MANUFACTURING INSTRUCTION
FOR SECTIONAL DOORS
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PREFACE
The recommended scheme of engineering process of sectional doors manufacturing and assembling with description of main manufacturing operations, the list of necessary equipment and tool are adduced in the instruction. This instruction can be used as the management directive during training and work of technical staff. It should be used together with calculating design program “DoorHan – components” and with “Doors components catalogue”, on basis of both – its data and customer’s requests – the product’s components are chosen (choice of lift type, operator type, lids and guides types and sizes etc.). Because of permanent sectional doors construction development the company “DoorHan” is able to modify this instruction.

TOOLS
1. Tape measure 10 m
2. Kneepiece
3. Fretsaw
4. Drill, set of drills
5. Riveting tool
6. Caliper
7. Pencil
8. Set of bench tool
9. Building water level 0.5 m
10. Cutting torch
11. Batten = 2.5 m
12. Doors Pencil
13. Rubber lump hammer
14. Rubber braids (length 1 m, 4 pcs)
4. Doors manufacturing in small-scale enterprise

1. Racks for long-length shafts, C-profiles, corner racks, guides semi-manufactured articles.
2. Racks for long-length panels semi-manufactured articles.
3. Racks for long-length aluminum profiles semi-manufactured articles.
4. Racks for long-length springs semi-manufactured articles.
5. Racks for lids semi-manufactured articles.
6. Trimmer for shafts, C-profiles, corner racks and guides cutting.
7. Rack for rifled shafts, C-profiles, corner racks and guides semi-manufactured articles.
8. Trimmer and driller for aluminum profiles semi-manufactured articles cutting and drilling.
9. Place for longitudinal and transversal panels cutting.
10. Trimmer for springs semi-manufactured articles.
12. Place for doors leaf assembling.
13. Place for wicket assembling and mounting.
15. Rack for corner racks and guides assembling.
16. Master’s room.
17. Emery.
18. Case for components and tools.

The working area is 272 sq. m. The quantity of working staff is 4-5 persons. The quantity of products per shift is 8-10 pcs.
5. Department equipment

Racks for doors leaf assembling. The upper beam should be covered by soft material in order not to scratch the panel (felt, linoleum etc.). Material: Tube 60x30.

Racks for guides assembling. Material: Tube 60x30.

Table for springs cutting and ends mounting.

Circular rotary saw for aluminum profiles cutting. Circular saw for corner racks, shafts, guides and C-profiles cutting.

Rack for wicket assembling.

Driller.
6. Manufacturing and assembling method for sectional doors

Manufacturing and assembling process flowsheet for sectional doors

1. Doors calculation and the “Department” card transfer to the factory for doors manufacturing (place 16).
2. Long-length panels semi-manufactured articles storage (place 2); long-length semi-manufactured articles storage on the racks (shafts, C-profile, corner racks, guides – place 1), (springs – place 4), (aluminum profile – place 3) and storage of components (lids – place 5, rubber seals – place 19).
3. Shafts, C-profile, corner racks, guides cutting (place 6).
4. Cut shafts, C-profile, corner racks, guides storage (place 11).
5. Springs cutting (place 10) and cut springs storage (place 11).
6. Lids storage (place 5).
7. Panels cutting (place 9).
8. Doors leaf assembling, lids and aluminum profiles mounting (place 12).
9. Wicket embrasure rabbet in the doors leaf (place 13).
10. Wicket mounting into the doors leaf (place 14).
11. Corner racks and guides assembling (place 15).
12. Components assembling and doors package (place 9).
7. Necessary leaf sizes

Measure the sizes indicated on the picture with the tape measure and check the horizontality and verticality of the embrasure with building water level. According to these sizes one chooses the lift type, calculate the doors leaf and the necessary components with the help of the program “DoorHan – components”.

The embrasure view inside the premises

- **H** – embrasure height
- **B** – embrasure width
- **L** – premises depth
- **b1, b2** – the distance from the left and from the right of the embrasure
- **h** – the distance from the ceiling to the upper edge of the embrasure
## COMPONENTS

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<td>Upper seal semi-manufactured article</td>
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<td>80041</td>
<td>Aluminum upper profile semi-manufactured article</td>
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<td>4</td>
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<td>Side lid for middle panel of the doors</td>
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<tr>
<td>5</td>
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<tr>
<td>8</td>
<td>01011–01235</td>
<td>385, 500, 610 mm semi-manufactured article</td>
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**Fastening elements**

<table>
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<th>Article</th>
<th>Name</th>
<th>Quantity</th>
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<td>14017</td>
<td>Self-taping screw for doors 6,3x25 panels</td>
<td>*</td>
</tr>
<tr>
<td></td>
<td>Rivet Ø 4 mm, length 15 mm</td>
<td>*</td>
</tr>
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</table>

* - Quantity depends on the doors sizes and is calculated by the program “DoorHan – components”.
Attention! Lids and hinges are fastened to the inner side of the panel. Steel reinforcing plates for hinges fastening are located on the inner side of the panels.

The calculation program gives the card of the following doors leaf parameters:

- Doors leaf width $B$ mm – 5 mm
- Doors leaf height $H$ mm – 20 mm

The holes position for hinges on the doors leaf (Hinges quantity is given by the program “DoorHan – components”).
MANUFACTURING THE DOORS LEAF OF SANDWICH PANELS

Put the semi-manufactured article on the rack (place 9).

Measure on the semi-manufactured article of the sandwich-panel the panel’s length indicated in the card reduced on 5 mm (for side lids mounting).

Mark the cutting line with the help of the knee-piece and the pencil.

Cut the necessary length with the fretsaw according to the marked line.

All the panels indicated in the card “Department” are cut similarly.

If necessary the upper or/and lower panels can be cut so that the doors leaf height H indicated in the card “Department” reduces on 20 mm – for upper and lower aluminum profiles mounting.
Measure and cut the necessary lengths of upper and lower aluminum profiles’ semi-manufactured articles indicated in the card “Department” from the long-length aluminum profile. It is necessary to cut it on the machine.

Work the cutting place up removing the wire-edge with the file.

Mark and drill the holes $\varnothing 4.2\, \text{mm}$ through the upper and lower aluminum profiles. It is necessary to drill them on the driller (place 8).

The hinges are arranged evenly along the whole length of the panel. According to the quantity of hinges indicated in the card “Department” mark and drill the holes $\varnothing 4\, \text{mm}$ to the depth of 10 mm in the upper parts of the panels (on lower and middle panels).

Marking of holes for hinges (place 12).

Put the panels on the rack (place 12) close to each other the inner side upwards. Even the panels according to the width.
MANUFACTURING THE DOORS LEAF OF SANDWICH PANELS

Fix the upper and lower aluminum profiles.

Put the side lids on the panels.

Depending on the panel reduced in height (upper or lower) their lids are also reduced (left or right; place 6).

Work the cutting place up removing the wire-edge with the file.

2 mm

Even the lids according to the width of aluminum profiles.

Check the doors leaf diagonals. They should be equal. Check the height and the width of the doors leaf.
MANUFACTURING THE DOORS LEAF OF SANDWICH PANELS

1. Drill the holes ø 4.2 mm to depth 10 mm in panels for side lids and aluminum profiles fastening.
2. Fix the aluminum profiles and side lids with rivets.
3. Fix the lower and upper aluminum profiles from the necessary doors leaf side.
4. Cut the necessary length of rubber seals indicated in the card “Department” with scissors.
5. Put the lower rubber seal on the lower aluminum profile so that it projects at edges for 15 mm.
Put the upper rubber seal on the slot near the external doors leaf side in the upper aluminum profile so that it projects at edges for 15 mm.

Pack the ready doors leaf. Put the paperboard between the panels. Then wrap the panels up with packing film.
9. Manufacturing the doors leaf of sandwich panels with finger protection

**COMPONENTS**

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<td>DH80042</td>
<td>Aluminum upper profile semi-manufactured article</td>
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<td>DH800322(pair)</td>
<td>Side lid for lower panel of the doors</td>
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<td>Lower seal semi-manufactured article</td>
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<tr>
<td>7</td>
<td>DH80043</td>
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<td>DH01111–DH01132</td>
<td>Panel 385, 500, 610 mm semi-manufactured article</td>
<td>*</td>
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</table>

Fastening elements

- 14017 Self-taping screw for doors 6,3x25 panels
- Rivet Ø 4 mm, length 15 mm

* – Quantity depends on the doors sizes and is calculated by the program “DoorHan – components.”
Attention! Lids and hinges are fastened to the inner side of the panel. Steel reinforcing plates for hinges fastening are located on the inner side of the panels.

The calculation program gives the card of the following doors leaf parameters:

- Doors leaf height $H$ mm – 20 mm
- Doors leaf width $B$ mm – 5 mm

The holes position for hinges on the doors leaf (Hinges quantity is given by the program “DoorHan – components”).
MANUFACTURING THE DOORS LEAF OF SANDWICH PANELS WITH FINGER PROTECTION

Put the semi-manufactured article on the rack (place 9).

Measure on the semi-manufactured article of the sandwich-panel the panel’s length indicated in the card reduced on 5 mm (for side lids mounting).

Mark the cutting line with the help of the kneepiece and the pencil.

Cut the necessary length with the fretsaw according to the marked line.

All the panels indicated in the card “Department” are cut similarly.

If necessary the upper or/and lower panels can be cut so that the doors leaf height H indicated in the card “Department” reduces on 20 mm – for upper and lower aluminum profiles mounting.
Measure and cut the necessary lengths of upper and lower aluminum profiles’ semi-manufactured articles indicated in the card “Department” from the long-length aluminum profile. It is necessary to cut it on the machine.

Work the cutting place up removing the wire-edge with the file.

Mark and drill the holes $\varnothing 4,2 \text{ mm}$ through the upper and lower aluminum profiles. It is necessary to drill them on the driller (place 8).

The hinges are arranged evenly along the whole length of the panel. According to the quantity of hinges indicated in the card “Department” mark and drill the holes $\varnothing 4 \text{ mm}$ to the depth of $10 \text{ mm}$ in the upper parts of the panels (on lower and middle panels).

Marking of holes for hinges (place 12).

Put the panels on the rack (place 12) close to each other the inner side upwards. Even the panels according to the width.

The doors leaf height \( H \text{ mm} \) – 20 mm

The doors leaf width \( B \text{ mm} \) – 5 mm

Cut (if necessary)
MANUFACTURING THE DOORS LEAF OF SANDWICH PANELS WITH FINGER PROTECTION

Fix the upper and lower aluminum profiles.

Put the side lids on the panels.

Cutting panel width - 5 mm

Even according to the contour

Depending on the panel reduced in height (upper or lower) their lids are also reduced (left or right; place 6).

Even the lids according to the width of aluminum profiles.

Work the cutting place up removing the wire-edge with the file.

Check the doors leaf diagonals. They should be equal. Check the height and the width of the doors leaf.
MANUFACTURING THE DOORS LEAF OF SANDWICH PANELS WITH FINGER PROTECTION

Holes for rivets fastening (drilled during the doors leaf assembling)

Side lid.

Drill the holes Ø 4.2 mm to depth 10 mm in panels for side lids and aluminum profiles fastening.

Fix the aluminum profiles and side lids with rivets.

Fix the lower and upper aluminum profiles from the necessary doors leaf side.

Cut the necessary length of rubber seals indicated in the card “Department” with scissors.

Put the lower rubber seal on the lower aluminum profile so that it projects at edges for 15 mm.
Put the upper rubber seal on the upper aluminum profile so that it projects at edges for 15 mm.

Pack the ready doors leaf. Put the paperboard between the panels. Then wrap the panels up with packing film.
10. Lift types

1. Standard lift
2. Standard inclined lift
3. High
4. High inclined
5. High lift, shaft below
6. High inclined, shaft below
LIFT TYPES

7. Vertical
8. Vertical lift, shaft below
9. Low lift, front drum
10. Low lift, back drum
11 GUIDES MANUFACTURING

11.1. Standard lift

Guides are cut according to the sizes indicated in the card “Department”

C-profile
- \( E \) – length

Horizontal guide
- \( R \) – curve radius
- \( D \) – length

Vertical guide
- \( A \) – corner rack length
- \( C \) – vertical guide length
- \( F_1 \) – distance to vertical guide on zero level
- \( F_2 \) – distance to vertical guide on the joint level

Side seal
- \( H + 50 \text{ mm} \) – length
- \( H \) – embrasure height

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<td>C-profile</td>
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<td>2</td>
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<tr>
<td>3</td>
<td>24703</td>
<td>Side seal</td>
</tr>
<tr>
<td>4</td>
<td>23691–23696</td>
<td>Corner rack</td>
</tr>
<tr>
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</tr>
<tr>
<td>6</td>
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<tr>
<td></td>
<td>14010</td>
<td>Bolt for guides assembling</td>
</tr>
<tr>
<td></td>
<td>14013</td>
<td>Nut</td>
</tr>
</tbody>
</table>
Mark and cut the long-length semi-manufactured articles of: corner rack, C-profile, vertical guide and horizontal guide curve according to the lengths indicated in the “Department” card.

Measure and cut the side seal according to the length indicated in the “Department” card. Put the side seal on the corner rack joining the corner rack bottom and the seal bottom (place 15).

Dispose C-profile in the upper part of the corner rack perpendicular. Put the end support bracket joining the slots and then mark the holes.

Drill the holes Ø 12 mm in C-profile. Work the cutting place up removing the wire-edge with the file.

Dispose the horizontal guide curve on C-profile and the vertical guide on corner rack (place 15).

Adjust the sizes F1 and F2 according to the patterns (place 15).
Mark the places of horizontal guide curve fastening to C-profile and vertical guide fastening to the corner rack.

Check the adjustable sizes correctness.

Dispose the connecting plate in the place of horizontal guide curve and vertical guide joint.

Drill the combined holes Ø 7 mm (8 holes) in the corner rack and in the connecting plate. Dispose the connecting plate on the vertical guide and fix it with six bolts with nuts (art. 14010, 14013).

Drill the combined holes Ø 7 mm in the marked points. Join C-profile with the horizontal guide curve with the help of the bolts with nuts (art. 14010, 14013).
Drill the combined holes ∅ 7 mm in the marked points. Join the corner rack with vertical guide with the help of the bolts with nuts (art. 14010, 14013).
11.2. Standard inclined lift

Guides are cut according to the sizes indicated in the card “Department”

C-profile

E – length

Horizontal guide

R – curve radius
D – length

Vertical guide

A – corner rack length
C – vertical guide length
a – incline angle
F1 – distance to vertical guide
on zero level
F2 – distance to vertical guide
on the joint level

Side seal

H + 50 mm – length
(H – embrasure height)

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<td></td>
<td>14010 Bolt for guides assembling</td>
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<tr>
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<td>14013 Nut</td>
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</table>
Mark and cut the long-length semi-manufactured articles of: corner rack, C-profile, vertical guide and horizontal guide curve according to the lengths indicated in the “Department” card. Work the cutting place up removing the wire-edge with the file.

Dispose on the rack the horizontal guide curve on C-profile and the vertical guide on corner rack.

Measure and cut the side seal according to the length indicated in the “Department” card. Put the side seal on the corner rack joining the corner rack bottom and the seal bottom (place 15).

Adjust the sizes F1 and F2 according to the patterns (place 15).

Check the adjustable sizes correctness.
GUIDES MANUFACTURING

Dispose the connecting plate in the place of horizontal guide curve and vertical guide joint.

Drill the combined holes $∅$ 7 mm (8 holes) in the corner rack and in the connecting plate. Dispose the connecting plate on the vertical guide and fix it with six bolts with nuts (art. 14010, 14013).

Drill the combined holes $∅$ 7 mm in the marked points. Join C-profile with the horizontal guide curve with the help of the bolts with nuts (art. 14010, 14013).

Drill the combined holes $∅$ 7 mm in the marked points. Join the corner rack with vertical guide with the help of the bolts with nuts (art. 14010, 14013).

Mark the places of horizontal guide curve fastening to C-profile and vertical guide fastening to the corner rack.
11.3. High lift
(see standard lift manufacturing)

Guides are cut according to the sizes indicated in the card “Department”

C-profile
E – length

Horizontal guide
R – curve radius
D – length

Vertical guide
A - corner rack length
C - vertical guide length
HL - distance from the horizontal guide level to the embrasure
F1 - distance to vertical guide on zero level
F2 - distance to vertical guide on the joint level

Side seal
H + 50 mm – length
(H – embrasure height)

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<tr>
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</table>
11.4. High inclined lift (see standard inclined lift manufacturing)

Guides are cut according to the sizes indicated in the card “Department”

C-profile
E – length

Horizontal guide
R – curve radius
D – length

Vertical guide
A - corner rack length
C - vertical guide length
HL - distance from the horizontal guide level to the embrasure
F1 - distance to vertical guide on zero level
F2 - distance to vertical guide on the joint level

Side seal
H + 50 mm – length
(H – embrasure height)
11.5. High lift, shaft below
(see standard lift manufacturing)

Guides are cut according to the sizes indicated in the card “Department”

**C-profile**
- E – length

**Horizontal guide**
- R – curve radius
- D – length

**Vertical guide**
- A - corner rack length
- C - vertical guide length
- HL - distance from the horizontal guide level to the embrasure
- F1 - distance to vertical guide on zero level
- F2 - distance to vertical guide on the joint level

**Side seal**
- H + 50 mm – length
  (H – embrasure height)

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</table>
11.6. High inclined lift, shaft below
(see standard inclined lift manufacturing)

Guides are cut according to the sizes indicated in the card “Department”

**C-profile**
- \( E \) – length

**Horizontal guide**
- \( R \) – curve radius
- \( D \) – length

**Vertical guide**
- \( A \) – corner rack length
- \( C \) – vertical guide length
- \( HL \) – distance from the horizontal guide level to the embrasure
- \( F1 \) – distance to vertical guide on zero level
- \( F2 \) – distance to vertical guide on the joint level

**Side seal**
- \( H + 50 \text{ mm} \) – length
- \( H \) – embrasure height

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<td>14010</td>
<td>Болт для сборки направляющих</td>
</tr>
<tr>
<td></td>
<td>14013</td>
<td>Гайка</td>
</tr>
</tbody>
</table>
11.7. Vertical lift

Guides are cut according to the sizes indicated in the card “Department”

**C-profile**

E – length

**Vertical guide**

A – corner rack length
F1 – distance to vertical guide on zero level
F2 – distance to vertical guide on the joint level

**Side seal**

H + 50 mm – length
(H – embrasure height)

<table>
<thead>
<tr>
<th>Pos.</th>
<th>Article</th>
<th>Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>24836–24870</td>
<td>C-profile</td>
</tr>
<tr>
<td>2</td>
<td>23691–23696</td>
<td>Corner rack</td>
</tr>
<tr>
<td>3</td>
<td>24703</td>
<td>Side seal</td>
</tr>
<tr>
<td>4</td>
<td>21340–21350</td>
<td>Vertical guide</td>
</tr>
<tr>
<td>5</td>
<td>25240–15</td>
<td>Connecting plate for vertical guides</td>
</tr>
<tr>
<td></td>
<td>(25240–20)</td>
<td></td>
</tr>
<tr>
<td>14010</td>
<td></td>
<td>Bolt for guides assembling</td>
</tr>
<tr>
<td>14013</td>
<td></td>
<td>Nut</td>
</tr>
</tbody>
</table>
Mark and cut the long-length semi-manufactured articles of: corner rack, C-profile, vertical guide and horizontal guide curve according to the lengths indicated in the “Department” card. Work the cutting place up removing the wire-edge with the file.

Measure and cut the side seal according to the length indicated in the “Department” card. Put the side seal on the corner rack joining the corner rack bottom and the seal bottom (place 15).

Dispose C-profile in the upper part of the corner rack perpendicular. Put the end support bracket joining the slots and then mark the holes.

Drill the holes $\varnothing$ 12 mm in C-profile. Work the cutting place up removing the wire-edge with the file.

Adjust the sizes F1 and F2 according to the patterns (place 15).

Drill the combined holes $\varnothing$ 7 mm in the marked points. Join the corner rack and the connecting plates with vertical guide with the help of the bolts with nuts (art. 14010, 14013).
11.8. Vertical lift, shaft below (see vertical lift manufacturing)

Guides are cut according to the sizes indicated in the card “Department”

**C-profile**
- E – length

**Vertical guide**
- A – corner rack length
- F1 – distance to vertical guide on zero level
- F2 – distance to vertical guide on the joint level

**Side seal**
- H + 50 mm – length
- (H – embrasure height)

<table>
<thead>
<tr>
<th>Pos.</th>
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<th>Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
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<td>24703</td>
<td>Side seal</td>
</tr>
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<td>4</td>
<td>21340–21350</td>
<td>Vertical guide</td>
</tr>
<tr>
<td>5</td>
<td>25240–15 (25240–20)</td>
<td>Connecting plate for vertical guides</td>
</tr>
<tr>
<td></td>
<td>14010</td>
<td>Bolt for guides assembling</td>
</tr>
<tr>
<td></td>
<td>14013</td>
<td>Nut</td>
</tr>
</tbody>
</table>
## GUIDES MANUFACTURING

### 11.9. Low lift, front drum

<table>
<thead>
<tr>
<th>Pos.</th>
<th>Article Number</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>24716</td>
<td>Pulley fastening bracket</td>
</tr>
<tr>
<td>2</td>
<td>22989 - 22989-4</td>
<td>Shortened curve for low lift</td>
</tr>
<tr>
<td>3</td>
<td>22250R305-22420R305</td>
<td>Horizontal guide curve</td>
</tr>
<tr>
<td>4</td>
<td>DH24610, DH24611</td>
<td>Connecting bracket for double guides</td>
</tr>
<tr>
<td>5</td>
<td>24609</td>
<td>Connecting plate for double guides</td>
</tr>
<tr>
<td>6</td>
<td>25240–15 (25240–20)</td>
<td>Connecting plate for vertical guides</td>
</tr>
<tr>
<td>7</td>
<td>21340–21350</td>
<td>Vertical guide</td>
</tr>
<tr>
<td>8</td>
<td>23691–23696</td>
<td>Corner rack</td>
</tr>
<tr>
<td>9</td>
<td>24703</td>
<td>Side seal</td>
</tr>
<tr>
<td></td>
<td>14010</td>
<td>Bolt for guides assembling</td>
</tr>
<tr>
<td></td>
<td>14013</td>
<td>Nut</td>
</tr>
</tbody>
</table>

Guides are cut according to the sizes indicated in the card “Department”

**C-profile**
- **E** – length

**Horizontal guide**
- **R** – curve radius
- **D** – length

**Vertical guide**
- **A** - corner rack length
- **C** - vertical guide length
- **F1** - distance to vertical guide on zero level
- **F2** - distance to vertical guide on the joint level

**Side seal**
- **H + 50 mm** – length
- **(H – embrasure height)**
Measure and cut the side seal according to the length indicated in the “Department” card. Put the side seal on the corner rack joining the corner rack bottom and the seal bottom (place 15).

Dispose the horizontal guides curves and the vertical guide on the corner rack (place 15). Fix the connecting bracket for double guides.

Mark and cut the long-length semi-manufactured articles of: corner rack, C-profile, vertical guide and horizontal guide curve according to the lengths indicated in the “Department” card. Work the cutting place up removing the wire-edge with the file.
11 GUIDES MANUFACTURING

Adjust and check the sizes.

Horizontal guide curve
Shortened upper guide curve
Connecting plate for vertical guides
Connecting bracket for double guides

Drill the holes $\varnothing 7$ mm for fastening the connecting bracket for double guides.

Dispose the connecting plate in the place of joint of horizontal guide curve and vertical guide.

Fix the brackets for double guides with the help of bolts with nuts (art. 14010, 14013).

Drill the combined holes $\varnothing 7$ mm (8 holes) in the corner rack and in the connecting plate. Dispose the connecting plate on the vertical guide and fix it with six bolts with nuts (art. 14010, 14013).
Dispose the bracket for pulley fastening and drill the holes ∅ 7 mm for its fastening to horizontal guides.

Fix these details with the help of the bolts with nuts (art. 14010, 14013).
11 GUIDES MANUFACTURING

11.10. Low lift, back drum
(see low lift, front drum manufacturing)

Guides are cut according to the sizes indicated in the card “Department”

**C-profile**
- E – length

**Horizontal guide**
- R – curve radius
- D – length

**Vertical guide**
- A – corner rack length
- C – vertical guide length
- F1 – distance to vertical guide on zero level
- F2 – distance to vertical guide on the joint level

**Side seal**
- H + 50 mm – length
- (H – embrasure height)

<table>
<thead>
<tr>
<th>Pos.</th>
<th>Article</th>
<th>Name</th>
</tr>
</thead>
<tbody>
<tr>
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<tr>
<td>5</td>
<td>24609</td>
<td>Connecting plate for double guides</td>
</tr>
<tr>
<td>6</td>
<td>25240–15 (25240–20)</td>
<td>Connecting plate for vertical guides</td>
</tr>
<tr>
<td>7</td>
<td>21340–21350</td>
<td>Vertical guide</td>
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<td>Corner rack</td>
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<tr>
<td>9</td>
<td>24703</td>
<td>Side seal</td>
</tr>
<tr>
<td>10</td>
<td>14010</td>
<td>Bolt for guides assembling</td>
</tr>
<tr>
<td>11</td>
<td>14013</td>
<td>Nut</td>
</tr>
</tbody>
</table>
12. Shaft cutting

Measure the shaft length indicated in the “Department” card from the long-length semi-manufactured article (place 6).

Cut the necessary shaft length from the long-length semi-manufactured article (place 6).

Work the cutting place up removing the wire-edge with the file.
13. Springs cutting

SPRING ASSEMBLING

- L – spring’s length
- D – spring’s inner diameter
- d – wire diameter

12001P12005, 12012

Spring with left coiling (L)
Spring with right coiling (R)
Measure the spring length indicated in the “Department” card from the long-length semi-manufactured article (place 10).

Insert the fork in the place of spring cutting.

Cut the spring with the cutting torch.

Fix the spring in the vise for ends mounting.

Twist the ends in from both sides by turns with the help of the stick Ø 12 mm.

The spring ends D95 and D152 should be warmed with the cutting torch evenly till the red glowing and bended inside the spring ends with the help of the device. The bended end should not prevent the side support’s bearing.
For simplification of spring turns’ calculation during the mounting it is recommended to mark the spring surface with painted line.
14. Coordinates of wicket location on the doors leaf

Tools
1. Tape measure 5 m
2. Ruler 1 m
3. Pencil
4. Fretsaw
5. Drill
6. Set of drills Ø 4 +12
7. Rubber hammer
8. File
9. Hacksaw for metal
10. Device for semi-manufactured articles cutting under necessary angle (in this case the angle is 45 degrees)
11. Rubber braids for leaf panels tightening (L = 1m)
12. Riveting tool
13. Kneepiece
14. Batten (L = 1,8...2 m)
15. Glasses
16. Gloves

Components
1. Aluminum profile (art. 80043)
2. Aluminum profile (art. 80030)
3. Aluminum wicket hinge (art. 80039)
4. Rivets
5. Lock for the wicket (art. 25148, DH25147)
Handle for the wicket (art. 25149)
6. Seal for the wicket (art. 80029)

In order to make the wicket manufacturing more convenient the embrasure should be marked and cut in horizontal position with hinges tightened beforehand with rubber braid. The wicket is assembled in the vertically disposed doors or in the doors fixed in the embrasure.
**WICKET MANUFACTURING**

<table>
<thead>
<tr>
<th>Panel’s type (mm)</th>
<th>610</th>
<th>500</th>
<th>385</th>
</tr>
</thead>
<tbody>
<tr>
<td>Profile length (mm)</td>
<td>614</td>
<td>501</td>
<td>387</td>
</tr>
</tbody>
</table>

Profile length = embrasure width - 8 mm

Profile length: cut accordingly

Profile length = embrasure width - 8 mm
Coordinates of wicket location on the doors leaf.

Assemble the doors leaf (see the chapter about the doors leaf assembling, pic. 1.1 – 1.22) on the rack with inner surface downwards. The leaf is tightened at edges with rubber braids in order to obtain the minimal gap between the panels (place 13).

The wicket embrasure is marked with the help of the pencil, the tape measure and the ruler taking into account that:

a) the distance (d) between the lower edge of the leaf and the lower part of the wicket embrasure should not be less than 140 mm

b) the lower and the upper lines of the wicket embrasure (sizes a, c, g) should not be closer than 100 mm to the joint of panels;

c) for maintenance of wicket parameters during exploitation it is recommended not to cut the wicket embrasure nearer than 500 mm to the side edge of the doors leaf (sizes e, f).

In the wicket embrasure mark the wicket itself indenting 15 mm from the top and the bottom and 35 mm from the left and right edges.
WICKET MANUFACTURING

Drill the through holes Ø 8-12 in the contour corners for inserting the fretsaw.

In every panel cut the inner contour of the wicket. The cut panels are accurately stored.

Cut the external contour of the wicket.

The semi-manufactured articles of embrasure frame are made of long-length semi-manufactured articles of aluminum profile.

Cutting of the aluminum profile with the help of the rotary electric saw with disk for aluminum cutting (place 8).

Aluminum profile cutting with the device.

<table>
<thead>
<tr>
<th>No</th>
<th>Profile type</th>
<th>Panel type</th>
<th>Quantity</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>h mm - 8 mm</td>
<td>610 500 385</td>
<td>1</td>
</tr>
<tr>
<td>2</td>
<td>h mm - 8 mm</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>According to the place</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>614 501 387</td>
<td>*</td>
<td></td>
</tr>
</tbody>
</table>
Put the doors leaf on the “Rack for wicket mounting”. The panels in which the wicket embrasure was cut are set on the rack. The doors leaf is evened according to the front lids and squeezed by upper hold-down (place 14).

Put the profile on the embrasure bottom and even it horizontally (according to the lines of doors leaf). On the sides put the profile semi-manufactured articles.

Fix the lower profile with the help of the rivets from the external side of the doors leaf. And side profiles set with the help of the rivets.

Dispose the upper and side profiles. The upper horizontal profile even horizontally (according to the lines of doors leaf).

Fix the upper horizontal profile with the help of the rivets and side profiles set at corners with the help of the rivets.

Measure the length of the side profile according to the place taking into account the middle of the panels joints and cut.
Cut the semi-manufactured article of hinge of necessary length from the long-length semi-manufactured article.

Drill the holes ∅4 mm in the hinges.

Set the side profile on the middle panels.

Even the middle side profiles according to the joints.

Even the left and the right sides according to the batten and fix the profiles with the help of rivets from the external side of the doors leaf.

Cut the semi-manufactured article of hinge of necessary length from the long-length semi-manufactured article.

Drill the holes ∅4 mm in the hinges.

Set the lower hinge with side gap of 2 mm. Fix the hinge with 5 fangs to the doors panel and the hinge with 4 fangs to the wicket panel.
**Hinges’ mounting.**

**Wicket framing.**
Set on the lower wicket section horizontal and side profiles.

**Lower hinge mounting (taking into account the lower gap).**

**Fix the rest of the hinges closely to each other on the joints.**

**Set the lower section in the wicket embrasure providing the gap 5-10 mm between the wicket section and the embrasure bottom.**

**Even the lines on the lower wicket section with the lines on the doors leaf.**
Put the upper horizontal profile on the upper wicket section.

Mark the side profiles on the hinges joints. Cut them and fix the profile to the lower section with the help of rivets.

Put on the middle wicket sections profiles.

Measure the necessary length of side profiles and put them on the upper wicket section. Even the side profiles.

Put on the middle wicket sections profiles.

Put the middle sections to the wicket embrasure.
Even all the profiles on the wicket embrasure according to the ruler and fix the aluminum profiles to the lower and upper sections with the help of rivets.

Remove all wicket sections with the exception of the lower. Put the lower wicket section close to the opened hinge and fix them with the help of rivets providing the side gap of 2 mm (see pic. 1.24).

Put the rest of the sections on the lower wicket section and fix them with hinges with the help of rivets.

Close the wicket. Even all the profiles on the joints and fix them with the help of rivets from the inner and external sides. Fix the profiles for wicket embrasure and for the wicket itself from the external side of the embrasure.

Mark and drill holes for the doors wicket.

Lock insertion. Apply and mark the holes for the lock.
WICKET MANUFACTURING

Drill the holes for the lock’s handle and bolt head.

Cut the slot in the front of the wicket section with the help of fretsaw.

Drill the holes in the front of the wicket embrasure for the lock’s catch and sommer.

Insert the lock and the bolt head into the wicket section. And fix the lock from behind with the help of rivets.

Set the lock’s handle and escutcheon.