



SAFETY INFORMATION

- Be sure to work from secure and safe platforms and ladders
- Secure area underneath your work space to make sure nobody gets hurt in case you drop something
- Edges of cut copper are sharp; be sure to wear proper gloves when handling cut gutter
- When cutting copper, be sure to wear approved safety goggles
- Never install or work on damaged roof material or structure
- When you install gutters, make sure the collected water can run off without causing damages
- Never modify parts without consulting a professional or Slate and Copper's technical support team
- Dispose of leftovers and off-cut safely and in accordance with best practices
- Never leave any parts or tools unsecured on your roof, they might fall down causing serious damage or injury
- Never do installation work alone- always work in a team
- Check for power lines
- Never install on icy or slippery roofs or in windy conditions

-IF YOU DO NOT FEEL YOU CAN COMPLETE THIS WORK SAFELY, CALL A LOCAL CONTRACTOR

WARNING:

Copper is a sharp metal and will bite you if you let it. Firmly and securely hold all pieces when working with them. Do not slide your hands or fingers along any straight or finished edges. This is partly the reason why we wore gloves in our demonstration. Wearing gloves will also help minimize the fingerprint marks on the gutter system. The best gloves to use especially for grip are ones with the palm and fingers coated with a rubber or latex material.

INSTALLING SPHERICAL END CAPS

Tools Required:

- * Green and/or Red Tin Snips also known as Left and Right Handed Tin Snips Respectively
- * Cord or Cordless Drill (3/8" size drill is perfect)
- * 1/8" Drill Bit for Drill
- * Pop Rivet Gun
- * 1/8" Diameter Copper Rivets
- * "C" Clamps (optional but very useful)
- * Soldering Equipment and Flux (do not use the pre-tinning flux)
- * Soldering Iron of some sort (many styles to choose from)
- * Mapp Gas Tank (yellow tank) with an Adjustable Flame Torch Head Nozzle



step 2



step 3



step 1



step 4

Spherical end caps are a universal end cap, and can be used on either end of the copper gutter.

PART 1

Installing the Spherical End Cap:

First part- straighten tabs of end caps

If you notice in picture Step 2 the tabs are curled in slightly. We need to straighten them out so the spherical end cap can fit onto the end of the gutter properly. In pictures Step 3, Step 4, Step 5, & Step 6 we used our finger to straighten the installation flange slightly.



step 5



step 6

PART 2

Second part- cutting the end cap to fit onto the end of the gutter.

In picture Step 7 we need to determine what side of the gutter we are installing the end cap onto, and what is the front and back side of the end cap.



step 7

Once we know what flange is going to be on the backside of the gutter we need to cut it. Picture Step 8 shows all the tools we need to be able to put our spherical and cap on. Just below picture Step 8 we show a pair of Vice Grip "C" Clamps a very useful tool for this installation. Take a pair of tin snips and cut about a 1/2" or so tab (see pictures Step 10 & Step 11). We made our cut at the top of the radius on the installation flange all the way back to the bead on the end cap.



step 8



step 9

Now make another cut as shown in pictures Step 12, Step 13, & Step 14 back to the bead on the end cap. Now cut the excess pieces off of the installation flange as shown in pictures Step 15, Step 16, & Step 17 till we have a tab that looks like in picture Step 18.



step 10

PART 2



step 11



step 15



step 12



step 16



step 13



step 17



step 14



step 18

PART 3

Third part- installing the end cap onto the end of the gutter.

Now that we have cut the installation flange and have our tab piece we can install the end cap onto the end of the gutter. In picture Step 19 we are lining up the spherical end cap to slide right onto the end of the gutter. The tab piece we cut needs to go on the outside of the back of the gutter. First start to slip the front installation flange into the front bead of the gutter (see picture Step 20). Continue to slide the spherical end cap onto the end of the gutter till it fits properly like in picture Step 21 & 22. Notice the soldering flange is on the inside of the gutter. We want to make sure the end cap is properly and securely fit onto the end of the gutter, so we used C clamps to hold the spherical into position for riveting. Pictures Step 23& Step 24 show the clamps on the gutter holding the spherical end cap into position.



step 20



step 21 & 22



step 23



step 19



step 24

PART 4

Fourth part- rivet end caps into place.

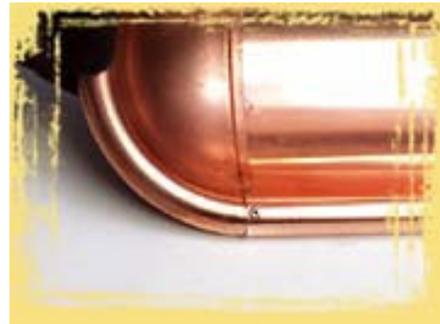
Now we have the end cap on the end of the gutter we can rivet it into place. First drill and rivet the front bead as shown in pictures Step 25, Step 26, & Step 27. Before we install the rivet on the back of the gutter we want to make sure the end cap is fitted onto the end of the way we want it (see picture Step 28). Now we can drill and put a rivet through the tab piece we cut earlier (see pictures Step 29, Step 30, Step 31, & Step 32). In picture Step 33 we show the spherical end cap installed onto the end of the gutter with 2 rivets. In pictures Step 33, Step 34 and Step 35 we show what the spherical end cap looks like once installed onto the end of the gutter. Notice that the spherical end cap sits a little bit below the back of the gutter, this is how it's supposed to fit onto the end of the gutter.



step 25



step 26

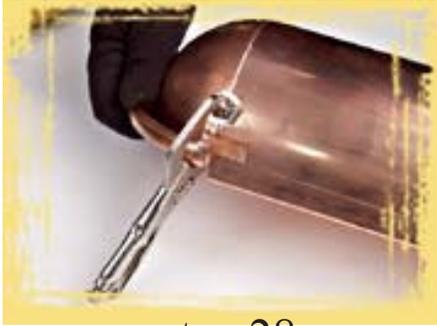


step 27

The reason for this is because once the gutter is installed into the gutter hangers the back of the gutter actually set's a little bit higher than the front of the gutter. Why? Because if the gutter ever becomes so clogged with leaves or debris the water will spill over the front of the gutter (desired) and not the back.

Now that we have the spherical end cap installed and riveted, we can solder it to the gutter.

PART 4



step 28



step 32



step 29



step 33



step 30



step 34



step 31



step 35

PART 5

Fifth part- flux and solder the spherical end cap onto the gutter.

In picture Step 36 we are applying flux with a flux brush all the way around the inside of the gutter on the soldering flange of the end cap.

We must apply flux to our seam, or the solder will not stick to the copper at all. If flux is not applied or gets dried out during soldering, then the solder will bead off like mercury. Simply apply or reapply some flux.

In pictures Step 37, Step 38, Step 39, Step 40, Step 41, & Step 42 we are soldering the end cap into place. If you are using a hand held torch to solder, then you will not need as many tack solder points- 3 to 4 would do.

Since we used a soldering iron as you can see in picture Step 38 we made many tack solder points. This many tack points is going to make our soldering job easier.



step 36



step 37



step 38



step 39

PART 5



step 40

In picture Step 39, the craftsman shows his perfectly completed soldering job on the inside of the gutter.



step 41

In pictures Step 40, Step 41, and Step 42 we see a little bead of solder all the way around the end cap. That little bit of solder is just what we are looking for. This means we did a good job.



step 42