

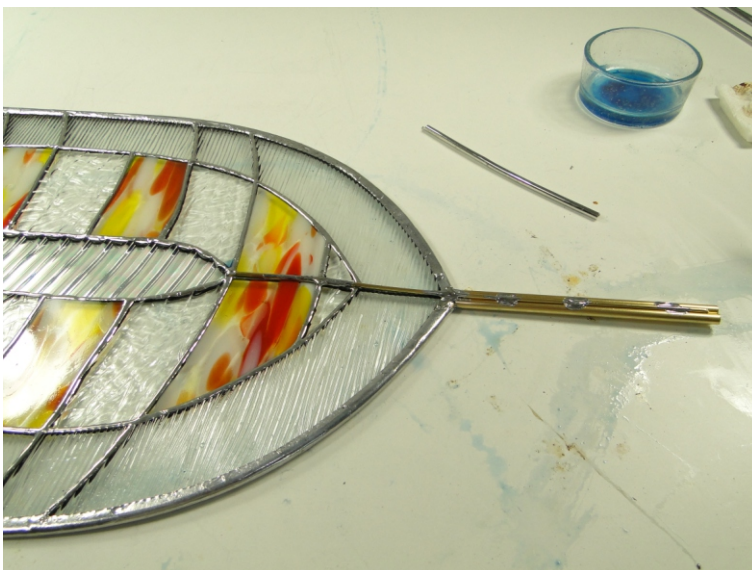
Garden Art - Construction of the Metal Frame

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Garden art " U-shaped mask "

Step by step - instructions of the metal frame



The principle is simple ..
Reinforce the glass work with
a strong metal frame then add
a pipe for a stand
and you're all set.

This guide contains
step-by-step instructions
for constructing the frame
and stand,
and includes a materials list.

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Here is an overview of all required Materials and tools:

Metal parts:

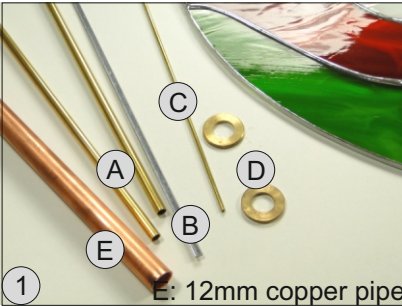
2 x 1 meter: brass pipe with 5 mm diameter and a wall thickness of approximately 0.45 mm

0.5 meters: brass pipe with a diameter of 2mm and wall thickness of approximately 0.5mm

1 Meter: Metal strip 3.6 x1mm

2 washers made of brass 20x10x2mm

approx. 1.25 meters of copper pipe 12x1mm



A: 5mm brass tube
B: 3,6x1mm Metal strip
C: 2mm brass tube
D: 2 x brass washers
E: 12mm copper pipe

See last page of this sheet for more details on Materials.



Use steel wool to remove oxide and any rough spots on the pipe to make soldering easier.



A 5mm brass tube is very stable, but can easily be bent, without the aid of any tools.

Bend the 5mm brass tube a little, at first...



...and gradually adjust the shape to match the glass work.

step by step, to the glass panel.



When you have bent the metal to the shape of the glass, the upper end can be marked to saw off.

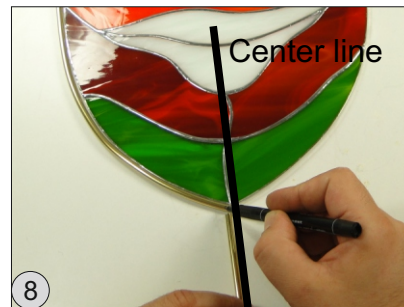
Leave about 2 cm sticking out.



Cut two 15cm lengths of the 5mm brass pipe.



Always smooth the sawed ends with a metal file!



Center Line - Lay the straight metal tube left-justified onto an imaginary center line.

Mark the point, where the bent tube should be cut, then saw it off.

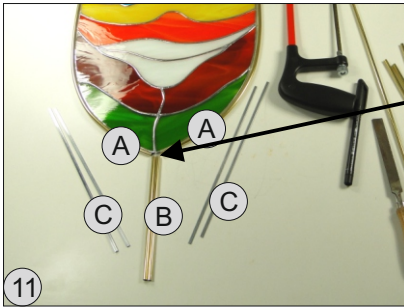
Garden art " U-shaped mask " Step by step



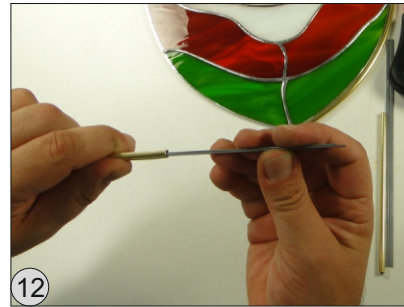
Repeat the same step done for the left side view, with right side one.



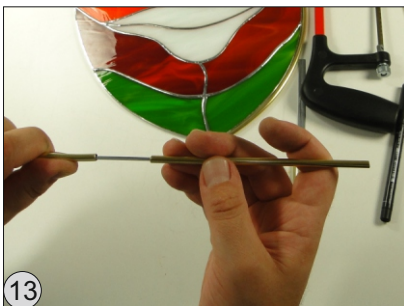
Now cut 4 pieces each, all of them about 25cm of the 3.6 x 1mm metal strip (wrench).



The 2 x 2 metal strips serve as a reinforcement between the tubes "A" + "B". Would the frame just be soldered, it would end up not sturdy enough.



Slide 2 metal strips halfway into the bent tube.



Now from the other side ..
Take the short straight tube and slide it over the metal strips.



Bend the tubes with the metal strips as shown.



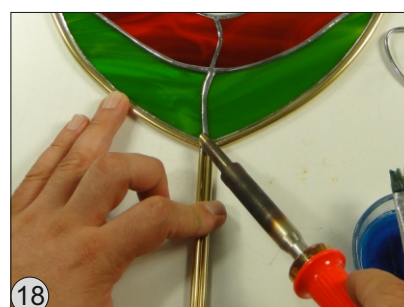
Try to keep from putting too much pressure on the glass as you solder.



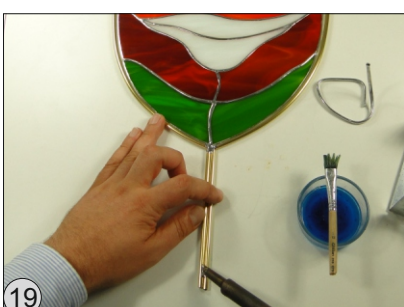
Detail of the bend.



In order for the glass image to stand STRAIGHT in the holder, you should adjust the metal frame properly, before you start soldering it! Later corrections are more difficult ..



Set the first solder pad exactly, as shown to the joint.
.. let it fill up with lots of tin!
Be sure that the two straight pipes stand closely against one another!



Holding the two straight pipes tightly together, join them at the bottom with a solder dot.

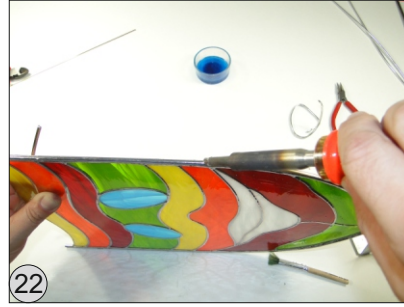


Join the metal frame to the glass work with dots of solder.

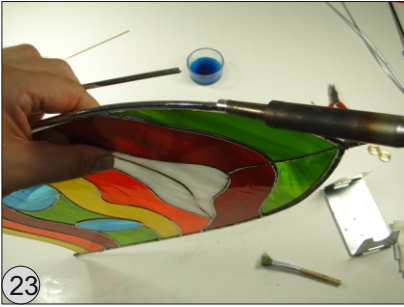
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Now solder the entire frame properly from above and below the glass panel.



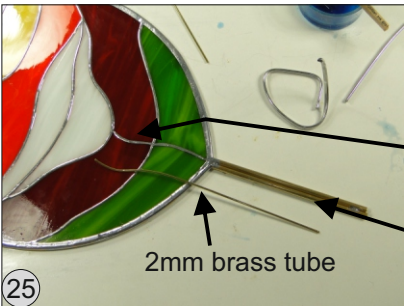
Simply redraw the sides with the hot soldering iron ..



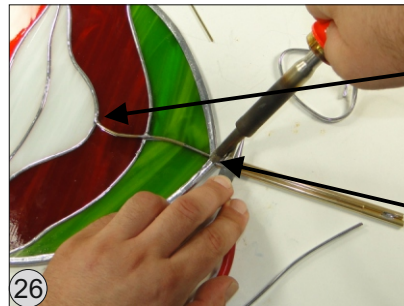
Holding the soldering iron in a horizontal position keeps the liquid from pouring out too quickly.



Close the open top of the pipe with a solder glob then let it cool down.



Bend the 2mm brass tube to follow the shape of the center solder line (in the glass panel) then down the length of the straight 5mm brass tubes.



Mount the 2mm tube at the first end of the soldered seam.

Now press the 2mm with a pipe tool onto the junction and completely solder it on.

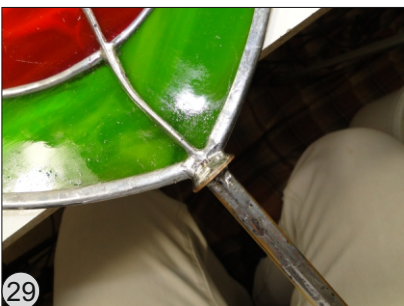


Turn the piece over and add a second 2mm tube to the other side. Both sides of the glass must be stabilized in this way!

Almost done



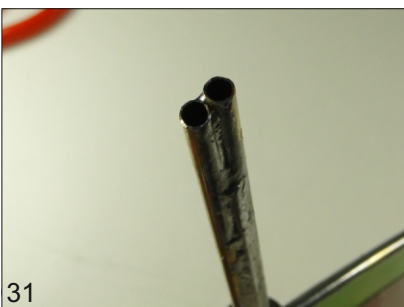
Now slide one of the brass washers up to the joint of the metal structure and solder them together as shown. This transforms the "Breaking point" into a stable and safe construction.



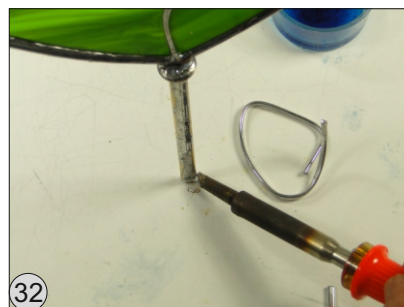
Add more solder at the top to increase stability.



Keep the underside of the washer joint clean so it fits neatly into the pipe later.

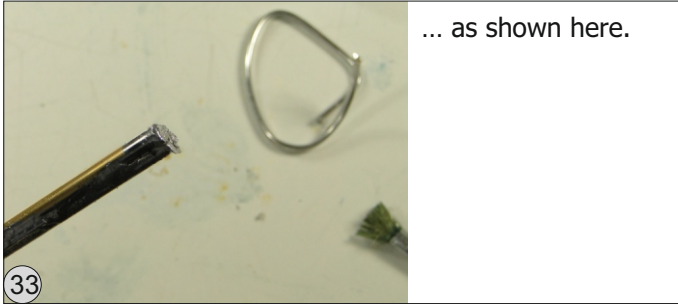


You should close the lower ends ..

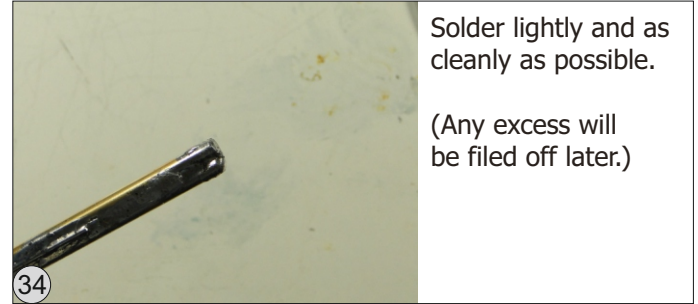


by simply just adding a little more solder ...

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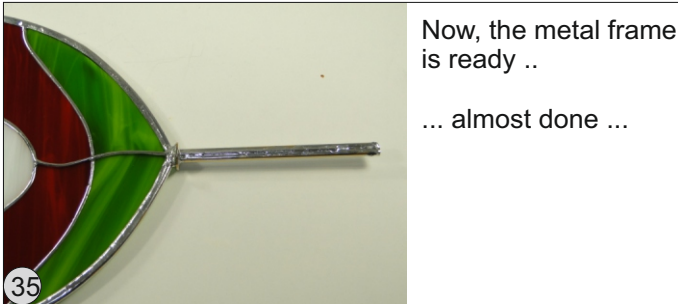


... as shown here.



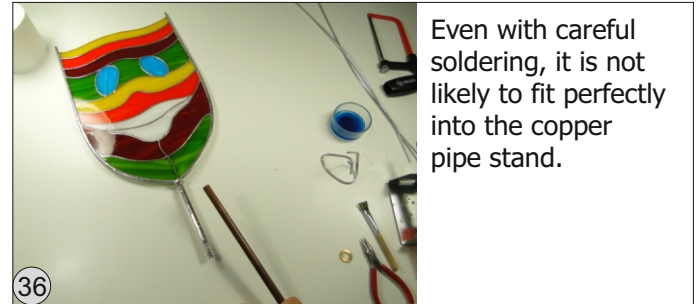
Solder lightly and as cleanly as possible.

(Any excess will be filed off later.)

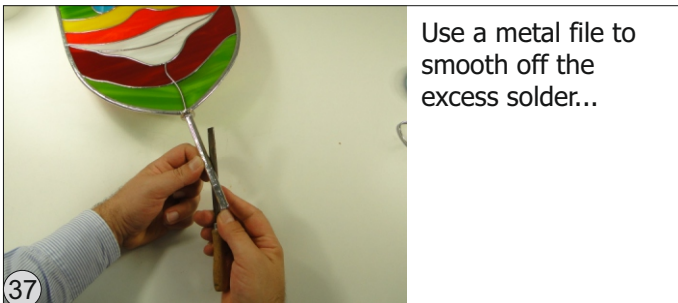


Now, the metal frame is ready ..

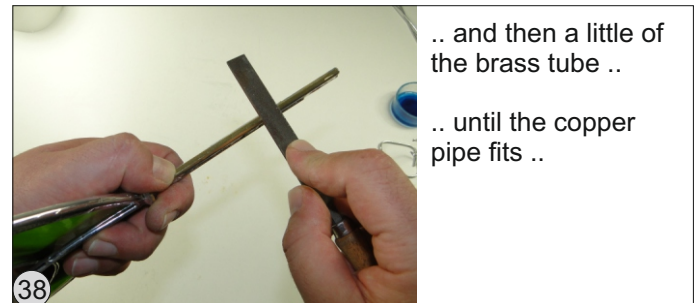
... almost done ...



Even with careful soldering, it is not likely to fit perfectly into the copper pipe stand.

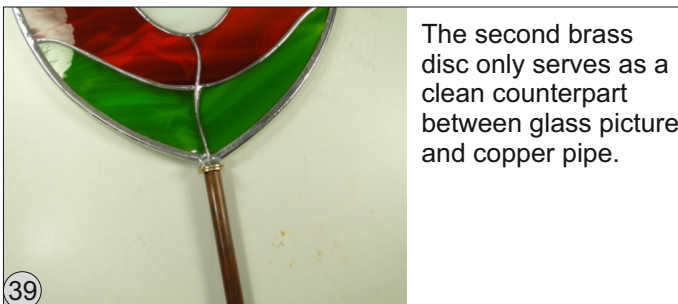


Use a metal file to smooth off the excess solder...

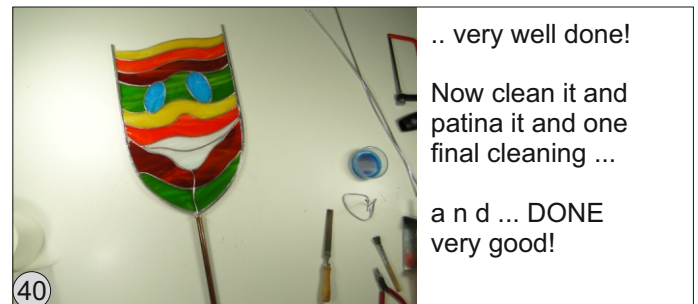


.. and then a little of the brass tube ..

.. until the copper pipe fits ..



The second brass disc only serves as a clean counterpart between glass picture and copper pipe.



.. very well done!

Now clean it and patina it and one final cleaning ...

a n d ... DONE very good!

A few general notes on the materials used in the metal frame:

Materials should be known under the following stock numbers at art glass suppliers in Europe:

4252000 - You will need 2 meters

1 meter brass tube with an outside diameter and 5mm wall thickness 0.45 mm

4251800 - You need 0.5 meters

1 meter of brass pipe with outer diameter and 2mm wall thickness 0.5 mm

4220000 - You will need 1 meter

Metal strips 1mm x 3.6 - usually as "wrench" means.

2431800 - You will need 2 pieces

Brass washer diameter 20mm x hole 10mm x 2mm thick

The copper tube with outer diameter 12mm and thickness 1mm is available at the hardware store.