**

Code:P60A-059  
Meter weight:0.28Kg  
Rubber: 0.314Kg  
Package:20 pieces/bag



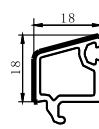
**GB30mm**

Code:P60-611  
Meter weight:0.27Kg  
Rubber: 0.034Kg  
Package:20 pieces/bag



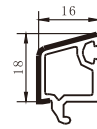
**GB20mm**

Code:P60A-060  
Meter weight:0.2Kg  
Rubber: 0.234Kg  
Package:20 pieces/bag



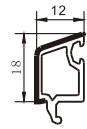
**GB18mm**

Code:P60A-110  
Meter weight:0.19Kg  
Rubber: 0.224Kg  
Package:20 pieces/bag



**GB16mm**

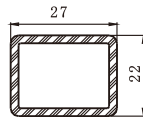
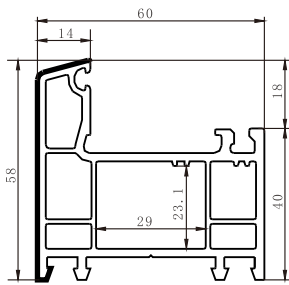
Code:P60A-160  
Meter weight:0.18Kg  
Rubber:0.214Kg  
Package:20 pieces/bag



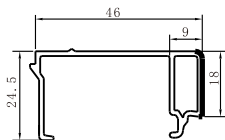
**GB12mm**

Code:P60A-570  
Meter weight:0.17Kg  
Rubber: 0.204Kg  
Package:20 pieces/bag

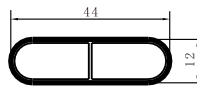
**LOUVER PROFILES**



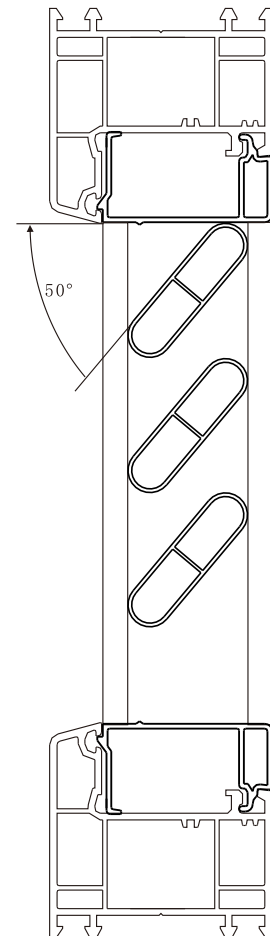
**frame(2.0mm)**  
P60A-052  
Meter weight: 1Kg  
Rubber: 1.034Kg  
Package:6 pieces/bag



**louver bead(1.5mm)**  
Code:P60-168  
Meter weight: 0.28Kg  
Package:20 pieces/bag



**louver sash(1.5mm)**  
Code:P60-167  
Meter weight: 0.22Kg  
Package:20 pieces/bag

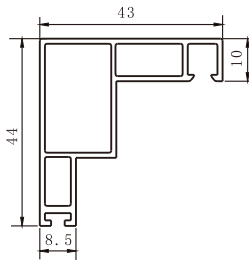


We reserve the right for technical improvement

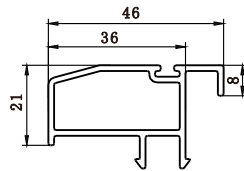
**Processing specification:**

1. Weld the outside frame of 60 flat-open frame
2. Install window-shade trim strips into the window frame and lay off materials to window-shade trim strips squarely. Align vertical edge punching window-shade trim strips at top-bottom window frames. Then, install them to the horizontal non-punching window-shade trim strips.
3. Insert the window-shade blades into trim strips of the punched hole.
4. They can also be assembled by window-shades fixation pieces.

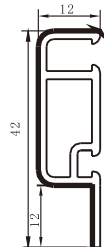
**60 CASEMENT SYSTEM AUXILIARY PROFILES** Thickness 1.5-1.7mm



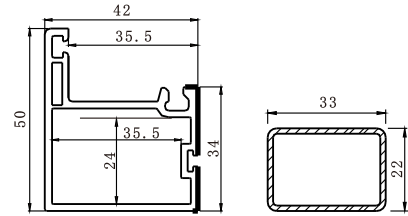
**screen sash**  
Code:P60-114  
Meter weight: 0.37Kg  
Package:16 pieces/bag



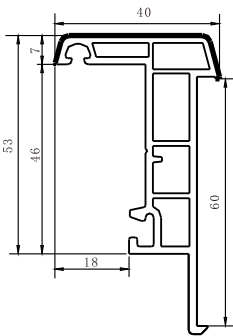
**door inter lock**  
Code:P60-613  
Meter weight: 0.353Kg  
Package: ??pieces/bag



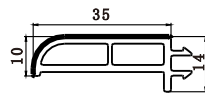
**screen sash**  
Code:P60-299  
Meter weight: 0.25Kg  
Package:20 pieces/bag



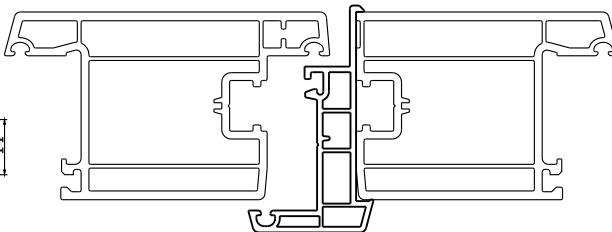
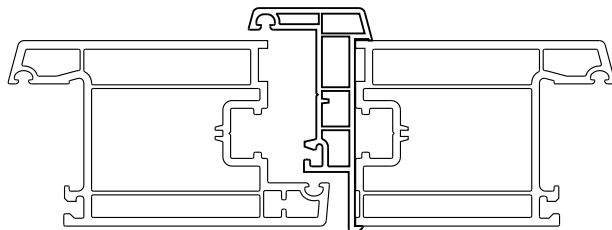
**screen door**  
Code:P60-479  
Meter weight: 0.57Kg  
Package:8 pieces/bag



**float mullion**  
Code:P60-158  
Meter weight: 0.67Kg  
Package:8 pieces/bag

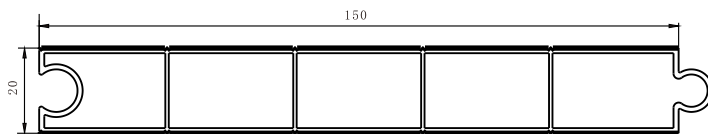


**architrave**  
Code:P60-612  
Meter weight: 0.3Kg  
Package:?? pieces/bag

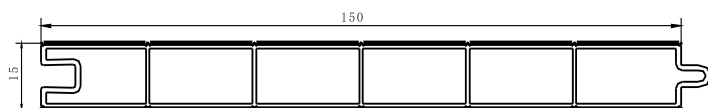


We reserve the right for technical improvement

**DOOR PANEL PROFILE** Thickness 1.5-1.7mm

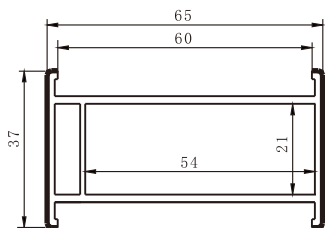


**20mm door panel**  
Code:P60-080  
Meter weight: 0.77Kg  
Package:6 pieces/bag



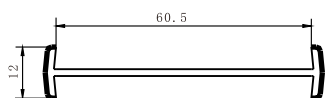
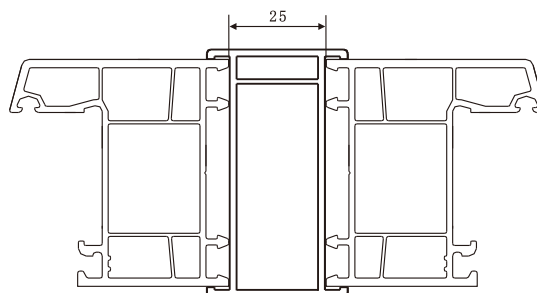
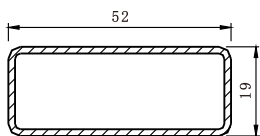
**15mm door panel**  
Code:P60-134  
Meter weight: 0.64Kg  
Package:6 pieces/bag

**60 CASEMENT SYSTEM AUXILIARY PROFILES** Thickness 1.5-1.7mm



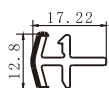
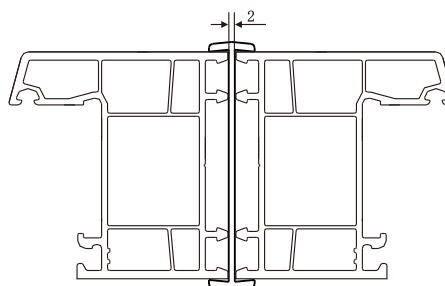
**coupling**

Code:P60-083  
Meter weight: 0.64Kg  
Package:8 pieces/bag



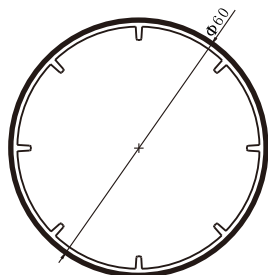
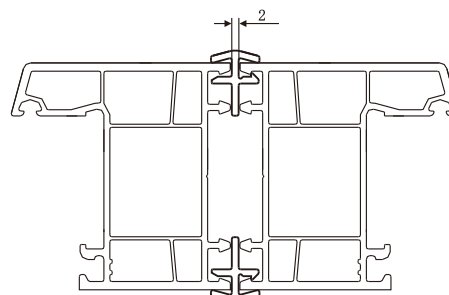
**coupling**

Code:P60-082  
Meter weight: 0.2Kg  
Package:20 pieces/bag



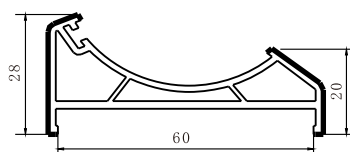
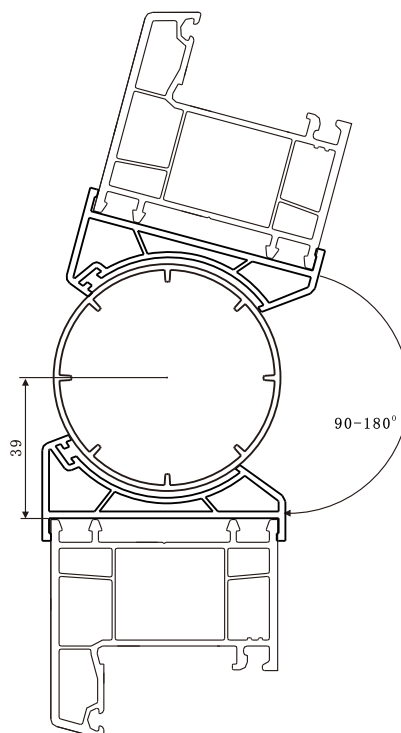
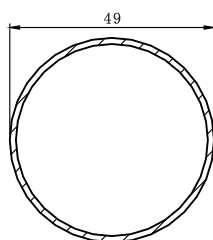
**coupling**

Code:P60-113  
Meter weight: 0.11Kg  
Package:40 pieces/bag



**coupling**

Code:P60-038  
Meter weight: 0.64Kg  
Package:4 pieces/bag

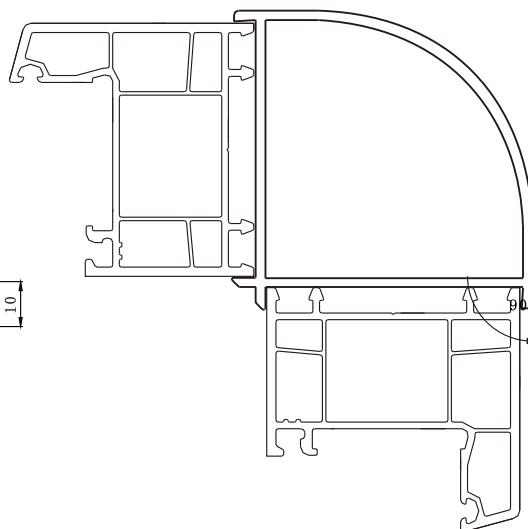
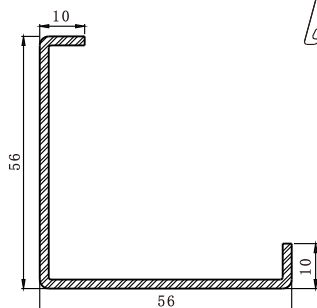
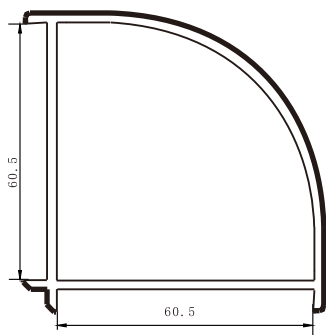


**coupling**

Code:P60-084  
Meter weight: 0.52Kg  
Package:8 pieces/bag

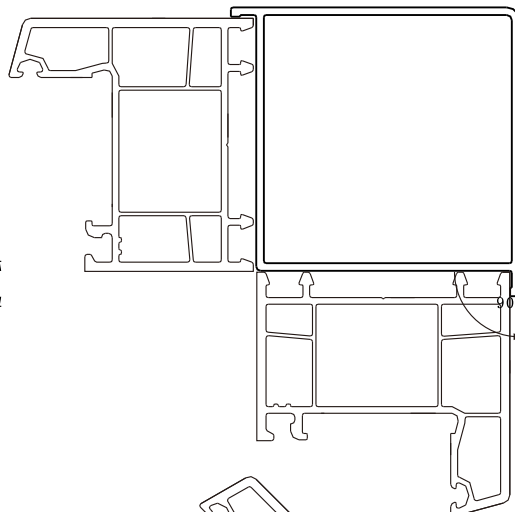
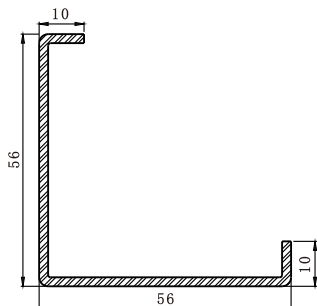
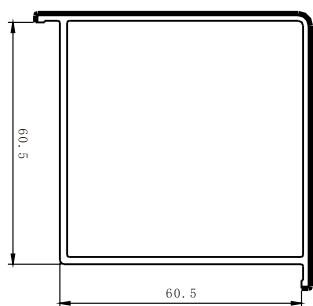
We reserve the right for technical improvement

**60 CASEMENT SYSTEM AUXILIARY PROFILES** Thickness 1.5-1.7mm



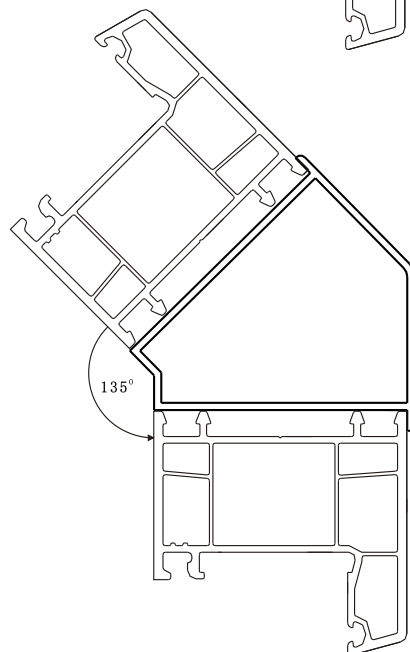
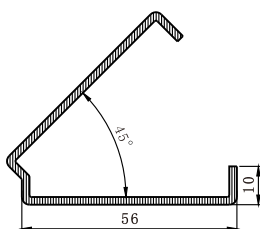
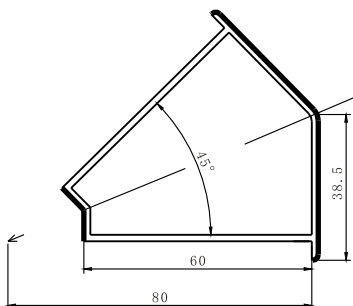
**coupling**

Code:P60-081  
 Meter weight: 0.75Kg  
 Package:4 pieces/bag



**coupling**

Code:P60-441  
 Meter weight: 0.72Kg  
 Package:4 pieces/bag



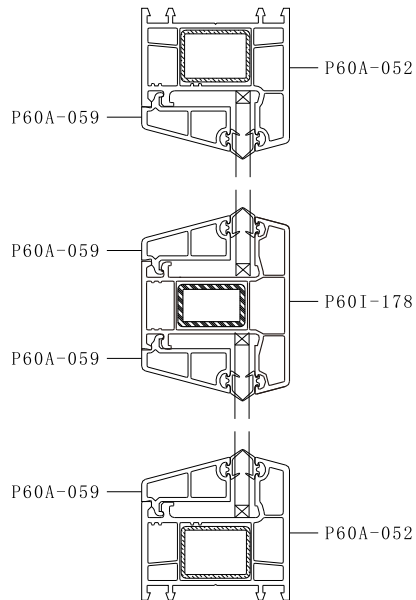
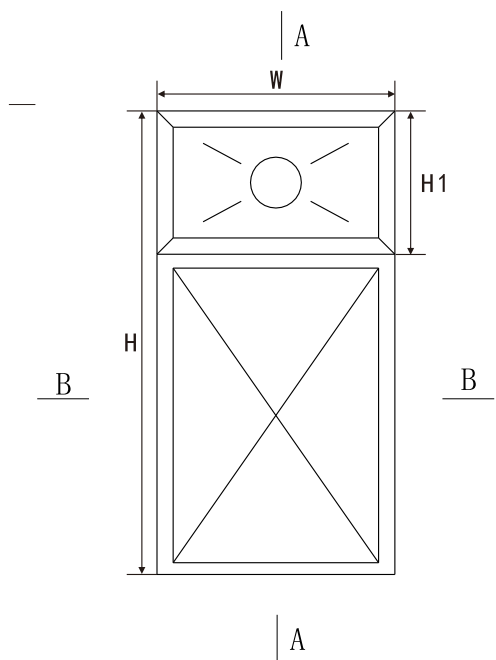
**135° coupling**

Code:T60-155  
 Meter weight: 0.67Kg  
 Package:7 pieces/bag

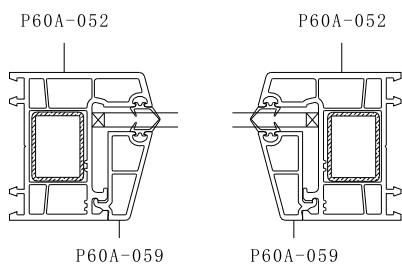
We reserve the right for technical improvement



# 60 FIXED WINDOW



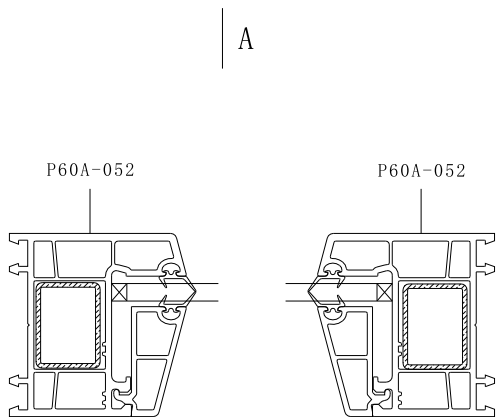
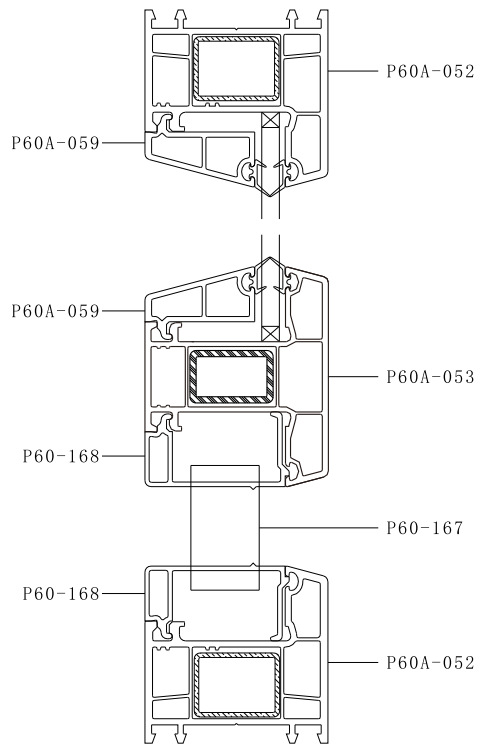
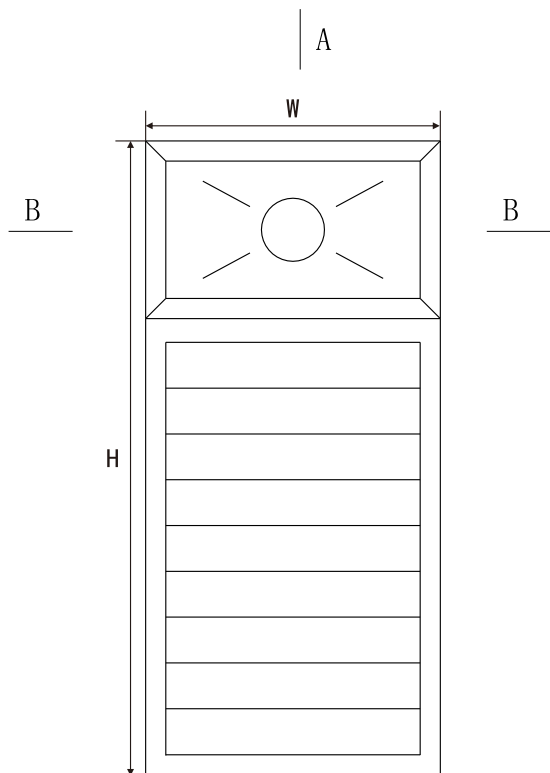
A-A



B-B

Material cutting list	
P60A-052	W+6
P60A-052	H+6
P60I-178	W-44+6

# 60 FIXED LOUVER



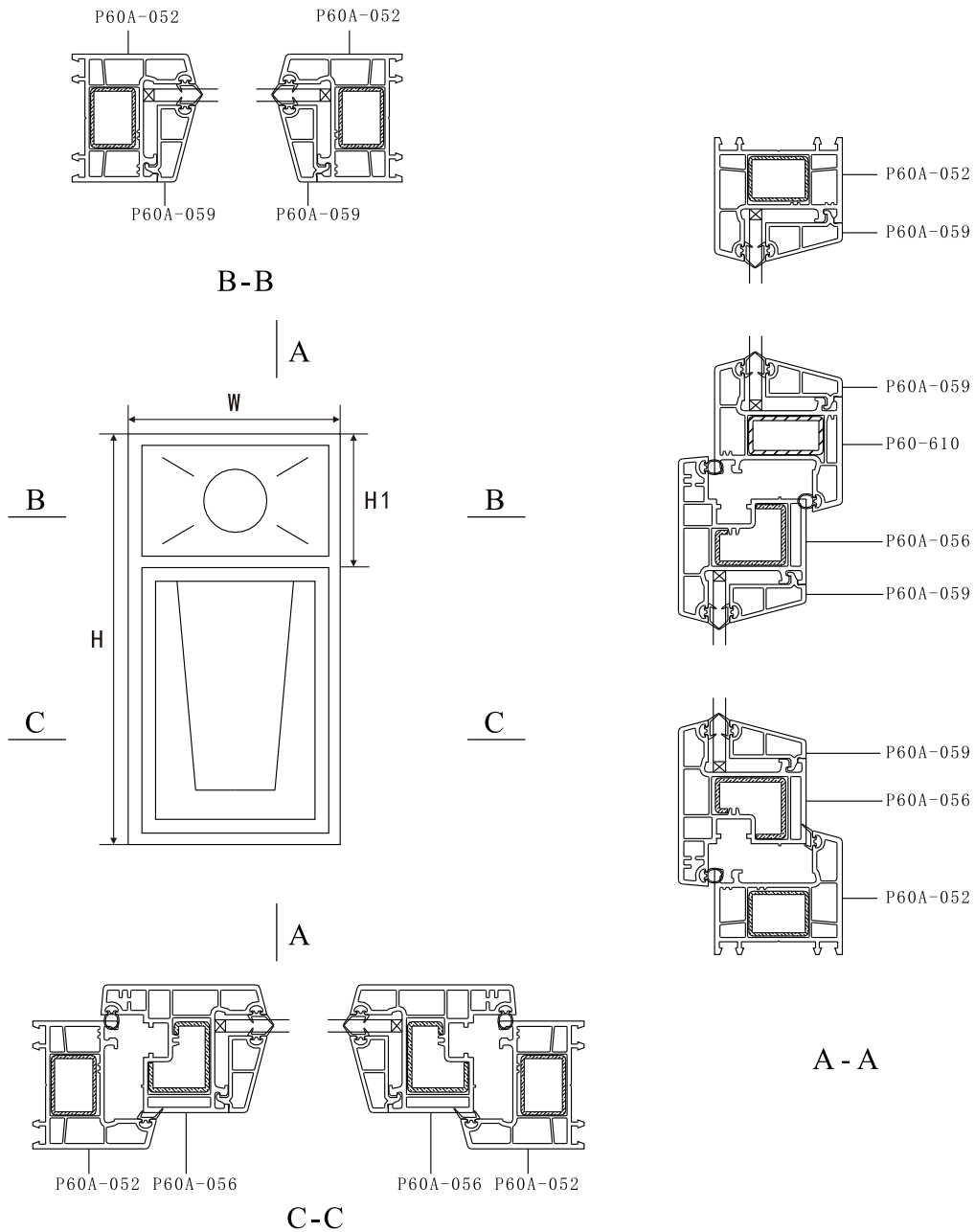
B-B

A-A

### Material cutting list

P60A-052	W+6
P60A-052	H+6
P60I-178	W-44+6

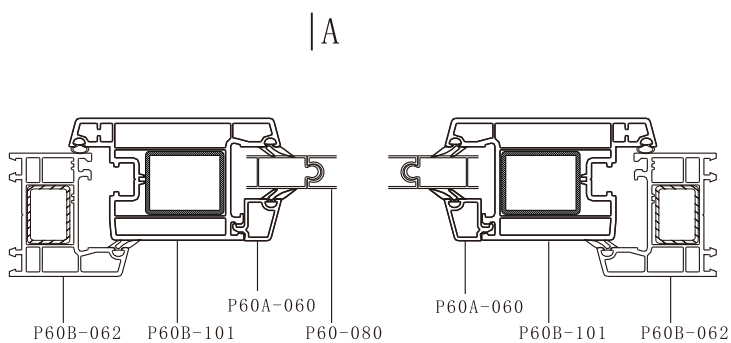
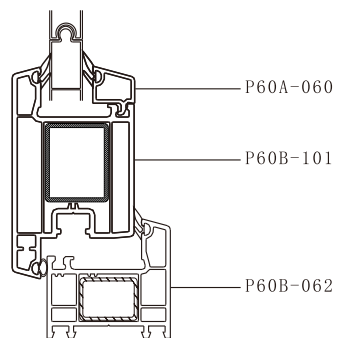
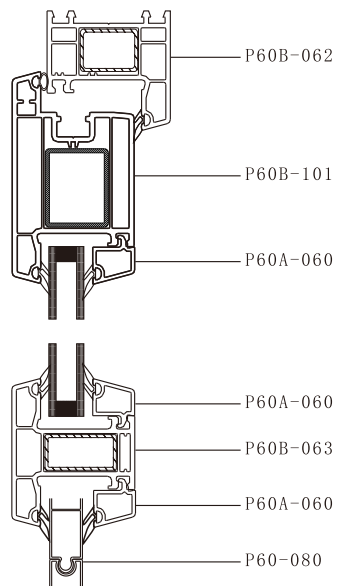
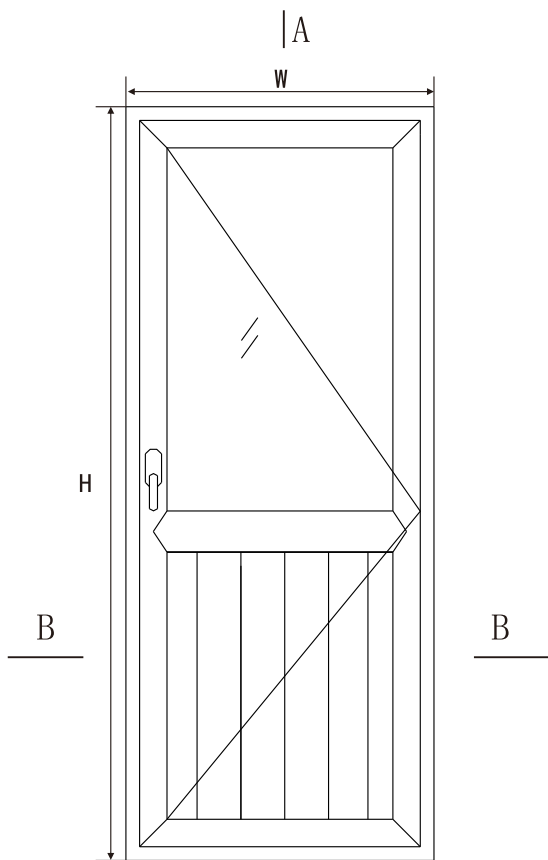
# 60 TOP FIXED FOR EXHAUST WITH TOP HUNG OPENING OUTWARD



We reserve the right for technical improvement

Material cutting list	
P60A-052	W+6
P60A-052	H1+6
P60A-052	H-H1+6
P60-610	W-44+6
P60A-056	W-64+6
P60A-056	W-42+6

# 60 OUTWARD-OPENING DOOR



B-B

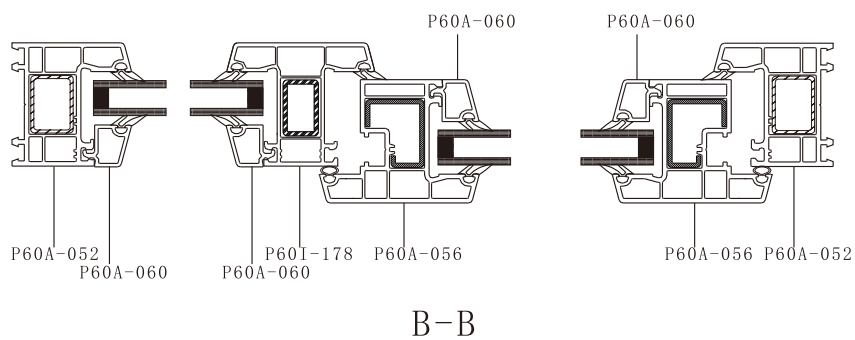
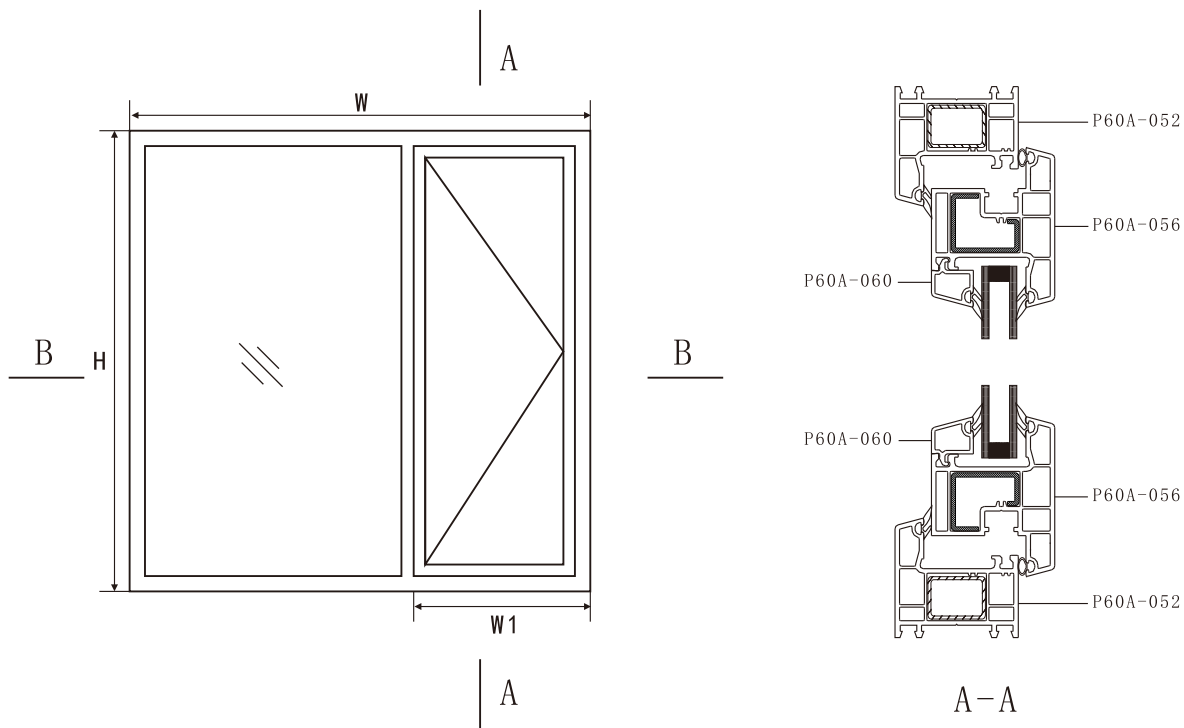
A-A

**Material cutting list**

P60B-062	W+6
P60B-062	H+6
P60B-063	W-200+6
P60B-101	W-64+6
P60B-101	H-64+6

We reserve the right for technical improvement

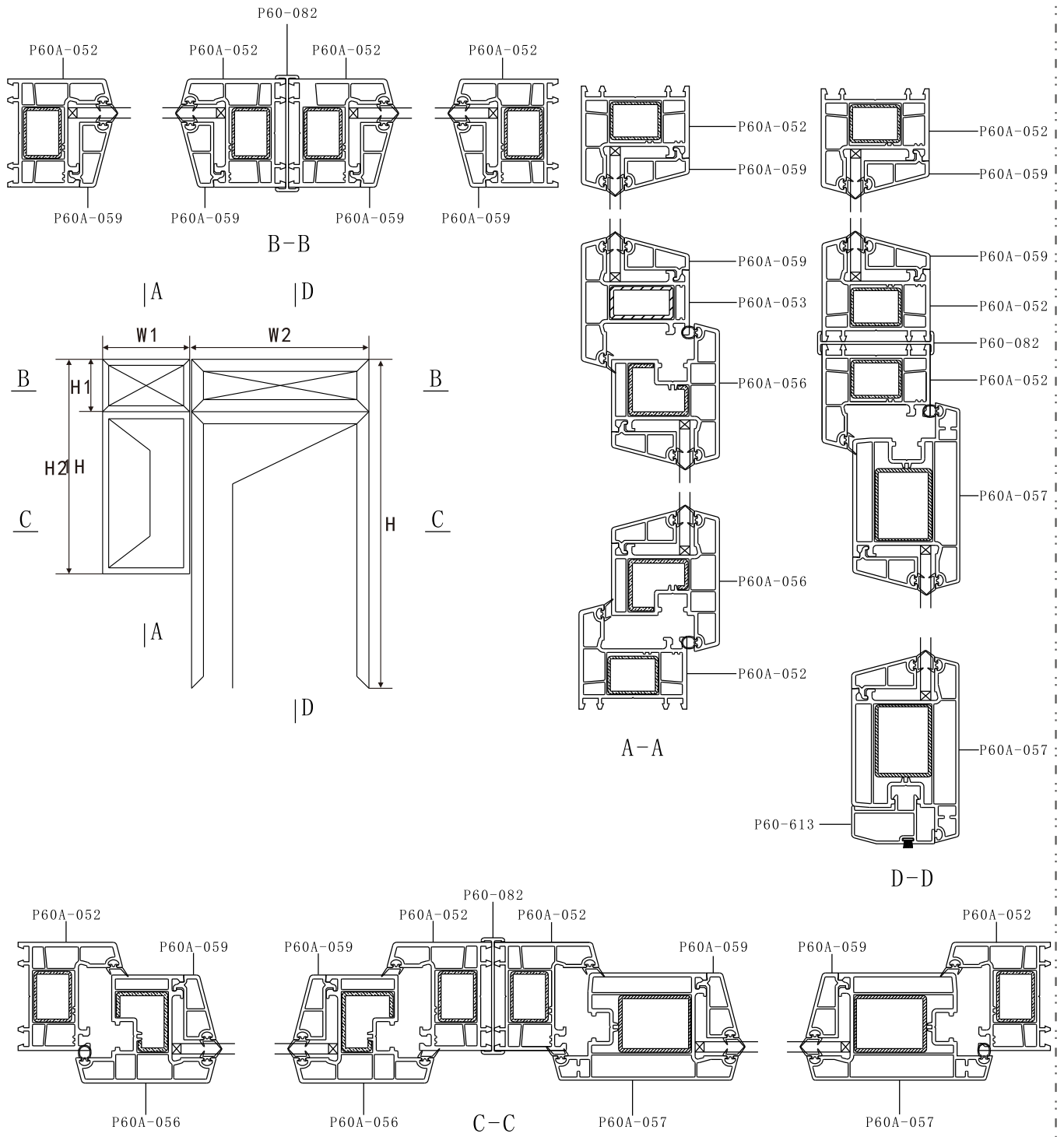
# 60 OUTWARD-OPENING WINDOW



Material cutting list	
P60A-052	W+6
P60A-052	H+6
P60I-178	H-44+6
P60A-056	W1-40+6
P60A-056	H-64+6

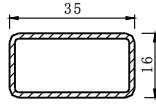
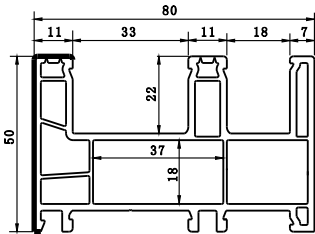
We reserve the right for technical improvement

# 60COMBINATION WINDOW FOR KITCHEN



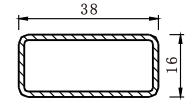
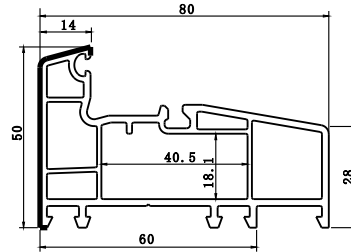
Material cutting list			
P60A-052	W1+6	P60A-056	H2-H1-40+6
P60A-052	W2-2+6	P60A-056	W1-64+6
P60A-052	H1+6	P60A-057	W2-64-2+6
P60A-052	H2+6	P60A-057	H-H1-32+6
P60A-052	H-H1-2+3	P60-082	H2
P60I-178	W1-44+6	P60-082	W2

**80SLIDING SYSTEM** Thickness 2.0mm



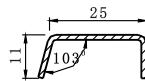
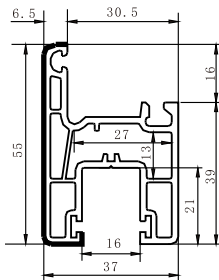
**frame**

Code:T80C-129  
 Meter weight: 1.24Kg  
 Package:6 pieces/bag



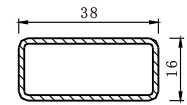
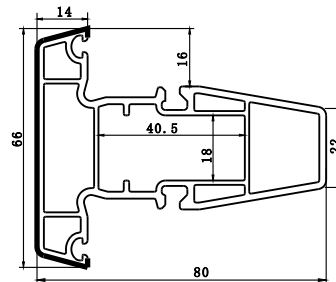
**fixed frame**

Code:T80A-016  
 Meter weight: 1.09Kg  
 Rubber: 1.124Kg  
 Package:6 pieces/bag



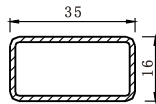
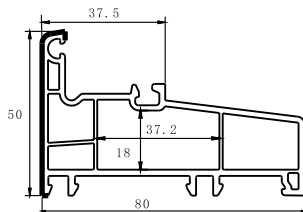
**sash**

Code:T80C-442  
 Meter weight: 0.72Kg  
 Rubber: 0.754Kg  
 Package:12 pieces/bag



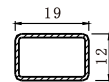
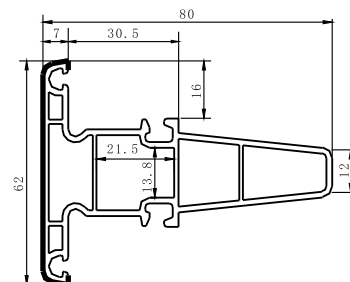
**fixed mullion**

Code:T80A-018  
 Meter weight: 1.25Kg  
 Rubber: 1.284Kg  
 Package:6pieces/bag



**fixed frame**

Code:T80C-429  
 Meter weight: 0.92Kg  
 Rubber: 0.954Kg  
 Package:6 pieces/bag

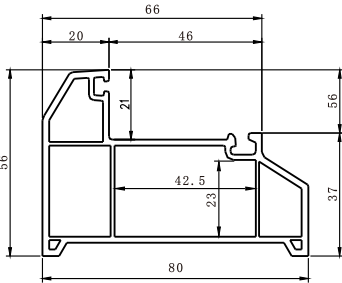


**fixed mullion (1.6mm)**

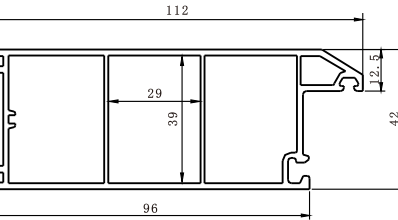
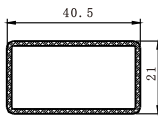
Code:T80B-015  
 Meter weight: 0.85Kg  
 Rubber: 0.917Kg  
 Package:6pieces/bag

We reserve the right for technical improvement

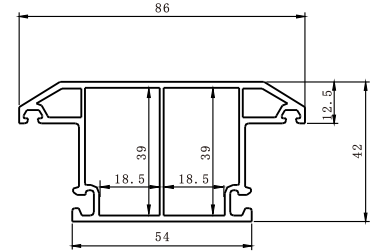
**80 CASEMENT SYSTEM** Thickness 1.5mm



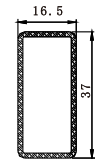
**frame**  
Code:P80A-401  
Meter weight: 0.75Kg  
Package:4 pieces/bag



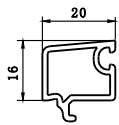
**sash**  
Code:P80A-402  
Meter weight: 0.92Kg  
Package:4 pieces/bag



**fixed mullion**  
Code:P80A-403  
Meter weight: 0.75Kg  
Package:4pieces/bag



(10mm Doorpanel  
Double sides with rubber  
Single Glass)



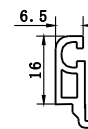
**GB20mm**  
Code:T80A-025  
Meter weight:0.17Kg  
Rubber: 0.204Kg  
Package:30 pieces/bag

(20mm Doorpanel  
without rubber)



**GB9mm**  
Code:T88-124  
Meter weight:0.16Kg  
Rubber: 0.2Kg  
Package:40 pieces/bag

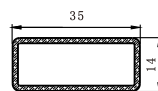
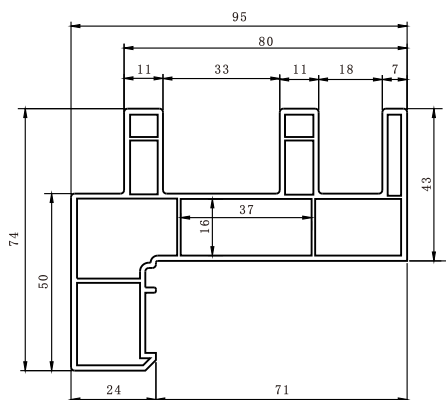
(20mm Doorpanel  
Single side with rubber  
with 4mm+9A+4mm Glass)



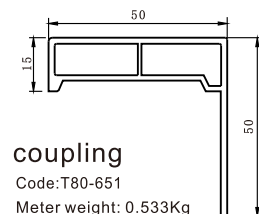
**GB6mm**  
Code:T80A-027  
Meter weight:0.1Kg  
Rubber: 0.134Kg  
Package:50 pieces/bag

We reserve the right for technical improvement

**80 INTEGRATED SLIDING SYSTEM** Thickness 1.5mm



**frame**  
Code:T80-650  
Meter weight: 1.367Kg  
Package:4 pieces/bag

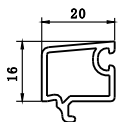


**coupling**  
Code:T80-651  
Meter weight: 0.533Kg  
Package:10 pieces/bag



**80 SLIDING SYSTEMGB**

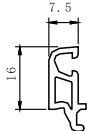
4-6mm glass



**GB20mm**

Code:T80A-025  
Meter weight:0.17Kg  
Rubber: 0.204Kg  
Package:30 pieces/bag

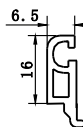
16-17mm glass



**GB7.5MM**

Code:T80A-429  
Meter weight:0.13Kg  
Rubber: 0.164Kg  
Package:50 pieces/bag

17-18mm glass



**GB6mm**

Code:T80A-027  
Meter weight:0.1Kg  
Rubber: 0.134Kg  
Package:50 pieces/bag

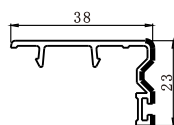
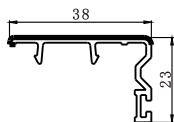
18-20mm glass



**GB5MM**

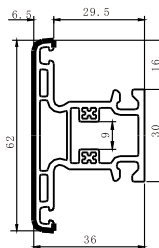
Code:T80A-222  
Meter weight:0.09Kg  
Rubber: 0.124Kg  
Package:50 pieces/bag

**80 SLIDING SYSTEM AUXILIARY PROFILES**



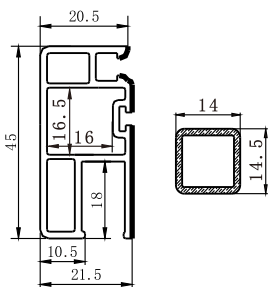
**inter lock**

Code:T80C-140  
Meter weight: 0.17Kg  
Package:20 pieces/bag



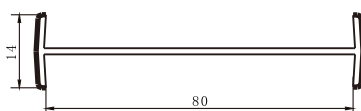
**sash mullion**

Code:T80A-021  
Meter weight: 0.71Kg  
Package:12 pieces/bag



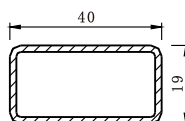
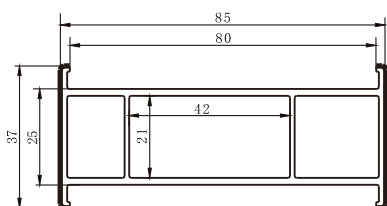
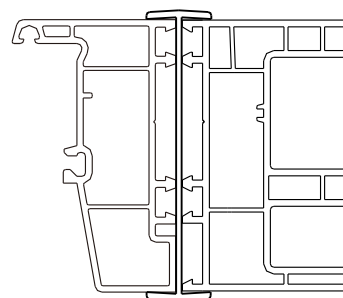
**screen sash**

Code:T80-032  
Meter weight: 0.4Kg  
Package:12 pieces/bag



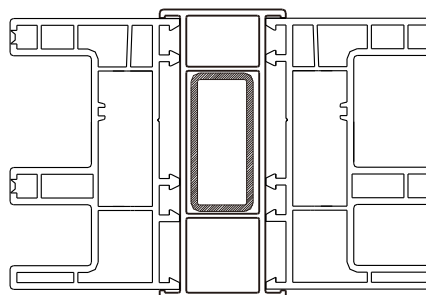
**coupling**

Code:T80-034  
Meter weight: 0.29Kg  
Package:20 pieces/bag

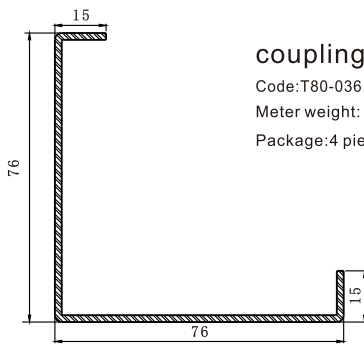
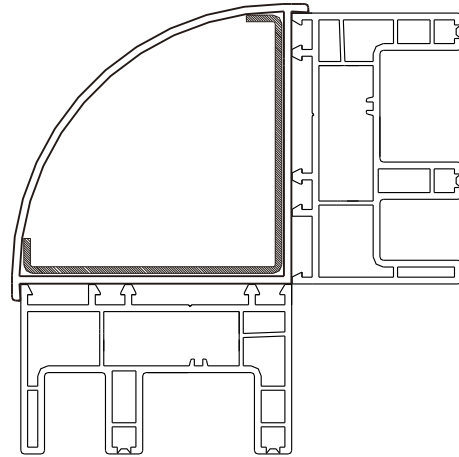
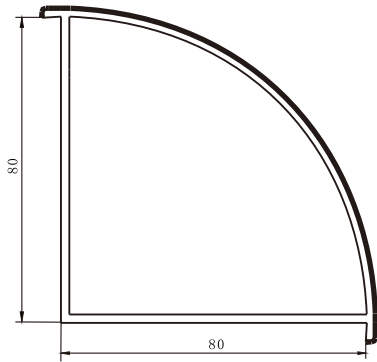


**coupling**

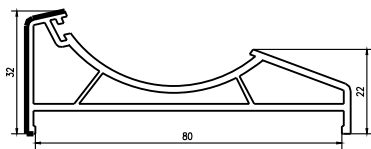
Code:T80-035  
Meter weight: 0.74Kg  
Package:8 pieces/bag



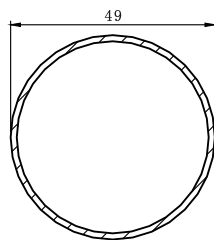
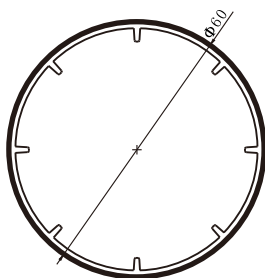
We reserve the right for technical improvement



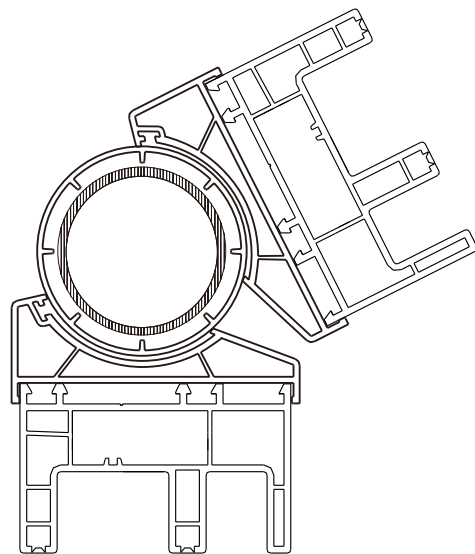
**coupling**  
Code:T80-036  
Meter weight: 0.87Kg  
Package:4 pieces/bag



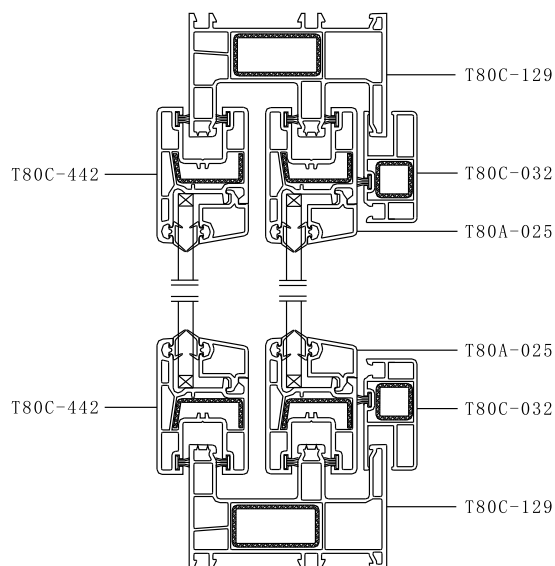
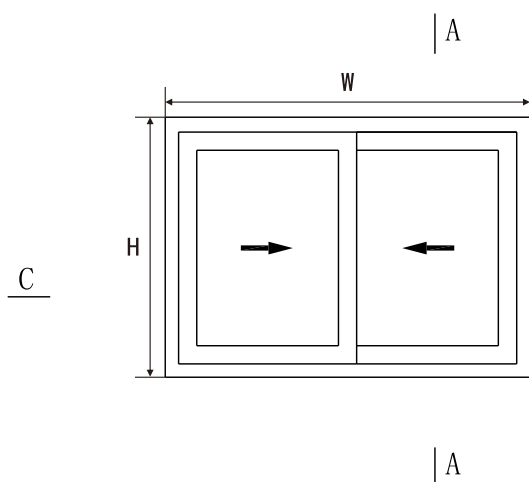
**coupling**  
Code:T80-037  
Meter weight: 0.57Kg  
Package:8 pieces/bag



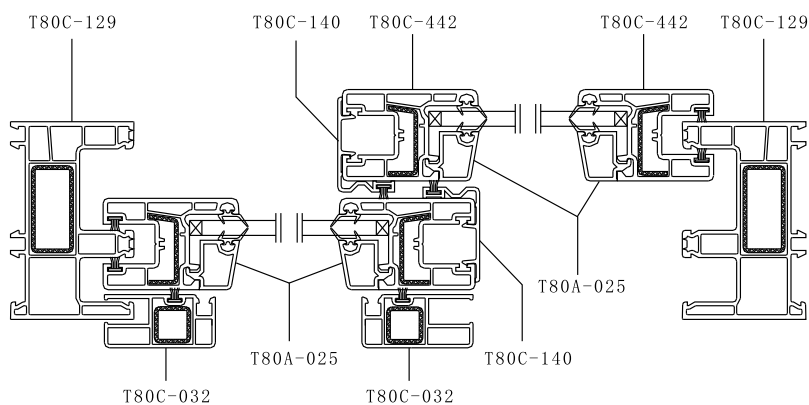
**coupling**  
Code:P60-038  
Meter weight: 0.64Kg  
Package:4 pieces/bag



# 80SLIDING WINDOW



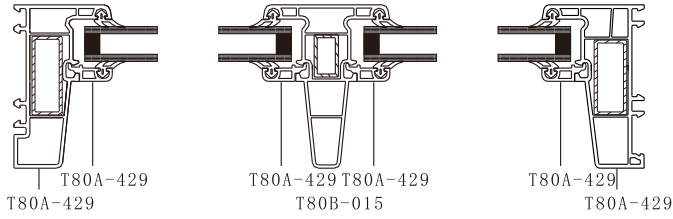
A-A



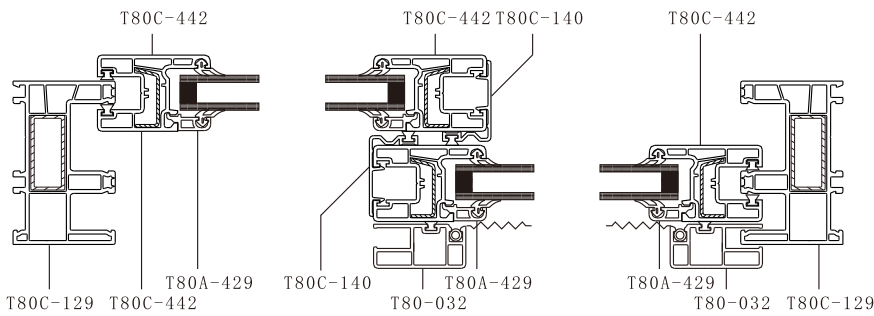
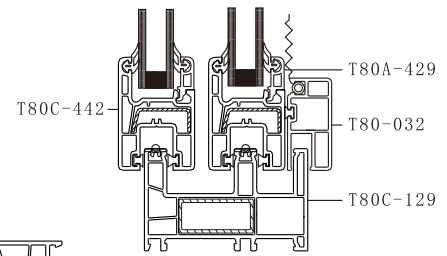
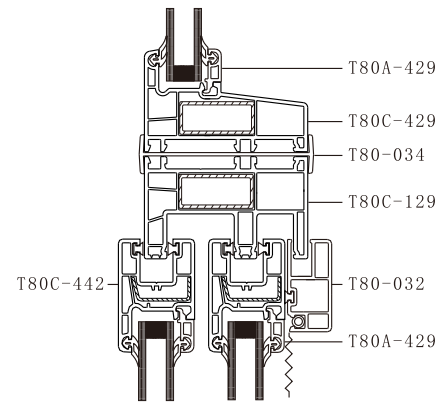
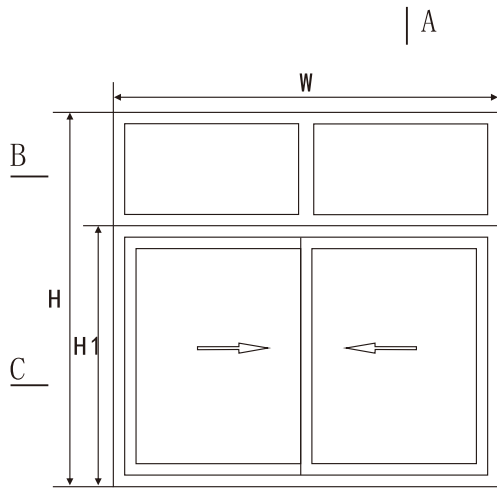
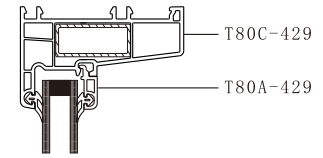
C-C

Material cutting list	
T80C-129	W+6
T80C-129	H+6
T80C-442	W/2-15.5+6
T80C-442	H-84+6

# 80SLIDING WINDOW



B-B



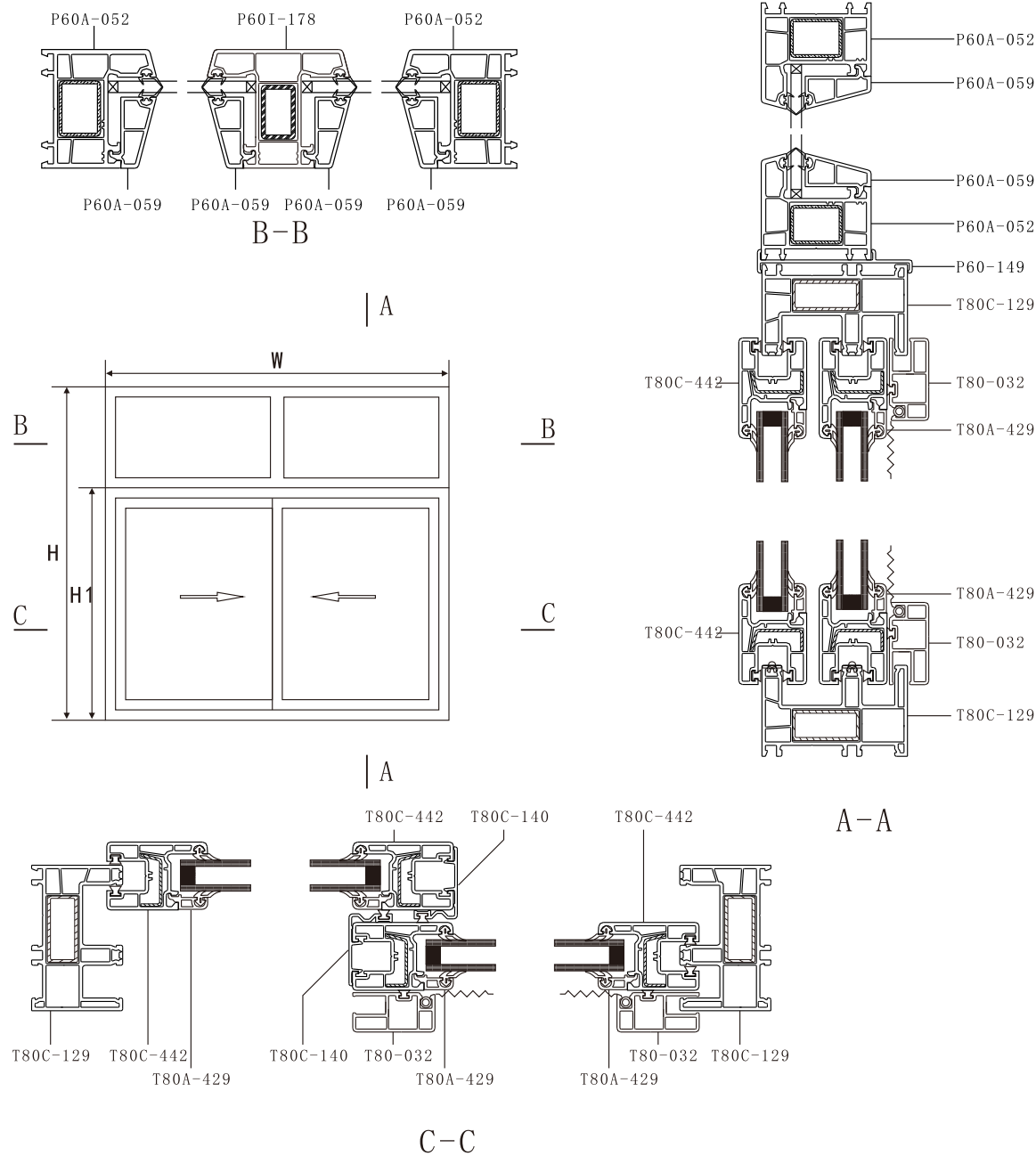
C-C

A-A

Material cutting list	
T80C-429	W+6
T80C-429	H-H1-2+6
T80B-015	H-H1-40+6
T80C-129	W+6
T80C-129	H1+6
T80C-442	W/2-15.5+6
T80C-442	H1-84+6
T80-034	W

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# 80SLIDING WINDOW

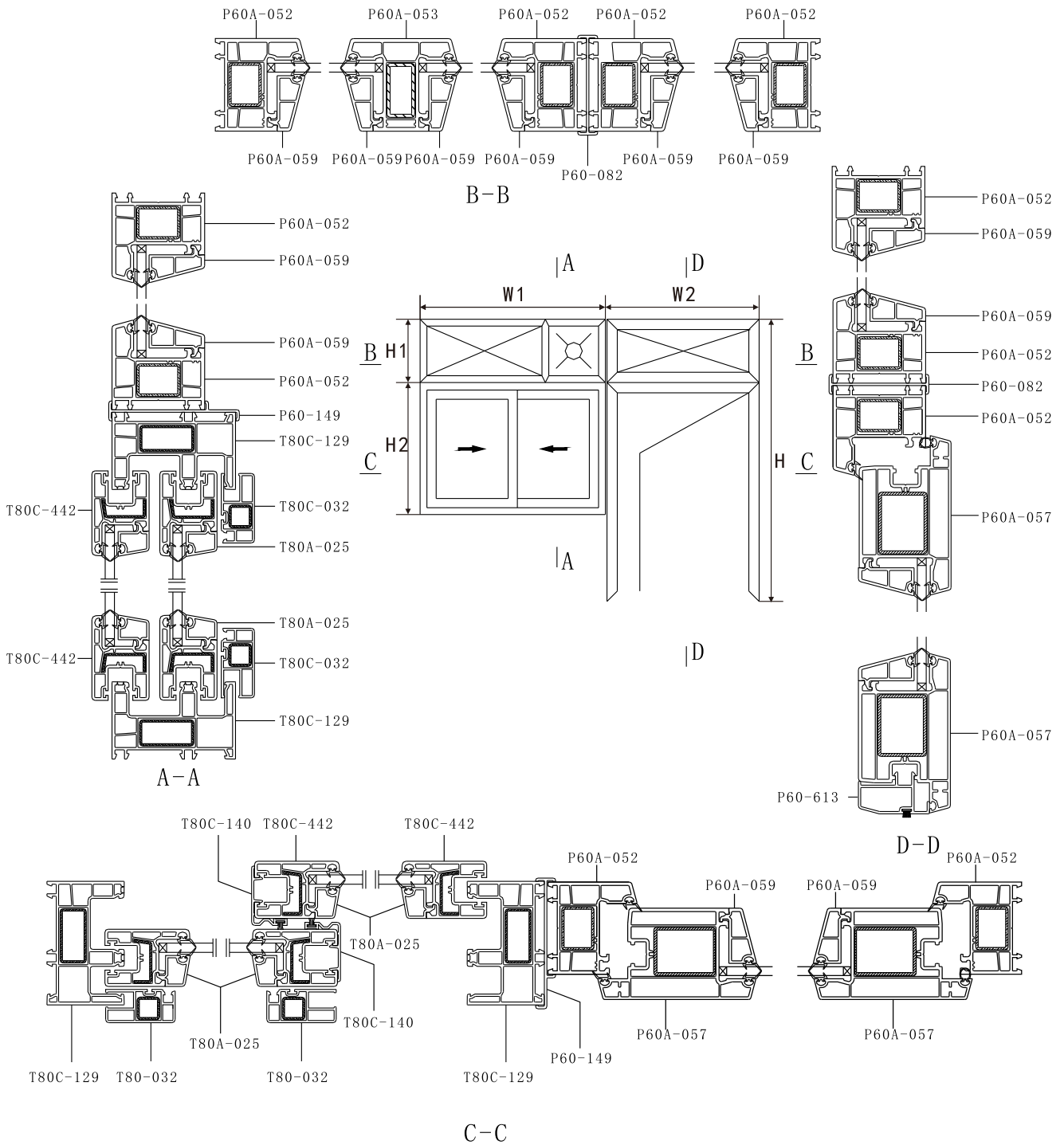


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### Material cutting list

P60A-059	$W+6$
P60A-059	$H-H_1-2+6$
T60I-178	$H-H_1-46+6$
T80C-129	$W+6$
T80C-129	$H_1+6$
T80C-442	$W/2-15.5+6$
T80C-442	$H_1-84+6$
P60-149	$W$

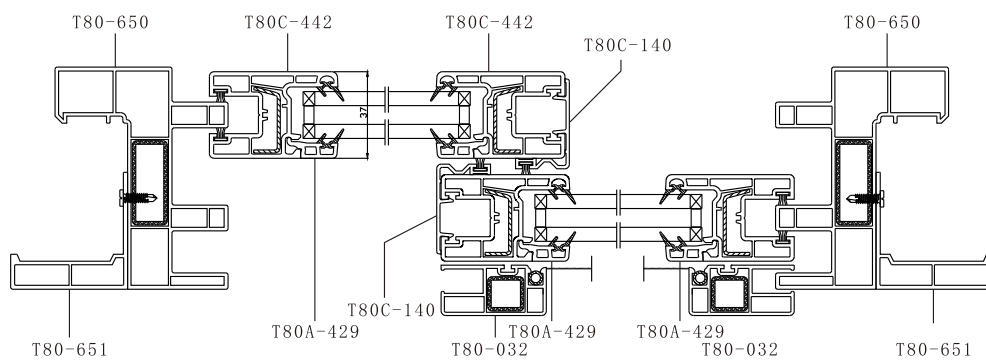
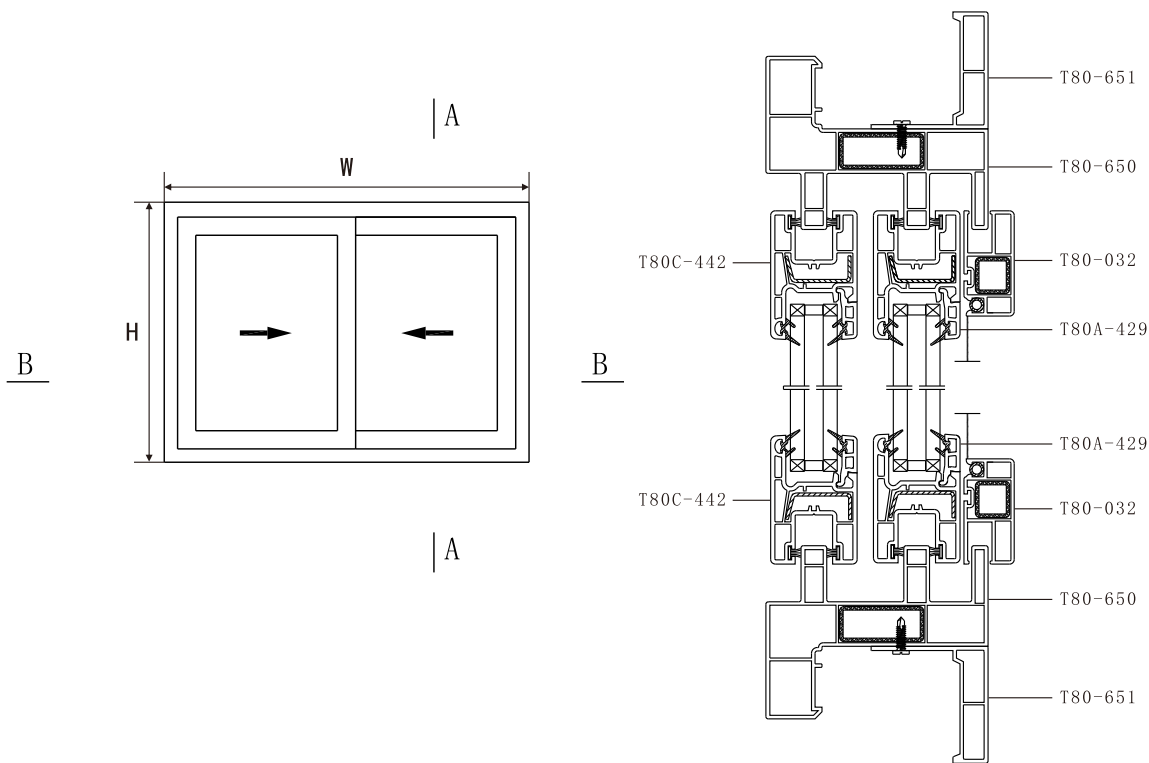
# 80SLIDING WINDOW



We reserve the right for technical improvement

Material cutting list			
P60A-052	W1+6	T80C-442	W1/2-15.5+6
P60A-052	W2-2+6	T80C-442	H2-84+6
P60A-052	H1+6	P60A-057	W2-64-2+6
P60A-052	H-H1-2+3	P60A-057	H-H1-32-2+6
P60I-178	W1-44+6	P60-082	W2
T80C-129	W1+6	P60-149	W1
T80C-129	H2-2+6	P60-149	H1+H2

# 80 INTEGRATED SLIDING WINDOW

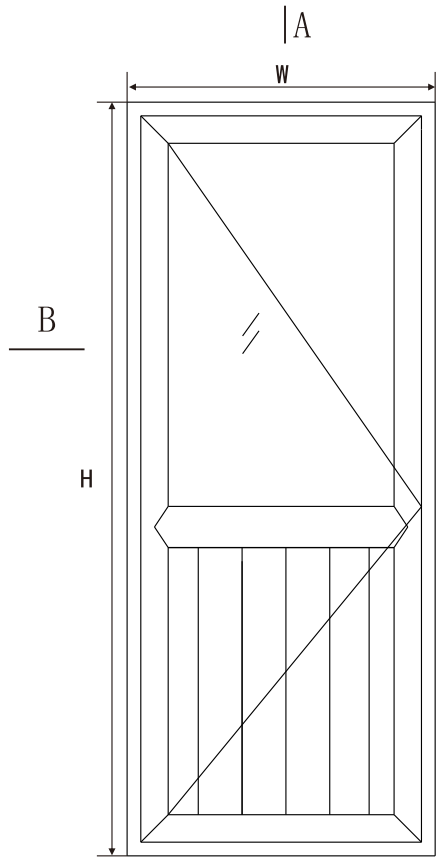


B-B

Material cutting list	
T80-650	W+6
T80-650	H+6
T80C-442	W/2-41.5+6
T80C-442	H-132+6

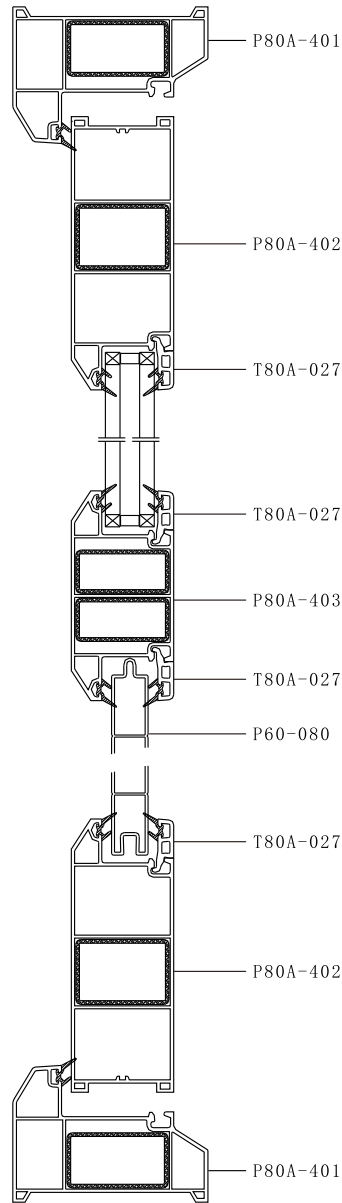
We reserve the right for technical improvement

# 80 INWARD-OPENING DOOR

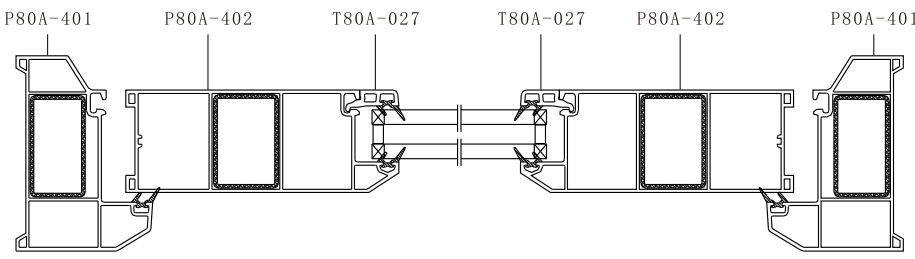


B

A



A-A



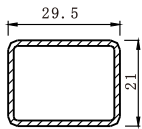
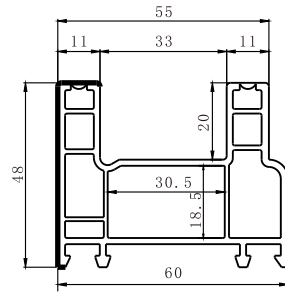
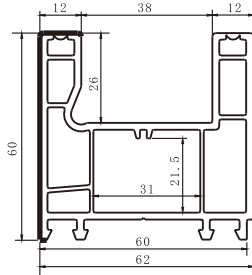
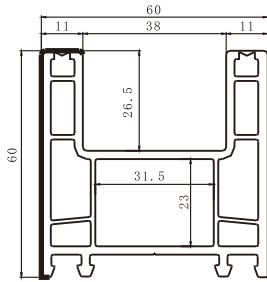
B-B

We reserve the right for technical improvement

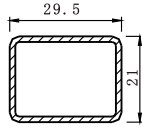
Material cutting list	
P80A-401	W+6
P80A-401	H+6
P80A-402	W-96+6
P80A-402	H-96+6
P80A-403	W-96-138+6



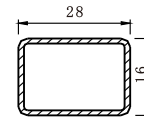
**60 SLIDING SYSTEM** Thickness 2.0mm



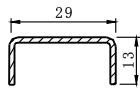
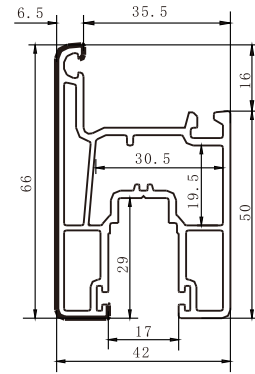
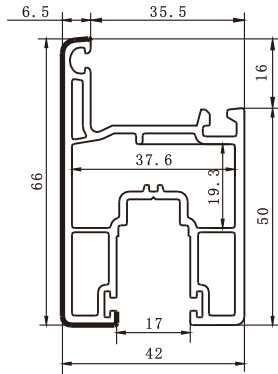
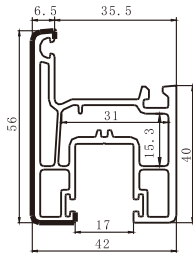
**frame**  
Code:T60-431-1  
Meter weight: 1.167Kg  
Package:6 pieces/bag



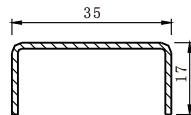
**frame(1.9mm)**  
Code:T60-109  
Meter weight:1.02 Kg  
Package:6 pieces/bag



**frame(1.7mm)**  
Code:T60-622  
Meter weight:0.834 Kg  
Package:6 pieces/bag

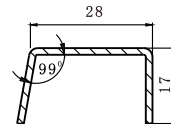


**sash**  
Code:T88H-464-1  
Meter weight: 0.87Kg  
Rubber: 0.904Kg  
Package:8 pieces/bag



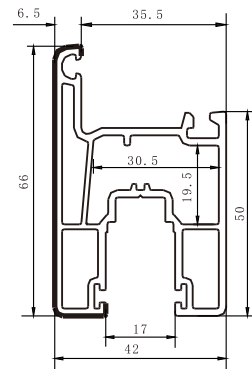
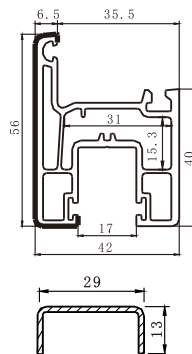
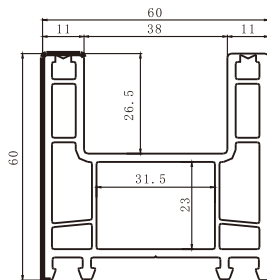
**sash**  
Code:T60-051-1  
Meter weight:0.97Kg  
Rubber: 1.004Kg  
Package:8 pieces/bag

**sash**  
Code:T60-051  
Meter weight:0.89Kg  
Rubber: 0.924Kg  
Package:8 pieces/bag

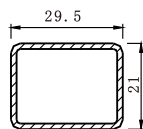


We reserve the right for technical improvement

**60B SLIDING SYSTEM** Thickness 2.5mm

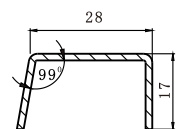


**frame**  
Code:T60-431  
Meter weight: 1.3Kg  
Package:6 pieces/bag

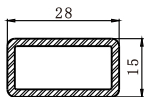
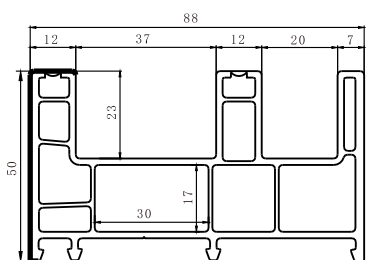


**sash**  
Code:T88H-464  
Meter weight: 0.94Kg  
Rubber: 0.974Kg  
Package:8 pieces/bag

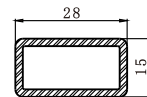
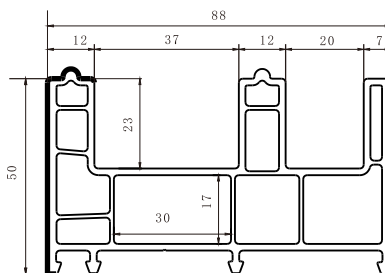
**sash**  
Code:T60-410  
Meter weight: 1.07Kg  
Rubber: 1.104Kg  
Package:8pieces/bag



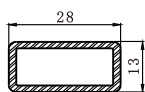
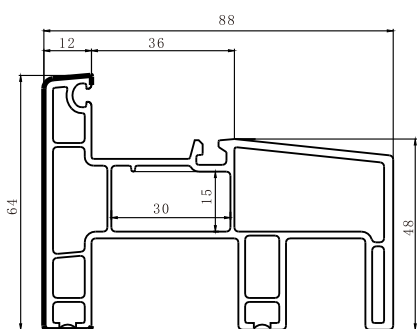
**88SLIDING SYSTEM** Thickness 2.5mm



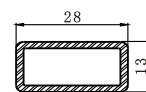
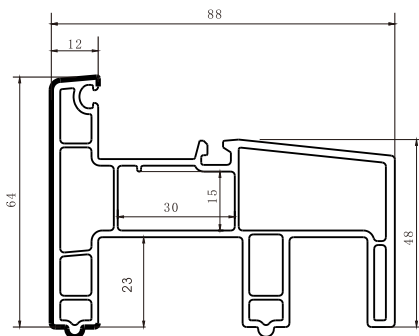
**frame**  
Code:T88H-460  
Meter weight: 1.34Kg  
Package:6 pieces/bag



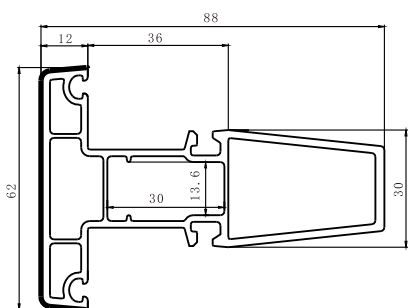
**frame (bump orbit)**  
Code:T88H-483  
Meter weight: 1.39Kg  
Package:6 pieces/bag



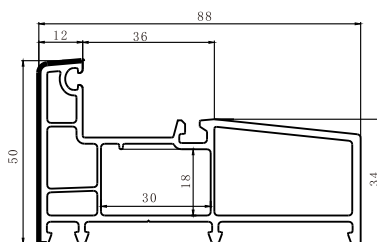
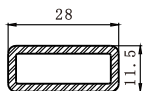
**integrated frame**  
Code:T88H-462  
Meter weight: 1.41Kg  
Rubber: 1.444Kg  
Package:4 pieces/bag



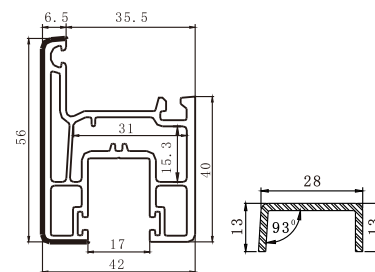
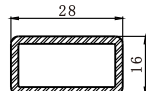
**integrated frame (bump orbit)**  
Code:T88H-484  
Meter weight: 1.45Kg  
Rubber: 1.484Kg  
Package:4 pieces/bag



**fixed mullion**  
Code:T88H-463  
Meter weight: 1.15Kg  
Rubber: 1.184Kg  
Package:6pieces/bag



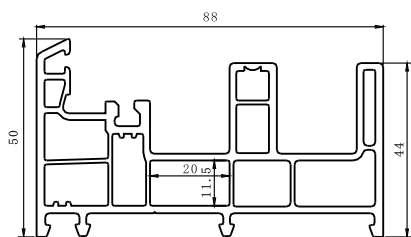
**fixed frame**  
Code:T88H-461  
Meter weight: 1.08Kg  
Rubber: 1.114Kg  
Package:6 pieces/bag



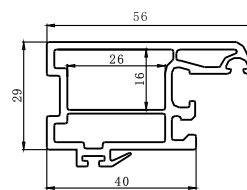
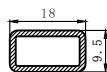
**sash**  
Code:T88H-464  
Meter weight: 0.94Kg  
Rubber: 0.974Kg  
Package:8 pieces/bag

We reserve the right for technical improvement

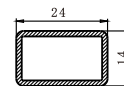
**MONORAIL SECTIONS SLIDING SYSTEM** Thickness 2.0mm



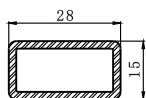
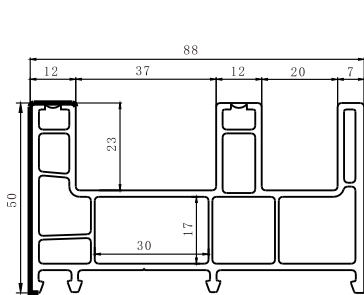
**frame**  
Code:T88-653  
Meter weight: 1.4 Kg  
Package:4 pieces/bag



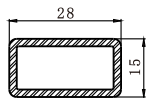
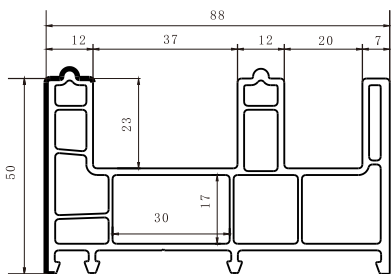
**fixed mullion**  
Code:T88-654  
Meter weight:0.7Kg  
Package:8 pieces/bag



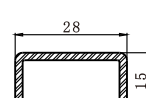
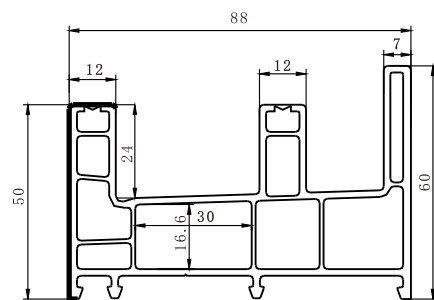
**88SLIDING SYSTEM** Thickness 2.2mm



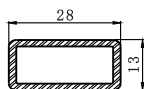
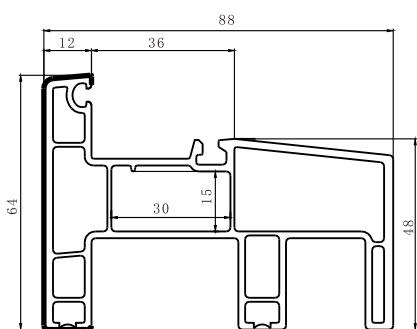
**frame**  
Code:T88H-460-1  
Meter weight: 1.27Kg  
Package:6 pieces/bag



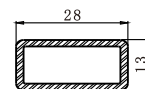
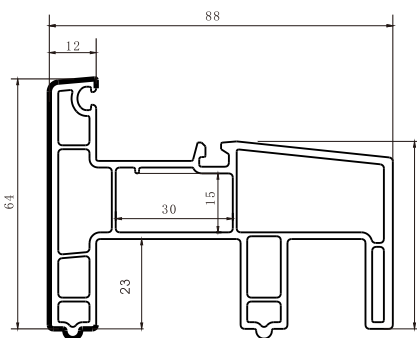
**frame (bump orbit)**  
Code:T88H-483-1  
Meter weight: 1.32Kg  
Package:6 pieces/bag



**frame**  
Code:T88-614  
Meter weight: 1.35Kg  
Package:6 pieces/bag

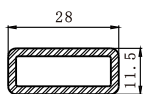
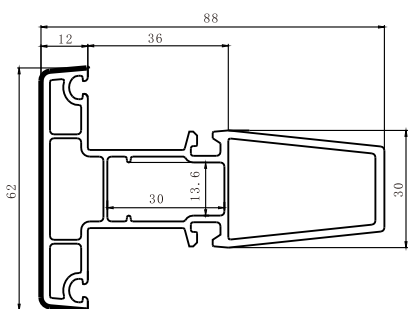


**integrated frame**  
Code:T88H-462-1  
Meter weight: 1.34Kg  
Rubber: 1.374Kg  
Package:4 pieces/bag

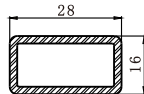
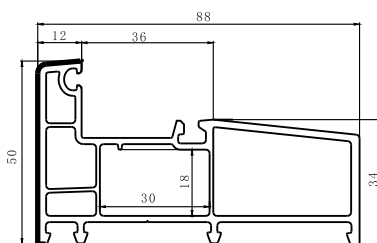


**integrated frame (bump orbit)**  
Code:T88H-484-1  
Meter weight: 1.39Kg  
Rubber: 1.424Kg  
Package:4 pieces/bag

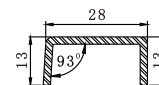
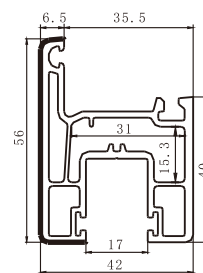
We reserve the right for technical improvement



**fixed mullion**  
Code:T88H-463-1  
Meter weight: 1.1Kg  
Rubber: 1.167Kg  
Package:6pieces/bag



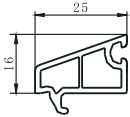
**fixed frame**  
Code:T88H-461-1  
Meter weight: 1.03Kg  
Rubber: 1.064Kg  
Package:6 pieces/bag



**sash**  
Code:T88H-464-1  
Meter weight: 0.87Kg  
Rubber: 0.904Kg  
Package:8 pieces/bag

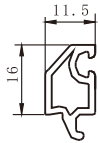
**60/88 SLIDING SYSTEMGB**

4-6mm glass



**GB25mm**  
Code:T88-044  
Meter weight:0.21Kg  
Rubber: 0.244Kg  
Package:30 pieces/bag

17-19mm glass



**GB11mm**  
Code:T88-045  
Meter weight:0.16Kg  
Rubber: 0.194Kg  
Package:40 pieces/bag

19-21mm glass



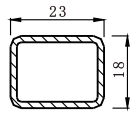
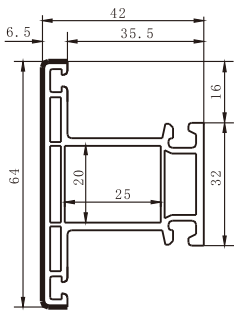
**GB9mm**  
Code:T88-124  
Meter weight:0.16Kg  
Rubber: 0.194Kg  
Package:40 pieces/bag

23-25mm glass

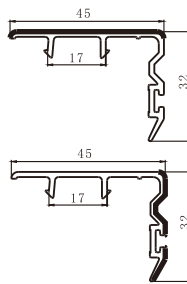


**GB7mm**  
Code:T88-430  
Meter weight:0.13Kg  
Rubber: 0.164Kg  
Package:50 pieces/bag

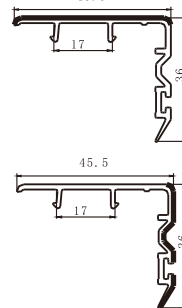
**60/88 SLIDING SYSTEM AUXILIARY PROFILES**



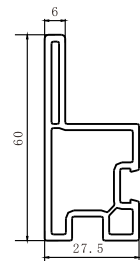
**sash mullion**  
Code:T88-043  
Meter weight: 0.72Kg  
Rubber: 0.787Kg  
Package:8 pieces/bag



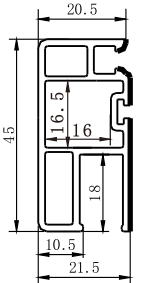
**inter lock**  
Code:T88H-465  
Meter weight: 0.27Kg  
Package:20 pieces/bag



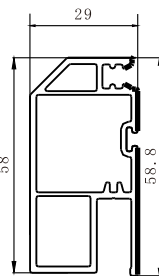
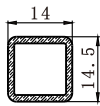
**66inter lock**  
Code:T60-414  
Meter weight: 0.27Kg  
Package:20 pieces/bag



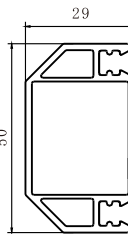
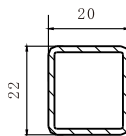
**add on screen track**  
Code:T60-620  
Meter weight: 0.6Kg  
Package:8 pieces/bag



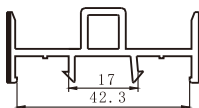
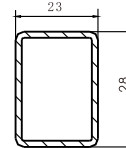
**screen sash**  
Code:T80-032  
Meter weight: 0.4Kg  
Package:12 pieces/bag



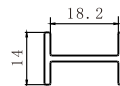
**screen sash**  
Code:T88-617  
Meter weight: 0.645Kg  
Package:?? pieces/bag



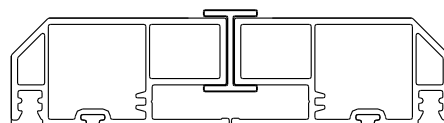
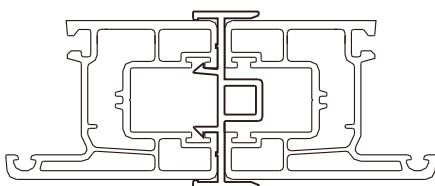
**screen sash mullion**  
Code:T88-618  
Meter weight: 0.56Kg  
Package:?? pieces/bag



**sash joint**  
Code:T60-411  
Meter weight: 0.34Kg  
Package:10 pieces/bag

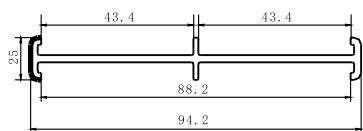


**screen sash joint**  
Code:T88-619  
Meter weight: 0.145Kg  
Package:16 pieces/bag



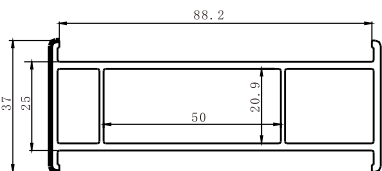
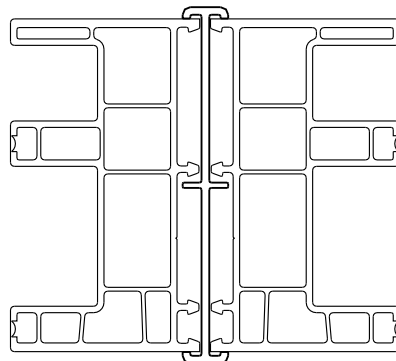
We reserve the right for technical improvement

**60/88 SLIDING SYSTEM AUXILIARY PROFILES**



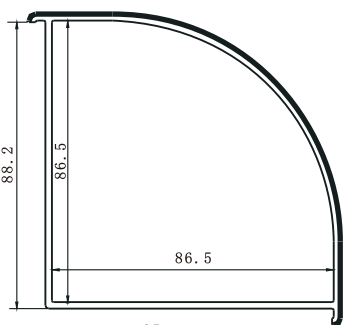
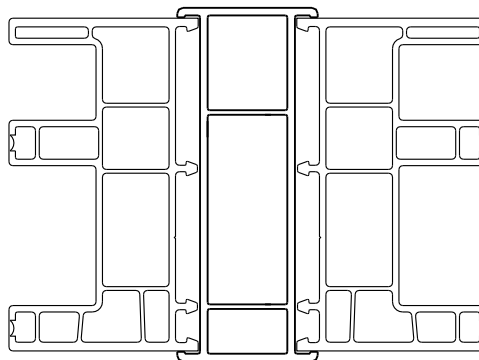
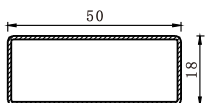
**coupling**

Code:T88-047  
 Meter weight: 0.38Kg  
 Package:20 pieces/bag



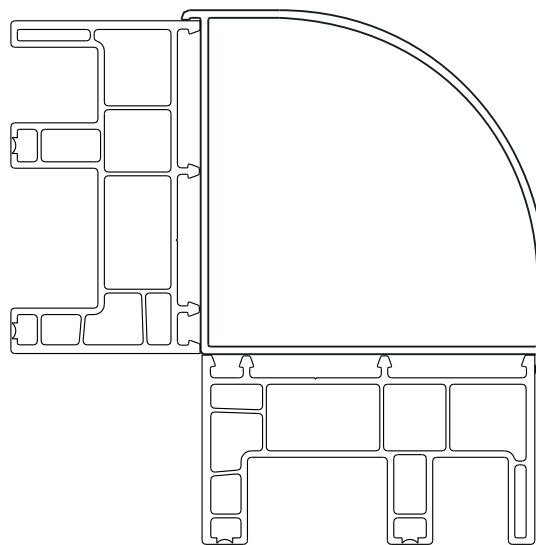
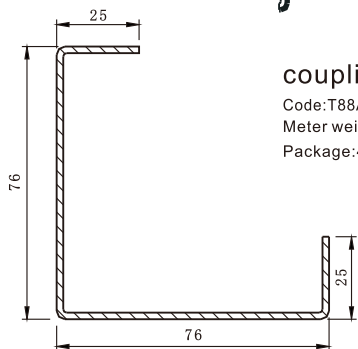
**coupling**

Code:T88-048  
 Meter weight: 0.84Kg  
 Package:6 pieces/bag



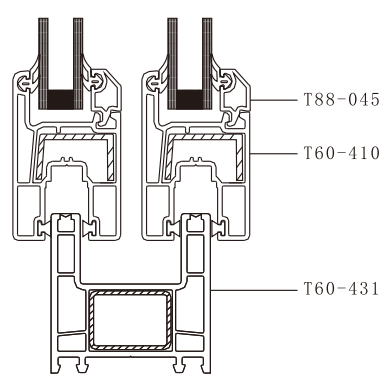
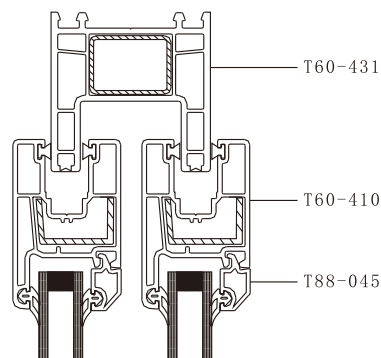
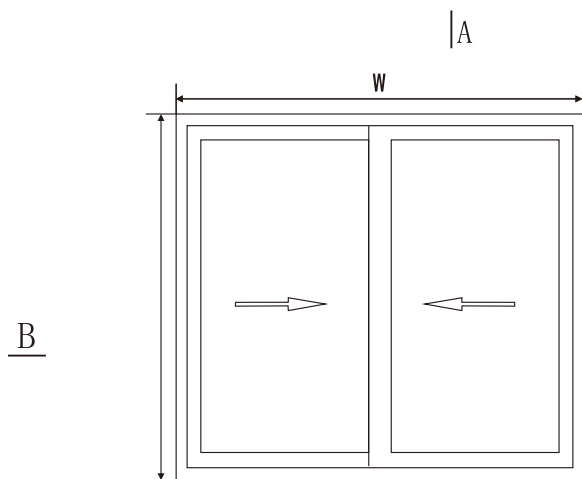
**coupling**

Code:T88A-049  
 Meter weight: 1.04Kg  
 Package:4 pieces/bag

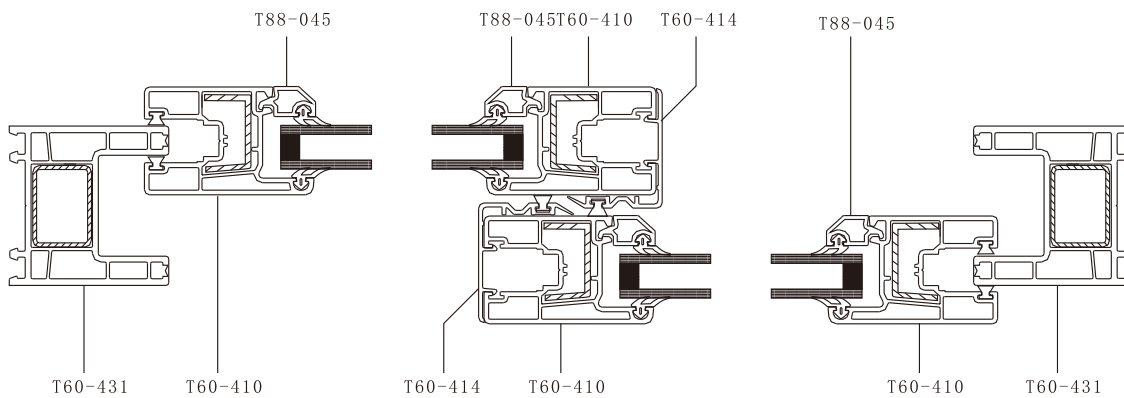


We reserve the right for technical improvement

# 60 SLIDING WINDOW



A-A

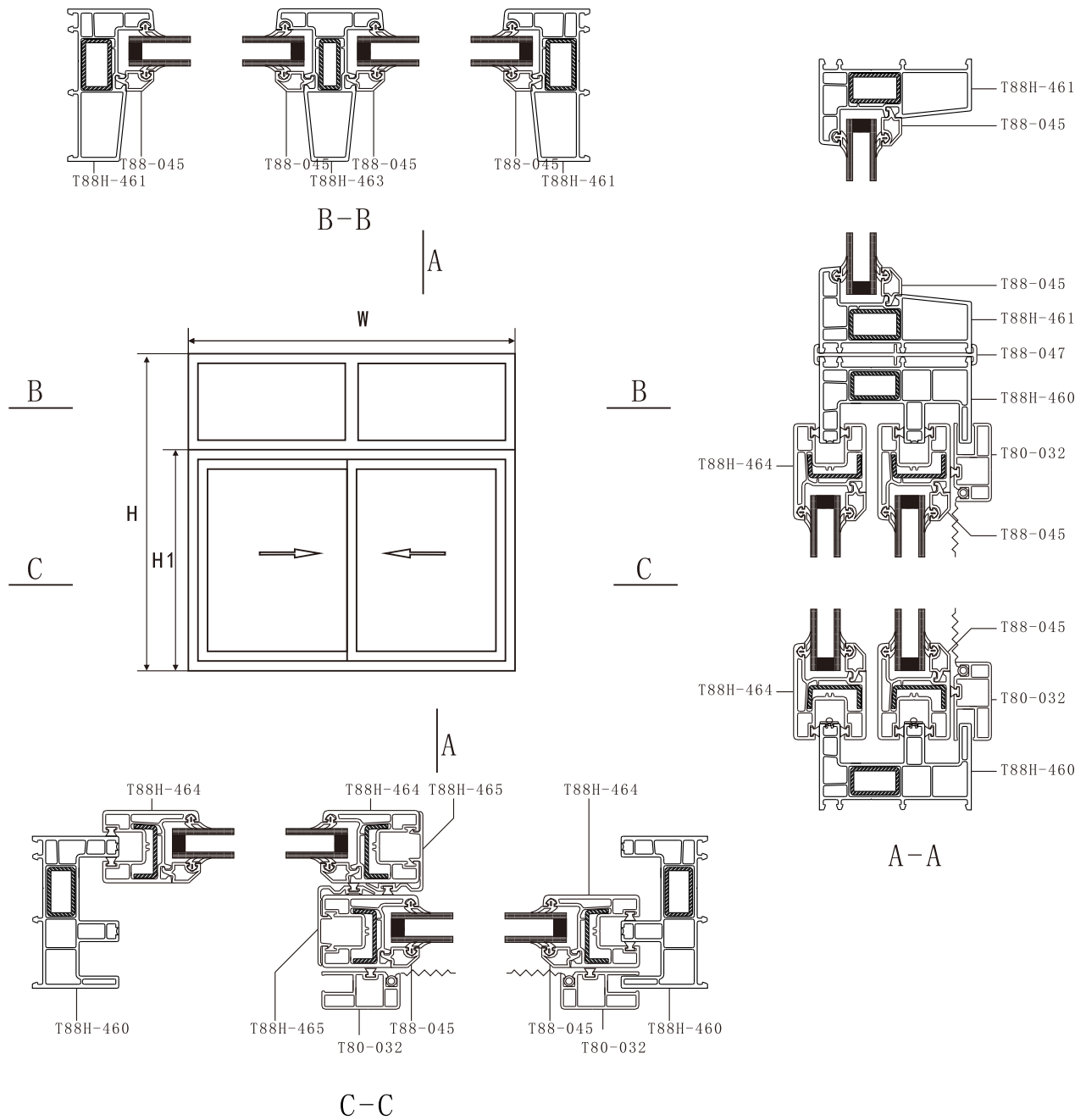


B-B

Material cutting list	
T60-431	W+6
T60-431	H+6
T60-410	W/2-20+6
T60-410	H-104+6

We reserve the right for technical improvement

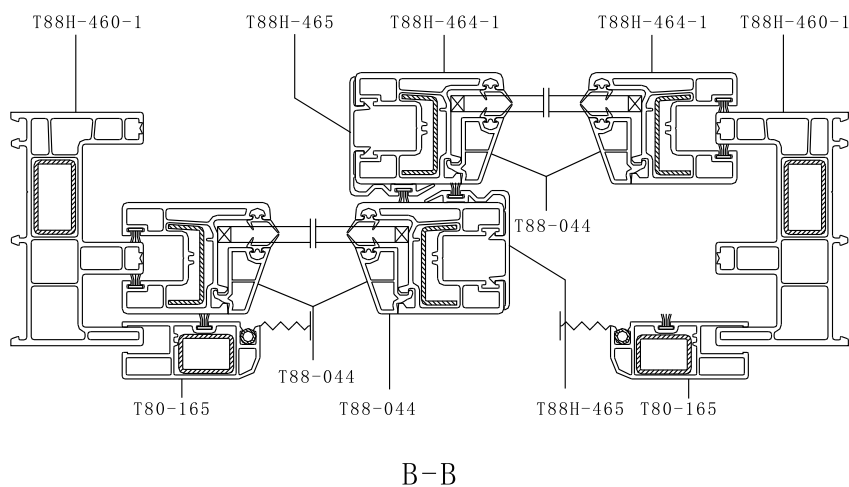
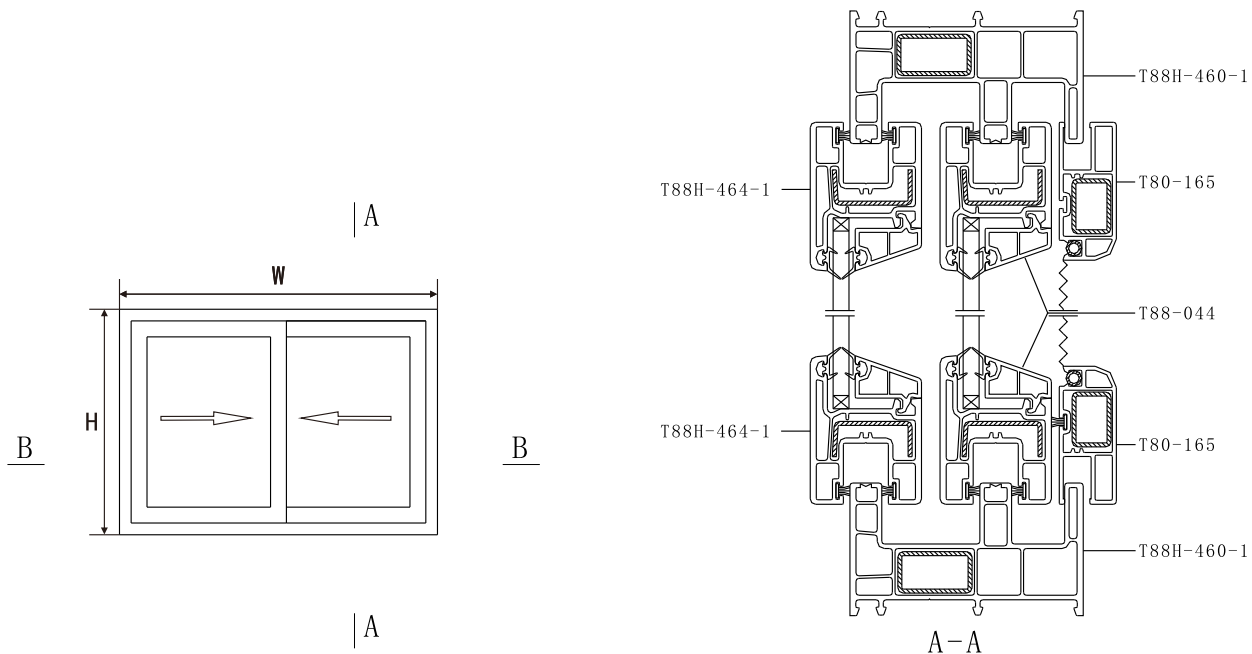
# 88 SLIDING WINDOW



We reserve the right for technical improvement

Material cutting list	
T88H-461	W+6
T88H-461	H-H1-2+6
T88H-463	H-H1-38-2+6
T88H-460	W+6
T88H-460	H1+6
T88H-464	W/2-15+6
T88H-464	H1-84+6
T88-047	W

# 88SLIDING WINDOW

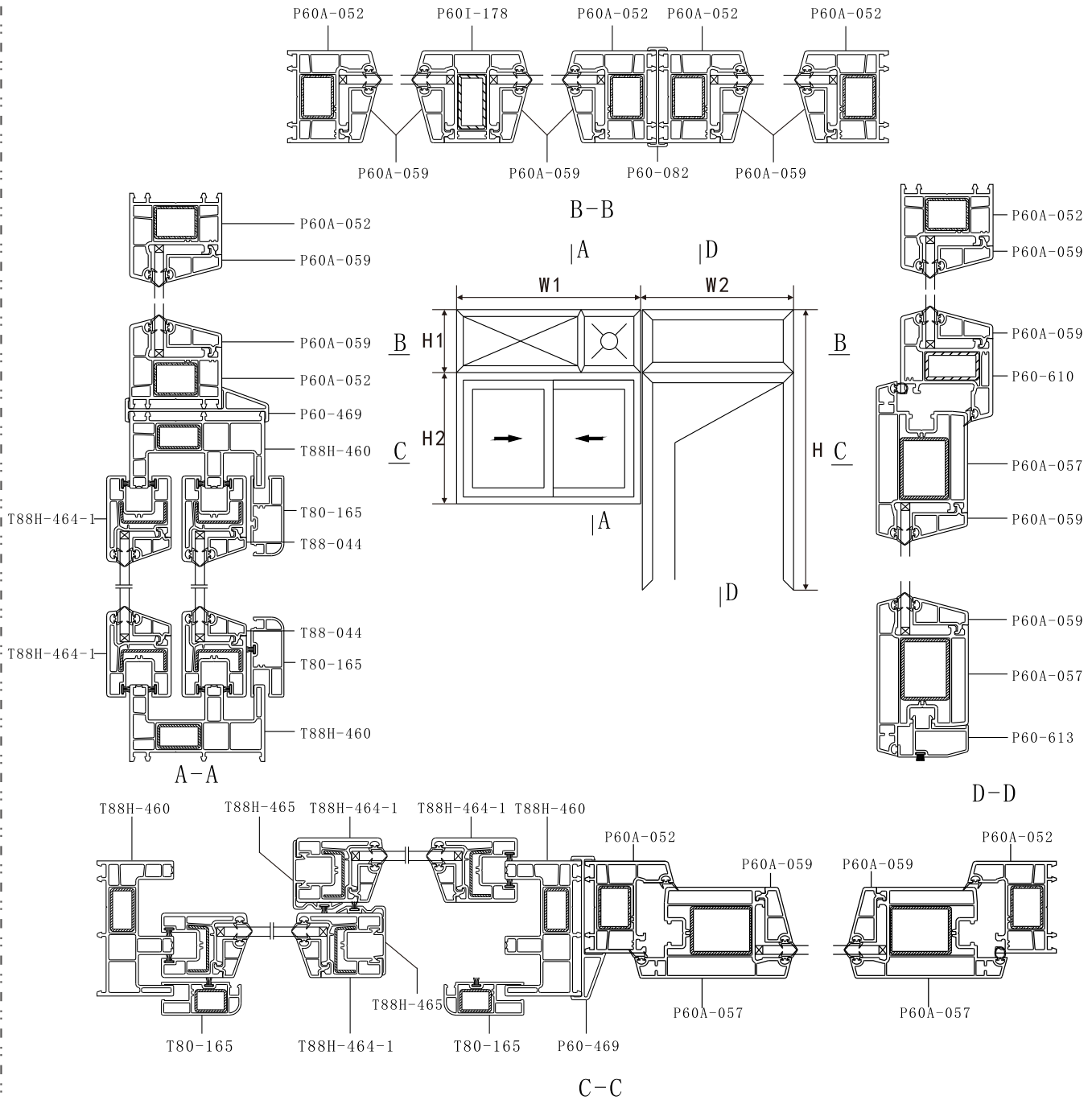


Material cutting list	
T88H-460-1	W+6
T88H-460-1	H+6
T88H-464-1	W/2-15+6
T88H-464-1	H-84+6

We reserve the right for technical improvement



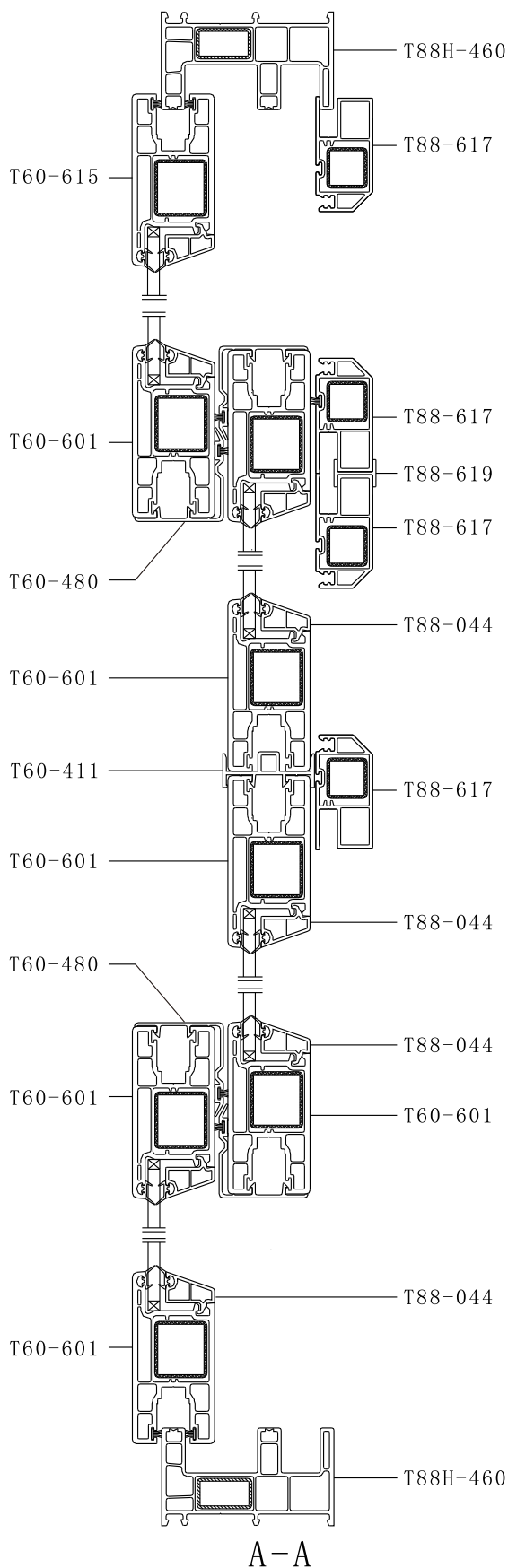
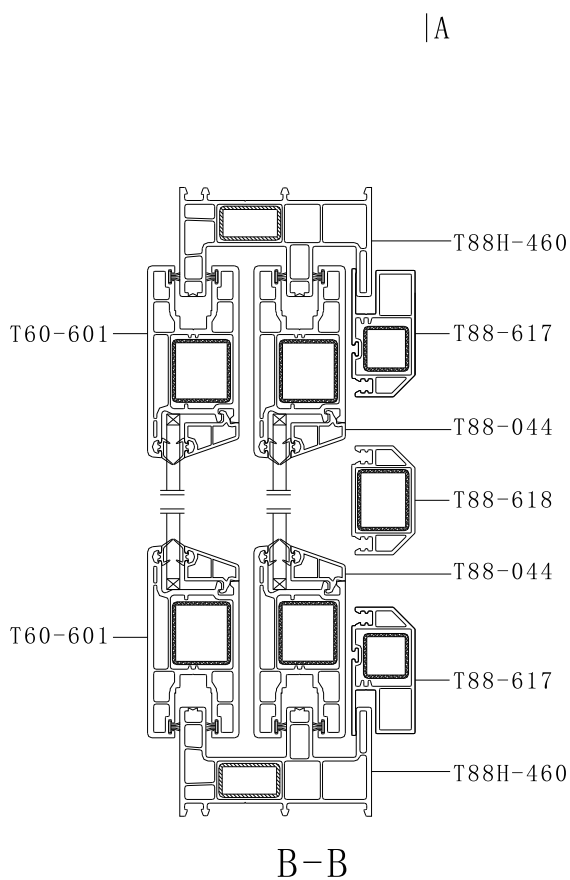
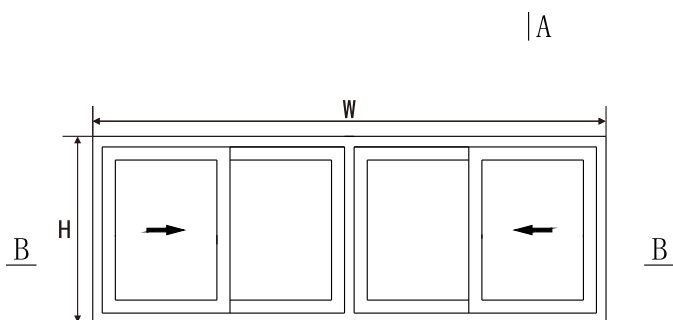
# 88SLIDING WINDOW



We reserve the right for technical improvement

Material cutting list			
P60A-052	W1+6	T88H-464-1	W1/2-15+6
P60A-052	W2-2+6	T88H-464-1	H2-84-2+6
P60A-052	H1+6	P60-610	W2-2-44+6
P60A-052	H-H1-2+3	P60A-057	W2-64-2+6
P60I-178	W1-44+6	P60A-057	H-H1-32-2+6
T88H-460	W1+6	P60-469	H1+H2
T88H-460	H2-2+6	P60-469	W1

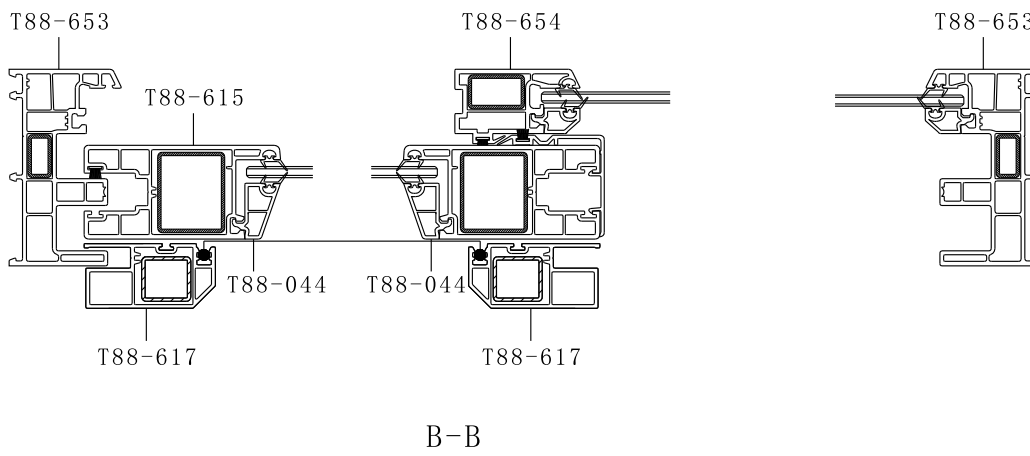
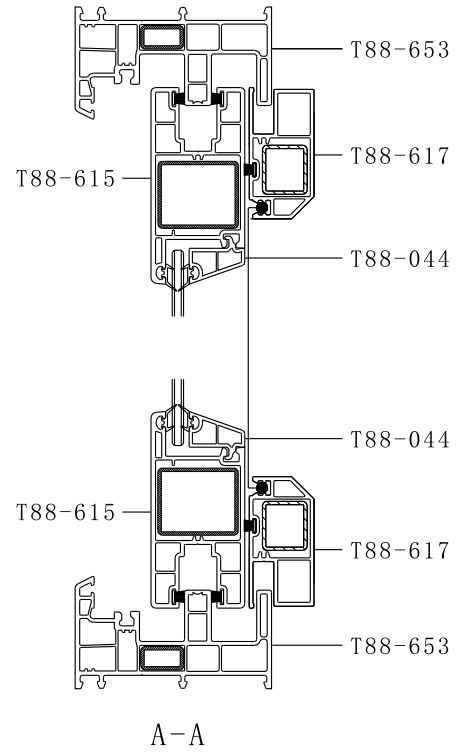
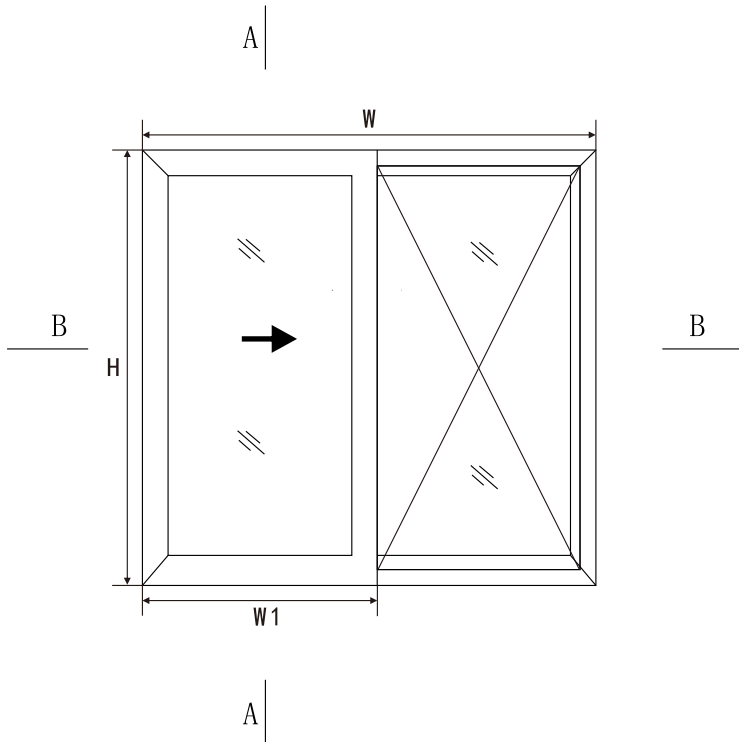
# 88DOUBLE SLIDING DOOR



Material cutting list	
T88H-464	W+6
T88H-464	H+6
T60-601	H-84+6
T60-601	W/4+1+6

We reserve the right for technical improvement

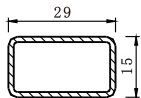
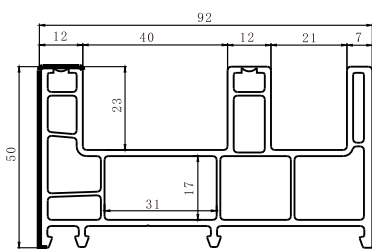
# MONORAIL SECTIONS SLIDING DOOR



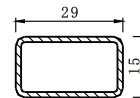
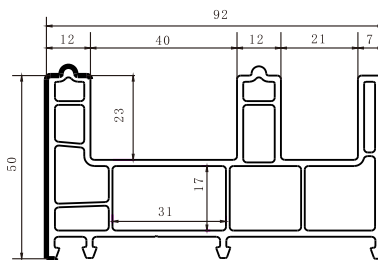
Material cutting list	
T88-653	W+6
T88-653	H+6
T88-615	H-72+6
T88-615	W1+6
T88-654	H-68

We reserve the right for technical improvement

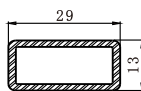
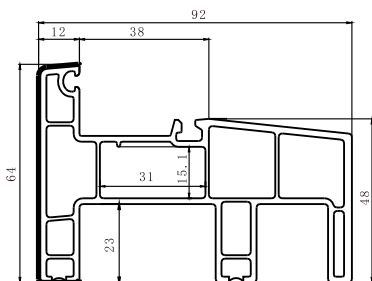
**92SLIDING SYSTEM** Thickness 2.5mm



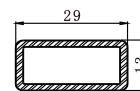
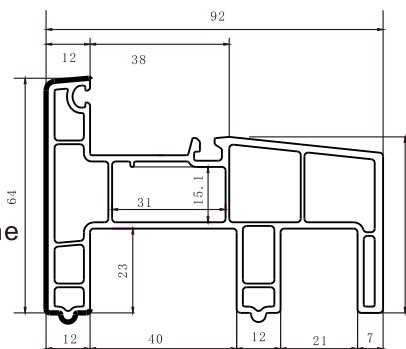
**frame**  
Code:T92A-449  
Meter weight: 1.37Kg  
Package:4 pieces/bag



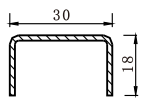
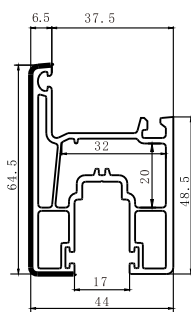
**frame (bump orbit)**  
Code:T92A-481  
Meter weight: 1.42Kg  
Package:4 pieces/bag



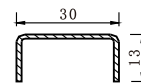
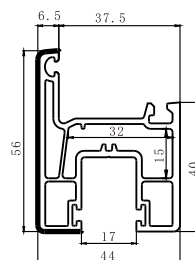
**integrated frame**  
Code:T92A-451  
Meter weight: 1.47Kg  
Rubber: 1.504Kg  
Package:4 pieces/bag



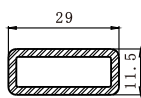
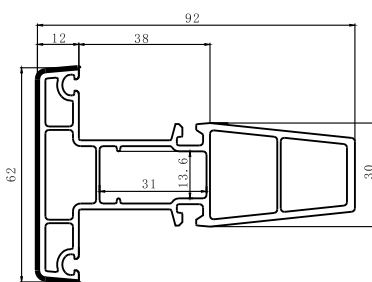
**integrated frame (bump orbit)**  
Code:T92A-482  
Meter weight: 1.52Kg  
Rubber: 1.554Kg  
Package:4 pieces/bag



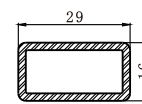
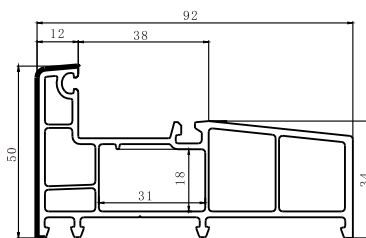
**sash**  
Code:T92A-452  
Meter weight: 1.04Kg  
Rubber: 1.074Kg  
Package:8 pieces/bag



**sash**  
Code:T92A-453  
Meter weight: 0.97Kg  
Rubber: 1.004Kg  
Package:8 pieces/bag



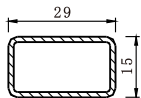
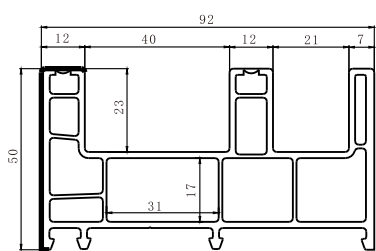
**fixed mullion**  
Code:T92A-454  
Meter weight: 1.21Kg  
Rubber: 1.187Kg  
Package:6pieces/bag



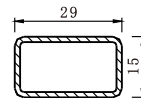
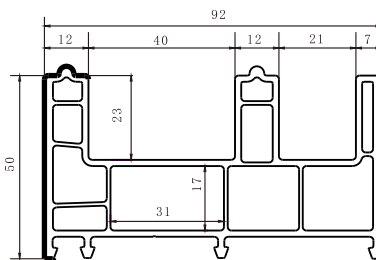
**fixed frame**  
Code:T92A-450  
Meter weight: 1.14Kg  
Rubber: 1.174Kg  
Package:6 pieces/bag

We reserve the right for technical improvement

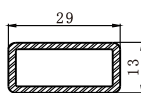
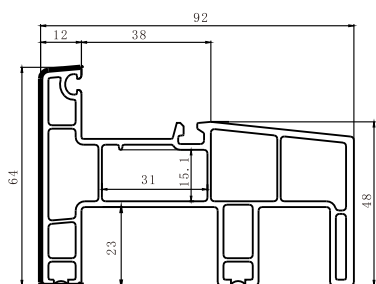
**92SLIDING SYSTEM** Thickness 2.2mm



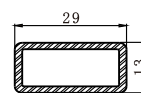
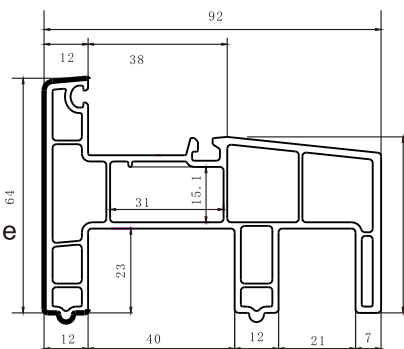
**frame**  
Code:T92A-449-1  
Meter weight: 1.3Kg  
Package:4 pieces/bag



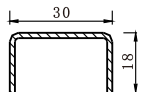
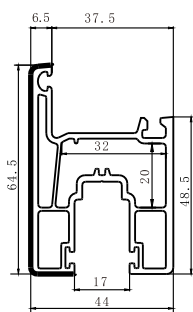
**frame (bump orbit)**  
Code:T92A-481-1  
Meter weight: 1.35Kg  
Package:4 pieces/bag



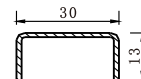
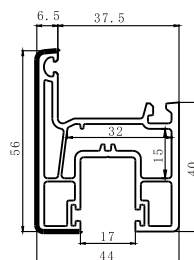
**integrated frame**  
Code:T92A-451-1  
Meter weight: 1.4Kg  
Rubber: 1.434Kg  
Package:4 pieces/bag



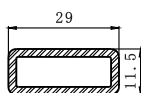
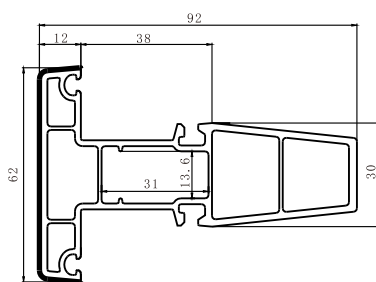
**integrated frame (bump orbit)**  
Code:T92A-482-1  
Meter weight: 1.45Kg  
Rubber: 1.484Kg  
Package:4 pieces/bag



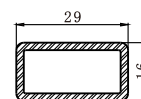
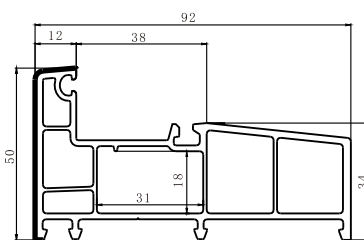
**sash**  
Code:T92A-452-1  
Meter weight: 0.99Kg  
Rubber: 1.024Kg  
Package:8 pieces/bag



**sash**  
Code:T92A-453-1  
Meter weight: 0.9Kg  
Rubber: 0.934Kg  
Package:8 pieces/bag



**Fixed mullion**  
Code:T92A-454-1  
Meter weight: 1.13Kg  
Rubber: 1.197Kg  
Package:6pieces/bag

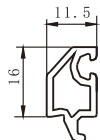


**Fixed frame**  
Code:T92A-450-1  
Meter weight: 1.08Kg  
Rubber: 1.114Kg  
Package:6 pieces/bag

We reserve the right for technical improvement

**92 SLIDING SYSTEMGB**

20mm glass



**GB11mm**  
Code:T88-045  
Meter weight:0.16Kg  
Rubber: 0.194Kg  
Package:40 pieces/bag

22mm glass



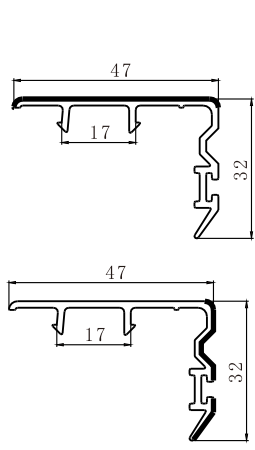
**GB9mm**  
Code:T88-124  
Meter weight:0.16Kg  
Rubber: 0.194Kg  
Package:40 pieces/bag

26mm glass

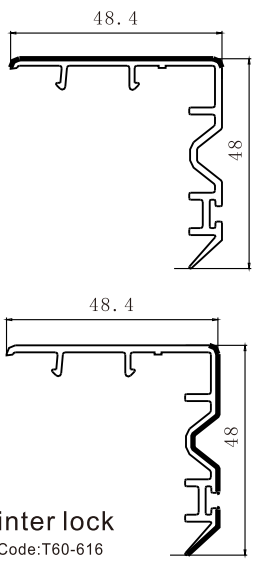


**GB7mm**  
Code:T88-430  
Meter weight:0.13Kg  
Rubber: 0.164Kg  
Package:50 pieces/bag

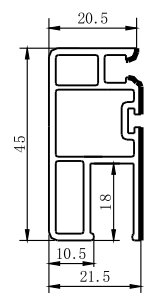
**92 SLIDING SYSTEM AUXILIARY PROFILES**



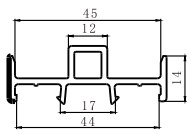
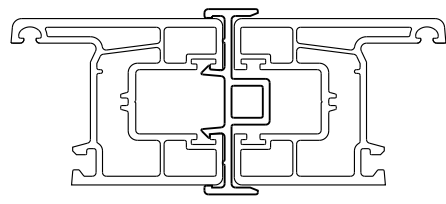
**inter lock**  
Code:T92-458  
Meter weight: 0.29Kg  
Package:20 pieces/bag



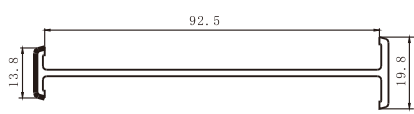
**inter lock**  
Code:T60-616  
Meter weight: 0.38Kg  
Package:20 pieces/bag



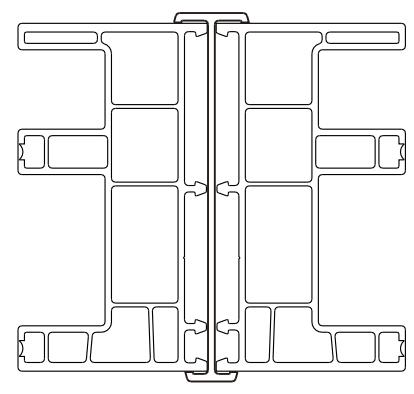
**screen sash**  
Code:T80-032  
Meter weight: 0.4Kg  
Package:12 pieces/bag



**coupling**  
Code:T92-459  
Meter weight: 0.37Kg  
Package:10 pieces/bag

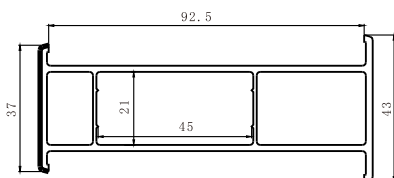


**coupling**  
Code:T92-456  
Meter weight: 0.42Kg  
Package:20 pieces/bag



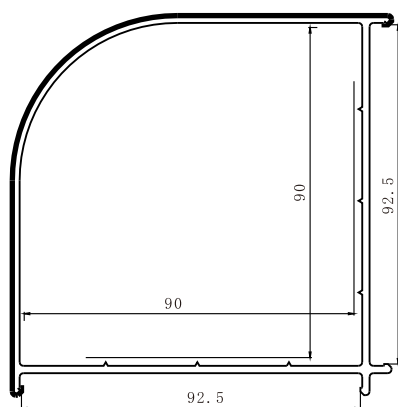
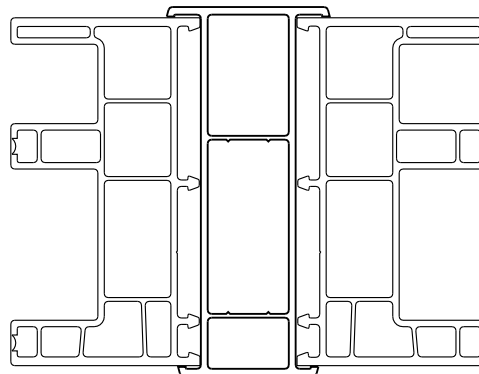
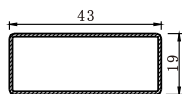
We reserve the right for technical improvement

# 92 SLIDING SYSTEM AUXILIARY PROFILES



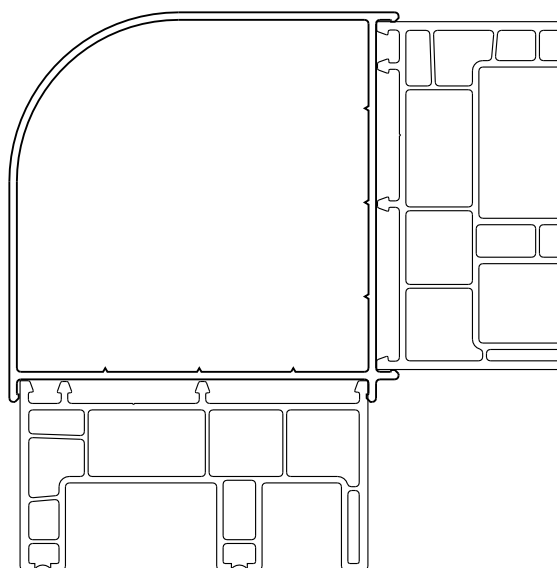
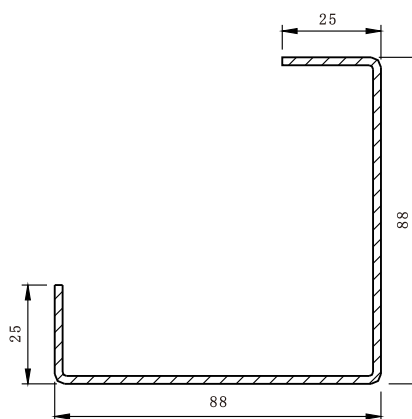
**coupling**

Code: T92-457  
Meter weight: 0.9Kg  
Package: 6 pieces/bag



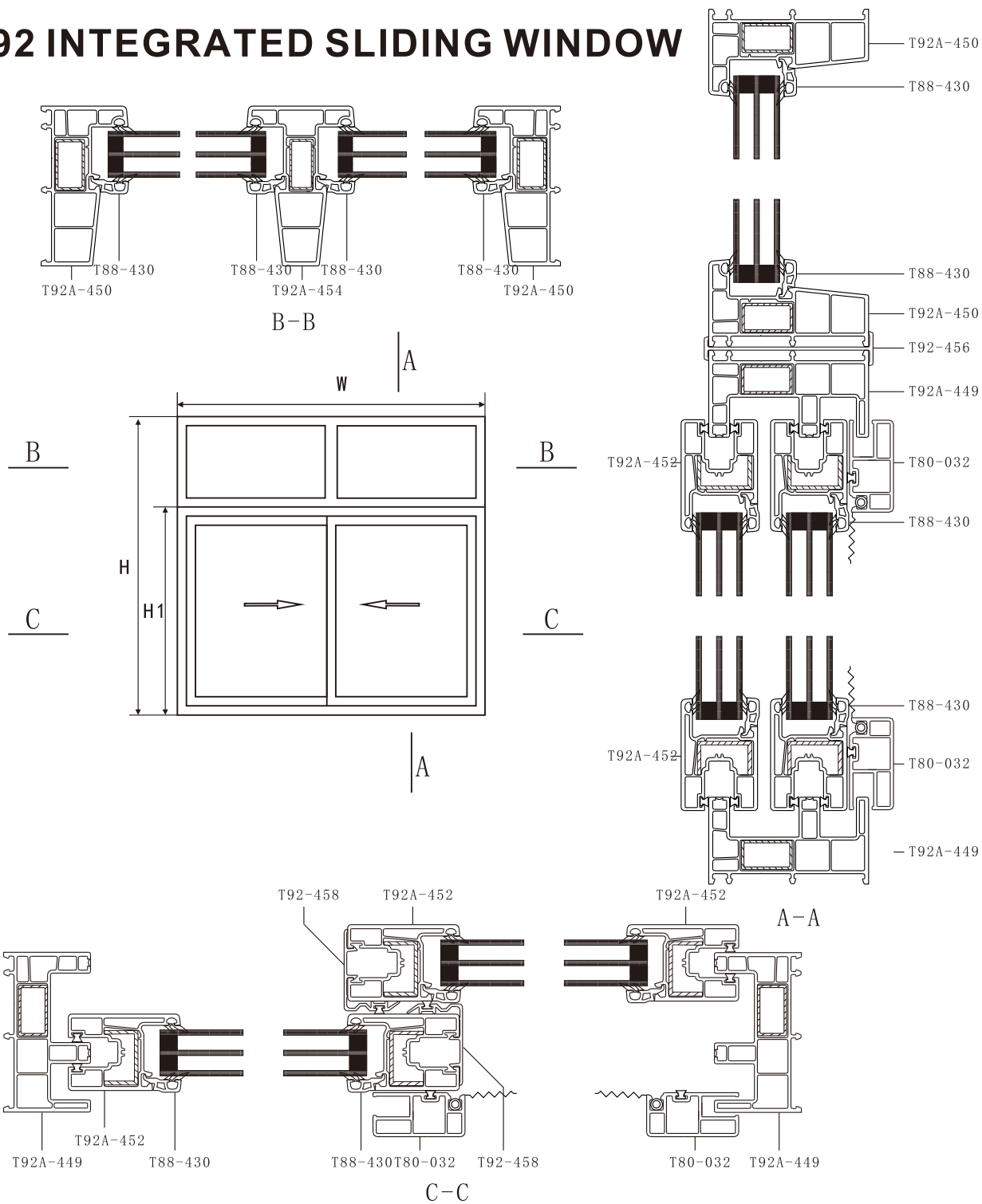
**coupling**

Code: T92-455  
Meter weight: 1.3Kg  
Package: 4 pieces/bag



We reserve the right for technical improvement

# 92 INTEGRATED SLIDING WINDOW

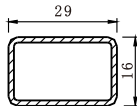
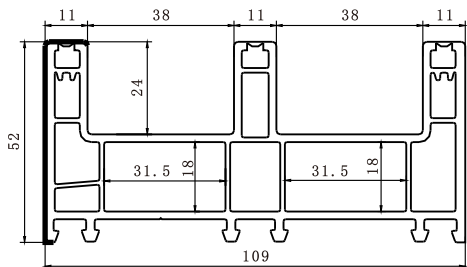


We reserve the right for technical improvement

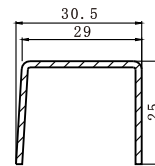
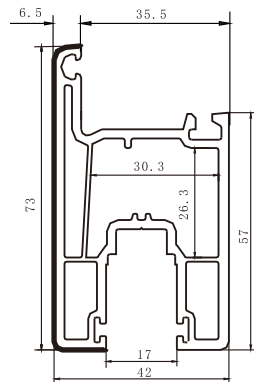
Material cutting list	
T92A-450	W+6
T92A-450	H-H1-2+6
T92A-454	H-H1-38-2+6
T92A-449	W+6
T92A-449	H1+6
T92A-452	W/2-15+6
T92A-452	H1-84+6
T92-456	W



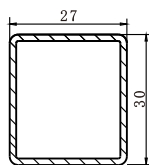
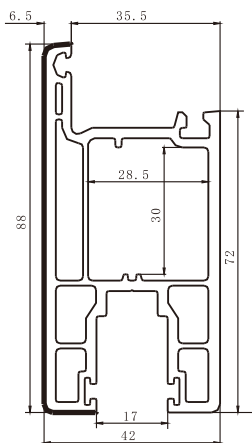
**109 SLIDING SYSTEM** Thickness 2.5mm



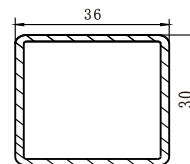
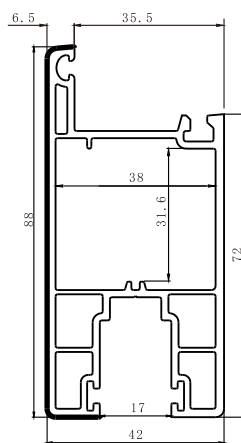
**frame**  
Code:T109-600  
Meter weight: 1.72Kg  
Package:4pieces/bag



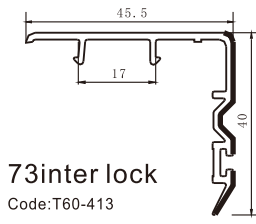
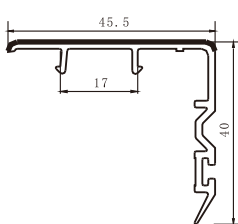
**sash**  
Code:T60-412  
Meter weight: 1.12Kg  
Rubber: 1.154Kg  
Package:4pieces/bag



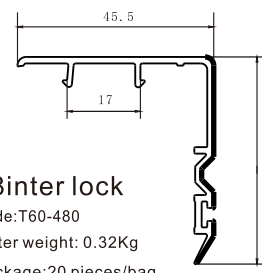
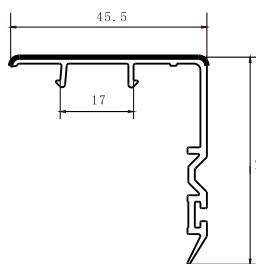
**sash**  
Code:T60-601  
Meter weight: 1.4Kg  
Rubber: 1.434Kg  
Package:4pieces/bag



**sash(2.0mm)**  
Code:T60-615  
Meter weight: 1.16Kg  
Rubber: 1.194Kg  
Package:4pieces/bag



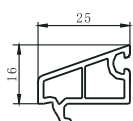
**73inter lock**  
Code:T60-413  
Meter weight: 0.29Kg  
Package:20 pieces/bag



**88inter lock**  
Code:T60-480  
Meter weight: 0.32Kg  
Package:20 pieces/bag

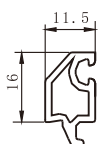
**109 SLIDING SYSTEMGB**

4-6mm glass



**GB25mm**  
Code:T88-044  
Meter weight:0.21Kg  
Rubber: 0.244Kg  
Package:30 pieces/bag

17-19mm glass



**GB11mm**  
Code:T88-045  
Meter weight:0.16Kg  
Rubber: 0.194Kg  
Package:40 pieces/bag

19-21mm glass



**GB9mm**  
Code:T88-124  
Meter weight:0.16Kg  
Rubber: 0.194Kg  
Package:40 pieces/bag

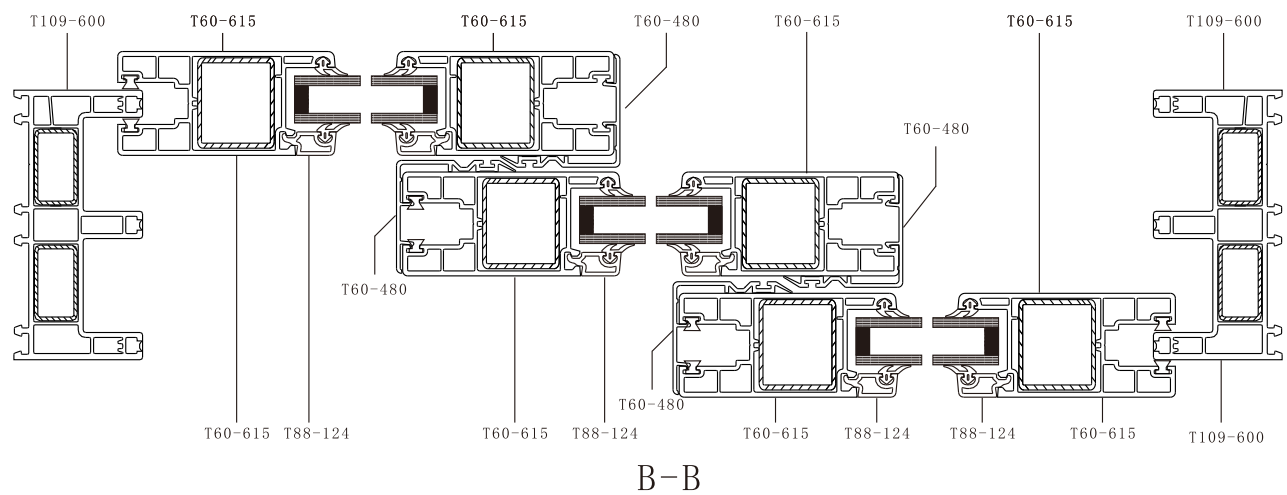
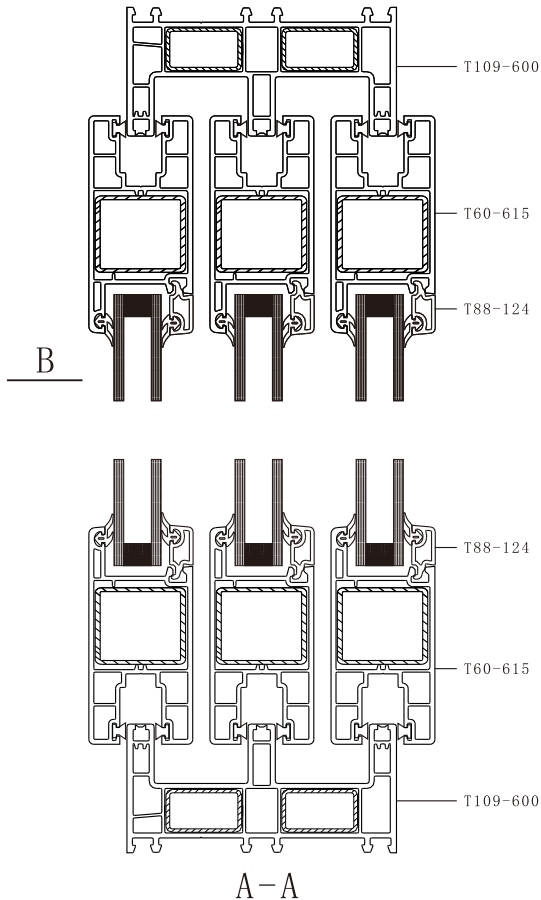
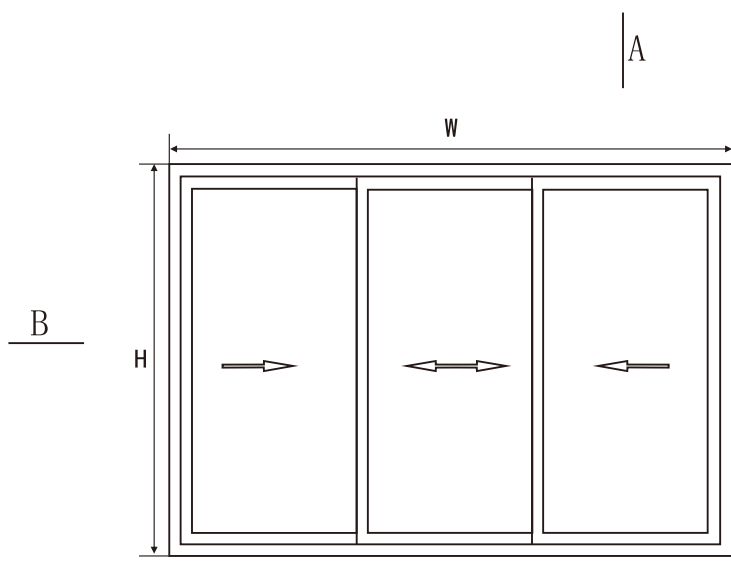
23-25mm glass



**GB7mm**  
Code:T88-430  
Meter weight:0.13Kg  
Rubber: 0.164Kg  
Package:50 pieces/bag

We reserve the right for technical improvement

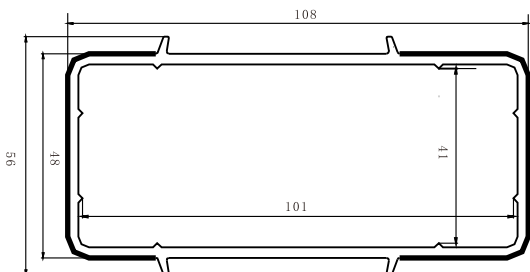
# 109SLIDING WINDOW



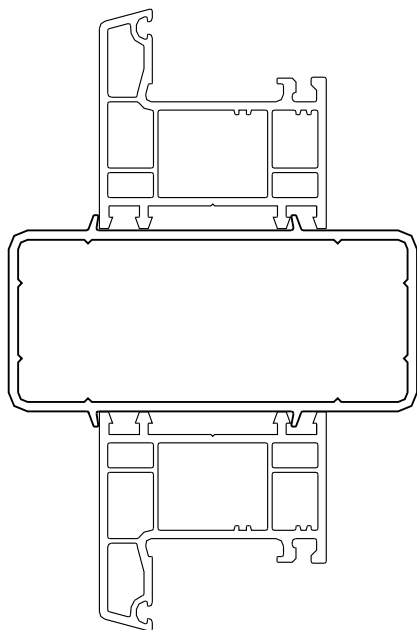
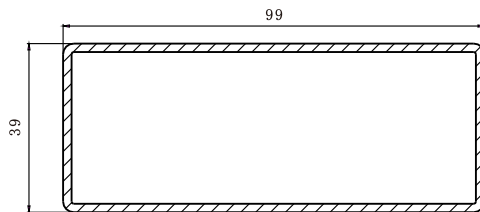
Material cutting list	
T109-600	W+6
T109-600	H+6
T60-615	H-84+6
T60-615	W/3+1+6

We reserve the right for technical improvement

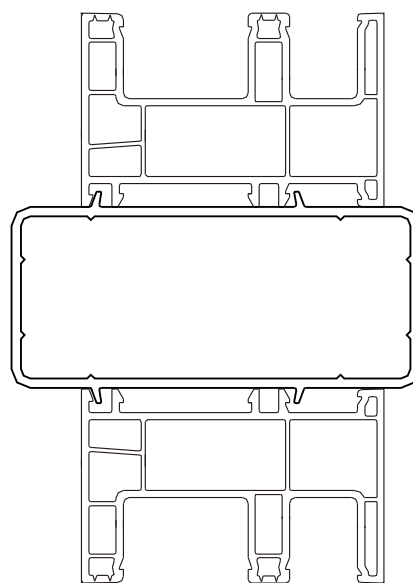
**JOINTED CONVERSION MATERIALS OF ALL SERIES**



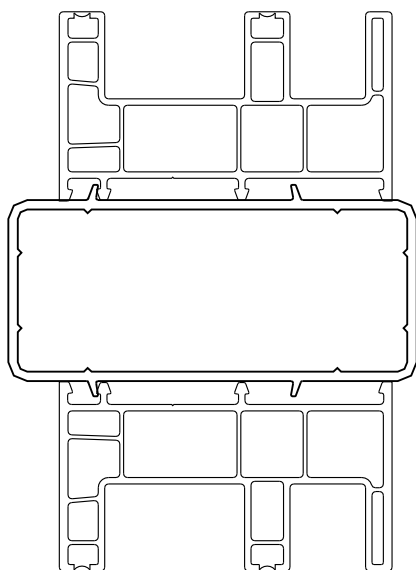
**coupling**  
Code:T88-428  
Meter weight: 1.24Kg  
Package:4 pieces/bag



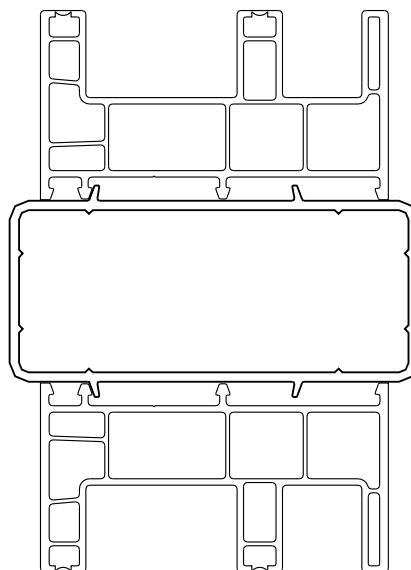
**60 casement series**



**80 sliding series**



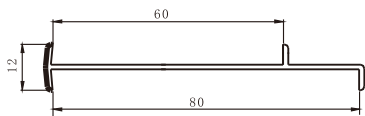
**88 sliding series**



**92 sliding series**

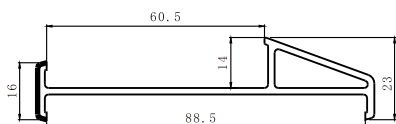
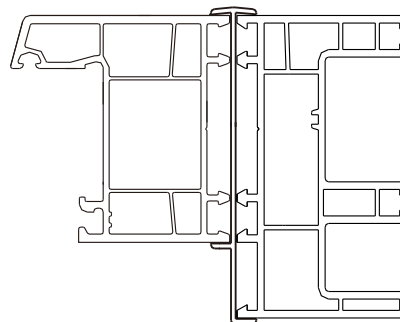
We reserve the right for technical improvement

**JOINTED CONVERSION MATERIALS OF ALL SERIES**



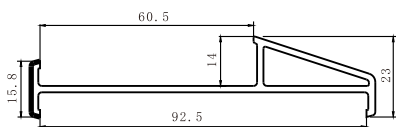
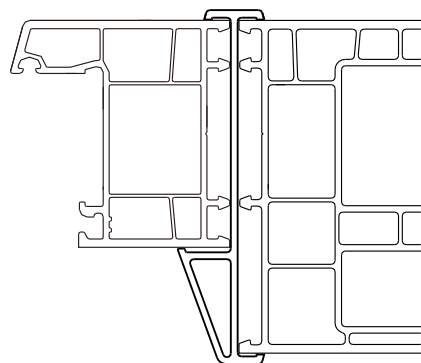
**60-80 coupling**

Code:P60-149  
 Meter weight: 0.25Kg  
 Package:20 pieces/bag



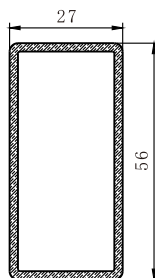
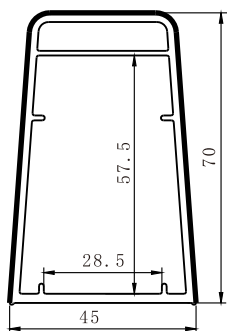
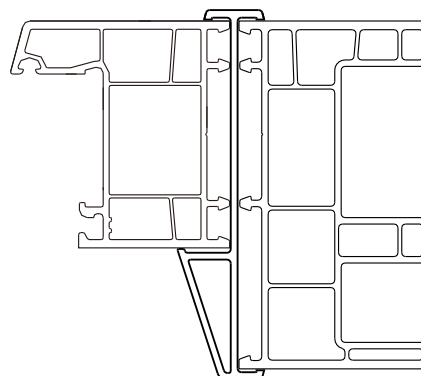
**60-88 coupling**

Code:P60-469  
 Meter weight: 0.5Kg  
 Package:20 pieces/bag



**60-92 coupling**

Code:P60-468  
 Meter weight: 0.54Kg  
 Package:20 pieces/bag

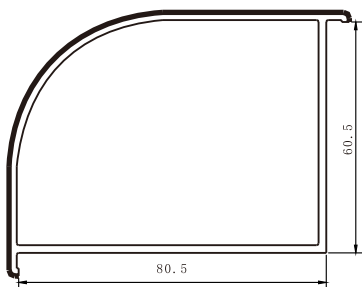


**hurricane bar**

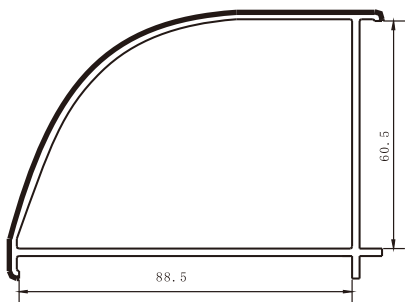
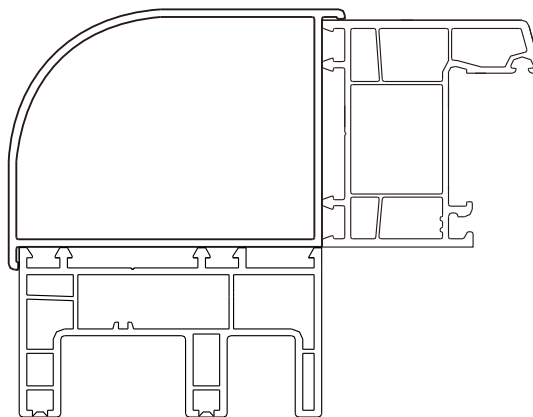
Code:T109-621  
 Meter weight: 0.85Kg  
 Package:6 pieces/bag

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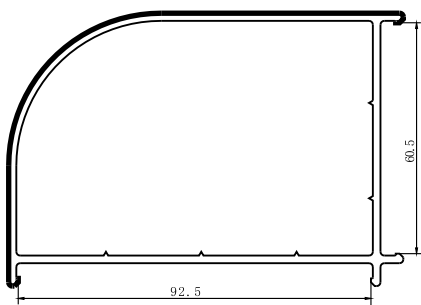
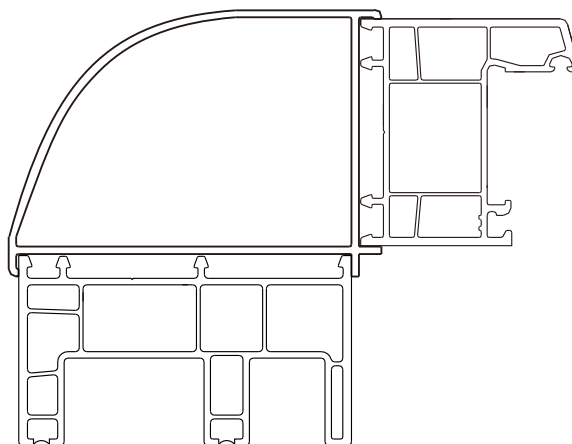
**JOINTED CONVERSION MATERIALS OF ALL SERIES**



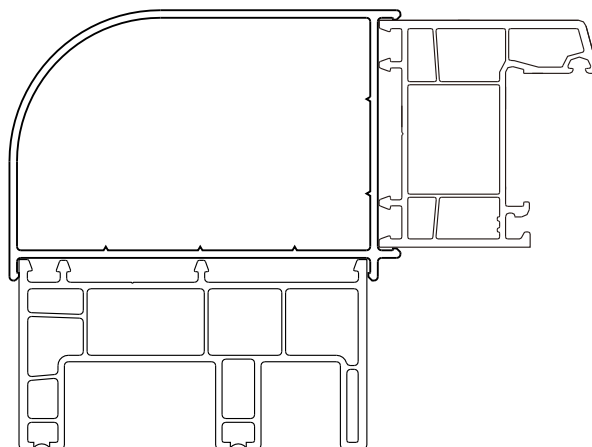
**60-80 coupling**  
Code:P60-133  
Meter weight: 0.84Kg  
Package:4 pieces/bag



**60-88coupling**  
Code:T88B-219  
Meter weight: 0.87Kg  
Package:4 pieces/bag



**60-92 coupling**  
Code:T92A-467  
Meter weight: 1.09Kg  
Package:4 pieces/bag



We reserve the right for technical improvement

## Indian wind pressure calculation

China 《Building structure load specification》 GB5009 Basic wind speed definition: 10 meters above the ground, recording time is 10 minutes, the maximum wind speed is in 50 years. India IS:875-19877 PART 3 specification of the definition of basic wind speed: The ground exposed category is an open space of Class II, 10 meters above the ground, recording a time interval of 3 seconds, and a 50-year gust wind speed.

It can be seen that the definition of the basic wind speed in the two countries is the same from the height of the ground and the return period. It is only different in the recording time. Therefore, the mutual conversion of the basic wind speeds between the two countries is the wind speed is converted into the wind speed at the same time interval. According to the Indian specification IS802:1995, the recording time interval is converted from 3 seconds to 10 minutes of basic wind speed, divided by a factor of 1.375.

Basic wind pressure calculation:

Basic wind speed  $v_0 = 45/1.375 \text{ m/s} = 32.7 \text{ m/s}$

According to Bernoulli formula  $W_0 = 1/2 \rho v_0^2$  Determine basic wind speed ①

$\rho$  Air density

$\rho = \gamma / g$ ,  $\gamma$  is Air gravity density  $g$  is Gravity acceleration ;②

Bring ② into ①

Air density according to uniform standards  $\rho = 1.25 \text{ kg/m}^3$ ,

Therefore,  $W_0 = v_0^2 / 1600 \text{ (KN/m}^2 \text{)}$

$$W_0 = 32.7^2 / 1600 \text{ KN/m}^2 \\ = 0.668 \text{ KN/m}^2$$

According to the new edition 《Building structure load specification》 (GB50009, implemented on October 1, 2012), the calculation of wind loads is carried out.

First, a concept is clarified: the basic wind pressure value is not the pressure of the wind on the surface of the building. The pressure of the wind on the surface of the building (expressed as wind load) is related to the height of the building, the shape of the body, the surface position, etc., and is related to the height of the wind. The wind load standard value  $W_k$  (unit  $\text{kN/m}^2$ ) per unit area perpendicular to the surface of the building can be calculated as follows:

According to 《Building structure load specification》 (GB50009) define:

$W_k = \beta Z * \mu S * \mu Z * W_0$  Load bearing structure

$W_k = \beta g Z * \mu S * \mu Z * W_0$  Envelope structure (As door and window, it belongs to the building envelope structure)

$\mu S$  -----Wind load body shape coefficient, which is related to the position and direction of the door and window;

$W_0$  -----Basic wind pressure ( $\text{KN/m}^2$ ), it can be checked the basic wind pressure distribution map in the Code for Loads of Building Structures. It gives the maximum basic wind pressure in 10 years, 50 years and 100 years in all regions of the country.

$\beta Z$  -----The wind vibration coefficient at the  $Z$  height,  $\beta g Z$  is the gust coefficient at the  $Z$  height, and GB50009 can be checked.

Such as :

The Indian region is about 100 meters high and is in the rough terrain of the city's Class A (seaside); the windward side and the edge of the building; it is required to withstand the strong winds of 50 years. Then check GB50009 to:

	Class A ground roughness (100 meters)
$W_0$ Basic wind pressure ( $\text{KN/m}^2$ )	0.668
Wind pressure height variation coefficient $\mu Z$	2.23
Wind load shape factor $\mu S$	1.00
Height gust factor $\beta g Z$	1.46
Wind load standard value $W_k$ ( $\text{kN/m}^2$ )	2.175

# Product technical manual of 2018

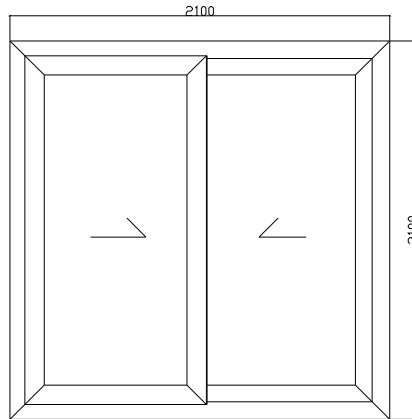
That is, if the ground roughness is Class A, the designed wind-resistant steel doors and windows should have a wind-resistant capacity of more than 2.175 kN/m<sup>2</sup> at a height of 100 m.

The window design and force analysis are as follows:

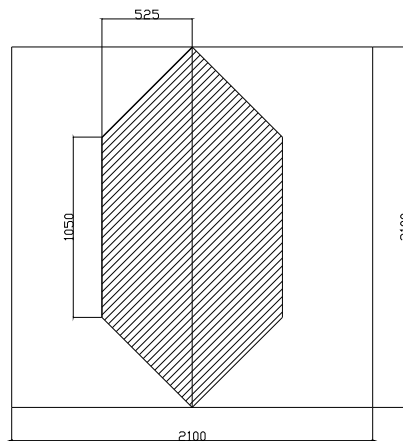
First, the force analysis chart:

It adopts T88H type material, the glass is 5mm single glass, and the steel lining thickness is 2.0mm.

It is analyzed that the wind pressure load of the window type is mainly concentrated on the sliding door sash part



Force analysis: door sash part.



## 1. Door sash:

Calculation of the area under load:

$$A = (1.05 + 2.1) \times 0.525 = 1.654 \text{ m}^2$$

Stiffness calculation, which is the algebraic sum of the stiffness of the profile and the stiffness of the corresponding lining steel.

$$(E \cdot I)_{\text{total}} = (E \cdot I)_{\text{PVC}} + (E \cdot I)_{\text{reinforcement}}$$

UPVC PROFILE part                      Reinforcement part

$$E_{\text{PVC}} = 2.5 \times 10^9 \text{ Pa} \quad E_{\text{steel}} = 2.1 \times 10^{11} \text{ Pa}$$

$$I_{\text{IT-MS(A)}} = 57.38 \times 10^{-8} \text{ m}^4 \quad I_{\text{IT-MS(A)}} = 2.25 \times 10^{-8} \text{ m}^4 \text{ (2.0mm thickness)}$$

$$\text{Total stiffness } (E \cdot I) = 2 \times 2.5 \times 10^9 \times 57.38 \times 10^{-8} + 2 \times 2.1 \times 10^{11} \times 2.25 \times 10^{-8} = 123193 \text{ N} \cdot \text{m}^2$$

Determination of span L, L=2.1m

The determination of  $\lambda$ , from the wind pressure load distribution map,  $K_L = 0.46875 \text{ m}$ , therefore,  $x = K_L / L = 0.525 / 2.1 = 0.25$

$\lambda = 0.25 = 644$ , deflection calculation:

$$F_{\text{max}} = P \cdot A \cdot L^3 / \lambda \cdot (E \cdot I)_{\text{total}} < L / 120,$$

Calculated according to this formula:  $P < 900 \text{ N/m}^2 = 0.900 \text{ KN/m}^2$

## Product technical manual of 2018

When the window type adopts T88H series, the maximum wind pressure that can be withstood is 1.506KN/m<sup>2</sup>, which is less than the wind pressure that must be achieved in the local doors and windows.

Third, the use of T88H series, glass is 5mm single glass, reinforcement thickness 6.0mm.

1. Door sash:

1. Calculation of the area under load:

$$A = (1.05 + 2.1) * 0.525 = 1.654 \text{m}^2$$

2. Stiffness calculation, which is the algebraic sum of the stiffness of the profile and the stiffness of the corresponding reinforcement

$$(E \cdot I)_{\text{total}} = (E \cdot I)_{\text{PVC}} + (E \cdot I)_{\text{reinforcement}}$$

UPVC PROFILE part                      Reinforcement part

$$E_{\text{PVC}} = 2.5 * 10^9 \text{Pa}                      E_{\text{steel}} = 2.1 * 10^{11} \text{Pa}$$

$$I_{\text{T-MS(A)}} = 57.38 * 10^{-8} \text{m}^4                      I_{\text{T-MS(A)}} = 4.67 * 10^{-8} \text{m}^4 \text{ (4mm thickness)}$$

$$(1) \text{ Total stiffness } (E \cdot I) = 2 * 2.5 * 10^9 * 57.38 * 10^{-8} + 2 * 2.1 * 10^{11} * 4.67 * 10^{-8} = 22483 \text{N} * \text{m}^2$$

(2) Determination of span L, L=2.1m

3, The determination of  $\lambda x$ , from the wind pressure load distribution map, KL=0.46875m, therefore,

$$x = KL/L = 0.525/2.1 = 0.25$$

$$\lambda * 0.25 = 64$$

4, deflection calculation:

$$F_{\text{max}} = P * A * L^3 / \lambda^4 * (E \cdot I)_{\text{total}} < L/120,$$

$$\text{Calculated according to this formula: } P < 1644 \text{N/m}^2 = 1.644 \text{KN/m}^2$$

When the window type adopts T88H series, the steel lining thickness is 6.0mm, and the maximum wind pressure that can be withstood is 1.644KN/m<sup>2</sup>, which is less than the wind pressure that must be achieved in the local doors and windows.

Fourth, it adopts T88H type series, the glass is 5mm single glass, and the steel lining thickness is 2.0mm.

The reinforcement is used on the door sash, and the thickness of the reinforcement is 2.0mm

1. Door sash:

1. Calculation of the area under load:

$$A = (1.05 + 2.1) * 0.525 = 1.654 \text{m}^2$$

2. Stiffness calculation, which is the algebraic sum of the stiffness of the profile and the stiffness of the corresponding reinforcement

$$(E \cdot I)_{\text{total}} = (E \cdot I)_{\text{PVC}} + (E \cdot I)_{\text{reinforcement}}$$

UPVC PROFILE part                      Reinforcement part

$$E_{\text{PVC}} = 2.5 * 10^9 \text{Pa}                      E_{\text{steel}} = 2.1 * 10^{11} \text{Pa}$$

$$I_{\text{T-MS(A)}} = 57.38 * 10^{-8} \text{m}^4                      I_{\text{T-MS(A)}} = 2.25 * 10^{-8} \text{m}^4 \text{ (2.0mm thickness)}$$

$$I_{\text{p60-JQT}} = 8.47 * 10^{-8} \text{m}^4                      I_{\text{p60-JQT}} = 4.89 * 10^{-8} \text{m}^4 \text{ (2.0mm thickness)}$$

$$(1) \text{ Total stiffness } (E \cdot I) = 2 * 2.5 * 10^9 * (57.38 * 10^{-8} + 8.47 * 10^{-8}) + 2 * 2.1 * 10^{11} * (2.25 + 4.89) * 10^{-8} = 33280 \text{N} * \text{m}^2$$

(2) Determination of span L, L=2.1m

3, The determination of  $\lambda x$ , from the wind pressure load distribution map, KL=0.46875m, therefore,

$$x = KL/L = 0.525/2.1 = 0.25$$

$$\lambda * 0.25 = 64$$

4, deflection calculation:

$$F_{\text{max}} = P * A * L^3 / \lambda^4 * (E \cdot I)_{\text{total}} < L/120,$$

$$\text{Calculated according to this formula: } P < 2433 \text{N/m}^2 = 2.433 \text{KN/m}^2$$

When the window type adopts T88H series, the glass is 5mm single glass, and the reinforcement thickness is 2.0mm. A reinforcing body is used on the door sash, and the thickness is 2.0mm. The maximum wind pressure that can be withstood is 2.433KN/m<sup>2</sup>, which is greater than the wind pressure that must be achieved in the local doors and windows (the ground roughness is Class A, the designed wind-resistant steel doors and windows at a height of 100 meters should be greater than 2.175kN/m<sup>2</sup>).

(The above design and calculation are for reference only!)





*We are an AAA enterprise in terms of quality, service and reputation*  
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*National Customer Assurance Brand*

Tianjin Tongli Plastic Product Co., Ltd

Address: No.8 Quanhui Road, Wuqing Development Zone, Tianjin

Tel: 022-26912845

Fax: 022-26910463