



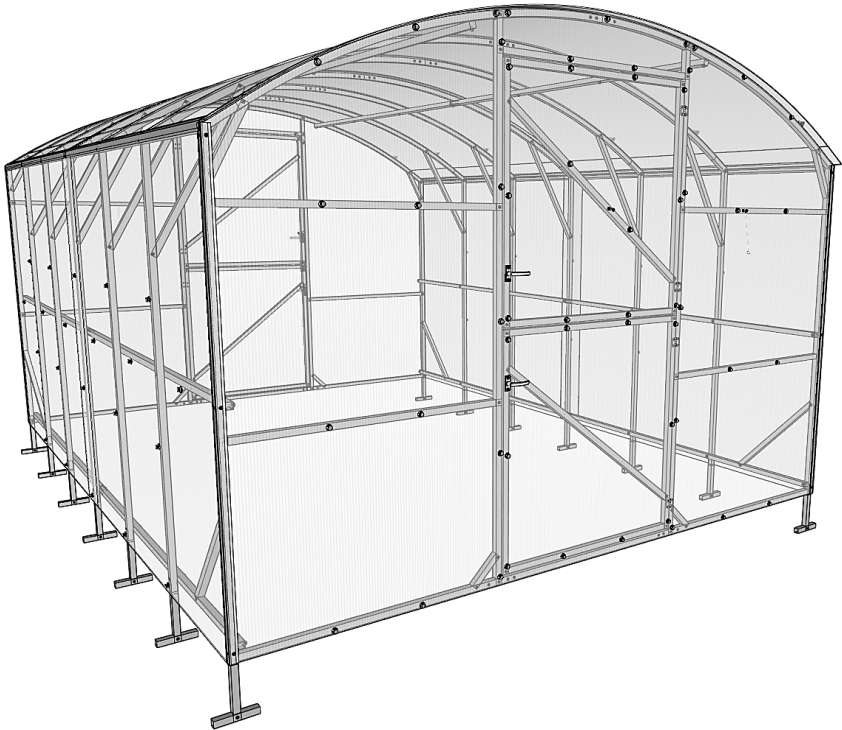
**Velcom, Inc**  
www.GreenhouseToGrow.com

**TECHNICAL MANUAL**

# **MAGNOLIA**

**Made of 1"x1" Galvanized Steel Pipe**

**Covered with High Density UV Polycarbonate**



***Set of product***

***Width 10ft (3m) • Height 7.1ft (2.15m)***

***Length of base 13ft (4m) • Optional Extension by 6.5ft (2m) etc.***

## TECHNICAL CERTIFICATE of GREENHOUSE “MAGNOLIA”

### DISCRIPTION

The greenhouse “**MAGNOLIA**” is designed to create the climate, which is productive to grow horticultural crops on the garden plots.

The length of the greenhouse is 13’ (4m) width is 10’ (3m) and height is 7.1’ (2.15m) with ability to extend length by 6.5’ (2m) up to 32.5’ (10m) the surface of the protected soil is 130 ft<sup>2</sup>.

The frame of the greenhouse is made of square galvanized pipe 1”x1” and it is assembled with the studs, screws, nuts. The kit includes everything you need to assemble the frame and fasten the covering. The foundation of the greenhouse is not obligatory to install but recommended.

The greenhouse is fixed on the ground by digging in to the ground special frame endings. For fixing cellular polycarbonate to the greenhouse roof, galvanized steel strapping tape is used.

The greenhouse covering is completed on buyer’s request. To cover the greenhouse you need a greenhouse frame is designed for covering with cellular polycarbonate 4 mm thick with a High Density of at least 0.7 kg / m<sup>2</sup>. The greenhouse has two doors, one on each end and two vents.

### Assembly instructions and operating rules

The greenhouse should be assembled and installed on the ground according the instruction.

The buyer should control the assembly quality if it is made by third person.

Self-tapping screws of mount structure should be tightened to contact the flat head of the screw with the covering surface and hold it to the frame, but do not allow the extra rundown of the screws.

Avoid installing the greenhouse closely to the buildings and trees. The melting snow or ice is a potential hazard. The recommended distance is minimum 7ft.

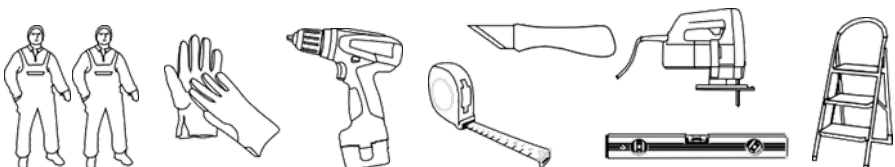
The greenhouse is designed to endure the wind of less than 50mph.

There is no need to skin the greenhouse during the winter time for the greater parts of the regions of Canada and USA. If the greenhouse in not looked after during winter, the customer should determine the possible snow load or to skin the covering.





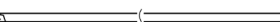
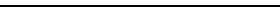





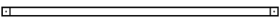



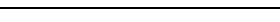


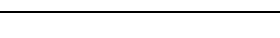
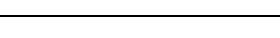

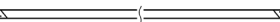


The limit snow load for the frame takes place when the weight of the snow blanket is 240 kg/m<sup>2</sup> (120Lb/ft<sup>2</sup>) of horizontal ground surface. This limit snow load requires characteristic snow load of the North snow region (according the classification of construction rules and regulations “Loads and actions”).

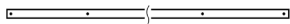
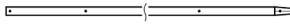



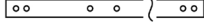











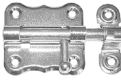

**For assembly, you will need:** a 10mm wrench, a screwdriver with a PH2 attachment, a sharp knife, a carpenter square, a level, a 7-10 m tape measure, a ladder and protective gloves.

**\*Metric measuring tape needed! Cm/mm**

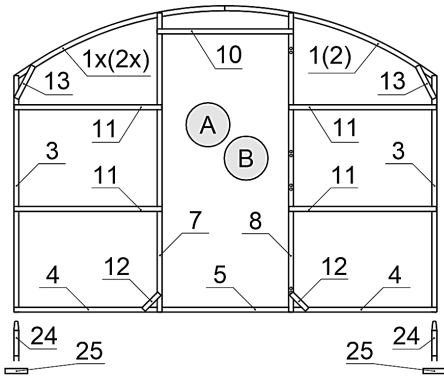


## 1. LIST OF ACCESSORIES

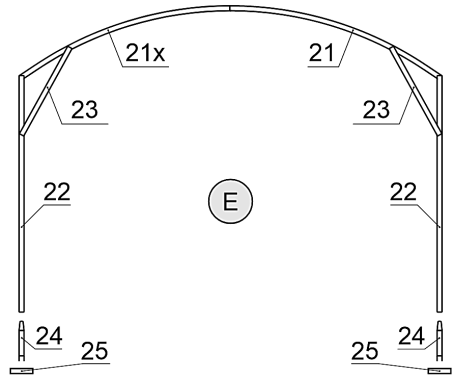
<b>Nº</b>	<b>Part name</b>	<b>BASE 13'L</b>	<b>INSERT +6.5'L (optional)</b>	<b>Image</b> <i>(could be different from the actual configuration)</i>
1	End-Face half-arch, right -hand "A"	1	-	
1x	End-Face half-arch, left-hand, "A" (with X-crimping)	1	-	
2	End-Face half-arch, right -hand "B"	1	-	
2x	End-face half-arch, left-hand, "B" (with X-crimping)	1	-	
3	End-face post, side, 1670 mm	4	-	
4	Lower lintel, side for End-face (4L- left,4R - right), 1045mm	4	-	
5	Lower lintel, middle for End-face , 910mm (with X-crimping)	2	-	
7	Left door-way post, 2115 mm	2	-	
8	Right door-way post, 2115 mm (with holes for hinge)	2	-	
10	Top lintel, middle for End-face, 960mm	2	-	
11	Middle lintel, side for End-face, 1040mm	8	-	
12	Jib-stick, small support, 150mm	4	-	
13	Jib-stick, middle support, 250mm	4	-	
15	Air gate lintel, top/bottom "C", "D", 902mm	8	-	
16	Air gate right post "C", "D", 960 mm (with hinge holes)	4	-	
17	Air gate left post, "C", 960mm (Hole for Handle Bottom)	2	-	
18	Air gate left post, "D", 960mm (Hole for handle from above)	2	-	
19	Diagonal air gate support "C", "D", 1100 mm	4	-	
21	Intermediate arch, half-arc, right-hand "E" "	5	3	
21x	Intermediate arch, half-arch, left-hand "E" (with X-insert)	5	3	
22	Side post for intermediate arch, "E", 1670 mm	10	6	
23	Intermediate arch, top diagonal support "E", 700mm	10	6	
24	Anchor post, 250mm	14	6	
25	Anchor grouser, 150mm	14	6	

<b>№</b>	<b>Part name</b>	<b>BASE 13'L</b>	<b>INSERT +6.5'L (optional)</b>	<b>Image</b> (could be different from the actual configuration)
26	Connecting stringer starter, 2012 mm	6	-	
27	Connecting stringer With X-crimping, 2068 mm	6	6	
28	Side diagonal support, 600 mm	4	-	
29	Outside corner roof molding, 120° / 2025 MM	8	4	
30	Outside corner molding, 90° / 1670 MM	8	4	
31	Steel Tie band,, 20x3400MM	7	3	
40	Bolt M6x60mm	42	18	
41	Nut M6.	42	18	
42	Washer M6.	56	24	
43	Bolt m4x35 mm	40	3	
44	Nut M4.	40	3	
45	Self-Tapping screw 4,2x16mm (for assembling frame elements)	420	86	
46	Self-Tapping screw 4.2x19mm (for fastening polycarbonate)	190	30	
47	Thermo-pad with cap (for fastening polycarbonate)	190	30	
48	Set of door knob (handle, pad, rigl)	4	-	
49	Door holder, 200 mm	2	-	
50	Door hinge	8	-	
51	Door latch	2	-	
52	Stubborn plate for door, 100mm	2	-	

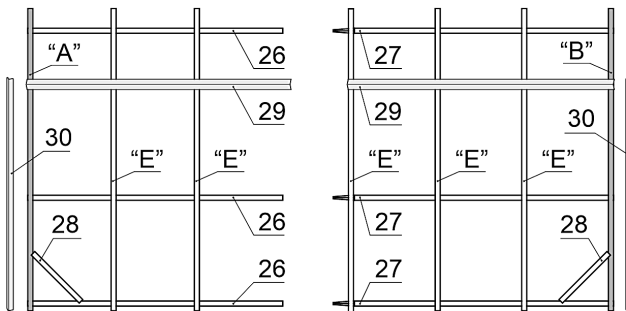
## 2. ASSEMBLY DIAGRAM "MAGNOLIA" PRODUCT



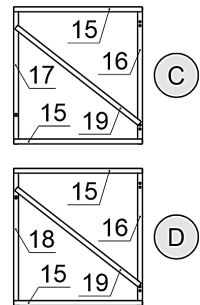
**Fig.1 End-Face "A" and "B"**



**Fig.2 Intermediate arch "E"**



**Fig.3 Assembling frame (side view)**



**Fig.4 Air gate Doors "C", "D"**

### 3. Assembling End-Face "A" and "B" Fig.1

#### Attention!

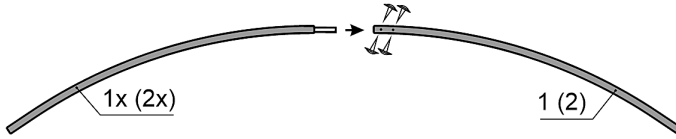
**Places of fastening parts are indented and circled with a marker. Polycarbonate mounting places are indented.**

To comply with the correct geometry, the assembly must be made on a flat surface. Before assembly, sort and decompose the details of the ends, doors and intermediate arches according to the scheme and the list of components.

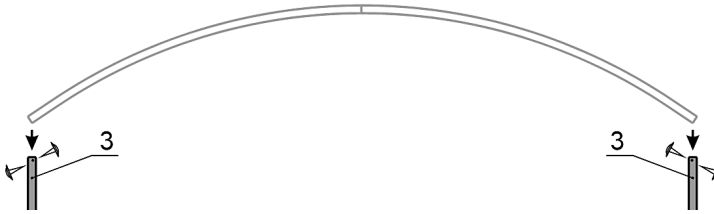
For convenience and to accelerate assembly, the fastening of parts by self-drawers can be made on one side of the assembly element, then gently flip the design and secure the screws on the other side.

**3.1.** Connect the left **1x** and right **1** half-arch of the end-face "A". Secure the connection from two sides by four self-tapping screws **45 (16 mm)**.

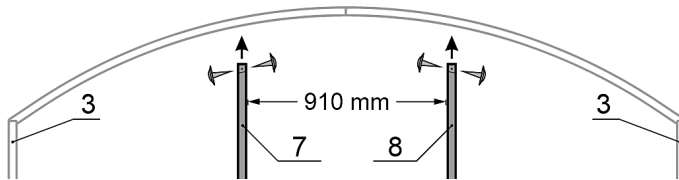
Similarly, connecting left **2x** and right **2**, and assembling the end-face "B".



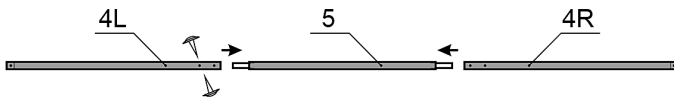
**3.2.** Secure the post **3** to the Arch ends by self-tapping screws **45**.



**3.2.** Secure the Left post **7** to the arc and the right post **8** of the doorway stands with self-tapping screws **45** on both sides. The distance between posts **7-8** is **910mm**

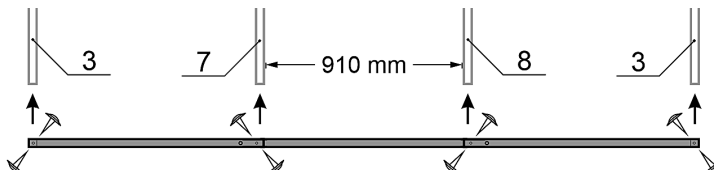


**3.3** Connect the Lower lintels **4(4L-4R)** with lintel **5**, fasten with screws **45** on both sides by tying **2** screws on **1** compound:

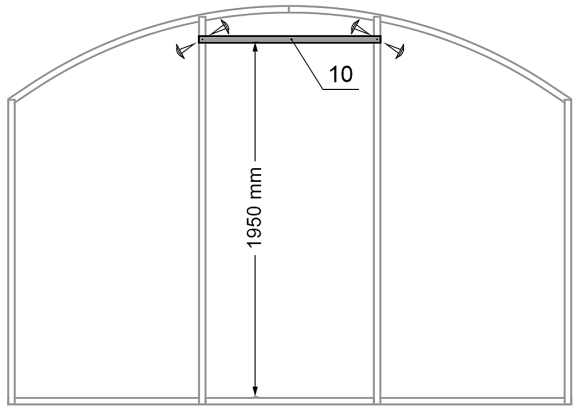


**3.4.** Fasten the collected item from clause **3.3**. Door-way posts **3-7-8** at the bottom with self-tapping screws **45** on both sides, **2** self-compound self-press.

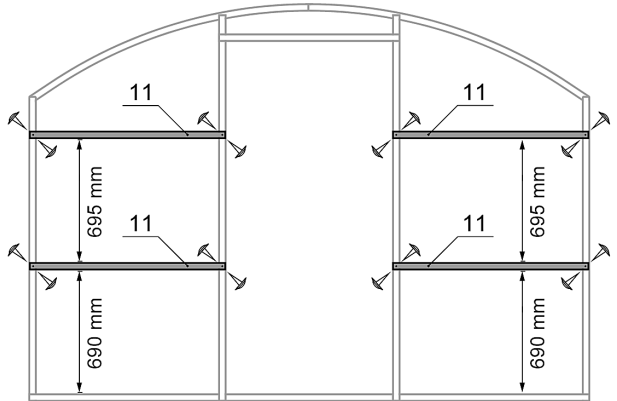
The distance between the door-way posts **7-8** should be **910 mm**:



**3.5.** Install the Top lintel **10** between the posts **7-8** at a distance of **1950mm** from the lower lintel, fasten with the screws **45**:



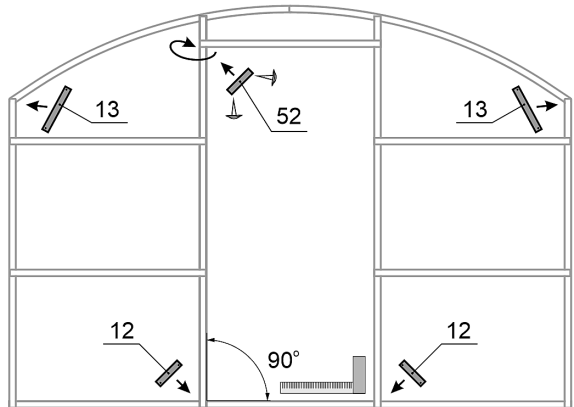
**3.6.** Set four Middle lintels **11** between the doorway posts **7-8** and side post **3**, secure with the screws **45**:



**3.7.** In a door-way, Insert carpenter's Square and make sure it is 90°. Fasten the Jib-sticks **12** with screws **45** to posts **7-8**

**3.8.** Fasten the Jib-sticks **13** with screws **45** to post **3** and top arch.

**3.9.** Fasten the Stubborn plate for door **52** with screws **45** In the upper left corner of the doorway from the inside (to prevent the door opening inside).

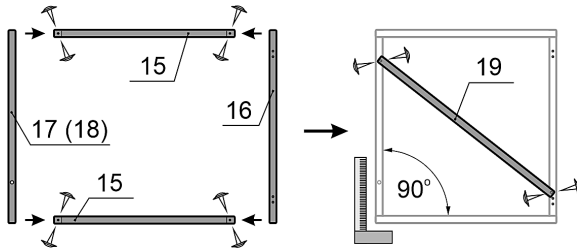


### Assembling Air gate Doors "C", "D" Fig.4

**3.10.** Using the details **15-16-17-18-19**, assemble with self-tapping screws **45** the top door "**C**" and the lower door "**D**". Right post **16** on door "**C**", "**D**", **960mm** (with hinge holes) must be right, and **17(18)** with hole for handle must be left.

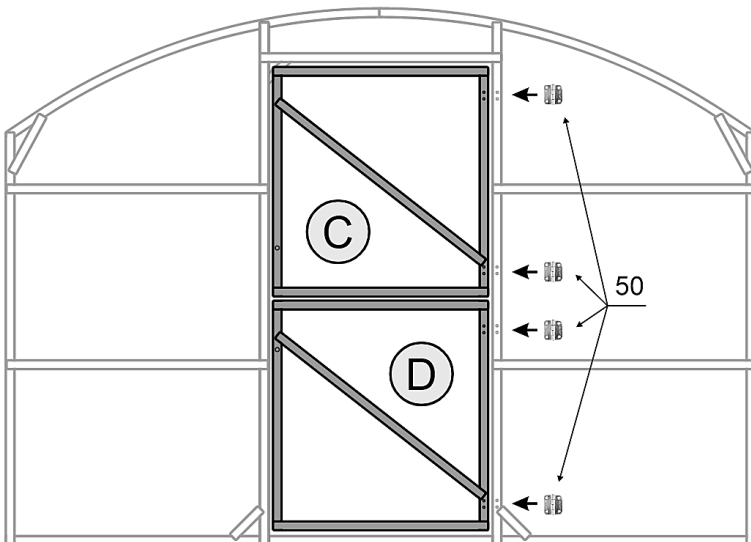
Hole for the handle in the top door "**C**" should be located below, and in the bottom door "**D**" - from above.

Insert carpenter's Square and make sure it is  $90^\circ$ . Insert and fasten the diagonal air gate door support **19** with screws **45**:



Doors "**C**", "**D**"

**3.11.** Insert the doors "**C**", "**D**" in the opening of the End-Face "**A**" and "**B**", secure with hinge **50**, bolts **43** and nuts **44**:

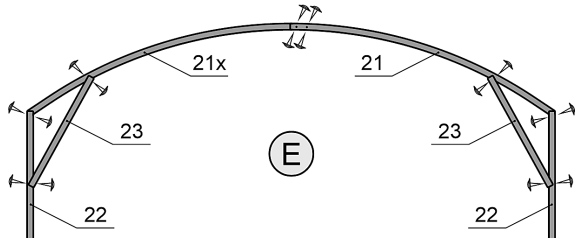




#### 4. Assembling intermediate arches Fig.2

Assemble the intermediate arches "E" using the half-arc 21x-21, Side posts for intermediate arch 22, install top diagonal support 23 with the self-tapping screws 45.

*To comply with the correct geometry of the arches, use the assembled end as a template, setting it the details for the assembly of the arch.*



#### 5. Assembling the FRAME For the frame assembly scheme, Fig.3

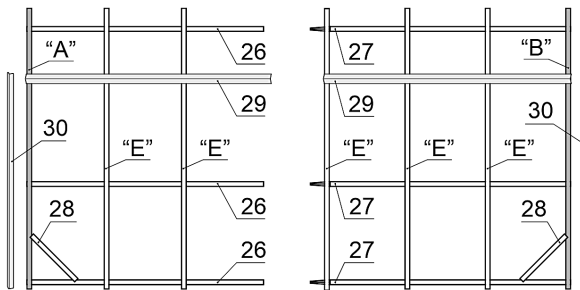
5.1. Using bolts 40, washers 41 and nuts 42 connect the Front end "A" with six starting stringers 26 through the holes drilled in the side posts.

5.2. Next fasten using bolts 40 starter stringers with two intermediate arches "E".

5.3. Insert 27 X-Crimp stringers into 26 starter stringers.

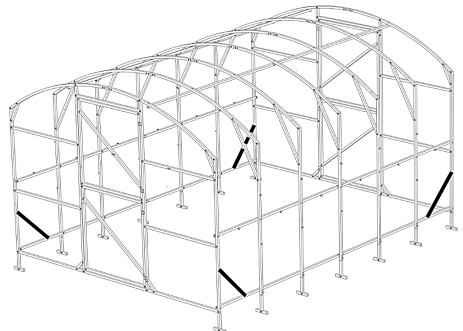
5.4. Fasten using bolts 40 the stringers 27 with intermediate arches "E" through the drilled holes.

5.5. Fasten with bolts 40 to the End Face "B" (for base frame 13' (4 m) long).

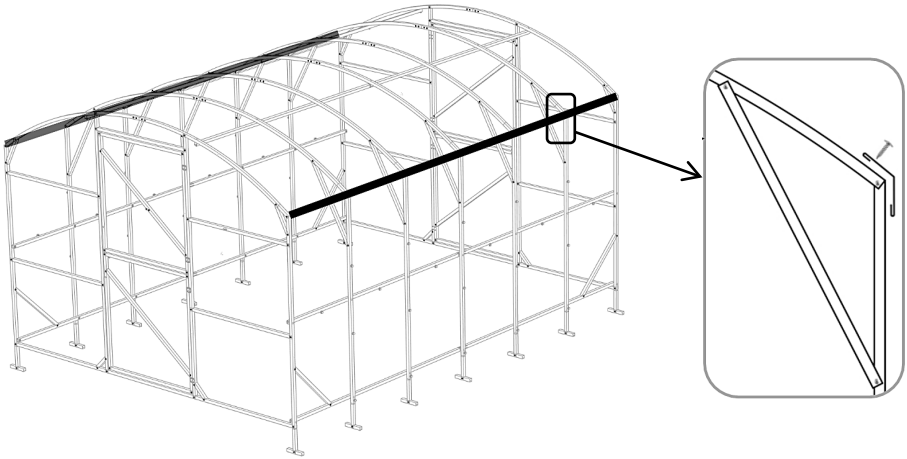


*To EXTEND the frame by 6.5' (2m), use sets of six 27 X-crimp stringers and three intermediate arches (Optional possible extension length is 19.5'L , 26'L etc.).*

5.6. Install the side diagonal support, 600 MM 28 between the side posts of the end face 3 and the lower longitudinal stringers 26-27. Fix the braces with self-tapping screws 45, preliminarily setting an angle of 90 degree between the end face and the stringer using a Carpenter square.



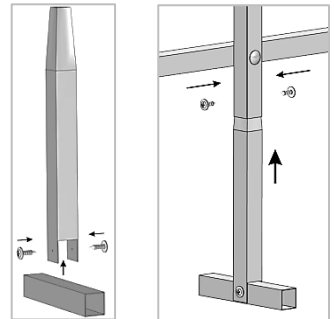
**5.7.** Install the Outside corner roof molding **29** (120° / 2025mm) in the joints of the pillars and the roof arch, fix them from above with self-tapping screws **45**.



**5.8.** Connect the Anchor grouser **25** (150mm) with Anchor post **24** (250mm) using self-tapping screws **45** so that you get **T-shaped Anchor-legs**.

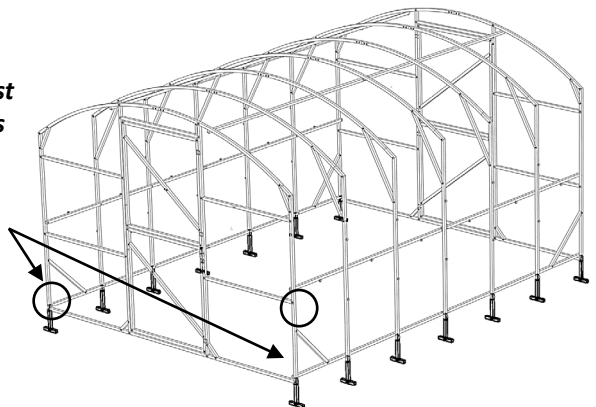
**5.9.** Insert the Anchor-legs into the side post from below until it stops, fix with two self-tapping screws **45**.

**5.10.** Install the all Anchor-legs in all other racks in the same way.



**Attention!**

**For mounting Anchor-legs into the end posts, you must first unscrew the self-tapping screws connecting the post and the lower crossbar, mount the leg, screw the self-tapping screws back.**



## 5. INSTALLATION OF CELLULAR POLYCARBONATE (CP) TO THE ENDS

*The required number of sheets and cutting patterns for cellular polycarbonate are given at the end of the instructions Annex 1.*

*The greenhouse frame is designed to be covered with Cellular polycarbonate 4mm thick*

**Attention!** When installing the Polycarbonate, it is important that the lines of the joint venture cells are located vertically (from top to bottom). That is necessary to remove the wrapping film from both sides of the sheet. The front (facing the sun) side of cellular polycarbonate is indicated by the manufacturer with a corresponding symbol (colored stripe, sticker, or in another way).

**5.1.** Cut the polycarbonate into pieces according to the cutting pattern **Annex 1**.

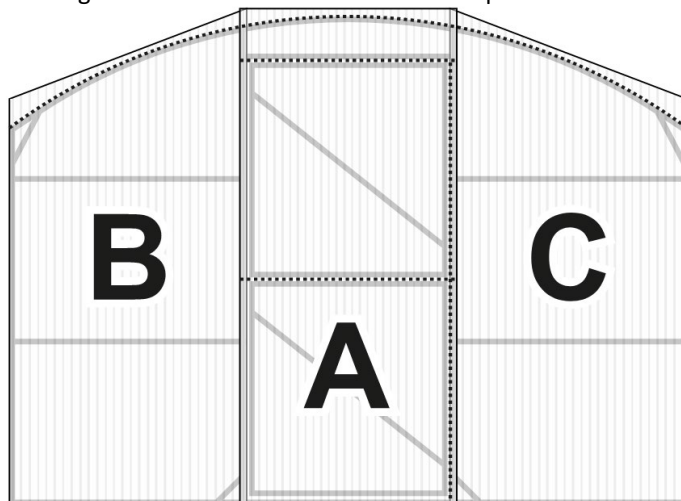
**5.2.** Attach part "A" of **Polycarbonate** to the end door, aligning the bottom edge of the polycarbonate with the bottom lintel of the end. Fix part "A" with self-tapping screws **46** through thermo washers **47** according to the polycarbonate fastening scheme (see below).

**5.3.** Attach part "B" of **Polycarbonate** to the left side of the **End-Face "A" and "B"** and part "C" to the right side of the **End-Face "A" and "B"**, aligning the lower edge of the joint venture with the lower lintel of the **End-Face**. Fix parts "B" and "C" with self-tapping screws **46 (19 mm)** through thermo washers **47** according to the scheme for attaching polycarbonate to the **End-Face** (see below).

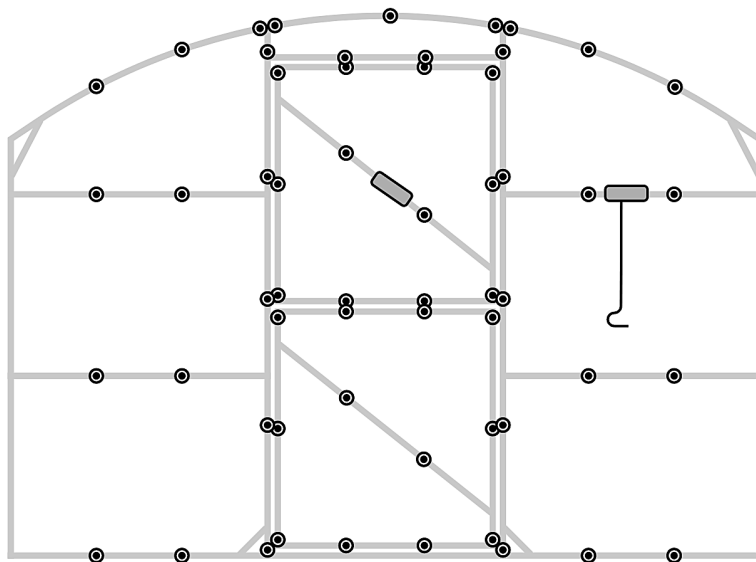
**5.4.** Mount the polycarbonate on the Back-end in the same way.

**5.5.** Cut off the protruding edges of the **Polycarbonate** along the outer edge of the frame.

**5.6.** Cut through the slots of the doors and vents in parts "A".



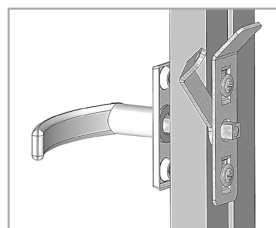
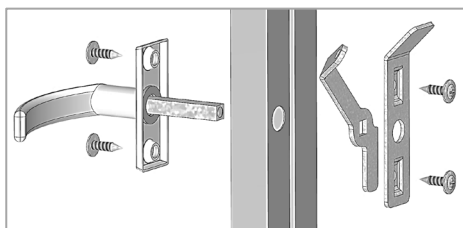
**Layout of polycarbonate sheets at the Front/Back End**



**The scheme of fixing cellular polycarbonate to the end-face and doors**

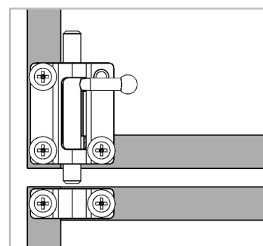
**5.7.** Fasten hook **49** with self-tapping screws **45** to the right upper crosspiece of the end, the counter loop of the hook on the diagonal of the upper door so that the hook fixes the door in the open position (see the picture above).

**5.8.** Insert the handles from kit **48** into the  $\varnothing 12$  holes on the door, having previously drilled the corresponding holes in the polycarbonate. On the reverse side, put on the deadbolt and pad, fix the handle and pad with self-tapping screws **45**.



**5.9.** Fasten the door latch **51** with self-tapping screws **45** from the inside between the lower and upper Air-doors so that the doors can be fixed to each other.

To do this, it will be necessary to unscrew the self-tapping screw in the corner of the door, mount the latch, and screw the self-tapping screw back.



## 6. MOUNTING OF CELLULAR POLYCARBONATE ON SIDE WALLS

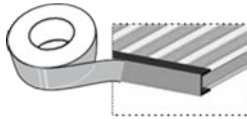
**Parts "E" with dimensions 2100x1670mm are used for side walls mounting. Annex 1.**

**6.1.** Start mounting the Polycarbonate sheets "E" on the sides from the ends. Attach a sheet of polycarbonate to the wall of the frame, aligning the top of the sheet in the center of corner No. 29, and the side edge of the joint venture along the end post (without a protrusion).

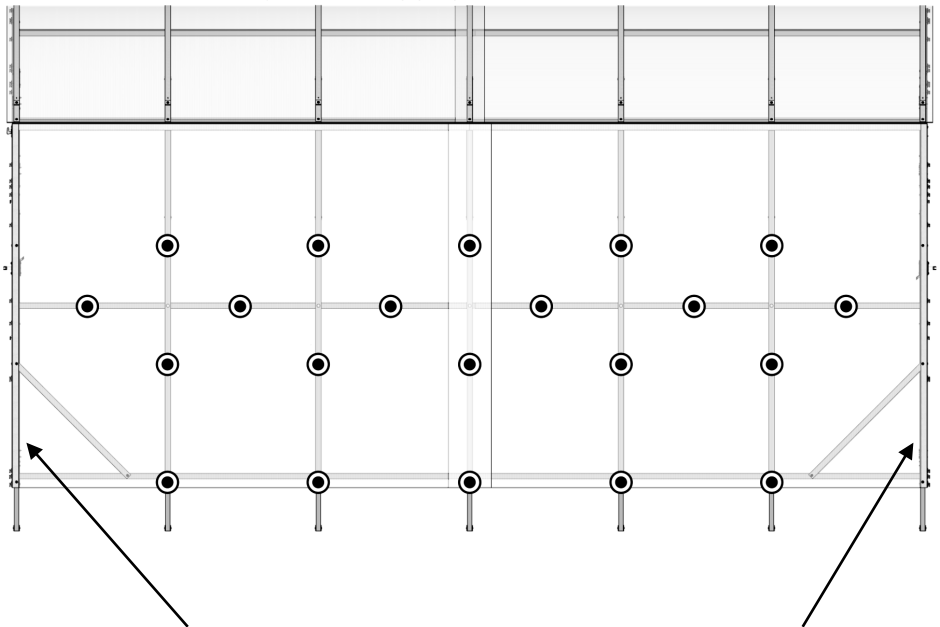
**6.2.** Fix the Polycarbonate with self-tapping screws 46 through thermo washers 47 to the side posts and progressive stringers according to the following fastening scheme.

**6.3.** In the same way, mount the remaining side sheets of the polycarbonate, overlapping with the previous ones, and also on the opposite wall.

**To prevent moisture from entering the polycarbonate open honeycomb and inside the greenhouse, we recommend sealing the joint of polycarbonate sheets along the entire length with a waterproof self-adhesive tape (dense tape or similar material).**



**Scheme for attaching polycarbonate to the side walls**



**Attention! The Polycarbonate sheet is not attached to the end posts!  
(The vertical polycarbonate joint will be fixed with an outer triangle corner 30)**

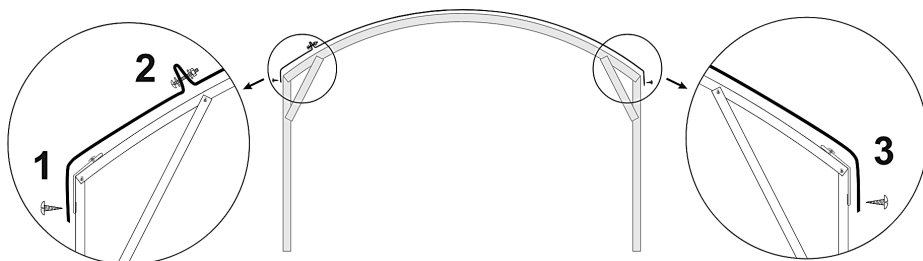
## 7. MOUNTING OF CELLULAR POLYCARBONATE ON THE ROOF

**Attention!** When installing the polycarbonate, it is important that the lines of the Polycarbonate cells are located on the roof along the arcs, and on the side walls - vertically.

**Parts "D" with dimensions 2100x3250mm are used for Roof mounting. Annex 1.**

**7.1.** Start the installation of the Polycarbonate sheets on the roof from the ends. Lay the joint venture on the roof so that the sheet protrudes (hangs) over the edge of the end above the door by about **5cm**. The lateral edges of the polycarbonate (with open honeycombs) should overlap the upper edge of the polycarbonate on the wall, but not protrude outward, so the polycarbonate will need to be trimmed after installation ...

**7.2.** Press the sheet of the polycarbonate with a strapping tape **31** on one side of the arc (**1**) and fix the end of the tape with a self-tapping screw **45** to the side post:



**7.3.** Bend the tape in the place where two holes (**2**) were punched at a distance of **5 cm** from each other so that the holes are opposite each other. Insert the **43** screw with two **42** washers into the holes, slightly tightening the **44** nut. Pull the Steel Tie band **31** by hand, press the **SP** tape and fix the other end with self-tapping screw **45** to the opposite post (**3**).

**7.4.** Align the Steel Tie band along the roof arch. Tension the strap by tightening screw **43**. The strap should hold the sheet tightly against the arch.

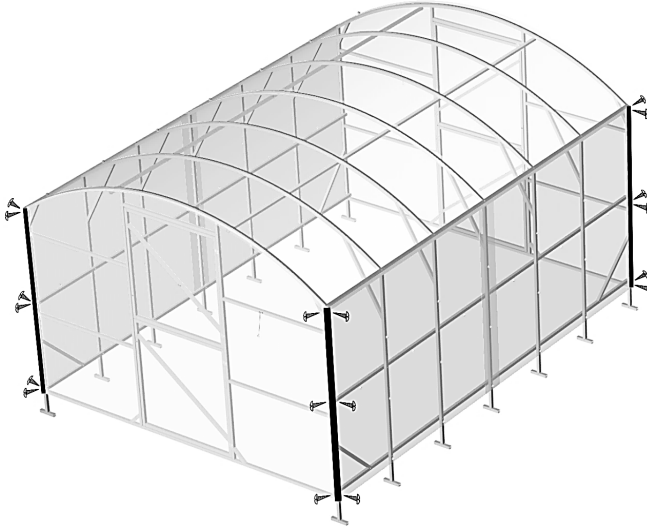
**7.5.** Mount the intermediate sheet of the polycarbonate (for a greenhouse with a length of **6 m** and more **ONLY!**) with an overlap with the previous sheet and press down with tie straps.

**7.6.** After installing all the sheets, check the correct position of the polycarbonate sheets, the parallelism of the honeycomb lines in relation to the arches, the position and tension of the tie straps.

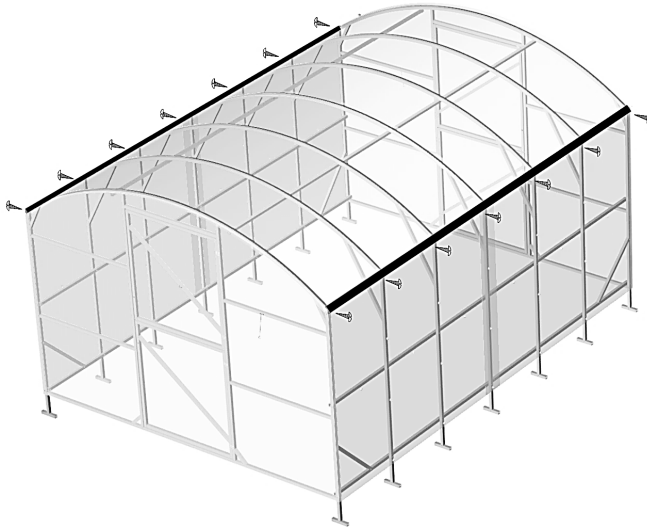
**Check the tension of the tie straps once a year!**

## 8. MOUNTING OF EXTERNAL CORNERS

**8.1.** Mount four corners **30** (90°, 1670 mm) using self-tapping screws **46** (19mm) on the vertical corners of the frame, 6 screws per corner, closing the corner joints of polycarbonate sheets:



**8.2.** Mount the remaining corners **29** (120°, 2025 mm) over the junction of the roof and wall polycarbonate sheets using self-tapping screws 46 (19mm):







## ATTENTION!

The greenhouse has a sailing. Do not leave the greenhouse on unfortified ground. When installing a greenhouse in a windy area, additional fastening to the ground with improvised materials (rod, reinforcement, etc.) is required.

Do not install the greenhouse in close proximity (less than 2 meters) to buildings, fences or walls.

The area where the greenhouse is installed must be flat, without significant changes in ground level.

In winter, in order to exclude deformation of the greenhouse parts from the effects of snow and wind loads, it is necessary to remove all sheets of cellular polycarbonate from the arched part of the greenhouse (greenhouse roof) by dismantling the tie straps. The advantage of removing the sheets for the winter period is that snow gets inside the greenhouse, which, when it melts, enriches the soil with useful minerals, protects it from desalination. The roof open for the winter prevents a situation in which harmful insects crawl into a warm greenhouse with the onset of cold weather, and in spring they eat young roots and sprouts.

If it is not possible to dismantle the sheets, it is necessary to reinforce the arches from the inside with T-shaped wooden supports (made of a wooden bar with a cross section of at least 50x50mm), placing them inside the greenhouse - one bar for each arch. Wooden supports are not included in the set, they are made independently. Depending on the climatic conditions and (or) the location of the greenhouse, the buyer himself must assess the possible snow load and, if necessary, put supports or remove snow from the frame.

***Failure to comply with the above requirements is the basis for refusal to provide warranty service for the product.***

Install the greenhouse no closer than **2** meters to buildings, fences and fences. When installing the greenhouse in a windy area, provide a rigid attachment to the soil surface with the help of improvised means (rod, reinforcement, etc.). Do not expose the greenhouse frame to excessive mechanical stress. Do not alter the design of the product yourself.

## **10. LIMITED WARRANTY OBLIGATIONS**

1. The manufacturer guarantees that the greenhouse frame (hereinafter referred to as the product) is new, fully equipped, and free from manufacturing defects.

2. The manufacturer is responsible for completing the product.

3. The manufacturer is responsible for the collection of the product in accordance with the instructions.

4. The warranty period for full coverage of the product is for 12 month period from the date of sale. Including any manufacturing and material defects. If the repair is determined to be covered under warranty and it is consumer responsibility to send required evidence as pictures and video of damaged or broken parts.

5. The limited warranty includes the stipulation that the seller and the consumer split half and half for cost of repairs and replacement parts for a 24 month period after 1 year of full coverage. If the repair is determined to be covered under warranty and it is consumer responsibility to send required evidence as pictures and video of damaged or broken parts.

6. The warranty covers delivery cost within 50 mile radius from the store. The customer is responsible for freight charges to all further destinations outside of 50 mile radius.

7. The warranty covers any manufacturing and material defects.

8. The warranty does not cover damage caused by corrosion of the product's structural elements, snow 240kg/m<sup>2</sup> (120Lb/ft<sup>2</sup>) and wind load (up too 50mph ).

9. The warranty ends:

- If the instructions for assembly and installation are not followed;
- In case of violation of the requirements for the operation of the greenhouse;
- When using the greenhouse for other purposes;
- Upon the occurrence of force majeure circumstances (natural disasters);
- In the absence of a passport for the product/instruction.

10. For all questions regarding warranty coverage please contact us by email:

[info@greenhousetogrow.com](mailto:info@greenhousetogrow.com)

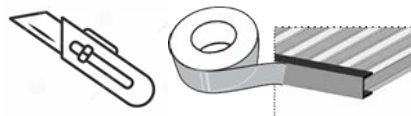
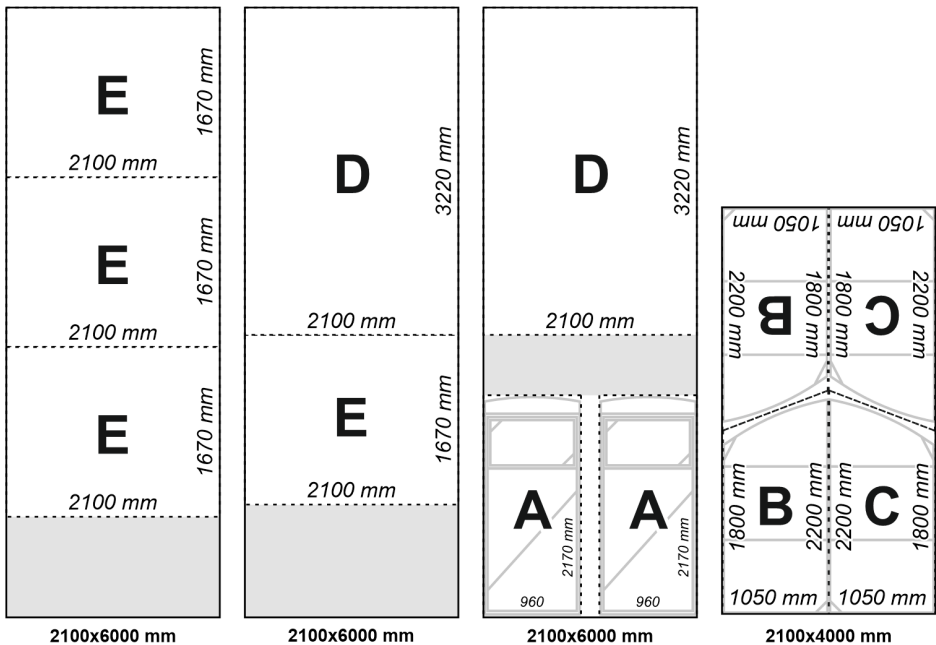
**Quantity of sheets and cutting scheme of cellular polycarbonate with the size of 2100x6000mm for greenhouses with length of 4 - 6 - 8 - 10 m**

To prevent moisture from entering the polycarbonate open honeycomb and inside the greenhouse, we recommend sealing the joint of polycarbonate sheets along the entire length with a waterproof self-adhesive tape (dense tape or similar material).

**Magnolia greenhouse with length of 13'L (4m) (1 base)**

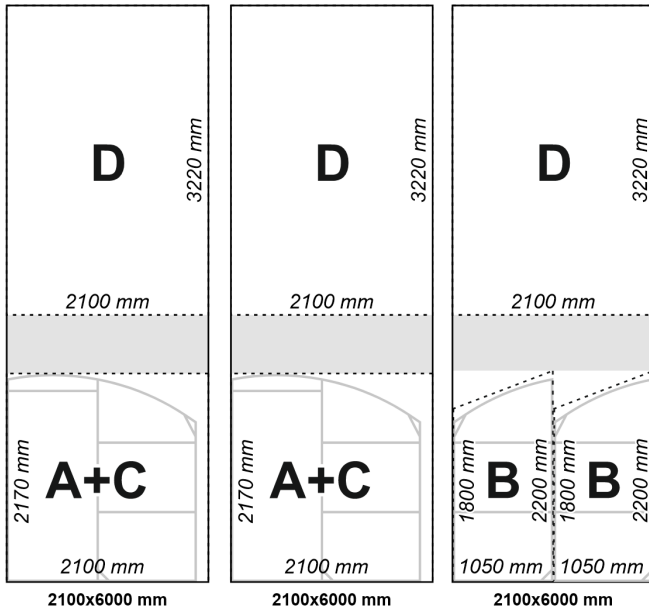
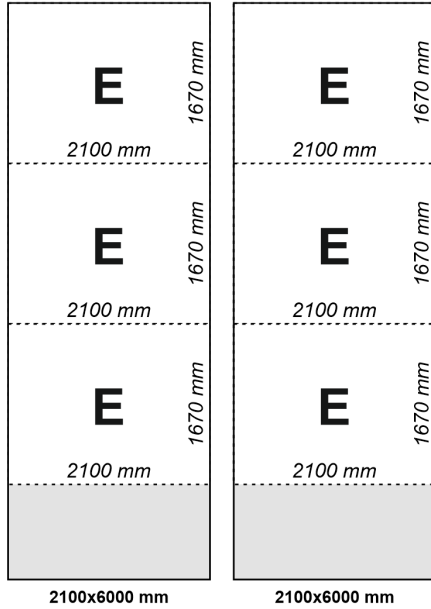
Cellular polycarbonate sheet 2100x6000 mm – 3 pcs.

Cellular polycarbonate sheet 2100x4000 mm – 1 pc.



# Magnolia greenhouse with length 19.5'L (6m) (1 base + 1 extension)

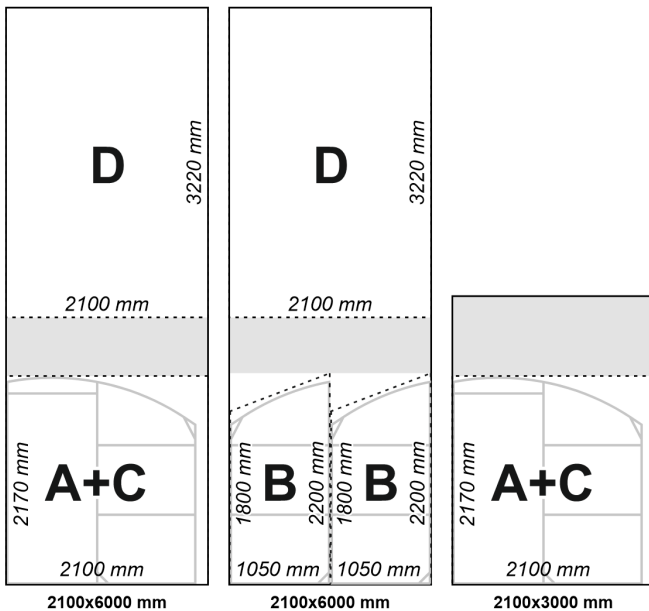
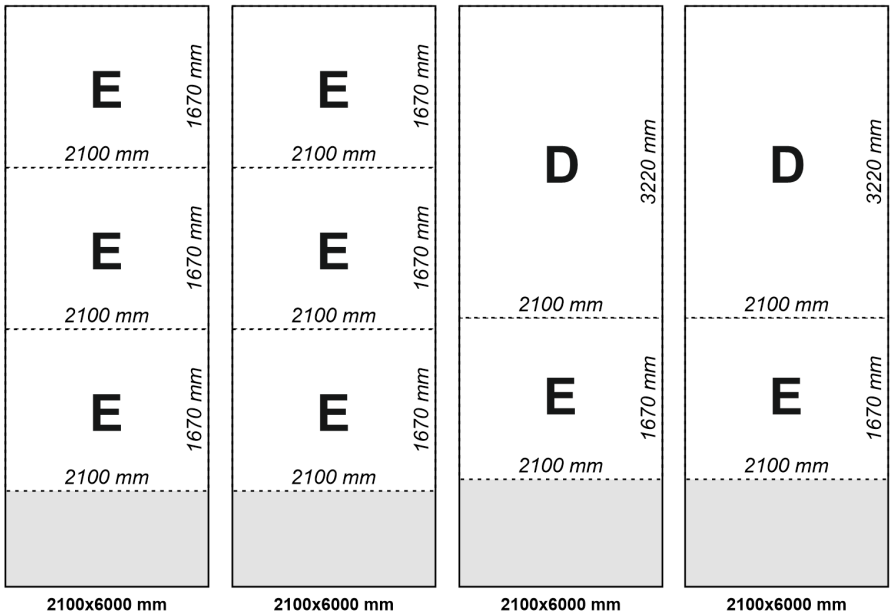
Cellular polycarbonate sheet 2100x6000 mm – 5 pcs.



# Magnolia greenhouse with length of 26'L (8m) (1 base + 2 extensions)

Cellular polycarbonate sheet 2100x6000 mm – 6 pcs.

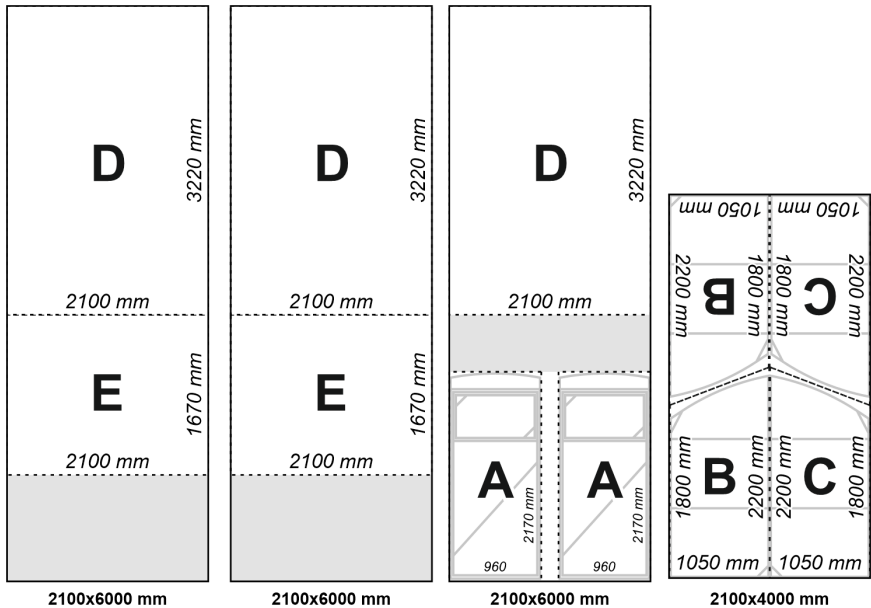
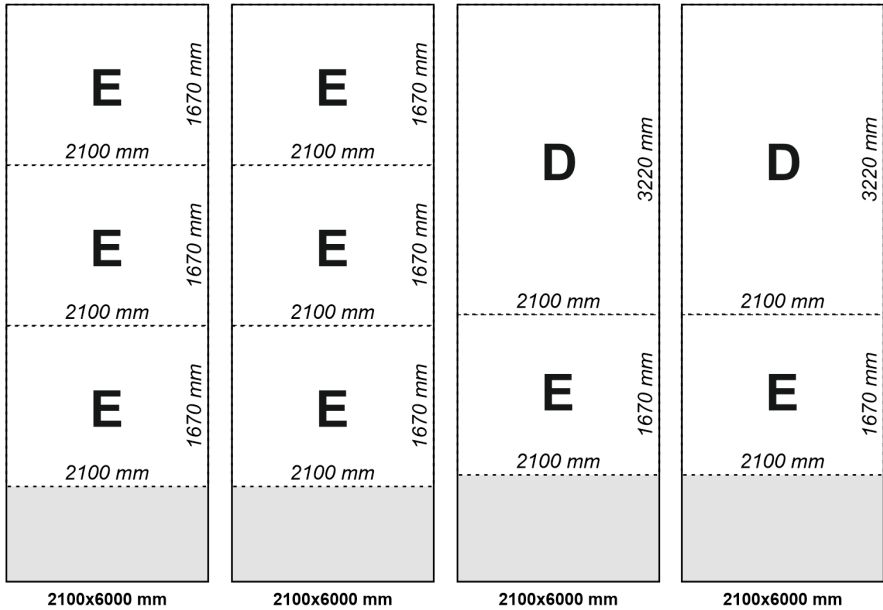
Cellular polycarbonate sheet 2100x2000 mm – 1 pc.



# Magnolia greenhouse with length of 32.5'L (10m) (1 base + 3 exten.)

Cellular polycarbonate sheet 2100x6000 mm – 7 pcs.

Cellular polycarbonate sheet 2100x2000 mm – 1 pc.



**Thank you for choosing the MAGNOLIA greenhouse  
Which will serve you for decades under proper usage !**



***Velcom.Inc***  
[www.GreenhouseToGrow.com](http://www.GreenhouseToGrow.com)

Due to the continuous improvement of the products  
the manufacturer reserves the right to make changes  
in the design without prior notice to the consumer.

The products are not subject to mandatory certification.

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