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Aluminium Windows and Doors

铝合金门窗

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Foreword

This standard mainly makes reference to JIS A 4702-2000 "Doors", JIS A 4706-2000 "Window", EN 14351-1:2006 "Windows and doors, Product standard, Performance Characteristics, Windows and External Pedestrian Doorsets without Resistance to Fire and/or sMOke Leakage Characteristics", and ANSI/AAMA/NWDA 101/I.S.2-97 "Voluntary Specifications for Aluminum, Vinyl (PVC) and Wood Windows and Glass Doors".

This standard replaces GB/T 8478-2003 "Aluminium doors" and GB/T 8479-2003 "Aluminium Windows".

There have been some significant changes in this national standard over GB/T 8478-2003 and GB/T 8479-2003:

——the aforementioned two standards are combined into one standard under name of "Aluminium Windows and Doors"

——the application scope and inapplicable scope of this standard are amended;

——in Chapter 3: Terms and Definition of this standard, such terms and definition as solar shading property, major load-bearing frame member and major profiles are added.

——the title of Chapter 4 in the previous edition "Classification, Specification and Code" is changed into the "Classification, Denomination and Marking" in this standard, therein, the classification of external wall and internal wall according to their purposes is added; the classification names divided according to "Properties" is changed into "Types", and the type of solar shading doors and windows is added; the classification names divided according to "Opening form" is changed into "Variety", and such new opening forms of doors and windows as "folding hinged, hinged and sliding type, lift and sliding type, folding and push-pull type, tilt-sliding, hinged" are added; the product series is added; the "Specification model" according to dimension of openings is changed into the "Specifications" represented according to the tectonic width and height of doors and windows, the "Denomination" of products is added, and the designation method is amended;

——the contents of Chapter 5 "Materials" in the previous edition are adjusted into the Section 5.1: Materials in Chapter 5 "Requirements" of this standard, therein, Article 5.1.7 the requirements on "The stainless steel fasteners shall be adopted in the assembly and machinery connection of aluminum doors and windows. The aluminium and aluminium alloy self-plugging rivets shall be prohibited to being adopted as the fasteners for the strained connection of doors and windows." is added.

——the Section 6.1 "Appearance" in the previous edition is changed into the Section 5.2 "Appearance" of this standard, therein, the requirements on the appearance of aluminium alloy profiles and glass surface of jambs and leaves are added;

——the Section 6.2 "Dimensional Variation" in the previous edition is changed into Section 5.3 "Dimensions" in this standard, therein, the dimensional requirements on the single set of door and window and the composite door and window are added.

——for the difference among width, height and opposite side dimension of the doors and windows is changed from such two columns " 2000 and >2000" into range of the three columns "<2000, 2000~<3500, and 3500"; the difference in the dimensions of diagonal

lines of door and window frames is cancelled; the two items such as the difference between the width and its opposite side dimension and the difference between height and its opposite side dimension of the doors and windows are combined and are adjusted appropriately; the title "difference of height at one plane" is changed into the "Difference in height of the joint seam of frames and member bars", and is respectively specified to be 0.3 and 0.5 according to such two kinds of permissible variations in profiles of same cross section and profiles of different cross sections; the title "assemblage gap" is renamed to be "Assemblage gap of frame and leaf member bar", and the permissible variation is re-specified from 0.2 to 0.3;

——Table 5 and Table 6 related to glass and slot cooperation in Article 6.3 of the former standard have been abolished. They have been replaced by "Inlaid structural dimension of jamb and leaf glass shall be in accordance with the minimum installation dimension of glass specified in JGJ 113" specified in Article 5.3.2.2 in this standard;

——Contents of "hidden frame supported window glass assembling requirements" in Item 6.3 c) of GB/T 8479-2003 have been replaced by "Bonding and fixing dimensions of the glass structure of hidden frame supported window" specified in Article 5.3.2.3 of this standard. Therein, the requirements of "Each opening window sash should be set with two aluminium alloy or stainless steel back-up strips with thickness no less than 2mm and length no less than 50mm at the lower stile for bearing the glass weight" have been increased;

——Requirements of relative surface normal deflection of major load-bearing frame members of windows and doors in the previous edition have been revised. "Supporting single-layer and laminated glass: $L/120$; support sealed insulating glass unit: $L/180$; and the maximum value shall not exceed 15mm" have been respectively modified into " $L/100$, $L/150$ and 20mm";

——In this standard, single index value R_w of the airborne sound insulating property in the previous edition has been revised to "the sum of weight noise insulation factor and traffic noise spectra correction data ($R_w + C_{tr}$) shall be taken as graded index for exterior doors and windows; the sum of weight noise insulation factor and pink noise spectra correction data ($R_w + C$) shall be taken as the graded index of internal doors and windows";

——Solar shading property of windows and doors has been increased in Article 5.6.6 of this standard, taking shading coefficient of window SC as the index and classification;

——Static torsion resistance property of hinged or pivoted doors has been increased in Article 5.6.12 of this standard;

——Table 16 "group, quantity and test sequence of property inspection specimens for windows and doors" has been increased in Article 6.7 of this standard;

——"Opening and closing force, glass and slot cooperation" in factory inspection items specified in Chapter 8 of the previous edition has been abolished, while the type inspection has been reserved;

——Requirements of sampling methods of type inspection in Article 7.3.3 have been increased in Chapter 7 Test Rules of this standard. In addition, Informative Annex B Elevation Shapes and Specifications of Typical Specimens for Type Inspection of Aluminium Windows and Doors also have been correspondingly increased;

——Contents about the product marking requirements in Chapter 8 have been revised.

Contents of product qualification certificate and instruction have been increased together with the informative Annex C Main Contents of Instructions of Aluminium Windows and Doors correspondingly;

—Annex A Standards for Common Materials has also been renewed and supplemented in this standard.

Annexes A, B and C in this standard are informative annexes.

This national standard was proposed by the Ministry of Housing and Urban-Rural Development of the People's Republic of China (MOHURD).

This national standard is under the jurisdiction of Standardization Technical Committee of Building Components and Fittings of MOHURD.

This national standard was mainly drafted by Guangdong Architectural Scientific Research Institute and China Academy of Building Research.

This national standard was drafted by Shenzhen Xinshan Curtain Wall Technology Consultation Co., Ltd., Guangdong Golden Curtain Wall Engineering Co., Ltd., China Construction Metal Structure Association, China Construction Decoration Association Curtain Wall Project Committee, Shenzhen King Façade Decoration Engineering Co., Ltd., Guangzhou Aluminium Decoration Engineering Co., Ltd., Beijing Jinyige Curtain Wall Engineering Co., Ltd., Beijing JIAYU Door, Window and Curtain Wall Joint-Stock Co., Ltd., Wuhan Teling Energy Saving Windows and Doors Co., Ltd., Building Material Test Center of China, Shanghai Architectural Science And Technology Research Institute Co., Ltd., Henan Provincial Academy of Building Research, CITIC Bohai Aluminium Curtain Wall Decoration Co., Ltd., Shenzhen Tairan Aluminium Alloy Engineering Co., Ltd, Nonfemet International (China-Canada-Japan) Aluminum Co., Ltd., Zhongshan Shengxing Limited-liability Company, alu-Win Door & Window Technology (Shanghai) Co., Ltd, Guangdong Jianmei Aluminum Profile Factory Co., Ltd., Fujian Nanping Aluminium Industrial Co., Ltd., Guangdong Asia Aluminium Factory Co., Ltd., Shenzhen South-Glass Engineering Glass Co., Ltd., Dongguan Kinlong Hardware Products Co., Ltd., Roto Frank Constructional Hardware (Beijing) Co., Ltd., Guangzhou Baiyuan Chemical Industry Co., Ltd., Hangzhou Zhijiang Silicone Co., Ltd., Technoform Bautech (Suzhou) Thermal Insulation Materials Co., Ltd.

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The issue situation of the standards replaced by this standard are

—GB/T 8478-1987, GB/T 8480-1987, GB/T 8482-1987, GB/T 8478-2003.

—GB/T 8479-1987, GB/T 8481-1987, GB/T 8479-2003.

Aluminium Windows and Doors

1 Scope

This standard specifies the terms and definitions, classification, denomination and tag of the aluminium windows and doors, requirements, test methods, test rules, product mark, qualification, instruction book, pack, transport and store for the aluminium windows and doors.

This standard is applicable to the manual opening building external wall and internal partition window and sideway door as well as the plumb lucarne.

This standard is not applicable to scuttle, non-plumb lucarne, rolling door and window, revolving door.

This standard is not applicable to special door and window such as fire door and window, escape door and window, exhaust louver, rayproof containment shell door and window.

2. Normative References

The following standards contain provisions which, through reference in this text, constitute provisions of this standard. For dated reference, subsequent amendments (including correction) to, or revisions of, any of these publications do not apply. However, parties to agreements based on this code are encouraged to investigate the possibility of applying the most recent editions of the codes indicated below. For undated references, the latest edition of the cooperative document referred to applies.

GB/T 191 Packaging--Pictorial Marking for Handling of Goods

GB/T 2680 Determination of Light Transmittance, Solar Direct Transmittance, Total Solar Energy Transmittance and Ultraviolet Transmittance for Glass in Building and Related Glazing Factors

GB/T 4956 Non-magnetic Coatings on Magnetic Substrates--Measurement of Coating Thickness--Magnetic Method

GB/T 5237 Wrought Aluminum Alloy Extruded Profiles for Architecture (All Parts)

GB/T 5823 Terminology for Building Windows and Doors

GB/T 5824 Size System of Opening for Windows and Doors in Building

GB/T 7106 Graduations and Test Methods of Air Permeability Watertightness Wind Load Resistance Performance for Building External Windows and Doors

GB/T 8484 Graduation and Test Method for Thermal Insulating Properties of Doors and Windows

GB/T 8485 Graduation and Test for Airborne Sound Insulating Properties of Windows and Doors

GB/T 14155—2008 Doorsets - Soft Heavy Body Impact Test

GB/T 9158—1988 Mechanical Test Methods for Windows
GB 9969.1 General Principles for Preparation of Instructions for Use of Industrial Products
GB 11614 Float Glass
GB/T 11976 Graduation and Test Method for Daylighting Properties of Windows
GB/T 13306 Plates
GB/T 14436 General Principles of Industrial Product Guarantee Documents
GB/T 12967.6--2008 Test Methods for Anodic Oxidation Coatings of Aluminium and Aluminium Alloys - Part 6: Determination of Color Differences and Appearance of Colored Anodic Oxide Films by Viewing Method
GB/T 15519 Chemical Conversion Coatings--Black Oxide Coating on Iron and Steel--Specification and Test Methods
GB 16776 Structural Silicon Sealants for Building
JG/T 192 Test Method for Repeated Opening and Closing Performance of Windows and Doors
JGJ 113 Technical Specifications for Application of Architectural Glass
JGJ/T 151 Calculation Specification for Thermal Performance of Windows, Doors and Glass Curtain-Walls
ISO 8275:1985 Doorsets -- Vertical load test
ISO 9381:2005 Hinged or Pivoted Doors -- Determination of the Resistance to Static Torsion

3 Terms and Definitions

The following terms and definitions determined in GB/T 5823 and GB/T 5824 are applicable to this standard:

3.1

Aluminium windows and doors

It is the generic term of the doors and windows whose frame and fan frame member structure are made of aluminium alloy architectural section.

3.2

Solar shading property

It is the solar heat obstructing property of door and window in summer. The shading property is denoted in shading coefficient (SC).

3.3

Shading coefficient of window

SC

Under the given conditions, it is the calorific power ratio of the indoor calorific power forms from the solar radiation (permeating from exterior door and window) and transparent glass with a 3mm thickness (permeating a same area under the same conditions).

Note: The given conditions indicate the test condition of glass sunlight spectra and computational condition of doorset and windowset shading coefficient.

3.4

Major load-bearing frame member

The main profile like transom , mullion and fan and the frame profile of composite door and window which bear and transfer the self- gravitation of door and window and the acting force of level wind load in the vertical plane of door and window.

3.5

Major profiles

It is the basic structure that composes the door and window frame system, fan frame member system, the unlocking fan or glass, supplemental profile, adnexal door and window frame, fan profile as well as the frame profile of composite door and window are assembled on it.

3.6

Supplemental profile

In the door and window system, it is the additional profile (such as glazing bead and tilting fillet, etc) which may transmit the force or carry out some kinds of functions, and the profile is inlaid or fixed on the main profile member.

3.7

Major load-bearing parts of profile crosssection

On the cross section of door and window profile, they are the connected stress sections, of the ventral shield, flange and those used to fix other members and installation kits, bear plumb and horizontal direction load force.

Note: The major load-bearing parts of profile crosssection are wall thicknesses of Class A and B which are stated in GB/T 5237.1.

3.8

Fittings for windows and doors

They are fittings and components which are used to assemble the door and window.

3.9

Bimetallic corrosion

It is a bimetallic corrosion which is formed in different poles (the poles are formed in different metals).

[GB/T 10123—2001, Definition 3.14]

3.10

Verification

It is an authentication that proves the stated requirements are met in the way of offering objective evidences.

[GB/T 19000—2000, Definition 3.8.4]

4 Classification, Denomination and Designation

4.1 Classification and Code

4.1.1 Purposes

The doors and windows are divided into two kinds according to their functions of outer

enclosure and inner enclosure.

a) The code of those used for external wall is W;

b) The code of those used for internal wall is N.

4.1.2 Types

See Table 1 and Table 2 respectively for the types and codes as well as the corresponding properties of the doors and windows divided according to the functions of use.

Table 1 Functional Type and Code of Doors

Property	Type	Conventional type conventional type		Sound isolation type		Heat-insulating type		Solar shading type
	Code	PT		GS		BW		ZY
		External door	Internal door	External door	Internal door	External door	Internal door	External door
Wind load resistance (P_3)								
Water tightness (P)								
Air permeability performance ($q_1; q_2$)								
Airborne sound isolating properties $R_w+C_{tr}; R_w+C$								
Heat-insulating property (K)								
Solar shading property (SC)								
Opening and closing force								
Repeated opening and closing performance								
Impact resistance property ^a								
Vertical load resistance property ^a								
Anti-static distortion property ^a								
Note 1: means the necessary property; means the selected property.								
Note 2: The spring doors are not be with the air permeability performance, water tightness, wind load resistance, sound isolation and heat-insulating properties.								
^a The Impact resistance property, Vertical load resistance property and anti-static distortion property are the necessary properties of such hinged doors and pivoted doors								

Table 2 Functional Types and Codes of Windows

Property	Type	Conventional type		Sound isolation type		Heat-insulated type		Solar shading type
	Code	PT		GS		BW		ZY
		External window	Internal window	External window	Internal window	External window	Internal window	External window
Wind load resistance (P_3)								
Water tightness (P)								

Air tightness (q_1/q_2)							
Airborne sound isolating properties R_w+C_w/R_w+C							
Heat-insulating property (K)							
Solar shading property (SC)							
Daylighting property (T_r)							
Opening and closing force							
Repeated opening and closing performance							
Note: means the necessary property; means the selected property.							

4.1.3 Variety

The varieties and codes of the doors and windows are divided according to the opening forms, and respectively shall meet those specified in Table 3 and Table 4.

Table 3 Varieties and Codes of the Opening Forms of Doors

Opening form	Hinged and pivoted type			Push-pull and sliding type			Folding type	
	(hinged flap) Hinged type	Floor spring hinged type	Hinged and hopper type	(horizontal) push-pull type	Lift and sliding type	Tilt-sliding	Folding hinged type	Folding and push-pull type
Code	P	DHP	PX	T	ST	TX	ZP	ZT

Table 4 Varieties and Codes of the Opening Forms of Windows

Opening type	Hinged and pivoted type							
Opening form	(hinged flap) hinged type	Poppethead hinged type	Hopper type	Hopper type	Center-pivoted type	Poppethead hopper type	Hinged and hopper type	Reversible type
Code	P	HZP	SX	XX	ZX	HSX	PX	LZ
Opening type	Push-pull and sliding type						Folding type	
Opening form	(horizontal) push-pull type	Lift and sliding type	Hinged and sliding type	Tilt-sliding type	Lifting type	Folding and push-pull type		
Code	T	ST	PT	TX	TL	ZT		

4.1.4 Product series

The product series is divided according to the design size of door and window frame in the openings in the depth direction—the structural size of the thickness of door and window frame (code: C2, unit: mm).

The doors and windows with the thickness of the door and window frame meeting the submodular series of 1/10 M (10mm) buildings are of the basic series; in the basic series, the

ones with values inserted in grade of 5mm is of the subsidiary series.

When the thickness of door and window frame is less than one basic series value or one subsidiary series value, the product series shall be marked according to the earlier grade of the above series. (For example, the product series is 70 series if the thickness of door and window frame is 72mm, and the product series is 65 series if the thickness is 69mm)

4.1.5 Specifications

The specifications for doors and windows shall be represented in a digit of six figures according to the design width and height of doors and windows, and this digit is composed of the numbers in the fourth, third, tenth and first positions left of the decimal point in the tectonic width (B_2) and tectonic height (A_2) of the doors and windows in turn. For example,

The B_2 A_2 and of the doors and windows respectively are 1150mm and 1450mm, then the size model is 115145.

4.2 Denomination and Designation

4.2.1 Denomination method

The doors and windows shall be denominated according to the sequence of purposes, functions, series, varieties, product short forms (the code of aluminium alloy door is LM and be code of aluminium alloy window is LC) of doors and windows.

4.2.2 Designation method

The doors and windows shall be marked according to the sequence of the short form and denomination code sequence of product—dimensional code, physical property sign and grade or index value (wind load resistance P_3 - water tightness P—air tightness q_1/q_2 —airborne sound insulating properties R_wC_{tr}/R_wC —heat-insulating property K —solar shading property SC—Daylighting property T_r) and the standard code.

4.2.3 Denomination and designation illustration

Illustration 1: Denomination—(for external wall) conventional type hinged aluminium alloy window of 50 series, the specification model of this product is 115145, the wind load resistance: Grade 5, the water tightness: Grade 3, the air tightness: Grade 7, and the designation is

Aluminium alloy window WPT50PLC-115145(P35- P3-q17) GB/T 8478-2008.

Illustration 2: Denomination—(for external wall) heat-isolating type hinged aluminium alloy door of 60 series, the specification model of this product is 226246, the wind load resistance: Grade 6, the water tightness: Grade 5, the air tightness: Grade 8, and the designation is

Aluminium alloy door: WBW65PLM-085205(P36- P5-q18) GB/T 8478-2008.

Illustration 3: Denomination—(for internal wall), the sound isolating type lift and sliding aluminium alloy door of 80 series, the specification model of this product is 175205, the sound isolating property: Grade 4, the designation is:

Aluminium alloy door: NGS80STLM-175205(R_w+C4) GB/T 8478-2008.

Illustration 4: Denomination—(for external wall) solar shading type poppethead

hinged aluminium alloy window of 60 series, the specification model of this type of product is 115145, the wind load resistance: Grade 6, the water tightness: Grade 4, the air tightness: Grade 7, and the SC value of solar shading property is 0.5, the designation is:

Aluminium alloy window: WZY50HZPLC-115145(P36- P4-q17-SC0.5) GB/T 8478-2008.

5 Requirements

5.1 materials

5.1.1 General requirements

The materials and accessories of aluminium windows and doors shall be in accordance with those specified in the relevant standards, and see Annex A for the standard of common materials. Other materials that are no less than the properties and quality as specified in Annex A may also be adopted. The contact surface of different metallic materials shall be adopted with the measures for preventing bimetallic corrosion.

5.1.2 Aluminium alloy profiles

5.1.2.1 Wall thickness and dimensional variation of base materials

5.1.2.1.1 The wall thickness of major profiles used for such major load-bearing frame members as external door and window frame, leaf and transom mullion frame shall be determined through design calculation or test. As for the actually minimum measured wall thickness of the base material at the main strained position of the cross section of major profiles, that of external door shall not be less 2.0mm and that the external window shall not be less than 1.4mm.

5.1.2.1.2 The dimensional variation of such profiles with assembly relationship shall be adopted with the high precision grade or super-high precision grade as specified in GB/T 5237.1.

5.1.2.2 Surface treatment

The requirements on the thickness of the surface treatment coating on aluminium alloy profile shall be in accordance with those specified in Table 5.

Table 5 Thickness Requirement on the Surface Treatment Coating of Aluminium Alloy Profiles

Variety	Anodization Anodization and electrolytic colouring Anodization and organic colouring	Electrophoretic coating		Powder spraying coating	Fluoro-carbon paint coating
Thickness of surface treatment coating	Film thickness gradation	Film thickness gradation		Minimum local thickness of the coating on finishing surface μm	Average film thickness of finishing surface μm
	AA15	B (Gloss or matte celluloid paint)	S (Gloss or matte color paint)	40	30(Twice) 40(Third)

5.1.3 Steel products

The steel products for aluminium windows and doors should be adopted with the austenitic stainless steel materials. The other ferrous materials, if adopted, shall be adopted with such antiseptic treatments as hot dip galvanizing, electrogalvanizing, blacken oxidation and antirust paint.

5.1.4 Glass

The glass for aluminium doors and windows shall be adopted with the float glass of architectural grade as specified in GB 11614 or other various processed glass with such float glass as master film. The variety, thickness and maximum allowable area of the glass shall be in accordance with the relevant regulations specified in JGJ 113.

5.1.5 Sealing and elastic materials

The sealant adopted for inlaying, connecting member bars and assembling accessories of the aluminium doors and windows shall be consistent to these materials they contact. The silicone structural sealant for hidden frame supported window shall be featured of the consistency with the contacted materials and accessories and the caking property with the bonded base material.

The elastic materials bearing block pad and locating piece of glass shall be in accordance with the relevant regulations on installation materials of glass specified in JGJ 113.

5.1.6 Hardware accessories

The functional hardware accessories for the connection and fixing of frames and leaves of aluminium doors and windows shall meet the requirement on the bearing capacity of the whole set of doors and windows, and their repeated opening and closing performance shall meet such requirement of doors and windows.

5.1.7 Fasteners

The stainless steel fasteners shall be adopted in the assembly and machinery connection of aluminum doors and windows. The aluminium and aluminium alloy self-plugging rivets shall be prohibited to being adopted as the fasteners for the strained connection of doors and windows.

5.2 Appearance

5.2.1 The product surface shall be free of aluminium chips, burr, oil stain or other smears; the sealant joints shall be continuous and smooth and have no sealant spilt over at the connecting parts; the joint strips shall be installed at the right places with four corners inlaid reliably, and the decoupling phenomenon is strictly prohibited.

5.2.2 The surface of the aluminium alloy profiles for jambs and leaves shall be free of such defects as obvious color difference, roughness, scuff, scratch and bruise. In one glass lattice, the scratches and scuffs on the surface of aluminium alloy profiles shall be in accordance with those specified in Table 6.

Table 6 Requirements on Scratches and Scuffs on the Surface of Aluminium Alloy Profiles for Jambs and Leaves

Items	Requirements	
	Outdoor side	Indoor side
Scratching and scoring depth	No larger than the thickness of surface treatment coating	

Total scratching area,mm ²	500	300
Total scoring length, mm	150	100
Numbers of the scratched and scuffed parts	4	3

5.2.3 The scratches and scuffs on the surface of aluminium alloy profiles within permissible scope may be repaired with methods, and the repaired parts shall have the fundamentally same color and politure with the original coating.

5.2.4 The glass surface shall be free of obvious color difference, scratch marks and scratches.

5.3 Dimensions

5.3.1 Specifications

5.3.1.1 Single door and window

The width and height of single door and window shall be determined according to the thickness of the practically applied finishing materials at the door and window openings, and the dimensions of attached frame and erection gap based on the standard dimension or structural dimension of the width and height of the door and window openings. The fundamental doors and windows shall be adopted firstly in the design.

5.3.1.2 Composite doors and windows

As for the doors and windows connected and assembled with two or more than two sets of single doors and windows, the structural dimensions of their width and height shall be in accordance with the standard dimensions of the width and height of the openings as specified in GB/T 5824.

5.3.2 Doors and windows and fixing dimension

5.3.2.1 Deviation in the fixing dimension of jambs and leaves

The permissible variations in the dimensions and shapes of doors and windows and deviation in the assembly dimension of frames and leaves shall be in accordance with those specified in Table 7.

Table 7 Deviation in the Doors and Windows as well as the Fixing Dimension in: mm

Items	Dimensional range	Permissible variation	
		Door	Window
Structural dimension of the width and height of doors and windows at inner side	<2000	±1.5	
	2000<3500	±2.0	
	3500	±2.5	
Difference in the structural dimension of width and height of doors and windows at inner side and the side dimension	<2000	2.0	
	2000 <3500	3.0	
	3500	4.0	
Lap width of jambs and leaves		±2.0	±1.0
Difference in the height of the joint seams among member bars of frames and leaves	Profiles of same cross section	0.3	
	Profiles of different cross sections	0.5	
Assemblage gap among member bars of frames and leaves		0.3	

5.3.2.2 Inlaid structural dimension of glass

Inlaid structural dimension of jamb and leaf glass shall be in accordance with the minimum installation dimension of glass specified in JGJ 113.

5.3.2.3 Bonding and fixing dimensions of the glass structure of hidden frame supported window

The binding width and thickness of the hidden frame supported window frame with silicone structural sealant shall meet the design requirements. Each opening window sash should be set with two aluminium alloy or stainless steel back-up strips with thickness no less than 2mm and length no less than 50mm at the lower stile for bearing the glass weight.

5.4 Assembly quality

5.4.1 The jambs and the member bars shall be connected firmly, the assemblage gaps shall be sealed effectively, the fasteners are placed at right positioned and be sealed.

5.4.2 The fittings for windows and doors shall be installed firmly, the hardware accessories of the opening leaf shall move flexibly without binding. The fasteners shall be placed evenly and be sealed.

5.5 Structure

5.5.1 The connecting structures for jambs and leaf member bars shall be reliable, the parts where are human accessible shall be smooth and can be used safely.

5.5.2 The installing and connecting structures of the fittings for windows and doors shall be reliable and shall be convenient for replacement and repairing. The hardware accessories bearing loads and the repeated opening and closing actions of doors and windows for long term shall be in convenient for replacing their quick-wear parts.

5.6 Properties

5.6.1 Wind load resistance property

5.6.1.1 Property gradation

The grades and index value P_3 of the wind load resistance of external doors and windows shall be in accordance with those specified in Table 8.

Table 8 Wind Load Resistance Grade of External Doors and Windows in: kPa

Grade	1	2	3	4	5	6	7	8	9
Grading index	1.0 $P_3 < 1.$	1.5 $P_3 < 2.$	2.0 $P_3 < 2.$	2.5 $P_3 < 3.$	3.0 $P_3 < 3.$	3.5 $P_3 < 4.$	4.0 $P_3 < 4.$	4.5 $P_3 < 5.$	P_3 5.
value P_3	5	0	5	0	5	0	5	0	0

Note: The Grade 9 shall be indicated with the specific detection pressure difference simultaneously after grading.

5.6.1.2 Property requirements

With the action of wind pressures of index values of each property grade, the relative deflection (face normal) of the major load-bearing frame members of external doors and windows shall be in accordance with those specified in Table 9; after the action of wind pressure ending, the doors and windows shall be free of any functional obstacle and damage

in application.

Table 9 Deflection requirements of the Major Load-bearing Frame Members of Doors and Windows

Relative to the Face Normal		in: mm
Variety of supporting glass	Single-glass and triplex glass	Hollow glass
Relative deflection	$L/100$	$L/150$
Maximum relative deflection	20	

Note: L is the supporting span of major load-bearing frame members.

5.6.2 Water tightness

5.6.2.1 Property gradation

The grades and index value P3 of the water tightness of external doors and windows shall be in accordance with those specified in Table 10.

Table 10 Water Tightness Grade of External Doors and Windows in: kPa

Grade	1	2	3	4	5	6
Grading index value P	100 $P < 150$	150 $P < 250$	250 $P < 350$	350 $P < 500$	500 $P < 700$	$P \geq 700$

Note: The Grade 6 shall be indicated with the specific detection pressure difference simultaneously after grading.

5.6.2.2 Property requirements

With the action of the index value of each property grade, the external door and window specimens shall be free of such severe leakage phenomenon that the water penetrates into the indoor side of specimen continuously or repeatedly or the water splashes or outflows from the specimen interface.

5.6.3 Air tightness

5.6.3.1 Property gradation

The grades and absolute index value of the air tightness of external doors and windows shall be in accordance with those specified in Table 11.

Note: The air tightness index of doors and windows are the positive value and negative value measured when the length of unit opening joint of the air infiltration capacity of unit area are able to be divided into positive pressure and negative pressure.

Table 11 Air Tightness Grade of Doors and Windows

Grade	1	2	3	4	5	6	7	8
Grading index value of the length of unit opening joint q_1 ($m^3/(m \cdot h)$)	4.0 $q_1 > 3.5$	3.5 $q_1 > 3.0$	3.0 $q_1 > 2.5$ 5	2.5 $q_1 > 2.0$ 0	2.0 $q_1 > 1.5$ 5	1.5 $q_1 > 1.0$ 0	1.0 $q_1 > 0.5$ 5	$q_1 \leq 0.5$ 5
Grading index value of unit area q_2 ($m^3/(m^2 \cdot h)$)	12 $q_2 > 10$ 5	10.5 $q_2 > 9$ 0	9.0 $q_2 > 7.5$ 5	7.5 $q_2 > 6$ 0	6.0 $q_2 > 4.5$ 5	4.5 $q_2 > 3$ 0	3.0 $q_2 > 1.5$ 5	$q_2 \leq 1.5$ 5

5.6.3.2 Property requirements

At standard conditions, when the pressure difference of door and window specimen is 10Pa, the air infiltration capacity q_1 of unit opening joint length and the air infiltration capacity q_2 of unit area shall not exceed the corresponding index value of each grade specified in Table 11.

5.6.4 Airborne sound insulating properties

5.6.4.1 Property index

The external doors and external windows shall be taken with the "sum (R_w+C_{tr}) of weighted noise insulation factor and spectra correction data of traffic noise" as the grading index; and the internal doors and internal windows shall be taken with the "sum (R_w+C) of weighted noise insulation factor and spectra correction data of pink noise" as the grading index.

5.6.4.2 Property gradation

The grades and index value of the airborne sound insulating properties of doors and windows shall be in accordance with those specified in Table 12.

Table 12 Grade of airborne sound insulating properties of Doors and Windows in: db

Grade	Grading index value of external doors and windows	Grading index value of internal doors and windows
1	20 $R_w+C_{tr}<25$	20 $R_w+C<25$
2	25 $R_w+C_{tr}<30$	25 $R_w+C<30$
3	30 $R_w+C_{tr}<35$	30 $R_w+C<35$
4	35 $R_w+C_{tr}<40$	35 $R_w+C<40$
5	40 $R_w+C_{tr}<45$	40 $R_w+C<45$
6	R_w+C_{tr} 45	R_w+C 45

Note: As for the low frequency noise, the sound insulating internal doors and windows of the noise sources of such machines and equipments in buildings should be graded with the index value of external doors and windows; as for the medium and high frequency noise, they may also be graded with the index value of internal doors and windows.

5.6.5 Heat-insulating property

5.6.5.1 Property index

The heat-insulating property index of doors and windows shall be represented in the heat transfer coefficient K value [$W/(m^2 \cdot K)$] of doors and windows.

5.6.5.2 Property gradation

The grades and index value of heat-insulating property of doors and windows shall be respectively in accordance with those specified in Table 13.

Table 13 Grade of the Heat-insulating Property of Doors and Windows in: W/m2

Grade	1	2	3	4	5
Grading index value	K 5.0	$5.0>K$ 4.0	$4.0>K$ 3.5	$3.5>K$ 3.0	$3.0>K$ 2.5
Grade	6	7	8	9	10
Grading index value	$2.5>K$ 2.0	$2.0>K$ 1.6	$1.6>K$ 1.3	$1.3>K$ 1.1	$K<1.1$

5.6.6 Solar shading property

5.6.6.1 Property index

The solar shading property index of doors and windows—the shading coefficient of window SC is the value calculated according to this code by adopting with the standard computational condition in summer as specified in JGJ/T 151.

5.6.6.2 Property gradation

The grade and index value SC of the solar shading property of doors and windows shall be in accordance with those specified in Table 14.

Table 14 Grade of Solar Shading Property of Doors and Windows

Grade	1	2	3	4	5	6	7
Grading index value SC	0.8 $SC>0.7$	0.7 $SC>0.6$	0.6 $SC>0.5$	0.5 $SC>0.4$	0.4 $SC>0.3$	0.3 $SC>0.2$	SC 0.2

5.6.7 Daylighting property (External window)

5.6.7.1 Property gradation

The daylighting property of external windows shall be represented in the transmittance reduced coefficient T_r , and its grade and index value shall be in accordance with those specified in Table 15.

Table 15 Grade of Daylighting Property of External Windows

Grade	1	2	3	4	5
Grading index value T_r	0.20 $T_r < 0.30$	0.30 $T_r < 0.40$	0.40 $T_r < 0.50$	0.50 $T_r < 0.60$	$T_r \geq 0.60$

Note: Specific value shall be supplied if the T_r value is larger than 0.60.

5.6.7.2 Property requirements

The transmittance reduced coefficient T_r of external windows that are with requirement on natural illumination shall not be less than 0.45. And that of the external windows also with requirement on solar shading property shall be determined through comprehensive consideration of the requirements of shading coefficient of window.

5.6.8 Opening and closing force

5.6.8.1 The doors and windows shall be able to open and close flexibly under the action of the force no larger than 50N.

5.6.8.2 As for such doors and windows as the door and lift and sliding type door with automatic closing gears (such as door closer and floor spring) as well as the folding and push-pull type window and the vertical sliding window without lifting power equilibrator, the property index of start-stop force shall be determined by negotiation between the supplier and buyer.

5.6.9 Repeated opening and closing performance

5.6.9.1 Property index

The doors shall be repeatedly opened and closed for at least 0.10 million times; and the windows shall be repeatedly opened and closed for at least 0.010 million times;

The repeated opening and closing times of the hinged doors and spring doors that are with door closers as well as the folding and push-pull, tilt-sliding, lift and sliding, hinged doors and windows shall be determined by negotiation between the supplier and buyer.

5.6.9.2 Property requirements

After passing the repeated opening and closing performance test, the doors and windows shall be able to be opened and closed normally without obstacle.

5.6.10 Impact resistance property (Hinged and pivoted doors with glass area accounting for no more than 50% of the door leaf area)

If being impacted by the 30kg sandbag dropping from a height of 170mm at the handle of the closed door leaf, no obvious deformation appears, the opening and closing states are normal, and the application is successful, and no glass obscission except for the tempered glass.

5.6.11 Anti-vertical load property (hinged and pivoted doors)

After bearing a 500N vertical static load for 15min at opening state, the remain sag of door leaf after unloading for 3min is less than 3mm, the opening and closing states are normal, and the application is successful.

5.6.12 Static torsion resistance property (Hinged and pivoted doors)

After bearing a 500N horizontal static load for 5min at opening state, no obvious

deformation appears on the door leaf after unloading for 3min, the opening and closing states are normal and the application is successful.

6 Test Methods

6.1 Material

6.1.1 Quality verification of materials and fittings

As for the incoming materials and fittings for aluminium windows and doors, their attached technical documents such as product qualification certificate or quality assurance shall be inspected in order to verify the compliance between the documents marked properties and quality index values with the corresponding standards (or contract requirements) specified in Annex A.

6.1.2 Aluminum alloy profile

6.1.2.1 Substrate wall thickness and dimensional deviation

As for the substrate wall thickness, film thickness detector whose resolution is $0.5/\mu\text{m}$ and vernier caliper whose accuracy is 0.02mm shall be adopted to respectively measure the film thickness of the surface treatment coating and wall thickness (total thickness) of the profiles in different positions, and the measuring point shall not be less than three. The actual measured wall thickness of the substrate is the difference between the profile wall thickness and film thickness through calculation, which shall be accurate to 0.01mm and be the mean value.

The profile dimensional deviation shall be verified according to those specified in GB/T 5237.1.

6.1.2.2 Surface treatment coating thickness

Adopt film thickness detector whose resolution is $0.5/\mu\text{m}$ to measure the surface treatment coating thickness at different profile positions, the measuring point shall not be less than three and their mean value shall be adopted.

6.1.3 Steel

Hot dip galvanizing, zinc electroplating and antirust paint treatment coating thickness of the steel surfaces shall be verified according to those specified in GB/T 4956; while the black oxidation film quality of the steel shall be verified according to those specified in GB/T 15519.

6.1.4 Glass

Variety, thickness and quality of the glass shall be verified according to those specified in 6.1.1.

6.1.5 Sealing material

Compatibility and cementation tests of silicone sealant shall be carried out according to those specified in GB 16776.

6.1.6 Hardware fittings and fastener

Carrying capacity and repeated opening and closing performance of the hardware fittings and materials and mechanical properties of fasteners shall be verified according to those specified in 6.1.1.

6.2 Appearance

Appearance shall be verified by steel rules and visual observation method according to those observation conditions specified in Chapter 7 of GB/T 14952.3-1994.

6.3 Dimension

It shall be verified by steel tape, steel rule, vernier caliper, depth gauge and feeler gauge.

6.4 Assembly quality

It shall be verified by visual observation and hand test methods.

6.5 Structure

It shall be verified by visual observation and hand test methods.

6.6 Property

6.6.1 Wind load resistance, watertightness and air permeability performance

Air permeability, watertightness and wind load resistance performance shall be tested in turn according to those specified in GB/T 7106.

6.6.2 Airborne sound insulating property

It shall be tested according to those specified in GB/T 8485.

6.6.3 Thermal insulating property

It shall be tested according to those specified in GB/T 8484, or calculate the heat transfer coefficient of windows and doors in standard winter computational conditions according to those specified in JGJ/T 151.

6.6.4 Solar shading property

Based on the sunlight spectral transmittance, reflectance and other parameters of the single-piece door/window glass actually measured according to those specified in GB/T 2680, calculate the shading coefficient of windows and doors in standard summer computational conditions according to those specified in JGJ/T 151.

6.6.5 Daylighting property (of external windows)

It shall be tested according to those specified in GB/T 11976.

6.6.6 Opening and closing force

According to those specified in GB/T 9158-1988, measure the locking force and loosening force of the specimen locking device and the maximum force needed for door/window sashes in the opening and closing processes, and adopt the maximum value among the locking force, loosening force, opening force and closing force as the opening and closing force property value of windows and doors.

6.6.7 Repeated opening and closing performance

Repeated opening and closing performance test of windows and doors shall be carried

out according to those specified in JG/T 192.

6.6.8 Impact resistance property (hinged or pivoted doors)

According to those specified in GB/T 14155-2008, carry out soft heavy body impact test of doorsets and impact doorknobs or transoms.

6.6.9 Vertical load resistance property (hinged or pivoted doors)

Carry out vertical load resistance performance test of doorsets according to those specified in ISO 8275:1985.

6.6.10 Static torsion resistance property (hinged or pivoted doors)

Carry out static torsion test according to those specified in GB/T iso9381:2005.

6.7 Groups, quantity and test sequence of property test specimens

Groups, quantity and test sequences of property test specimens of windows and doors are described in Table 16.

Table 16 Groups, Quantity and Test Sequences of Property Test Specimens of Windows and Doors

Specimen group	1			2	3		4 (hinged or pivoted doors)		
Test items and sequence	Sound insulation	Daylighting (of external windows)	1) Air permeability 2) Watertightness 3) Wind load resistance	Thermal insulation	Opening and closing force	Repeated opening and closing	Impact resistance	Vertical load resistance	Static torsion resistance
Specimen quantity of frames	3	1	3	1	3	1	1	1	1
Total frame specimens	3			1	3		3		

7 Test Rules

7.1 Test types and items

7.1.1 Production inspections are classified into factory inspection and type inspection.

7.1.2 Factory inspection items include 5.2 Appearance, 5.3.2.1 Assembly dimensional deviation of windows and doors and frames, and 5.4 Assembly quality.

7.1.3 Type inspection items include all items in 5.2 Appearance, 5.3 Dimension, 5.4 Assembly quality, 5.5 Structure and 5.6 Property.

7.2 Factory inspection

7.2.1 Batching the sampling rules

7.2.1.1 Appearance and assembly quality inspection shall be 100% inspection.

7.2.1.2 As for the assembly dimensional deviation inspection of windows and doors and frames, select 10% of products with different varieties, series and specifications randomly from each factory inspection (delivery) batch and the quantity shall not be less than 3 frames.

7.2.2 Determination and reinspection rules

When all the randomly inspected products are tested to meet requirements in this standard, the batch of products is determined to be qualified.

If more than one frame fails to meet the requirements in this standard, then this batch of products are determined to be unqualified.

If one frame or more is tested to be unqualified in the test items, then double products may be selected from this batch for reinspection. This item shall be determined to be qualified when all the inspection results are up to the requirements in this standard. And this batch of products shall also be determined to be qualified when all the retest items are qualified, or else, they shall be determined to be unqualified.

7.3 Type inspection

7.3.1 Inspection time

If one of the following conditions is met, then type inspection shall be carried out:

- a) When trial production stereotype verification shall be made for factory transit produced new or old products;
- b) When raw materials, structures or production processes of products change greatly and may affect the product performance after the formal production;
- c) When the production is resumed after six month-production halt or more;
- d) When there is great difference between the factory inspection result and the last type inspection result;
- e) When the national quality supervision organizations propose to carry out the type inspection;
- f) Type inspection shall be at least conducted once biennially during regular production.

7.3.2 Batching the sampling rules

Select randomly from the inspection batch which is qualified through factory inspection according to the quantity specified in Table 16.

7.3.3 Sampling method

As for type inspection of products, single-frame basic windows and doors of common door/window elevation shape and dimension in various uses, types, varieties and series shall be selected as the typical specimens for product performance test. Elevation shapes and specifications of typical specimens for type inspection of aluminium windows and doors are specified in Annex B.

7.3.4 Determination and reinspection rules

When all the randomly inspected products meet requirements in Items 5.2~5.6, type inspection of the products is determined to be qualified.

The determination and reinspection of inspection items for appearance, assembly

dimensional deviation and assembly quality of windows and doors and frames shall be in accordance with those specified in 7.2.2.

If there are unqualified items in the property inspection items, then double specimens may be taken from this batch of products again for re-test of unqualified items, this batch of products are determined to be qualified if all the re-test results conform to the requirements, or else, they would be determined to be unqualified.

8 Product Marking, Certificate and Instruction

8.1 Product marking

8.1.1 Basic marking contents

Aluminium windows and doors markings shall include the following contents:

- a) Product name or brand;
- b) Product implemented standard serial number;
- c) Manufacturer name, production date or batch number;
- d) Production license mark and serial number.

8.1.2 Warning marking and explanation

Concise and effective warning markings and explanation (including words and diagrams) shall be installed for products which are with complex structures, comparatively special opening methods and may pose self-destruction or application safety problems on grounds of misapplication.

8.1.3 Marking method

8.1.3.1 Marking contents specified in 8.1.1 a)~d) shall be marked by aluminium and stainless steel plates or plates of other materials. The printing of plates shall be in accordance with those specified in GB/T 13306.

8.1.3.2 Door plates shall be fixed to evident positions like upper frame and transom.

8.1.3.3 Window plates shall be fixed to proper positional like upper frame, transom and sash stile side (in order to be seen after the windows are opened).

8.1.3.4 Striking product application warning markings and explanation shall be stuck near the opening and closing devices such as door/window handles or knobs.

8.2 Product qualification certificate

8.2.1 Product qualification certificate shall be provided for each factory inspection or delivery batch. Product qualification certificate shall be developed in accordance with those specified in GB/T 14436.

8.2.2 Product qualification certificate of windows and doors shall include the following contents:

- a) Product name, brand and mark (including the implemented product standard serial number);
- b) Physical property and mechanical property parameter values of the product's type inspection;

- c) The product batch quantity (frame number and area), dimensions and types;
- d) Surface treatment varieties, color and film thickness of door/window frame aluminum alloy profiles;
- e) Varieties, color and thickness of glasses and filming;
- f) Production date, inspection date and release date of windows and doors, inspector's signature and manufacturer's quality inspection stamp;
- g) Production license mark and serial number;
- h) Quality certification or energy-saving property marking and other markings;
- i) Manufacturer name, address and contact telephone of the receiving division for quality problems;
- j) User name and address.

8.3 Product instruction

8.3.1 Product instruction shall be provided for each batch of windows and doors when they are rolled out or delivered if they are of comparatively complex structures, relatively special opening method and are hard to install and use. The product instruction shall be developed in accordance with those specified in GB 9969.1.

8.3.2 The product instruction of windows and doors shall include product description, mounting instruction, operating instruction and maintenance instruction and some other major aspect, with the specific contents specified in Annex C.

9 Packing, Transportation and Storage

9.1 Packing

9.1.1 Appropriate materials free from corrosion shall be applied for the packing according to surface treatment conditions of aluminum alloy profiles, glasses and fittings used for windows and doors.

9.1.2 Packing containers shall have adequate carrying capacity to ensure no damage in the transportation.

9.1.3 Various parts in the packing containers shall keep clear of mutual collision and shifting.

9.1.4 Packaging-pictorial markings and application methods shall be in accordance with those specified in GB/T 191.

9.2 Transportation

9.2.1 Packing containers shall be kept clear of mutual collision in the transportation process.

9.2.2 Packing containers in the transportation process shall be handled with care, they must not be thrown and impinged on.

9.2.3 Transport vehicle shall be provided with rainproof measures to keep clean and pollution-free.

9.3 Storage

9.3.1 Products shall be stored in dry places with ventilation. They must not be contacted with acid, alkali and salt substances and must be protected against rainwater.

9.3.2 Products must not be directly contacted with the grounds with the bottom blocking up larger than 100mm.

9.3.3 Products shall be leveled up by nonmetal washers when being placed, the placing angle shall not be less than 70°.

Annex A

(Informative)

Standards for Common Materials

A.1 Aluminum alloy profiles

GB/T 5237.1—2008 Wrought Aluminium Alloy Extruded Profiles for Architecture - Part 1: Mill Finish Profiles

GB/T 5237.2—2008 Wrought Aluminium Alloy Extruded Profiles for Architecture - Part 2: Anodized Profiles

GB/T 5237.3—2008 Wrought Aluminium Alloy Extruded Profiles for Architecture - Part 3: Electrophoretic Coating Profiles

GB/T 5237.4—2008 Wrought Aluminium Alloy Extruded Profiles for Architecture - Part 4: Powder Coating Profiles

GB/T 5237.5—2008 Wrought Aluminium Alloy Extruded Profiles for Architecture - Part 5: PVDF Coating Profiles

GB/T 5237.6—2004 Wrought Aluminium Alloy Extruded Profiles for Architecture - Part 6: Thermal Barrier Profiles

JG/T 133—2000 Fluorocarbon Coatings on Architectural Aluminum Extrusions and Panels

JG/T 174—2005 Thermal Barrier Strip for Construction Industry

JG/T 175—2005 Insulating Aluminum Alloy Profile with Thermal Barrier Strip for Construction

A.2 Steel

GB/T 700—2006 Carbon Structural Steels

GB/T 707—1988 Hot-rolled Channel Steel - Dimensions, Shape, Weight and Tolerances

GB/T 708—2006 Dimension, Shape, Weight, and Tolerance for Cold-rolled Steel Plates and Sheets

GB/T 716—1991 Cold-rolled Carbon Structural Steel Strips

GB/T 912—1989 Hot-rolled Plain Carbon and Low Alloy Structural Steel Sheets and Strips

GB/T 2518—2004 Continuous Hot-dip Zinc-coated Steel Sheets and Strips

GB/T 3280—2007 Cold Rolled Stainless Steel Plate, Sheet and Strip

GB/T 4239—1991 Cold Rolled Stainless Steel and Heatresisting Steel Strips

GB/T 6725—2002 Cold Formed Steel Sections

GB/T 6728—2002 Cold Formed Steel Hollow Sections for General Structure - Dimensions, Shapes, Weight and Permissible Deviations

GB/T 9787—1988 Hot-rolled Equal-leg Angle Steel - Dimensions, Shape, Weight and

Tolerances

GB/T 9788—1988 Hot-rolled Unequal-leg Angle Steel - Dimensions, Shape, Weight and

Tolerances

GB/T 9799—1997 Metallic Coatings - Electroplated coatings of Zinc on Iron or Steel

GB/T 11253—2007 Cold-rolled Sheets and Strips of Carbon Structural Steels

GB/T 13912—2002 Metallic Coatings - Hot Dip Galvanized Coatings on Fabricated Iron and Steel Articles-Specifications and Test Methods

A.3 Glass

GB 9962—1999 Laminated Glass

GB 11614—1999 Float Glass

GB/T 11944—2002 Sealed Insulating Glass Unit

GB 15763.1—2001 Safety Glazing Materials in Building Fire-resistant Glass

GB 15763.2—2005 Safety Glazing Materials in Building Part 2: Tempered Glass

GB 17841—1999 Tempered and Heat-strengthened Glass Used in Curtain Wall

GB/T 18701—2002 Colored Glass

GB/T 18915.1—2002 Coated Glass-Part 1: Solar Control Coated Glass

GB/T 18915.2—2002 Coated Glass-Part2: Low Emissivity Coated Glass

JC 433—1991 Wired Glass

JC/T 511—2002 Patterned Glass

A.4 Sealing material

GB/T 5574—1994 Industrial Rubber Sheet

GB/T 14683—2003 Silicone Sealant for Building

GB/T 16589—1996 Rubber, Vulcanized - Classification - Rubber Materials

GB 16776—2005 Structural Silicon Sealants for Building

HG/T 3100—2004 Rubber, Vulcanized and Thermoplastic - Preformed Gaskets Used in Buildings - Classification, Specification and Test Methods

JC/T 187—2006 Gaskets for Doors and Windows of Buildings

JC/T 483—2006 Polysulfide Sealant for Building

JC/T 485—2007 Glazing Elastic Sealants for Building

JC/T 635—1996 Technical Requirements of Seal Wool Top for Doors and Windows of Buildings

A.5 Hardware fittings

JG/T 124—2007 Building Hardware for Windows and Doors - Handles for Espagnolette Gears

JG/T 125—2007 Building Hardware for Windows and Doors - Hinges

JG/T 126—2007 Building Hardware for Windows and Doors - Espagnolette Gears

JG/T 127—2007 Building Hardware for Windows and Doors - Friction Hinges

JG/T 128—2007 Building Hardware for Windows and Doors - Stay Arms

JG/T 129—2007 Building Hardware for Windows and Doors - Rollers
JG/T 130—2007 Building Hardware for Windows and Doors - Single Point Locking

Gears

JG/T 168—2004 Tilt & Turn Hardware System of Doors and Windows
JG/T 212—2007 Building Hardware for Windows and Doors - General Requirements
JG/T 213—2007 Building Hardware for Windows and Doors - Casement Fastener

Handles

JG/T 214—2007 Building Hardware for Windows and Doors - Latch Bolts
JG/T 215—2007 Building Hardware for Windows and Doors - Multipoint Locking

Gears

QB/T 2475—2000 Flat Tumbler Mortice Door Lock
QB/T 2476—2000 Ball Door Lock
QB/T 2697—2005 Floor Spring
QB/T 2698—2005 Door Closer

A.6 Connectors and fasteners

GB/T 13821—1992 Zinc Alloy Die Castings
GB/T 15114—1994 Aluminum Alloy Die Castings
GB/T 41—2000 Hexagon Nuts—Product Grade C
GB/T 65—2000 Slotted Cheese Head Screws
GB 95—2002 Plain Washers-Product Grade C
GB 97.1—2002 Plain Washers-Product Grade A
GB/T 818—2000 Pan Head Screws with Cross Recess
GB/T 819.1—2000 Countersunk Flat Head Screws (Common Head Style) with Cross

Recess-Part 1: Steel of Property Class 4.8

GB/T 845—1985 Cross Recessed Pan Head Tapping Screws
GB/T 846—1985 Cross Recessed Countersunk Head Tapping Screws
GB/T 859—1987 Single Coil Spring Lock Washers, Light Type
GB/T 5780—2000 Hexagon Head Bolts-Product Grade C
GB/T 5781—2000 Hexagon Head Bolts-full Thread-Product Grade C
GB/T 6170—2000 Hexagon Nuts, Style 1
GB/T 6172.1—2000 Hexagon Thin Nuts (chamfered) with Fin Pitch Thread
GB/T 12615—2004 Mushroom Head Break Mandrel Closed End Blind Rivets
GB/T 12616—2004 Closed and Blind Rivets with Break Pull Mandrel and Countersunk

Head-Property Class 11

GB/T 12617—2006 Open End Blind Rivets with Break Pull Mandrel and Countersunk

Head

GB/T 12618—2006 Open and Blind Rivets with Break Pull Mandrel and Mushroom

Head

GB 12619—1990 Specifications for Break Mandrel Blind Rivets
GB/T 12619 AMD1—1994 Specifications for Break Mandrel Blind Rivets No.1

Revision

GB/T 15856.1—2002 Cross Recessed Pan Head Drilling Screws with Tapping Screw

Thread

GB/T 15856.2—2002 Cross Recessed Countersunk Head Drilling Screws with Tapping
Screw Thread

GB.T 3098.1—2000 Mechanical Properties of Fasteners-Bolts, Screws and Studs

GB.T 3098.2—2000 Mechanical Properties of Fasteners-Nuts-Coarse Thread

GB/T 3098.4—2000 Mechanical Properties of Fasteners-Nuts-Fine Pitch Thread

GB/T 3098.5—2000 Mechanical Properties of Fasteners-Tapping Screws

GB/T 3098.6—2000 Mechanical Properties of Fasteners-Bolts, Screws and Studs Made
of Stainless-steel

GB/T 3098.10—2000 Mechanical Properties of Fasteners-Bolts, Screws, studs and Nuts
Made of Non-ferrous Metals

GB/T 3098.11—2002 Mechanical Properties of Fasteners--Drilling Screws with Tapping
Screw Thread

GB/T 3098.15—2000 Mechanical Properties of Fasteners-Nuts Made of Stainless-steel

GB/T 3098.19—2004 Mechanical Properties of Fasteners-Blind Rivets with Break Pull
Mandrel

Annex B

(Informative)

Elevation Shapes and Specifications of Typical Specimens for Type Inspection of Aluminium Windows and Doors

Table B.1 Elevation Shapes and Specifications of Typical Specimens for Type Inspection of Aluminium Doors

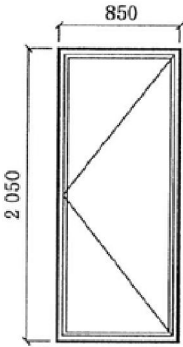
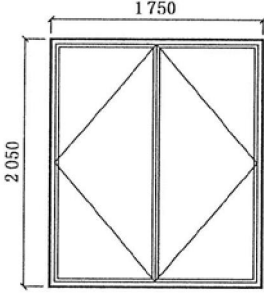
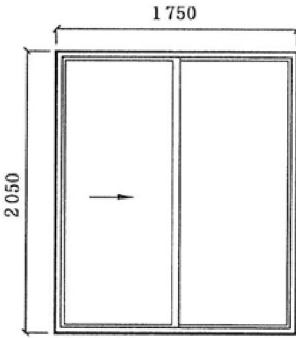
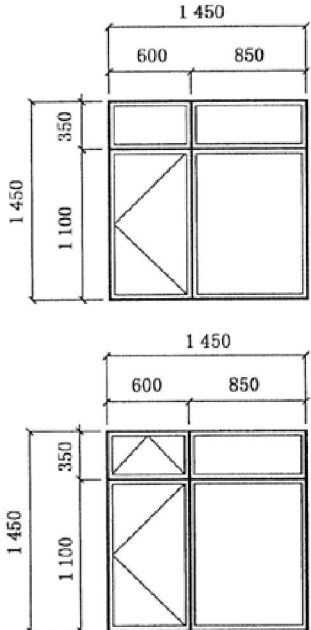
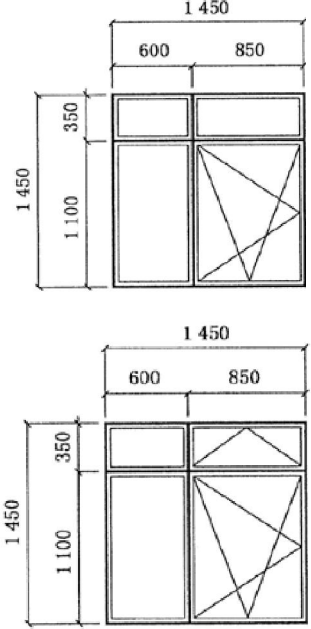
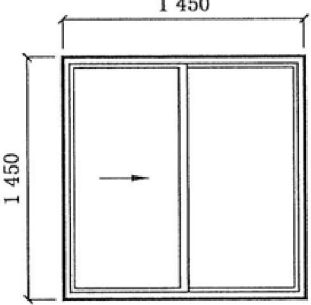
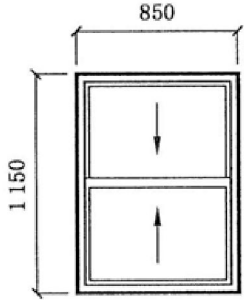
Serial number	Elevation shape, width and height of doors mm	Applicable doors
1		<p>Single hinged doors (hinged) swing doors (PM) Spring doors (THM) Floor spring doors (DHM) Tilt and turn doors (PXM)</p>
2		<p>Biparting hinged doors ^a (hinged) swing doors (YPM) Tilt and turn doors (PXM) Spring doors (THM) Floor spring doors (DHM)</p>
3		<p>Biparting sliding doors ^b Sliding doors (TM) Lift-slide doors (STM) Tilt-sliding doors (XTM) Bi-fold sliding doors (TZM)</p>
<p>^aOne of the sashes may be fixed sash. ^bIt may be two active sashes.</p>		

Table B.2 Elevation Shapes and Specifications of Typical Specimens for Type Inspection of Aluminium

Windows

Serial number	Elevation shape, width and height of windows mm	Applicable windows
1		<p>Casement window (PC) (outward swing and inward flush))</p> <p>Spool windows (HZPC) (outward swing and inward swing)</p>
2		<p>Interior casement window (PC)</p> <p>Tilt and turn windows (PXC)</p> <p>Top-hung windows (SXC)</p> <p>Hopper windows (XXC)</p> <p>Spool top hung windows (HSXC)</p>
3		<p>Sliding windows^a(TC)</p> <p>Sliding hopper windows (XTC)</p> <p>Hinged sliding windows (PTC)</p> <p>Lift sliding windows (STC)</p>

4		Vertical sliding windows ^b (TLC)
<p>NOTE 1: As for other windows not listed in the table, their specimen shapes and dimensions may be selected referring to the aforesaid similar opening method.</p> <p>NOTE 2: Fixed windows may be any kind of elevation shapes specified in serial number 1~3.</p>		
<p>^aIt may be two active sashes.</p> <p>^bWhen the vertical sliding windows are provided with up and down lifting force equilibrators, the specimen specification shall still be 1500mm×1500mm.</p>		

Annex C

(Informative)

Main Contents of Instructions of Aluminium Windows and Doors

a) Product specifications shall include:

——Product name, characteristics (including materials and fittings) and main applications as well as the application scope and design working life;

——Compositions of the product name and mark code and their meanings;

——Physical property and mechanical property parameter values of windows and doors for type inspection.

b) Mounting instructions shall include:

——Installation conditions and technical requirements of windows and doors, including installation procedure, method, materials and appliances;

——Installation and adjustment notices, installation/acceptance/inspection items and methods;

——Safety technical measures that shall be adopted in installation and construction processes.

c) Operating instructions shall include:

——Correct opening and closing methods of windows and doors, possible faulty operation and countermeasures should be described clearly by both figures and words;

——Notices in the application, including no extra heavy hanging or applying in the opened windows and opening and closing impediments;

——Accurate purging methods for cleaning windows and doors and accurate application of cleaning materials, as well as safety problems shall be paid attention to when cleaning windows and doors.

d) Maintenance instructions shall include:

——Requirements for periodical lubrication, adjustment and fastening of opening devices of the opening windows;

——Requirements for timely inspection and displacement of hardware fittings, fasteners, gaskets, and sealing tops as well as other wearing parts;

——Measures that shall be adopted when breakage condition happens to glasses, and safety measures for replacement as well as other notices.

References

- [1] GB/T 10123—2001 Corrosion of Metals and Alloys-Basic Terms and Definitions
- [2] GB/T 19000—2000 Quality Management System— Fundamentals and Vocabulary