



Participant Handbook

Sector
Furniture and Fittings

Sub-Sector
Wooden Furniture

Occupation
Production -Fitting

Reference ID: **FFS/Q6101**, Version No. **1.0**
NSQF Level 3



**Assembler-
Doors/Windows (Glass)
Option:
Wooden/Aluminium**

Published by



VIKAS® PUBLISHING HOUSE PVT. LTD.

E-28, Sector-8, Noida-201301 (UP)

Phone: 0120-4078900 • Fax: 0120-4078999

Regd. Office: 7361, Ravindra Mansion, Ram Nagar, New Delhi-110055

Website: www.vikaspublishing.com • Email: vocational@vikaspublishing.com

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First Edition, August 2018

ISBN 978-93-5271-242-7

Printed in India

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Shri Narendra Modi
Prime Minister of India

“ Skilling is building a better India.
If we have to move India towards
development then Skill Development
should be our mission. ”



Certificate
COMPLIANCE TO
QUALIFICATION PACK – NATIONAL OCCUPATIONAL
STANDARDS

is hereby issued by the

FURNITURE & FITTINGS SKILLS COUNCIL

for

SKILLING CONTENT : PARTICIPANT HANDBOOK

Complying to National Occupational Standards of
Job Role/ Qualification Pack: **"Assembler Door/Windows – Glass"**
QP No. **"FFS/Q6101 NSQF Level 3"**

Date of Issuance: July 12th, 2017

Valid up to*: July 11th, 2020

*Valid up to the next review date of the Qualification Pack

Authorized Signatory
(Furniture & Fittings Skill Council)

Acknowledgements

Furniture & Fittings Skill Council (FFSC) would like to express its gratitude to all the individuals and institutions who contributed in different ways towards the preparation of this "Participant Handbook". Without their contribution it could not have been completed. Special thanks are extended to those who collaborated in the preparation of its different modules. Sincere appreciation is also extended to all who provided peer review for these modules.

The preparation of this handbook would not have been possible without the Furniture & Fittings Industry's support. Industry feedback has been extremely encouraging from inception to conclusion and it is with their input that we have tried to bridge the skill gaps existing today in the industry.

This participant handbook is dedicated to the aspiring youth who desire to achieve special skills which will be a lifelong asset for their future endeavours.

About this book

This Participant Handbook is designed for providing skill training and /or upgrading the knowledge level of the Trainees to take up the job of an "Assembler-Doors/Windows (Glass) Option: Wooden/ Aluminium" in the Furniture & Fittings Sector.

This Participant Handbook is designed based on the Qualification Pack (QP) under the National Skill Qualification framework (NSQF) and it comprises of the following National Occupational Standards (NOS)/topics and additional topics.

- (FFS/N6101) Assist lead technician in work process – glass doors and windows
- (FFS/N8601) Ensure health and safety at workplace
- (FFS/N8501) Maintain work area, tools and machines
- (FFS/N8801) Work effectively with others
- Option : (FFS/N6102) Assist lead technician in work process-wooden/aluminium doors and windows

Symbols Used



Key Learning
Outcomes



Activity



Summary



Tips



Notes



Unit
Objectives

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1. Assist Lead Technician in Work Process – Glass Doors and Windows



Unit 1.1 Introduction

Unit 1.2 Various Types of Glass Doors and Windows Fitting Products

Unit 1.3 Marking, Cutting Glass, Polishing, Repairing Rough Edges etc.

Unit 1.4 Assembling Door and Windows and Placement of Glass

Unit 1.5 Assembling and Dismantling Procedure of Components

Unit 1.6 Product and Workplace Safety Specifications

Unit 1.7 Various Types of Defects and Troubleshooting Common Errors

Unit 1.8 Relevant Hand and Power Tools

Unit 1.9 Units of Measurement

Unit 1.10 Handling of Tools and Equipment with Care

Unit 1.11 Common Faults Encountered and Rectification Methods

Unit 1.12 Discussing Alignment, Strength of Material and Proper Setting of Frames, Doors

Unit 1.13 Adhesives, Sealants and Other Filling Materials Used in Fittings

Unit 1.14 Safety Standards and Precautions/Personal Protective Equipment

Unit 1.15 Quality Standards to be Maintained

Unit 1.16 Standard Operating Procedures

Unit 1.17 Reporting and Documentation Skills



Key Learning Outcomes

At the end of this module, you will be able to:

1. Identify the various types of glass doors and windows fitting products manufactured by the company along with their functions, specifications and components
2. Discuss the know-how of marking, cutting glass, polishing, repairing rough edges etc.
3. Demonstrate the process of assembling door and windows and placement of glass
4. Demonstrate the process of assembling and dismantling procedure of components for different products List Product and Workplace Safety Specifications
5. Identify various types of defects and troubleshooting common errors
6. Compare relevant hand and power tools
7. Discuss units of measurement
8. Practise handling of tools and equipment with care on finished surface
9. Identify common faults encountered with equipment and the methods to rectify them
10. Discuss alignment, strength of material and proper setting of frames, doors and other fittings
11. Discuss Adhesives, Sealants and other Filling Materials used in fittings of glass and other structures
12. Different types of personal protective environment and their usage
13. Appraise the quality standards to be maintained
14. Explain standard operating procedures
15. State the importance of reporting and documentation skills

Unit 1.1 Introduction

Unit Objectives

At the end of this unit, you will be able to:

1. Discuss about the Furniture & Fittings sector in India
2. Discuss about and introduce the job role of assembler- doors/windows (glass)
3. Describe the common types of glass and their properties

1.1.1 An Overview of the Furniture & Fittings sector in India

- Currently, India is the 14th largest market in the world for the Furniture and Fittings sector, as stated by HKTDC Research.
- The Indian middle-class population and business organizations are gradually recovering from the temporary market decline, which was driven by recent economic reforms and measures like Demonetization, introduction of the GST (Goods and Services Tax) and advent of the Long Term Capital Gains Tax.
- The GDP (Gross Domestic Product) of India, for the fiscal year 2018-19, has been forecasted to grow by 7-7.5% by the Economic Survey of India (2017-18).
- This can be attributed to the rise of per capita income level and the subsequent growth in consumption by the urban and semi-urban middle-class population.
- The choice and consumption of middle-class population in India are now driven by need, quality and convenience, rather than affordable prices.
- Middle-class households are now interested in enhancing their lifestyle standards by decorating their homes with modern and glass-fitted doors and windows.
- The Furniture & Fittings sector in India has been forecasted, by TechSci Research, to beat INR 3200 crores by 2019.

1.1.2 Introduction to the Job Role of Assembler- Doors/ Windows (Glass)


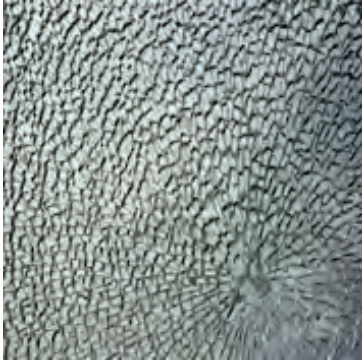

The Assembler- Doors/Windows (Glass) is responsible for assisting the technician and the rest of the team for installing glazed/ toughened/ plain glass windows, doors with fittings and fixtures.






She/he would be required to prepare for the installation by undertaking preparatory work and assisting in installation at the work site, in accordance to client requirements and quality standards.

- The job responsibilities of an Assembler- Doors/Windows (Glass) are given below:
 - Assembling structural components like doors, metal sashes, windows, window screens etc., using appropriate hand and power tools
 - Assembling frame components like tops, bottoms, sides, panels, moulds and fixtures
 - Smoothing the uneven edges of components for obtaining the specified and desired fit, using appropriate tools like Grinder or File
 - Punching and drilling holes for fastening, using tools like Hole Punch or Power Drill

- Aligning holes, connectors and components together, using Screwdriver or Wrenches
- Taking appropriate measurements, as per desired specifications and work order
- Marking and cutting glass to specified size
- Arranging and organizing workpiece in measuring jig to verify dimensions
- Examining workpiece for detecting scratches, cracks and other defects
- Using adhesive, putty, sealants etc. on frame and arranges pre-cut glass panes into the frame
- In order to be a successful Assembler- Doors/Windows (Glass), students need to have the following skills:
 - Knowledge of basic carpentry skills
 - Knowledge on the usage of power tools
 - Knowledge on Computer basics, including MS Office, AutoCAD, Internet usage, etc.

1.1.3 Common types of glass and their properties

Type of Glass	Properties
<p>Float glass</p> 	<p>Also known as Soda Lime glass, this is fabricated out of Sodium silicate and Calcium silicate. This glass is clear and flat, causing glare. Weight ranges between 6 to 36 kg/m². Thickness ranges between 2 - 20 mm.</p>
<p>Shatterproof glass</p> 	<p>This glass is used for building windows, skylights, floors, etc. This is primarily made of plastic poly-vinyl butyral and hence, cannot form sharp edges or jagged pieces on breaking.</p>
<p>Laminated glass</p> 	<p>This is fabricated by combining multiple layers of common glass. It is, hence, heavier than common glass. Used in aquariums, green houses and bridges, it is very thick and is resistant to Ultraviolet radiations and sound waves.</p>

Type of Glass	Properties
<p>Extra clean glass</p> 	<p>This type of glass is photocatalytic (easily reacts to and absorbs light) and hydrophilic (easily gets wet by water). This is resistant to stain and involves easy maintenance.</p>
<p>Chromatic glass</p>  	<p>This type of glass is generally used in Meeting Rooms, Eyewear and Intensive Care Units in hospitals. This controls the transparent efficiency of glass and prevents daylight from entering the interiors.</p>
<p>Toughened / Tempered glass</p> 	<p>Toughened or Tempered glass is a type of safety glass fabricated by controlled thermal or chemical treatments, to increase its strength, as compared with normal glass. Tempering subjects the outer surfaces to compression and the interior to tension. Such stresses cause the glass, when broken, to crumble into small granular chunks instead of splintering into jagged shards as plate glass does. These granular chunks are less hazardous. These glasses are mainly used in fire resistant doors, mobile screen protectors, etc.</p>
<p>Insulated Glazed Units</p> 	<p>This type comprises a glass sheet, separated into two to three layers by air or vacuum. This glass serves as a good insulator because of the air layers.</p>

Unit 1.2 Various Types of Glass Doors and Windows Fitting Products

Unit Objectives

At the end of this unit, you will be able to:

1. Describe the various types of fitting products for glass doors / windows

1.2.1 Various types of fitting products for glass doors / windows


Glass doors and windows come with various types of fitting products and accessories, based on the need and taste of the consumer. These are generally made of Aluminium, Zinc die-casting, forged Brass and 316 Stainless Steel.

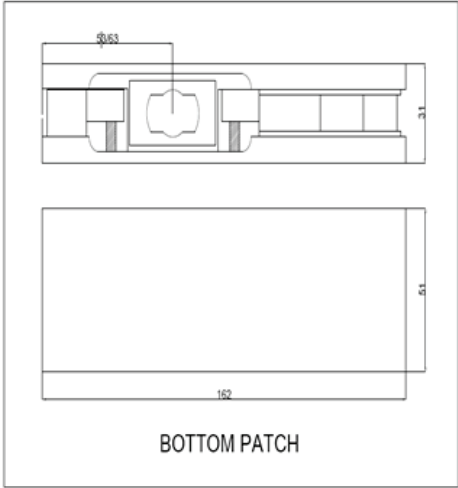

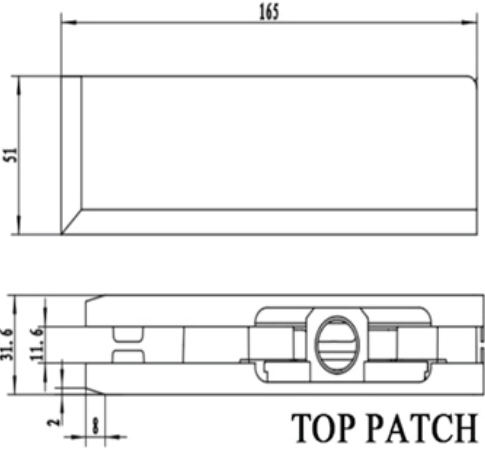


Patch Fittings:

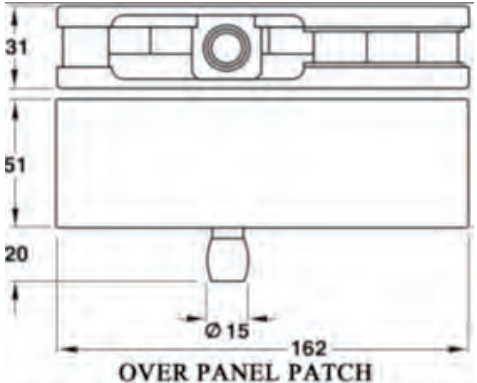

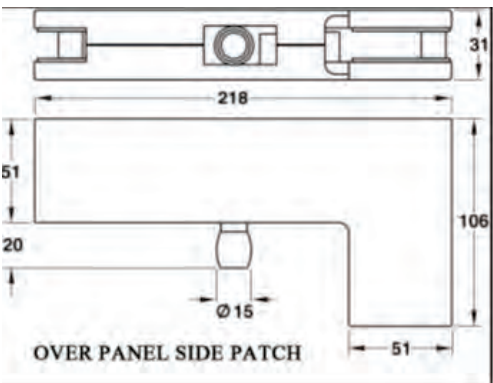
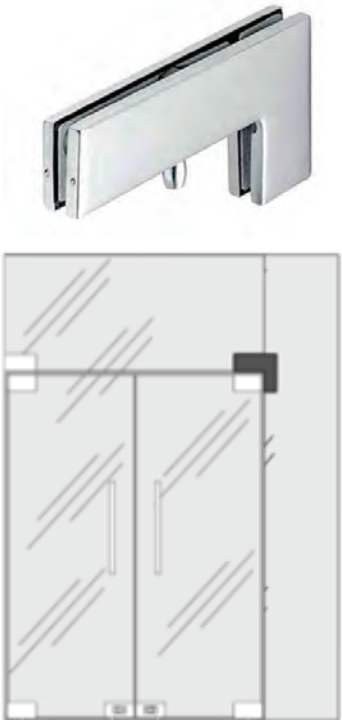
Functionality of Patch Fittings

- Patch Fitting is a modern, frameless glass concept, which incorporates the toughened glass (tempered and heated glass for strengthening) technology and is used in partitioned glasses.
- In Patch Fitting, silicon sealants are used as cushioning agents between the glass panels.
- Patch Fitting makes the glass door / window hardware architecture highly durable and strong. These are readily available in the market.
- Patch Fitting enables secure and reliable mounting of glass doors / windows.

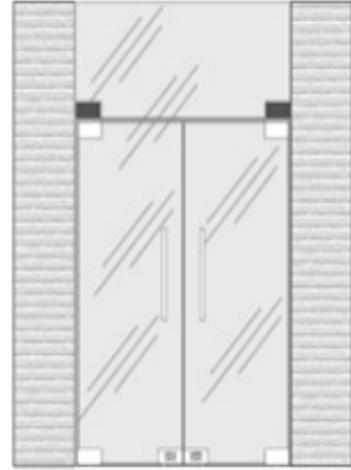
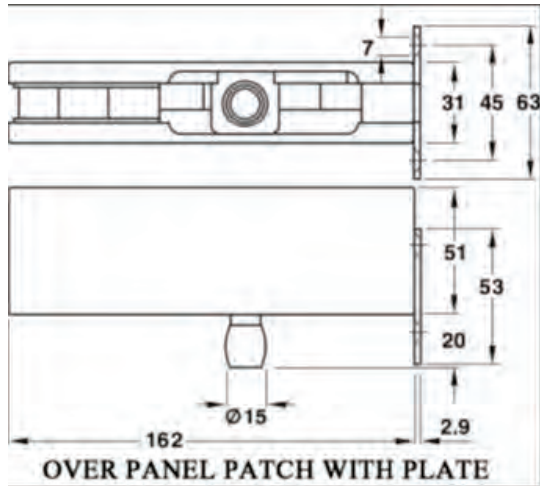
Patch Fittings - Components and Specifications:

Name of Component	Description / Specifications (Sample)	Image
Bottom Patch	<ul style="list-style-type: none"> • Comes with an insert for Floor Closer • Type is Pivot or Round Pivot (Diameter: 9/16") • Pivot Location: 2-3/4" • Weight in Kgs: <ul style="list-style-type: none"> ○ Aluminium: 0.564 ○ Brass: 0.680 ○ Stainless Steel: 0.662 	

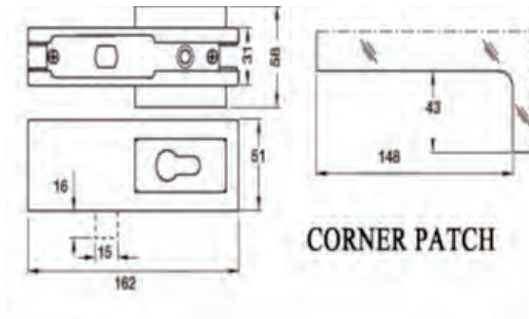
Name of Component	Description / Specifications (Sample)	Image
	 <p style="text-align: center;">BOTTOM PATCH</p>	
<p>Top Patch</p>	<ul style="list-style-type: none"> • Comes with safety insert for top pivot (Diameter: 19/32") • Pivot Location: 2-3/4" • Weight in Kgs: <ul style="list-style-type: none"> ○ Aluminium: 0.477 ○ Brass: 0.593 ○ Stainless Steel: 0.575  <p style="text-align: center;">TOP PATCH</p>	 

<p>Overpanel Patch</p>	 <p style="text-align: center;">OVER PANEL PATCH</p>	
<p>Overpanel Side Patch</p>	 <p style="text-align: center;">OVER PANEL SIDE PATCH</p>	

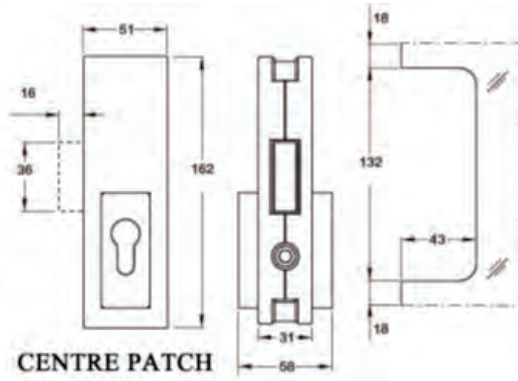
Overpanel Patch with Fixing Plate



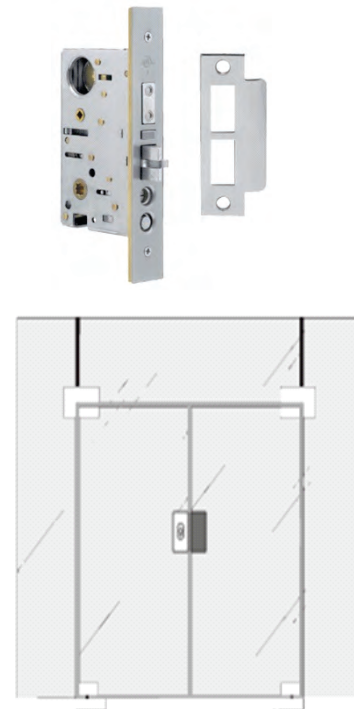
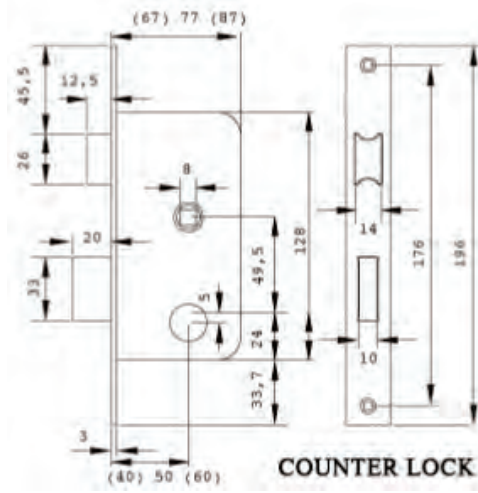
Corner Patch Lock

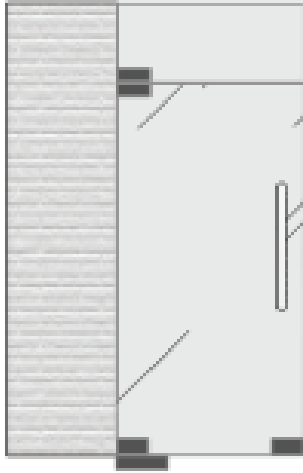

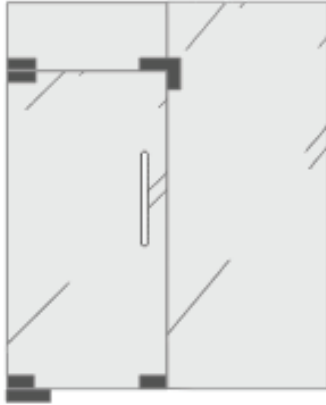
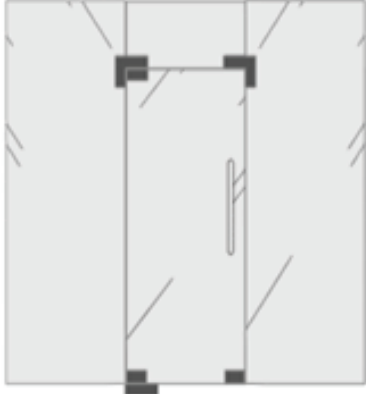



Centre Patch Lock



Counter Lock



<p>Single Door with Over-panel on top</p>	<p>Comes with:</p> <ul style="list-style-type: none"> • 1 Overpanel Patch with fixing plate • 1 Top Patch • 1 Bottom Patch • 1 Corner Patch Lock 	
<p>Double Door with Over-panel on top</p>	<p>Comes with:</p> <ul style="list-style-type: none"> • 2 Overpanel Patches with fixing plates • 2 Top Patches • 2 Bottom Patches • 2 Corner Patch Locks 	
<p>Single Door with Over-panel & Sidelight</p>	<p>Comes with:</p> <ul style="list-style-type: none"> • 1 Overpanel Patch • 1 Connector for Overpanel / Sidepanel • 1 Bottom Patch • 1 Top Patch • 1 Corner Patch Lock 	
<p>Single Door with Over-panel & Sidepanels (each side)</p>	<p>Comes with:</p> <ul style="list-style-type: none"> • 1 Overpanel side patch • 1 Connector for Overpanel / Sidepanel • 1 Bottom Patch • 1 Top Patch • 1 Corner Patch Lock 	

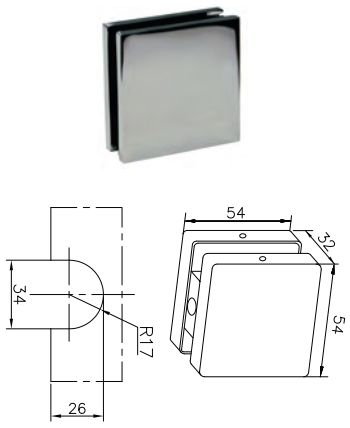
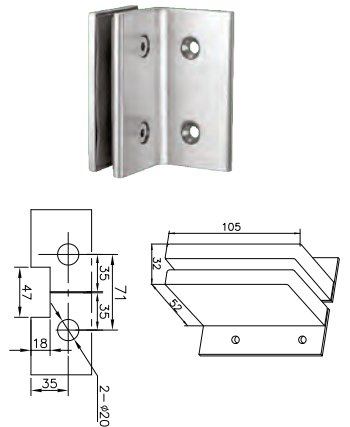
<p>Double Door with Over-panel & Side-panels (each side)</p>	<p>Comes with:</p> <ul style="list-style-type: none"> • 2 Overpanel side patches • 2 Bottom Patches • 2 Top Patches • 2 Corner Patch Locks 	
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B. Glass Door / Window Connectors:


Functionality of Connectors

- Connectors, as the name suggests, help in attaching two objects.
- The common connectors used in Glasswork are various types of Handles, Hinges and Knobs.

Patch Fittings - Components and Specifications:

Name of Component	Description / Specifications (Sample)	Image
<p>Glass Connectors (Type 1)</p>	<ul style="list-style-type: none"> • One connecting panel between Wall to Glass • Weight-carrying capacity: 20 Kgs/pair 	
<p>Glass Connectors (Type 2)</p>	<ul style="list-style-type: none"> • Two connecting panels between Wall to Glass • Weight-carrying capacity: 20 Kgs/pair 	

<p>Glass Connectors (Type 3)</p>	<ul style="list-style-type: none"> • Two connecting panels between Glass to Glass • Weight-carrying capacity: 20 Kgs/pair 	
<p>Connector for Overpanel</p>	<ul style="list-style-type: none"> • Weight-carrying capacity: 20 Kgs/pair 	
<p>Stainless Steel Lockable Pull Handles</p>	<p>Type1:</p> <ul style="list-style-type: none"> • 2 Points Fixing • Diameter: 35 mm, Material Thickness: 1.35 mm • Centre to centre: 925 mm, End to end: 1200mm • Material: Stainless steel 	

	<p>Type 2:</p> <ul style="list-style-type: none"> • 3 Point Fixing • Diameter: 35 mm, Material Thickness: 1.35 mm • Centre to centre bottom: 925 mm, Centre to centre upper: 725 mm • End to end: 1800 mm • Material: Stainless steel <p>Type 3:</p> <ul style="list-style-type: none"> • 3 Point Fixing • Diameter: 35 mm, Material Thickness: 1.35 mm • Centre to centre bottom: 925 mm, Centre to centre upper: 925 mm • End to end: 2000 mm • Material: Stainless steel <p>Type 4:</p> <ul style="list-style-type: none"> • 3 Point Fixing • Diameter: 35 mm, Material Thickness: 1.35 mm • Centre to centre bottom (C1): 1125 mm, Centre to centre upper (C2): 1125 mm • End to end: 2400 mm • Material: Stainless steel 	
Stainless Steel Pull Handles	<ul style="list-style-type: none"> • Installation height: 85 mm • Opening diameter: 12 mm • Fastening screws: included • Material: Stainless steel • Back to back handle diameter: 19-32 mm • Centre to centre length: 150-1500 mm • End to end length: 300-1800mm 	



<p>Glass Clamping Device</p>	<ul style="list-style-type: none"> • Suitable for 8 - 12 mm glass (toughened safety glass) • Includes threaded holes for the door closer 	
<p>Glass Sliding (Partition)</p>	<ul style="list-style-type: none"> • For Glass door of weight: 80 kg & 120 kg • Glass sliding track length: 3000 mm • Maximum Glass shutter width: 1500 mm only 	
<p>Glass Sliding</p>	<ul style="list-style-type: none"> • For Glass door of weight: 80 kg & 120 kg • Glass sliding track length: 3000 mm • Maximum Glass shutter width: 1500 mm only 	
<p>90° Wall to Glass / Floor to Glass Hinge</p>	<p>Type 1:</p> <ul style="list-style-type: none"> • Material: Brass with Chrome plating • For Glass thickness: 8-12 mm 	