

Costprices prototype – Real dimension

Leroy Merlin

Cardboard	4.24 €	14.24 €
Sticker Roll	6 €	6 €
Glue	8 €	8 €
Pump	15 €	15 €
PVC Tube	2 €	1.68 €
Black Container	6 €	6 €
Valve	14 €	14 €
Collecting container purified water	2 €	2 €

Plexicril

PMMA	30.75 €	61.5 €
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ElectroFun

ULTRASONIC SENSOR	11.02 €	11.02€
Arduino Uno R3	17.39 €	17.39 €
Servomotor	6.23 €	6.23 €

Total price

83.75 €

112.5 €

Elements

PART	PYRAMEDICAL TRANSPARANT COVER	SALT CONTAINER	WHITE BASE	STICKER FOR WHITE BASE	TUBE	COLLECTING CONTAINER	JUNCTION COVER- CONTAINER	ULTRASONIC SENSOR	ARDUINO UNO R3	SERVOMOTOR	
MATERIAL	PMMA	SLATE or PVC	Cardboard	Sticker roll	PVC	PVC	GLUE			Valve	pump
QUANTITY REAL DIMENSIONS	1x (3050 x 2030)cm / 2 mm	1 big container out of plastic with a perimeter of 1.50 m	2 x (300 x 120) cm	1	3x 0.30 m	A container of 10 liter	1	2 Ultrasonic Sensors	1 Arduino	1 Valve	1 pump
QUANTITY PROTOTYPE 1:5	2 x (3050 x 2030) mm/ 2 mm	A coaster for a flower pot with a perimeter of appr. 0.3 cm	1 x (250 x 120) cm	1	3x 0.10 m	A container of 5 liter	1	2 Ultrasonic Sensors	1 Arduino	1 Valve	1 pump
SUPPLIER first material	PLEXICRIL http://interactivapaper.pai.pt/rdr/1135/plexicril-ii-importacao-e-distribuiçao-de-acrilicos-e-policarbonatos-unipessoal-lda-produtos-e-servicos/collect_pdf	LEROY MERLIN	LEROY MERLIN http://www.leroymerlin.pt/Site/Produtos/Construcao/Tetos-e-divisorias/Placas/16486540.aspx	LEROY MERLIN	LEROY MERLIN	LEROY MERLIN	LEROY MERLIN	ELECTROFUN http://www.electrofun.pt/search?controller=search&orderby=position&orderway=desc&search_query=ultrasonic+sensor&submit_search=	ELECTROFUN http://www.electrofun.pt/160-arduino-compat%C3%ADvel-atmega328p.html	ELECTROFUN http://www.electrofun.pt/robot-motores-rodas/198-towerpro-servo-motor-sg90-.html	LEROY MERLIN
COST	30.75 € x1 for the prototype 30,75 € x 2 = 61.50 € for the big size.	6 €	7.12€ x 2 for the real dimensions. 6€ for the prototype	6 € for 200 mm x 45 mm	2 €	2 €	8 €	5.51 € x 2	17,39 €	6,23 €	15 €

1. PMMA

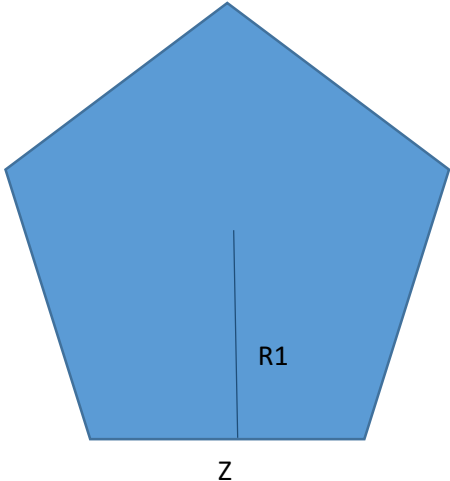
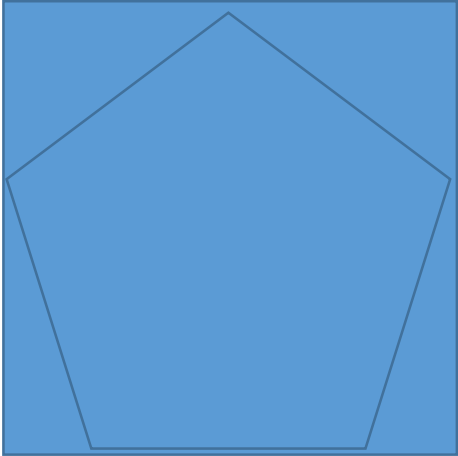
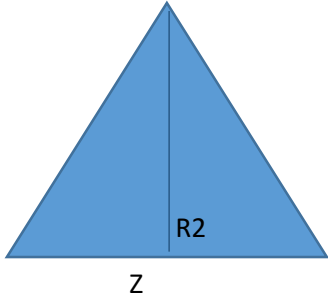
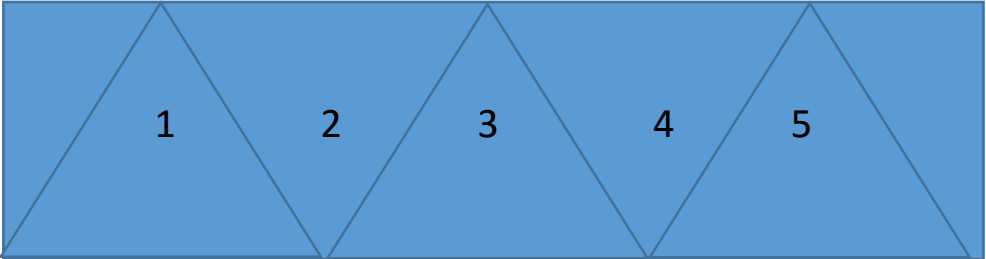
Transparent PMMA is chosen over Glass because for the pyramid because

- Light transmission: typical PMMA grades allow 92% of light to pass through it.
- Passes UV light. This light is more energetic and might kill some waste products in the seawater
- Good heat insulation enables saving the heat inside. The PMMA let UV light through, which make the process faster.
- Surface Hardness
- Does not shatter
- Lightweight
- Insoluble in water, resistant to salty water.
- No environmental damage or health risks by producing PMMA by containing any toxic materials or heavy metals
- Sustainable (see chapter Sustainable)
- Thickness of PMMA does not affect the transparency.

To easy attach the container with the pyramid, the container also will be made out of PMMA because this is sustainable, easy to attach a tube in and low cost. The vessel can be 0.05 m high

The amount of PMMA is seen on the next page.

The amount needed of PMMA for the prototype

Element	Quantity		
Bottom	0,38 m² in the shape of a pentagonal with z = 0,4 m and Radius R1 = 0,28 m Or a square of 0.56 m x 0.56 m		
	 		
Vertical sides	(0,05 m x 0,4 m) x 5 sides = 0,02 m² x 5 = 0,1 m²		
Triangles on 30° of the base	5 Triangles with an area = 5 times x 0,1898 m² With radius R2= 0,949 and base z= 0,4 m	OR	An perpendicular of R2 x (3 x z) = 0.949 m x 1,2 m which can be cut into 5 triangles, shown in the design below
	 		

The calculations for the amount is seen on the next page.

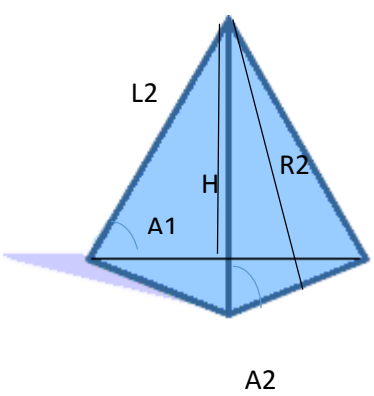
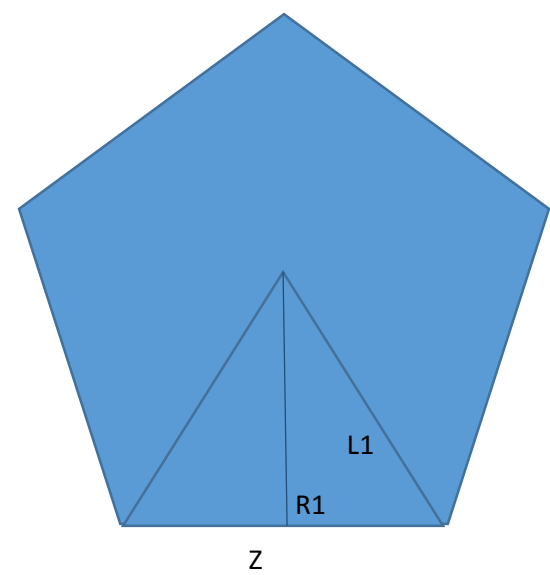
Real Dimensions

Pentagonal

z=1,372 m
Radius R1 of pentagonal=0,966 m
Length L1 of one side of the transparent cover=1,185 m
Radius of the salt container 0,8 m
Triangle area= 0,81291 m²
Full area= 4,06455 m²

Pyramid

Height H = 0,86 m
Angle A1= 30°
Length L2= 1,2 m
Radius R2= 1,00 m
Angle A2= 59,9°
Triangle area = 0,938448 m²
Full area = 4,692240 m²



Prototype

Pentagonal

z= 0,4 m
Radius R1 of pentagonal= 0,28 m
Length L1 of one side of the transparent cover= 0,344 m
Radius of the salt container 0,8 m
Triangle area= 0,096m²
Full area = 0,38 m²

Pyramid

Height H=0,199 m
Angle= 30°
Length L2= 0,397 m
Radius R2= 0,949 m
Angle A2= 59.75°
Triangle area= 0.1898 m²
Full area= 0,949 m²

2. Slate, PVC or ceramic for salt container

For the prototype PVC or ceramic coaster for flower pot will be used for the salt container, for the real dimensions Slate can be possible

This stone is chosen because of its advantages:

- Source (Valongo in the east of Portugal, 9km from Porto,)
- the good heat transfer
- Long lifetime
- Waterresistance
- Seawater resistance

3. Tube from PVC

Three tubes are needed. One to collect the concentrated saltwater and two others to transport the purified water to the big container and to the tap. These tubes can be of the same size, with a radius of 1.5 cm.

FOR it can be possible to use a hose pipe. This can be used to make the prototype

4. Container

For collecting the fresh salt water and the purified water, a container is needed. A container of a volume of 5 l is enough

5. Ultrasonic sensor

To detect the volume of the water inside the containers

6. Arduino UNO R3

To control the sensors and servomotors

7. Servomoter for Valve and pump

- A valve to collect the salt
- A pump to bring the salt water from the container inside the pyramid. The pump must work of an elevation of 2 m and does not have to work fast