YKK GROUP INTRODUCTION

YKK®

YKK ap®

Content

BHORUKA
A YKK AP COMPANY

- Overview and History of YKK Group
- YKK AP Business Overview

- **Overview and History of YKK Group**
- **YKK AP Business Overview**

BHORUKA
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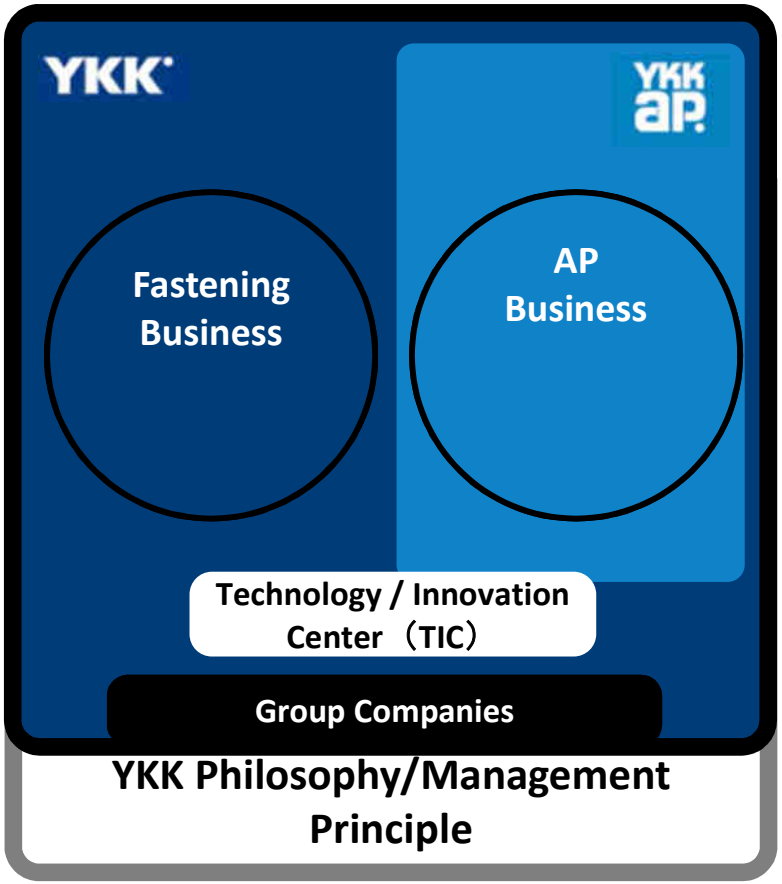
Global business management structure centered on Fastening / Architectural Products Business



70 Countries/Regions worldwide 112 Companies （532 Bases）

○Japan: 19 Companies （234 Bases）
○Overseas: 93 Companies （298 Bases）

※As of end Mar 2024

■ YKK Group 《Management Structure》

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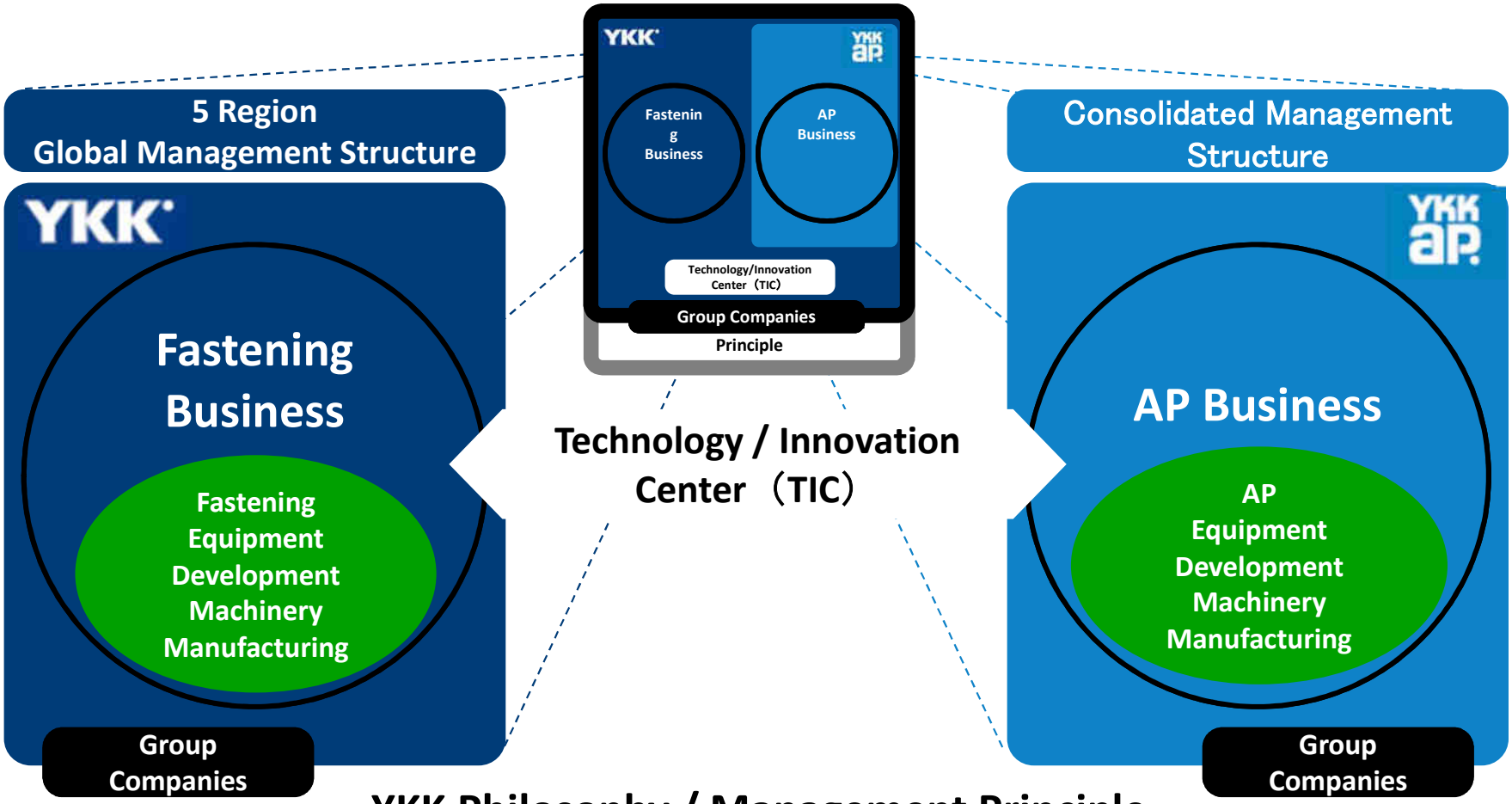
Fastening and AP businesses are the core of the corporate group, who shares the YKK Philosophy "Cycle of Goodness" and the Management Principle, linked to the philosophy.



To enhance business competitiveness, Fastening and AP businesses will each hold its individual equipment development and machinery manufacturing engineering functions. TIC will contribute to them from technical perspective.

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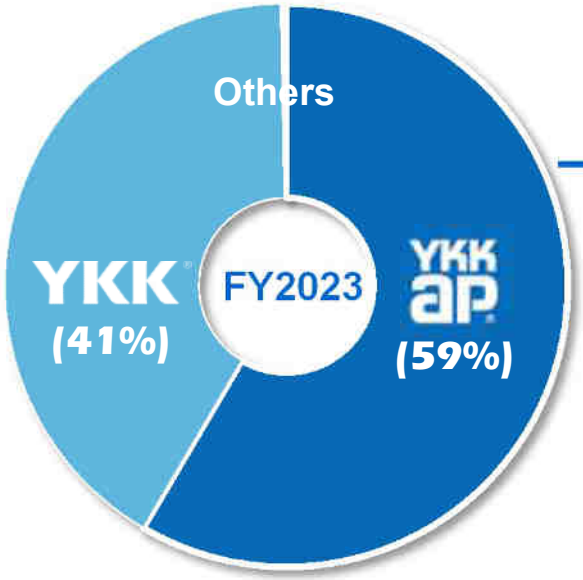
Consolidated sales US$ 6.6 billion

FY2023
1USD=140.47JPY

Fastening

US$ 2.7 billion



AP
（Architectural Products）

US$ 3.8 billion

Number of Employees 45,400

（Japan 18,100／Overseas 27,300）

《F》 26,700
（Japan 4,500/Overseas 22,200）

《AP》 17,800
（Japan 13,000/Overseas 4,800）

※As of end Mar 2024

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“Cycle of Goodness”

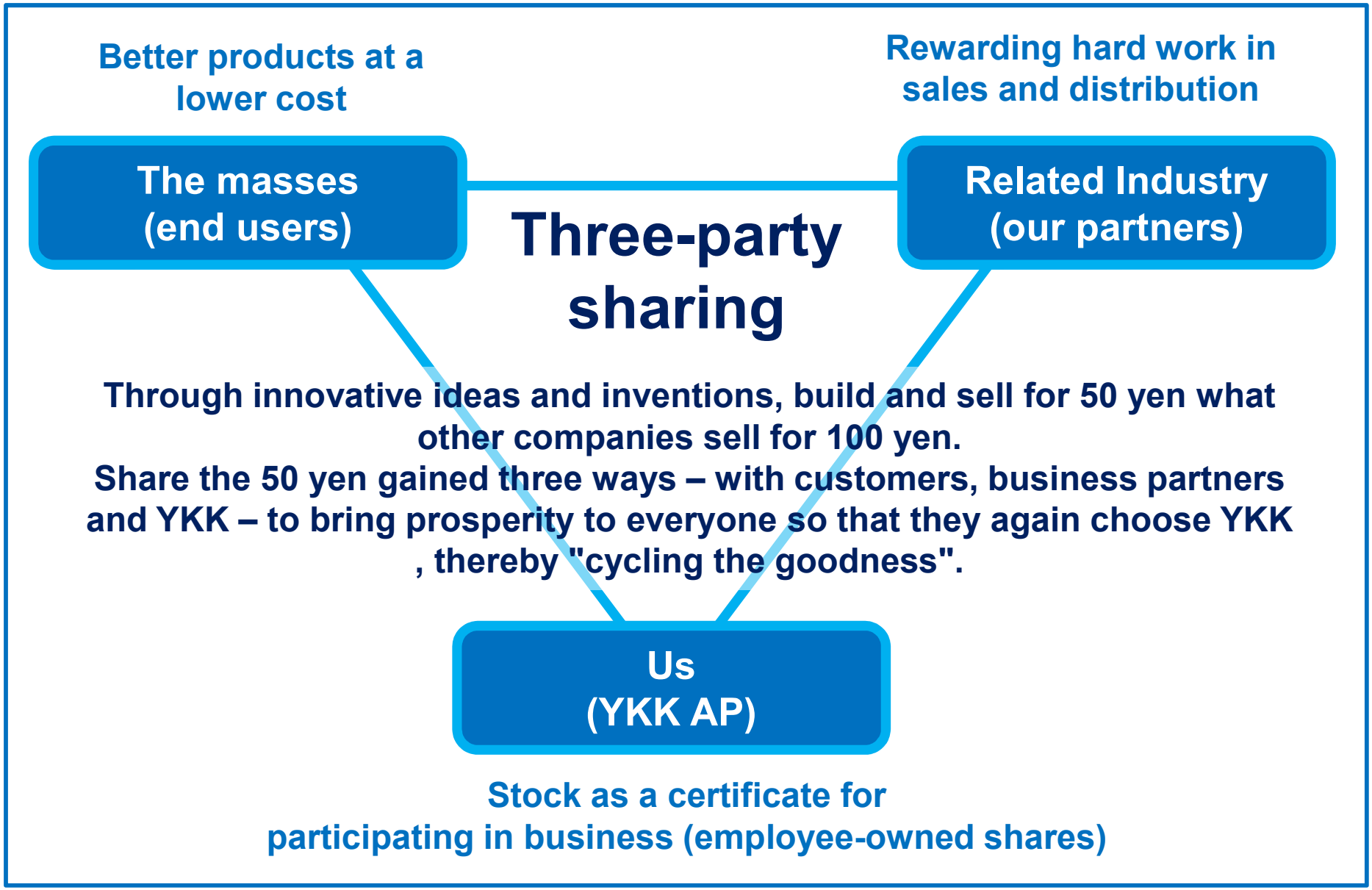
Typeface : Tenshiyo /Pen name : 「Rituzann」
(It is named after the Tateyama mountain range that I looked up to forever)

Founding president Tadao Yoshida

“No one prospers without rendering benefit to others”

If we keep creating new values by innovative ideas and inventions through our business activity, we can expand our business. That brings prosperity to our customers and business partners, and as a result, we can make a contribution to society.

■ Commitment to Achieving the "Cycle of Goodness"



■ YKK Philosophy・Management Principle・YKK Core Values

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YKK Philosophy

「 CYCLE OF GOODNESS 」
"No one prospers without rendering benefit to others"

If we keep creating new values by innovative ideas and inventions through our business activity, we can expand our business. That brings prosperity to our customers and business partners, and as a result, we can make a contribution to society.

Management Principle

YKK seeks corporate value of higher significance

Seeking corporate value of higher significance,
YKK will pursue innovative quality in the seven key areas shown above.

Basic concept for business success, which is the mission, direction, viewpoint of business management.

Core Values

Developing people
through ongoing "challenges"

Developing products
that deliver "quality" valued by our customers

Developing relationships
with society that are strong and long-term through "trust and reliability"

■ YKK Group 《Founding》

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1934 "San-es Shokai" in Kakigara-cho, Nihonbashi

1938 Moved to Komatsugawa in Edogawa ward
Company renamed "Yoshida Kogyosho"

1945 March: Komatsugawa plant lost in Great Tokyo Air Raid Evacuated to Uozu-machi, Toyama
June: Purchased Uozu Tekkousho K.K.
September: Company renamed "Yoshida Kogyo K.K."

1946 "YKK" registered as trademark

Approx. 2.5x the capital

1950 Four chain machines purchased from the US

Fastener mass production begins
100 same-type chain machines produced in Japan

Manual

Automatic

Work efficiency 30x
(Employees 160 → 6)

■ YKK Group 《Commitment to Quality – "Returning Upstream"》

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In our ongoing commitment to quality,
YKK practices "returning upstream", whereby we go back to the materials, back to the equipment, and back to the production line

1950: Chain machines from US
Mass production of fasteners begins

Materials and molds from outside company
"do not yield acceptable quality or prices"

R&D into metals and molds for fasteners
<<Machine Tools Division>> established

In-house integration - same-level quality globally

■ YKK Group 《YKK AP Founding》

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1959 Two hydraulic extruding machines (for copper and aluminum) imported from US for fastener production

Springboard into "architectural products"

1961 Start of production and sales of aluminum architectural products

1990 Trade name changed to "YKK Architectural Products, Inc."

Founding of YKK AP

2002 Trade name changed to "YKK AP Inc."

2003 Unification of architectural products business in YKK Group
YKK's Architectural Products Manufacturing Group incorporated into "YKK AP Inc."

"AP" stands for the capital letters of "Architectural Products".
Architectural is a complex of "Art" and "Technology".

Deeply understanding the cultural and social role of the architectural,
sincerely wishing we will continuously provide valuable architectural products which are indispensable to affluent life.

■ YKK AP 《Early Days of Architectural Products》

Showcases

Table edging

Spandrels
(wall/ceiling materials)

Aluminum
interior fittings

1962- Aluminum windows

- Overview and History of YKK Group
- **YKK AP Business Overview**

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YKK AP NEW VISION "Evolution 2030"

Become a Global Leading Company Through the Evolution of Architectural Products

Three policies

Contribute to the Global Environment

Create mechanisms toward the realization of decarbonization and a circular society

Create New Value for Our Customers

Higher thermal insulation performance, higher added value and integrated business services

Prioritize Employee Well-Being and Engagement

Well-being management based on the "Cycle of Goodness"

■ YKK AP's Corporate Message "Purpose(reason for corporate existence)"

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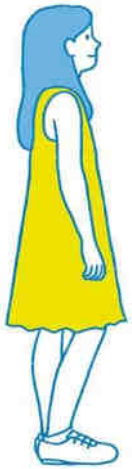

Architectural Products で
社会を幸せにする会社。

— We Build a Better Society Through Architectural Products —

**With a spirit of curiosity and exploration,
we develop architectural products of true value that connect
people, planet, and the future.**

**We want to create a better society,
while remaining committed to the art and technology
that have always been fundamental to architectural culture.**

While inheriting ideas from the time of our founding, we look even more to "building a better society through the business of YKK AP."

■ YKK AP 《Value Chain》

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Rsearch, development and verification

Creating technologies to support *monozukuri*

- R&D System (Japan/Germany/Indonesia)
- Technological development and research to respond to social issues
- Product development to address social issues
- Product development from a lifestyle point of view
  - Evaluation and verification of products and installation methods
- Product safety measures
- Establishment of quality assurance processes

Material procurement

Responsible material procurement

- Supply chain management based on YKK Group Procurement Policy
- Green Procurement
- Chemical substance managemant
- Recycling promotion across the entire product lifecycle

Manufacturing and logistics

In pursuit of manufacturing and delivery quality

- Integrated production system
- Optimal production lines created by the newly merged Machinery and Engineering Department
- Reduced energy consumption and CO2 emissions
- Waste management and consideration of the ecosystem
- Health and safety management
- Reducing packaging materials
- Developing logistics solutions nationwide

Sales

Product appeal and proposal capability

- Technical proposals to address social issues
- Development of tools to propose technologies (simulators for thermal insulation and airflow, VR)
- Enhancement of product exhibition facilities (experience, installation and technology)
- Awareneness-building activities by professional users at various forums and events
- Product proposals via online exhibitions

Design proposals utilizing BIM

Installation

In pursuit of greater construction quality

- Research, development and proposals of labor-saving installation methods and jigs
- Installation training and certification systems organized by field engineers for building contractors
- Improvement of installation skills and quality led by the YKK AP Group Installation Cooperative

Product use

User-friendly and socialfriendly products

- Healthy, comfortable, energy-efficient
- Disaster prevention and quake-resistant products
- Products for remodeling projects
- Maintenance by certified technicians
- Provision of information to customers and expanded online content
- Release of environmental infomation and environmental labels
- Improve product traceability

Foundations supporting our value chain

- Corporate governance
- Compliance
- Risk managemant
- Human resource development
- Health management
- Environmental management

※ About the SDGs

The sustainable Development Goals(SDGs) were adopted by the United Nations in 2015 and are comprised of 17 goals and 169 targets to be achieved by 2030. The SDGs require actions to be taken by everyone involved, from corporate entities to government agencies and the country as a whole.

SUSTAINABLE DEVELOPMENT GOALS

■ YKK AP 《Main Products》

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Windows

Entrance Doors

Exteriors

Commercial Products

Renovation Products

Industrial Products

■ YKK AP 《Domestic Business Development》

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# of Bases	25	7 plants, 18 factories
# of Employees	7,800	For AP Business in Japan: 12,800

※as of end May 2024


Kurobe Ekko Plant


Kurobe Plant


Kurobe Ogyu Plant

Area Management
Promoting business in 5 blocks & 1 area


Namerikawa Plant
Toyama Mizuhashi Factory
Toyama Fuchu Factory

Hokkaido Factory

Hokkaido/Tohoku Block


Tohoku Plant
Miyagi Ohira Factory

Niigata Factory

Tochigi Factory

Kurobe Area

Hyogo Factory

Okayama Factory

Hokushinetsu/Chubu Block

Saitama MADO (window) Plant

Hiroshima Factory

Metropolitan Block

Saitama Factory

:Plant
:Factory

Kyushu Plant
Kumamoto Kosa Factory

Kansai/Chugoku /Shikoku Block

Mie Factory

Rokko MADO (window) Factory

Kanagawa Factory

Yamanashi Factory

New Saitama Factory

Shikoku Plant

2023.7 Commenced operation

YKK AP Okinawa Inc.

Kyushu Block

Kanehide Aluminum Industry Co., Ltd.

■ YKK AP 《Overseas Business Development》

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Advanced into overseas market since 1976

※as of end Mar 2024

Localizing business bases (11 countries/regions 20 companies)

※Red:Manufacturing Base

※Germany is not included in our current sales market as we do not have any sales operations there.
YKK AP (SHANGHAI) INTERNATIONAL TRADING CO.,LTD is not included in the numbers shown above as it was established in May 2024.

Company name (Current)	Est.	Company name (Current)	Est.
1. YKK AP SINGAPORE PTE.LTD.	1976	12. Bhoruka Extrusions Private Limited (India)	2013
2. YKK AP HONG KONG LIMITED	1982	13. YKK AP FACADE VIETNAM COMPANY LIMITED	2013
3. PT YKK AP INDONESIA	1986	14. YKK AP (THAILAND) CO.,LTD.	2015
4. YKK AP AMERICA INC.	1988	15. ERIE ARCHITECTURAL PRODUCTS INC. (Canada)	2019
5. YKK AP TAIWAN CO.,LTD.	1989	16. ERIE ARCHITECTURAL PRODUCTS USA, INC.	2020
6. DALIAN YKK AP CO.,LTD.	1999	17. YKK AP Technologies Lab (NA) Inc.	2022
7. YKK AP CO.,LTD.	2001	18. YKK AP CORPORATE SERVICES (THAILAND) CO., LTD.	2023
8. YKK AP (SUZHOU) CO.,LTD.	2002	19. YHS International Ltd. (Thailand)	2023
9. YKK AP (CHINA) INVESTMENT CO.,LTD.	2002	20. Siam Metal Co., Ltd. (Thailand)	2023
10. YKK AP FACADE PTE.LTD.	2008	21. YKK AP (SHANGHAI) INTERNATIONAL TRADING CO.,LTD	2024
11. YKK AP MYS SDN.BHD.	2011		

■ YKK AP 《Overseas Major Production Bases》

※as of end Dec 2023

2002 YKK AP (Suzhou) Co., Ltd.

Headquarters/Plant：Suzhou

1999 Dalian YKK AP Co., Ltd.

Headquarters/Plant：
Dalian

2019 Erie Architectural Products Inc.

Headquarters/Plant:
Canada Ontario

2001 YKK AP (China)Investment Co., Ltd.

Headquarters
/Plant：
Shenzhen

1988 YKK AP America Inc.

Headquarters：Atlanta
Plant：Dublin/Macon/Dallas/Cincinnati

2013 Bhoruka Extrusions Pvt., Ltd.

Headquarters/Plant：Mysore

1989 YKK AP Taiwan Co., Ltd.

Headquarters：
Taipei
Plant：
Yangmei

2023 YHS International Ltd.
Siam Metal Co., Ltd.

Headquarters：
Bangkok
Plant：
Samutsakhon

1986 PT YKK AP Indonesia

Headquarters
/Plant：
Tangerang

■ YKK AP 《Overseas Products》

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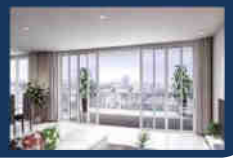
Developing, manufacturing, and selling products with assured quality and performance, tailored to local climate and culture

Secures basic performance against climatic condition

IWiN S
Aluminum Windows & Doors



(Thermal break aluminum profile) ***(Aluminum)***

Hurricane-resistant products (Vinyl)

STYLEGUARD®

YKK AP (CHINA) INVESTMENT CO., Ltd.

Bhoruka Extrusion Pvt. Ltd. (India)

YKK AP TAIWAN CO., Ltd.

YKK AP (THAILAND) Co., Ltd.
PT YKK AP INDONESIA

YKK AP America Inc.

Explosion-resistant products (Aluminum)

ProTek

Thermal Insulation Products (Vinyl & Aluminum)

enerGfacade
YKK AP Energy-Efficient Solutions

Large opening (Aluminum)

NEXSTA™

Water-tight products (Aluminum)

YRB-A Advance

■ YKK AP 《Major Domestic Achievements》

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〔November 2023〕 Nikkei Architecture

"Rankings of Preferred Construction Materials/ Equipment Manufacturers"

Residential Windows — **1st** for the **13th** consecutive yrs.

Residential Entrance Doors — **1st** for the **8th** consecutive yrs.

Commercial Windows & CWs — **1st** for the **19th** consecutive yrs.

〔September 2023〕 Kids Design Association

The 17th Kids Design Award
for the **12th** Consecutive Years

KIDS DESIGN AWARD 2023

Single-family home entrance door which automatically opens/closes with face recognition system
M30 Facial Recognition Automatic Door

Received the higher-tier award, the Encouragement Award: "KDA Chairman's Award" and also 2023 Japan Child Care Advocate Grand Prize

Kids Design Award URL: https://kidsdesignaward.jp/

〔October 2022〕 Japan Institute of Design Promotion

FY2022 GOOD DESIGN AWARD
25th Product

Interior door series "famitto"

GOOD DESIGN AWARD 2022

Also won Kids Design Award – 1st time for YKK AP

〔March 2024〕 Japan Aluminium Association

FY2023 Workplace Occupational Safety Awards

- Special Award of Excellence (5 locations)
  - Saitama Factory
  - Hokkaido Factory
  - Yamanashi Factory
  - Miyagi Ohira Factory
  - YKK AP Okinawa
- Award of Excellence (1 location)
  - Okayama Factory

Total 6 Locations

〔January 2023〕
Ministry of Economy, Trade and Industry, Japan

Gold Product Safety Companies

- FY2010, FY2014, FY2017 Minister of Economy, Trade and Industry Award
- Nov. 2017 Gold Product Safety Companies
- Jan. 2023 Gold Product Safety Companies (consecutive)

■ YKK AP 《Major Overseas Achievements》

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Products and businesses tailored to each country reap high praise

"Top 10 Window Brand List"
Awarded as the Best Brand
"YKK AP " is the only foreign company awarded for 9 years consecutive

China Architectural Metal Structure Association (March 2024)

9 yrs. in a row

China Real Estate Association
"Preferred Brand"

Real Estate Association (March 2024)

Selected 13 times in a row

Shenzhen City
"National Advanced Foreign Business"

Shenzhen City Chamber of Commerce (March 2023)

"BLT Built Design Awards"
in Construction Product
Wall & Isolation Systems and Materials

AP Product wins the award, selected by 40 experts in the Architecture and Design field

"T Series Entrance Systems"
(April 2023)

「WINDOW+DOOR AWARDS」
"Most Innovative Manufacturing Process"
(December 2023)

Residential business wins award from the National Glass Association's residential windows magazine

"2023 Top 10 Aluminum Products Manufacturers"

Selected as one of the TOP10 outstanding manufacturers of aluminum products from over 200 companies by "Industry Outlook," an authoritative trade magazine.
(February 2023)

Fine Manufacturer Association
"Top Brand"
1st Place in
Construction Materials Industry

12 yrs. in a row

Taiwan Architectural Aesthetics Culture & Economy Association (November 2023)

"Indonesia Brand Champion of the Year 2024"
Recognized by INFOBRAND.ID as a company/ brand that have received appreciation from parties nationally and internationally.

INFOBRAND.ID (January 2024)

"2024 National Waste Awareness Day"
Contribution in improved waste management recognized by the Regent of Tangerang and the Head of the Environmental Agency.

Tangerang Regency government (February 2024)

■ YKK AP 《Environmental Activity Achievements》

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YKK AP (March 2024)

Nine Consecutive Years: Recognized as an S-Class Company under the Act on the Rational Use of Energy

Organizer: Ministry of Economy, Trade and Industry
Outline: The system categorizes all businesses submitting periodic reports under the Act on the Rational Use of Energy into four tiers: S, A, B, and C. Companies attaining an annual reduction of 1% or more in the average basic unit for five consecutive years (the target) qualify for the S class.

Tohoku Plant

(March 2023)

Green Social Contribution Award

Organizer: Organization for Landscape and Urban Green Infrastructure
Sponsor: Ministry of Land, Infrastructure, Transport and Tourism
Outline: Achievements in environmental activities, such as regional contributions through public accessibility, biodiversity conservation, and the preservation of green spaces that serve as a national model.

YKK AP America Dublin Factory (June 2022)

KDLB 2022 Environmental Stewards Award

Organizer: Keep Dublin-Laurens Beautiful (KDLB)
Outline: The Dublin Factory was recognized for its proactive engagement in tree planting initiatives, spanning parks, green spaces, and municipal properties.

Kurobe Ekko Plant

Toyama Prefecture Certifies YKK AP as Eco-friendly Business Entity

Organizer: Toyama Prefecture, Japan
Outline: Toyama Prefecture certifies business establishments actively engaged in waste reduction, recycling, and environmentally friendly business activities.

富山県認定
エコ事業所

YKK AP (April 2023)

Certified as Eco-First Company

ECO FIRST

Organizer: Ministry of the Environment
Outline: The Minister of the Environment certifies advanced, unique and industry-leading business activities in the environmental field.

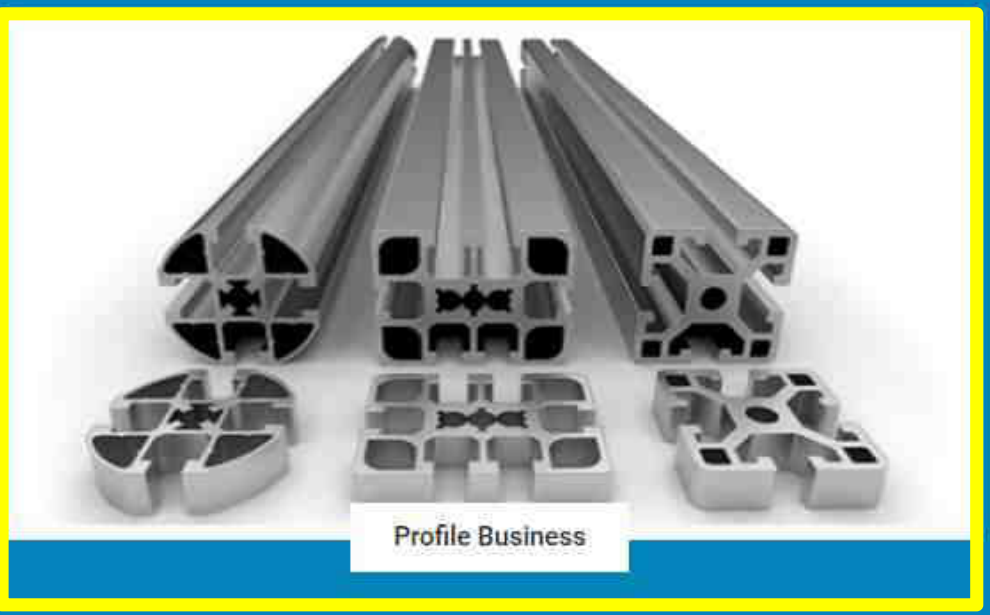
YKK AP China (November 2022)

Certified Green Building Materials in China

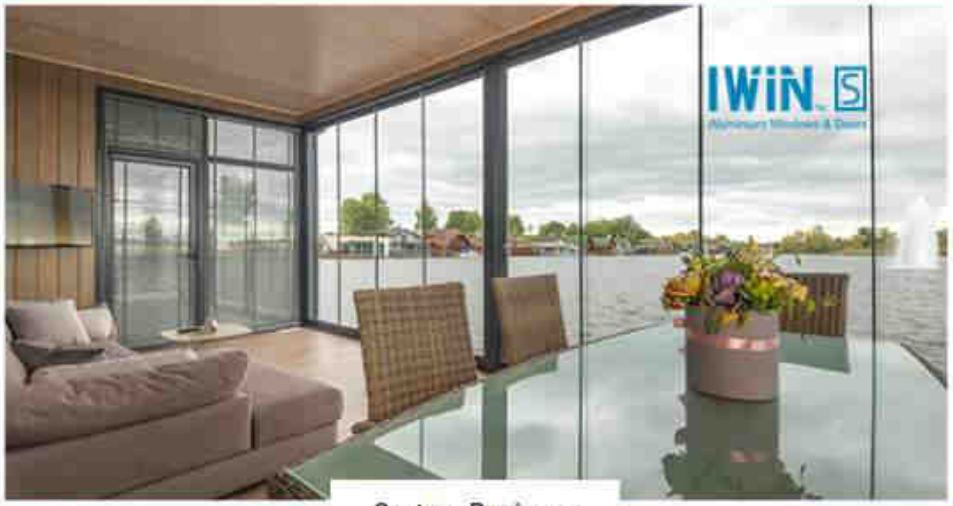
<Certified Products>
・Aluminum profiles (Anodized)
・Thermally broken Aluminum profiles (Anodized)

Organizer: China Academy of Building Research
Outline: Certified based on four aspects, resource use, environmental protection, energy, and quality, throughout the entire product life cycle.

Bhoruka Extrusions Profile Business – System Business



Profile Business



System Business

OUR STORY

Established in 1979, Bhoruka Extrusions Private Limited specialises in developing custom made-to-order aluminium extrusions, products and associated services. By providing a high degree of technology-enabled value creation, we are continually striving to become the preferred supplier to our customers. From 1st June 2013 to 16th November 2020, we were a 100% subsidiary of YKK Holding Asia Pte. Ltd., Singapore and starting 17th November 2020, we are a 100% subsidiary of YKK AP Inc. Japan.

Plant & Equipment at BEPL

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- Billet Casting
- Die Manufacturing
- Extrusion
- Anodising
- Powder Coating
- Machining
- Components

TECHNICAL FACT SHEET			
Parameters	**Press-1**	**Press-2**	**Press-3**
MAKE	**Weau United (USA)**	**Year Chang (Taiwan)**	**Cheng Hua (Taiwan)**
Strength of extrusion press (TONS)	1800	1100	2750
Diameter of billet	203 mm	152 mm	228mm & 203mm
Diameter of container	210 mm	158 mm	236mm & 210mm
Diameter of main Cylinder - Inches	37	29.5	44.48
Diameter of small Cylinder - Inches	9	7.087	9.09
Maximum pressure of Press (BAR)	210 BAR	210 BAR	230 BAR
Mark of Billets	6063, 6005, 6105, 6061		6063, 6060, 6101, 6005, 6351, 6061, 6082
(6063-6060)			
Conveyor Length	36Mtrs.	36Mtrs.	50.90 Mts
Type of Billet Oven (gas, diesel, induction)	Hot log shear	Induction	Hot log shear
Type of Puller	Track type	Track type	Track type

TOOL ROOM	
Die types	Solid, Hollow, Semi-hollow
Dia CCD	Solid – 254mm; Hollow-230mm
# of sections	>14,000
Lead Time	Solid - 15 days; Hollow - 21 days

BHORUKA ANODISING	
Make	Italtecno, Italy
Microns	5 to 25
Colors	Silver, Champagne, Bronze , Black
Maximum Length	6400 mm
Finish	Matt, Brush

BHORUKA POWDER COATING	
Pre - Treatment	Chemetall, Germany
Powder Coating	Nordson , U.S.
Spray System	Automatic
Thickness Range	60 To 120 Microns
Colors	All RAL Shades
Type	Metallic / Non Metallic
Gloss	High Glossy, Semi Glossy, Matt
Finish	Plain, Texture, Structure
Max Length	7500 mm

MACHINING	
Machining Centres	FMC 340, Blitz Alva-550 Double Head Cutting
Make	FOM Industries, Italy
Operations	Milling, Drilling, Boring, Countersinking, Angle Cutting, Turning & Tapping

Chemical & Mechanical Composition

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Chemical Composition as Per EN 573-3:2007									
Alloy	Si	Fe	Cu	Mn	Mg	Cr	Zn	Ti	Aluminium Min
6063	0.20-0.60	0.35	0.1	0.1	0.45-0.90	0.1	0.1	0.1	Remainder
6060	0.30-0.60	0.10-0.30	0.1	0.1	0.35-0.60	0.05	0.15	0.1	Remainder
6061	0.4-0.8	0.7	0.15-0.4	0.15	0.8-1.2	0.04-0.35	0.25	0.15	Remainder
6005	0.6-0.90	0.35	0.1	0.1	0.40-0.60	0.1	0.1	0.1	Remainder
6105	0.6-1.0	0.35	0.1	0.15	0.45-0.8	0.1	0.1	0.1	Remainder
6082	0.7-1.3	0.5	0.1	0.4-1.0	0.6-1.2	0.25	0.2	0.1	Remainder
6101	0.30-0.7	0.5	0.1	0.03	0.35-0.8	0.03	0.1	0	Remainder
6351	0.7-1.3	0.5	0.1	0.40-0.8	0.40-0.8	0	0.2	0.2	Remainder

Mechanical properties as per DIN 755-2/IS-1285			
Alloy/T6	Tensile Strength, *min* MPa	Proof Stress *min* MPa	Elongation A50mm *min* in %
6060	185	150	7
6101	200	170	8
6063	185	150	7
6005	255	200	15
6105	260	240	8
6061	290	235	7
6351	295	255	7
6082	295	255	7

Tempers:

- T4-Solution heat treated & naturally aged
- T5-Cooled from hot working and artificially aged (at elevated temperature)
- T6-Solution heat-treated & naturally aged.

One of the Largest Integrated Plant's in India

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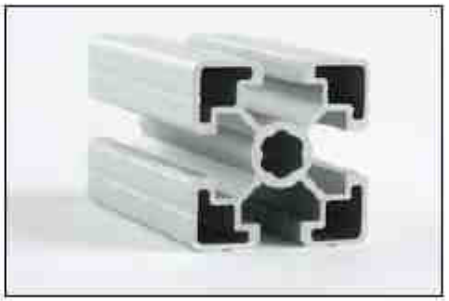
- **Extrusion**

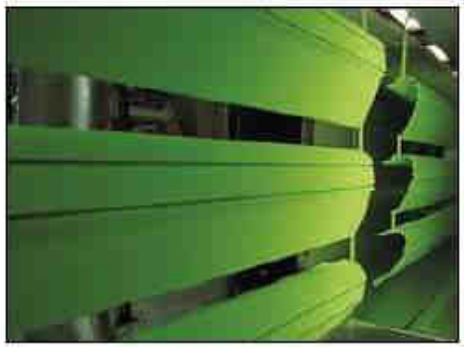


- **Billet Casting**

- **Die Tooling**

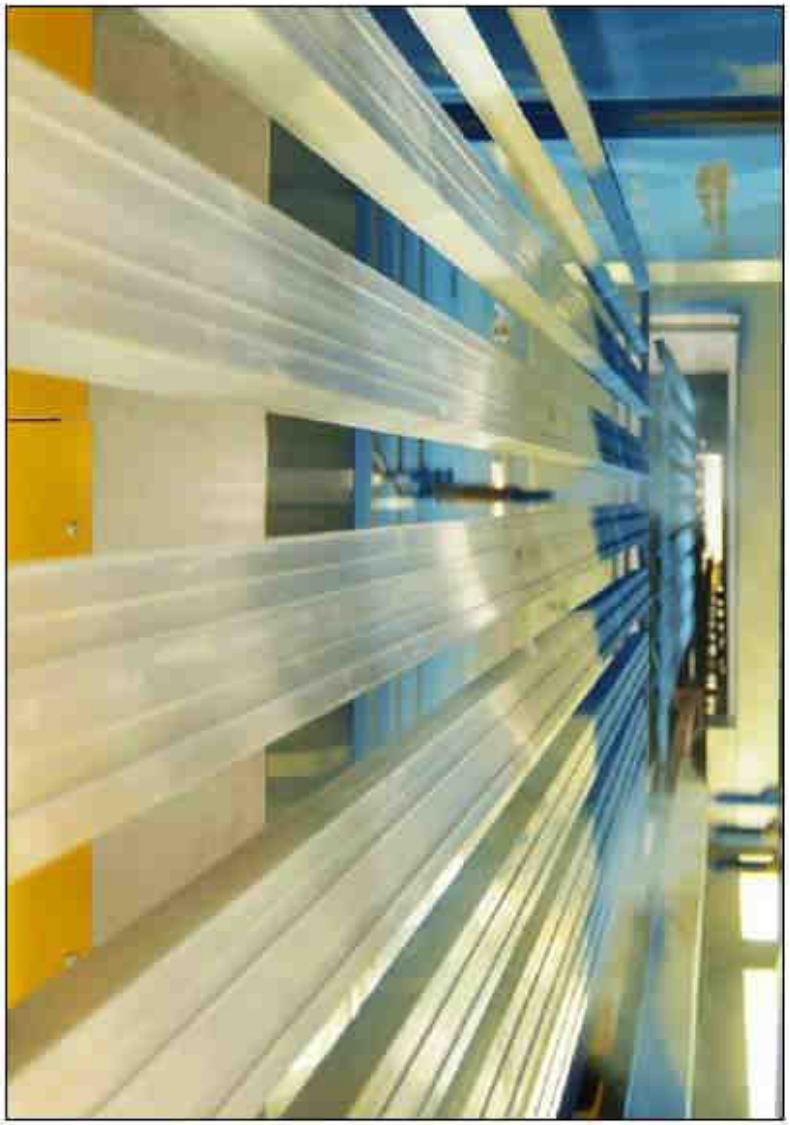
- **Anodizing**

- **Powder Coating**



- **Components**

Quality



- Percentage on complaints is at all-time low! Well below industry norms
- Rework percentage was very low and achieved the lowest plant rejection rate of 3.5 % last year
- Customer rejection is less than 0.27%

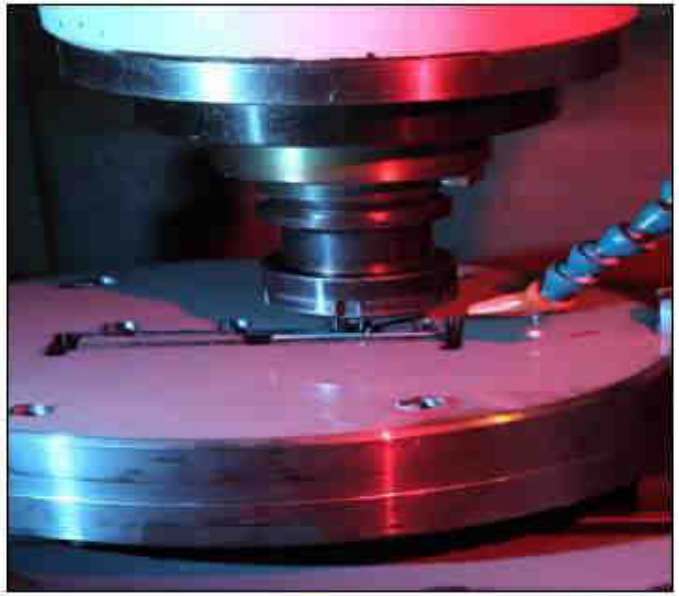
"No QC teams are needed, every process has QC inbuilt"

Mr. Mohan H C

Quality control

>14,000 customizing choices

BHORUKA
A YKK AP COMPANY



- With state of the art technology with latest machinery like CNC wire cutting, surface grinding etc, which helps improving die quality
- R&D is intrinsic to our process, we design exactly to your need
- We are consistently developing ~100 dies/month of which 75% are for new shapes

With our 3D-printing technology our customers can test the product for snap/slide fitment or gasket development prior to die manufacturing

- FFF printing technology with auto platform calibration.
- Print up a 60-micron resolution with a 0.25mm nozzle.

Servicing Industries Related to

BHORUKA
A YKK AP COMPANY

Building and Construction

We are one of the **largest direct-sales suppliers** to **the building and construction sector** in India and offer various products ranging from Doors, Windows, Railings, Formwork, Shutters, Curtain Wall systems and more in a wide variety of shapes, sizes and finishes! Our value offerings can be broadly categorised as follows -

Catalogue

Our catalogue contains more than 10,000 sections that Bhoruka has developed by virtue of being in the industry for more than 40 years. It offer a wide variety of readily available designs from various industries and sectors for you to choose from

Made-to-order

Drawing from our vast experience, our Design and Engineering department excels at meeting specific customer requests as per the needs and demands of various projects and helps in turning your vision into reality

Systems

We have the unique distinction of being the only extruder in India associated with many globally reputed systems such as Airclos, AluK, Dorma, EFP, Schueco to name a few. We will be delighted to offer their range of products through authorised channels

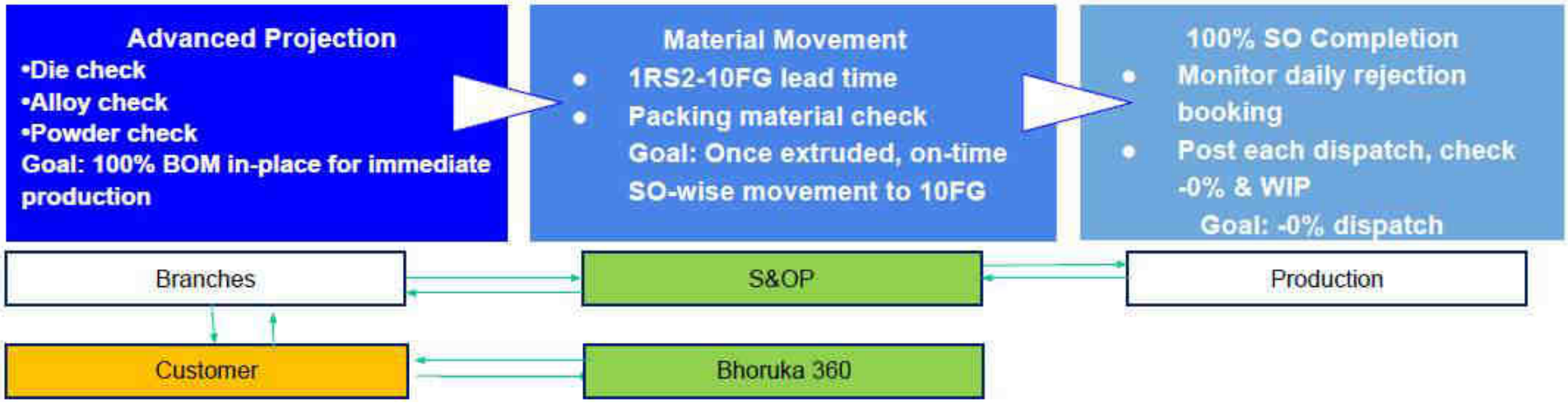
E-Catalogue Online self-updating catalogue with unique set of features

- Get instant access to thousands of profiles listed by different categories/sub-categories
- View product images & description along with other details
- Download drawings in PDF format right on your computer
- Send us an enquiry with complete details directly from the software
- Search by 'section number'
- More than 50 designs automatically added every month right on your computer
- Choose from our on-line as well as off-line module for on-the-go work

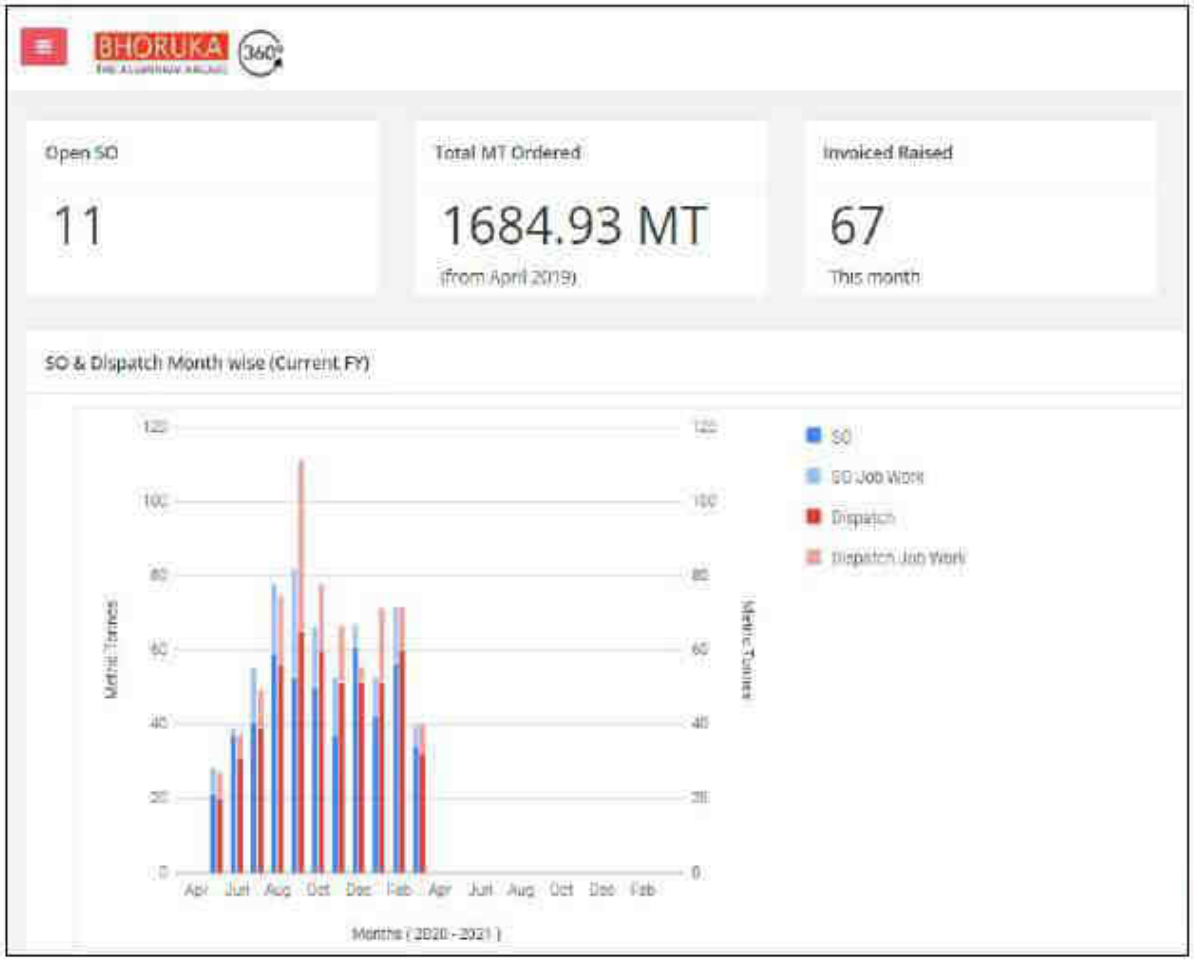
Key Features of buying from Bhoruka

BHORUKA
A YKK AP COMPANY

Factor	Bhoruka	Competitor	BEPL-Advantage
SO Release	Pieces	Kgs	Matches with FAB Cutting-list software
Weight Measurement	Drawing Mean Weight	Actual Weight	Matches with Tender weight, PO-Invoice consistency, ~3.5% savings on powder weight
Dispatch Tolerance	1-1000 pcs (-0%+5%)/ >1000 pcs (-0%+2%)	+/- 10% in Kgs	Reduced inventory and less total cost
Matching Section	@Aging and Invoice blocked	No check	Reduced inventory at customers
Order Status	Online	NA	Customer can track PO-Invoice online
Est Dt Dispatch	E-Planner (March 2019)	MS Excel	Customers can plan operations based on estimated date of dispatch



Leveraging on Technology – Bhoruka 360 & E-planner



- Industry-first CRM Module Bhoruka 360 for customers (100% automated via SAP)
- Invoices, test certificate and packing list are readily available in the portal
- Live updates on your orders are made available
- Real-time order status and expected order completion dates
- PO Upload, PI Approval and Ticketing system to raise the Quality Complaints
- Financial Ledgers of Transactions executed with Bhoruka Extrusions are made available

"Multi-dimensional operational metrics gives me a 360° view"

Mr. Mathew Shijoy

Ms. Suma S

Bhoruka Extrusions Profile Business – System Business

Profile Business

System Business

OUR STORY

Established in 1979, Bhoruka Extrusions Private Limited specialises in developing custom made-to-order aluminium extrusions, products and associated services. By providing a high degree of technology-enabled value creation, we are continually striving to become the preferred supplier to our customers. From 1st June 2013 to 16th November 2020, we were a 100% subsidiary of YKK Holding Asia Pte. Ltd., Singapore and starting 17th November 2020, we are a 100% subsidiary of YKK AP Inc. Japan.

Aluminum Windows & Doors

IWiN™

Quality with a Difference

IWIN™ S

India window "S"tandard

Setting Standards of Residential Fenestration Quality in India

IWIN-S is aiming to be India window "s"tandard

High-performance tested products

makes your comfortable living space

IWIN™ E

IWIN-E "E"levates your life

Reliable Quality with reasonable price for the window area

IWIN-E "e"levates your life space

with reasonable price

System product is no longer

only for Super high-end projects

Step inside your space of peace
Where calm and comfort never cease
Style and safety hand in hand
Transform indoors, make it grand
IWIN makes you quite the winner
With windows that…

ELEVATE
THE INNER
IWIN™

☐ IWIN S Product Line Up

IWIN-S Typologies			Wind Load	Water Tightness	Glass Type
IWIN-S	Sliding	2T + 2S/4S	2500Pa (2T4S)	350Pa (STEP SILL)	SGU(18mm groove) DGU(32mm groove)
		2.5T + 2S/4S	2500Pa (2T4S)	600Pa (2T2S with bigger bottom sill)	SGU(18mm groove) DGU(32mm groove)
		3T + 2S (1 Fly Screen)	2500Pa	350Pa (STEP SILL)	SGU(18mm groove) DGU(32mm groove)
		3T + 3S / 6S	2500Pa	350Pa (STEP SILL)	SGU(18mm groove) DGU(32mm groove)
		3.5T + 3S / 6S	2500Pa	600Pa (3T3S with 600PA bottom sill) 350Pa (STEP SILL)	SGU(18mm groove) DGU(32mm groove)
	Single Sliding	1T + 1S / 2S (1 FIX)	2500Pa	350Pa	SGU(18mm groove) DGU(32mm groove)
		+ Integrated Railing	2500Pa	350Pa	*Railing SGU(18mm groove)
	Corner Sliding	2T + 4S 3T + 6S	2500Pa	N/A	SGU(18mm groove)
	Big Opening	2T + 4S 3T + 6S	2500Pa	200Pa (STEP SILL) 150Pa (FLAT SILL)	SGU(18mm groove) DGU(32mm groove)
	Slim Type	2T + 2S	800 Pa	200Pa (STEP SILL) 150Pa (FLAT SILL)	DGU(32mm groove)
	Casement		2500Pa	350Pa 600Pa	SGU(18mm groove) DGU(32mm groove)
	Top Hung		2500Pa	350Pa	SGU(18mm groove) DGU(32mm groove)
	FIX		2500Pa	350Pa	SGU(18mm groove) DGU(32mm groove)
	Door		2500Pa	350Pa	SGU(18mm groove) DGU(32mm groove)

☐ IWIN E Product Line Up

IWIN-E Typologies			Wind Load	Water Tightness	Glass Type
IWIN-E	Sliding	2T + 2S / 4S	1600PA	N/A	SGU(18mm groove)
		2.5T + 2S / 4S	1600PA	N/A	SGU(18mm groove)
		3T + 2S (1 Fly Screen)	1600PA	N/A	SGU(18mm groove)
		3T + 3S	1600PA	N/A	SGU(18mm groove)
		3.5T + 3S / 6S	1600PA	N/A	SGU(18mm groove)
	Casement		1600PA	N/A	SGU(18mm groove)
	Top Hung		1600PA	N/A	SGU(18mm groove)
	FIX		1600PA	N/A	SGU(18mm groove)
	In - Casement		1600PA	N/A	SGU(18mm groove)
	Louvers		1600PA	N/A	
	In - Fly Screen		N/A	N/A	

Aluminum Windows & Doors

Grand Concept

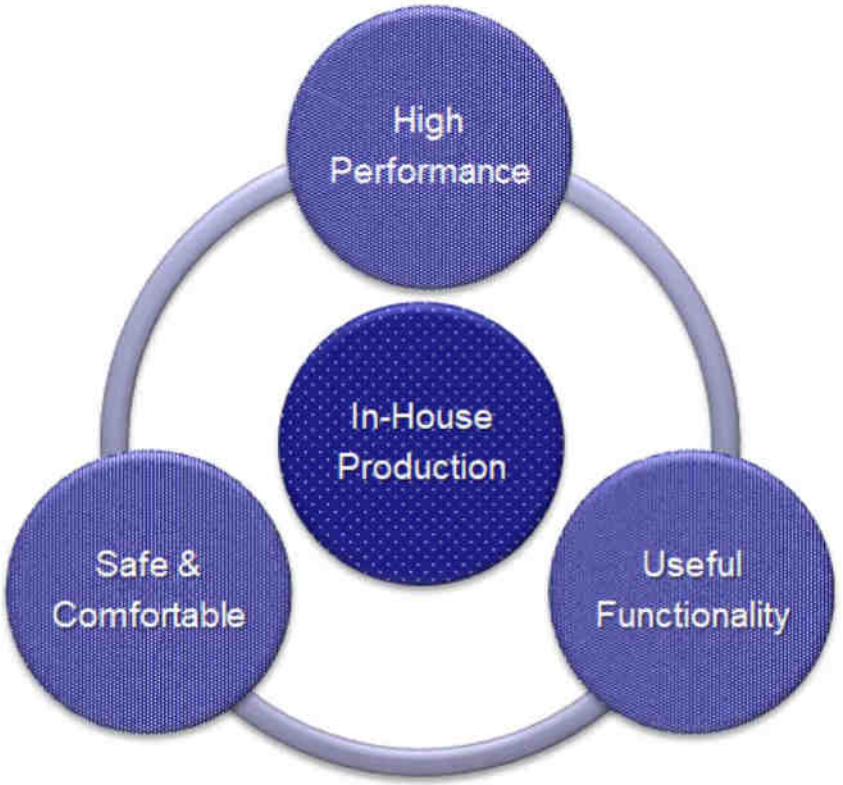
YKK AP presents operational excellence built up around the world combining research and development through detailed study of the climate and characteristics of each region, to conceptualize new ideas creating comfortable environment for the people residing.

Product Characteristics

IWiN S

Quality with a Difference

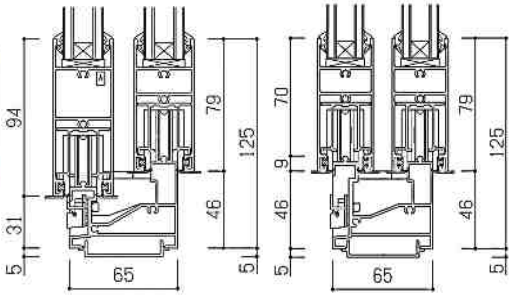
Setting Standards of Residential Fenestration Quality in India



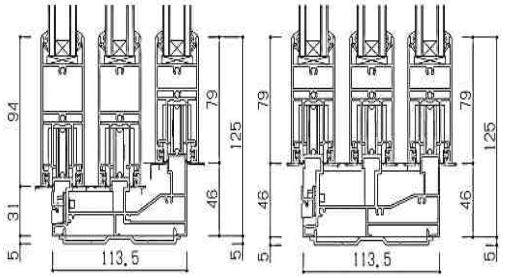
☐ Product Line Up

Sliding – 1

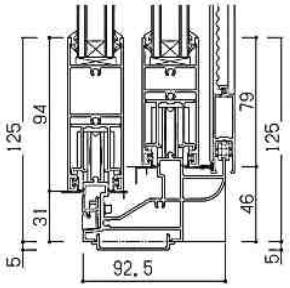
Sliding 2 Track 2/4 Shutter



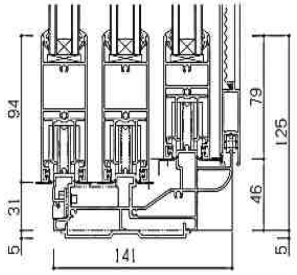
Sliding 3 Track 3/6 Shutter



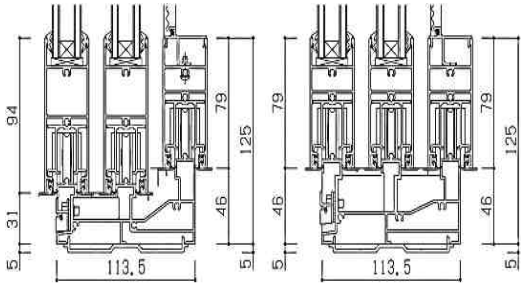
Sliding 2 Track 2/4 Shutter + 1 Fly Screen



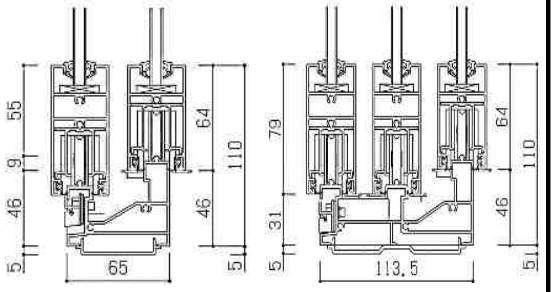
Sliding 3 Track 3/6 Shutter + 1 Fly Screen



Sliding 3 Track 2/4 Shutter (1 Fly Screen Shutter)



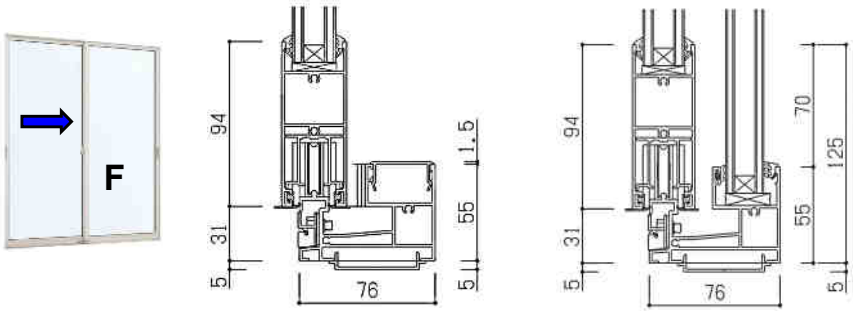
Sliding Window 2 Track 2/4 Shutter, 3 Track 3/6 Shutter



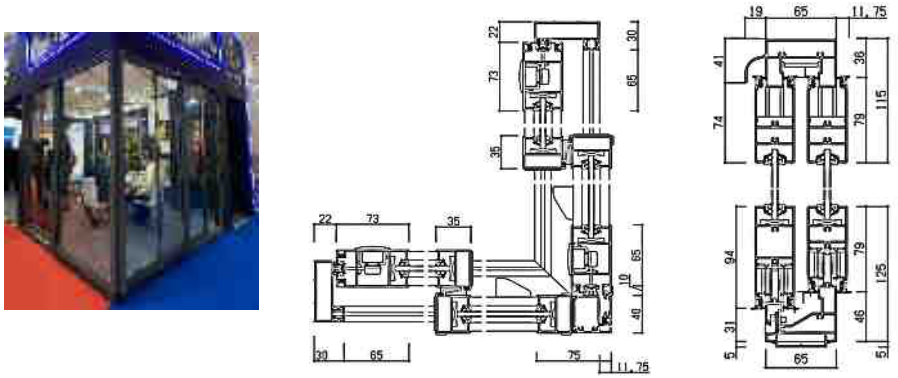
☐ Product Line Up

Sliding – 2

Single Sliding 1T 1S / 1T 2S



Sliding 90 degrees Sliding 2T 4S / 3T 6S



Fixed

Fixed

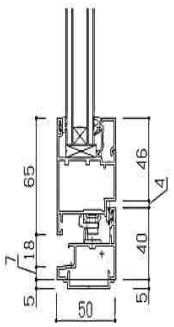
Casement / Top Hung

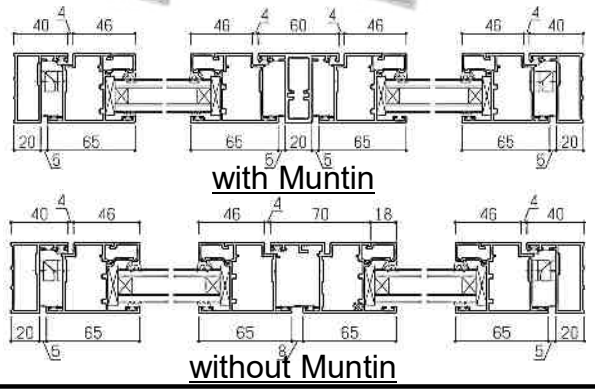
Casement

Top Hung

Casement with Muntin

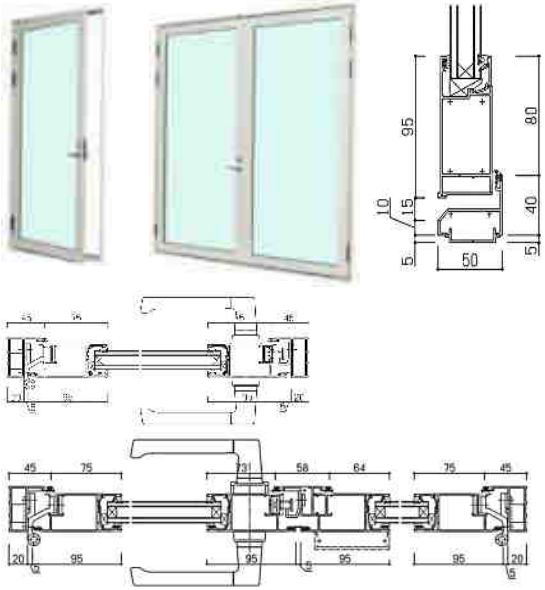
Casement without Muntin





Door

Door Single / Double

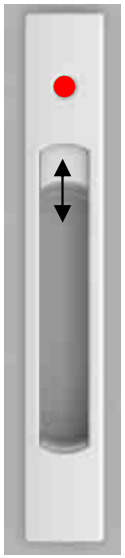


☐ Sliding - Various Options -

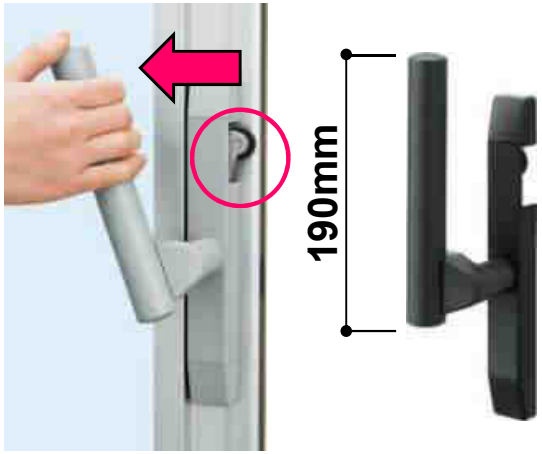
● Solid Hook Lock
[Default]

Unlock

Lock

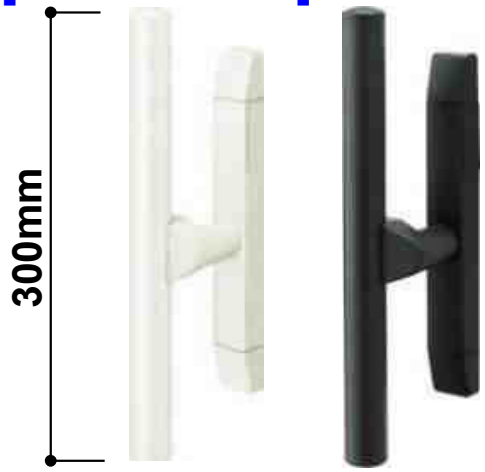


● Support Handle
[Value Added]



● Support Flush Handle
[Value Added]

● Large Handle
[Value Added]

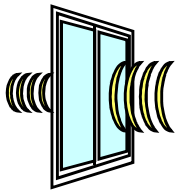


● Multipoint Lock Handle
[Value Added]

● Japanese Crescent Lock
[Cost Reduction]

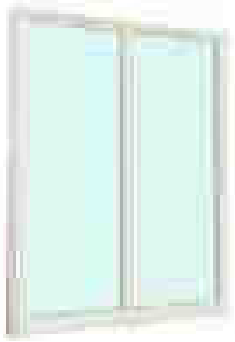
Performance & Size Limitation

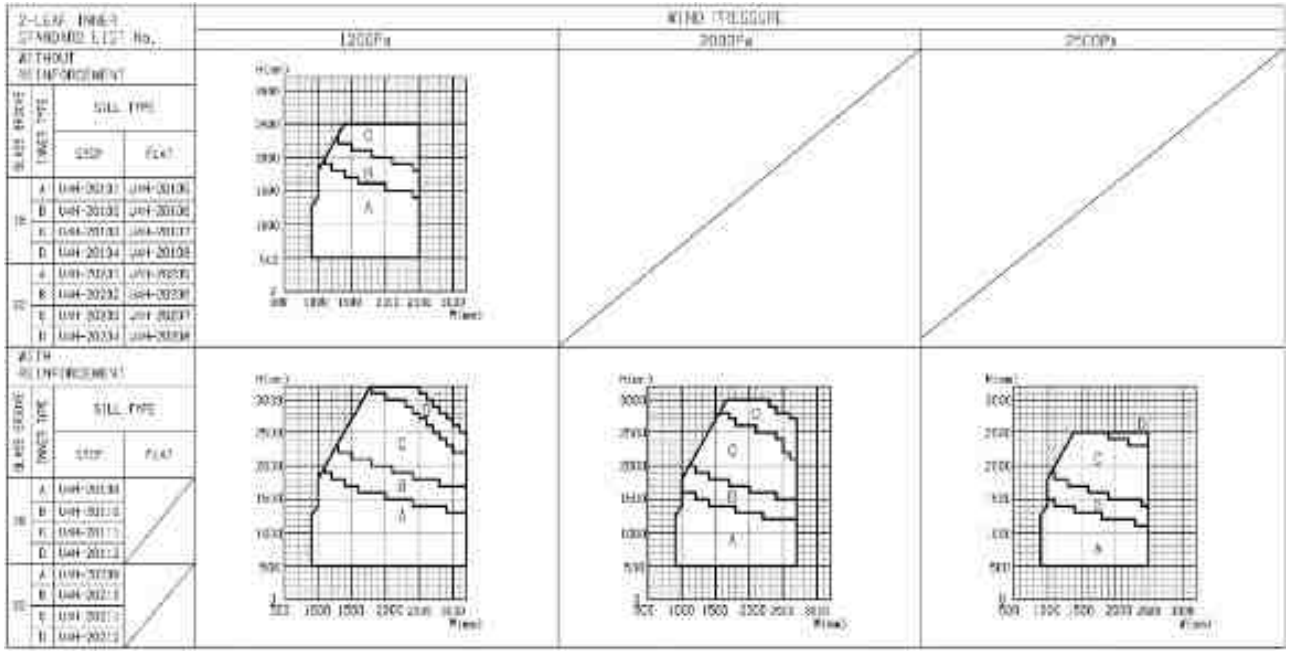
☐ Performance

Structural (Wind Load)		2500 Pa Deflection: 1/175 [ASTM E 330]	Sound Insulation		GradeT-2 [30dB] [JIS A 1416]
Air Infiltration		1.12m³ / (h·m²) Maximum at 75 Pa [ASTM E 283]	Open-Close Testing		10,000 Cycle No Damage [JIS A 4706]
Water Tightness		350 Pa / 300 Pa [ASTM E 331·547]			

Tested System with Basic Performance
Safety and operation measures are considered to create a comfortable living environment

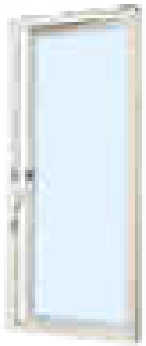
☐ Size Limitation
(e.g. 2T2S)

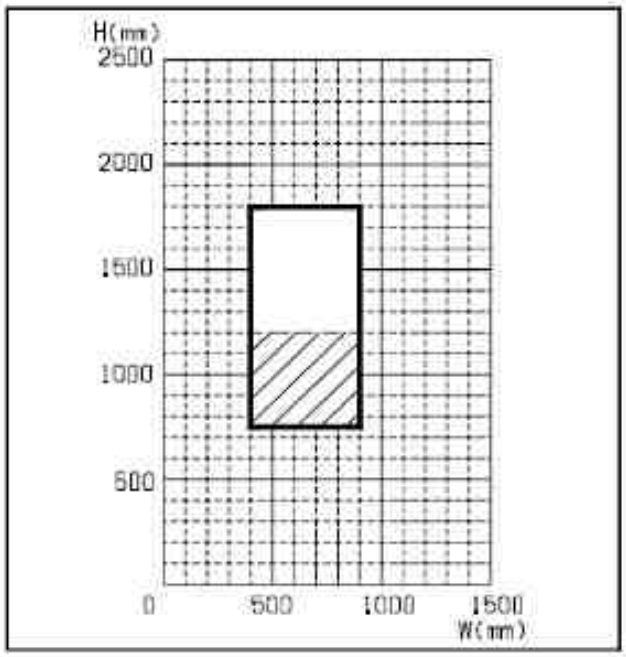




☐ Size Limitation

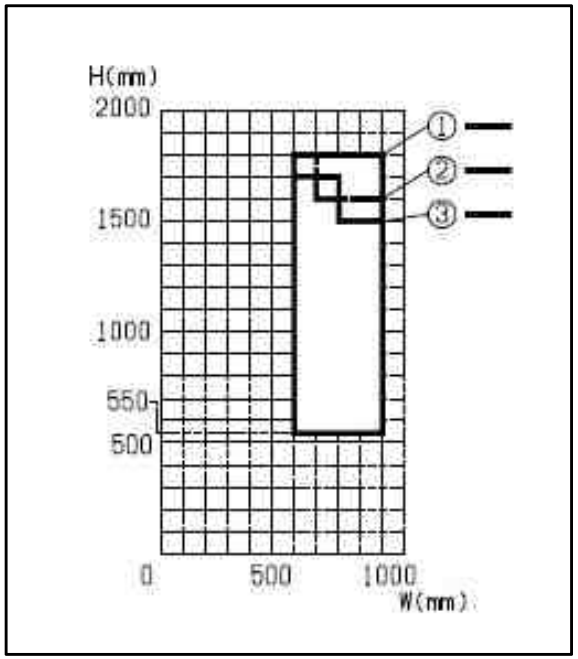
Casement





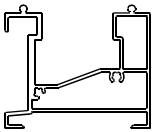
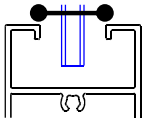
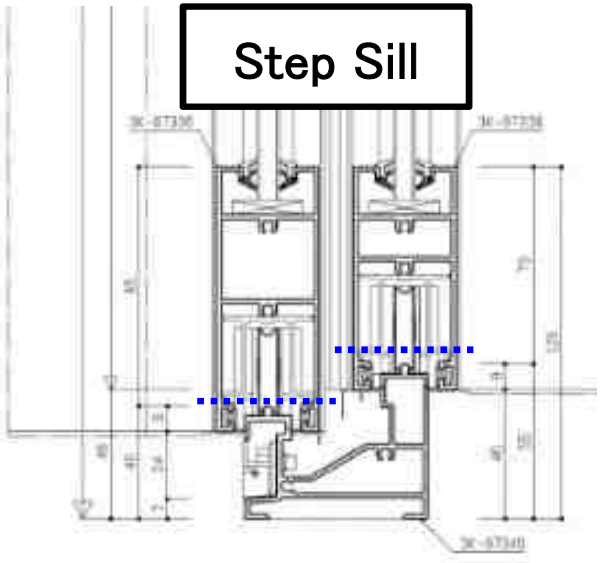
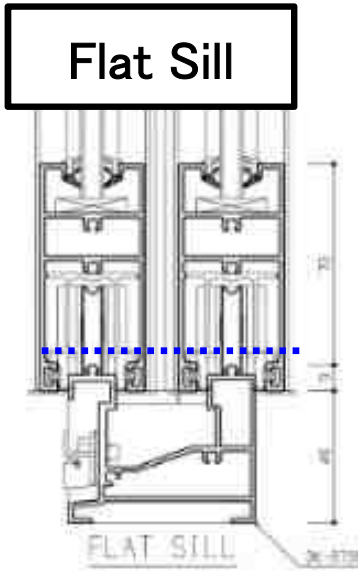
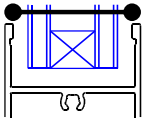
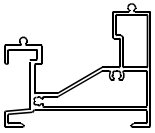
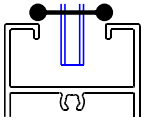
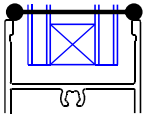
※Hatched area can't install safety stopper

Top Hung



NO.	PRESSURE (Pa)
①	1200
②	2000
③	2500

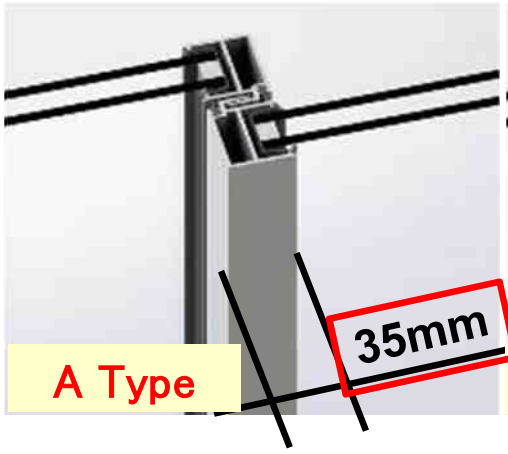
☐ Product Matrix for Sliding

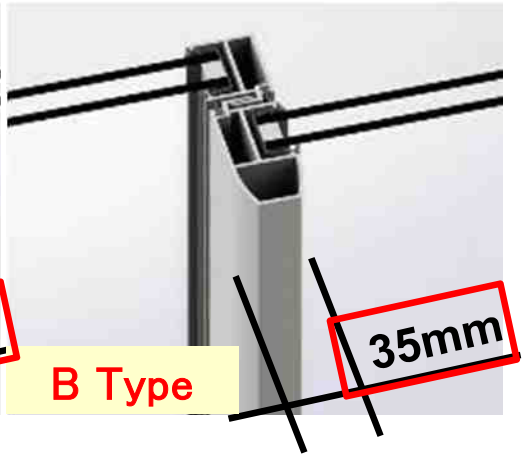
Water Tightness	Glass Type	Wind Pressure						
		1200Pa			2500Pa			
		Type A	Type B	Type C	Type A	Type B	Type C	Type D
								
300 Pa  FLAT SILL	18mm 							
	32mm 							
350 Pa  STEP SILL	18mm 							
	32mm 							

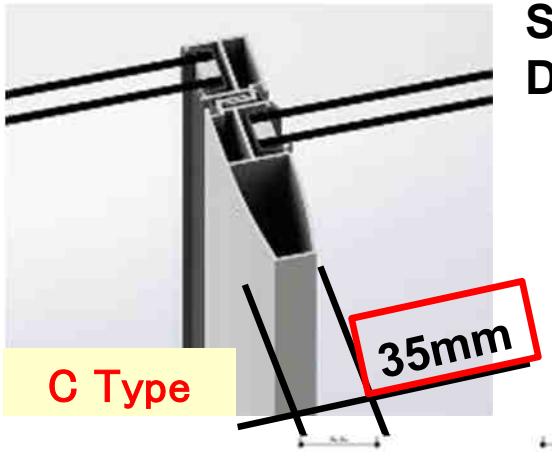
SGU : Glass thickness 5, 6, 8 10 mm
DGU : Glass thickness 22, 23, 25, 26 mm

Profile Shape

□ Profile Size

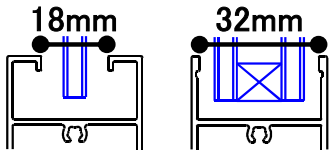


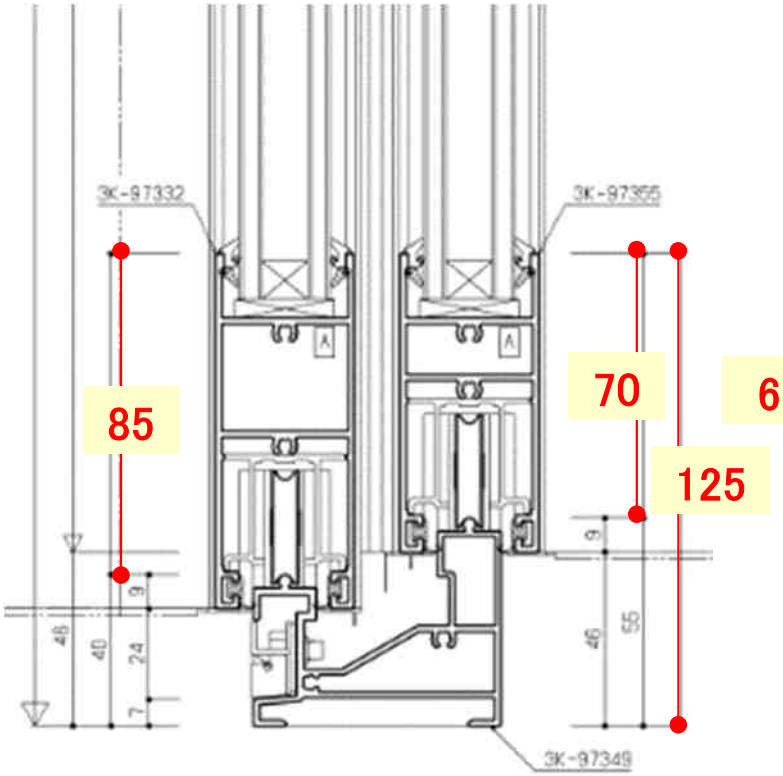


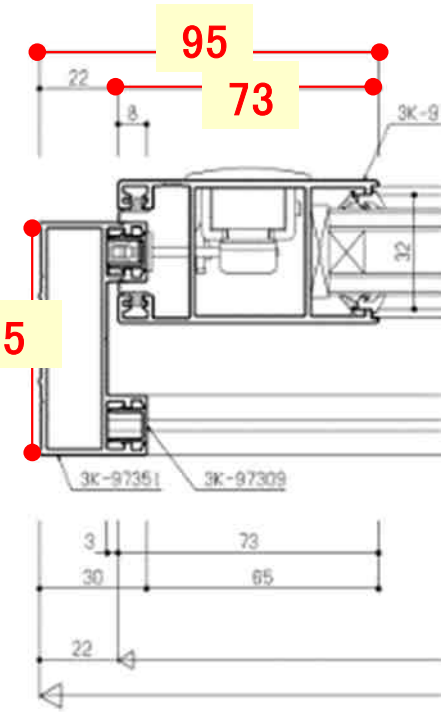


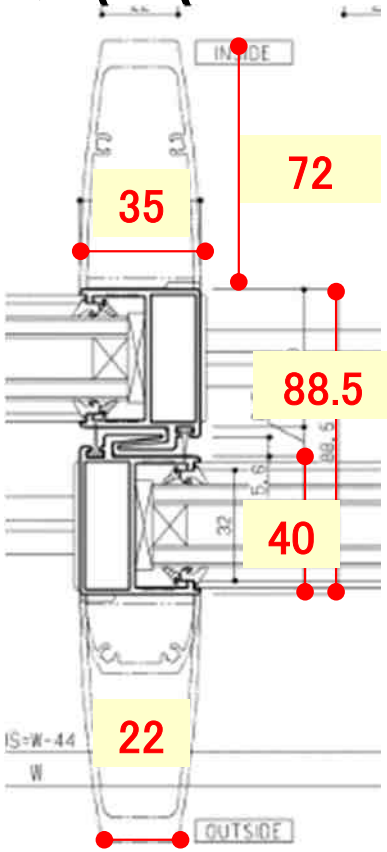
□ Glass Thickness

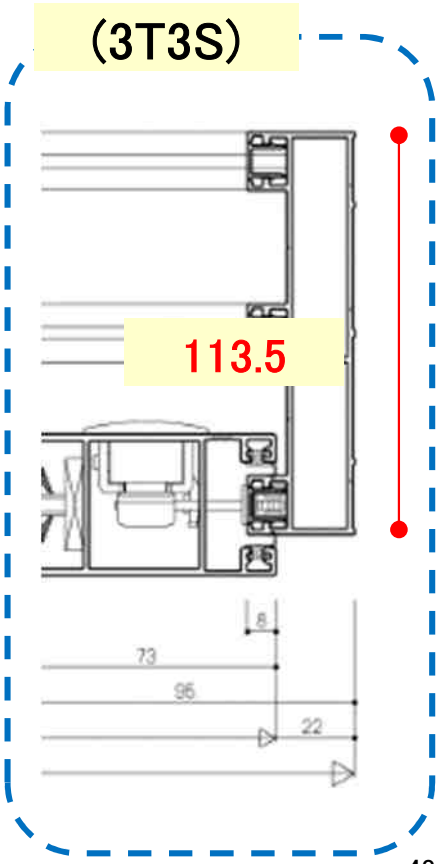
SGU : 5, 6, 8 10 mm
DGU : 22, 23,
24, 26 mm







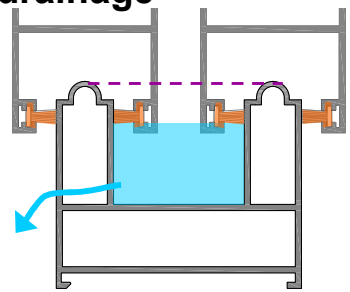




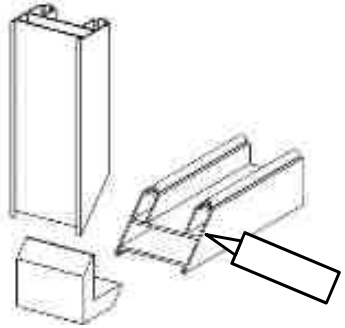
☐ Water Tightness Performance

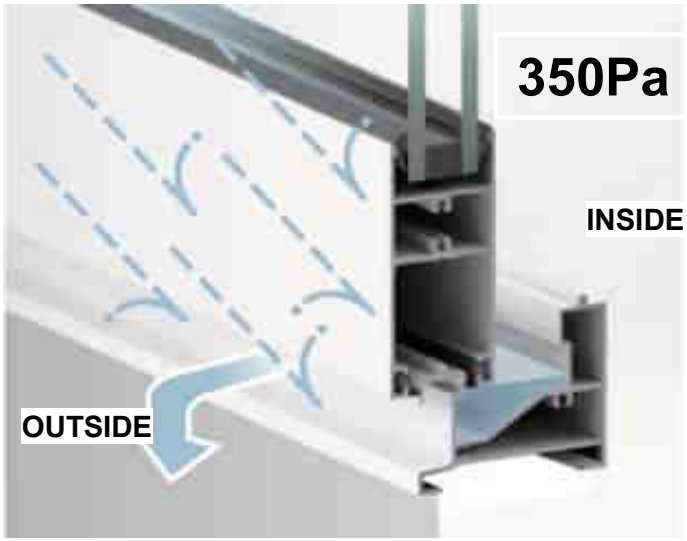
● Conventional Sliding Windows

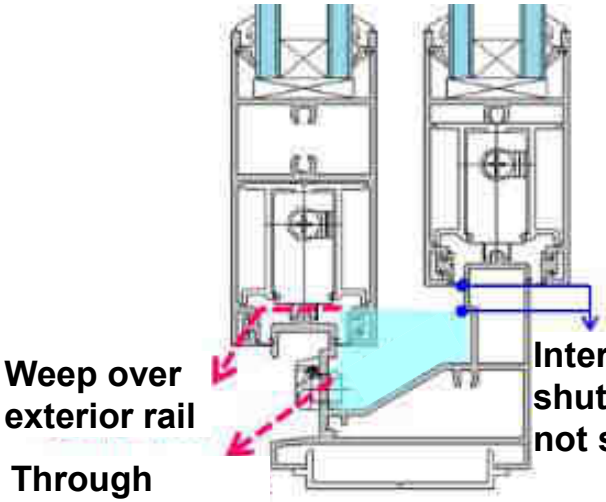
- The height of both interior and exterior rails are equal resulting in poor drainage



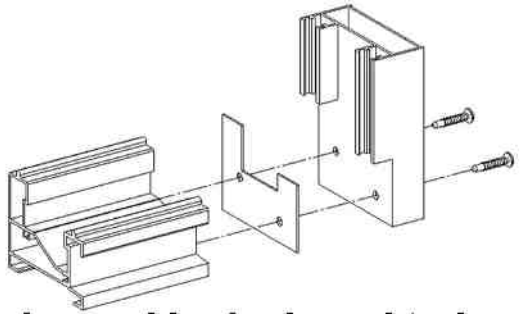
- Mitre joint frame corners result in low water tightness due to unstable sealing





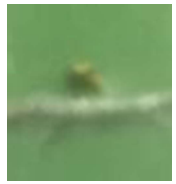


By using YKK AP's unique step system structure, where the height of outside and inside rail is different, provides superior drainage, ensuring stable water tightness of 350Pa.



Sealer pad is designed to keep water from entering and give sufficient water tightness

Watertight performance is tested for 15minutes under 3.4L/min/㎡ sprayed water based on ASTM



3.4L/min/ ㎡

2L/min/ ㎡

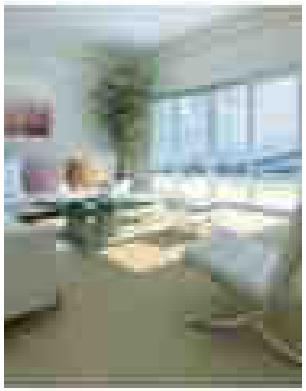
Ref. EN-1027 2L/min/㎡ over 50Pa

Step Sill achieves Water Tightness of 350 Pa

☐ Noise Level

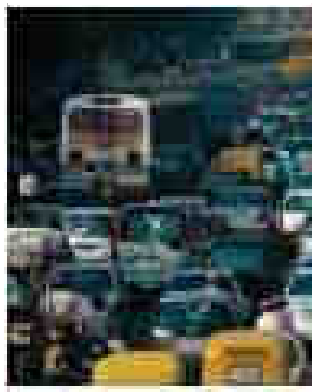
● The Standard of Noise Level and Noise Environment

Inside



50dB

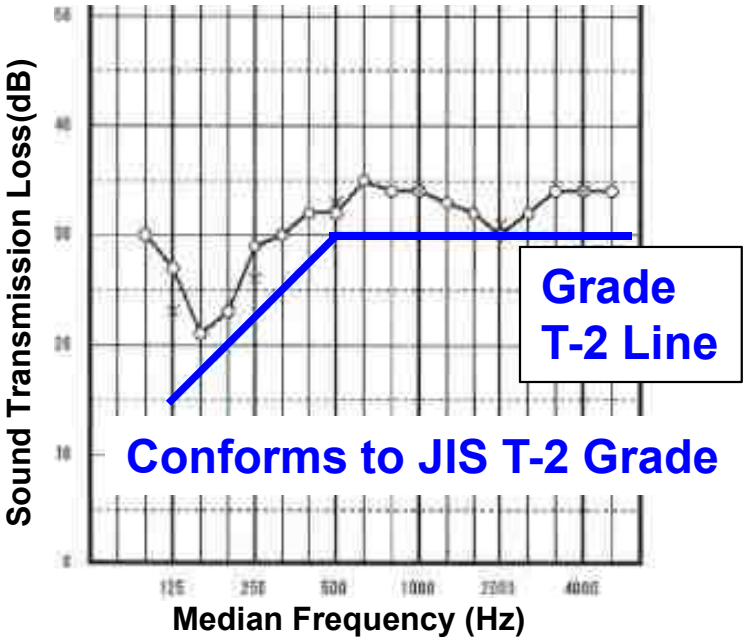
Outside



80dB

● IWIN-S Sound Insulation Test Result

【Test Specimen】
Sliding 2 LEAF
D Type
W 2500 × H 2500
Glass: FL6+A12+FL8



Noise Level (dB)	30	40	50	60	70	80	90
Environment	Nighttime in Suburban Area	Quiet Park	Quiet Office	Shops	Street Corners	Streets	Railways Airports
Sense of Noise	Quiet	Ideal Living Environment		Noisy		Extremely Noisy	

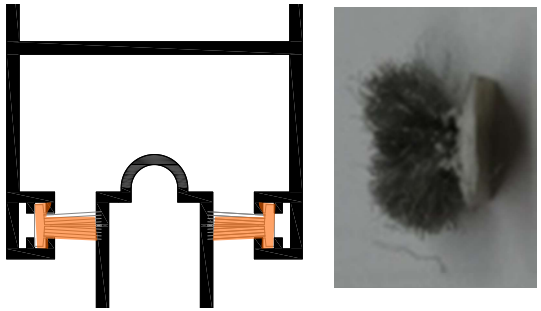
Outside noise level is reduced, creating a peaceful and quiet living environment

☐ Airtight Structure (Ex. Sliding 2 LEAF)

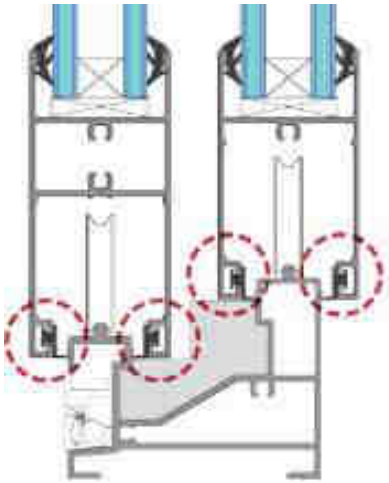
【Conventional Window】

● **Airtight Seal**

Wool pile are used for airtight seal.



Wind stoppers with layers keep the balance of air / water tightness and ensure smooth operation.
(Top & bottom interlocking stiles)



Rubber AT materials are placed in both inside and outside

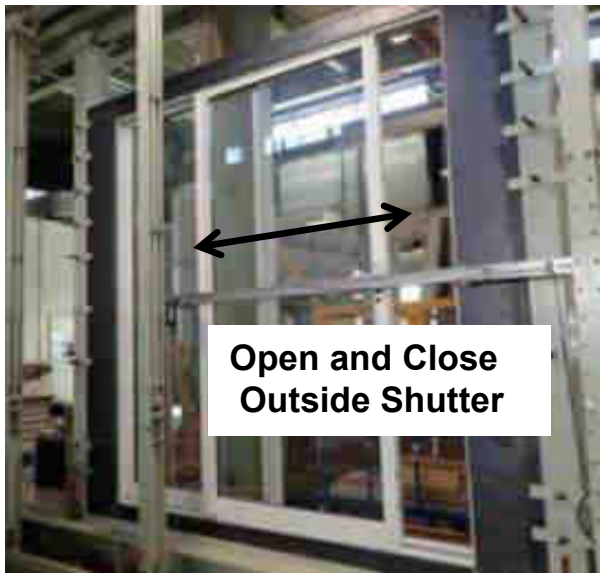
The cap at the bottom blocks sand and dust from coming in (Inside & outside)

Gaps are minimized by using various YKK AP accessories (AT Material, Wind Stopper) to assure airtight, water tight, and sound insulation performance

☐ Open – Close Durability Testing

● Ex. Test Specimen

Size: W 2,500mm × H 2,500mm
Glass: Double Glazing FL6+A12+FL8
Weight of Door Leaf : 103.6 Kg (Outside)



■ Test Result

After 30,000 times of opening and closing, there were no disorder for operation ⇒ Pass

Equivalent of 10 Years Usage (8 times open and closing per day)

● Quality Rollers for IWIN-S

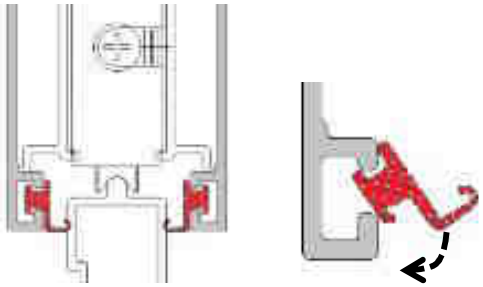
The double roller supports to equalize the load for heavy door leaf

Single Roller
[Standard]
(≦80Kg)

Double Roller
[Standard]
(＞80Kg)

● Ease of Maintenance

Considering long term use, the system is designed to replace accessories with ease.



AT materials can easily be replaced without special tools

Rollers can be replaced without dismantling the shutters

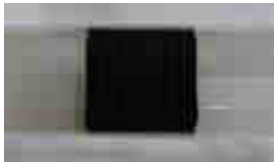
YKK AP conducts in-house testing for durability & operation, maintaining high quality and performance that lasts for a long period of time

High Quality Accessories Made by YKK AP

Anti-Lift Device

Stile Cap

Hook Lock



Wind Stopper

Pulling Piece

Large Handle (Optional)

Support Handle (Optional)

Stopper

Safety Stopper

Friction Stay

Handle

High quality accessories of IWIN-S are designed to maintain high performance, trouble-free, and long-lasting easy operation

Performance of Basic and Optional Accessories

High Quality Accessories Made by YKK AP

For Sliding	Material
Hook Lock	SUS304 / ASA etc
Lock Keeper	SUS304
Roller (Single & Double)	POM
Roller (Single & Double)	POM
Gasket (Same for Sliding & Casement)	EPDM / PVC
Stopper	PA6
Hole Cap	EVA

For Casement	Material
Friction Stay	SUS304
Corner Block	AL extrusion
Handle	ZDC2

☐ Line Up

■ 2 LEAF

■ 4 LEAF

■ 3 LEAF

■ 6 LEAF

2 Track

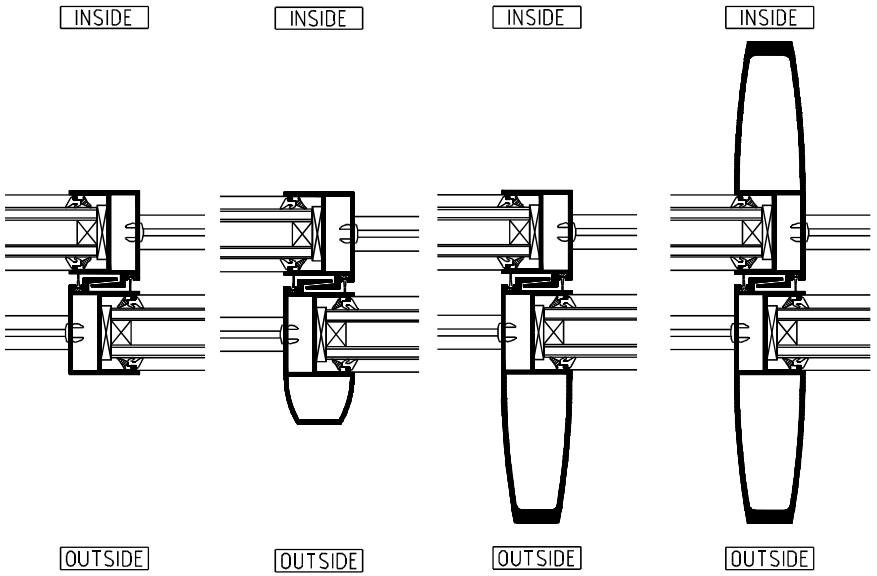
Frame Depth 65mm
Glass Groove 32mm (18mm)

3 Track

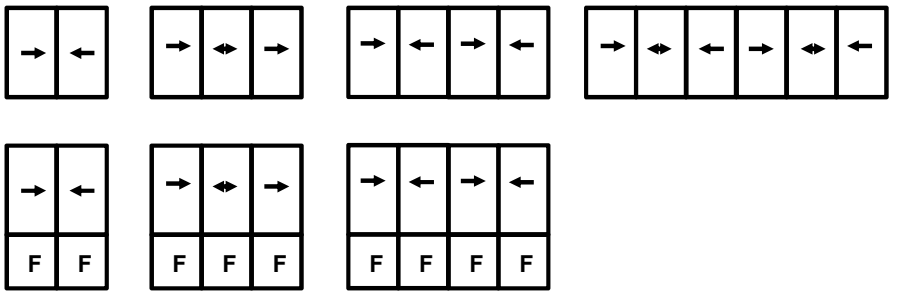
Frame Depth 113.5mm
Glass Groove 32mm (18mm)

■ Interlocking Stile

【A Type】 【B Type】 【C Type】 【D Type】



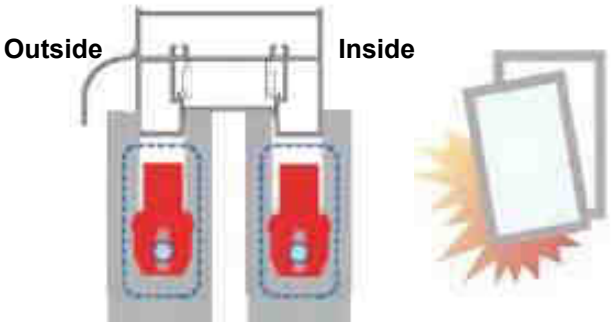
35mm



2 Track Frame Depth 65mm 2･4 LEAF, 3 Track Frame Depth 113.5mm 3･6 LEAF
Glass Groove 18･32mm, 4 Types of Interlocking Stile

☐ Safety & Comfort【Sliding】

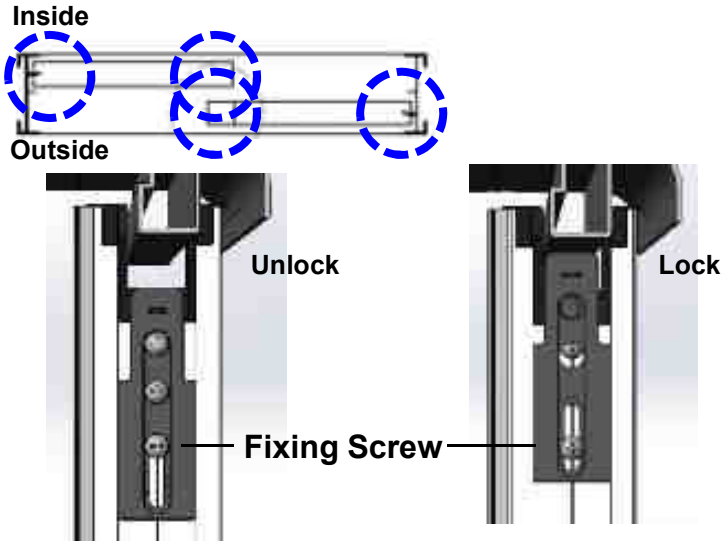
● Anti-Lift Device【Standard】



Anti-Lift device is set standard for both inner / outer shutters to prevent the shutters from falling out of position.

● How to set Anti-Lift Device

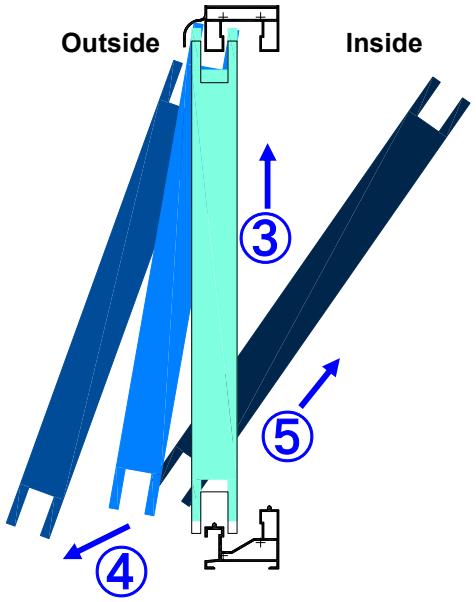
Loosen fixing screw at the top of interlocking and closing stiles and set the anti-lift device to locked position.
Tighten up the screw to fix.



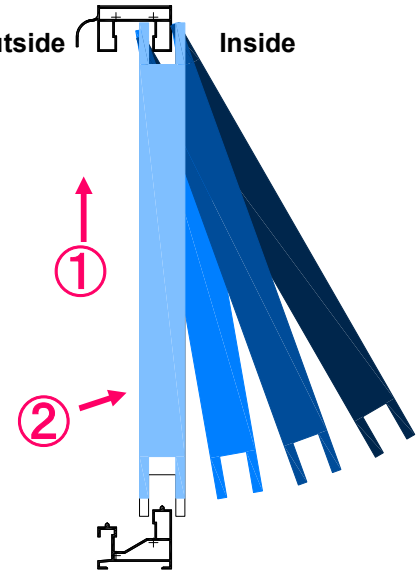
● How to Remove Shutters from Inside

NOTE)
Be sure to release anti-lift device in advance
【Inner Shutters】
① Lift inner shutter upward ② Pull it inside
【Outer Shutters】
③ Lift outer shutter upward
④ Swing out bottom of shutter
⑤ Pull it inside

【Outer Shutter】



【Inner Shutter】



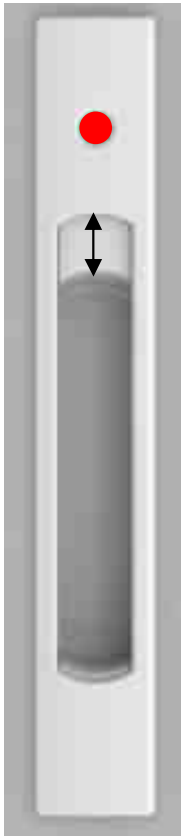
Anti-Lift device is set standard to prevent the shutters from falling out of position

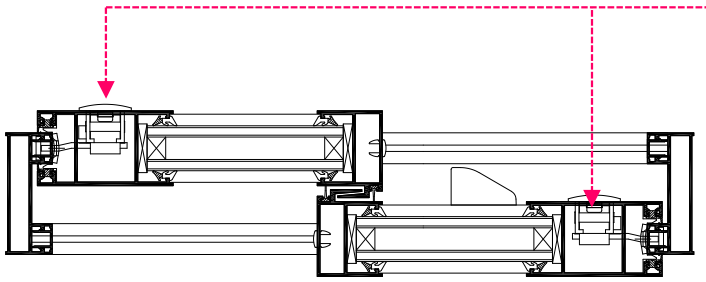
Detach the inner shutter safely from inside to do the maintenance and installation

☐ Operability & Safety Measures【Sliding】

● Flush Handle Lock【Standard】

Flush handle lock is set inside to enhance operability, such as locking / unlocking, and opening / closing of window / door





※ Refer to Universal Design information (See Next Page)

● Safety Cap for Interlocking Stile【Standard】

As a safety measure, plastic safety caps are set standard for top & bottom of interlock sections

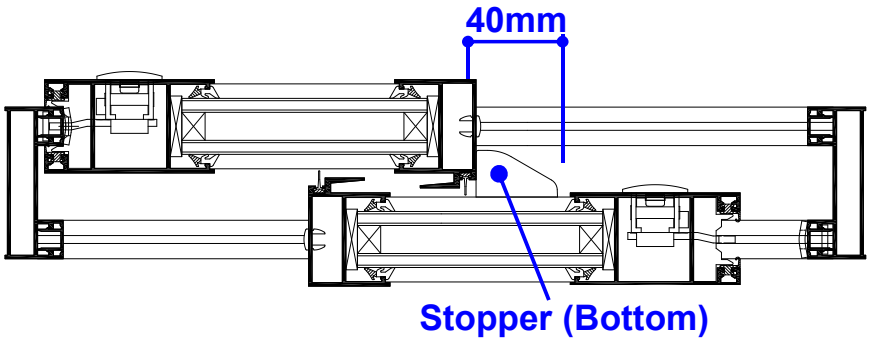
Bottom

Upper

● End Stopper【Standard 】

End stopper is set standard to prevent your hand from getting hit by the shutter

※ Preventing the shutters from hitting each other



Safety measures are taken to prevent injuries (Safety Cap / End Stopper)
And Universal design is adopted for easy operation from any height

☐ Measures for Easy Operation【Sliding】

● Support Handle【Optional】

Have you experienced difficulty opening / closing a heavy terrace door with a large opening and multi-layer glass? This sliding door has a feature that focuses attention on easy operation. By using this support handle, the initial force to open the door is reduced to about half, making it easy to operate the door for people of all ages.

Comparison of Opening Force

WITHOUT Support Handle		100%
WITH Support Handle	50%	−50%

※ The opening force differs depending on the size of window.

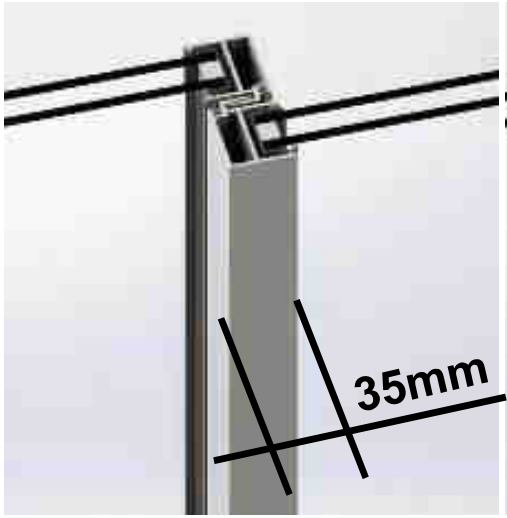
● Large Handle【Optional】

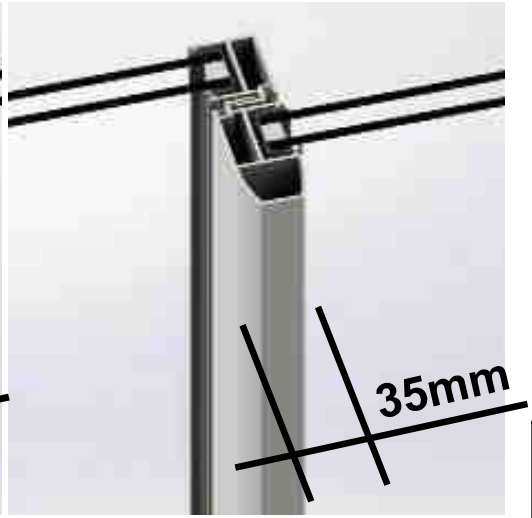
Easy operation with large size handle

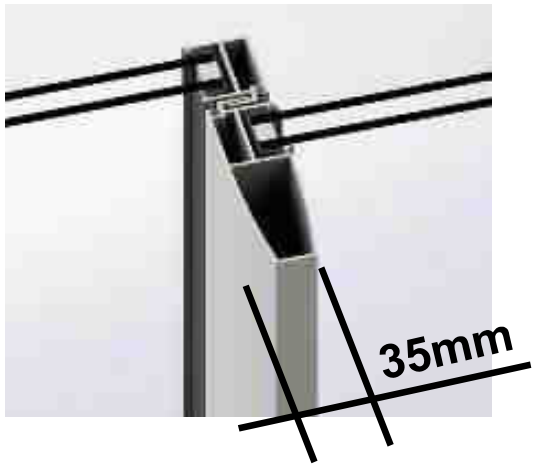
“Universal Design” optional handles can enhance the ease of operation

☐ Large Opening with Slim Interlock Profiles

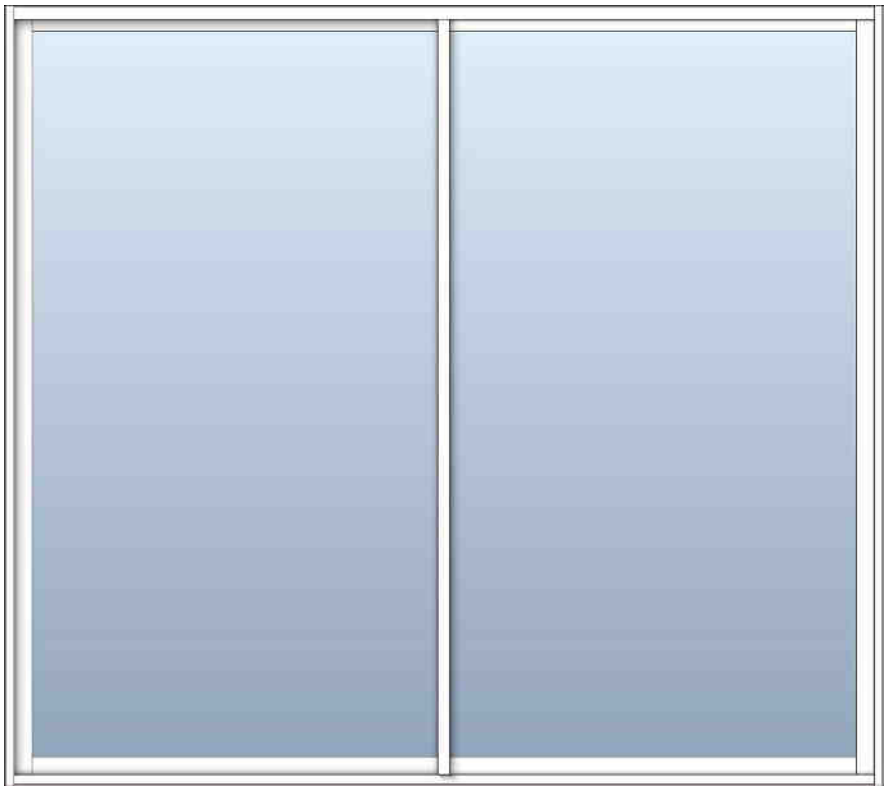
The interlocking stiles with face dimension of 35 mm offers sophisticated design to achieve clear view and stylish appearance even for deeper depth.







● **Ex: IWIN-S Sliding 2 leaf**



IWIN-S can achieve wide opening with slim interlock profiles offering a clear and refreshing view

☐ Line up　Frame Depth 50mm Glass Groove 32mm (18mm)

■ Fix

■ Casement

Single
Multipoint

Single
Friction Stay H≦1800
Butt Hinge H≦2200

■ Top Hung

Multipoint

Friction Stay

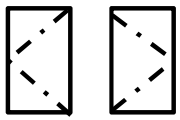
■ Casement Door (Butt Hinge)

Single
Outswing Bottom Sill

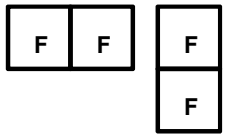
Double
Outswing Bottom Sill

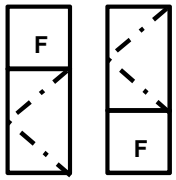
■ Variation【Outside View】

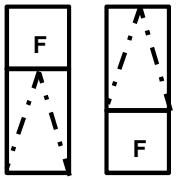
Single



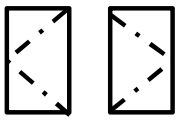
(R) (L)







Single



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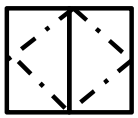


Frame depth 50mm for all variations

☐ Safety & Comfort

● Safety Friction Stay

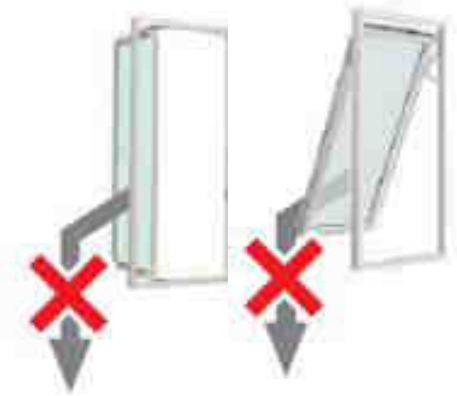
Friction stay is set standard for smooth operation.

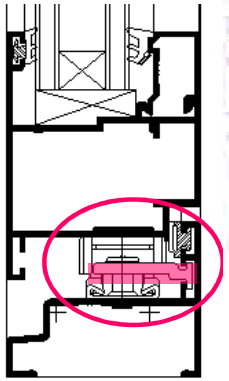
This device has passed a test of 10,000 operations. (Equivalent of 10 years of use)

【Casement Standard】(H≦1800mm)
Enables the panel to be opened to 90°.
Cleaning the glass from indoors can be done easily and safely.

Friction Stay to Prevent Shutter from Falling

There is a slot in the frame which keeps the friction stay in position.
This device prevents the shutter from falling, even if the screws for the friction stay may fall out of position.





● 6 Step Arm Stopper

【Top Hung Standard】
(H＞1300mm)
Enable to adjust the opening angle until 6 levels to control the air flowing.

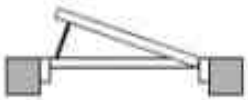
Safety measures are considered in standard specifications

☐ Safety & Comfort

● Safety Stopper【Optional】(H≧1200mm)

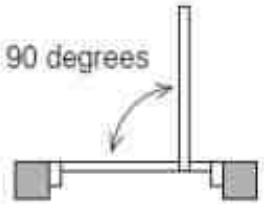
Restricts the opening to less than 110mm, to avoid unexpected accidents by children

Half - Open

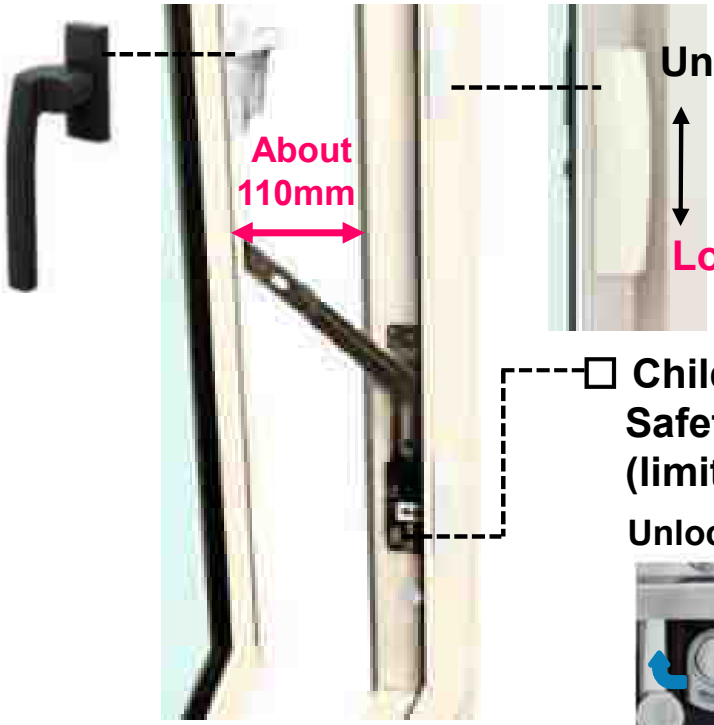


The opening can be restricted to 110mm for safety measures.
This can also prevent the shutters from rattling even with a strong gust of wind.

Full - Open



Cleaning of glass can be easily done when opening the shutter to 90 degrees.
To prevent accidents, a child lock is provided as additional safety.



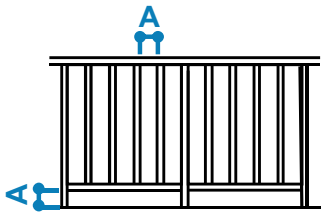
☐ Child Lock
Safety Opening
(limited to 90^0)

Unlock

Lock

【Safety Stopper Idea】

In Japan, there is a regulation for handrails by JIS. The gap (A) must not exceed 110mm, which is the size of an infant's head, to prevent unexpected accidents. Due to this regulation, we restrict the openning to less than 110mm.



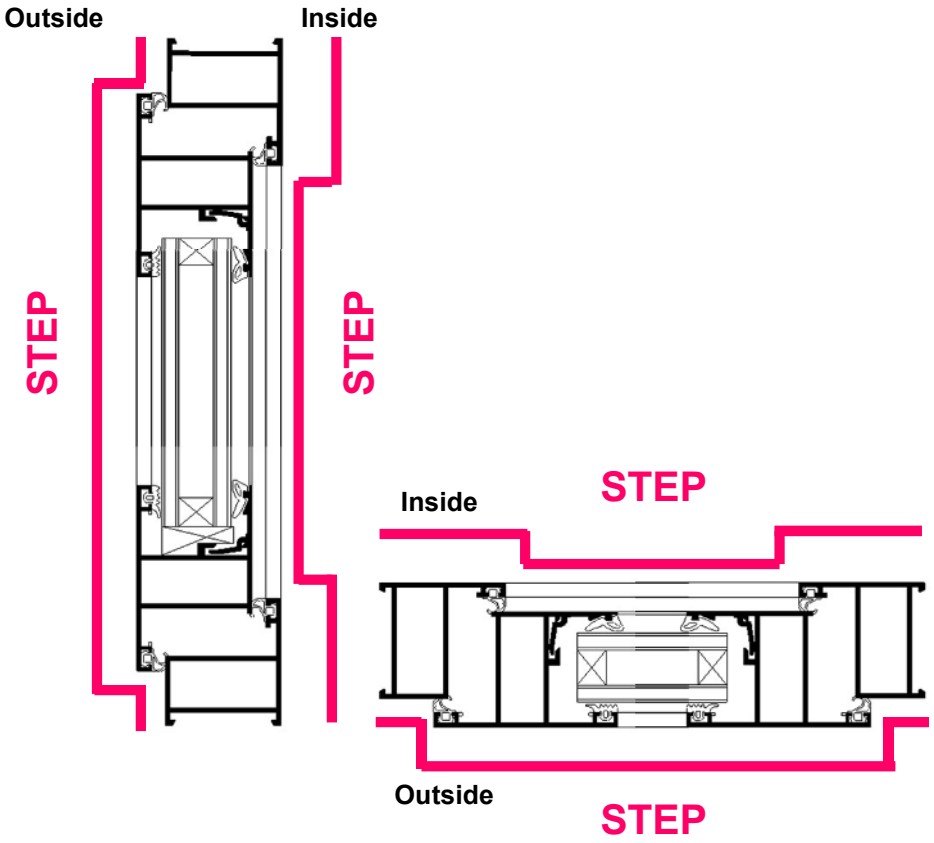
Optional accessories are available to enhance safety

☐ Stylish Design【Flat Design】

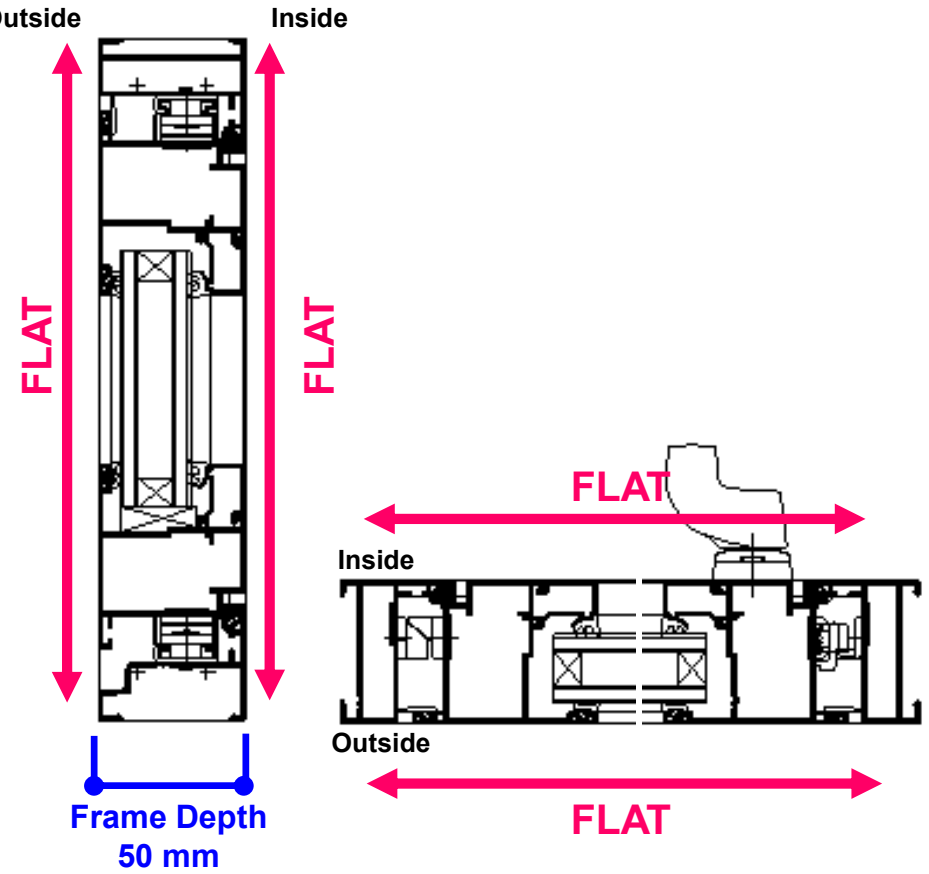
Frame and shutter are designed to create flat surface for both inside and outside.
Frame depth is narrowed down to 50mm.

● Conventional Window

Ex. Casement



● IWIN-S Casement and Top Hung

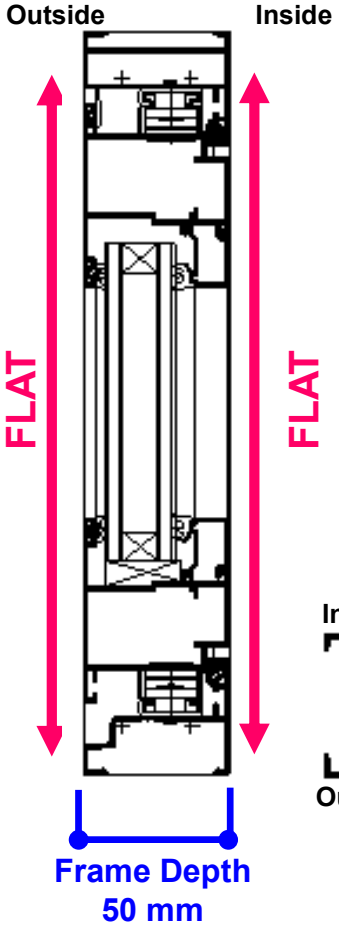


Flat design for both inner and outer is adopted for IWIN-S

☐ Stylish Design【Flat Design】

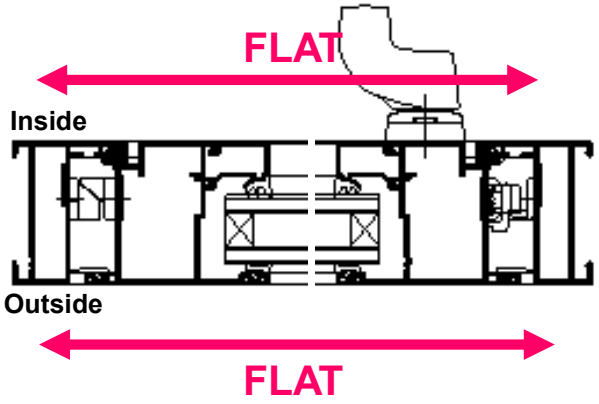
Frame and shutter are designed to create flat surface for both inside and outside.
Frame depth is narrowed down to 50mm.

Ex. Casement

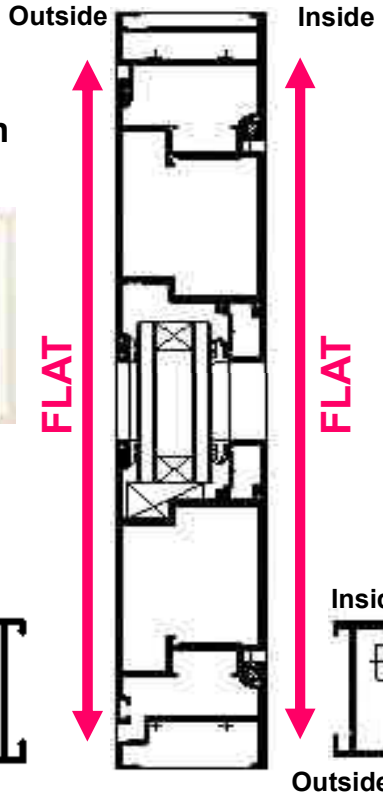


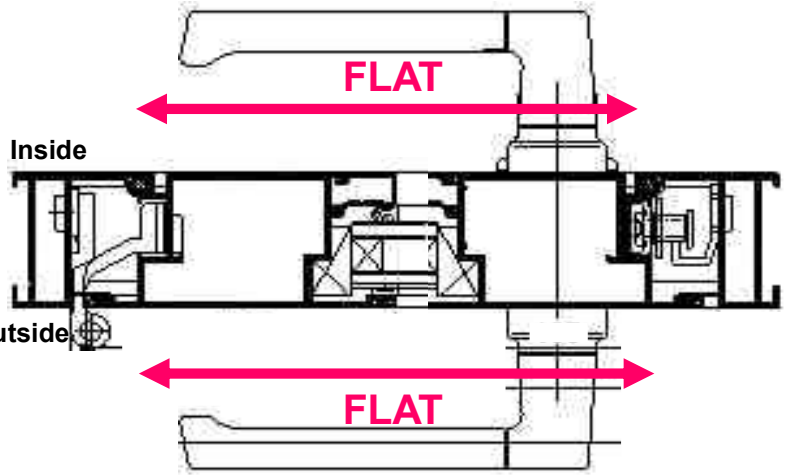
■ Clear Design

Clear Design with no muntin
for double casement



Ex. Casement Door



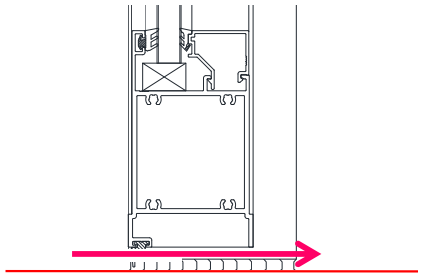


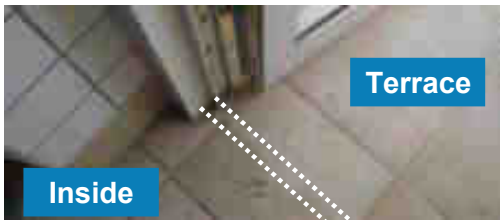
Flat design for both inner and outer is adopted for IWIN-S

☐ Reliable Performance

● Conventional Door

No bottom sill is the common condition.
AT material is set at the bottom sill to prevent water, insects, dusts etc to get inside

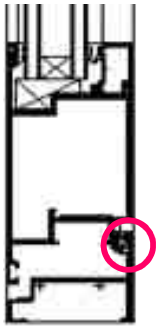




Water, rain, dust, and dirt can easily get inside if there are NO bottom sill

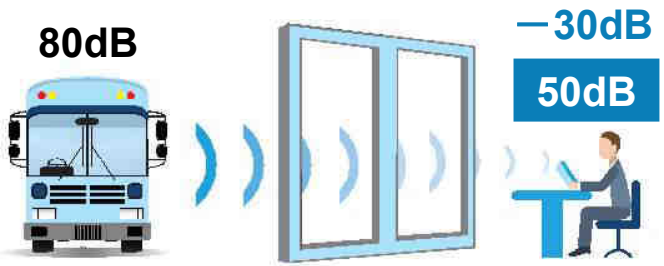
● Setting of Bottom Sill

Ensure performance of each types
【Out Swing Bottom Sill】
Water Tightness 500Pa
Air Infiltration A-4



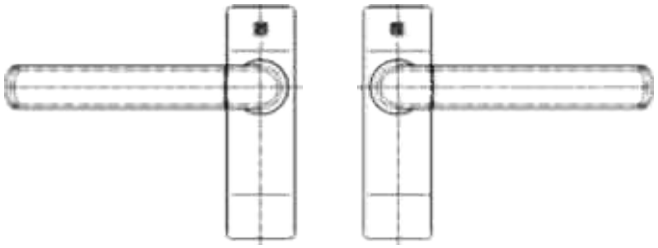
● Sound Insulation Performance

Reduce the noise 30 dB (T-2)



● Using High Quality & Durable Accessories

＜Lever Handle Lock＞
Standard



＜Thumb Turn Lock＞
Standard

＜Flush Bolt＞
Double Swing Door
Standard

＜Butt Hinge＞
(Aluminum)
Standard

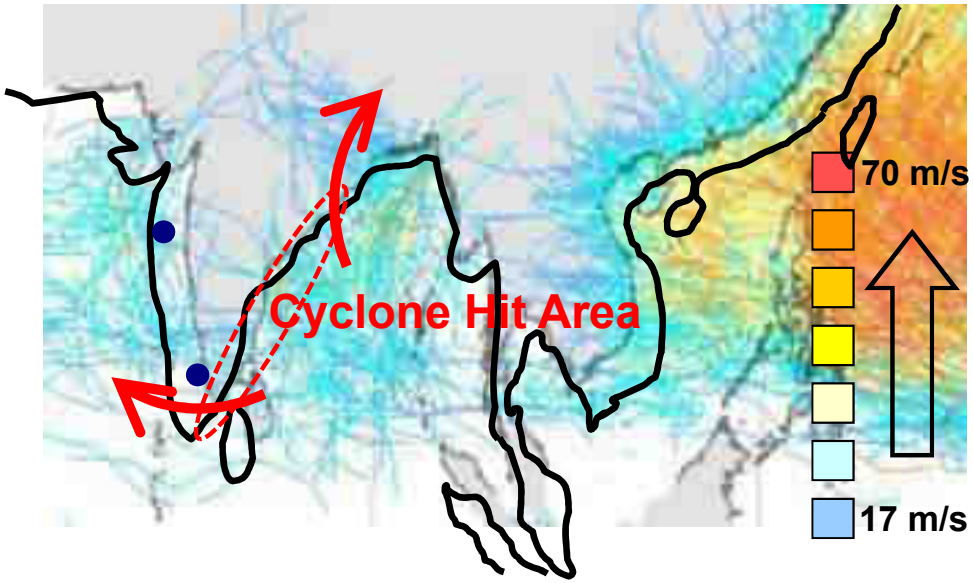
By setting the bottom sill, it prevents water, insects, dusts, etc. from entering inside

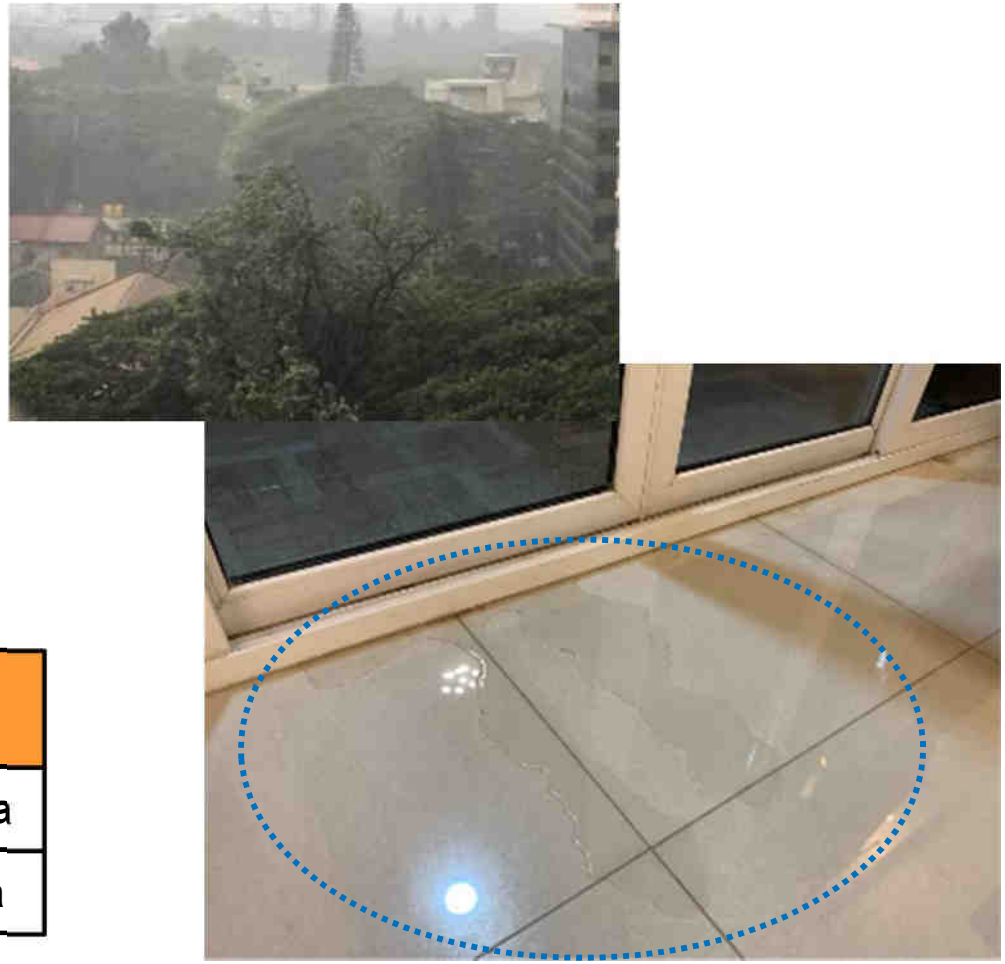
Aluminum Windows & Doors

Water Tightness 600Pa

☐IWIN-S Water Tightness 600Pa

●Tropical Cyclone Distribution Map (1945-2006)



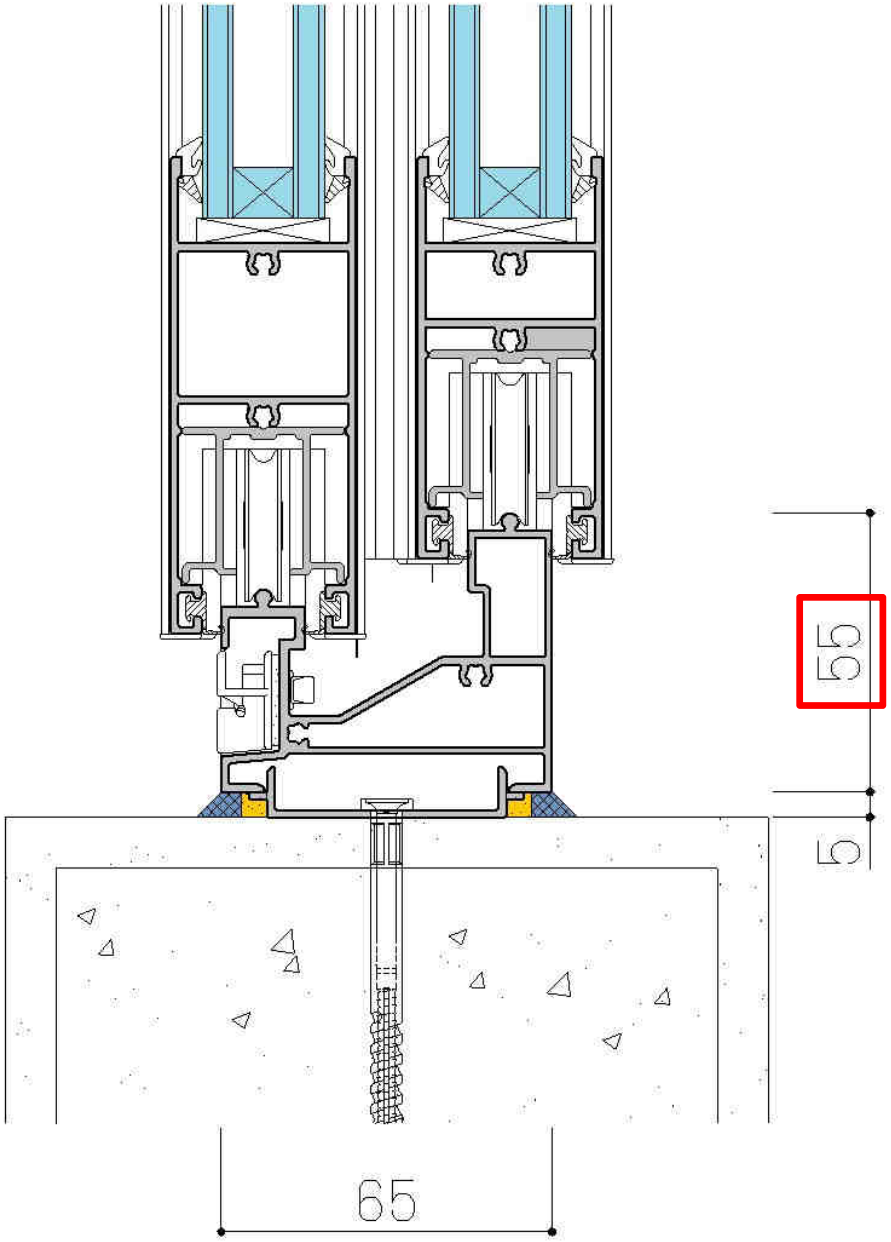


●Observed Wind Velocity(1945-2006)

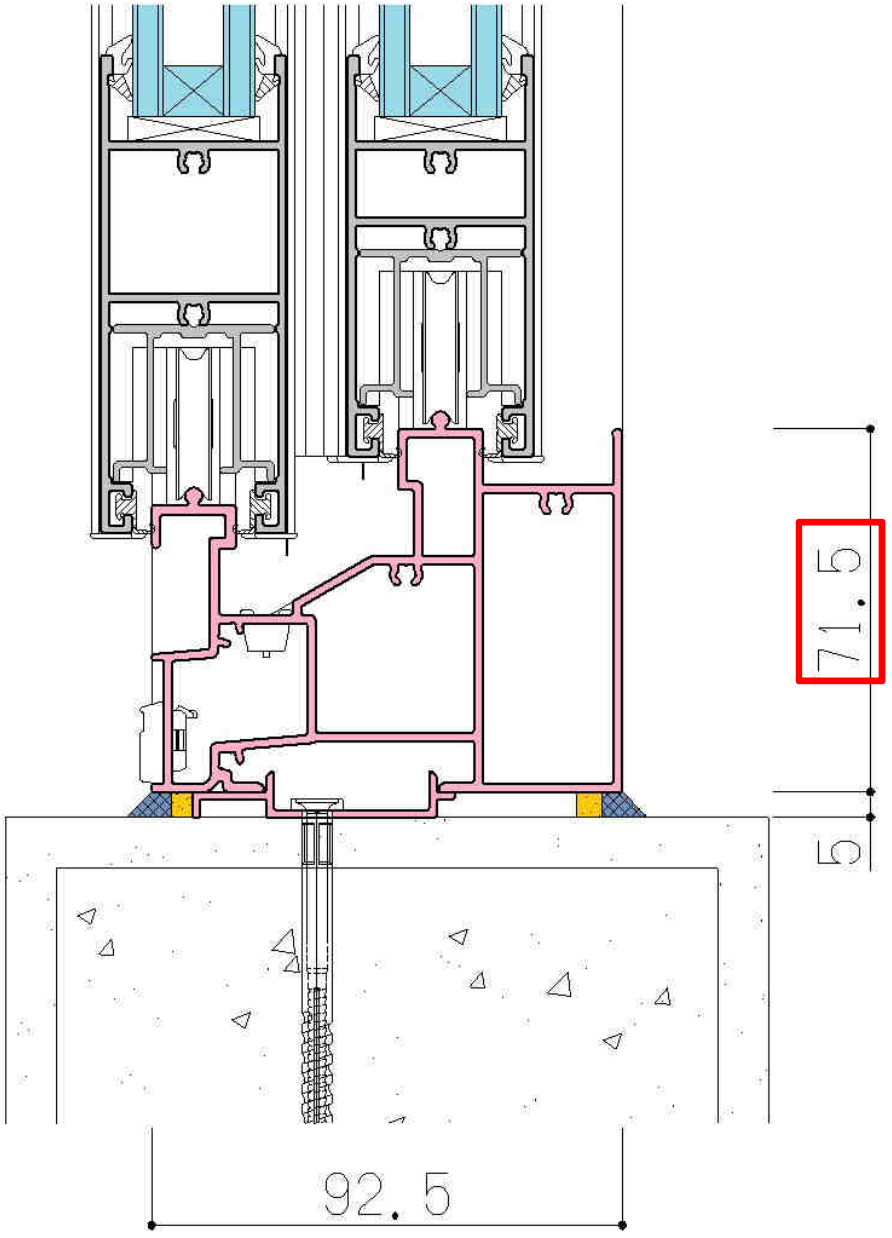
		Observed Value	Corresponding Value for 150m
Mumbai	West Coastal Area	9.3m/s	16.7m/s⇒170Pa
Bangalore	South Inland Area	4.1m/s	7.4m/s⇒ 33Pa

Recently, Higher water tightness requirement is increasing

☐IWIN-S Water Tightness 600Pa

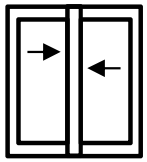
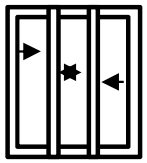
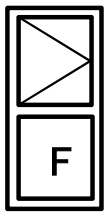


IWIN-S WaterTightness 350Pa



IWIN-S WaterTightness 600Pa

☐IWIN-S Water Tightness 600Pa Test Result summary

Window	Size	Testing		Spec	Result	
 2T2S	W2700×H2450 T6+A12+T8	Test	Air I	ASTM：75Pa 5.4(m3/h・㎡)	1.7 ($m^3/h \cdot m^2$)	Pass
				Project Spec：300Pa 1.8(m3/h・㎡)	4.36($m^3/h \cdot m^2$)	–
			Static Water T	600Pa−15min、3.4L/m2・min	No leakage	Pass
			Wind L	DP：2750Pa(Deflection：1/180) STP：4125Pa(Residual Deformation：0.2%)	Deflection：1/329、 Residual Deformation：0.005%	Pass
		Water Spray		AAMA 501.2	No leakage	Pass
	W2380×H2380 FL6+A12+FL8	Dynamic Water P		600Pa−15min、3.4L/m2・min	No leakage	Pass
 3T3S	W1500×H2340 FL6+A12+FL8	Test	Air I	ASTM：75Pa 5.4(m3/h・㎡)	4.41 ($m^3/h \cdot m^2$)	Pass
				Project Spec：300Pa 1.8(m3/h・㎡)	11.5($m^3/h \cdot m^2$)	–
			Static Water T	600Pa−15min、3.4L/m2・min	No leakage	Pass
			Wind L	DP：2750Pa(Deflection：1/180) STP：4125Pa(Residual Deformation：0.2%)	Deflection：1/329、 Residual Deformation：0.005%	Pass
		Water Dynamic P		600Pa−15min、3.4L/m2・min	No leakage	Pass
		Water Spray		AAMA 501.2	No leakage	Pass
 CS FIX	W950×H2340 FL6+A12+FL8	Test	Air I	ASTM：75Pa 5.4(m3/h・㎡)	0.34 ($m^3/h \cdot m^2$)	Pass
				Project Spec：300Pa 1.8(m3/h・㎡)	0.7($m^3/h \cdot m^2$)	Pass
			Static Water T	600Pa−15min、3.4L/m2・min	No leakage	Pass
			Wind L	DP：2750Pa(Deflection：1/180) STP：4125Pa(Residual Deformation：0.2%)	Deflection：1/329、 Residual Deformation：0.005%	Pass
		Dynamic Water P		600Pa−15min、3.4L/m2・min	No leakage	Pass
		Water Spray		AAMA 501.2	No leakage	Pass

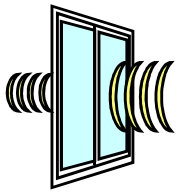
Aluminum Windows & Doors

Big Opening

IWiN S Performance & Size Limitation

BHORUKA
A YKK AP COMPANY

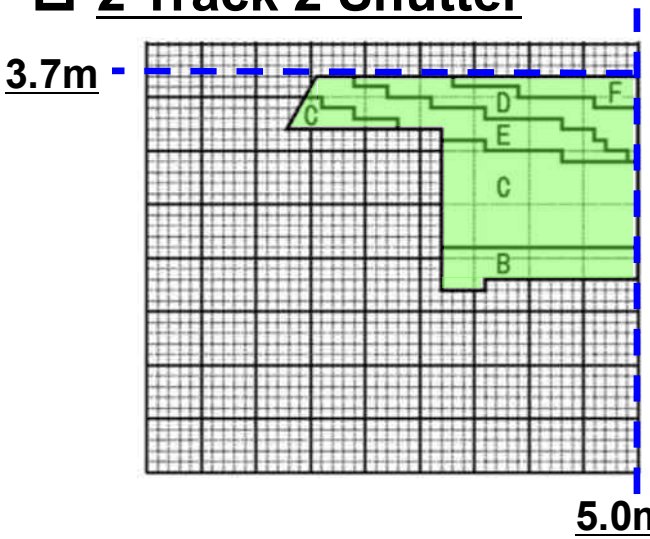
☐ Performance for Big Opening

Structural (Wind Load)		1200 Pa Deflection: 1/175 [ASTM E 330]	Sound Insulation		GradeT-2 [30dB] [JIS A 1416]
Air Infiltration		1.12m³ / (h·m²) Maximum at 75 Pa [ASTM E 283]	Open-Close Testing		10,000 Cycle No Damage [JIS A 4706]
Water Tightness		200 Pa [ASTM E 331·547]			

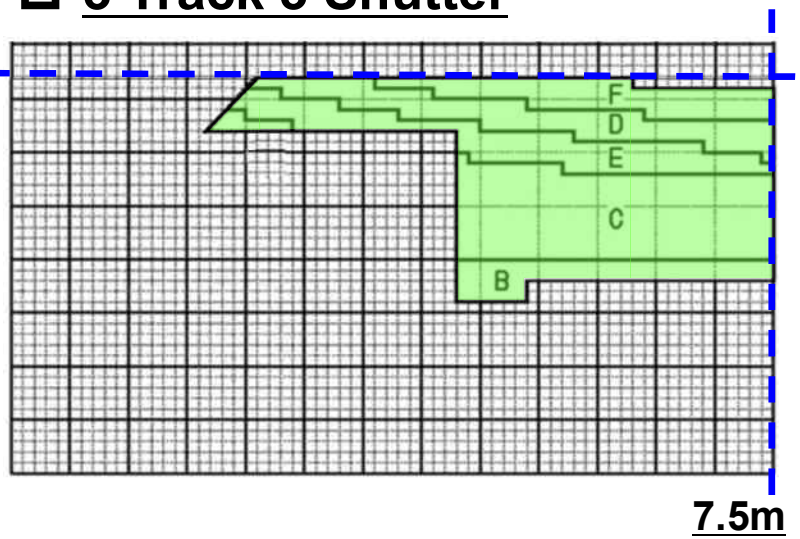
Tested System with Basic Performance
Height : Up to 3.7m
Width : Up to 2.5m /shutter

☐ Size Limitation (800Pa)

☐ 2 Track 2 Shutter



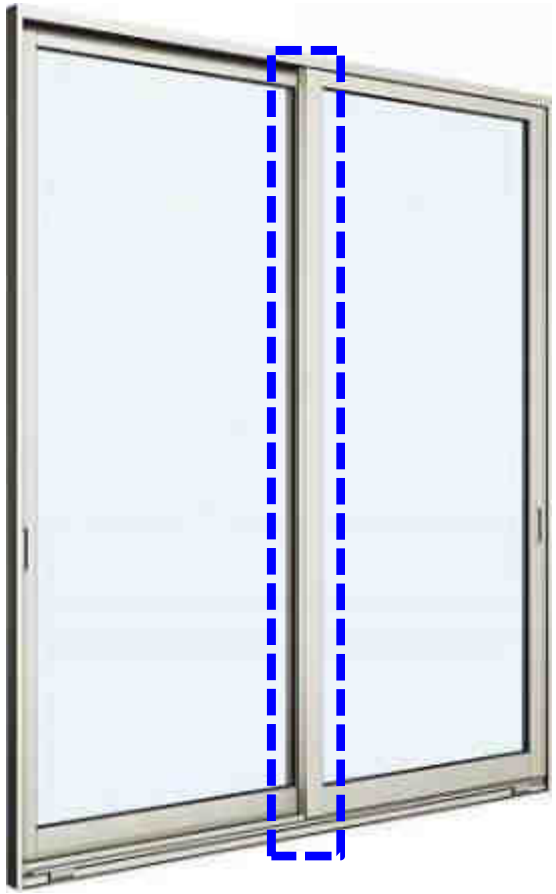
☐ 3 Track 3 Shutter

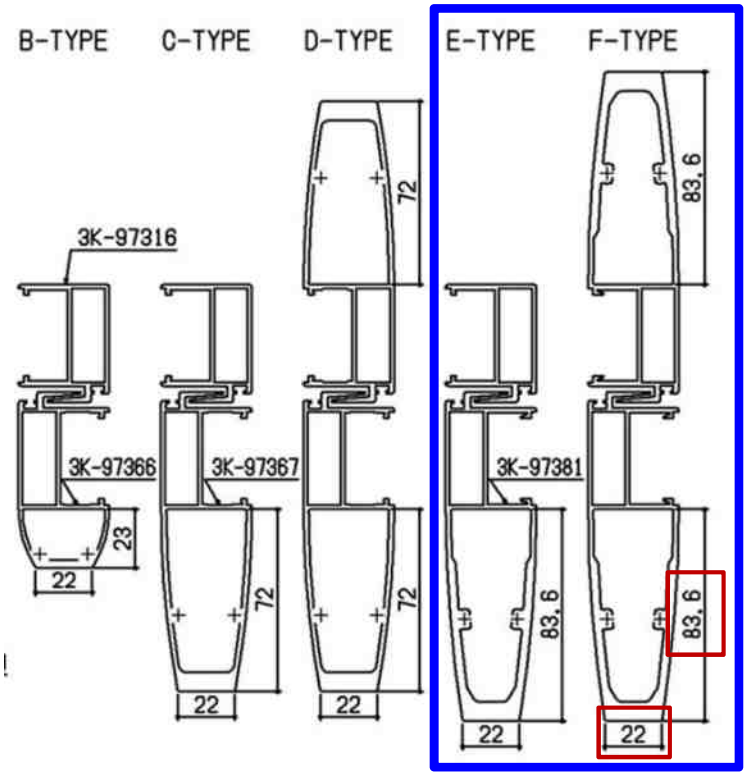


☐ Roller : Up to 250kg/shutter

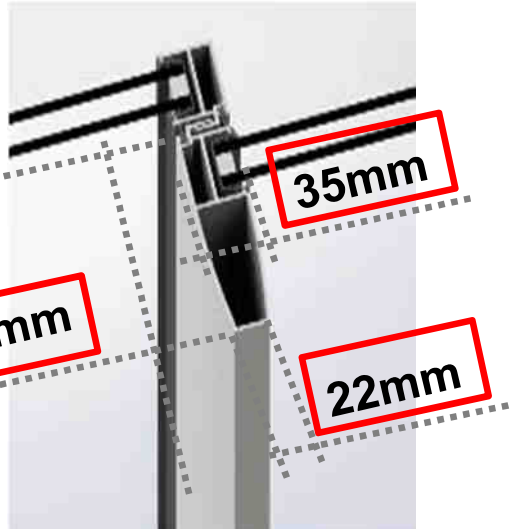
☐ Performance for Big Opening

☐ Tested Slim/Strong Interlocking Stile





E Type



☐ High Performance Triple Roller

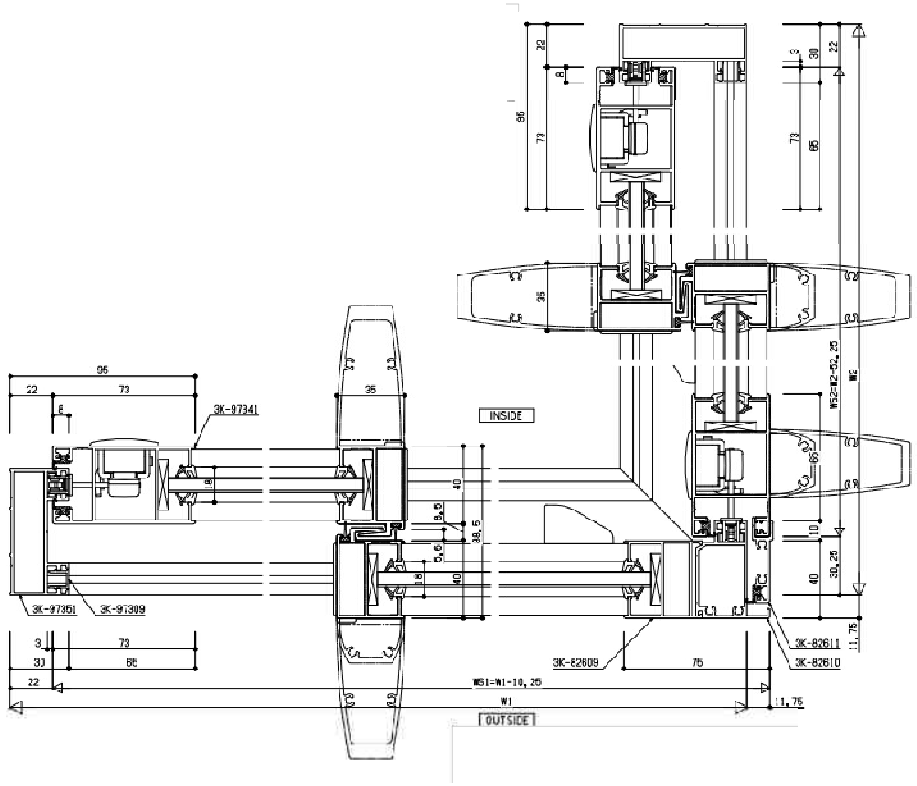
Aluminum Windows & Doors

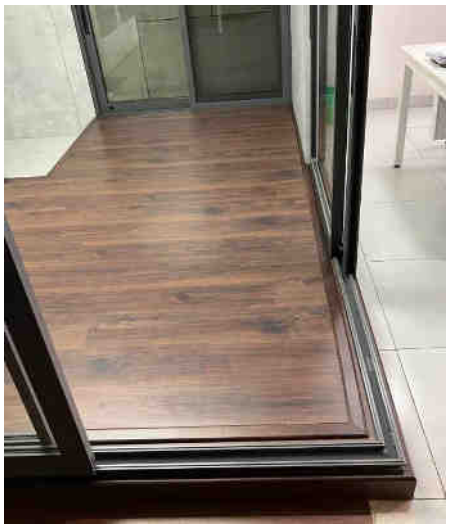
Corner Sliding

☐ IWIN-S Corner Sliding

- Want to utilize corner area of the building
- Mullion obstacles the clear view

⇒ IWIN-S Corner Sliding can solve the issues !





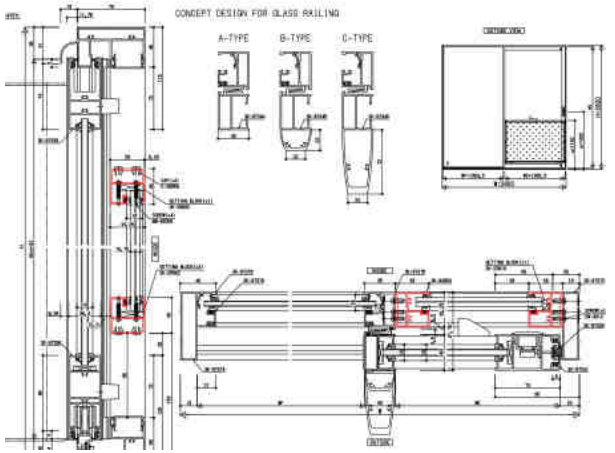
Aluminum Windows & Doors

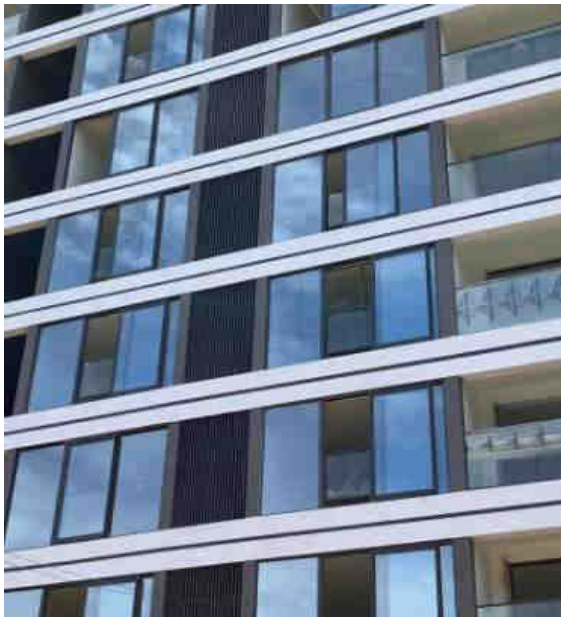
Integrated Railing

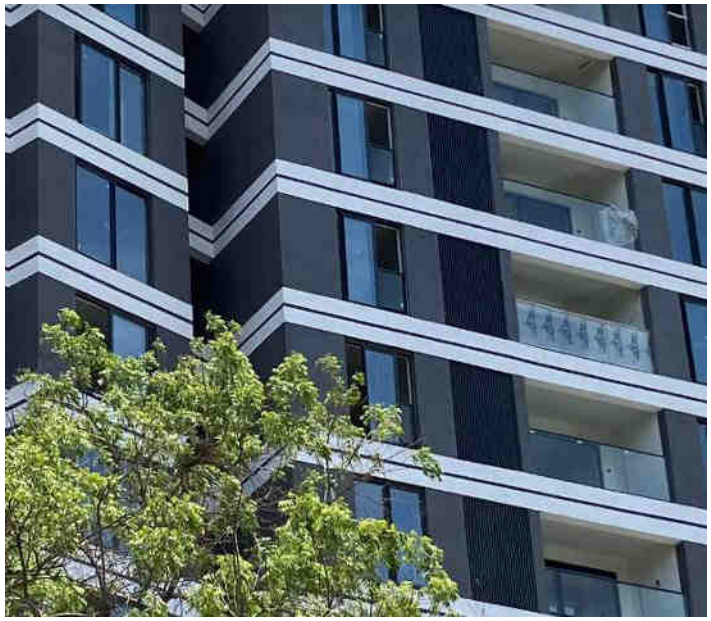
☐ IWIN-S Single Sliding + Integrated Railing

- Apart from the balcony area, want to make a big opening
- If using Mullion/Transom, so many members can be seen
- Worry about water leakage for the combined window
- Railing strength is important for the Safety

⇒ IWIN-S Integrated Railing can solve the issues !







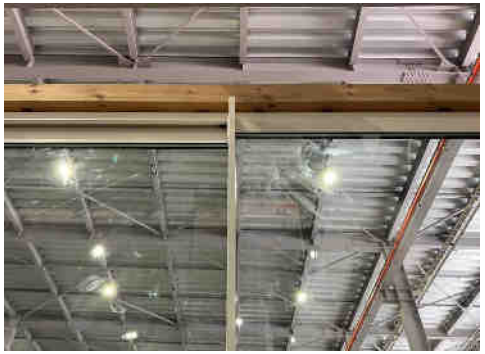
Aluminum Windows & Doors

Slim Interlocking

☐ Performance for Slim Interlocking Series

- Especially for the Balcony area, want to realize the good design
- Interlocking style area is the key of clear view

⇒ IWIN-S Slim Interlocking can realize your request !



☐ Performance for Slim Interlocking Series

●Basic Specifications

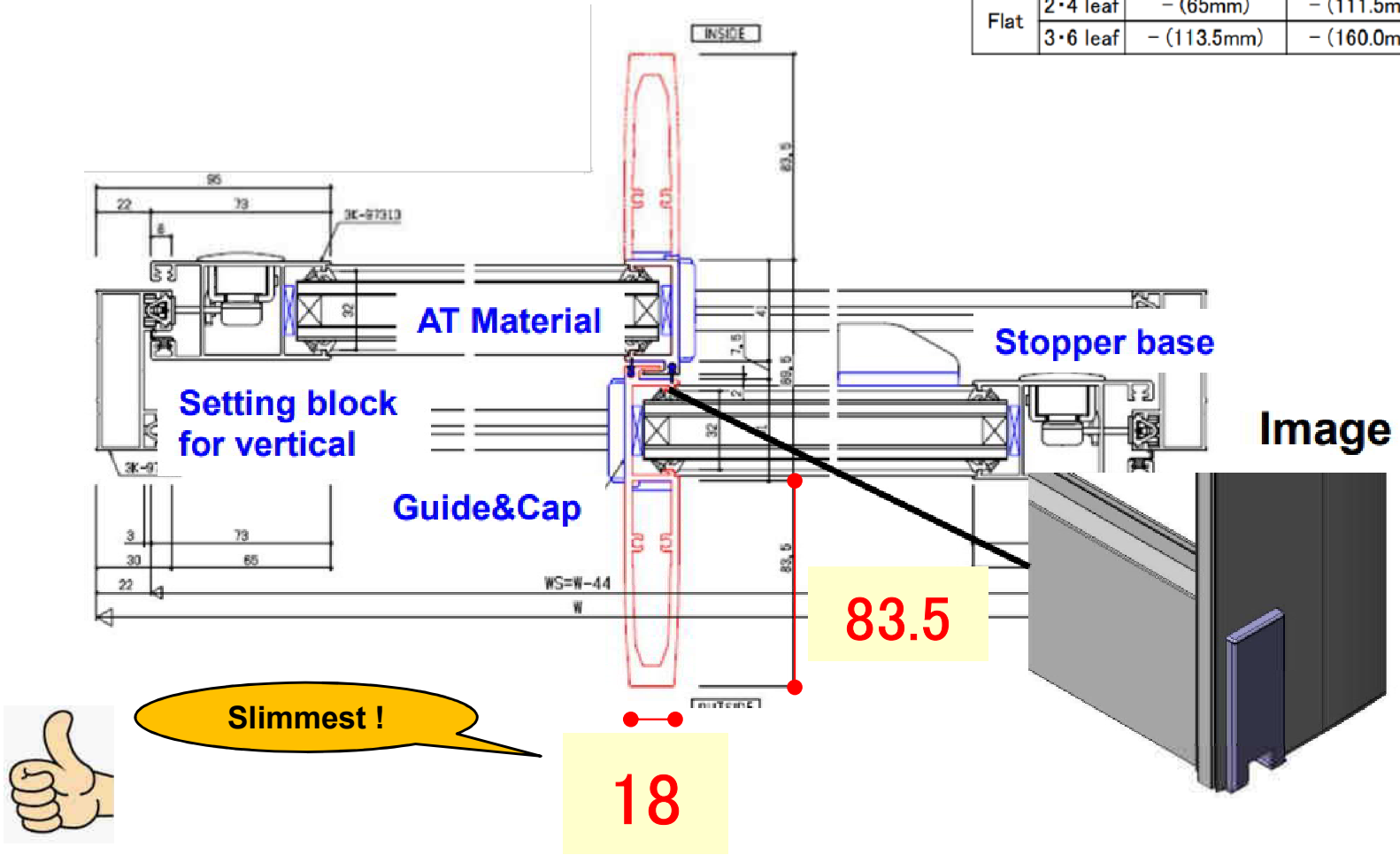
Air infiltration	ASTM E283-12	75Pa ≦5.4m³/(h・m²)
Water Tightness (Static)	ASTM E331-00	200Pa
Water Tightnesss (Dynamic)	ASTM E501.1-17	N/A
Structural	ASTM E330-14	Design load: 800Pa(W3.6m × H3.2m) L/175 or 19mm
		Proof load: 1200Pa (W3.6m × H3.2m)
Sound Insulation	ISO	T-1 (Rw≦25)
Open/Close	JIS	10000 cycle
Opening force	JIS	Less than 35N

●Glass

Glass groove / Structural	Sliding 18mm	Sliding 32mm
1200Pa	–	●

●Outer Frame

		Fly Screen rail: Without	Fly Screen rail: With
Step	2・4 leaf	● (65mm)	– (111.5mm)
	3・6 leaf	– (113.5mm)	– (160.0mm)
Flat	2・4 leaf	– (65mm)	– (111.5mm)
	3・6 leaf	– (113.5mm)	– (160.0mm)



Aluminum Windows & Doors

IWiNE™

Grand Concept

YKK AP presents operational excellence built up around the world combining research and development through detailed study of the climate and characteristics of each region, to conceptualize new ideas creating comfortable environment for the people residing.

Quality with a Difference

Setting Standards of Residential Fenestration Quality in India

Product Characteristics

IWIN E™

Aluminum Windows & Doors

Reliable Quality with reasonable price for the window area

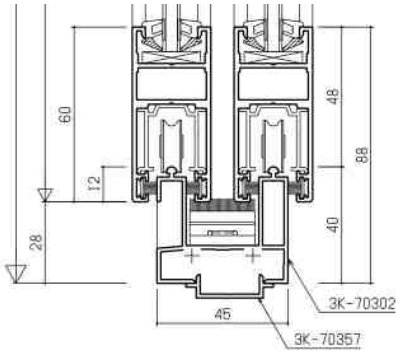
IWIN-E "e"levates your life space

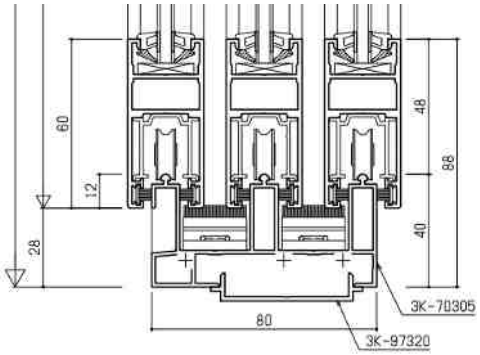
with reasonable price

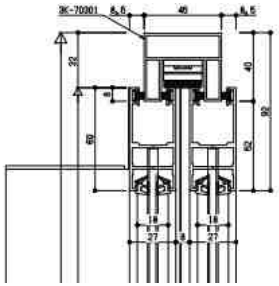
System product is no longer only for Super high-end projects

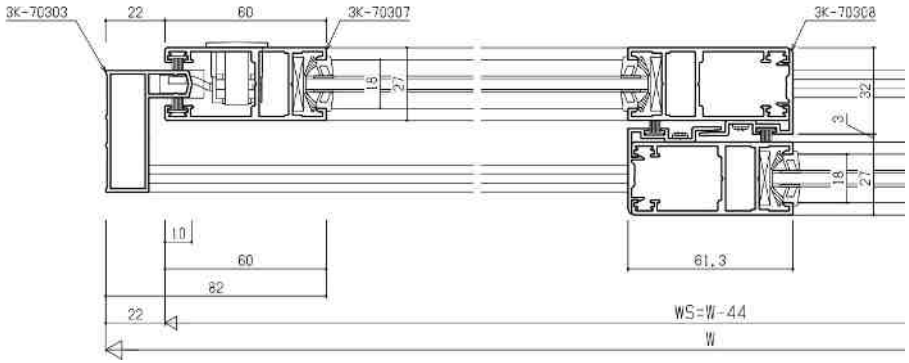
☐ Product Line Up

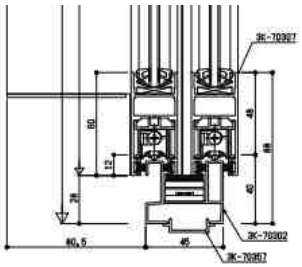
Sliding Window	Sliding Door
Sliding 2 Track 2/4 Shutter **Sliding 3 Track 3/6 Shutter**	

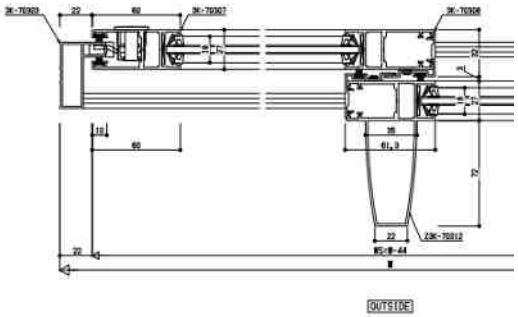




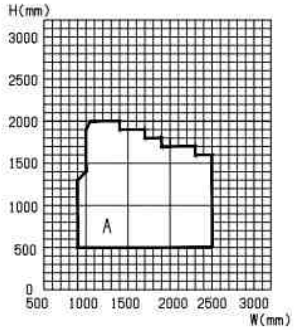
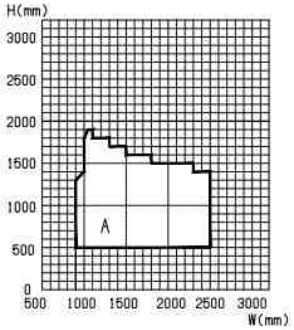
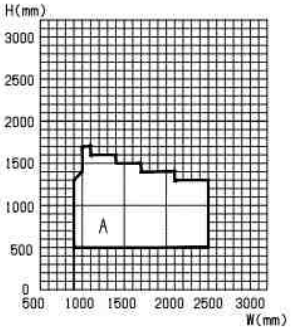


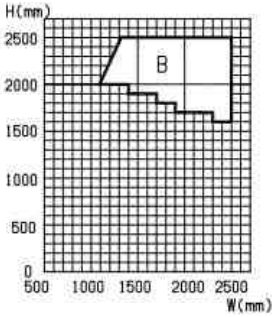
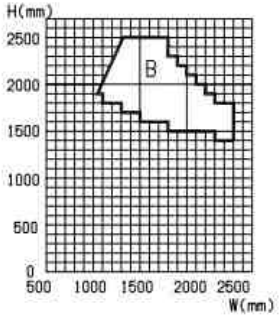
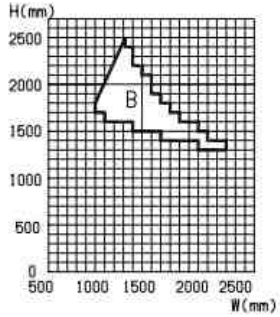






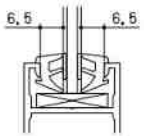
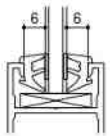
☐ Size Limitation - Sliding 2T2S -

2-LEAF INNER STANDARD LIST No.			WIND PRESSURE		
			800Pa	1200Pa	1600Pa
DESIGN PRESSURE P1					
GLASS GROOVE	OUTER	INNER			
18	T2H-21001	T2H-20101			
	T2H-21003	T2H-20102			

2-LEAF INNER STANDARD LIST No.				WIND PRESSURE		
				800Pa	1200Pa	1600Pa
DESIGN PRESSURE						
GLASS GROOVE	OUTER		INNER			
18	T2H-21001	B	ZT2H-20103			
	T2H-21003		ZT2H-20104			

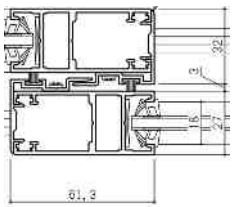
☐ Glass Groove

◆INSTALLATION OF GASKET & SETTING BLOCK (TENTATIVE DWG.)

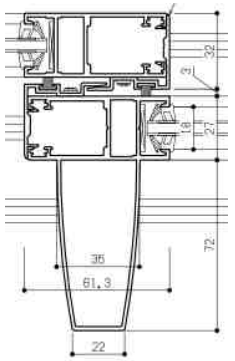
Glass Thk.		5mm	6mm
Glass Groove 18mm			
Setting Block	PARTS No.	3K-27891	
	MATERIAL	EDPM	
Gasket (Out, In)	PARTS No.	3K-27032	3K-27028
	MATERIAL	EPDM	

☐ Interlocking Stile

【A Type】



【B Type】



☐ Performance

Structural (Wind Load)		1600 Pa Deflection: 1/175 [ASTM E 330]	Open-Close Testing		10,000 Cycle No Damage [JIS A 4706]

Air Infiltration : N/A Water Tightness : N/A Sound Insulation : N/A

IWIN E

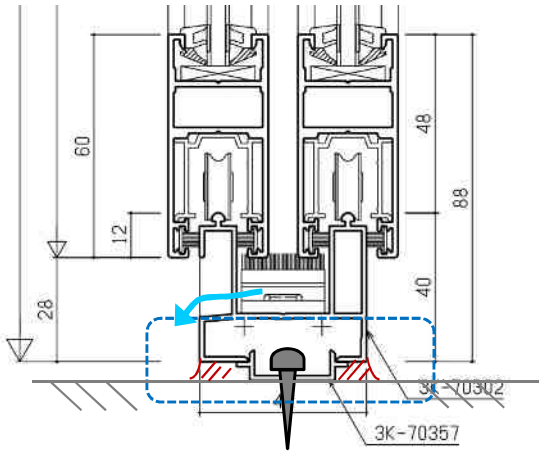
Drainage

Point 1

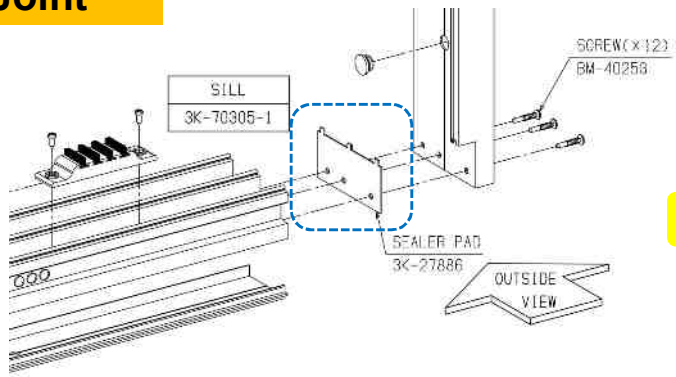
No Hole at Bottom Sill

Point 2

Ensure the Sealant area



Joint

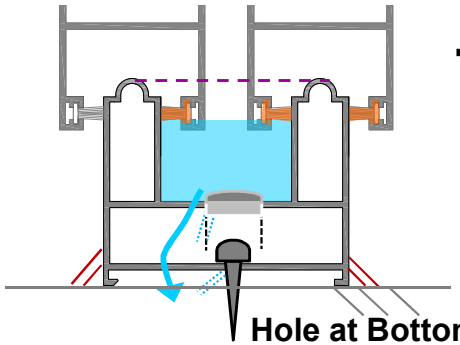


Point 3

Joint by Sealer Pad

Typical Local Window

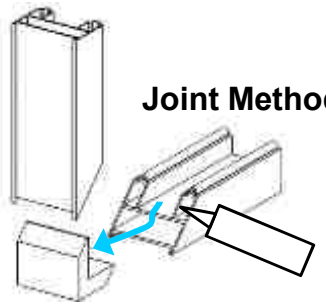
Drainage



Hole at Bottom Sill

- The height of both interior and exterior rails are equal resulting in poor drainage

Joint



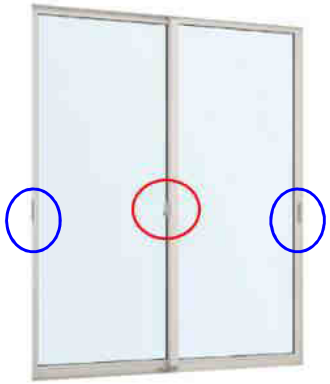
Joint Method

- Mitre joint frame corners result in low water tightness due to unstable sealing

☐ Sliding

IWIN E

☐ Lock System



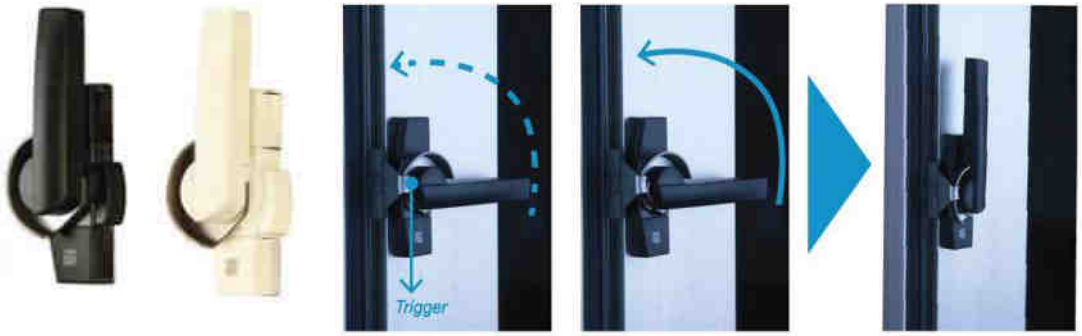
○ OP1 : Hook Lock (Outsource)

Recommend!

○ OP2 : Japan standard Crescent Lock (YKK AP in-house product)

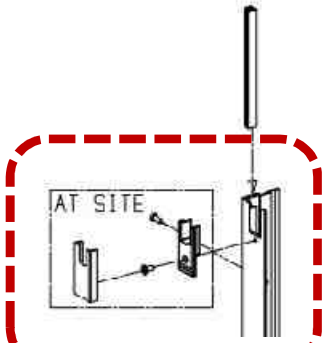
Crescent with False Locking Prevention (Option)

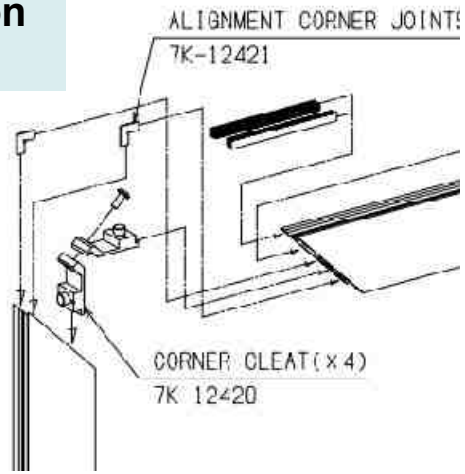
With this setting the function of lock will work appropriately.



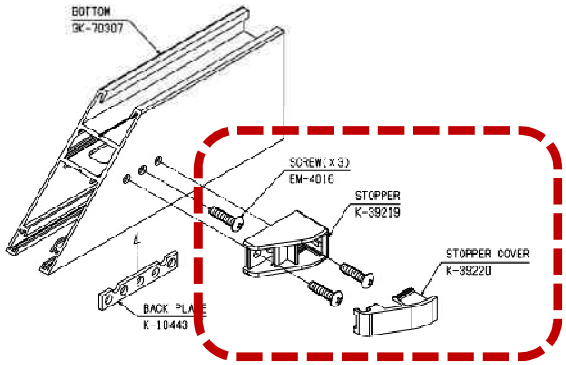
☐ Safety Accessories

- **Anti lift function for shutter**

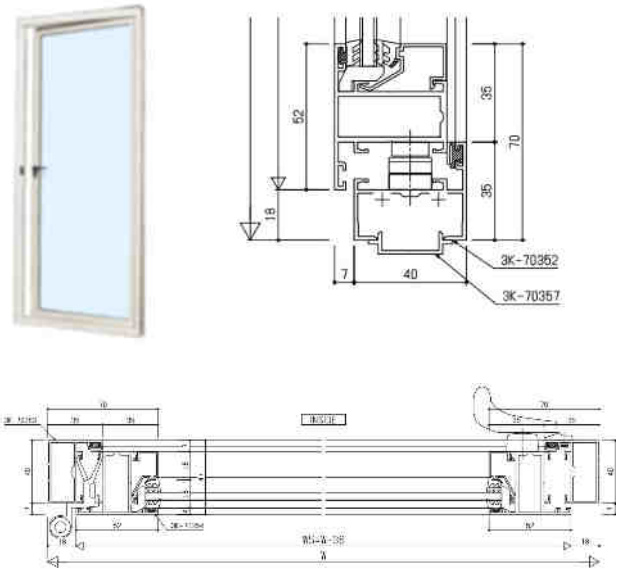




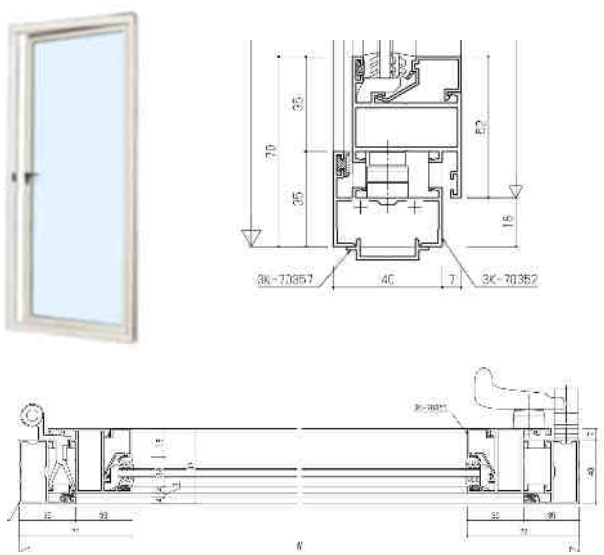
- **Safety stopper for shutter closing**



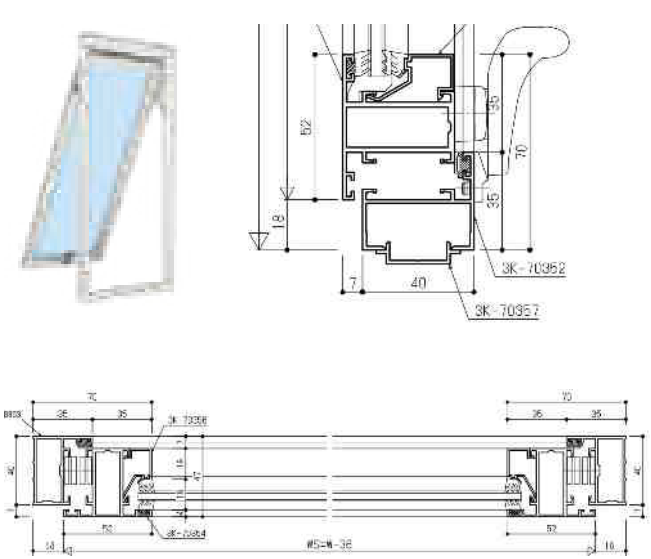
Casement (Outward)



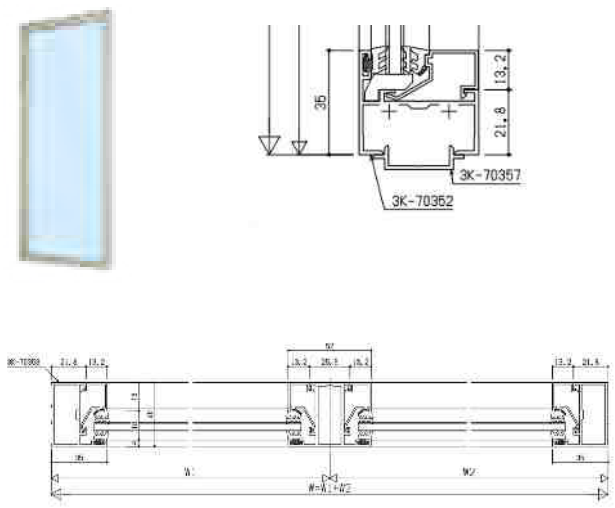
Casement (Inward)



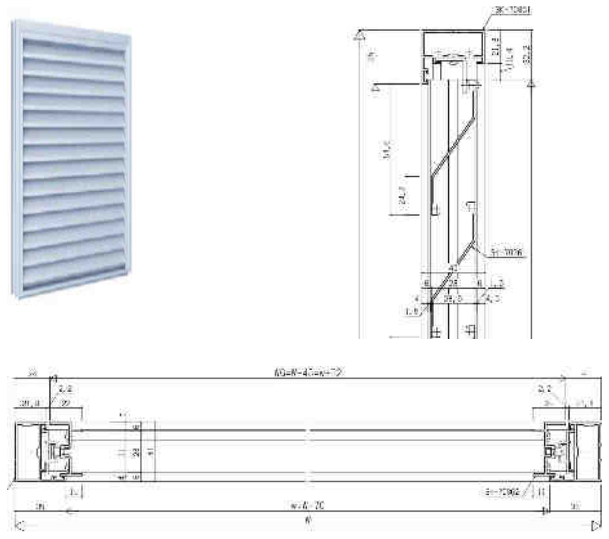
Top Hung



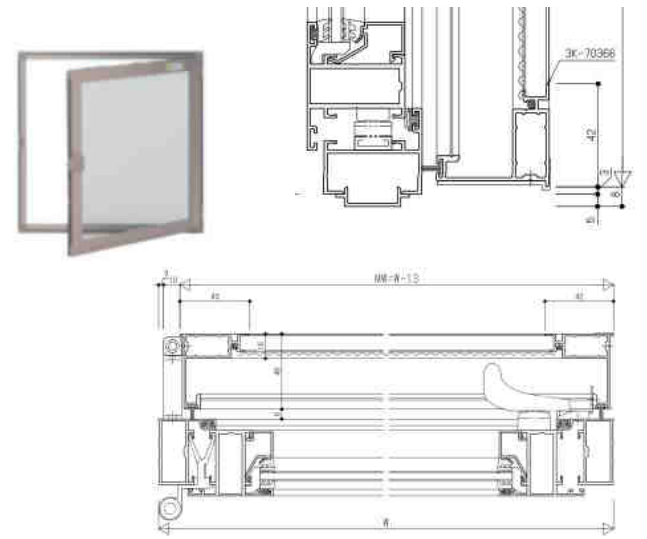
FIX



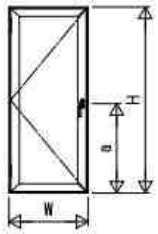
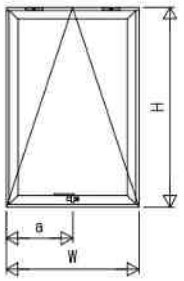
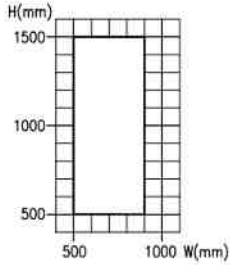
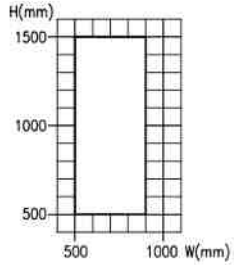
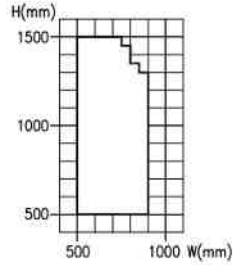
Louvers



Fly Screen

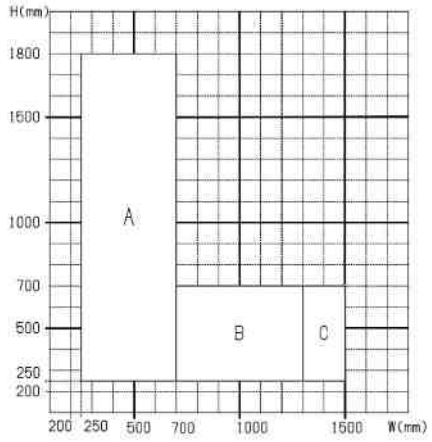


☐ Size Limitation – Casement(Out/In) / Top Hung-

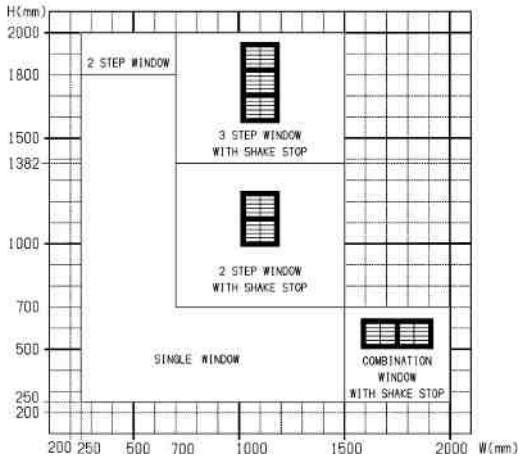
Outswing CASEMENT	TOP-HINGED OUT	800Pa	1200Pa	1600Pa
				

☐ Size Limitation - Louvers -

■SINGLE WINDOW



■COMBINATION WINDOW & STEP WINDOW



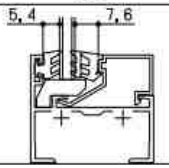
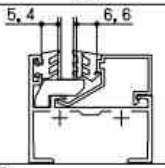
A··· NO SHAKE STOP

B··· SINGLE SHAKE STOP

C··· DOUBLE SHAKE STOP

☐ Glass Groove

◆INSTALLATION OF GASKET & SETTING BLOCK (TENTATIVE DWG.)

Glass Thk.		5mm	6mm
Glass Groove 18mm		 5, 4 7, 6	 5, 4 6, 6
Setting Block	PARTS No.	3K-27887	
	MATERIAL	EPDM-S	
Gasket (Out)	PARTS No.	3K-27026	
	MATERIAL	EPDM	
Gasket (In)	PARTS No.	3K-27030	3K-27031
	MATERIAL	EPDM	

☐ Performance

Structural (Wind Load)		1600 Pa Deflection: 1/175 [ASTM E 330]	Open-Close Testing		10,000 Cycle No Damage [JIS A 4706]

Air Infiltration : N/A Water Tightness : N/A Sound Insulation : N/A

IWIN E

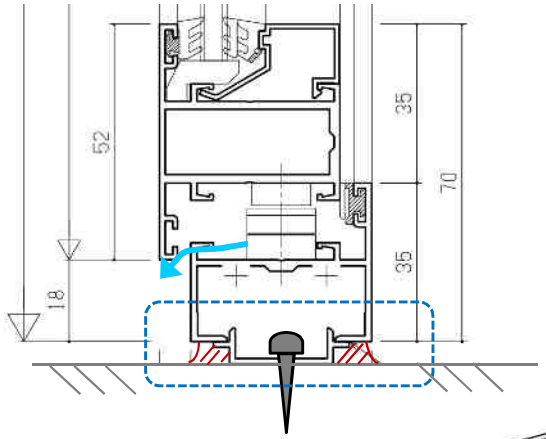
Drainage

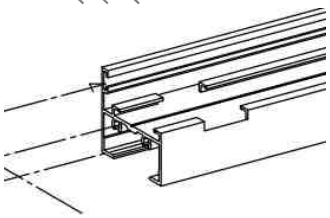
Point 1

No Hole at Bottom Sill

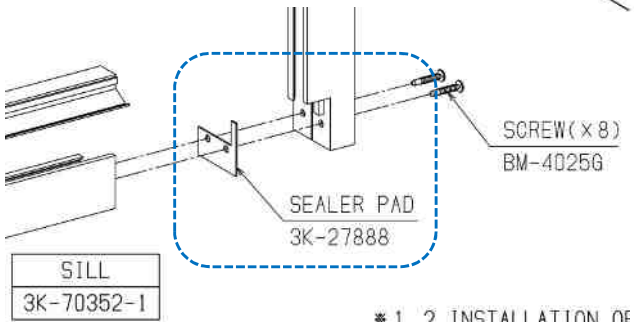
Point 2

Ensure the Sealant area





Joint



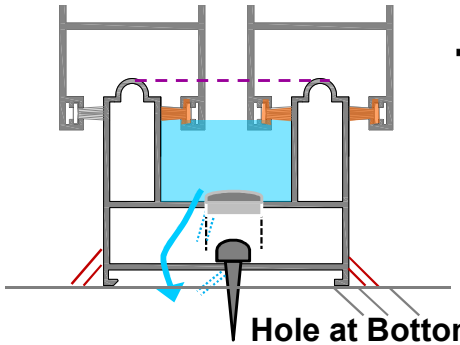
Point 3

Joint by Sealer Pad

※1 2 INSTALLATION OF

Typical Local Window

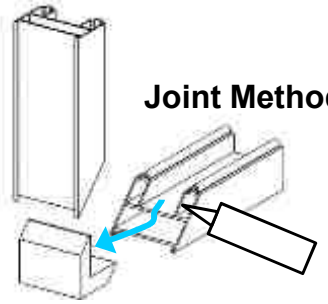
Drainage



Hole at Bottom Sill

- The height of both interior and exterior rails are equal resulting in poor drainage

Joint



Joint Method

- Mitre joint frame corners result in low water tightness due to unstable sealing

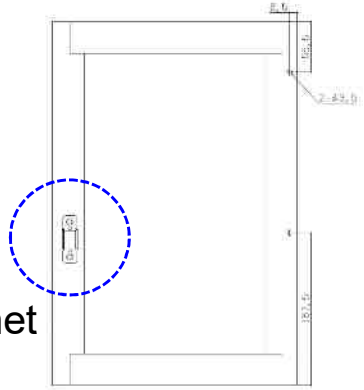
☐ Product Feature

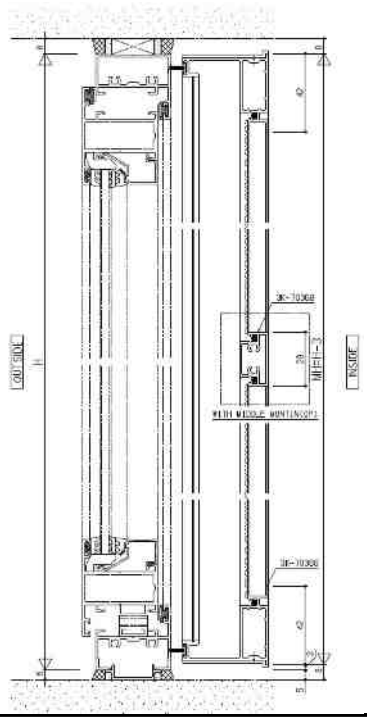
IWIN E

☐ Casement / Top Hung + Fly Screen

- **Cam Latch Handle(Single Point) (YKK AP in house)**

- **Demand of window open, but want to avoid mosquitoes…**
- **IWIN-E suggests Fly Screen option for Casement and Top Hung**



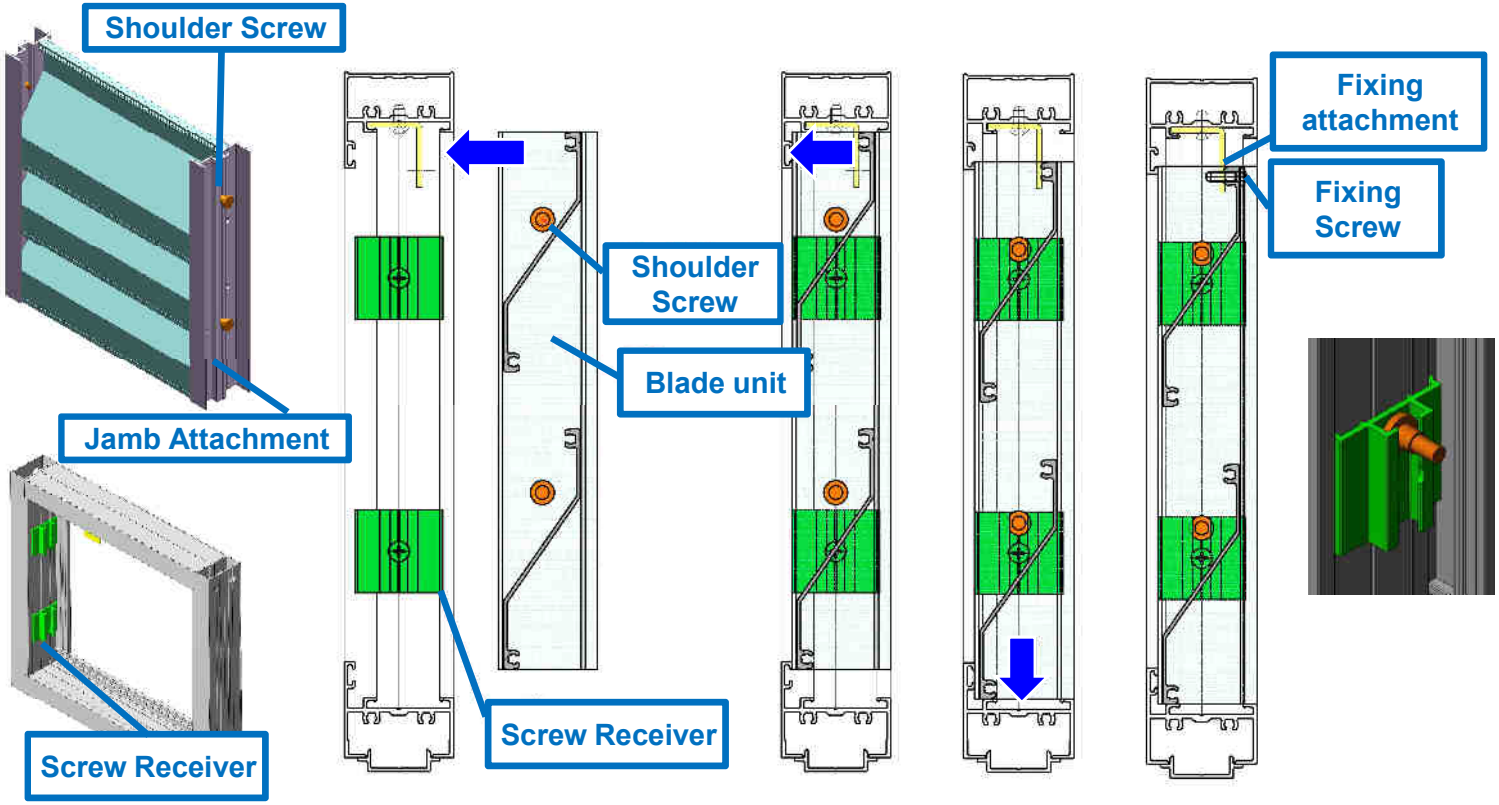


☐ Product Feature

IWIN E

☐ Louvers

Detachable



【Louvers】

- Mainly Louvers will be used for the maintenance area
  Need to be opened at the time of maintenance only
- IWIN-E Louvers can be detachable, by only using screw driver,
  Louver blade unit can be taken out.

窓を考える会社 YKK ap®

YKK AP
Company Thinking of Windows

Thank you

धन्यवाद

BHORUKA EXTRUSIONS PRIVATE LIMITED

Profiling the Future in Aluminium

Contact

BHORUKA
A YKK AP COMPANY

Mysore [Factory]

No.1 KRS Road, Metagalli, Mysore – 570016, Karnataka

enquiries@bhorukaextrusions.com

+91 91-821-428-6100

Bangalore [Branch Office]

Sunil Kumar Keshrwani
No. 1001 & 1002, "A" Wing, 10F, Mittal Tower, M. G. Road, Bangalore – 560001, Karnataka

sunil_k@bhorukaextrusions.com

+91-80-4256-0000

Mumbai [Branch Office]

Ravindra Londhe
F-438, 4th Floor, Solaris-1, Sakivihar Road Opp. to L&T Gate No.6 Andheri (East), Mumbai - 400072

ravindra_londhe@bhorukaextrusions.com

022-40152040 / 40152041 / 40152042

Chennai [Branch Office]

Girish Krishnan
Regus Grandeur Offices Private Limited, Regus Olympia Platina, 9th Floor, Olympia Platina, Room no 921, Plot No.33-B, South Phase, Guindy Industrial Estate, Chennai – 600032

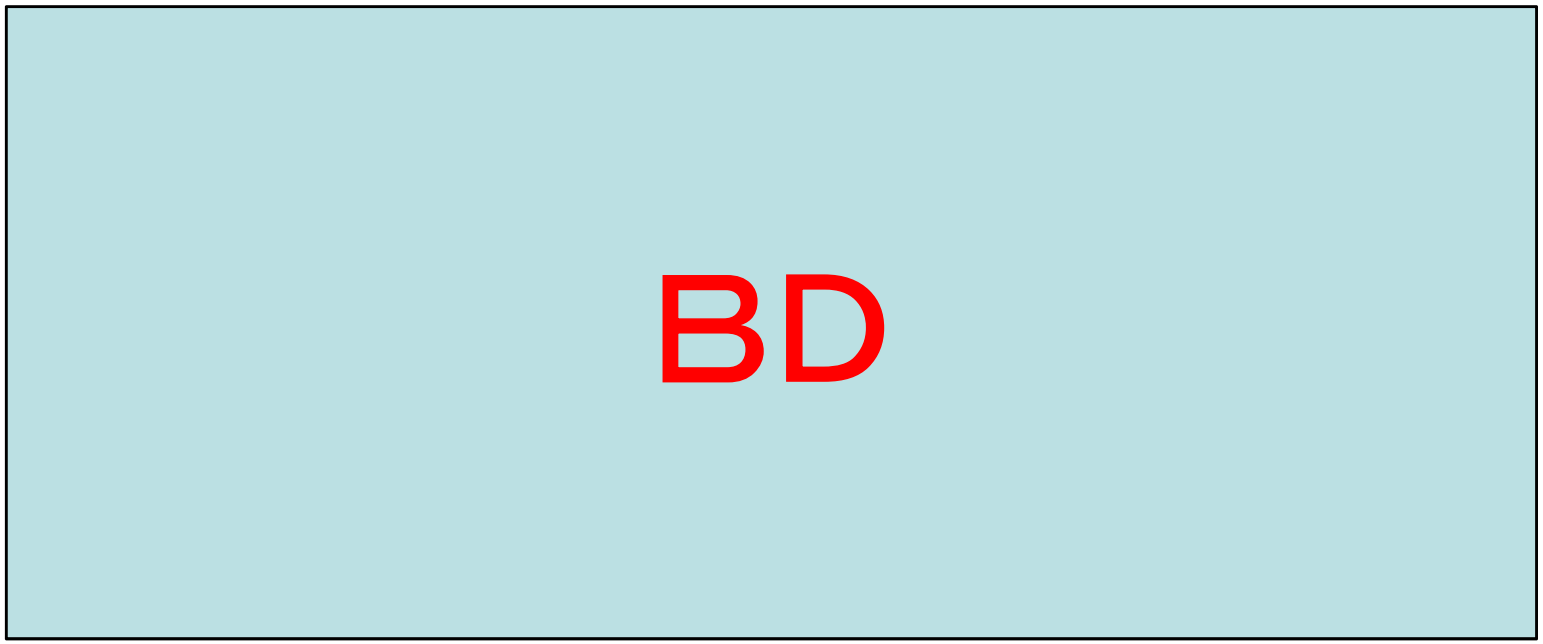
girish_krishnan@bhorukaextrusions.com

+91 95000 27368

Delhi [Branch Office]

Abhay Aggarwal
C/o Fume Infotech Pvt. Ltd, # 500, 5th Floor, ITL Twin Tower, Netaji Subhash Place, Pitampura, New Delhi-110034

abhay_aggarwal@bhorukaextrusions.com


BD

For ○○○○○

Introduction of YKK Group

XXX 2024

YKK AP Inc.

Indian Wind Pressure Resistant Design Std (IS 875 : Part3 – 1987)

BHORUKA
A YKK AP COMPANY

■Wind Load Calculation Procedure:

①Calculation of Design Wind Speed:

$$Vz = Vb \times k1 \times k2 \times k3 \quad \cdots(1)$$

Vz: Design Wind Speed in m/s

Vb: basic Wind Speed in m/s

k1: probability factor (risk coefficient) (see 5.3.1)—See Fig.1

k2: terrain, height & structure size factor(see 5.3.2)

k3: topography factor (see 5.3.3)

②Calculation of Design Wind Pressure:

$$Pz = 0.6 \times Vz^2 \quad \cdots(2)$$

Pz: design wind pressure in N/m²

Vz: design wind velocity in m/s at height 'z'

③Calculation of Wind Load on Individual Members:

$$F = (Cpe - Cpi) \times A \times Pd \quad \cdots(3)$$

Cpe: external pressure coefficeint (see 6.2.2)–Table 4, 5

Cpi: internal pressure coefficeint (see 6.2.3)–Table 3

A: surface area of structural element or cladding unit

Pd: design wind pressure (=Pz)

Target Wind Pressure Resistance

$$F/A = (Cpe - Cpi) \times Pd$$

Basic Wind Speed (Vb)

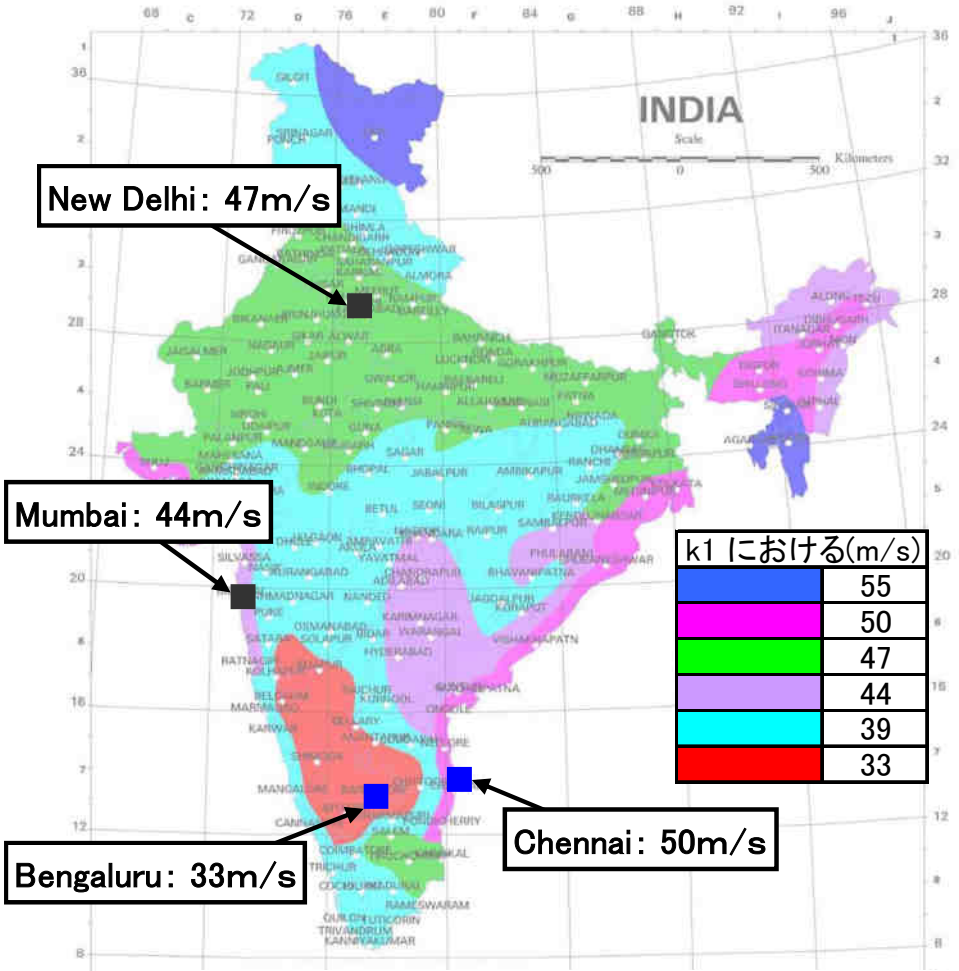


Fig. 1 Basic Wind Speed Distribution Map of India

Ground Height 10m

Basic Wind Speed (Mumbai) Vb = 44 m/s

Indian Wind Pressure Resistant Design Std. IS 875: Part 3 (3rd Revision)

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2023 Version – Calculation Procedure

① Calculation of Design Wind Speed (Red indicates additional items from 2015 version)

$$Vz = Vb \times k1 \times k2 \times k3 \times k4 \quad \cdots(1)$$

Vz: design wind speed at height z, in m/s

Vb: basic wind speed, in m/s

k1: preobability factor (risk coefficient) (see 6.3.1) – Table1

k2: terrain, roughness & height factor (see 6.3.2)

k3: topography factor (see 6.3.3)

k4: importance factor for the cyclonic region (see 6.3.4)

②Calculation of Design Wind Pressure:

$$Pz = 0.6 \times Vz^2 \quad \cdots(2)$$

Pz: wind pressure at height z, in N/m²

Vz: design wind speed at height z, in m/s

③Design Wind Pressure:

$$Pd = Kd \times Ka \times Kc \times Pz \quad \cdots(3)$$

Pd: design wind pressure, in N/m²,

Kd: wind directionality factor, Ka: area averaging factor,

Kc: combination factor (see 7.3.3.13)

④Wind Load on Individual Members:

$$F = (Cpe - Cpi) \times A \times Pd \quad \cdots(4)$$

Cpe: external pressure coefficient (see 6.2.2) – Table-2

Cpi: internal pressure coefficient (see 6.2.3) – Table-3

A: surface area of structural element or cladding unit

Pd: design wind pressure

Various Coefficients are added as Calculation Items

Selection of Coeffiecients for revisions:

k4: importance factor for the cyclonic region

Emergency Services (cyclone shelters, hospitals, schools etc.,)	1.28
Industrial structures	1.14
All other structures	1.00

⇒all other structures, choose k4＝1.0

Kd: wind directionality factor (wind randomness)

For buildings, solid & open signs, trussed towers	0.90
For circular, near circular or other forms	1.00

⇒all other forms, choose Kd＝1.0

Ka: area averaging factor (effect of pressure receiving area)

≦10m²	1.0
25m²	0.9
≧100	0.8

⇒severe most condition, choose Ka＝1.0

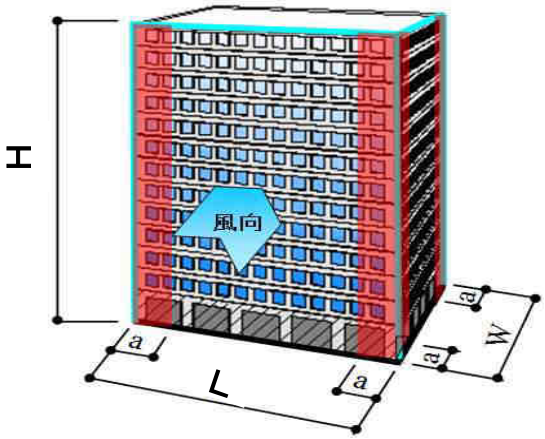
Kc: combination factor

In the case of wind loads on frames of clad buildings, a reduction factor of Kc = 0.90 may be used over the building envelope when roof is subjected to pressure & internal pressure is suction, or vice-versa.

⇒ when windows & doors are not clad、choose Kc＝1.0

Change in target wind pressure resistance performance

■Calculation of target wind pressure resistance



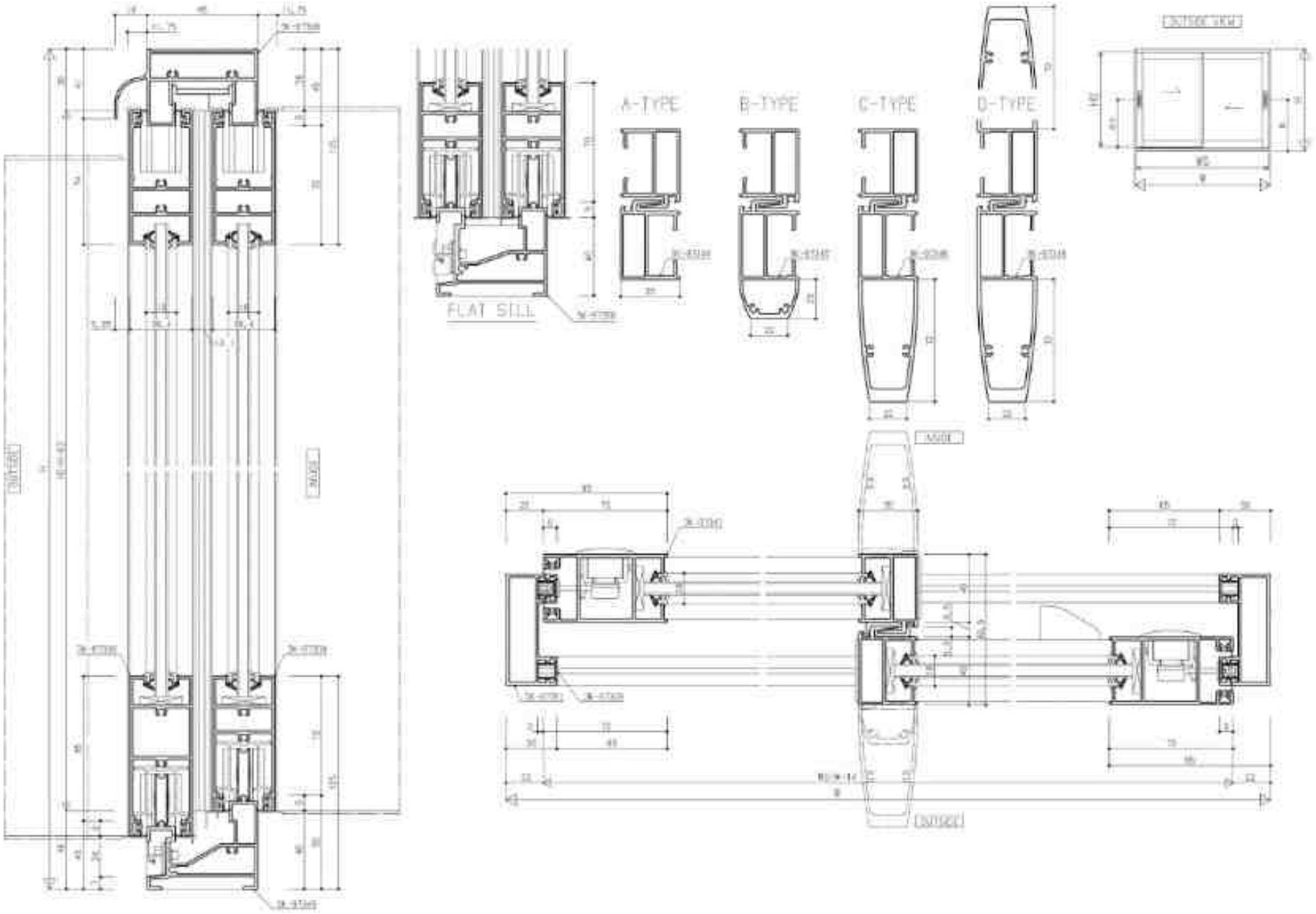
- *Calculate the targer wind pressure resistance of apartment houses with a height of 150 m in each city*
  - ・buidling conditions H＝150m、L＝45m、W＝30m a＝0．25m
  - ・h/W＝5 ／ L/W＝1．5
    - ⇒ Front Cp＝1．0 、 Back Cp＝－0．45 、 Corner Cp＝－1．4
      ※Cp＝Cpe－Cpi
  - ・Topography Category –III（Dense buildings upto 10m in height, with or without skyscrapers ）

Height (m)	Flr. Hgt. (F)	Chennai Design Wind speed Vb=50m/s		Delhi Vb=47m/s		Mumbai, Hyderabad Vb=44m/s		Kochi Vb=39m/s		Bangalore b=33m/s	
		Front	Corner	Front	Corner	Front	Corner	Front	Corner	Front	Corner
10	3	1118	-1565	988	-1383	866	-1212	680	-952	487	-682
15	5	1270	-1778	1122	-1571	984	-1377	773	-1082	553	-775
20	6	1377	-1928	1217	-1740	1066	-1493	838	-1173	600	-840
30	10	1517	-2124	1340	-1876	1175	-1645	923	-1292	661	-925
50	16	1693	-2371	1496	-2095	1311	-1836	1030	-1442	738	-1303
100	33	1944	-2722	1718	-2405	1505	-2108	1183	-1656	847	-1186
150	50	2076	-2906	1834	-2568	1607	-2250	1263	-1768	904	-1266
200	66	2177	-3048	1924	-2694	1686	-2361	1325	-1855	948	-1328

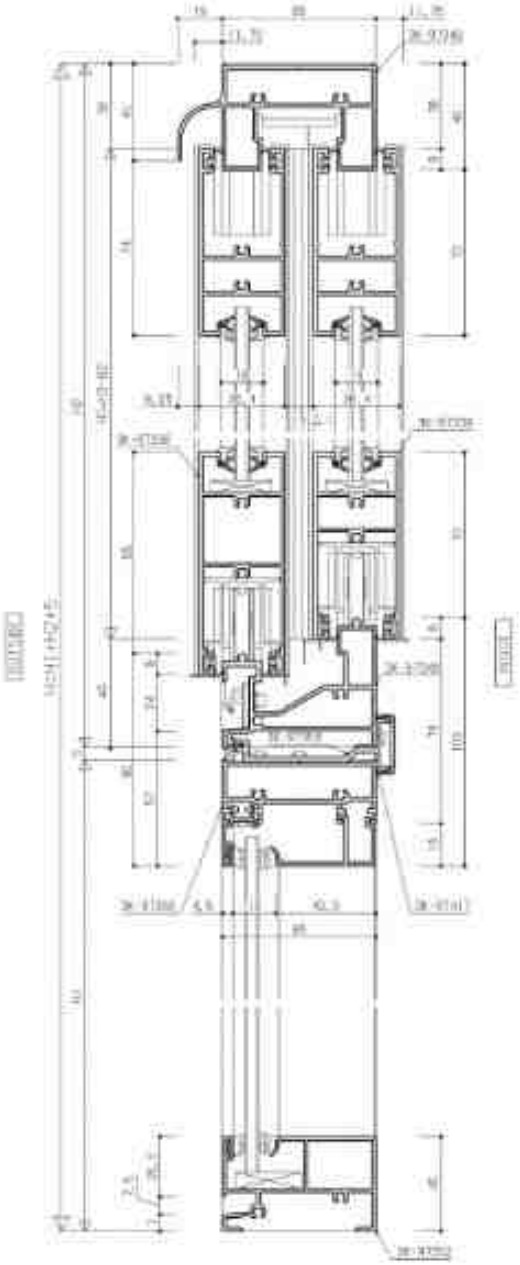
This is just for the reference. It depends on the PJ situation.

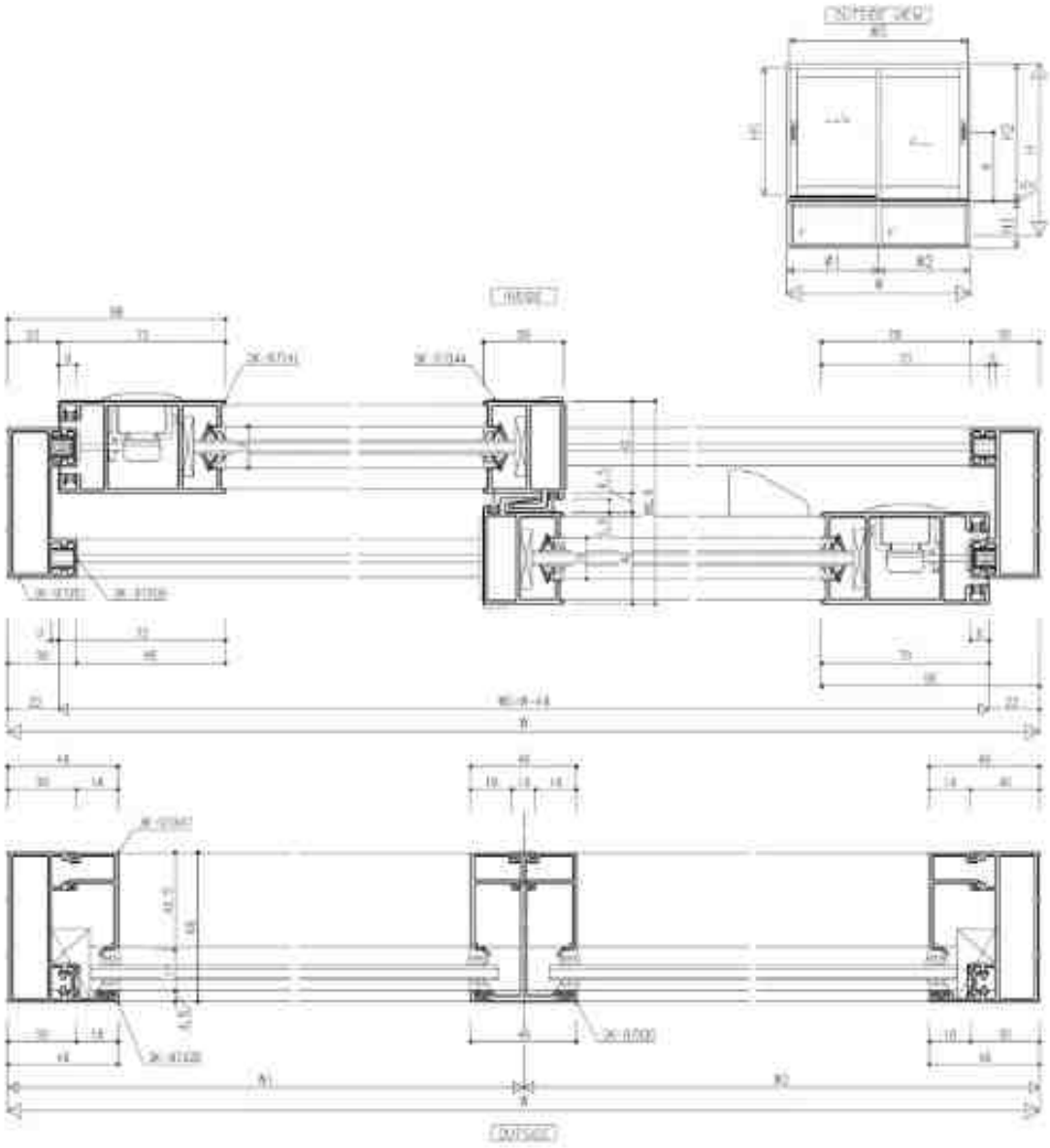
Aluminum Windows & Doors

☐ System drawing. Sliding 2-LEAF Glass Groove 18mm

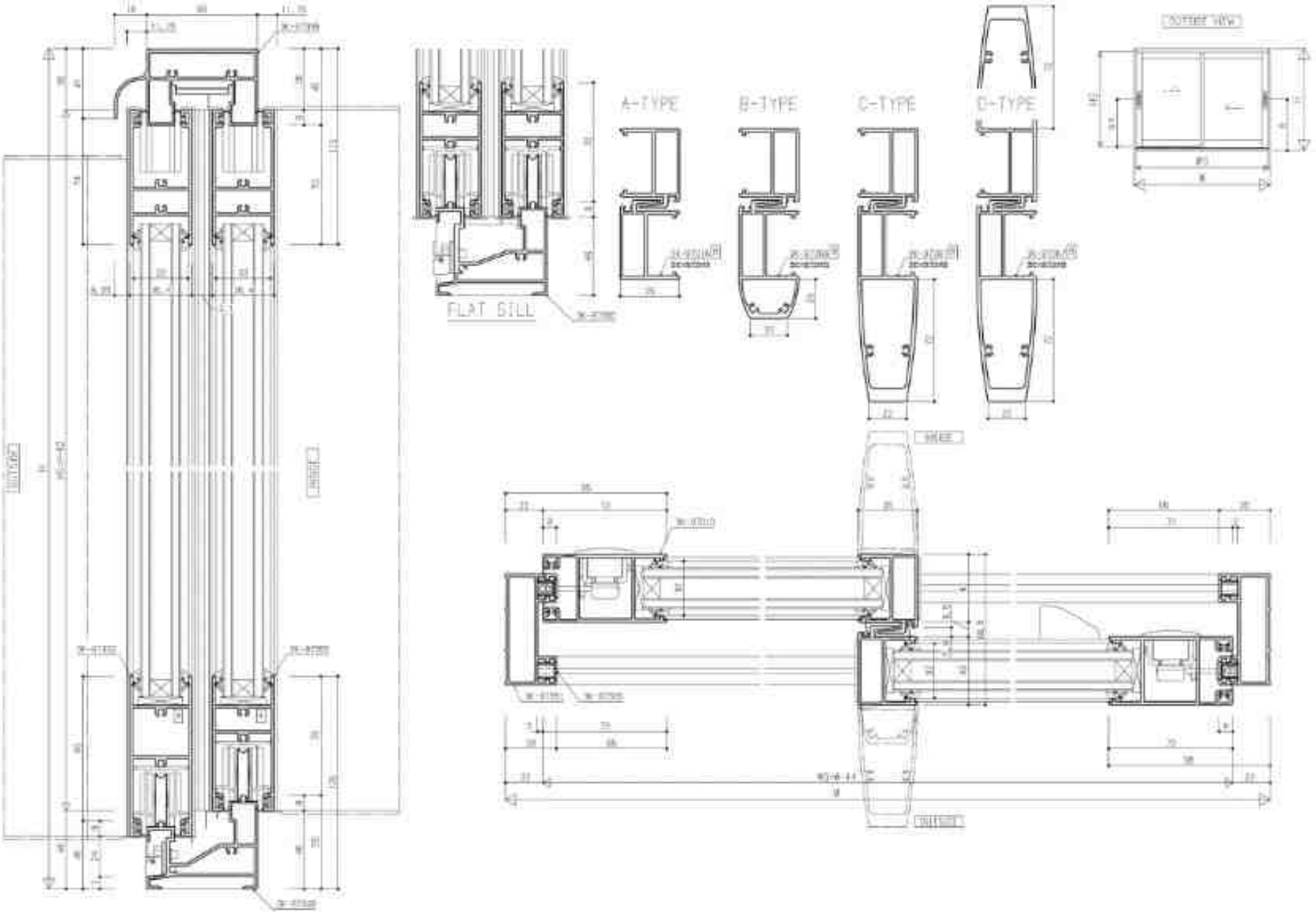


☐ System drawing. FIX / Sliding Glass Groove 18mm

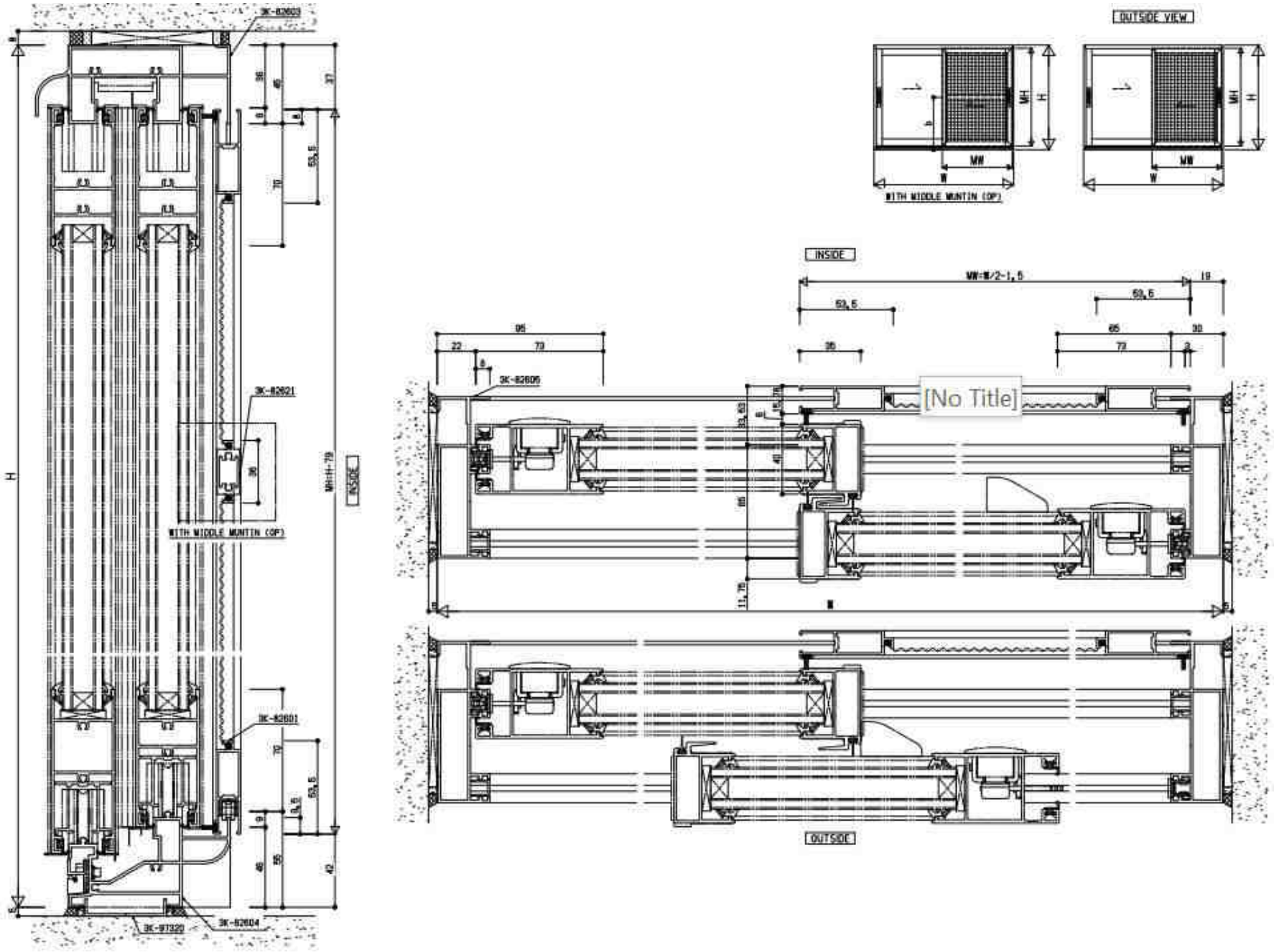




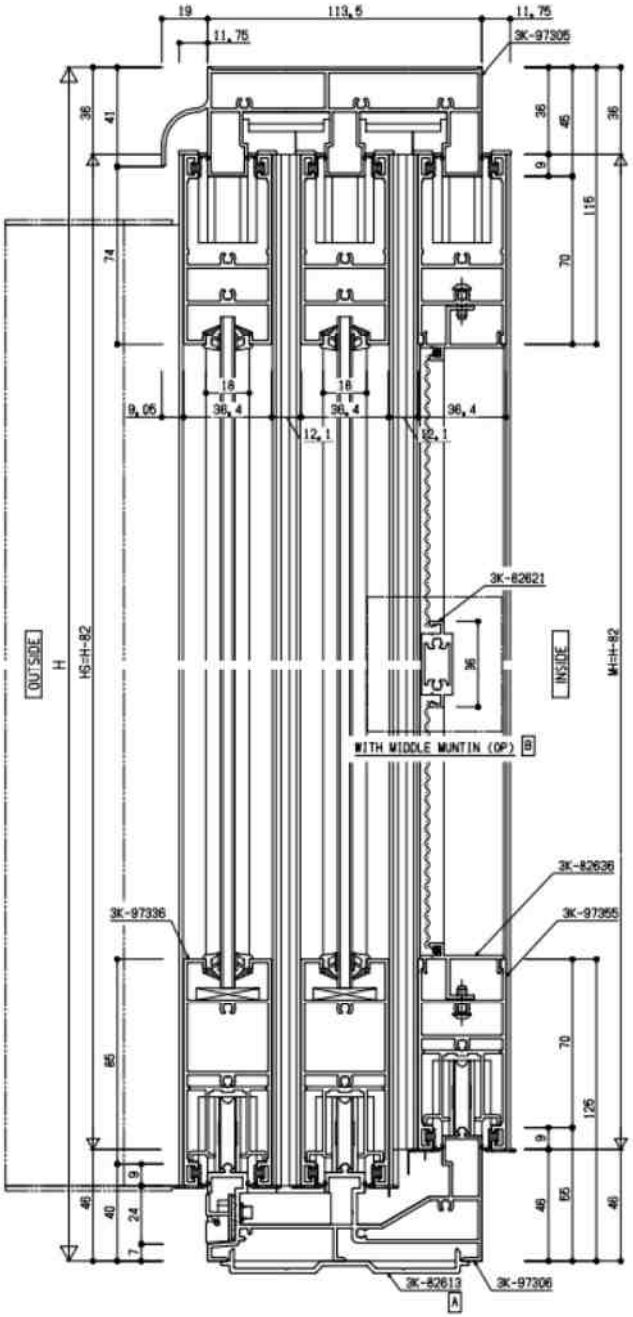
☐ System drawing. Sliding 2-LEAF Glass Groove 32mm

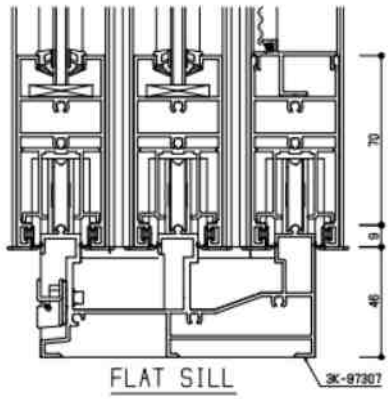


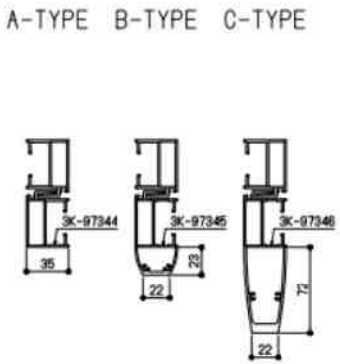
☐ System drawing. Fly Screen(2.5 track)

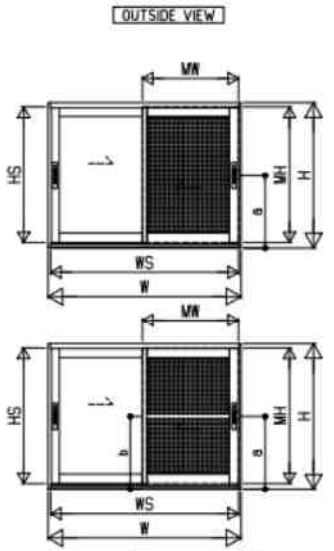


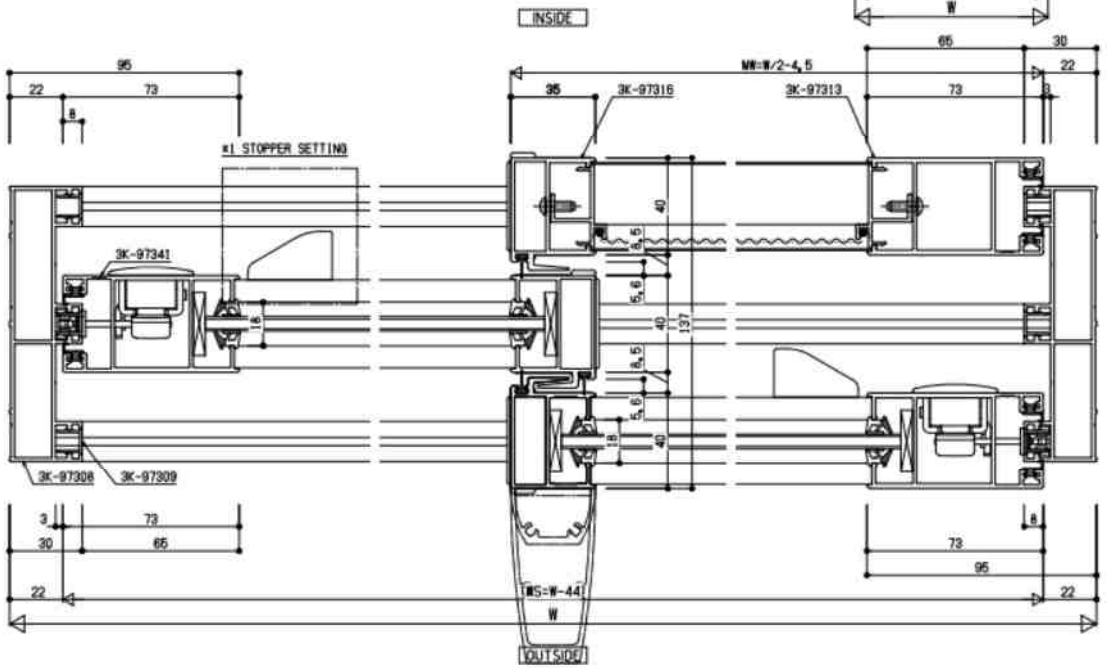
☐ System drawing. Fly Screen(3 track 2 Shutter)



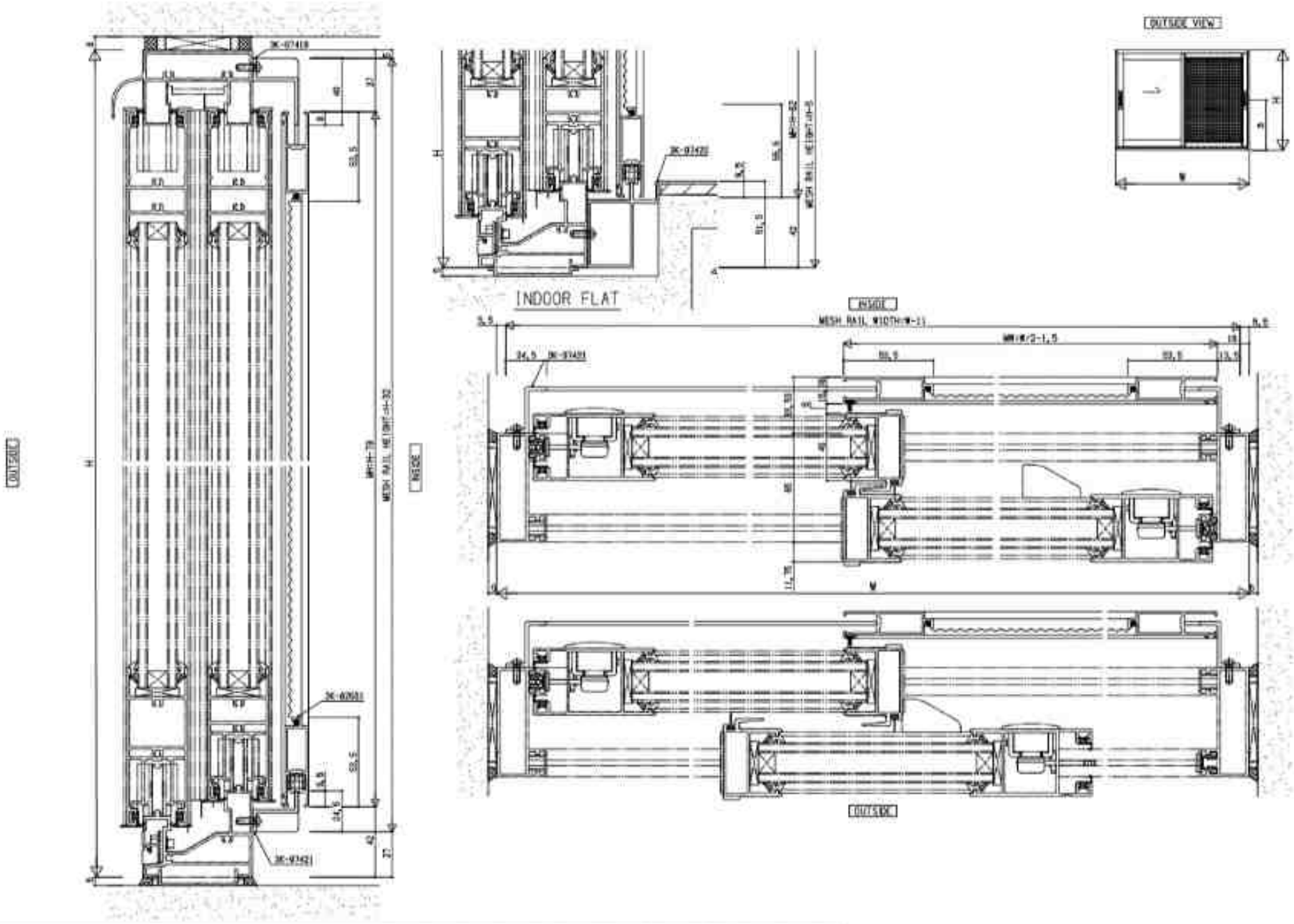






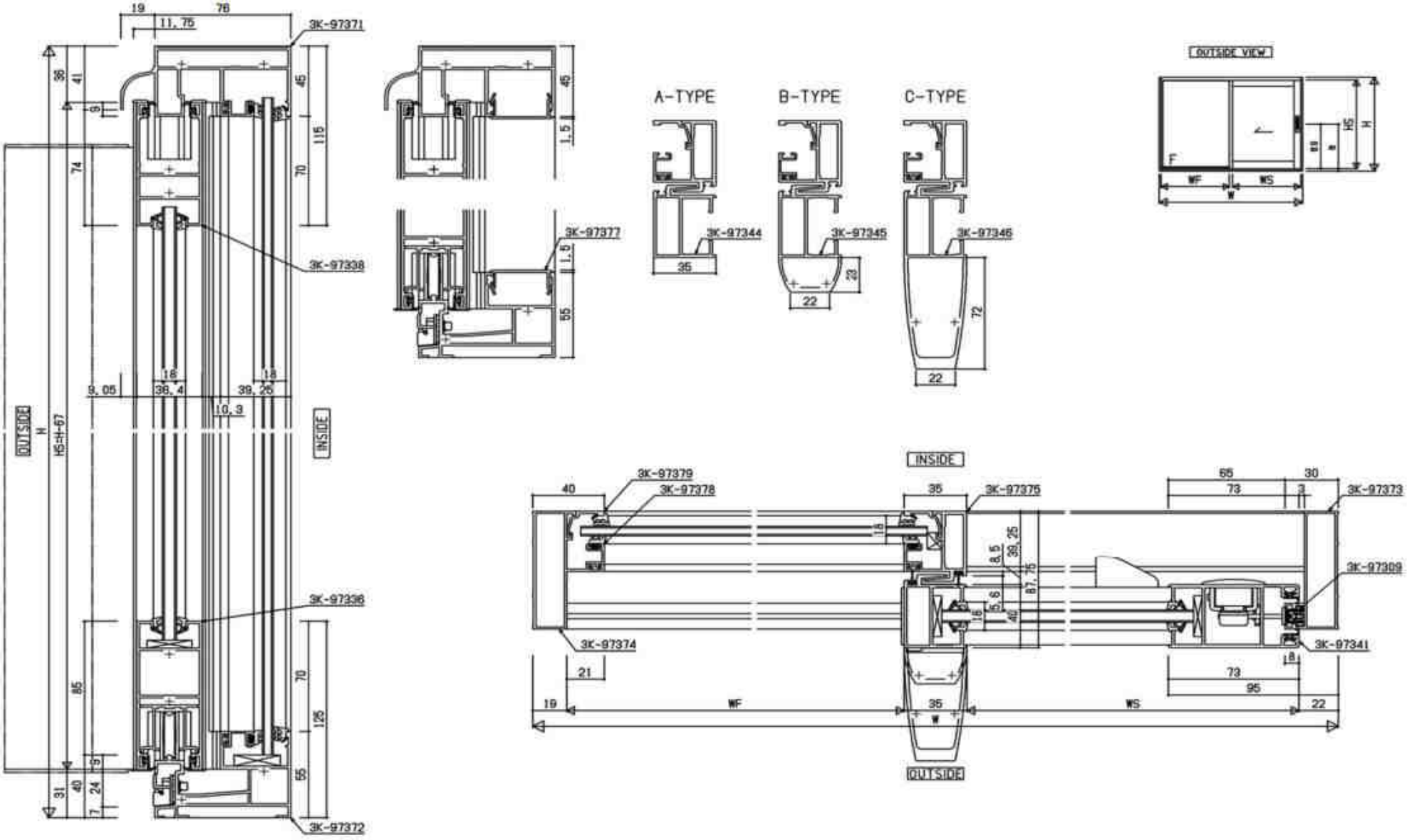


☐ System drawing. Fly Screen(Attach)



☐ System drawing. Single Sliding

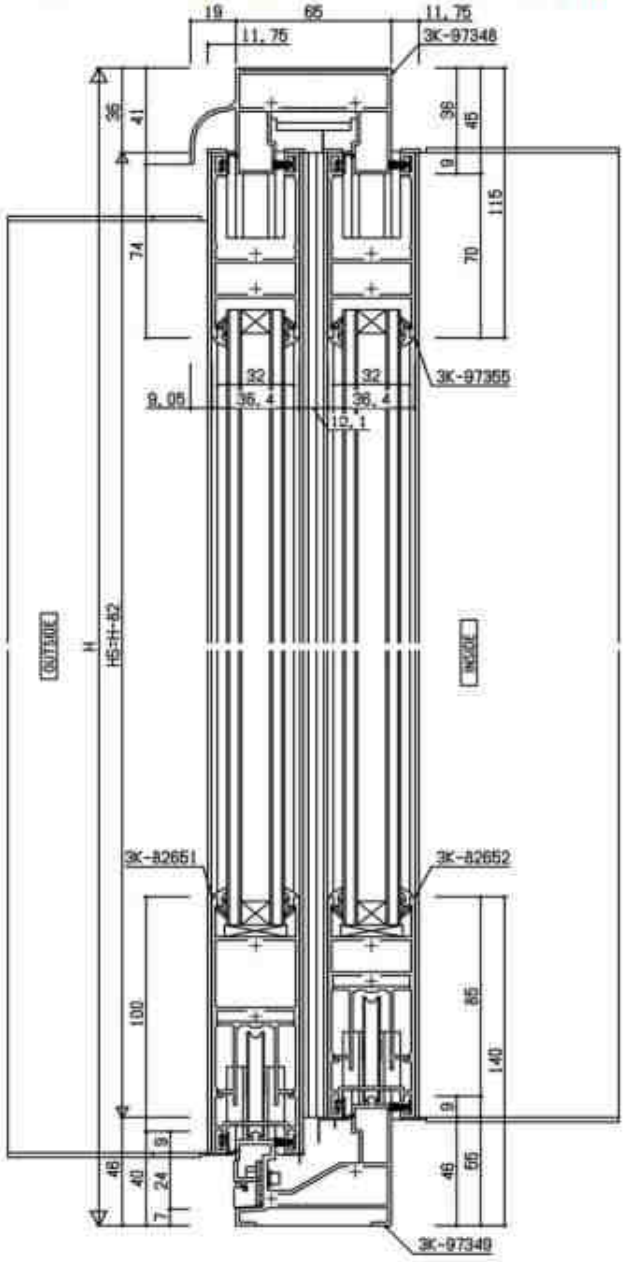
■SINGLE SLIDING
GLASS GROOVE: 18mm

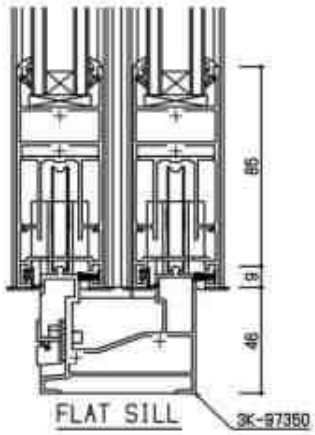


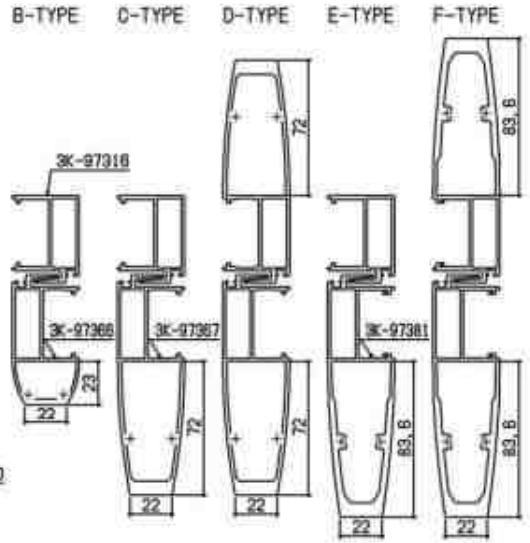
☐ System drawing. Sliding 2-LEAF Glass Groove 18mm Big Opening

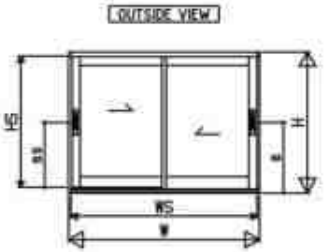
■2-LEAF

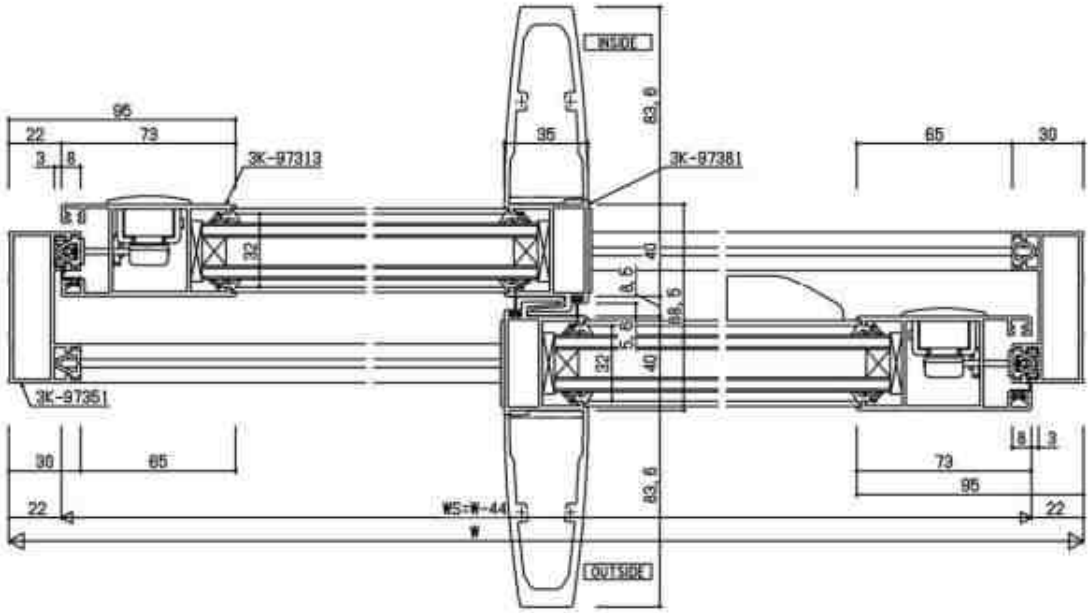
STEP SILL,FLAT SILL_GLASS GROOVE : 32mm_WATER TIGHTNESS : 200Pa



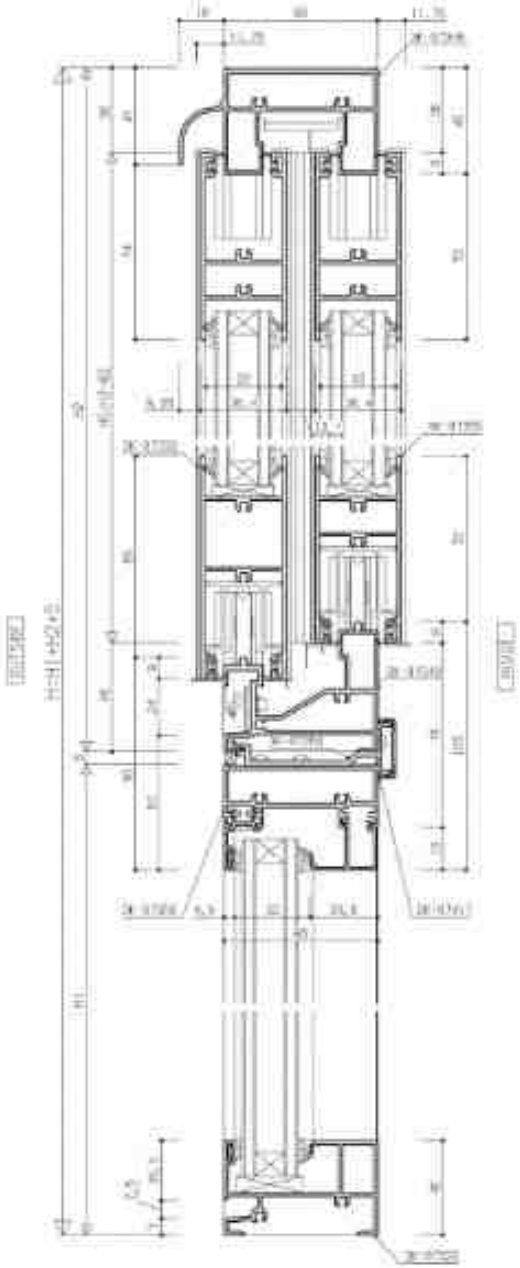


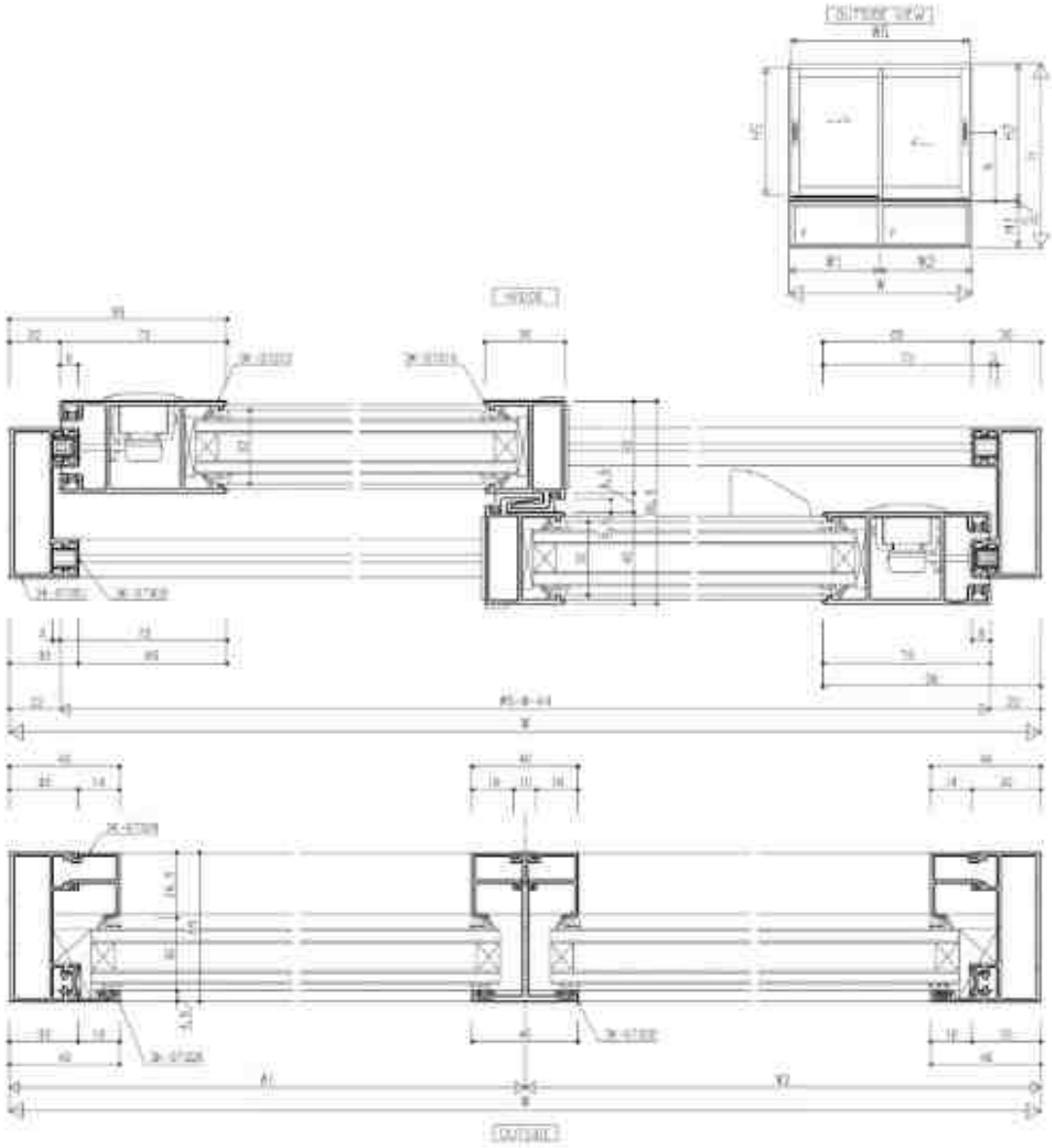




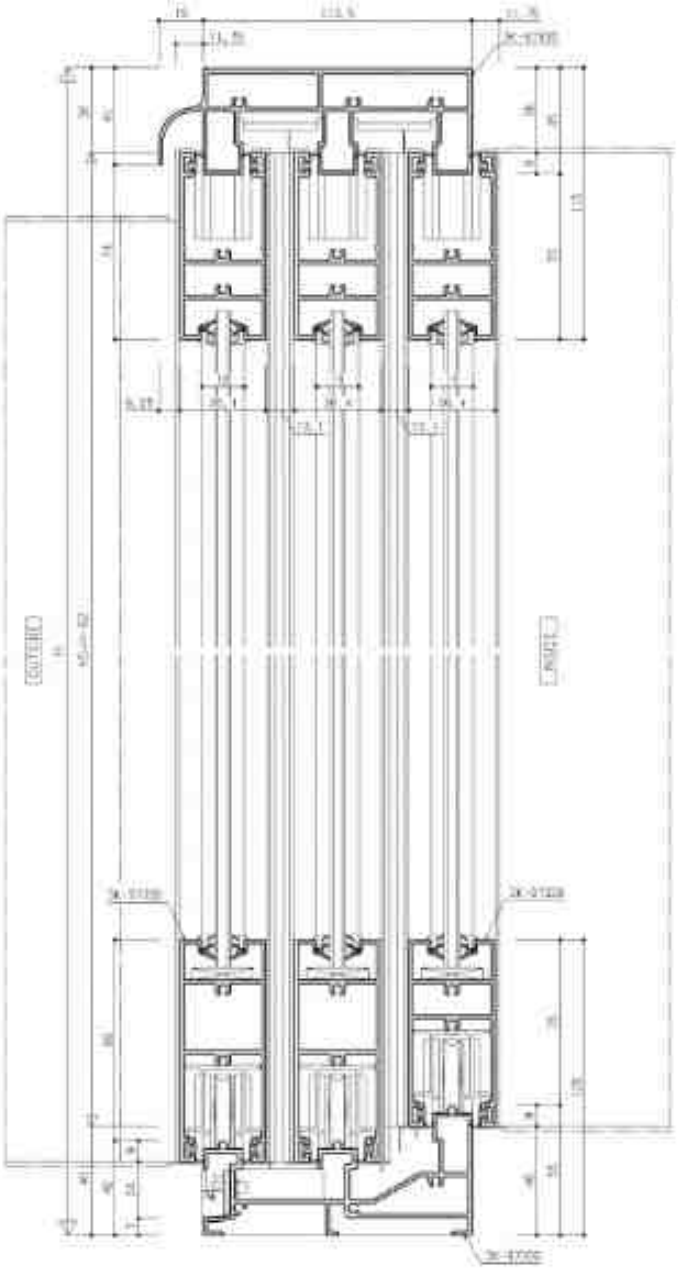


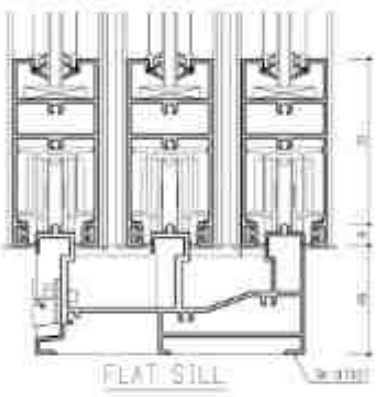
☐ System drawing. FIX / Sliding Glass Groove 32mm

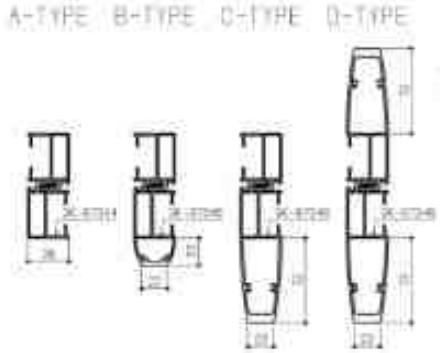


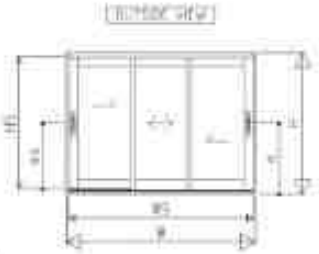


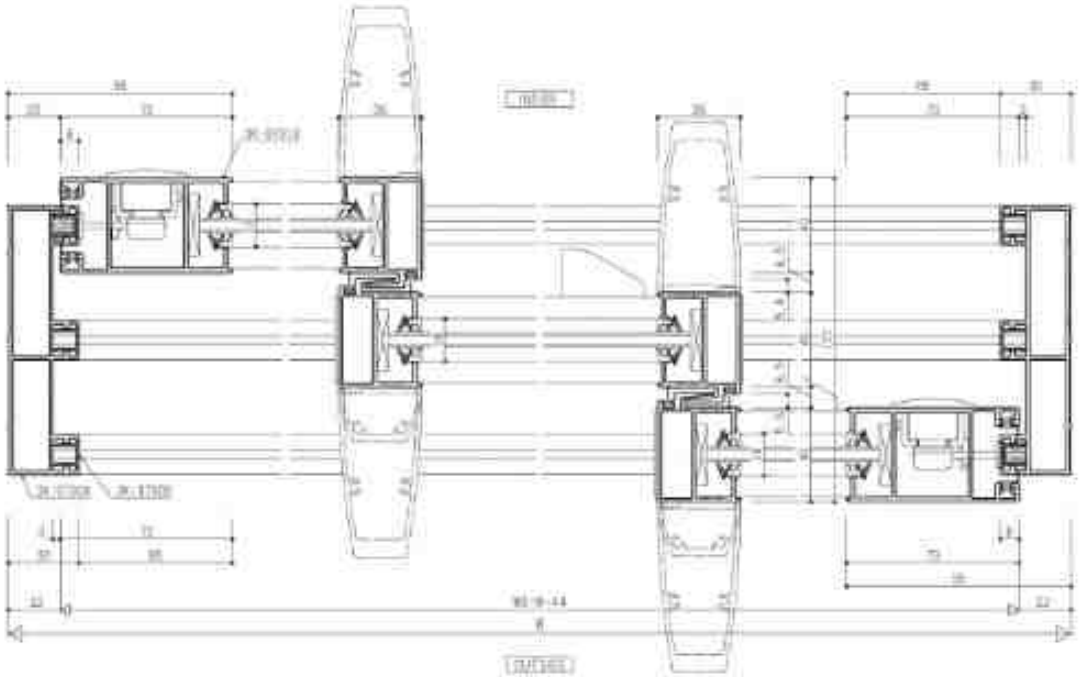
☐ System drawing. Sliding 3-LEAF Glass Groove 18mm



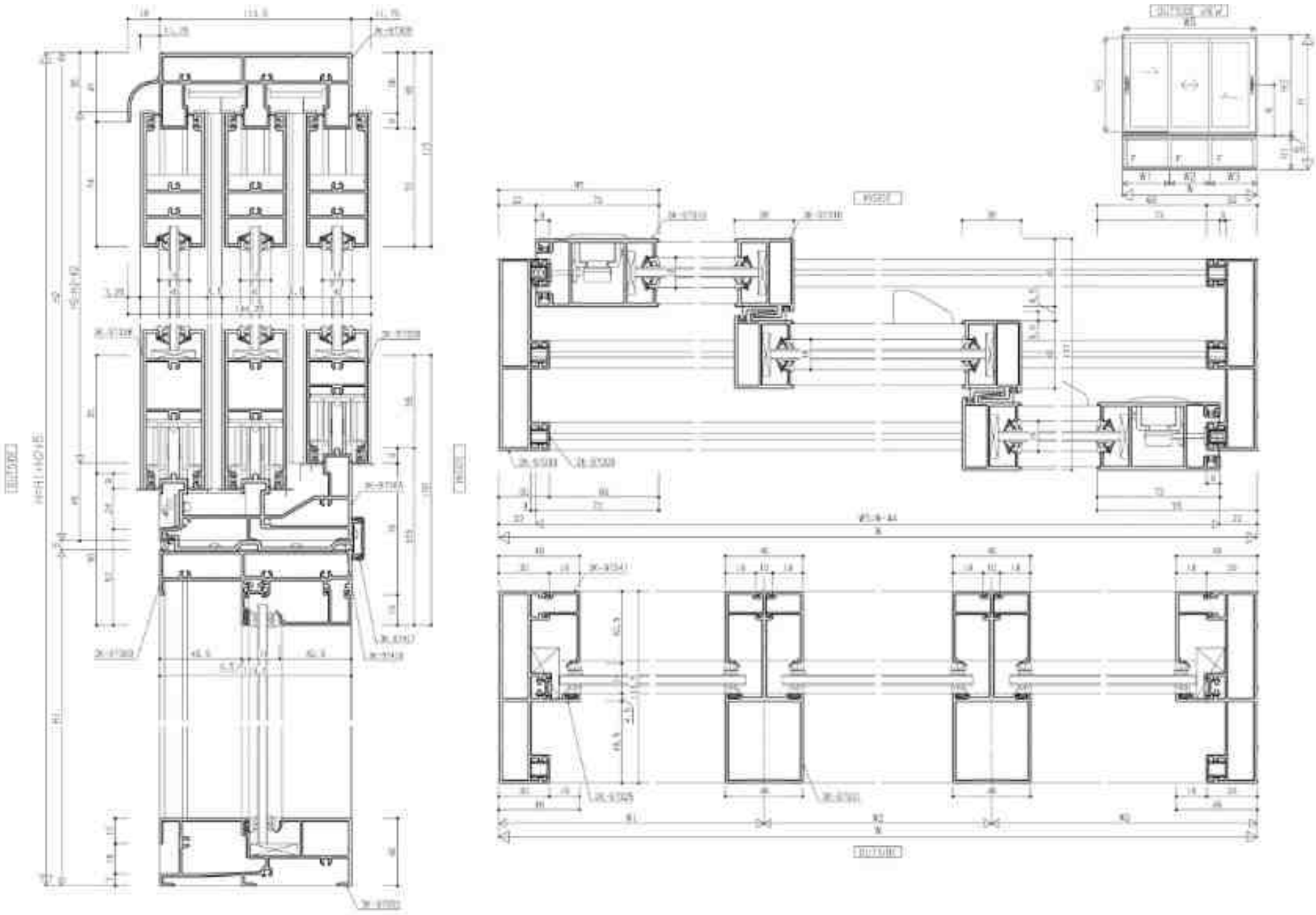




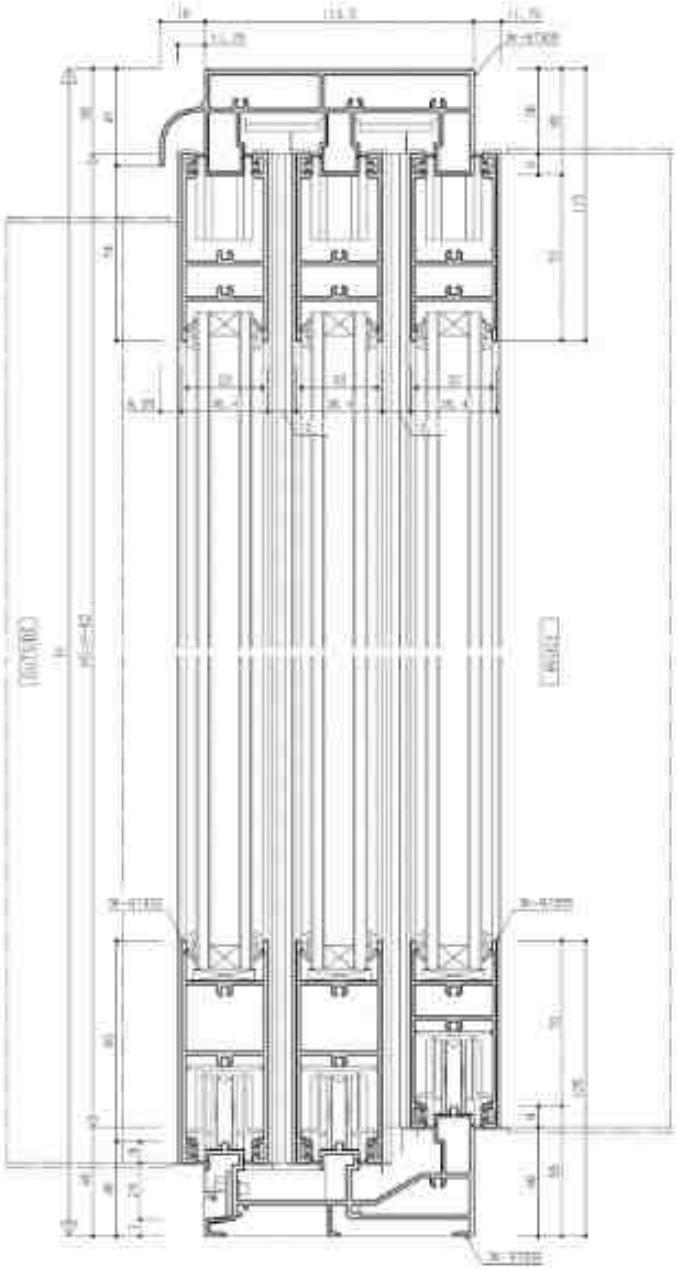


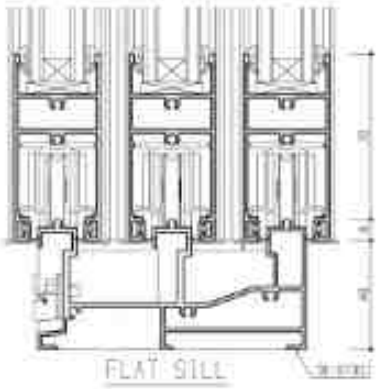


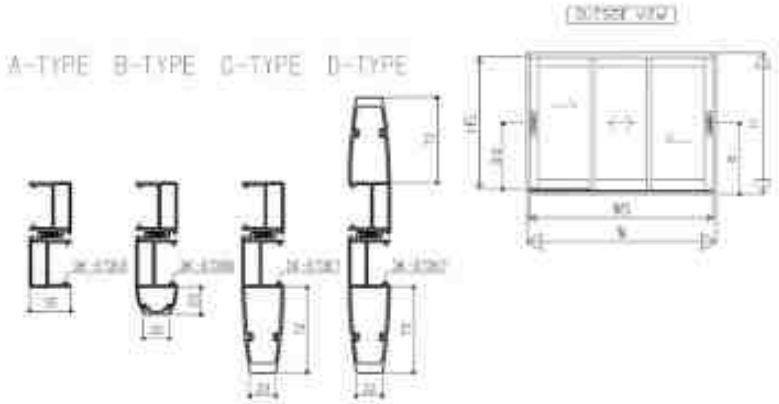
☐ System drawing. Fixed / Sliding Glass Groove 18mm

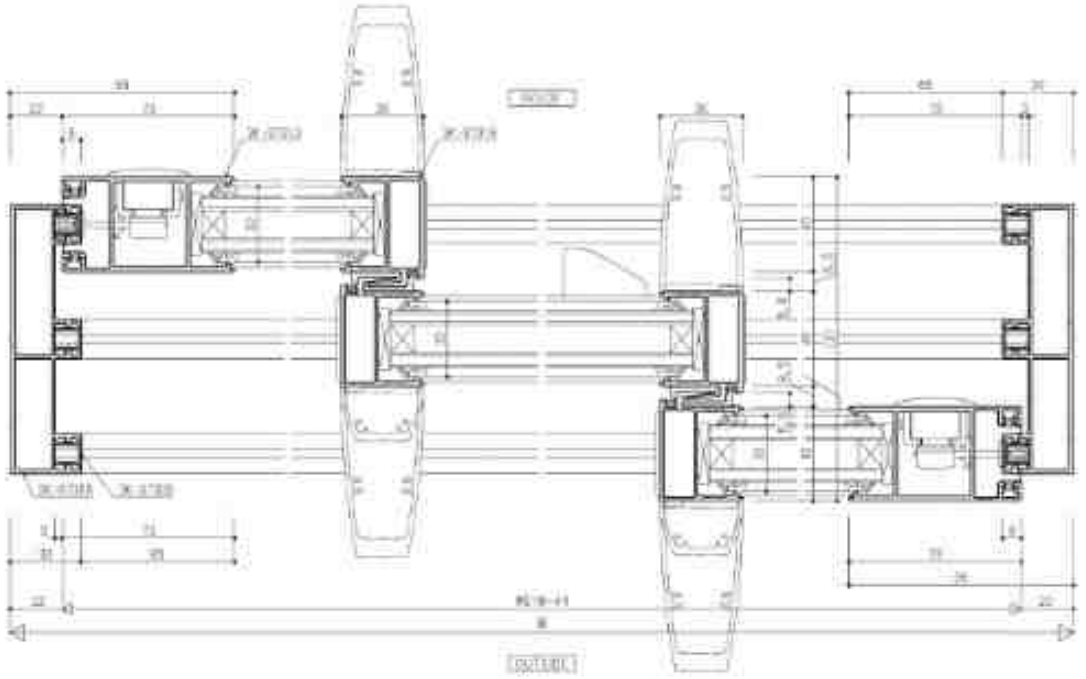


☐ System drawing. Sliding 3-LEAF Glass Groove 32mm

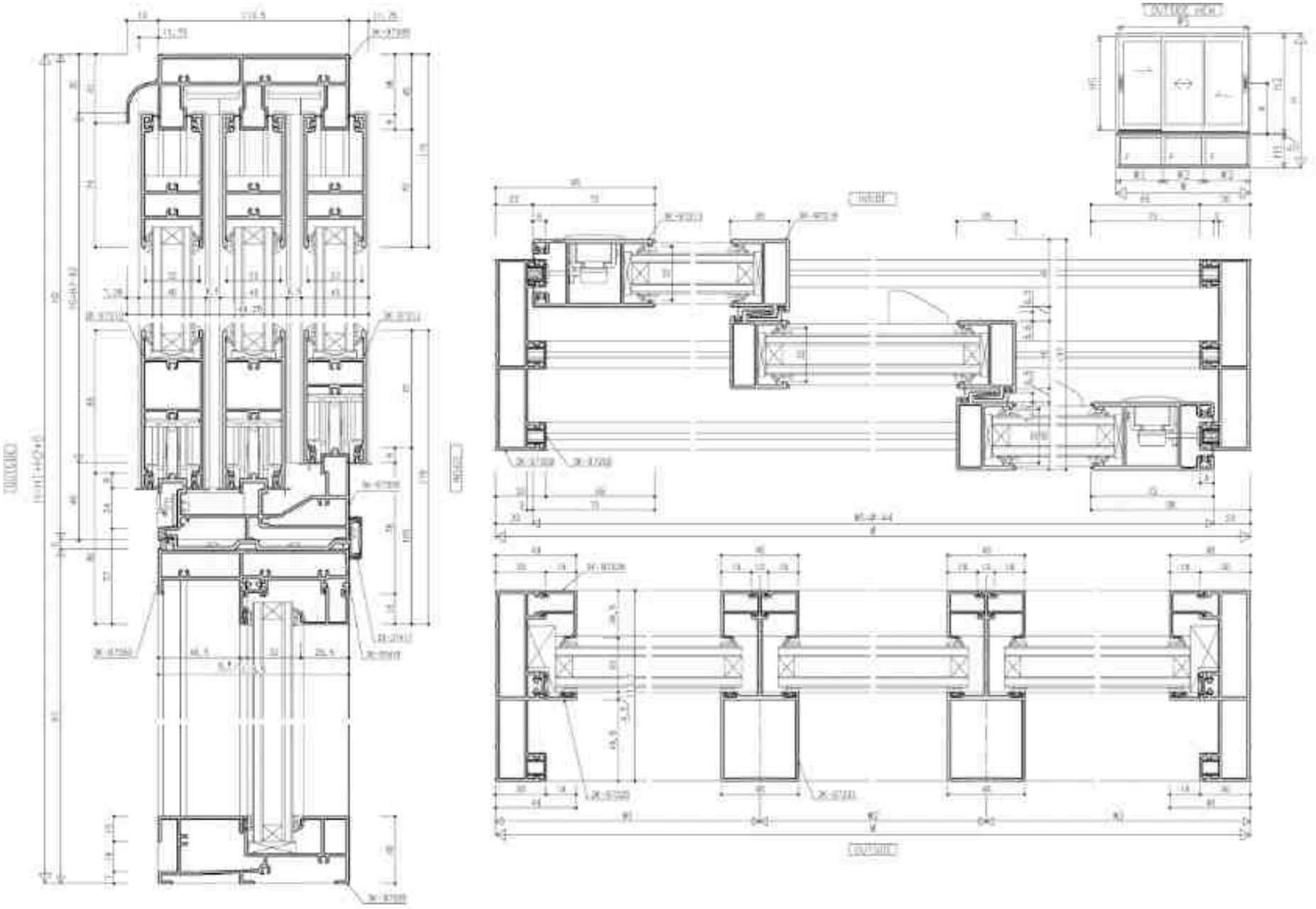




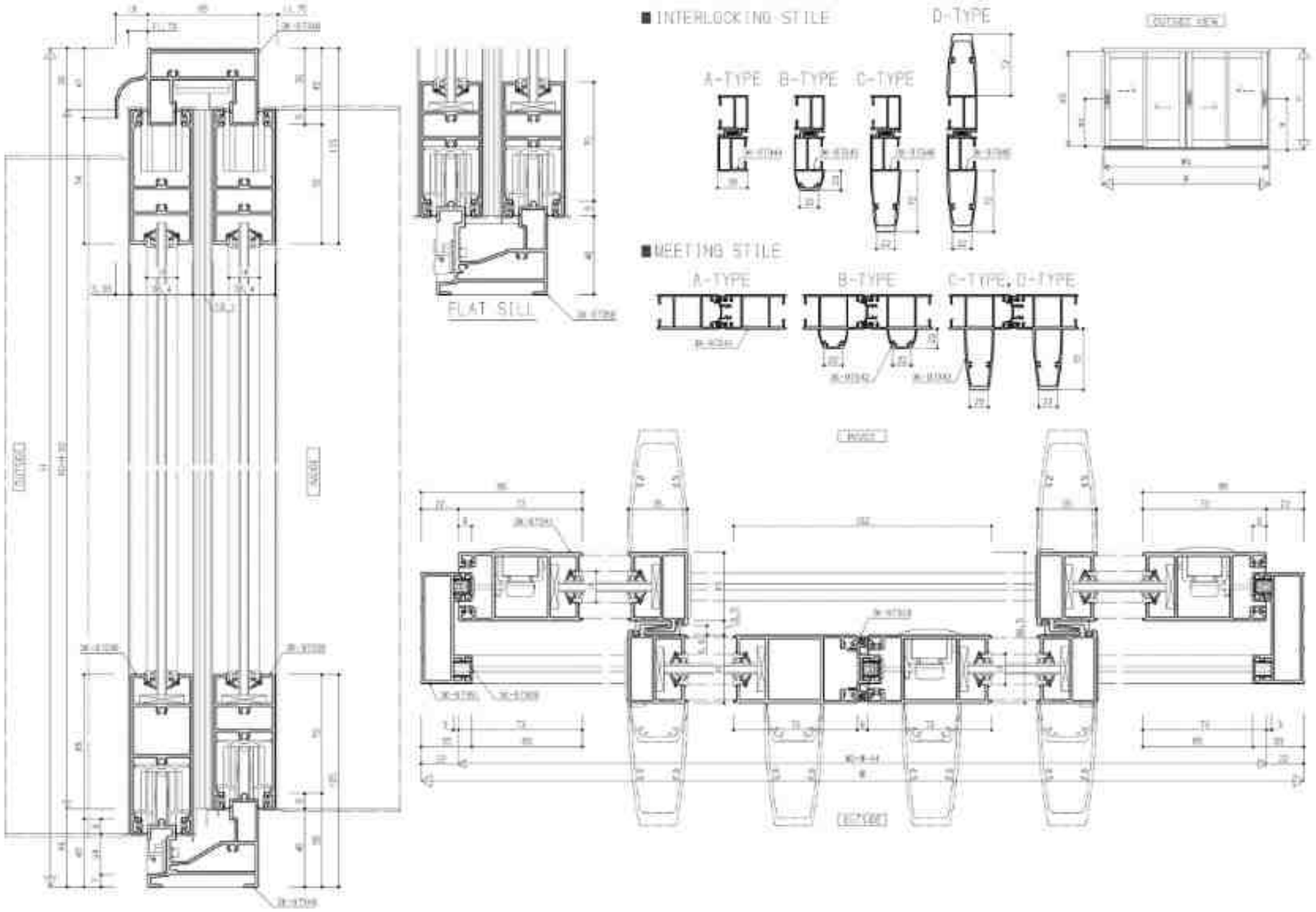




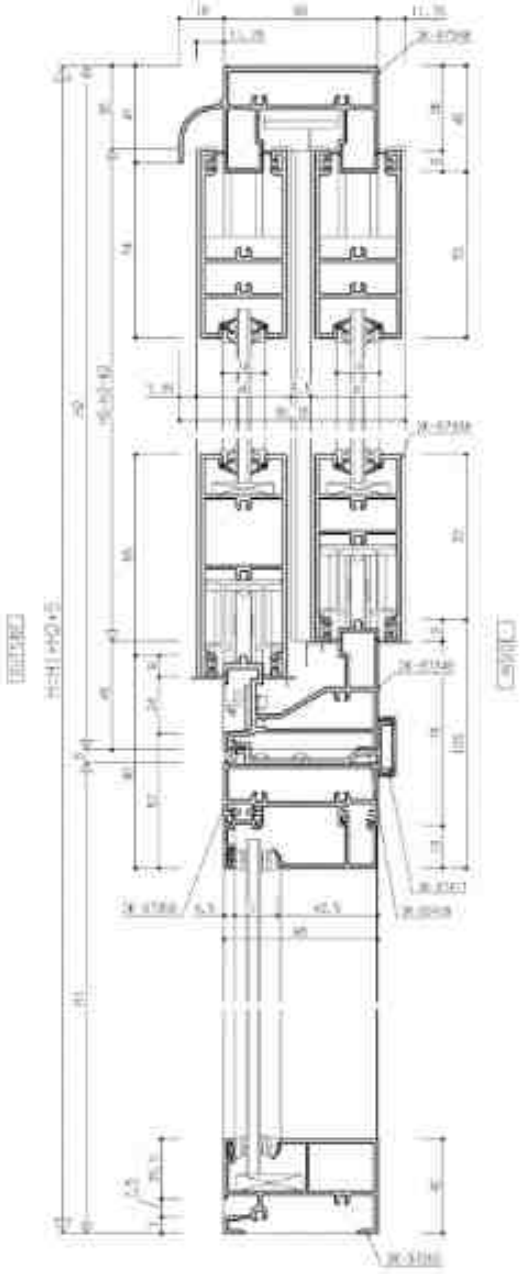
☐ System drawing. Fixed / Sliding Glass Groove 32mm

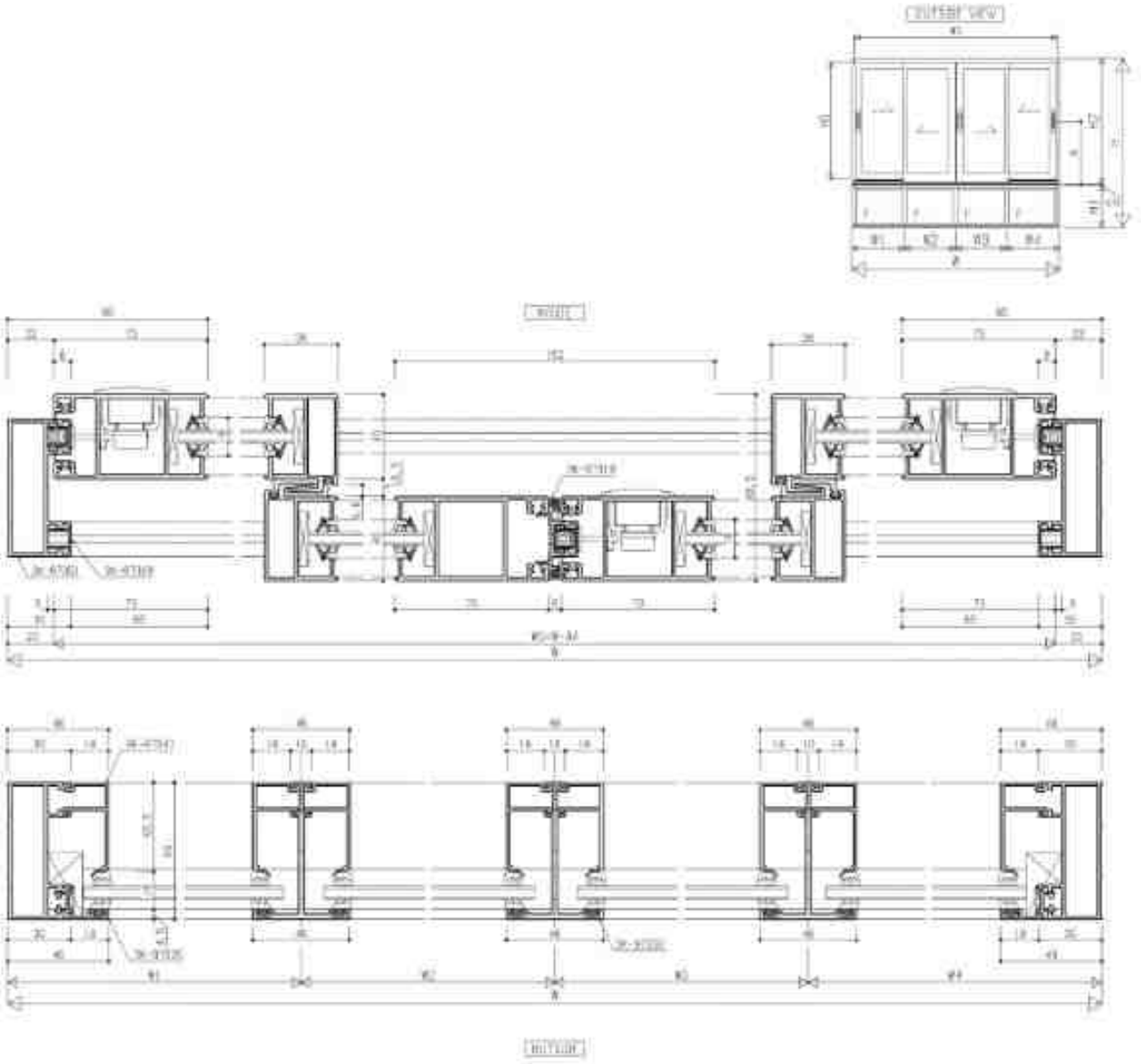


☐ System drawing. Sliding 4-LEAF Glass Groove 18mm

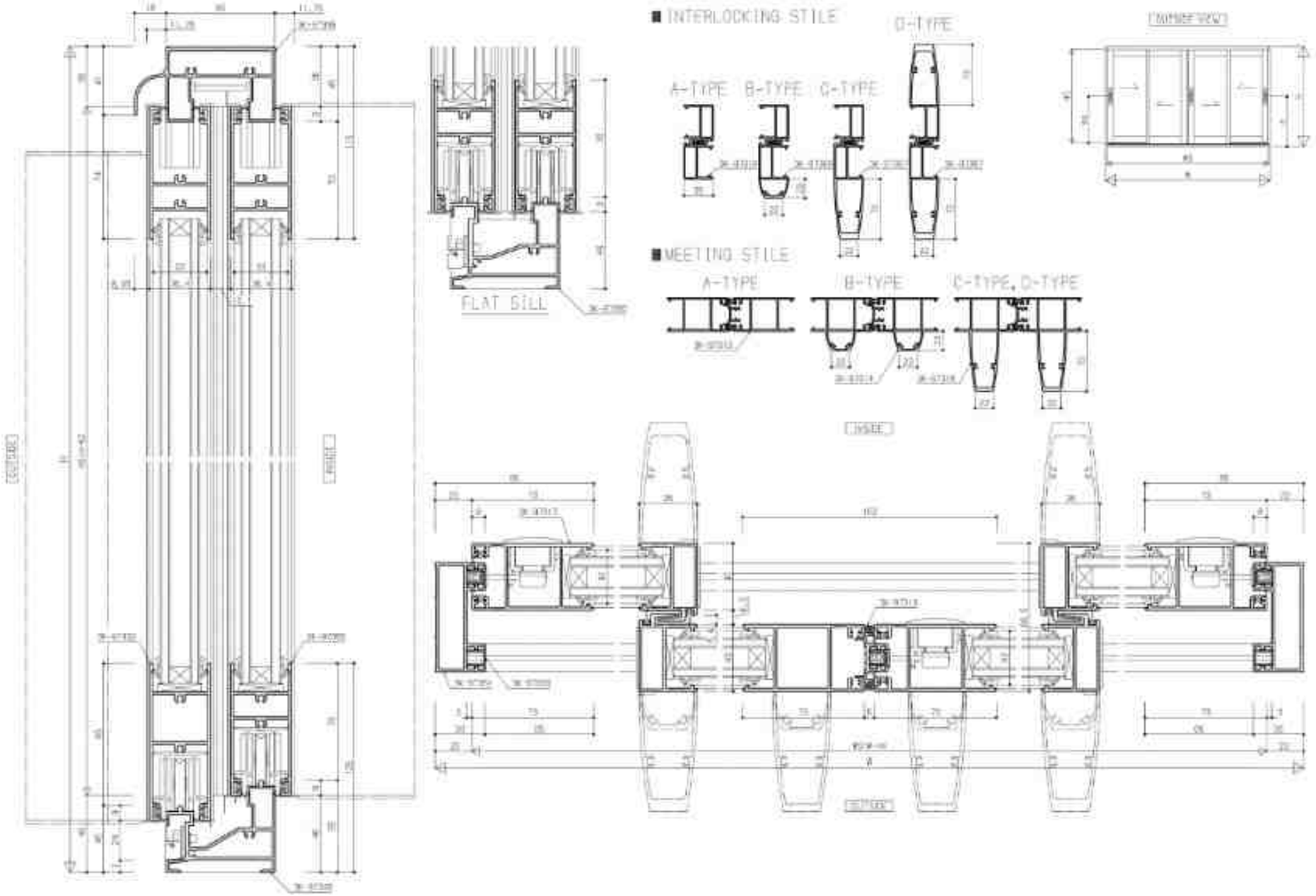


☐ System drawing. Fixed / Sliding Glass Groove 18mm

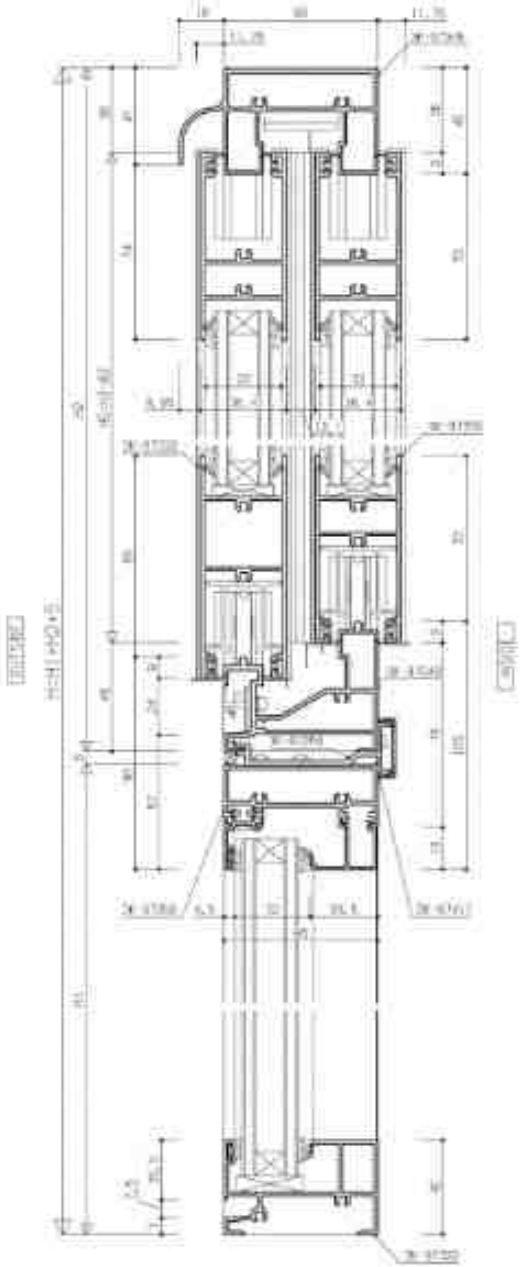


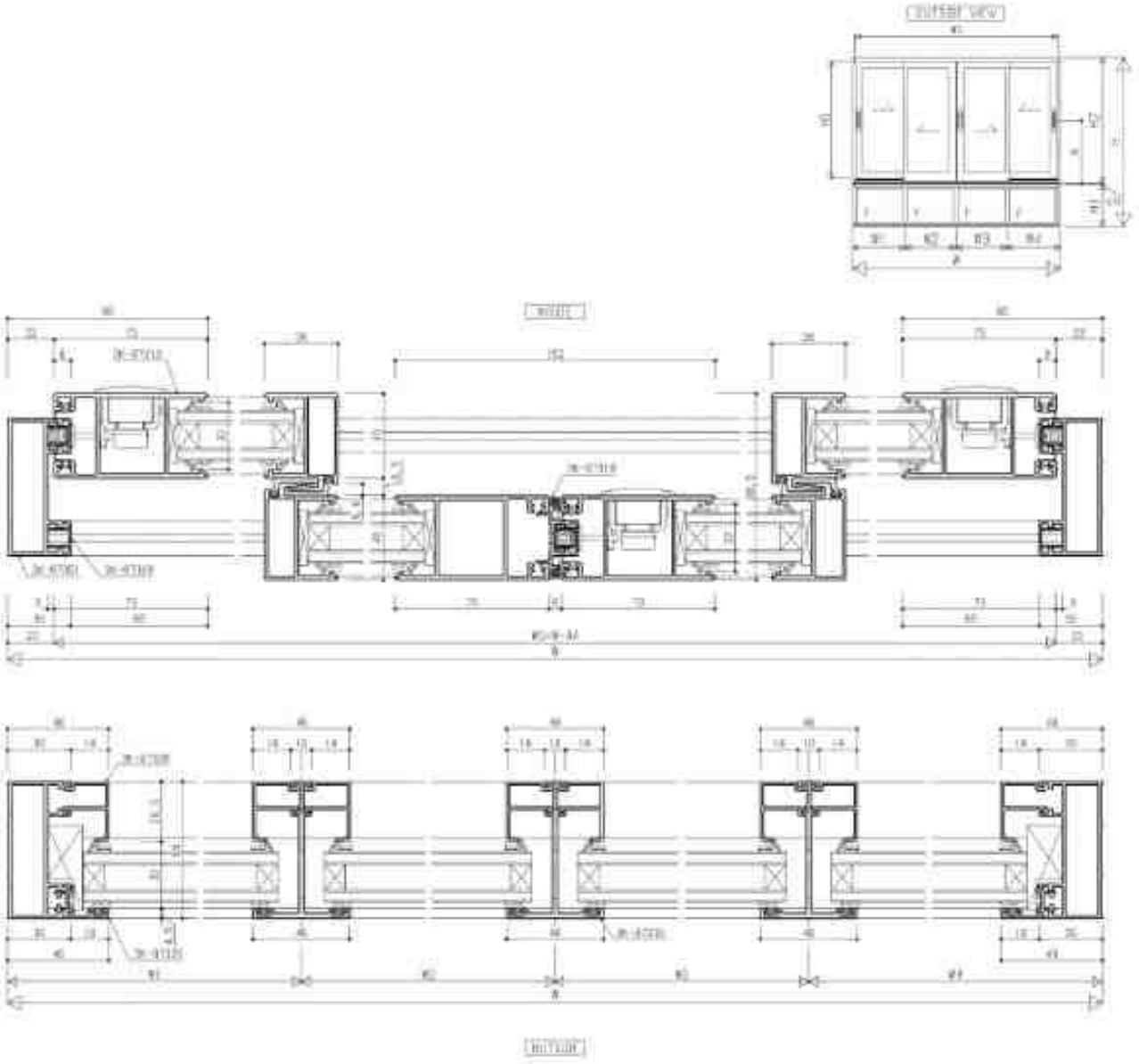


☐ System drawing. Sliding 4-LEAF Glass Groove 32mm

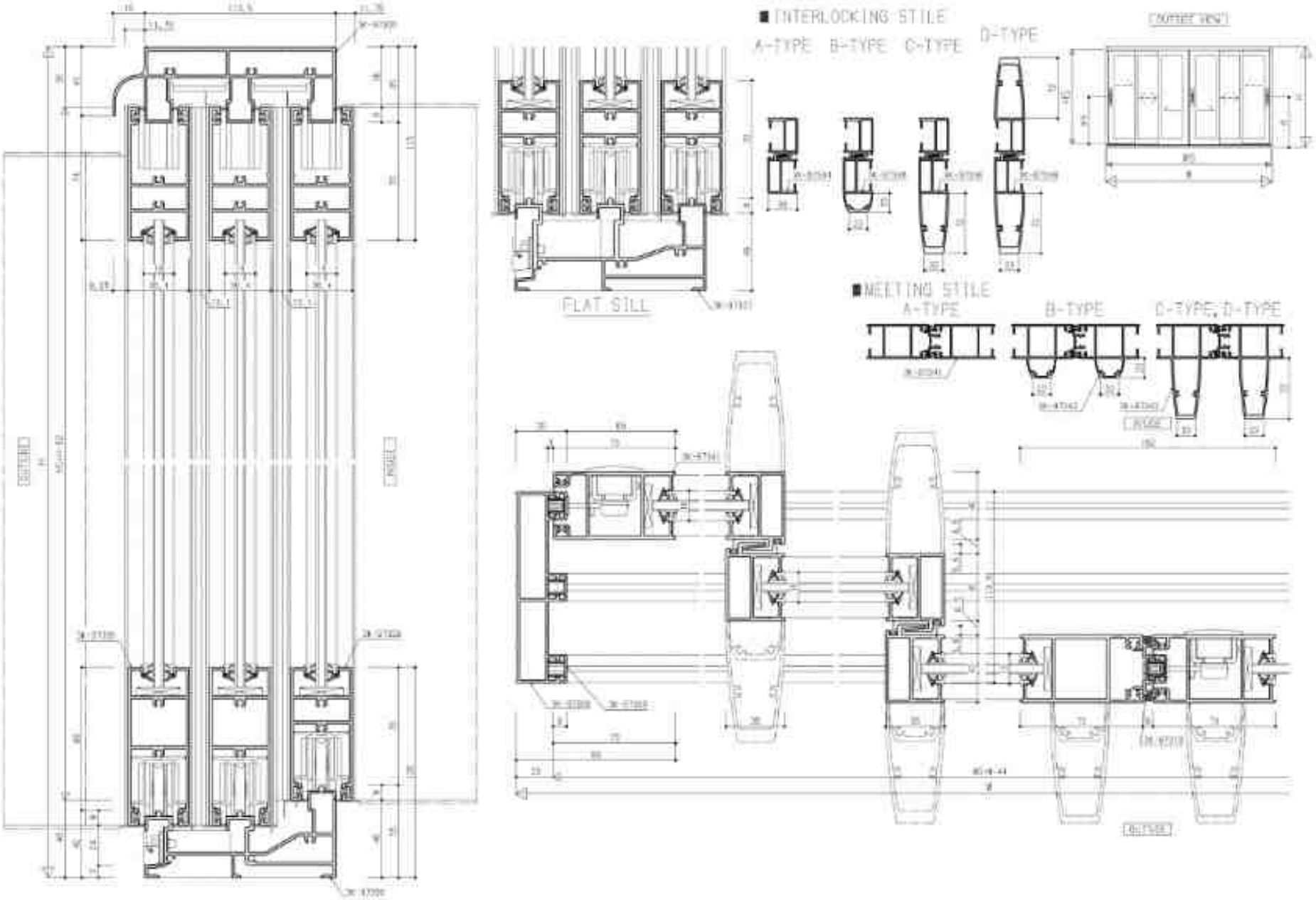


☐ System drawing. Fixed / Sliding Glass Groove 32mm

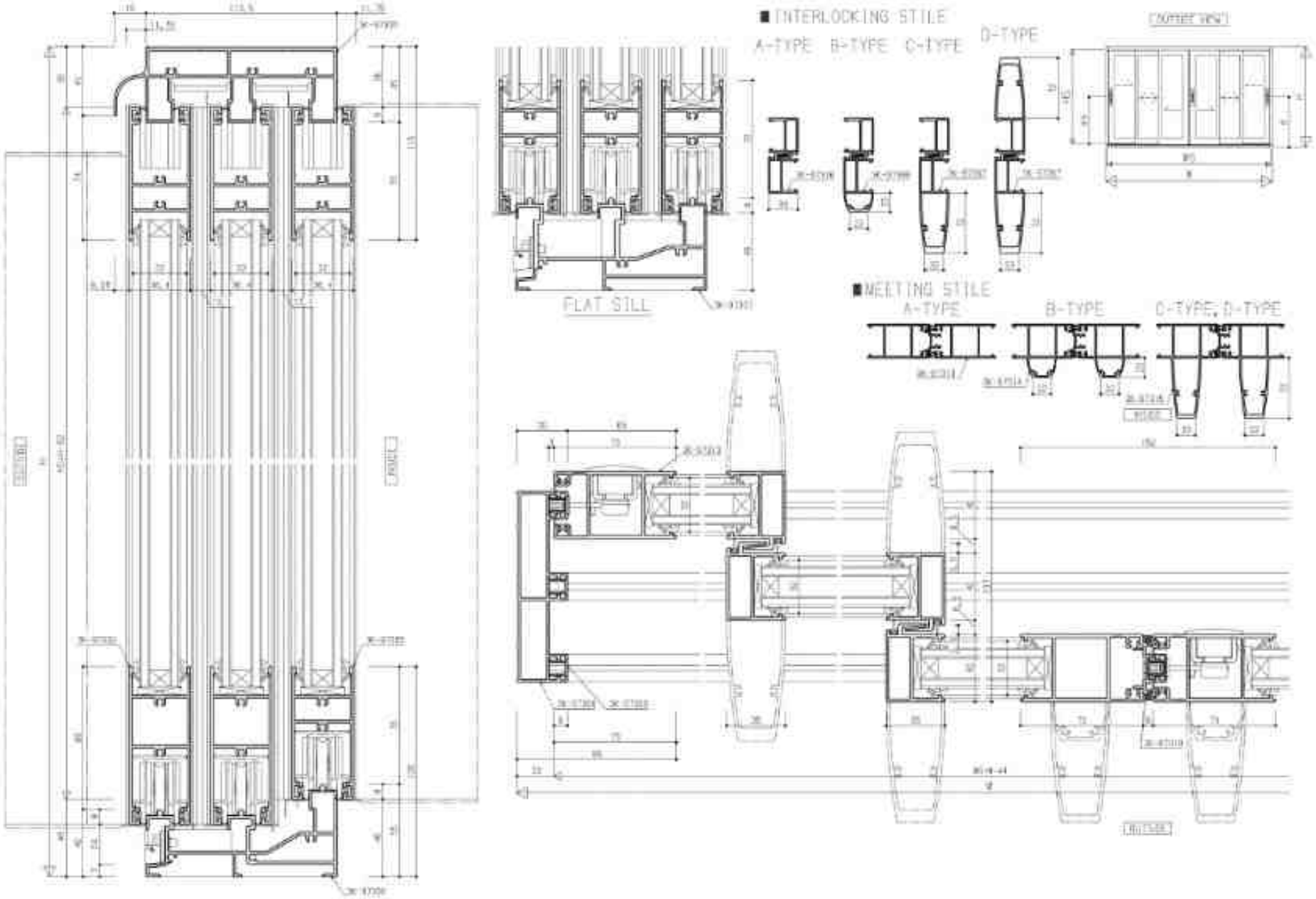




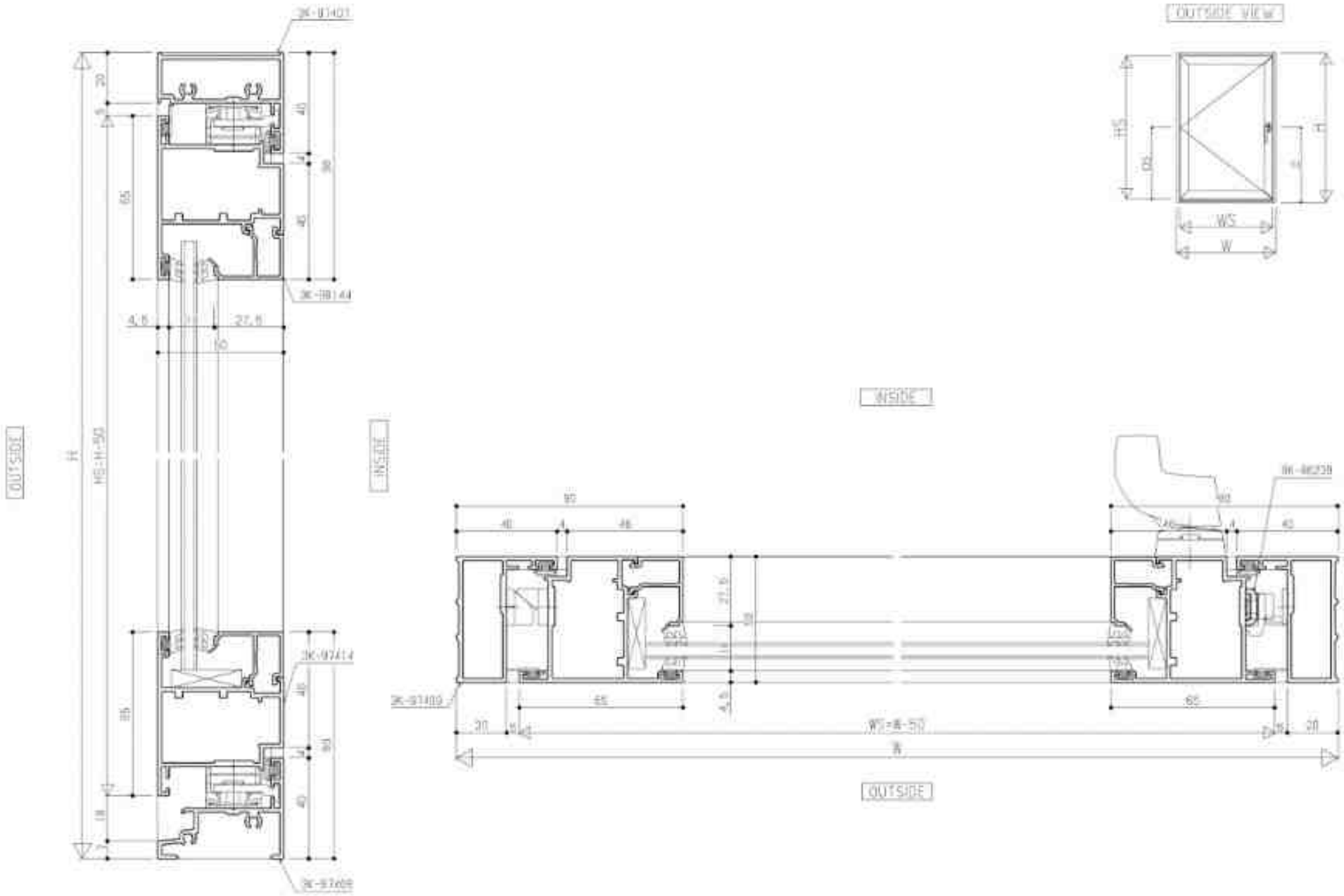
☐ System drawing. Sliding 6-LEAF Glass Groove 18mm



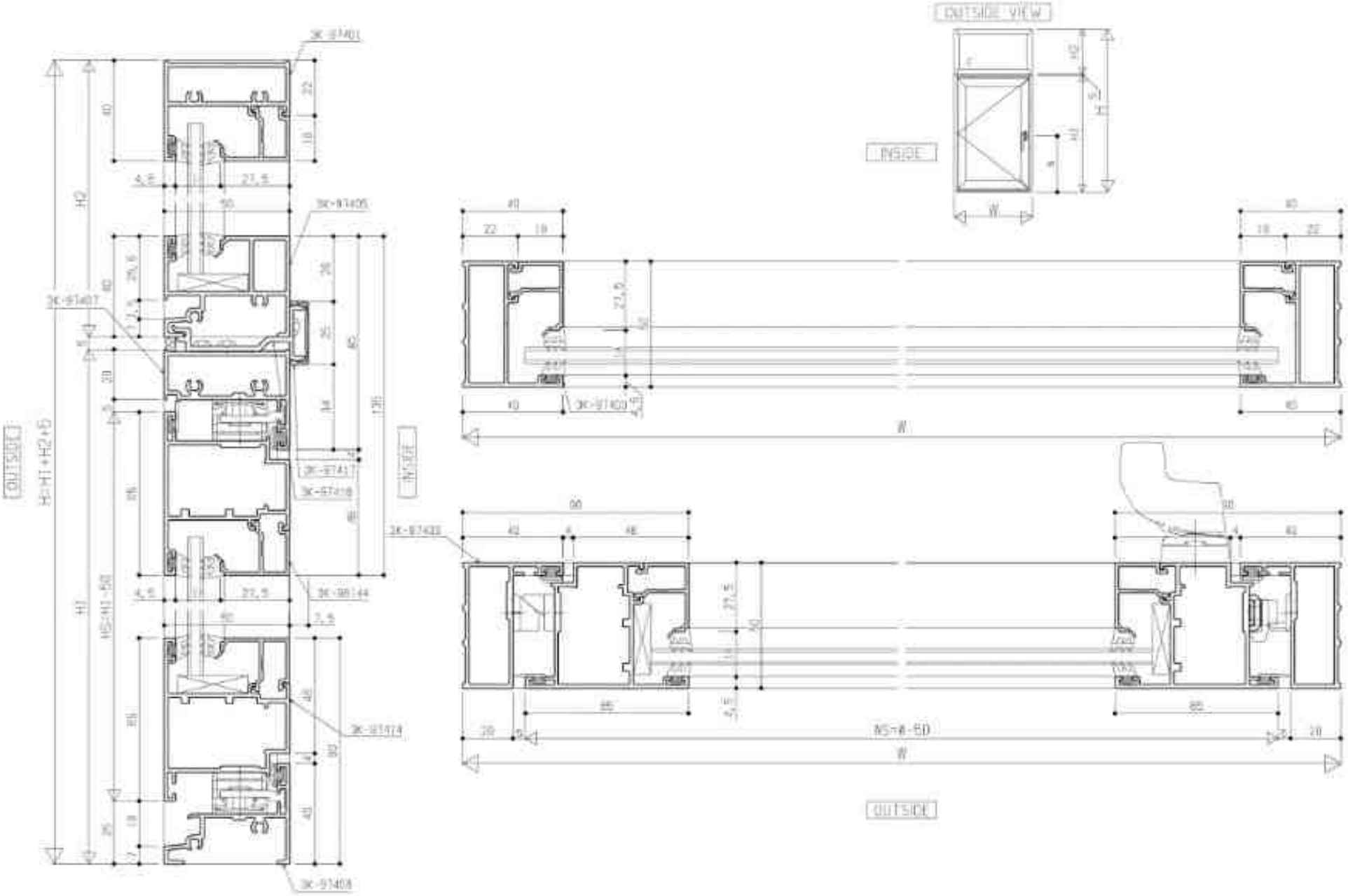
☐ System drawing. Sliding 6-LEAF Glass Groove 32mm



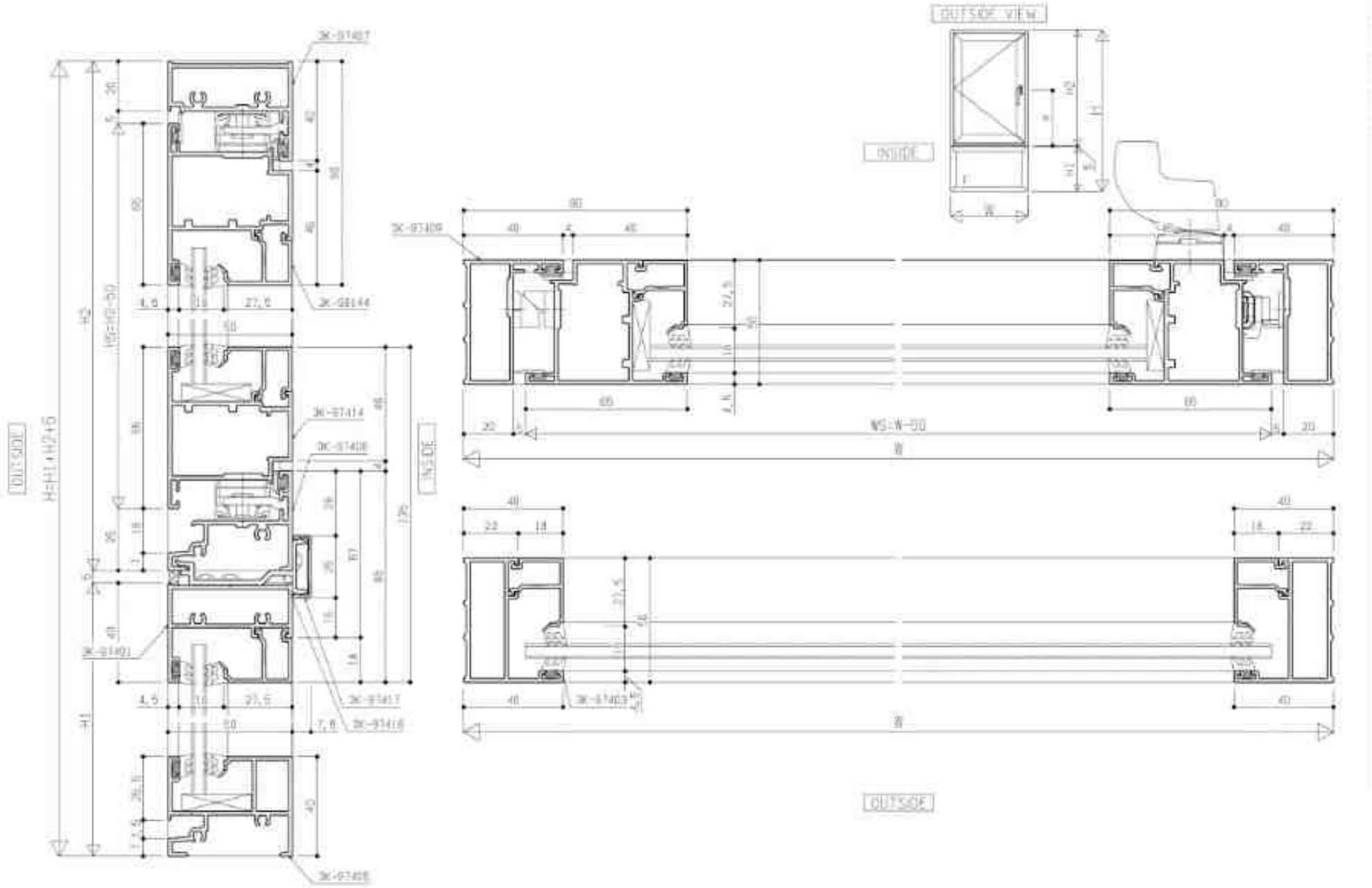
☐ System drawing. Casement Glass Groove 18mm



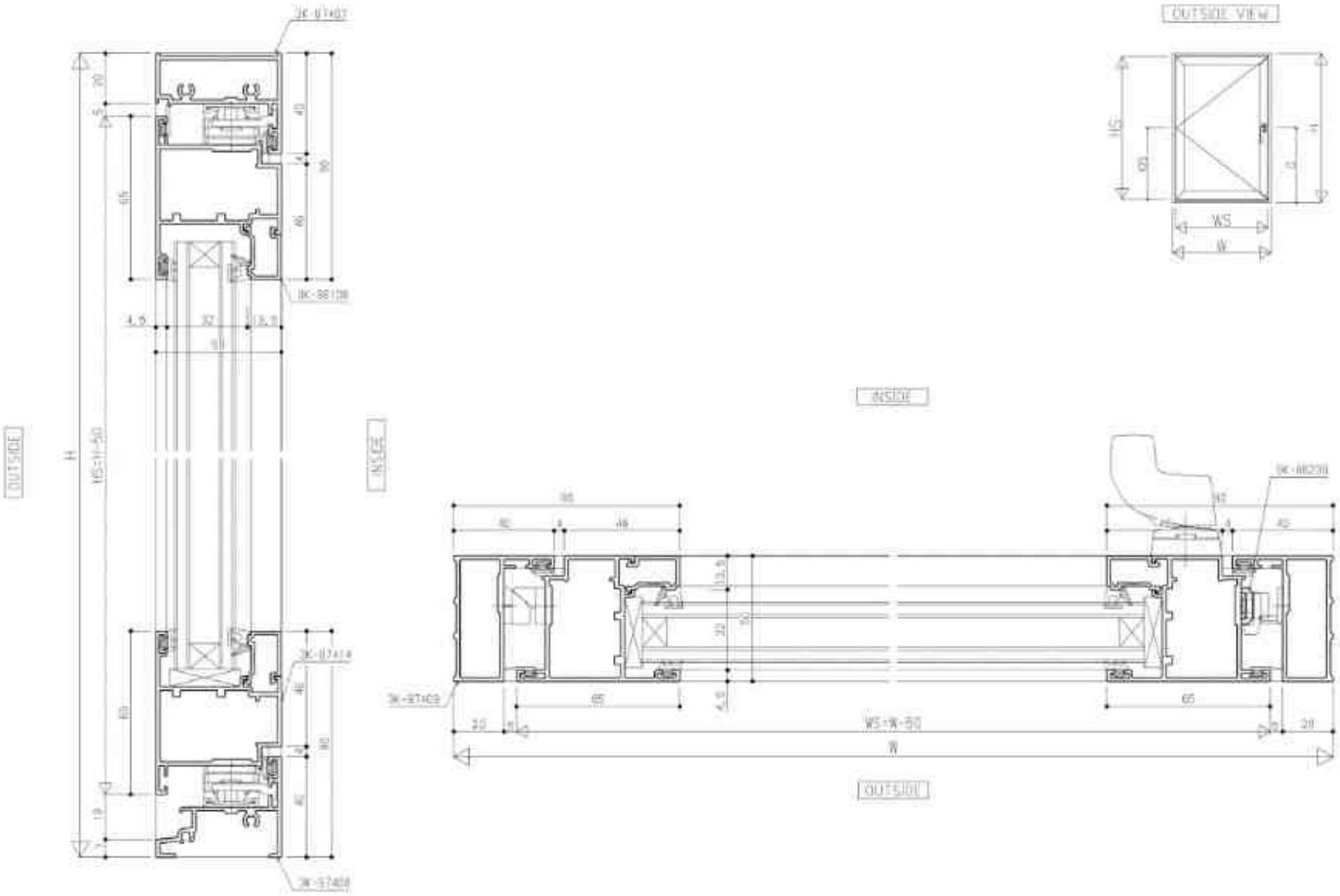
☐ System drawing. Casement / Fixed Glass Groove 18mm



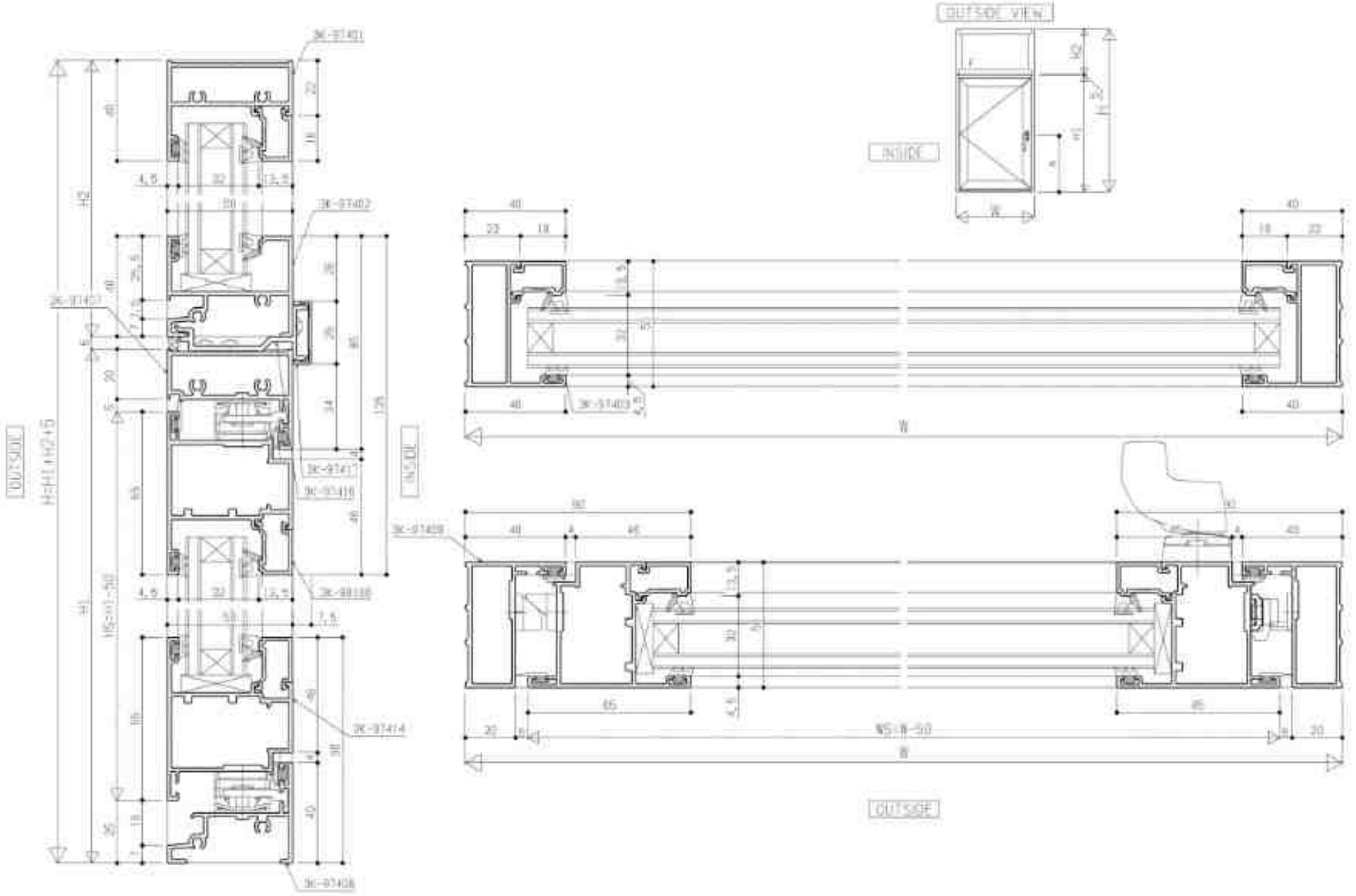
☐ System drawing. Fixed / Casement Glass Groove 18mm



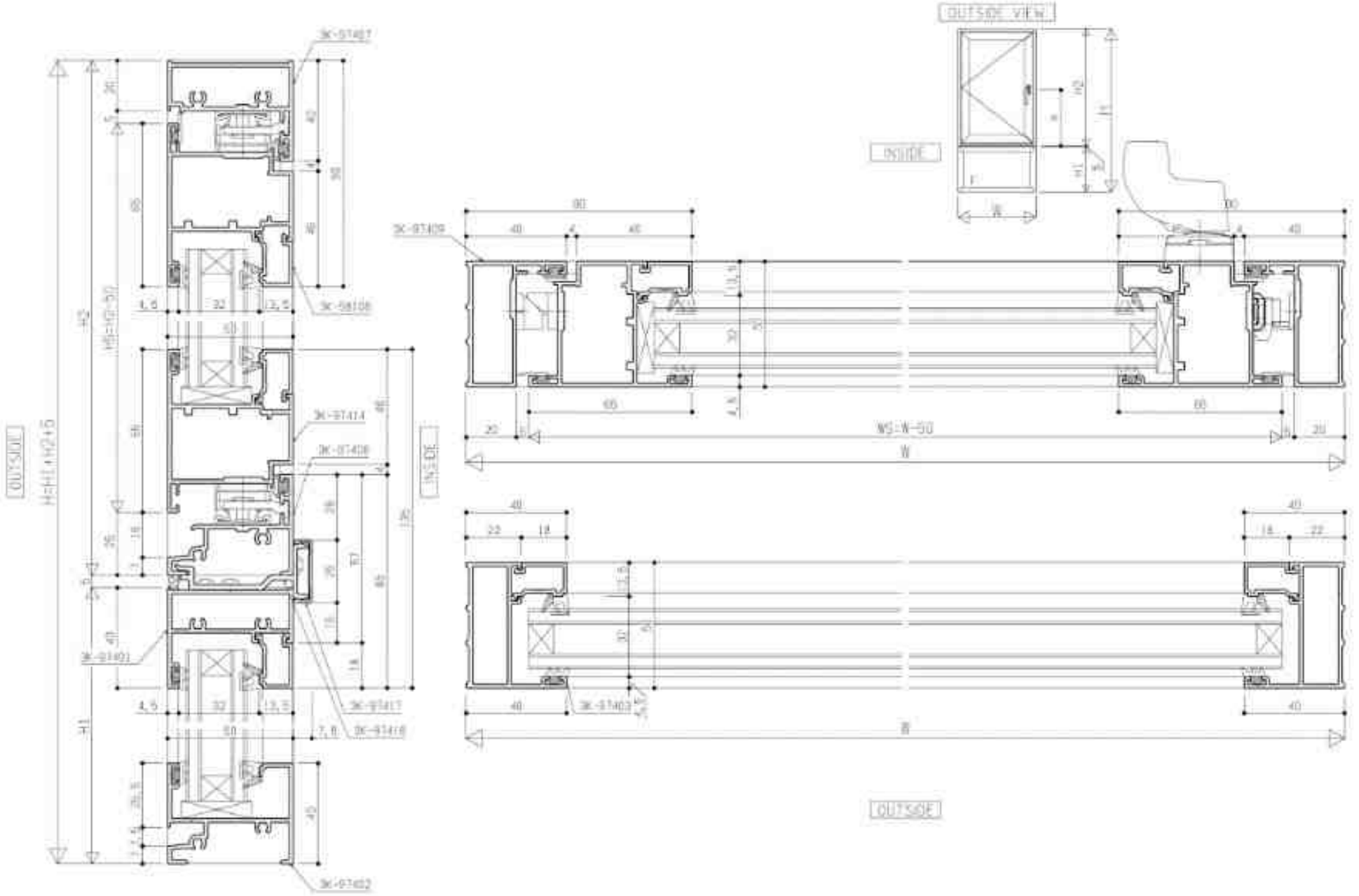
☐ System drawing. Casement Glass Groove 32mm



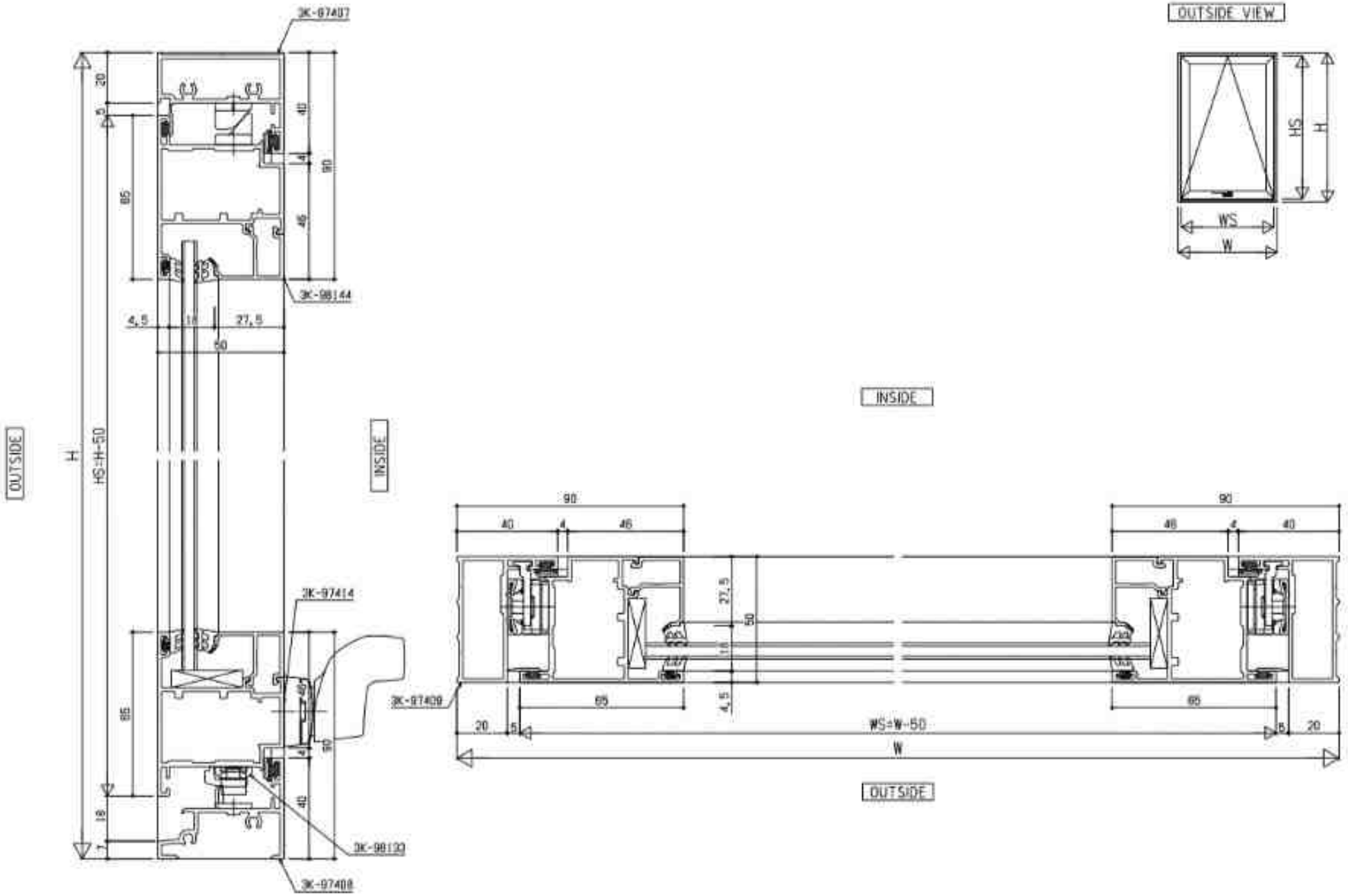
☐ System drawing. Casement / Fixed Glass Groove 32mm



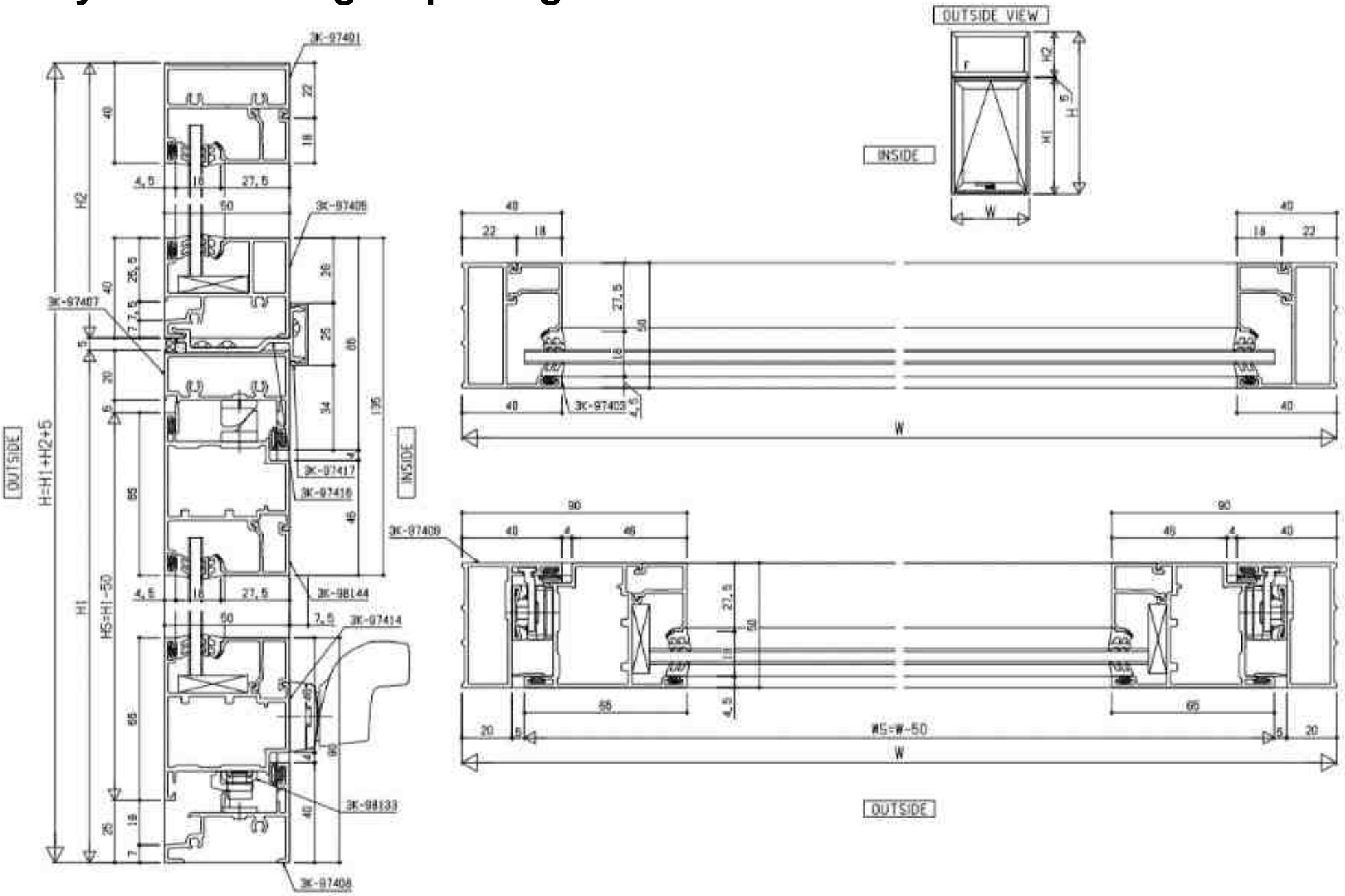
☐ System drawing. Fixed / Casement Glass Groove 32mm



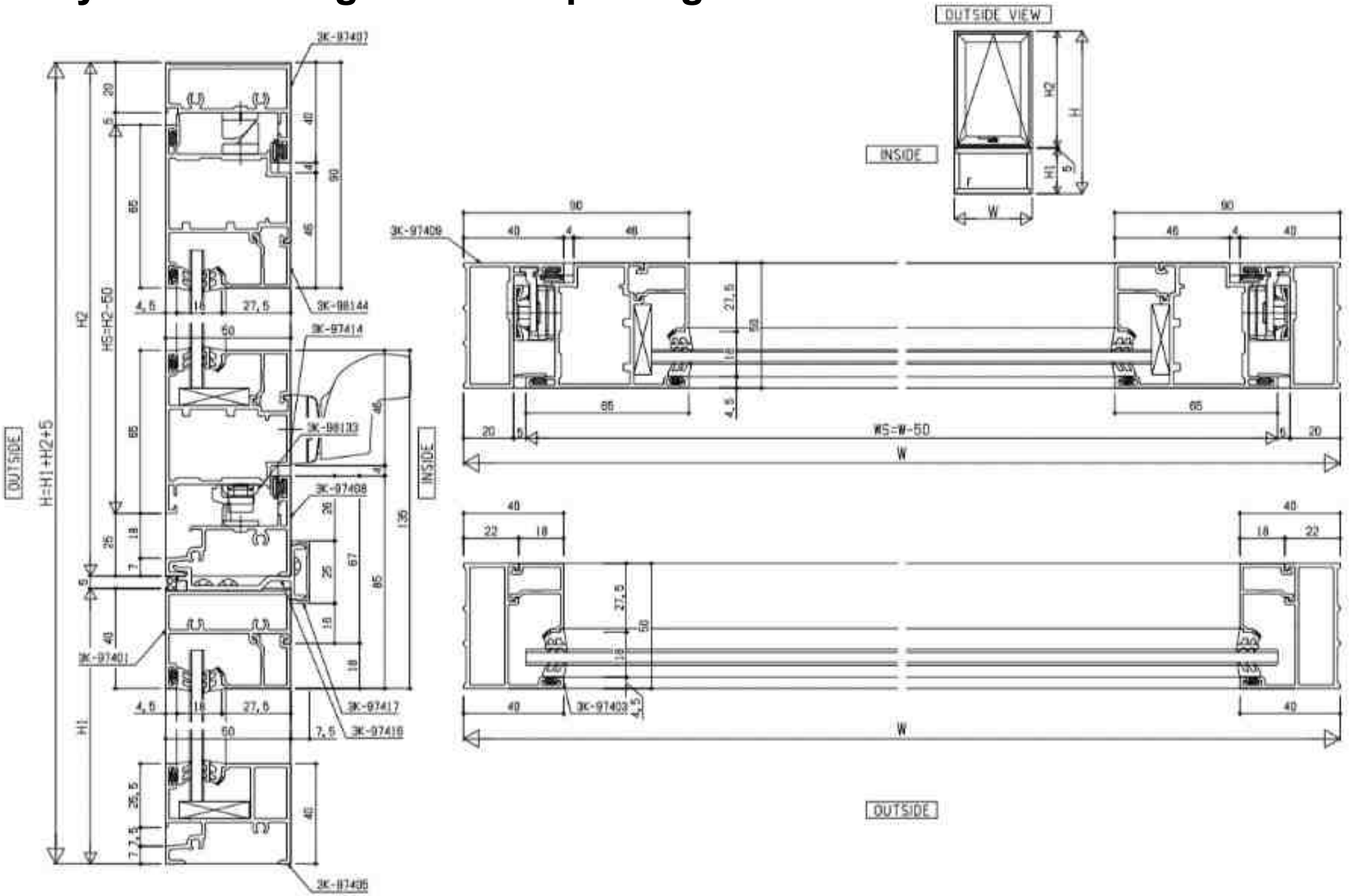
☐ System drawing. Top Hung Glass Groove 18mm



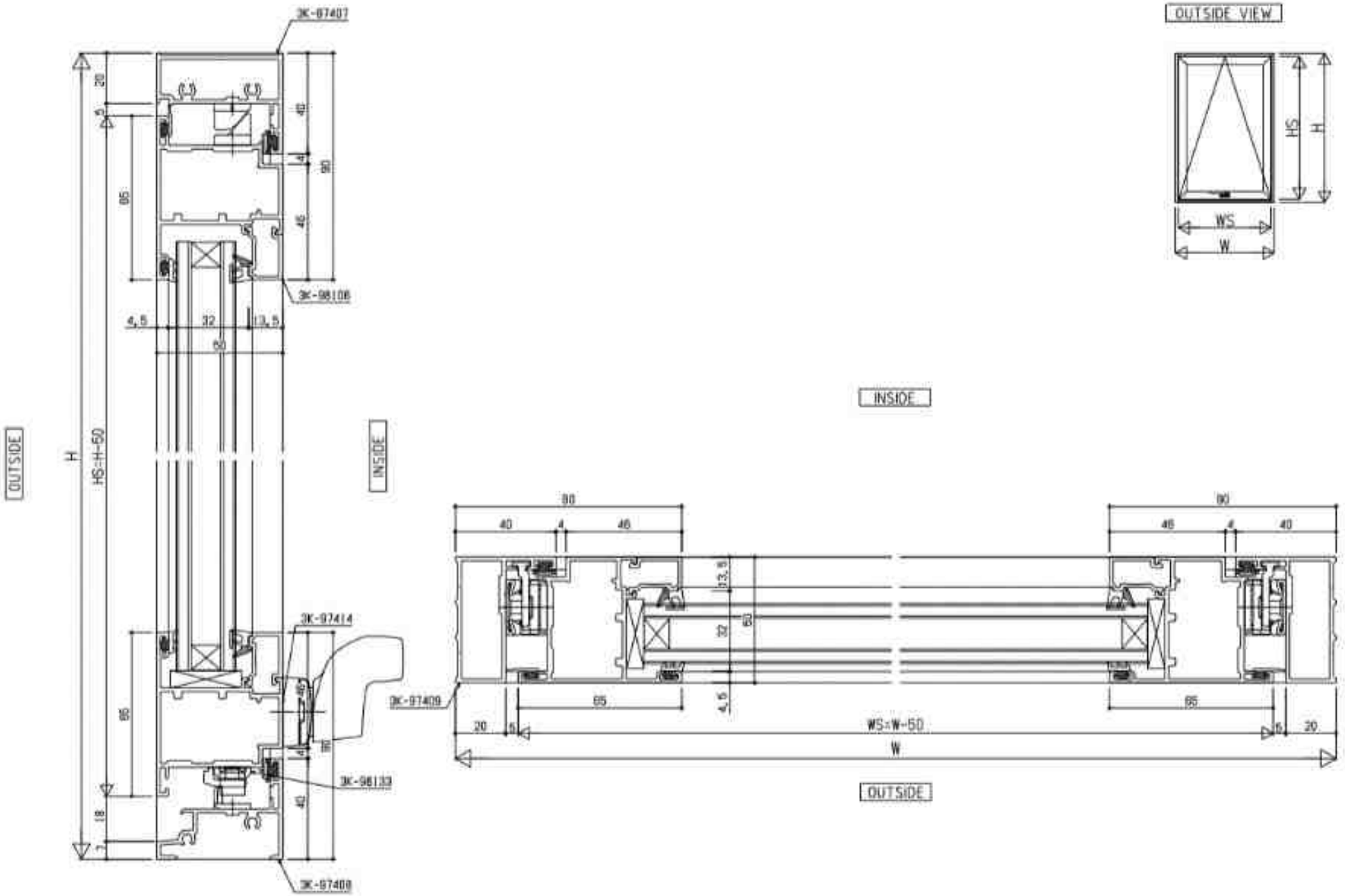
☐ System drawing. Top Hung / Fixed Glass Groove 18mm



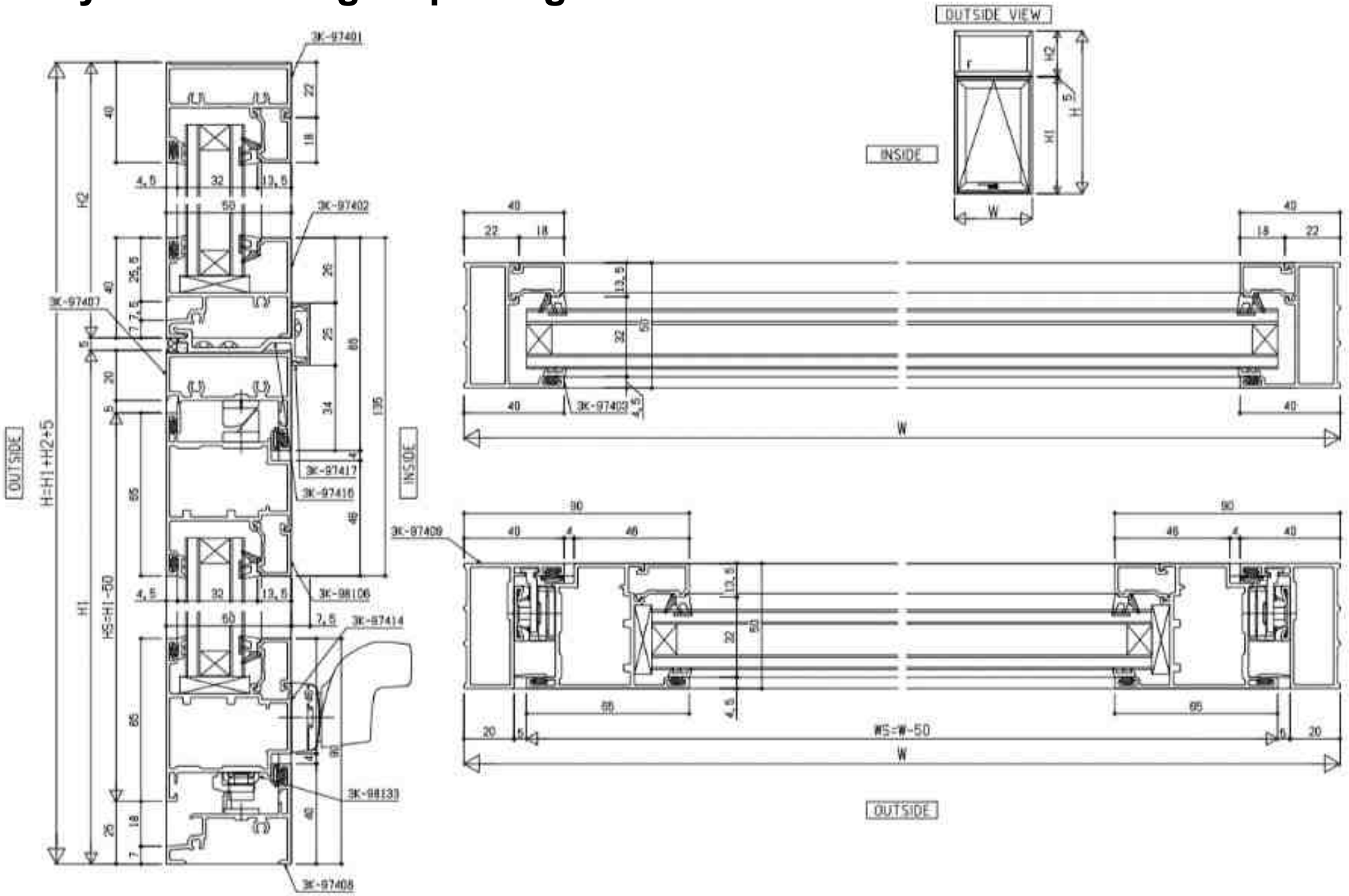
☐ System drawing. Fixed / Top Hung Glass Groove 18mm



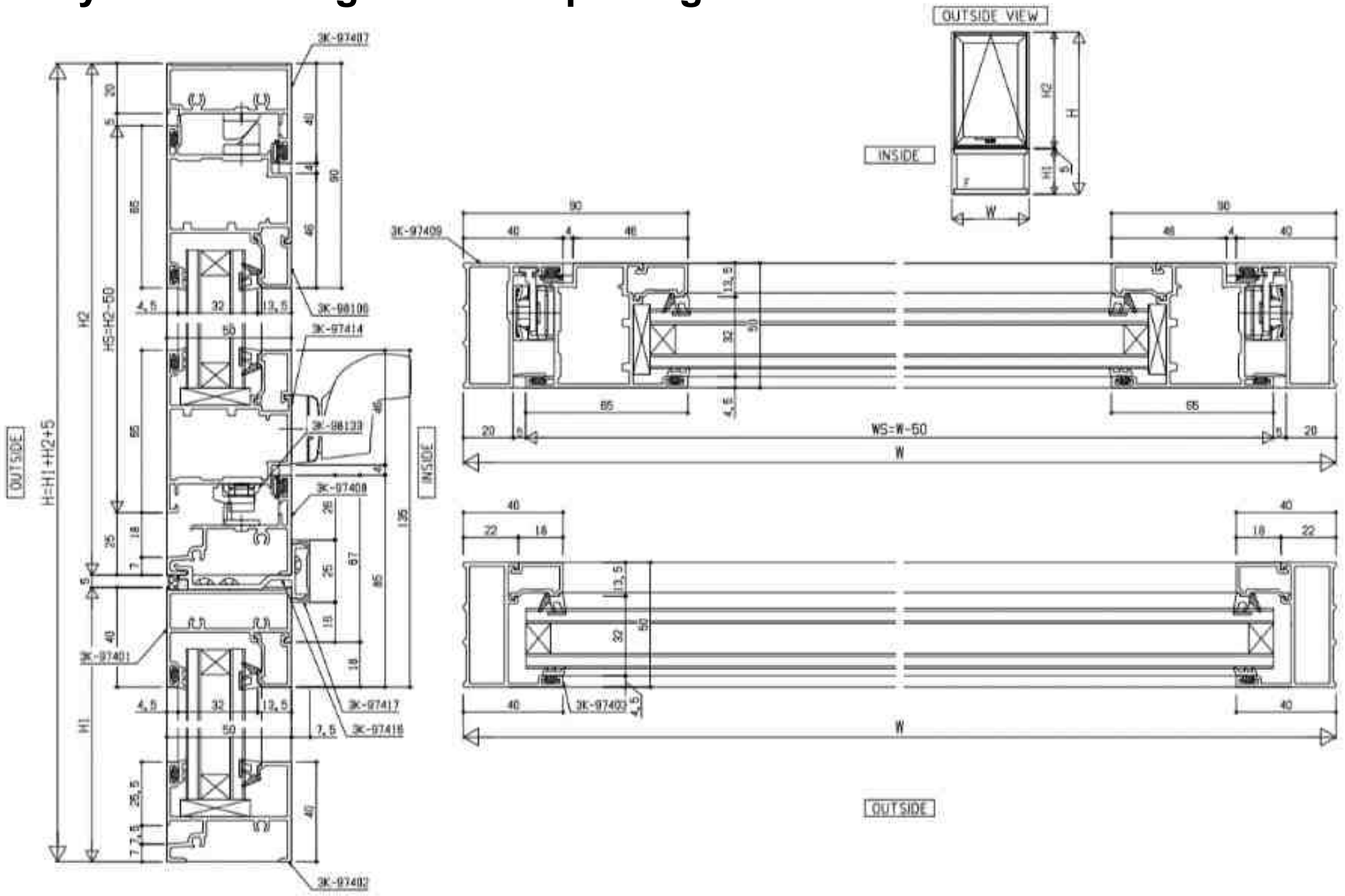
☐ System drawing. Top Hung Glass Groove 32mm



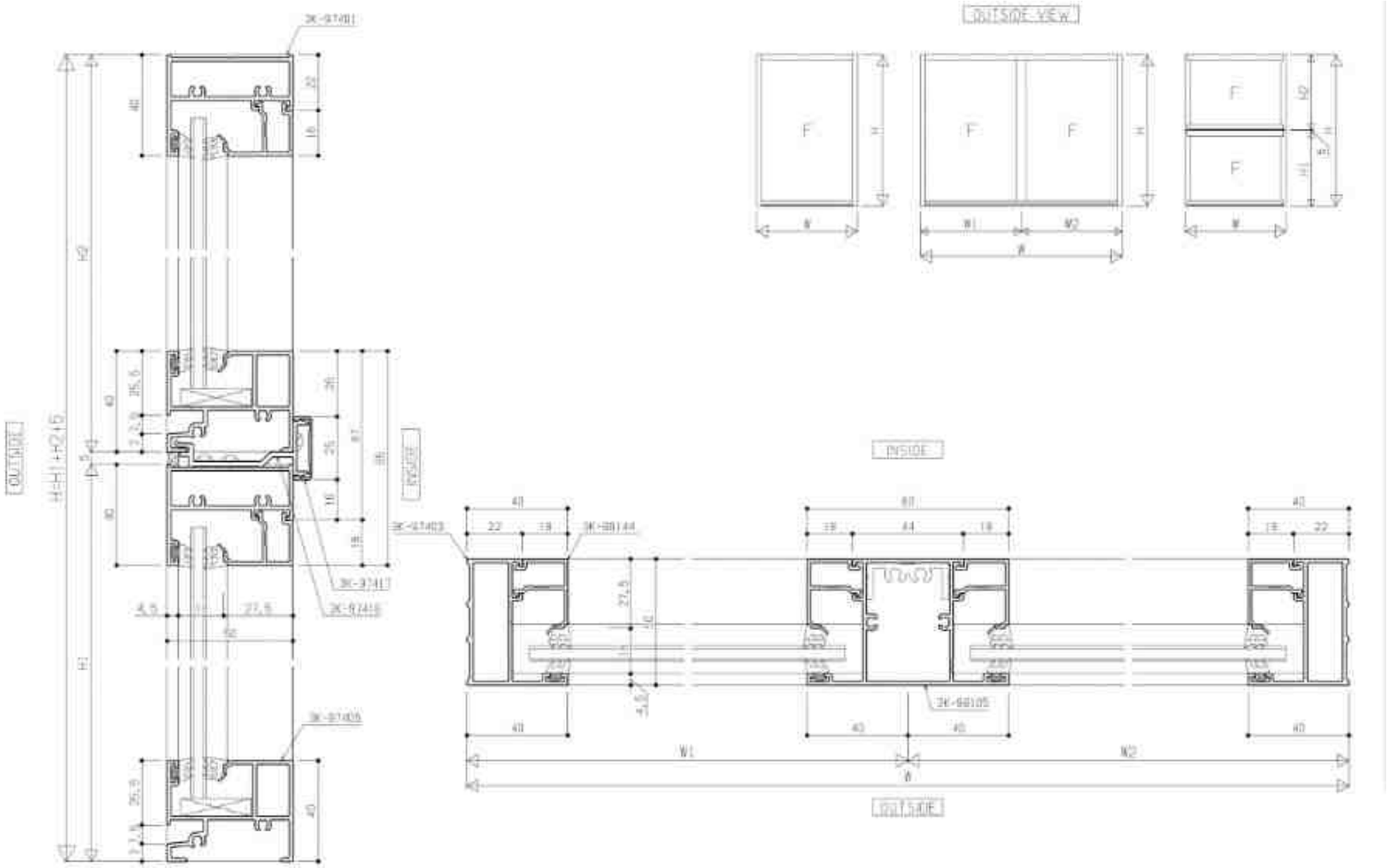
☐ System drawing. Top Hung / Fixed Glass Groove 32mm



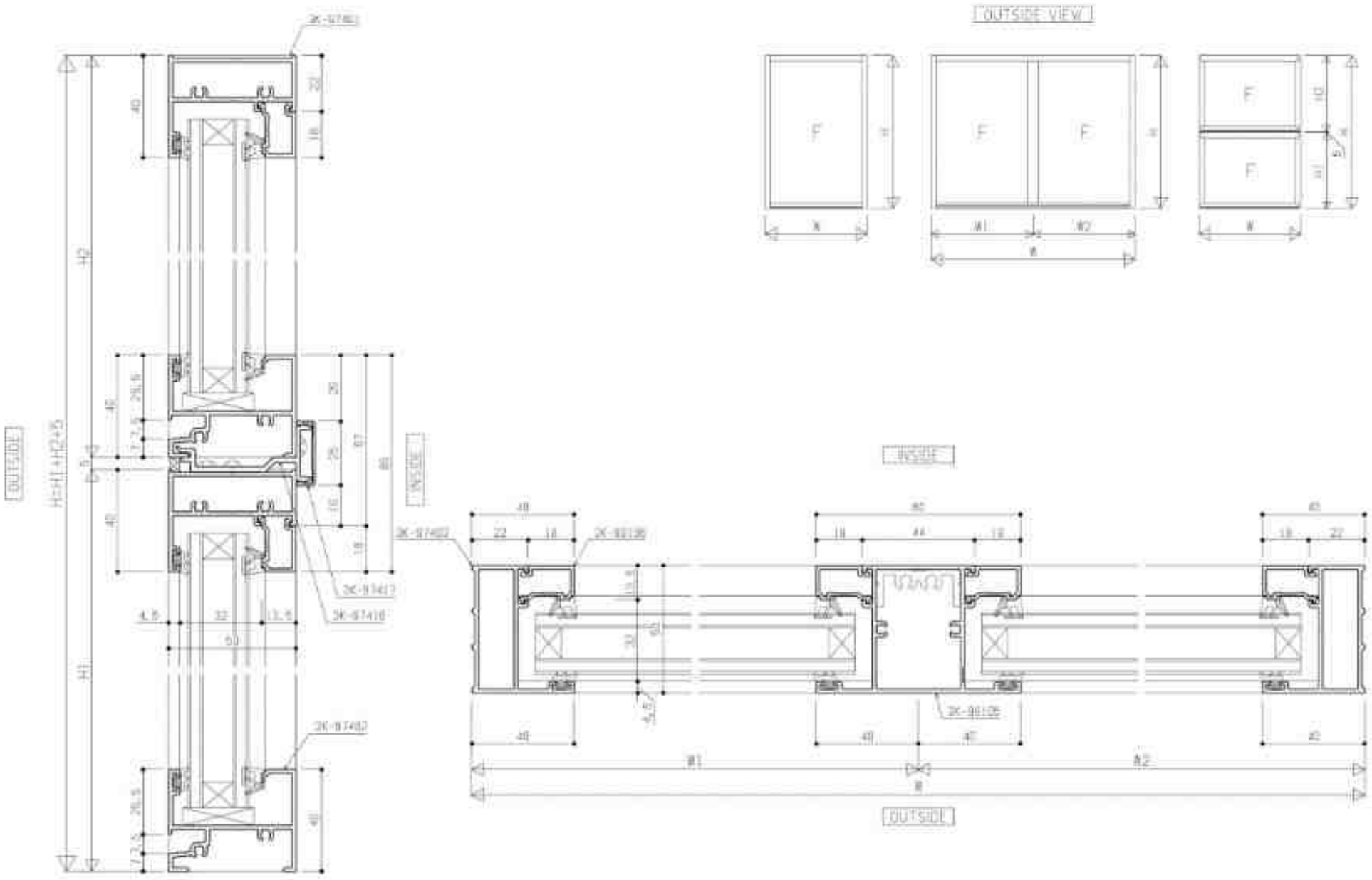
☐ System drawing. Fixed / Top Hung Glass Groove 32mm



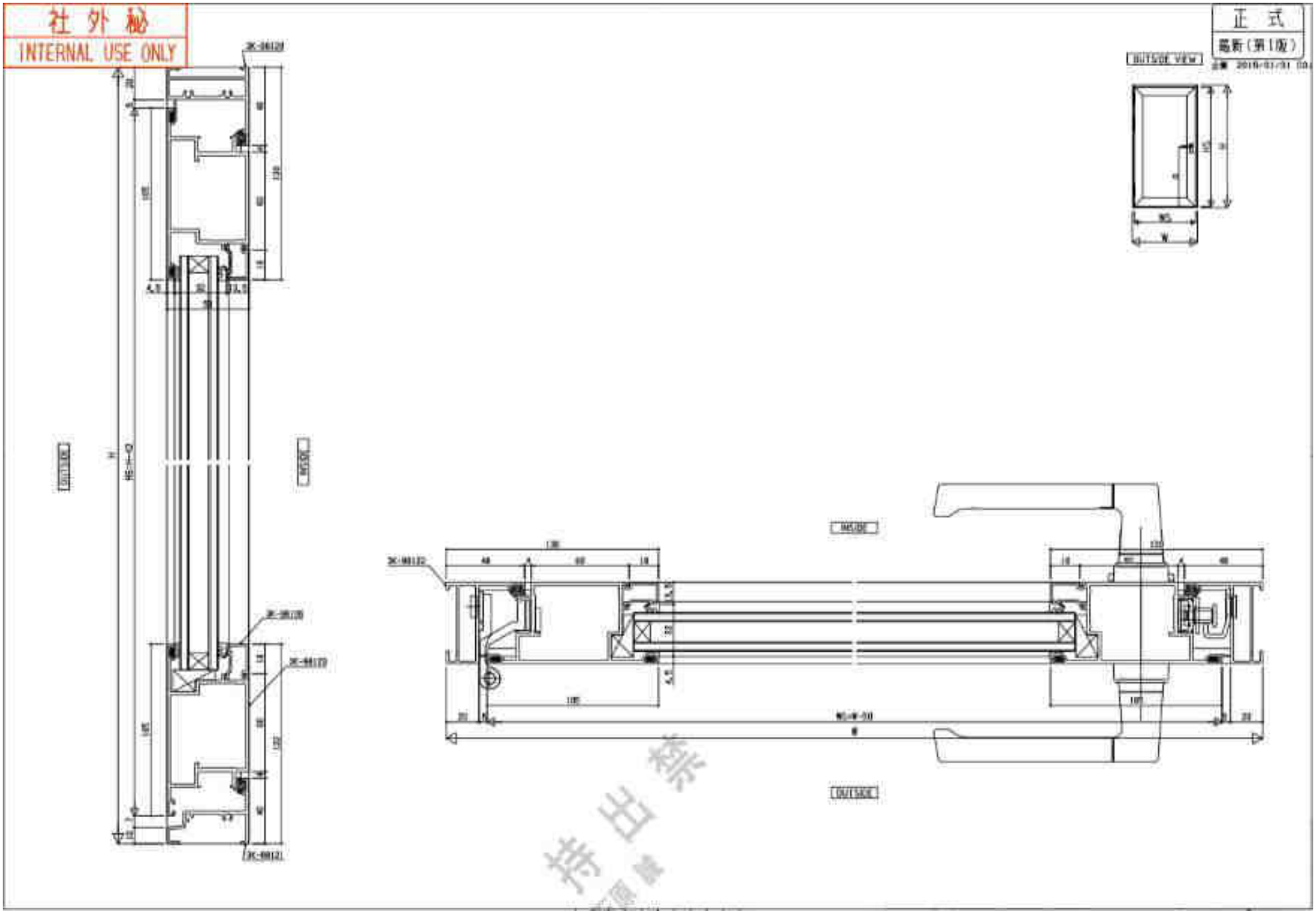
☐ System drawing. Fixed Glass Groove 18mm



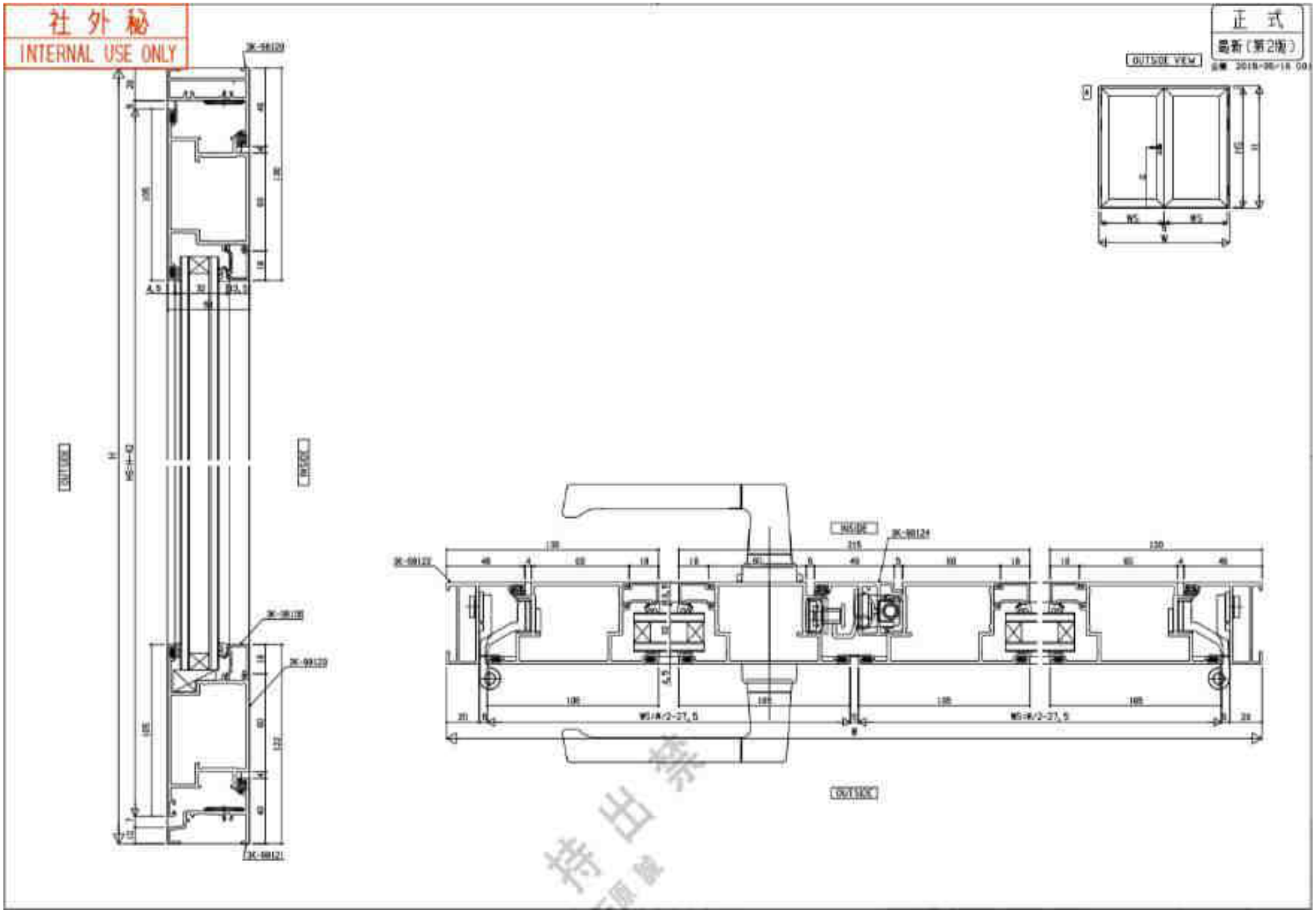
☐ System drawing. Fixed Glass Groove 32mm



☐ System drawing. Single Outswing Door Glass Groove 32mm

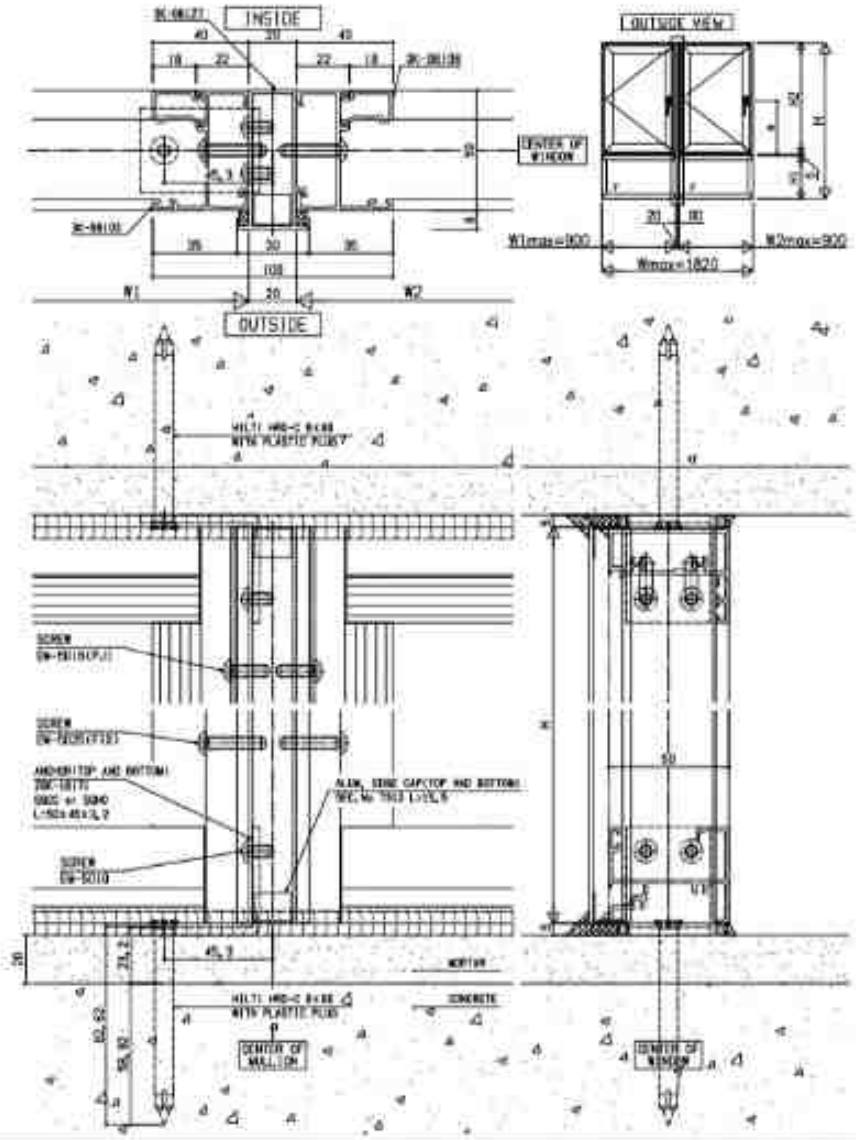


☐ System drawing. Double Outswing Door Glass Groove 32mm

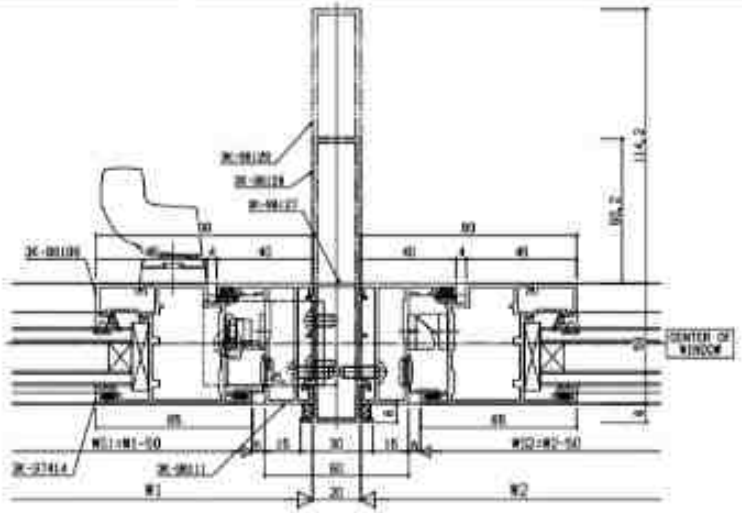


☐ System drawing. Mullion Variation

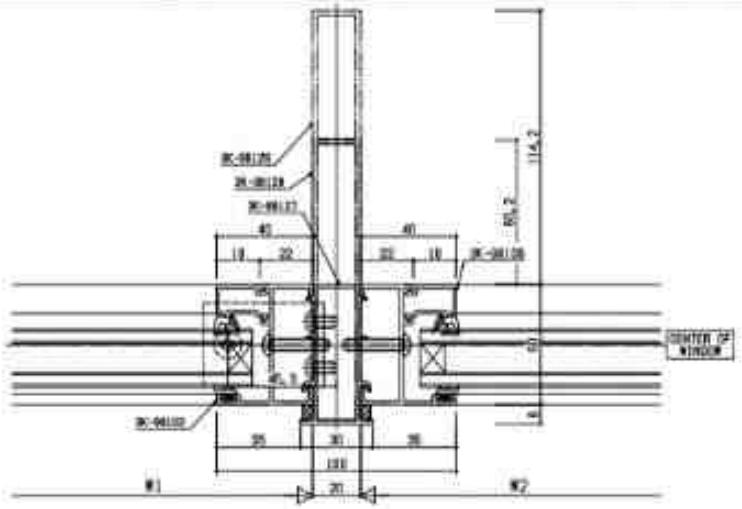
MULLION PARTS LAYOUT



SELECTION OF MULLION (CASEMENT - CASEMENT)

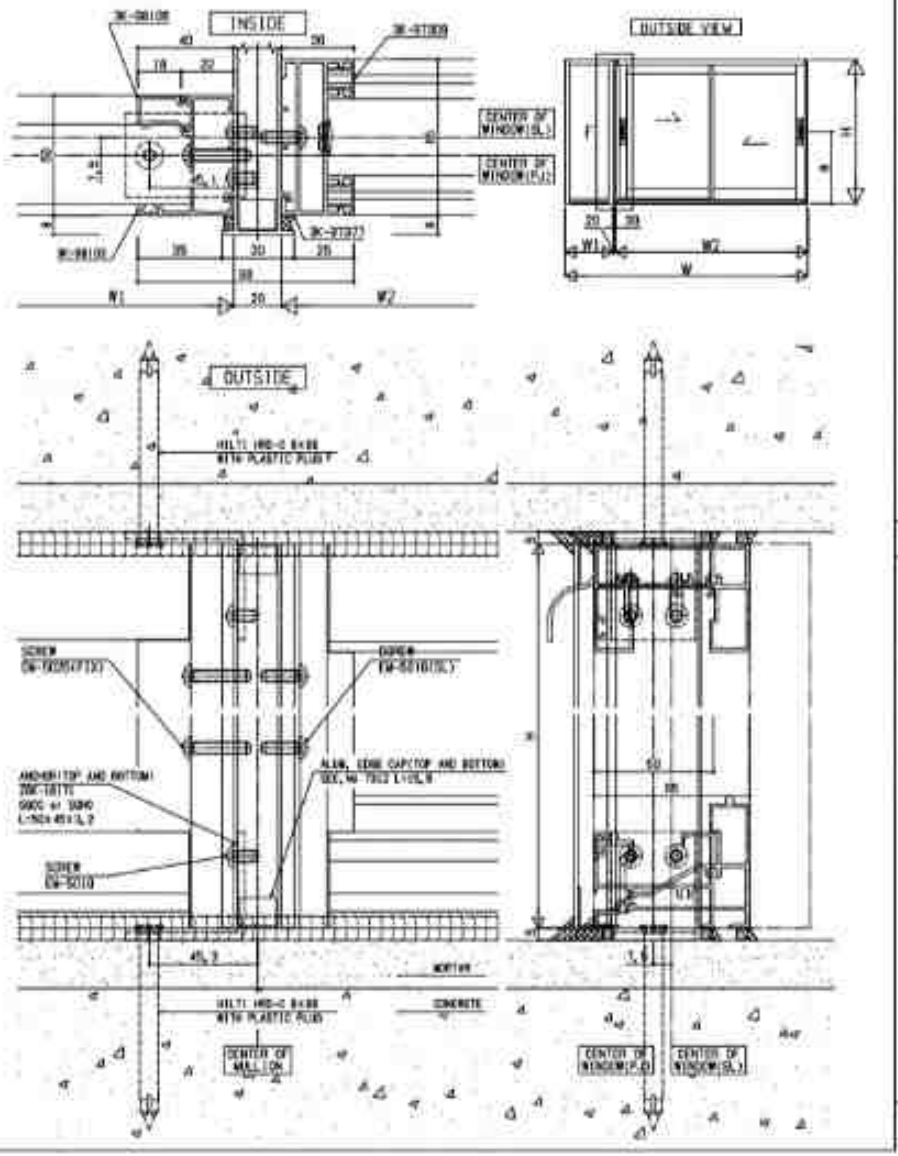


SELECTION OF MULLION (FIX - FIX)

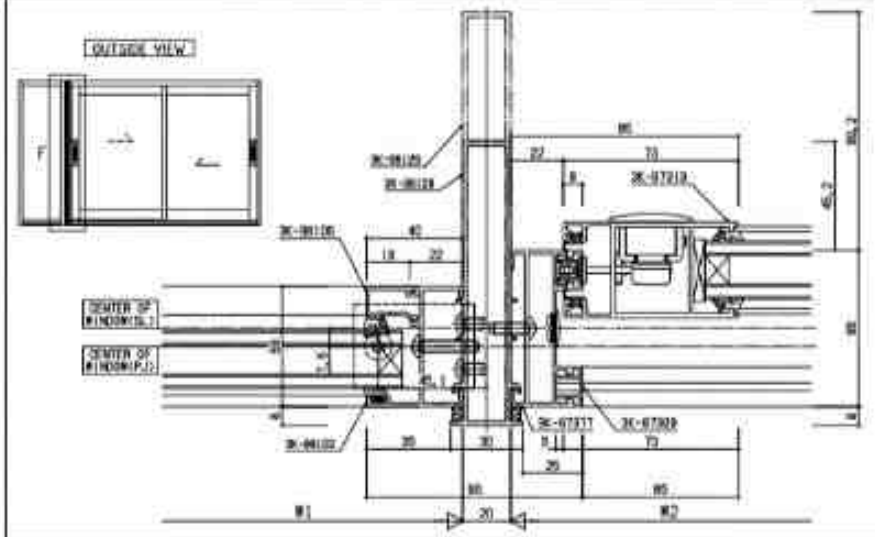


☐ System drawing. Mullion Variation

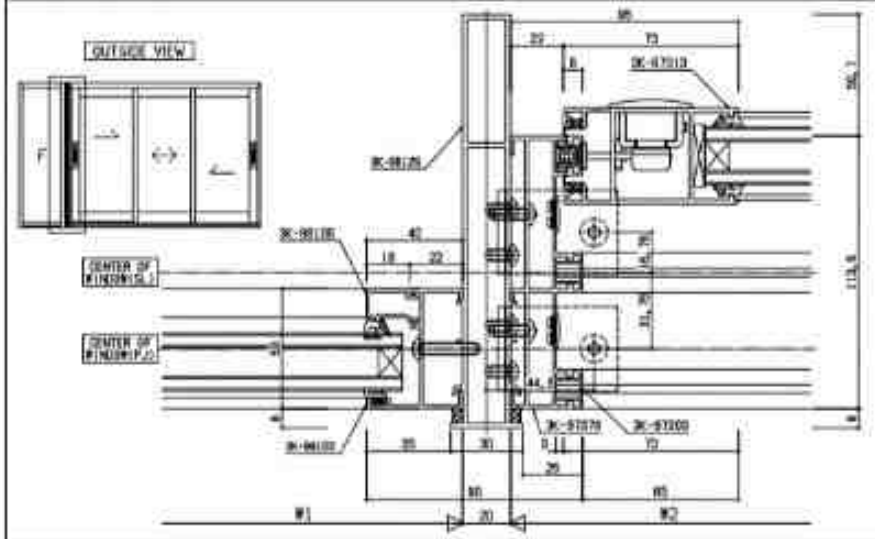
MULLION PARTS LAYOUT



SELECTION OF MULLION (FIX - 2T SLIDING)

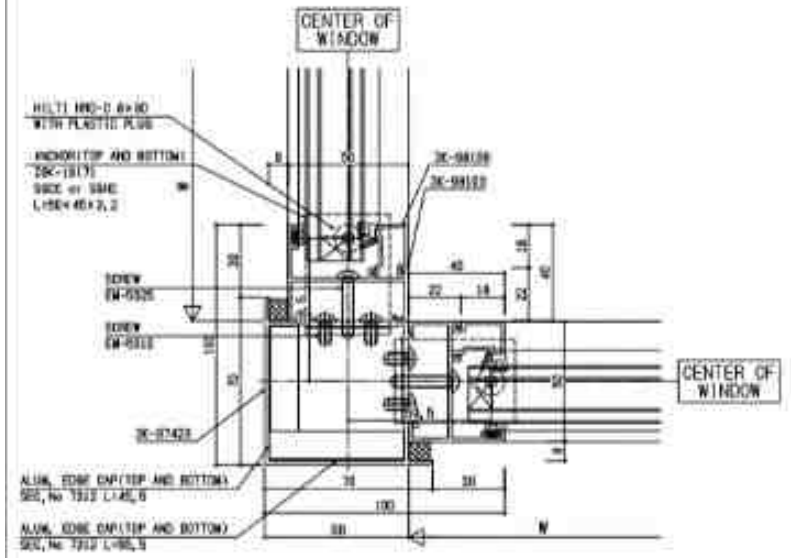


SELECTION OF MULLION ((FIX - 3T SLIDING))

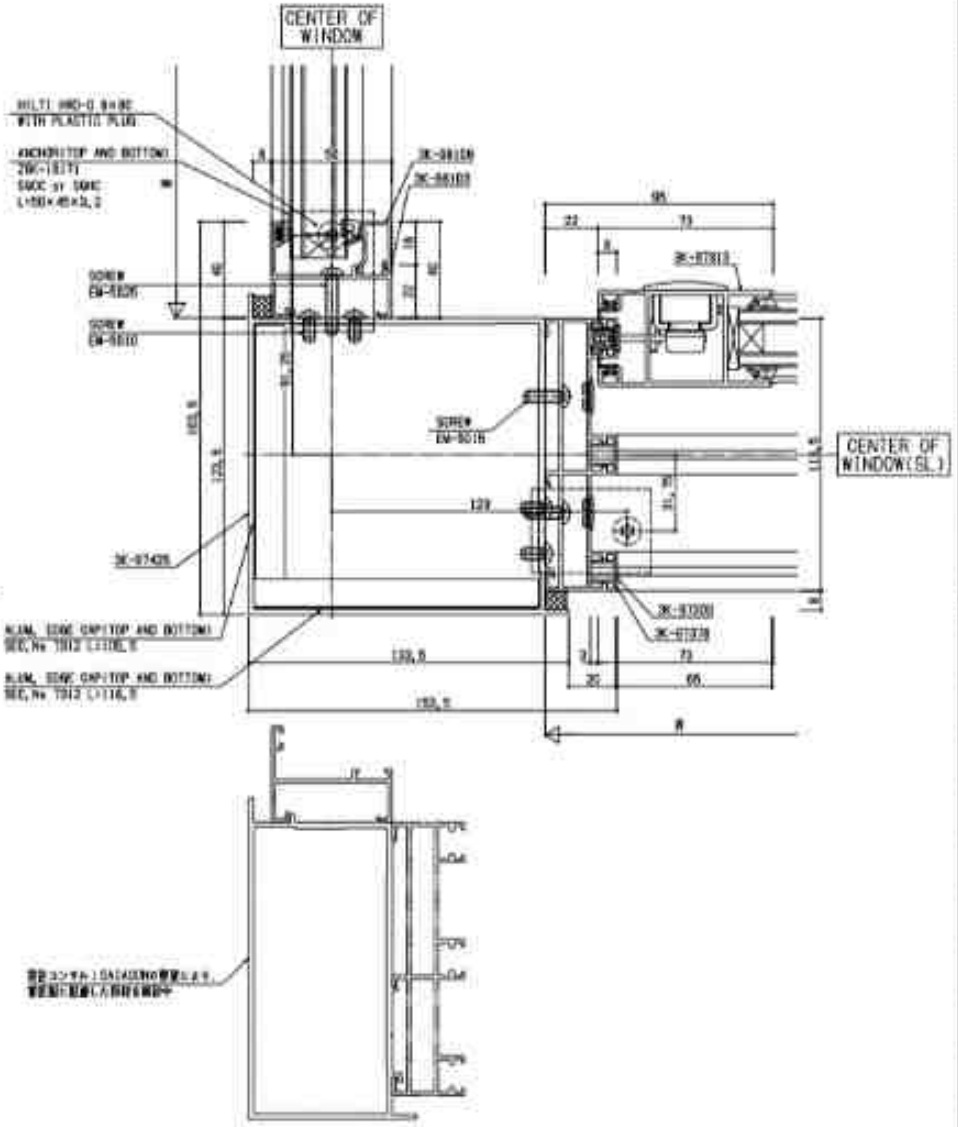


☐ System drawing. Mullion Variation

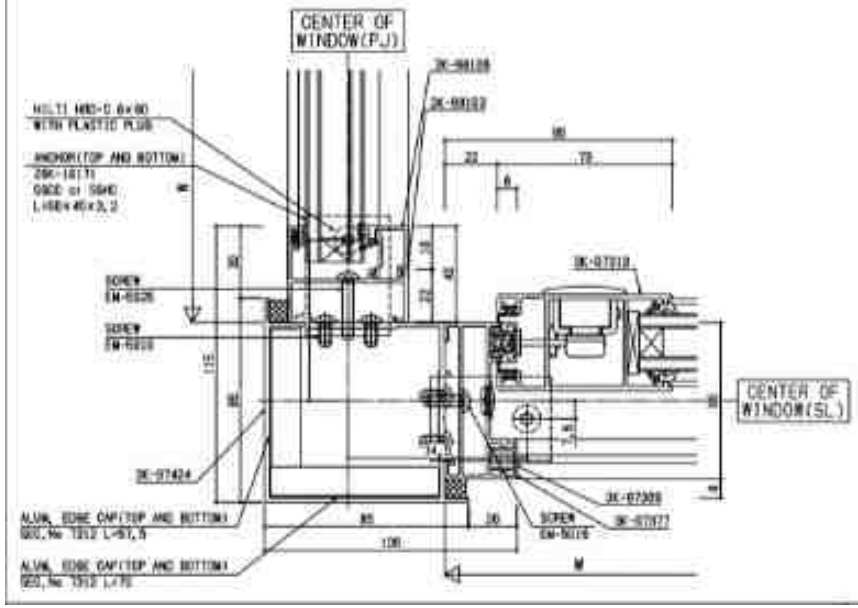
SELECTION OF CORNER MULLION (PJ-PJ)



SELECTION OF CORNER MULLION (PJ-3T SL)

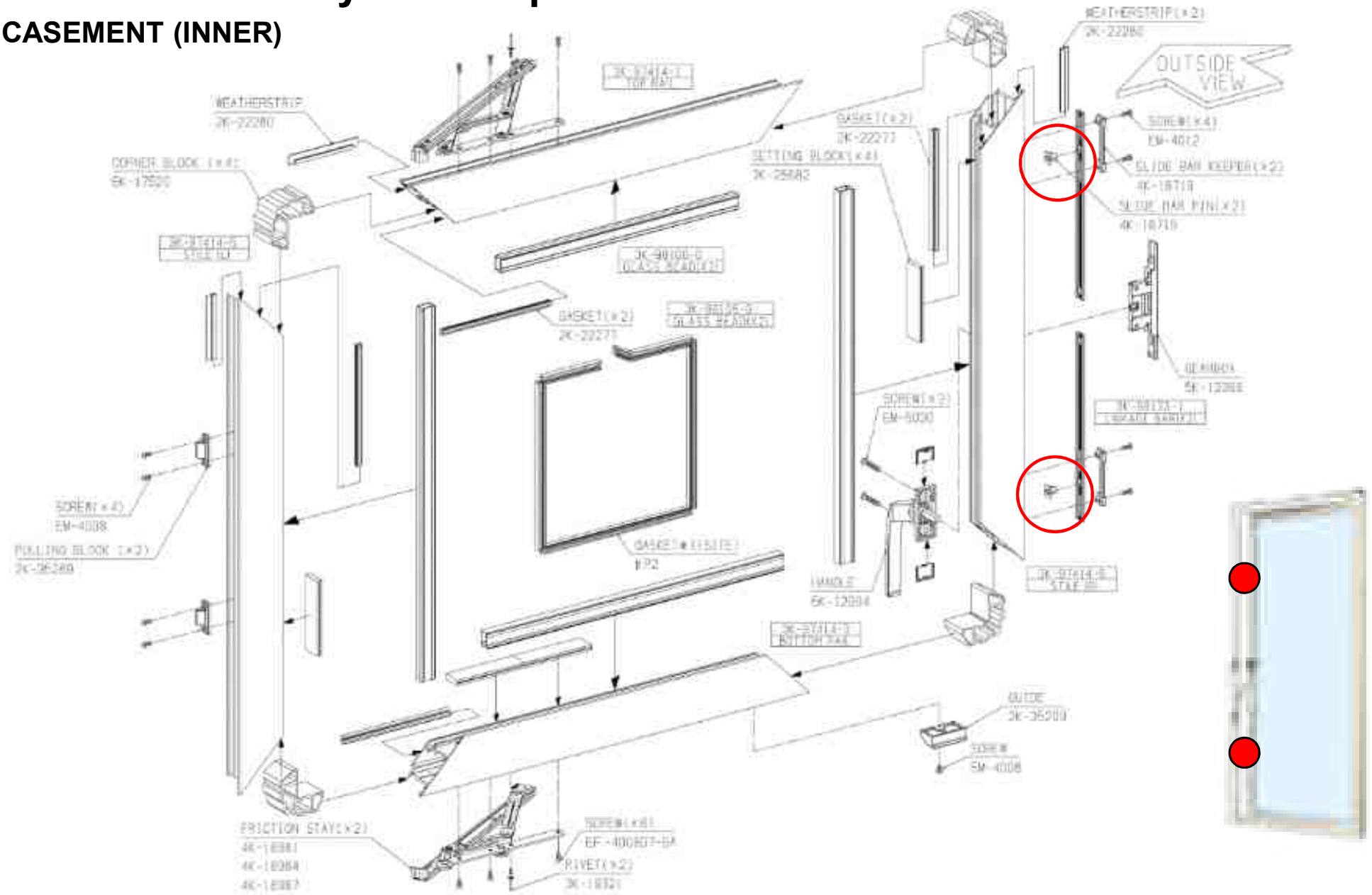


SELECTION OF CORNER MULLION (PJ-2T SL)



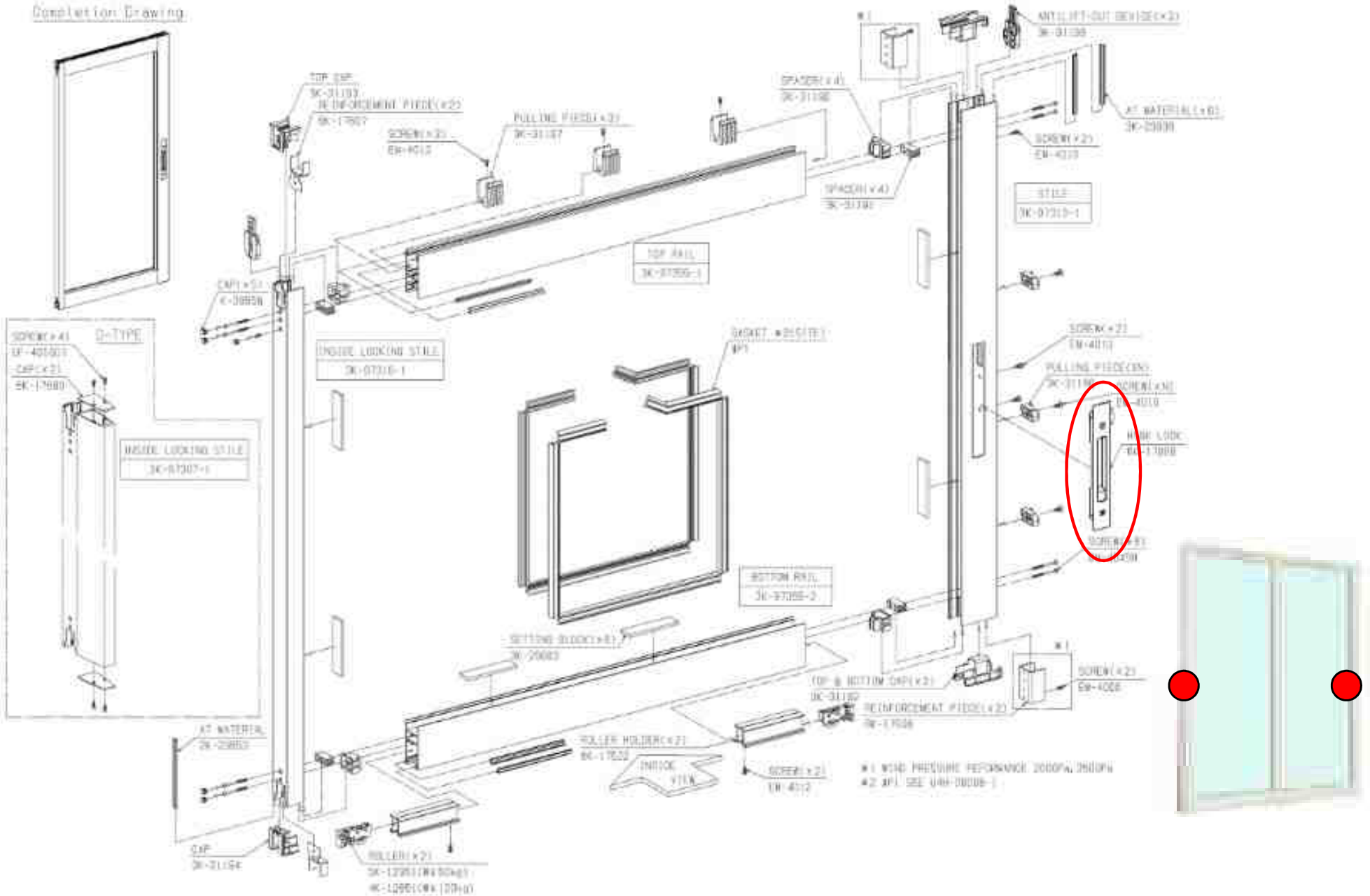
☐ Casement lock system : 2 point lock

■ CASEMENT (INNER)



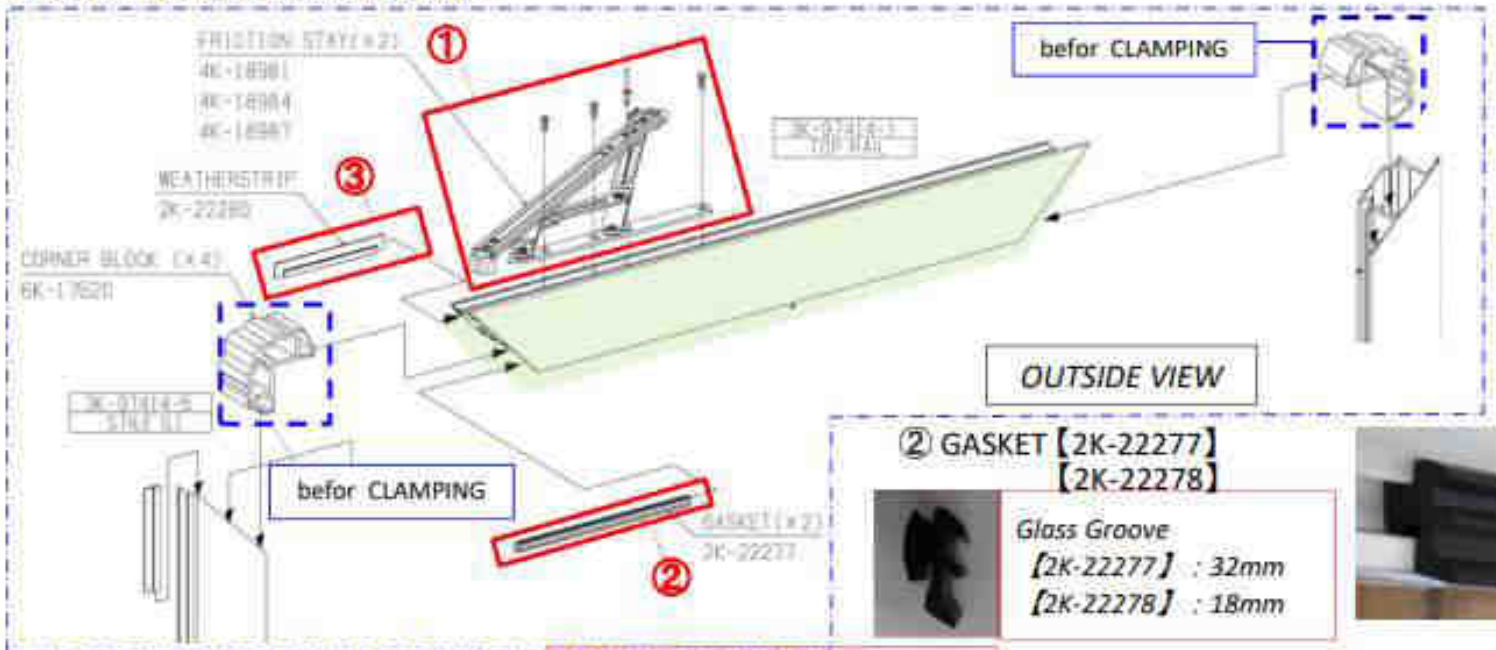
☐ Sliding lock system : 1 point lock

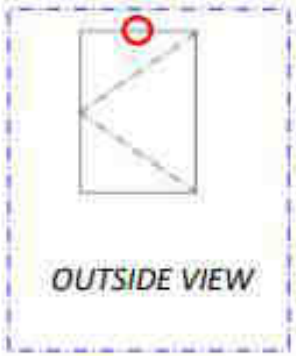
■ INNER (INSIDE 2/3/4/6-LEAF)



ASSEMBLING DRAWING

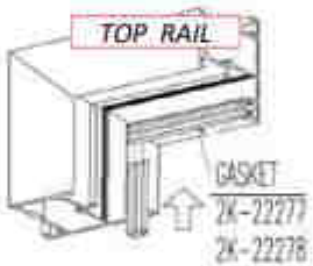
■ OUTSWING CASEMENT : TOP RAIL





② GASKET【2K-22277】
【2K-22278】

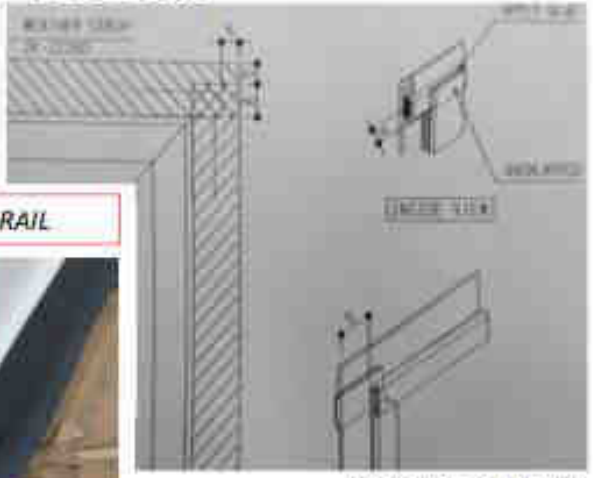
Glass Groove
【2K-22277】 : 32mm
【2K-22278】 : 18mm



① FRICTION STAY 【4K-18981】 【4K-18984】 【4K-18987】

【4K-18981】 : Weight ≦18Kg
【4K-18984】 : Weight ≦30Kg
【4K-18987】 : Weight ≦50Kg

③ WETHERSTRIP【2K-22280】



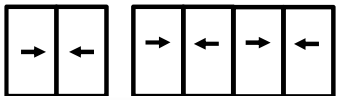
SHAPE No : 3K-97414

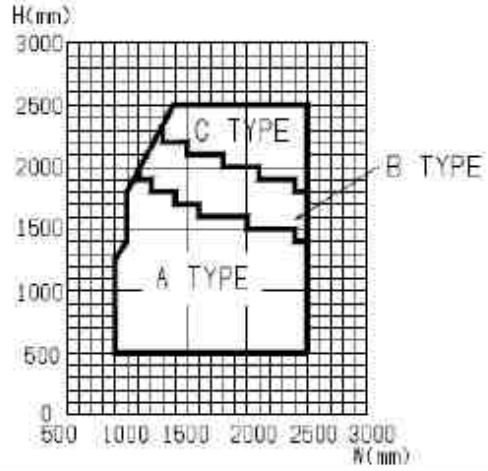
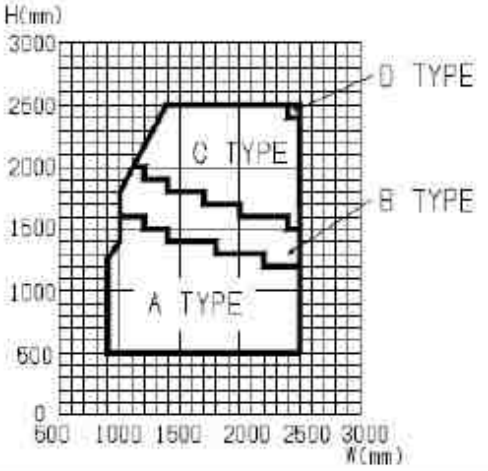
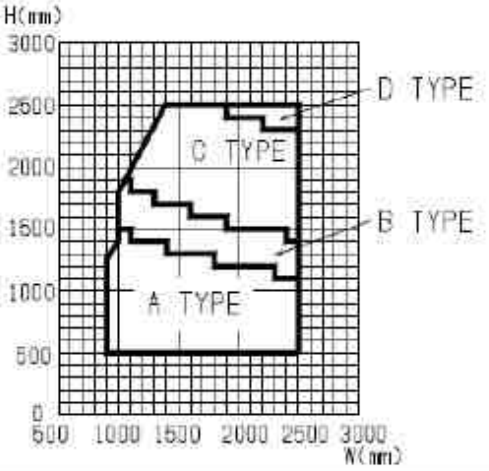
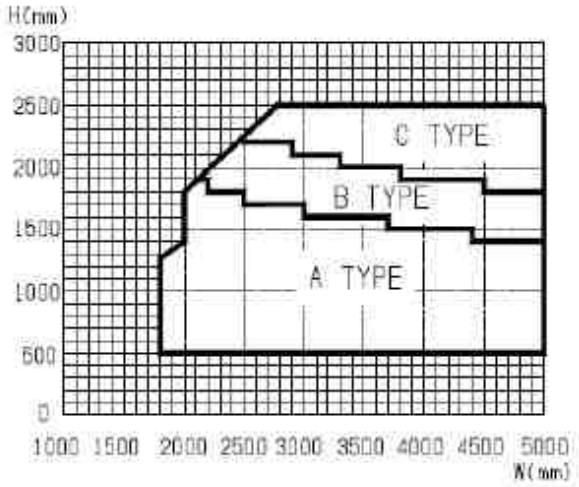
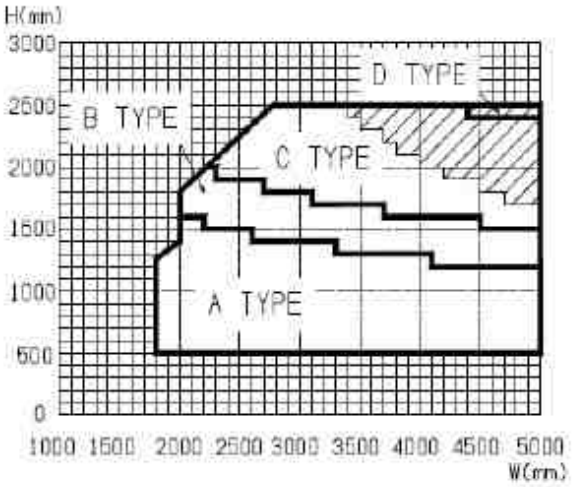
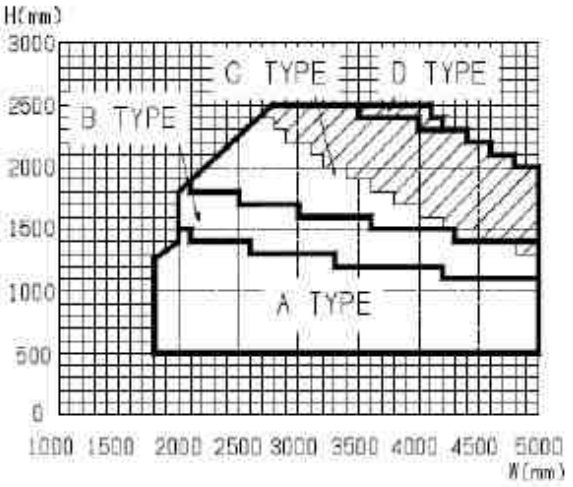
☐ Size Limitation (Against Pressure ASTM) DEPTH 65

Calculation conditions against wind pressure

Allowable deflection : ℓ / 175 or less (ℓ = Length of member)

Maximum load per LEAF for 4-LEAF : 4275(N / LEAF) or less



	1200Pa (WITHOUT REINFORCEMENT)	2000Pa (WITH REINFORCEMENT)	2500Pa (WITH REINFORCEMENT)
2-LEAF			
4-LEAF			

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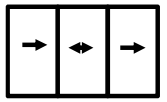
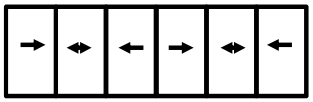
☐ Size Limitation (Against Pressure ASTM) DEPTH 65

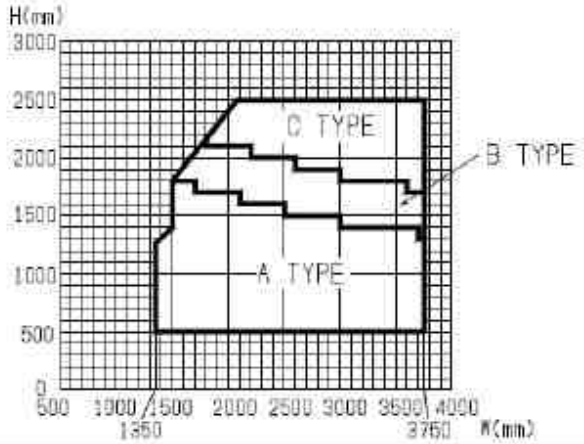
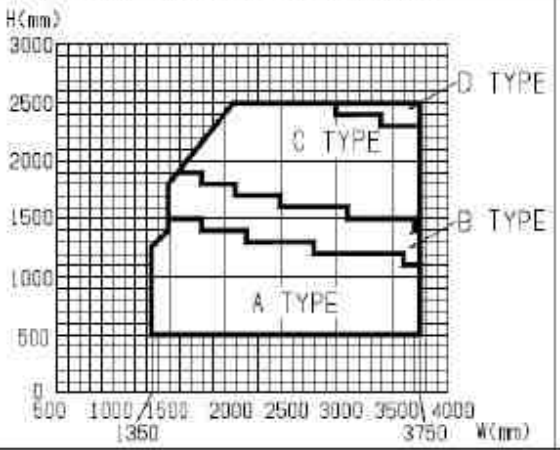
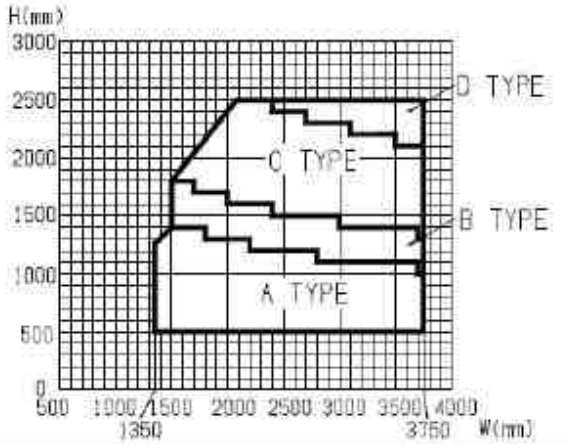
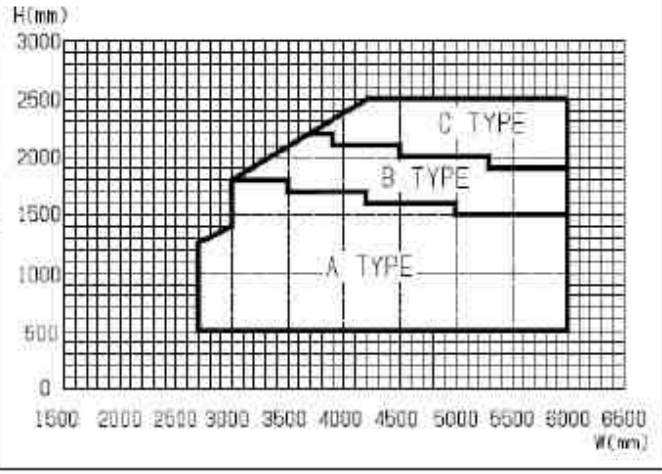
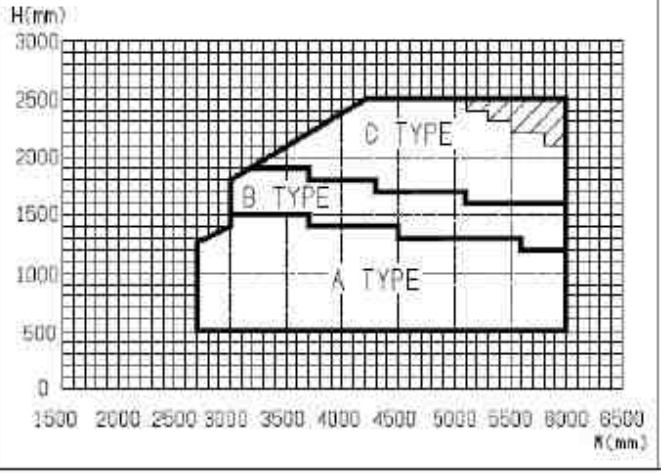
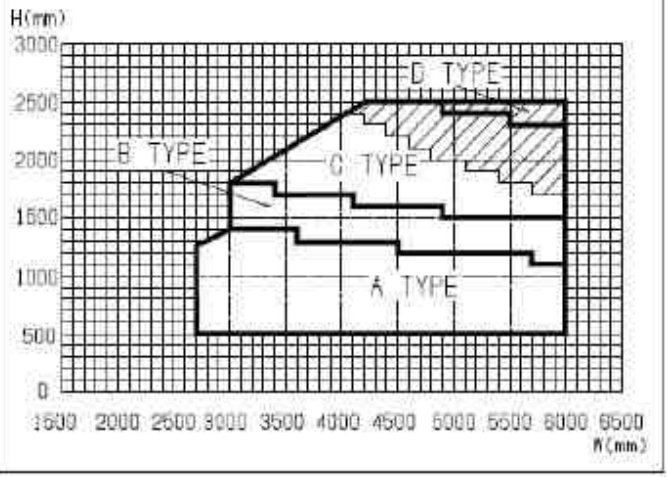
Calculation conditions against wind pressure

Allowable deflection : ℓ / 175 or less (ℓ = Length of member)

Maximum load per LEAF for 6-LEAF : 4275(N / LEAF) or less





	1200Pa (WITHOUT REINFORCEMENT)	2000Pa (WITH REINFORCEMENT)	2500Pa (WITH REINFORCEMENT)
3-LEAF			
6-LEAF			

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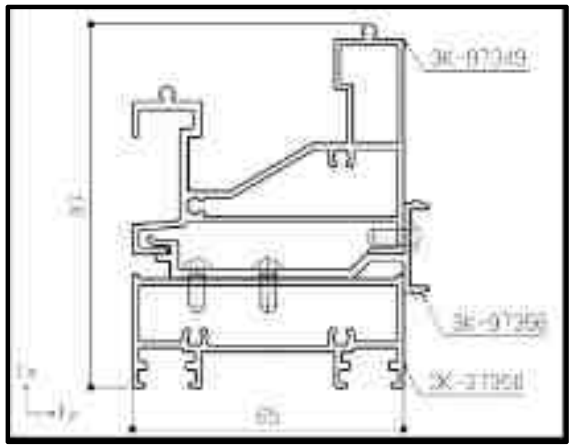
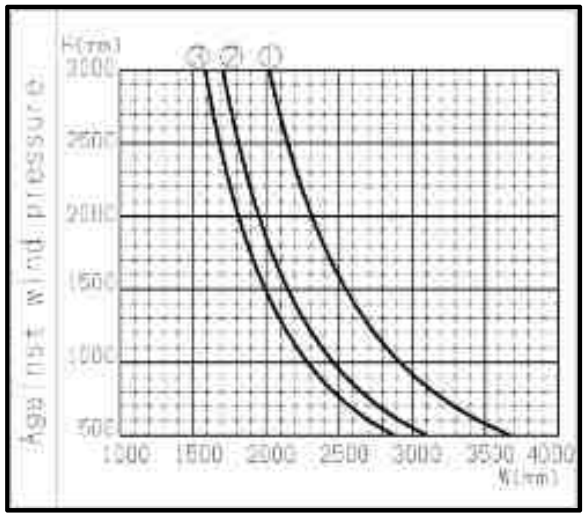
☐ Size Limitation (Against Pressure ASTM) Transom

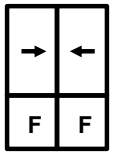
Calculation conditions against wind pressure

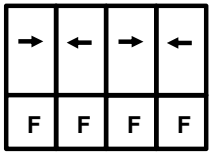
Allowable deflection : ℓ / 175 or less (ℓ = Length of member)

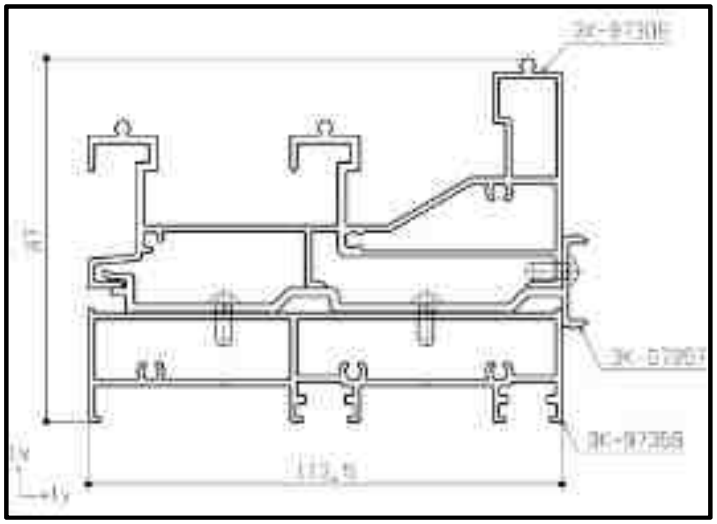


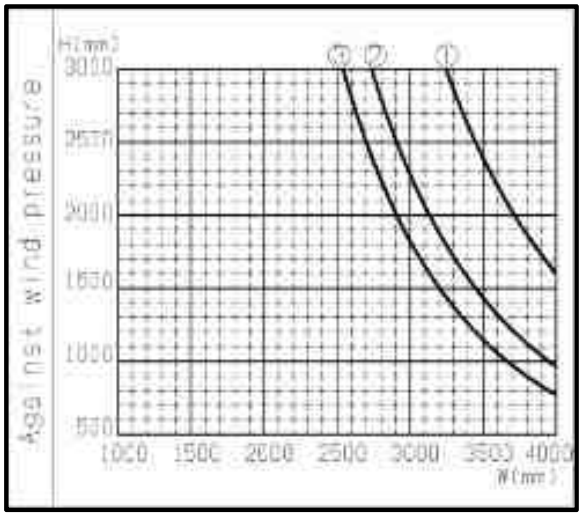


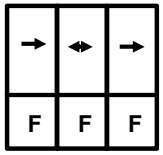
① 1200Pa
② 2000Pa
③ 2500Pa











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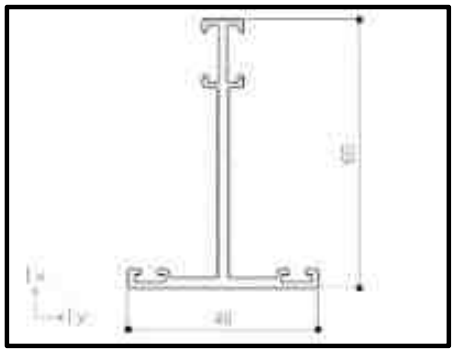
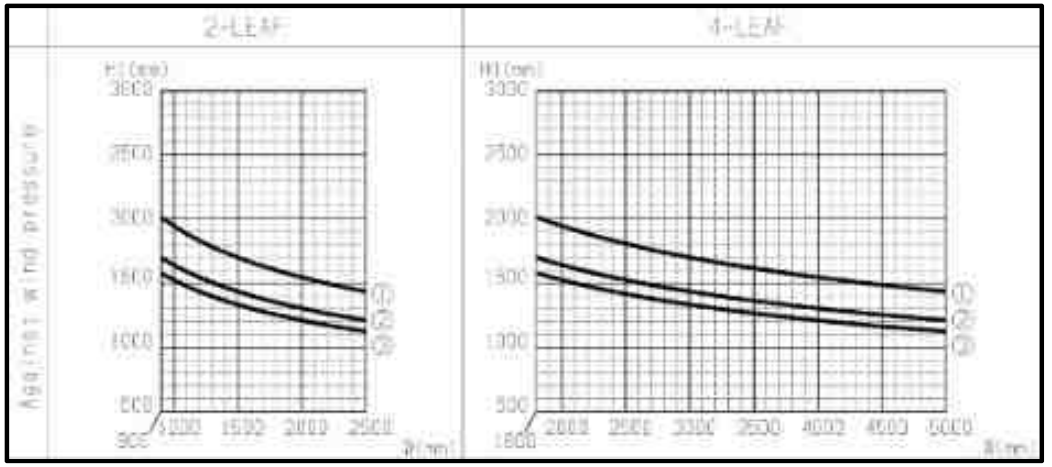
☐ Size Limitation (Against Pressure ASTM) Muntin

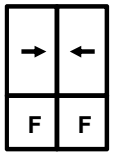
Calculation conditions against wind pressure

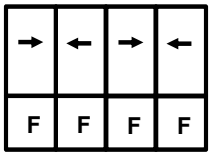
Allowable deflection : ℓ / 175 or less (ℓ = Length of member)

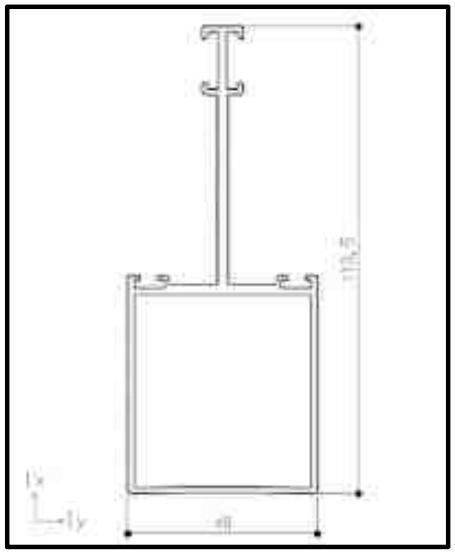


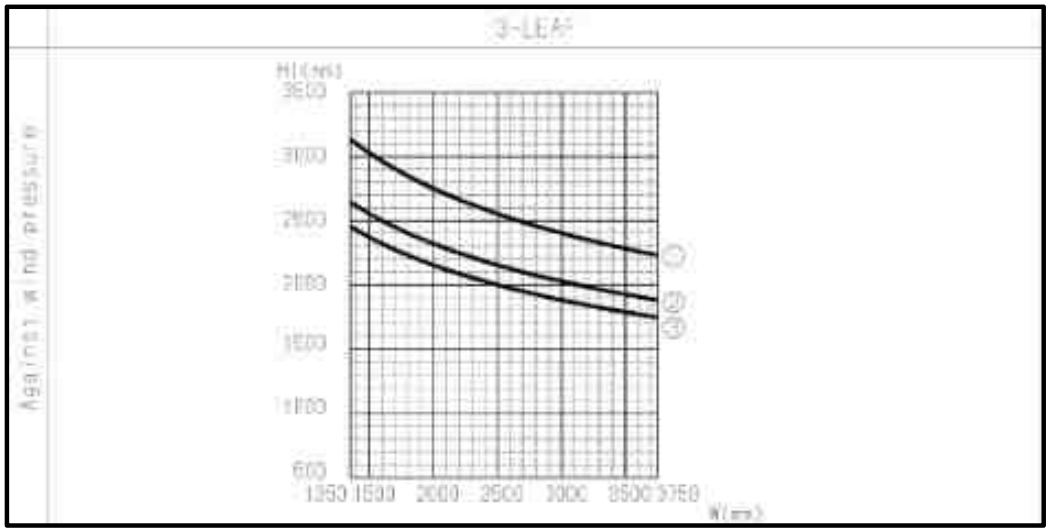


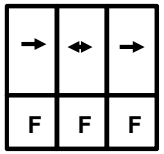
① 1200Pa
② 2000Pa
③ 2500Pa











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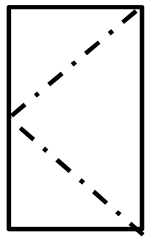
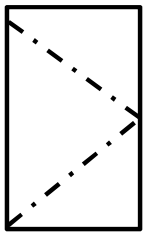
☐ Size Limitation

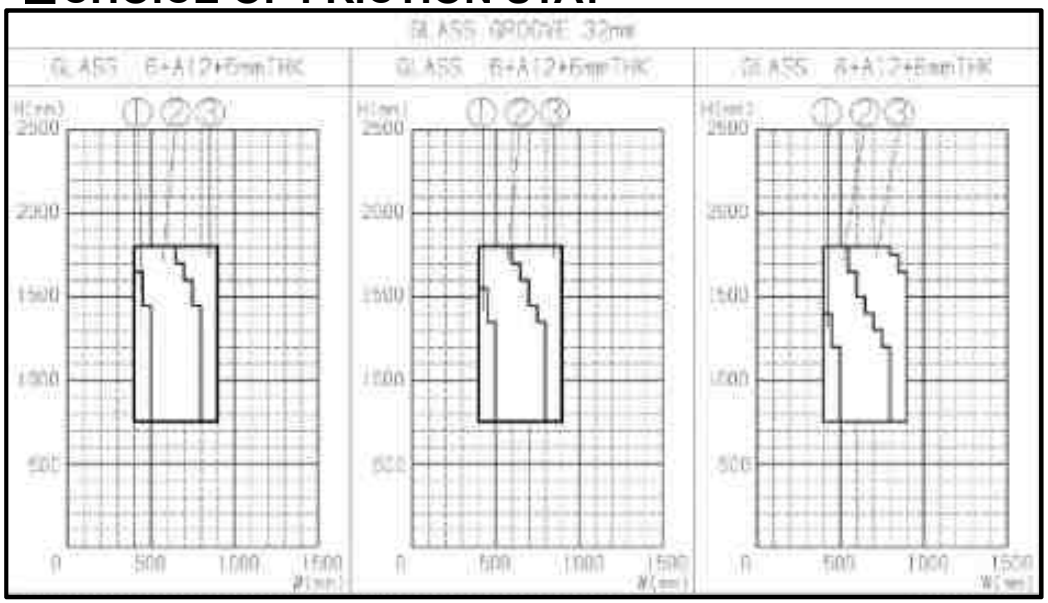


(R)



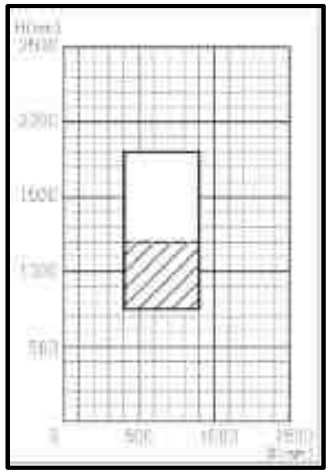
(L)

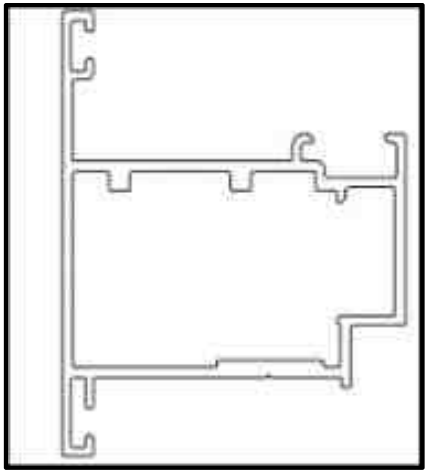
■CHOICE OF FRICTION STAY



NO.	inch.	PARTS NO. STANDARD	Allowable weight(kg)
①	10	AK-18981	15 or less
②	12	AK-18984	30 or less
③	16	AK-18987	50 or less

■AGAINST PRESSURE ASTM





※ Hatched area can't install safety stopper

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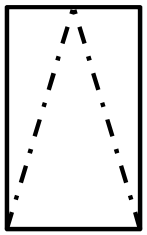
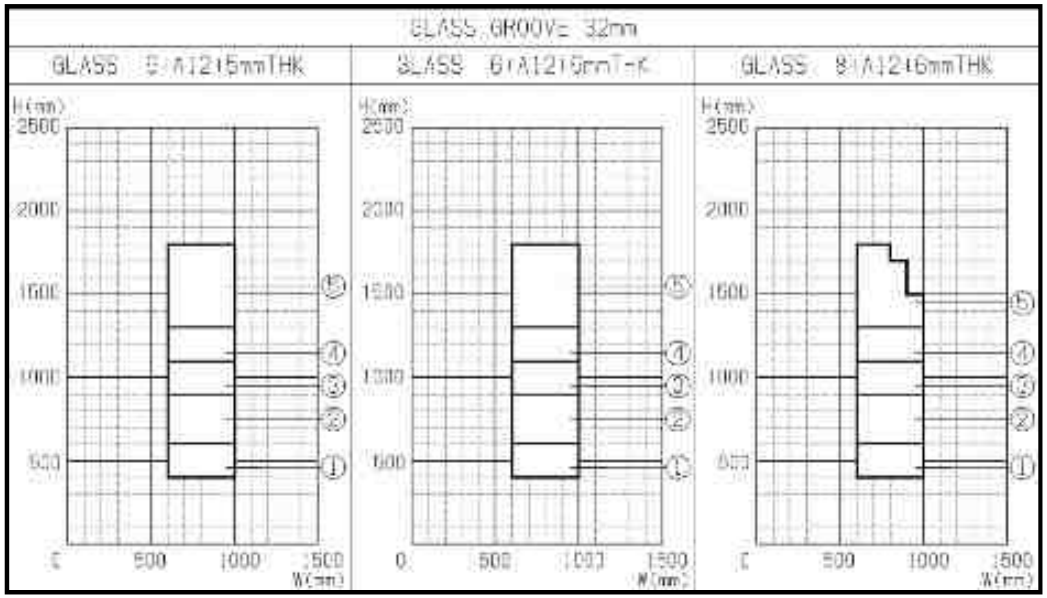
☐ Size Limitation

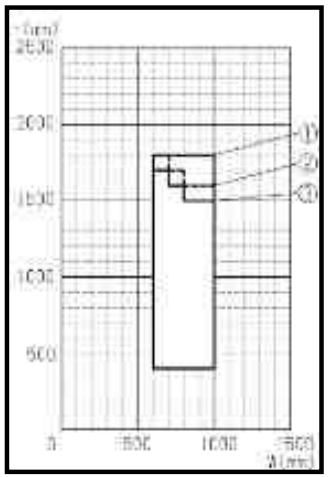


■CHOICE OF FRICTION STAY

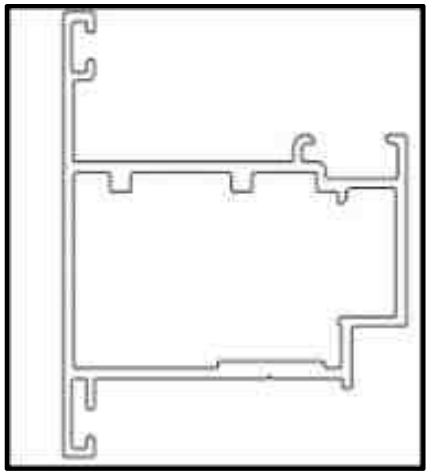


NO.	Inch.	PARTS NO. STANDARD	Allowable weight(kg)
①	10	4C-18952	25 or less
②	12	4C-18953	40 or less
③	14	4C-18955	45 or less
④	16	4C-18956	50 or less
⑤	18	4C-18958 (BK-17354, 5C-17356)	50 or less

■AGAINST PRESSURE ASTM



NO.	PRESSURE (Pa)
①	1200
②	2000
③	2500



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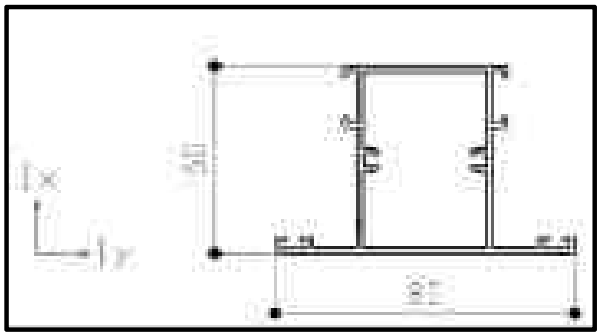
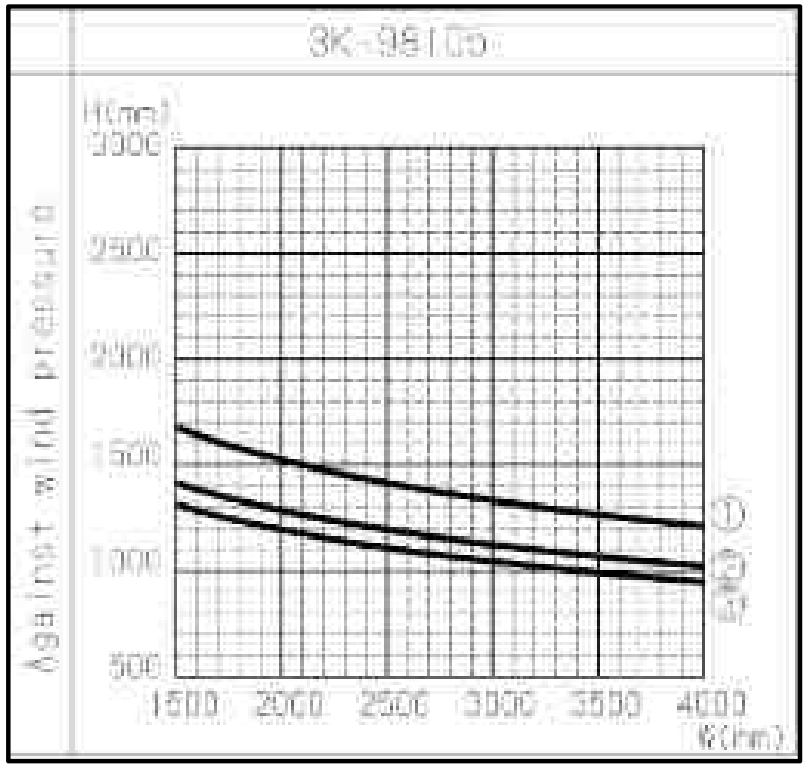
☐ Size Limitation (Against Pressure ASTM) Muntin

F	F

Calculation conditions against wind pressure

Allowable deflection : ℓ / 175 or less (ℓ = Length of member)





① 1200Pa
② 2000Pa
③ 2500Pa

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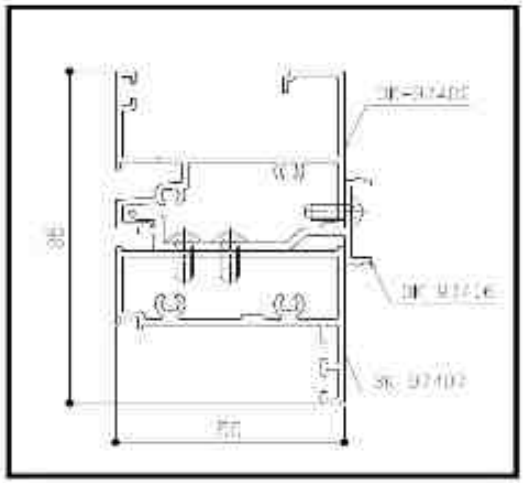
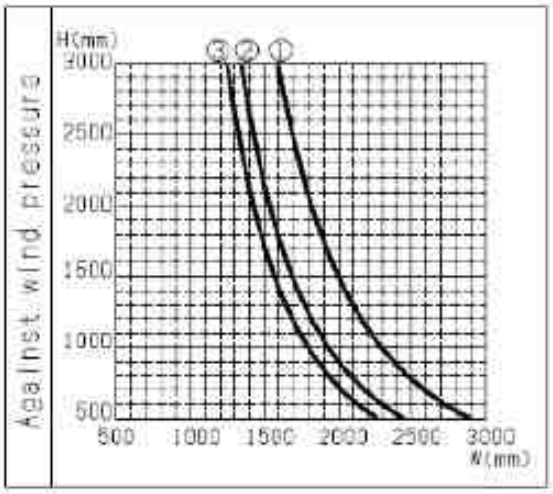
☐ Size Limitation (Against Pressure ASTM) Transom

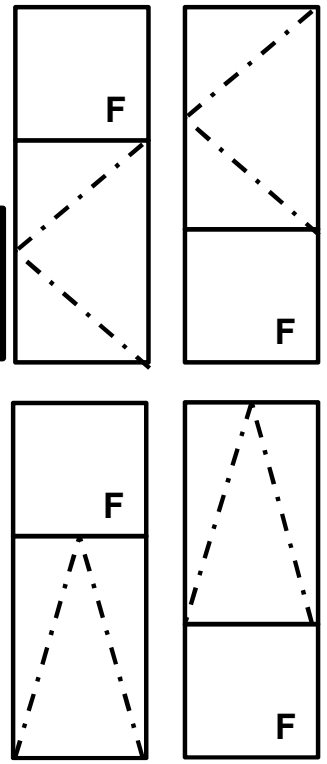
Calculation conditions against wind pressure

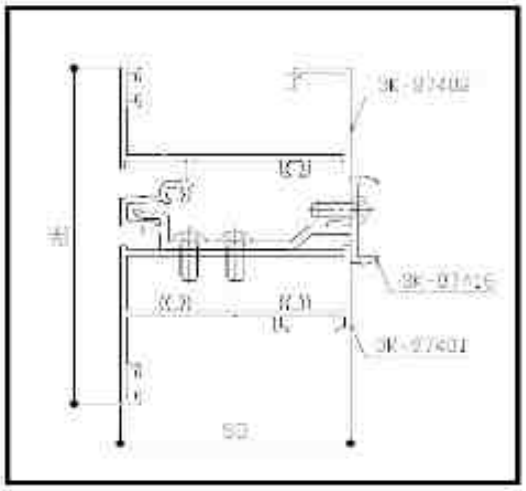
Allowable deflection : ℓ / 175 or less (ℓ = Length of member)

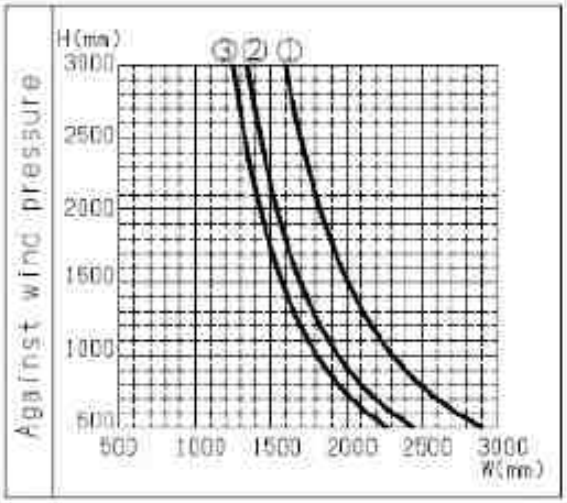




① 1200Pa
② 2000Pa
③ 2500Pa







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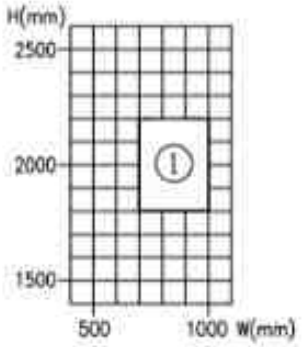
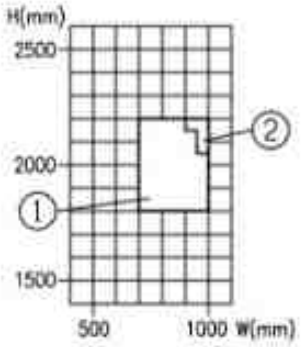
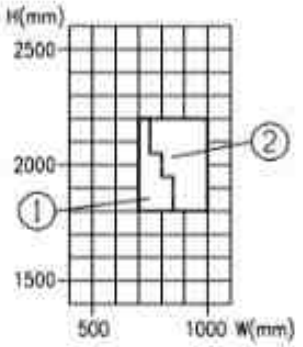
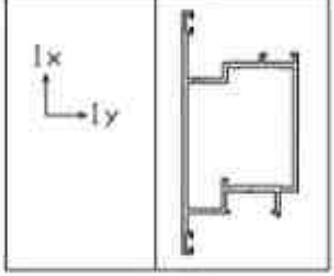
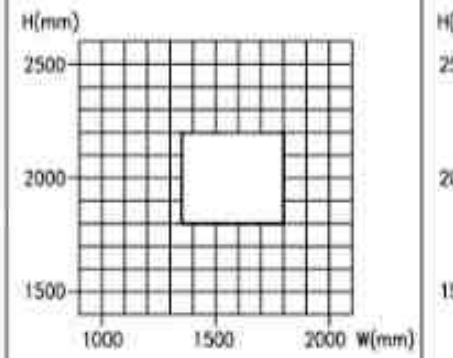
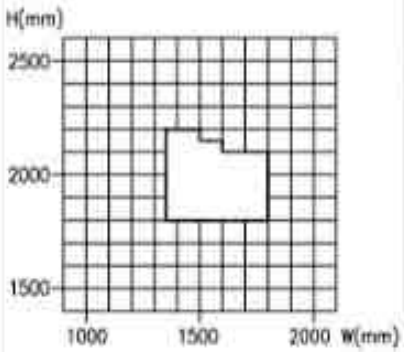
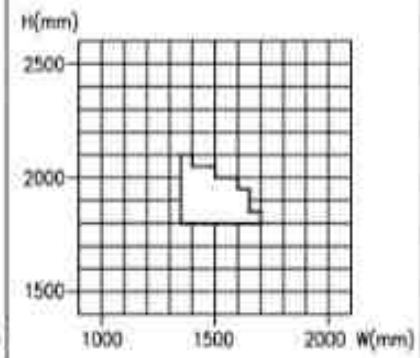
☐ Size Limitation

■AGAINST PRESSURE ASTM

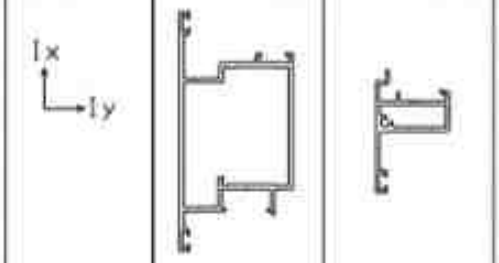
SINGLE SWING DOOR	1500Pa	2000Pa	2500Pa
①4POINTS CONSTRAINT ②5POINTS CONSTRAINT			

Shape No.	3K-98123
Zx(cm³)	8.56
Zy(cm³)	7.94
Ix(cm⁴)	45.62
Iy(cm⁴)	22.67



DOUBLE SWING DOOR	1500Pa	2000Pa	2500Pa
4POINTS CONSTRAINT			

Shape No.	3K-98123	3K-98124
Zx(cm³)	8.56	1.32
Zy(cm³)	7.94	1.64
Ix(cm⁴)	45.62	4.04
Iy(cm⁴)	22.67	3.47



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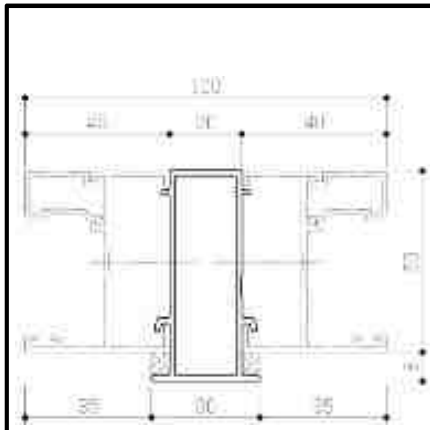
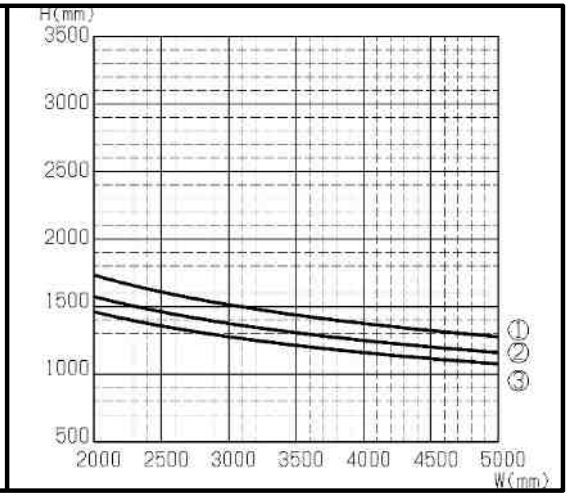
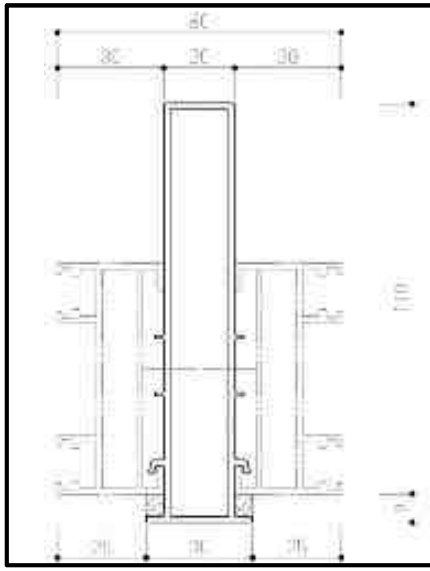
☐ Size Limitation (Against Pressure ASTM) Mullion

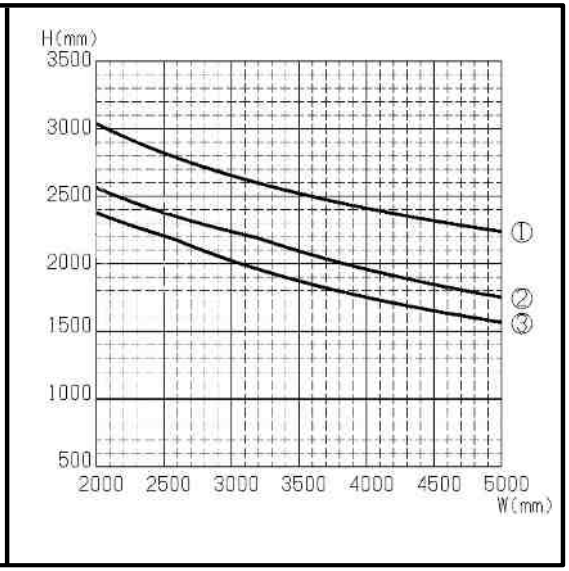
Calculation conditions against wind pressure

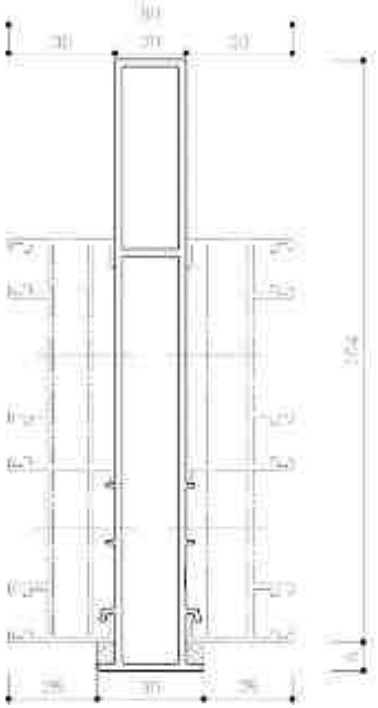
Allowable deflection : ℓ / 175 or less (ℓ = Length of member)

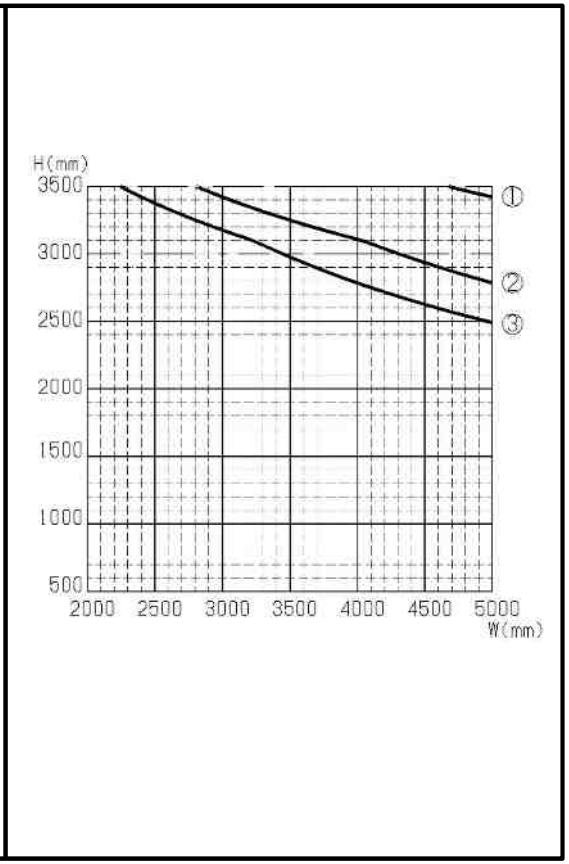












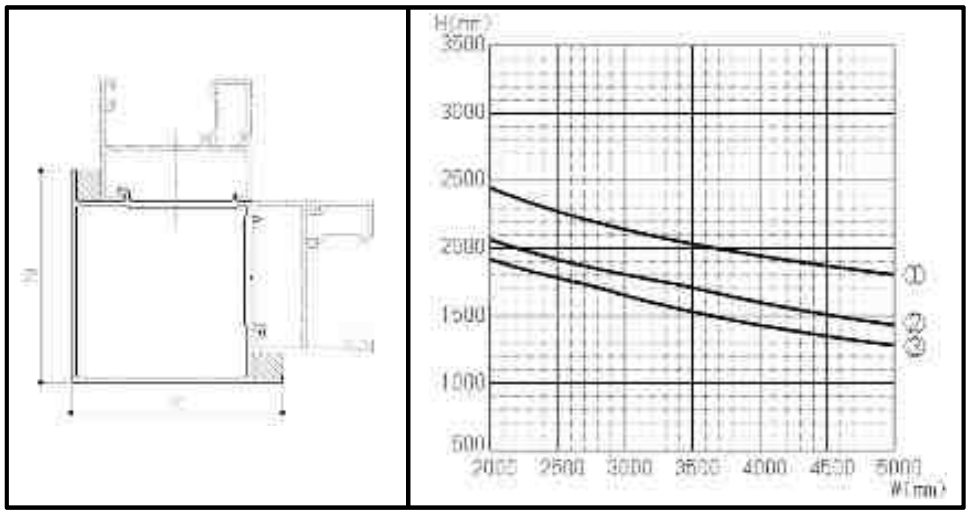
① 1200Pa
② 2000Pa
③ 2500Pa

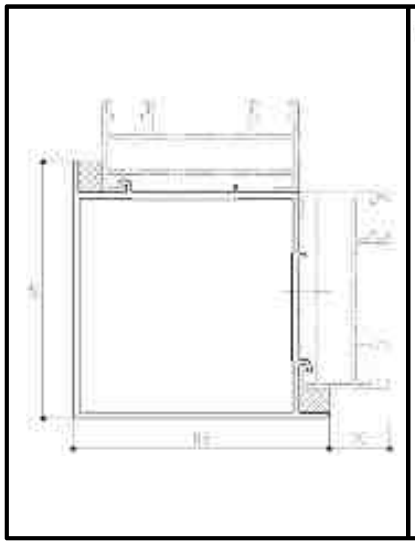
****

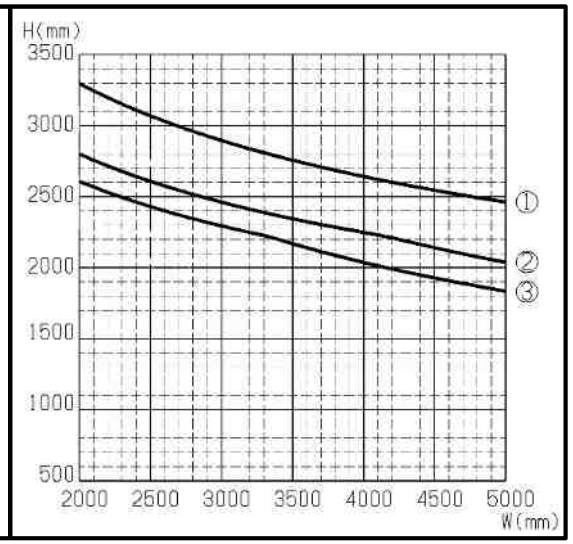
☐ Size Limitation (Against Pressure ASTM) Mullion

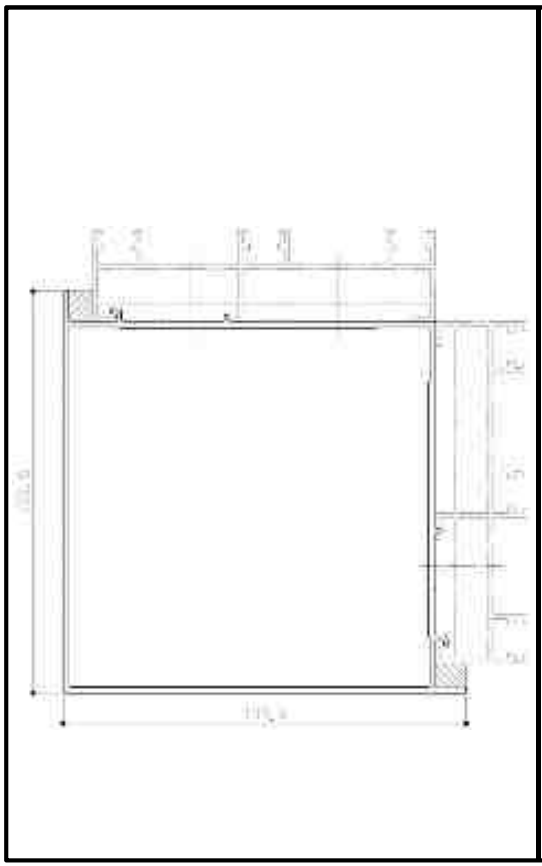
Calculation conditions against wind pressure

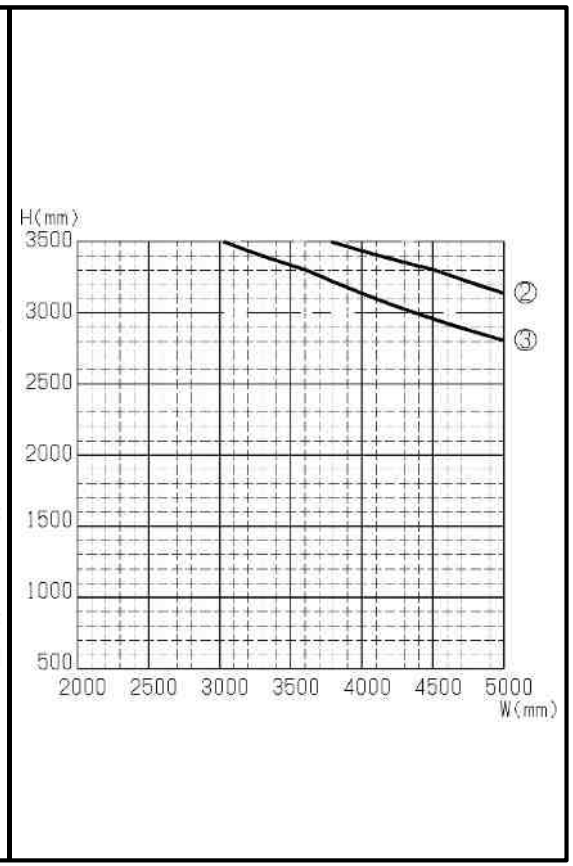
Allowable deflection : ℓ / 175 or less (ℓ = Length of member)











① 1200Pa
② 2000Pa
③ 2500Pa

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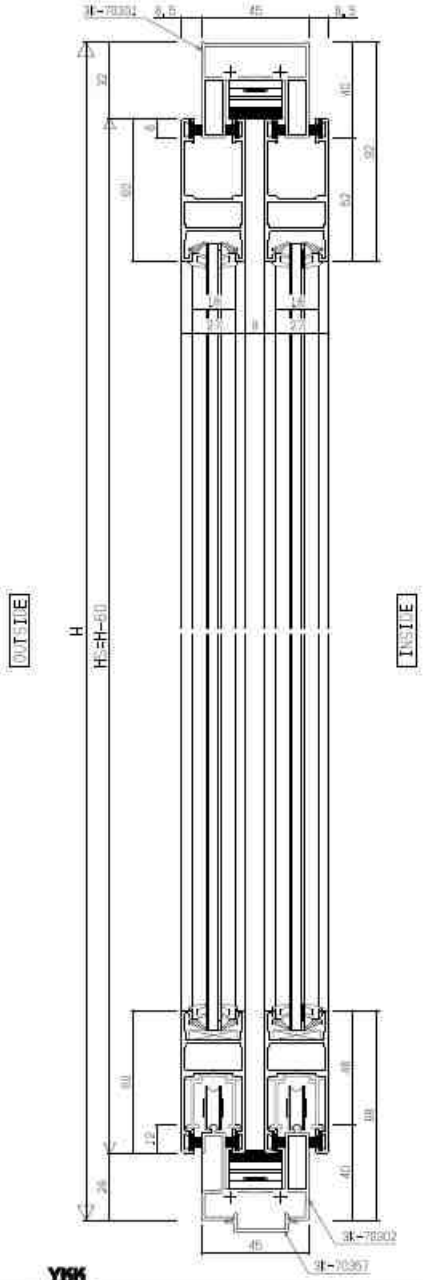
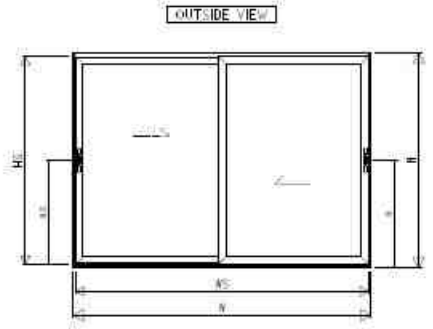
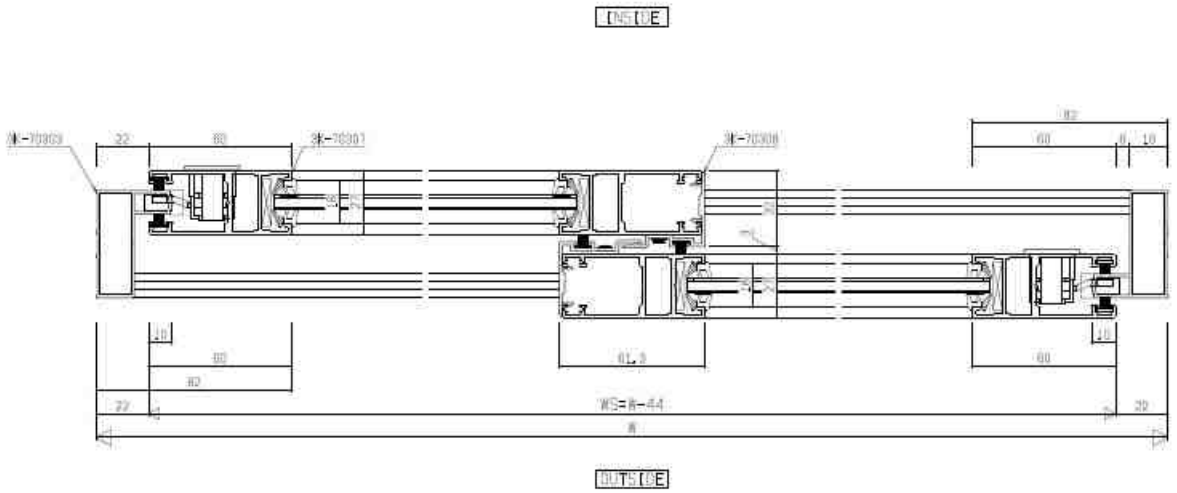
Aluminum Windows & Doors

☐ Drawing - (ref)Sliding 2T2S -

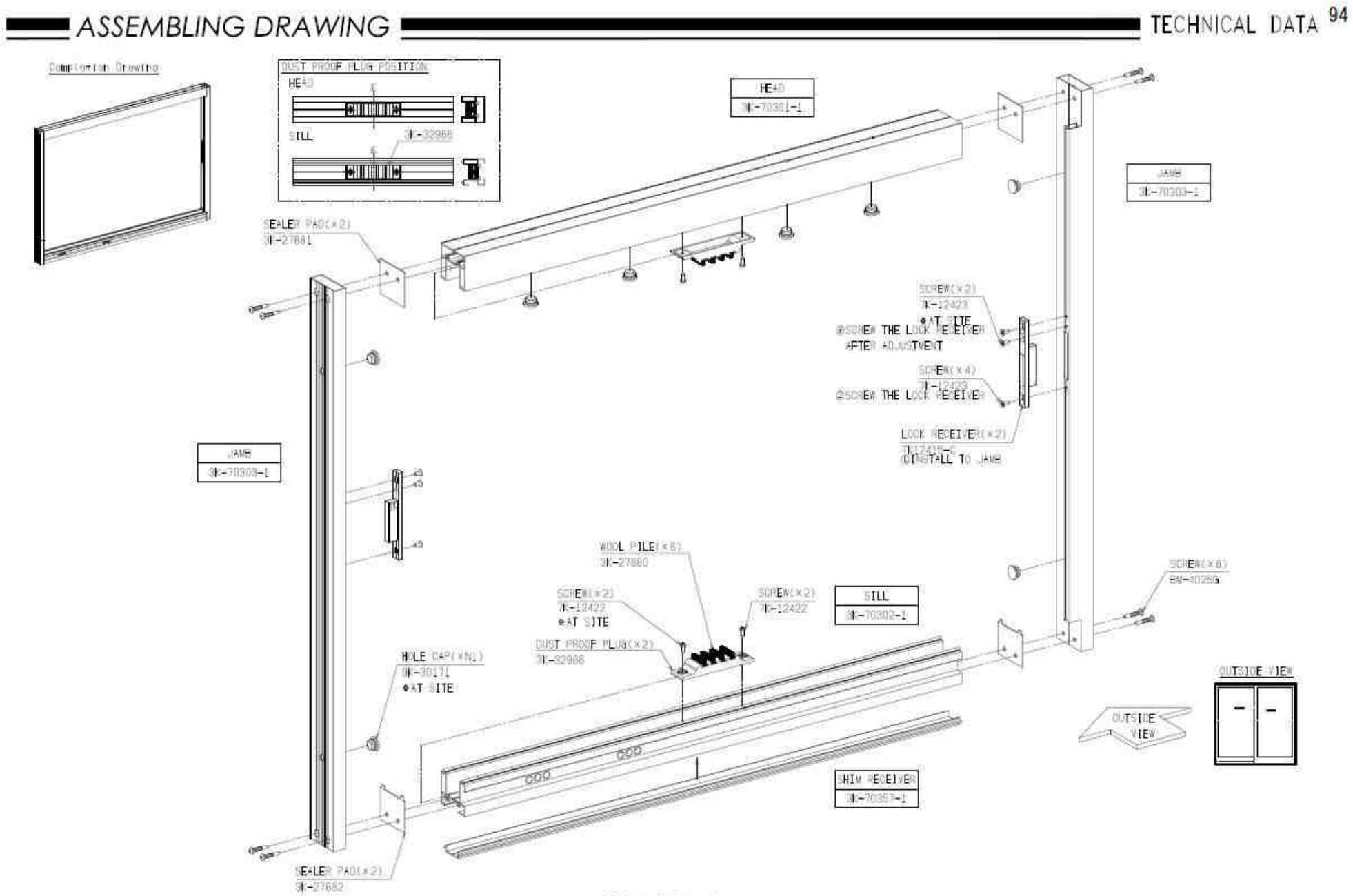
SYSTEM DRAWING GENERAL 7



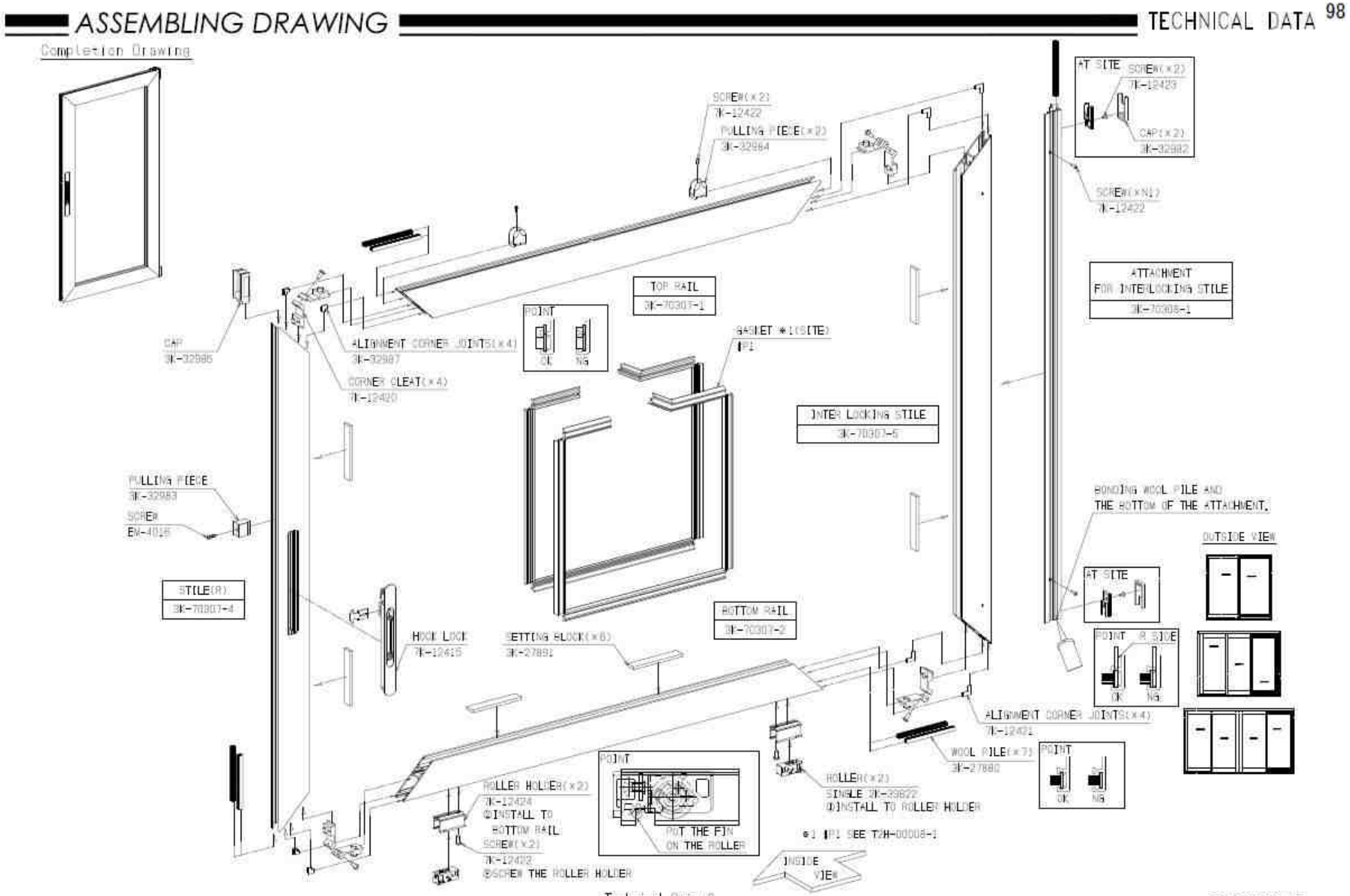




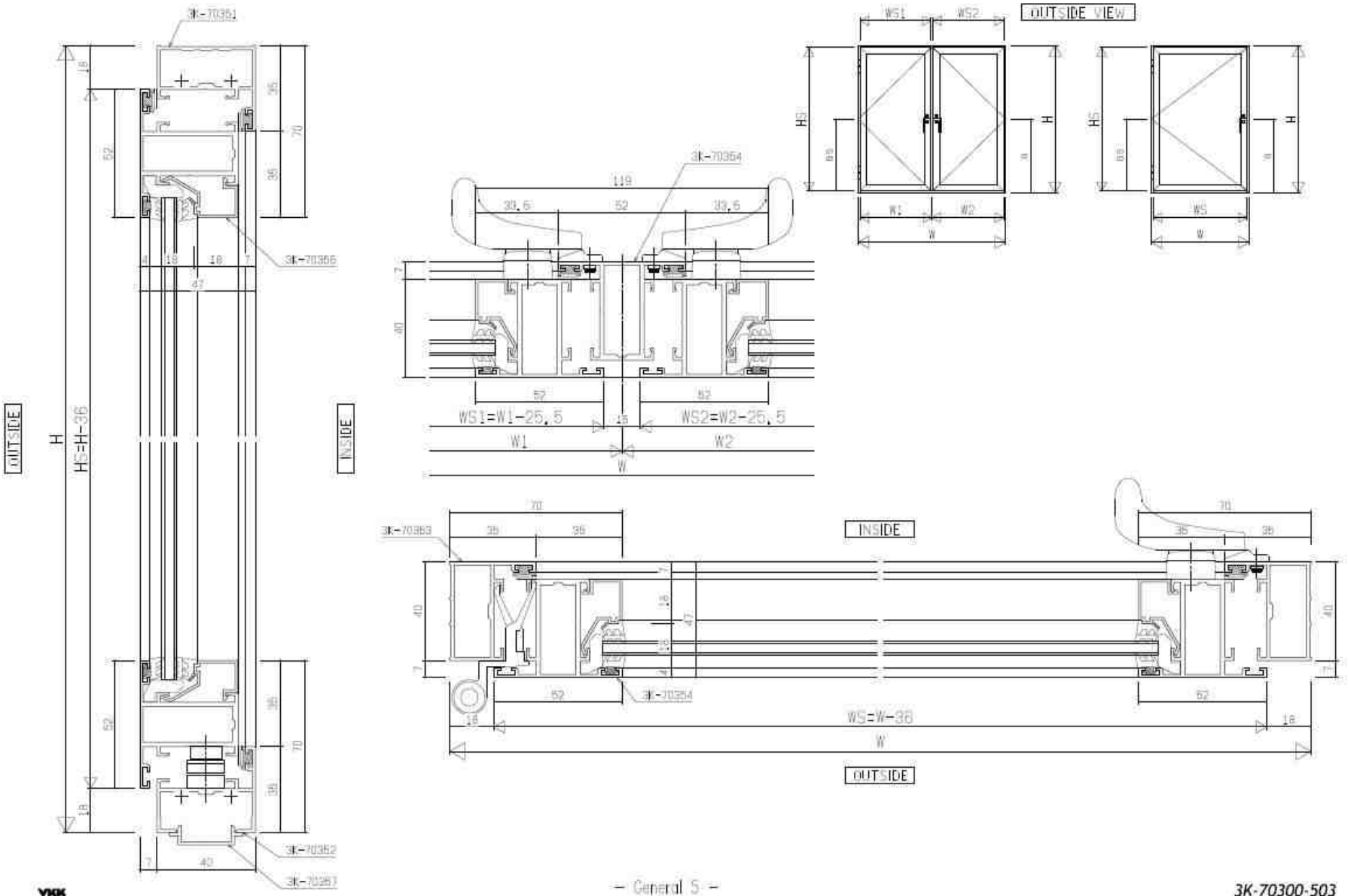
☐ Assembling Drawing - (ref)Sliding 2T2S -



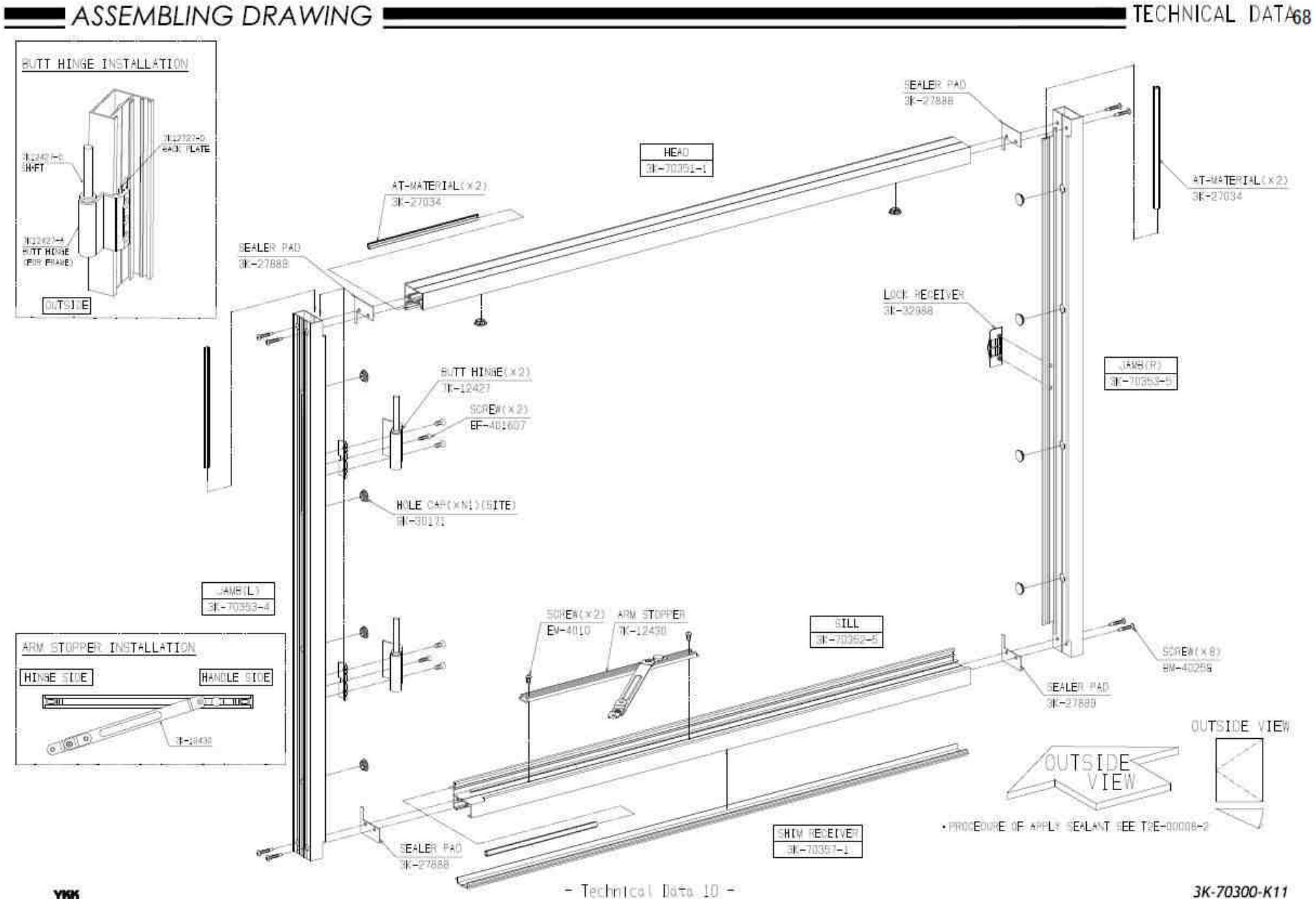
☐ Assembling Drawing - (ref)Sliding 2T2S -



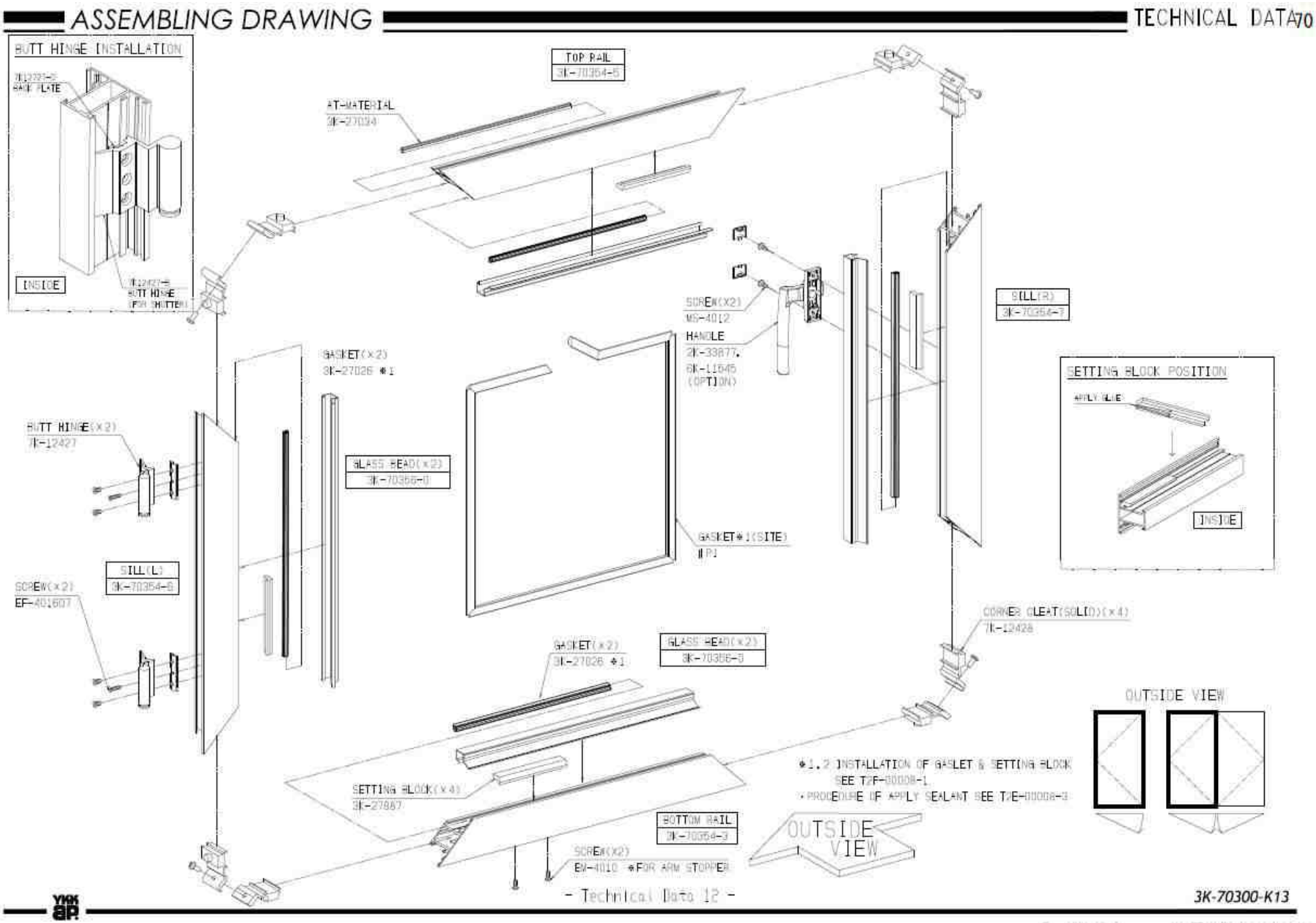
☐ Drawing - (ref) Outswing Casement -



☐ Assembling Drawing - (ref) Outswing Casement -



☐ Assembling Drawing - (ref) Outswing Casement -



BXW

Aluminum Windows & Doors

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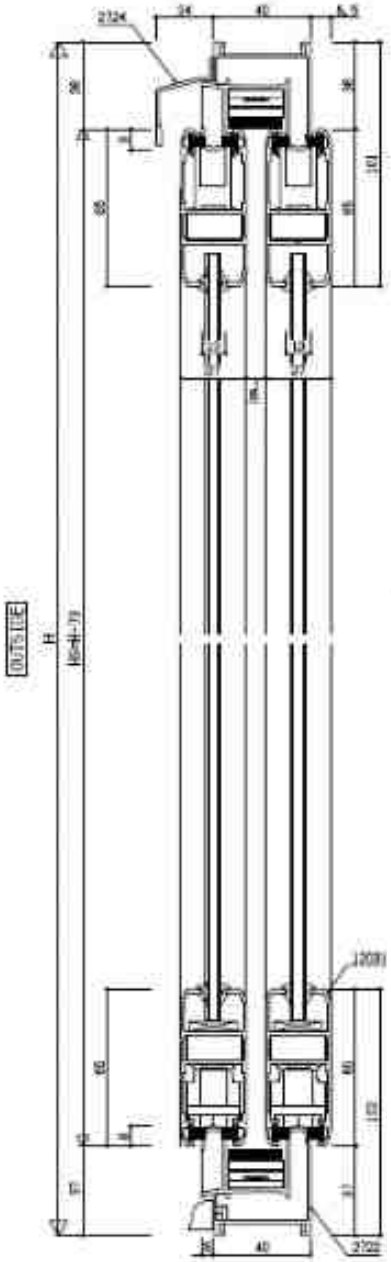
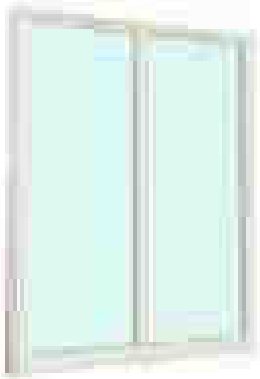
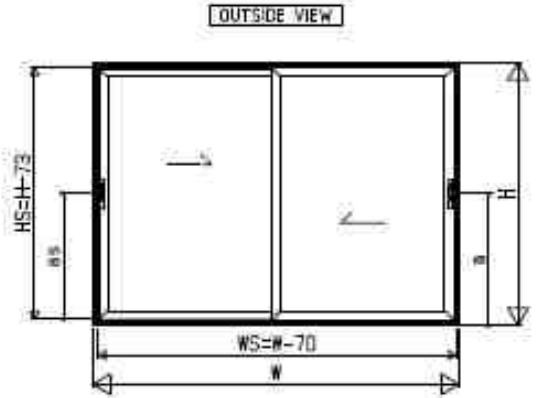
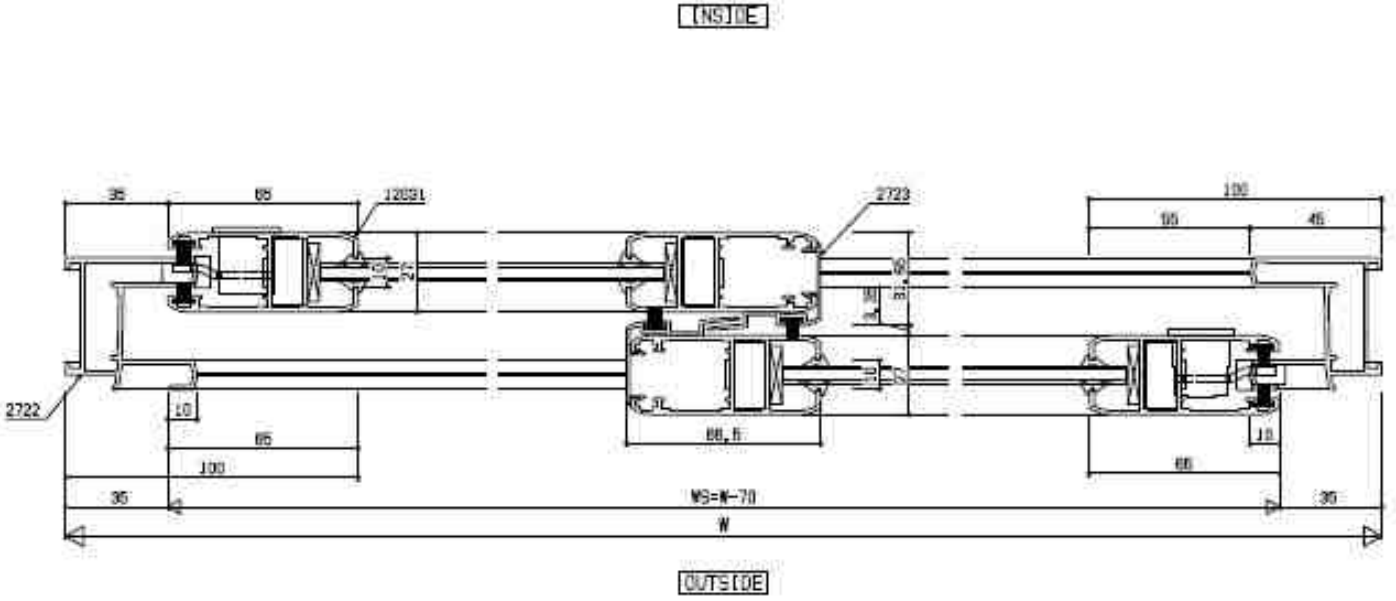
■ Sliding 2 LEAF (2 Track)









BXW

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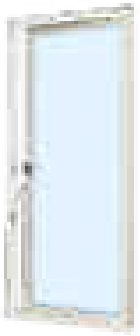
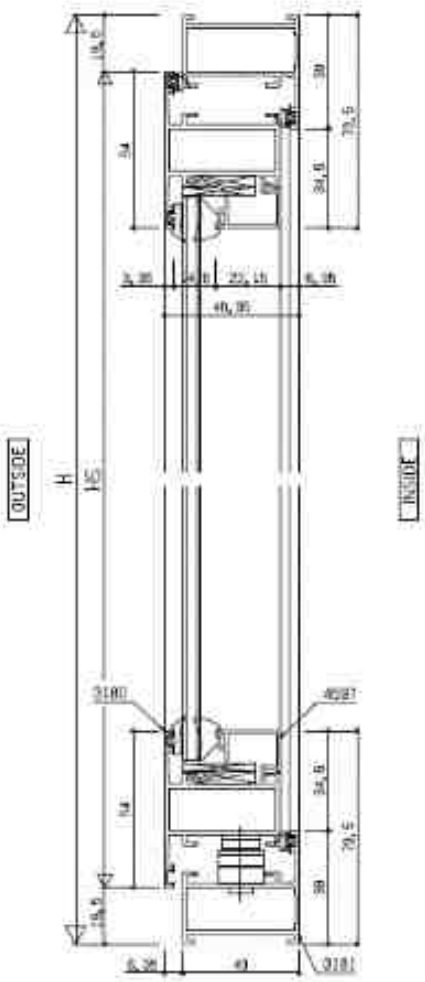
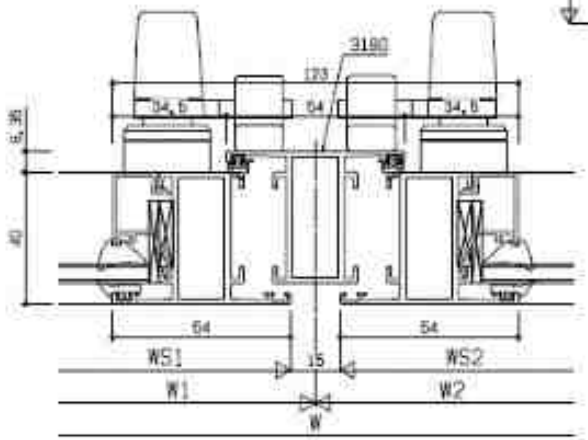
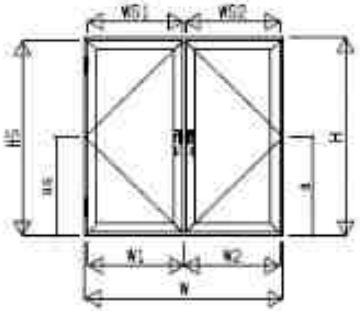
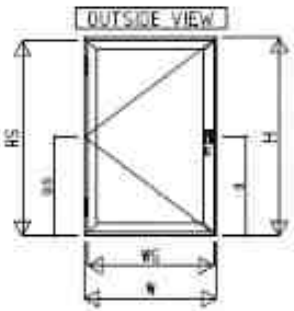
■ Casement

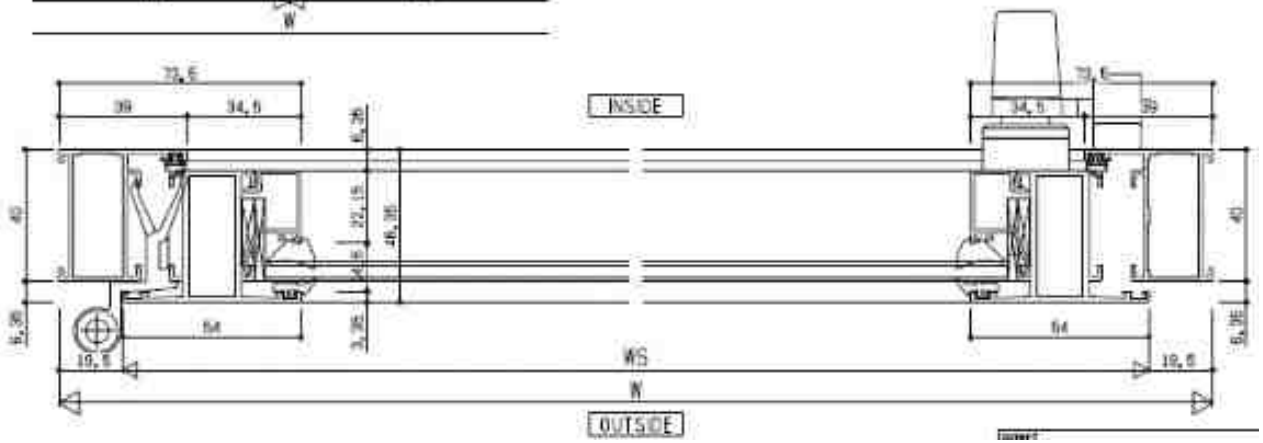












BXW

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☐ Performance

Structural (Wind Load)		- 1600 Pa Deflection: 1/175 [ASTM E 330]	Air Infiltration	N/A	Water Tightness	N/A
			Sound Insulation	N/A	Open-Close Testing	N/A

☐ Product Line Up

Sliding 2 LEAF (2 Track)

Fix

Casement

Sliding 4 LEAF (2 Track)

Sliding 3/6 LEAF (3 Track)

☐ Comparison

	IWIN-S	BXW
Performance	Secured	Only Wind Load (Theoretical)
Parts & Accessories Hardwares	YKK AP +	Outsource
Warranty	Available	N/A
Product Drawing FTS Document FTS Support	Available	Available

BXW

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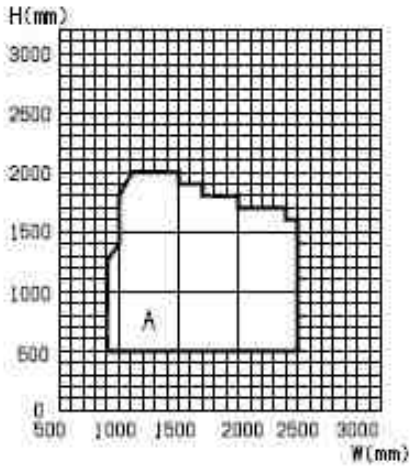
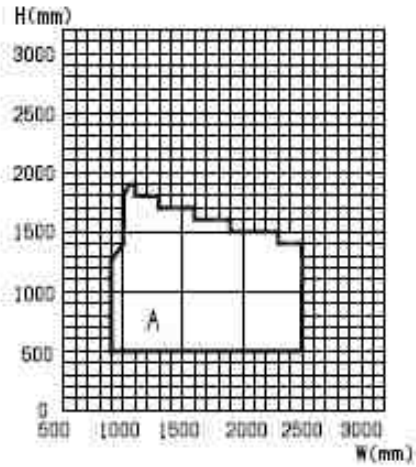
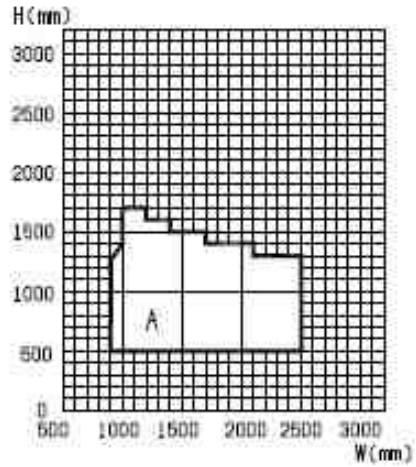
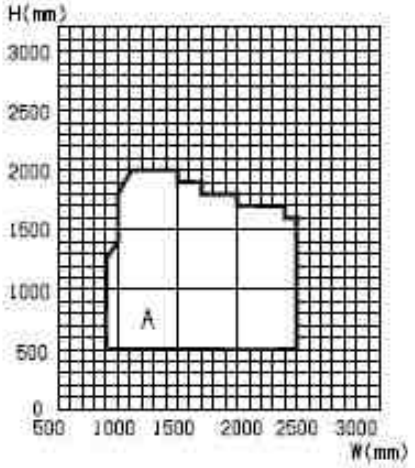
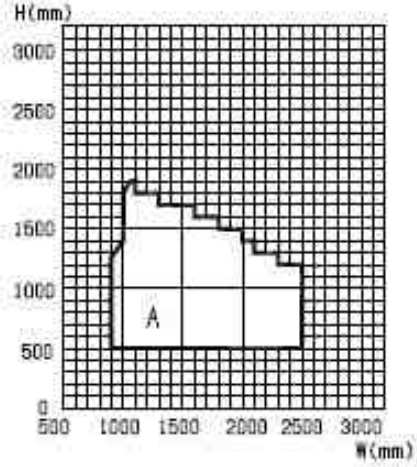
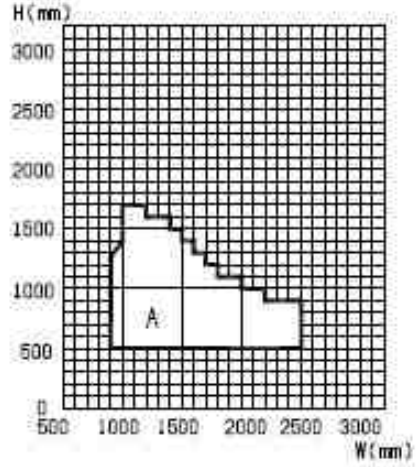
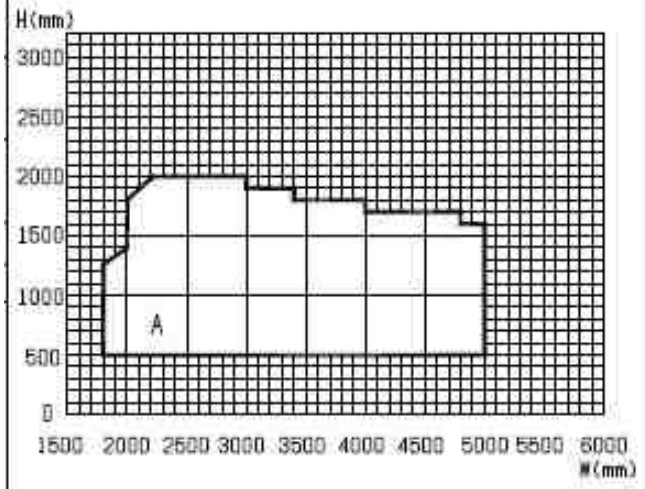
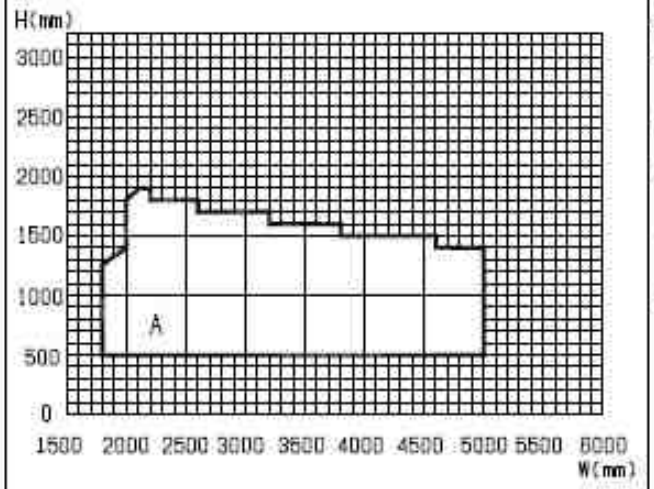
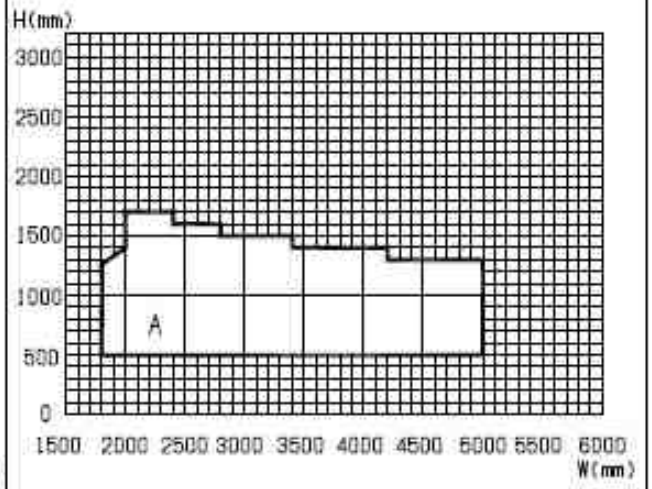
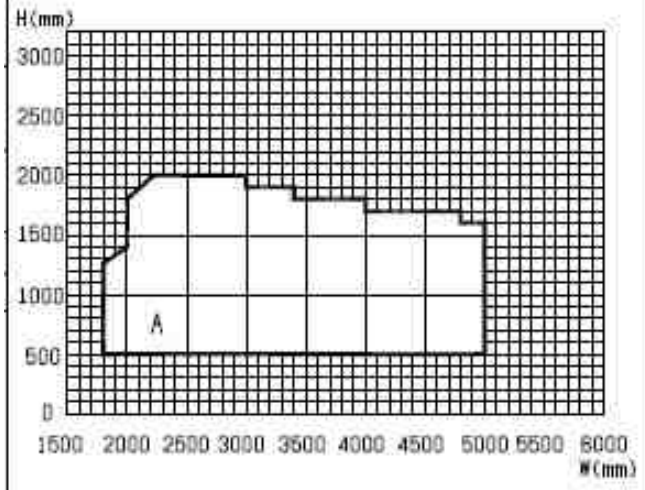
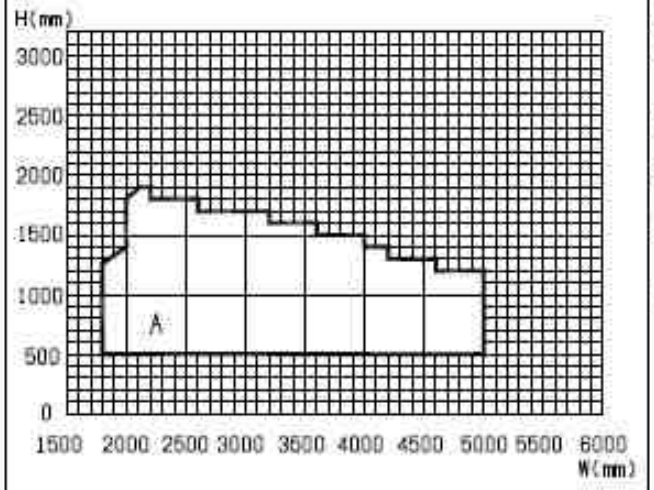
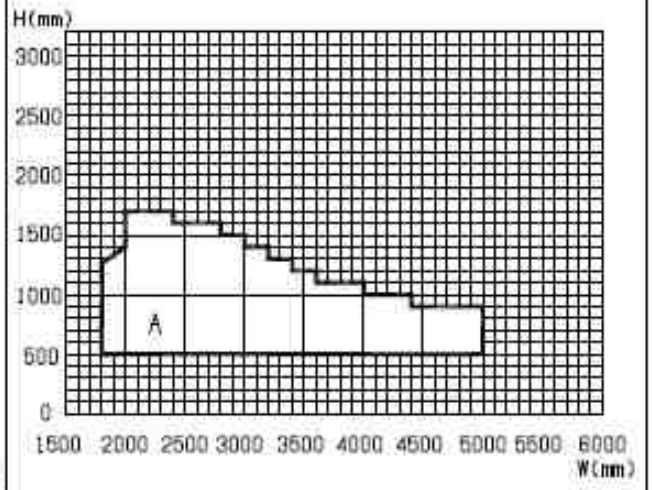
■ Sliding 2 LEAF (2 Track)

WIND PRESSURE		
800Pa	1200Pa	1600Pa
		
		

■ Sliding 4 LEAF (2 Track)

WIND PRESSURE		
800Pa	1200Pa	1600Pa
		
		

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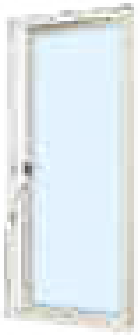
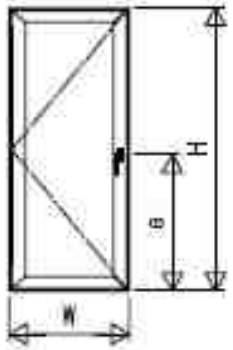
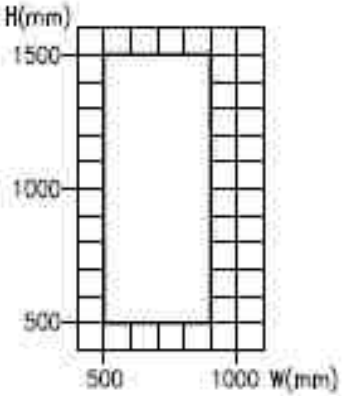
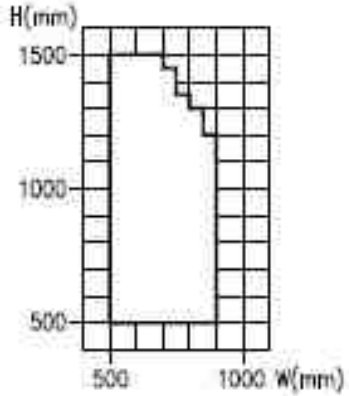
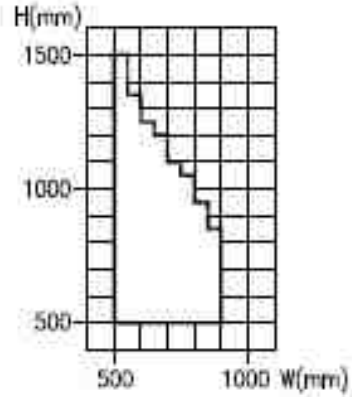
■ Casement



Outswing CASEMENT	800Pa	1200Pa	1600Pa
			

連段窓

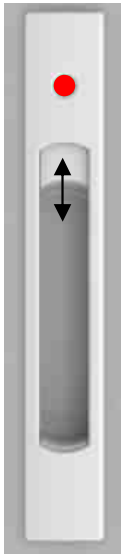
Big Opening Swing Door

☐ Sliding - Various Options - Price Comparison

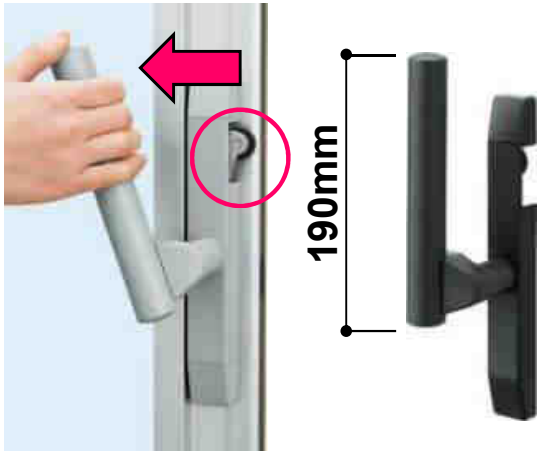
● Solid Hook Lock
[Default]

Unlock

Lock

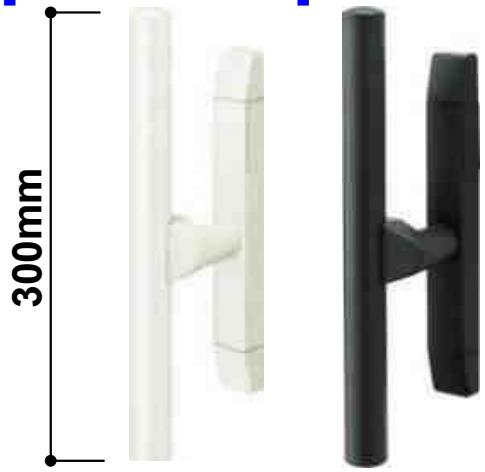


● Support Handle
[Value Added]



● Support Flush Handle
[Value Added]

● Large Handle
[Value Added]



● Multipoint Lock Handle
[Value Added]

● Japanese Crescent Lock
[Cost Reduction]