

City Theatrical How To: Soldering QolorFLEX NuNeon

Basic Backfeed Manipulation Tutorial

All you need to know about soldering QolorFLEX NuNeon in eight steps.

I. Backfeed

[QolorFLEX NuNeon®](#) helps lighting and scenic designers worldwide add bold and bright accents to their entertainment and architectural projects. This soldering tutorial shows how any end user of QolorFLEX NuNeon can solder it, and use this incredibly flexible and bright sealed LED linear lighting product to replace traditional neon.

QolorFLEX NuNeon comes factory standard with its power inputs, “Feeds”, “Cables” or “Tails” running out in straight line feeds from the ends of the tape. Many customers and designers want the power feeds to come out of the “back”, or the flat bottom portion of the tape, for ease of use and flush mounts.



Figure 1: QolorFLEX NuNeon stock feed, unaltered

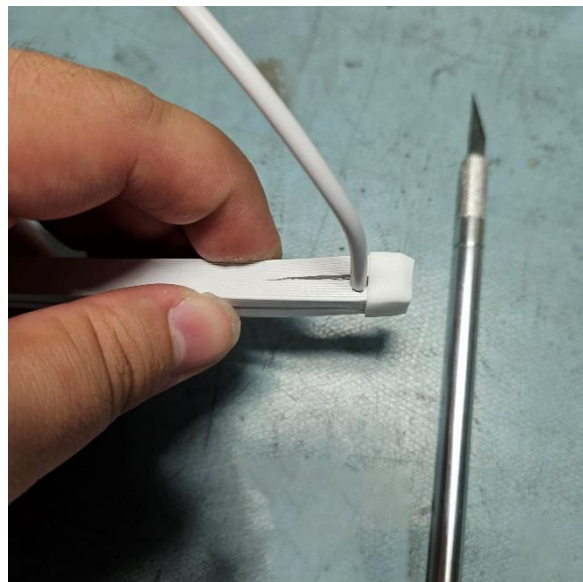


Figure 2: Example of backfeed, assembled

II. Tools Needed

The tools needed for soldering QolorFLEX NuNeon include those shown in Figure 3 below:

City Theatrical How To: Soldering QolorFLEX NuNeon

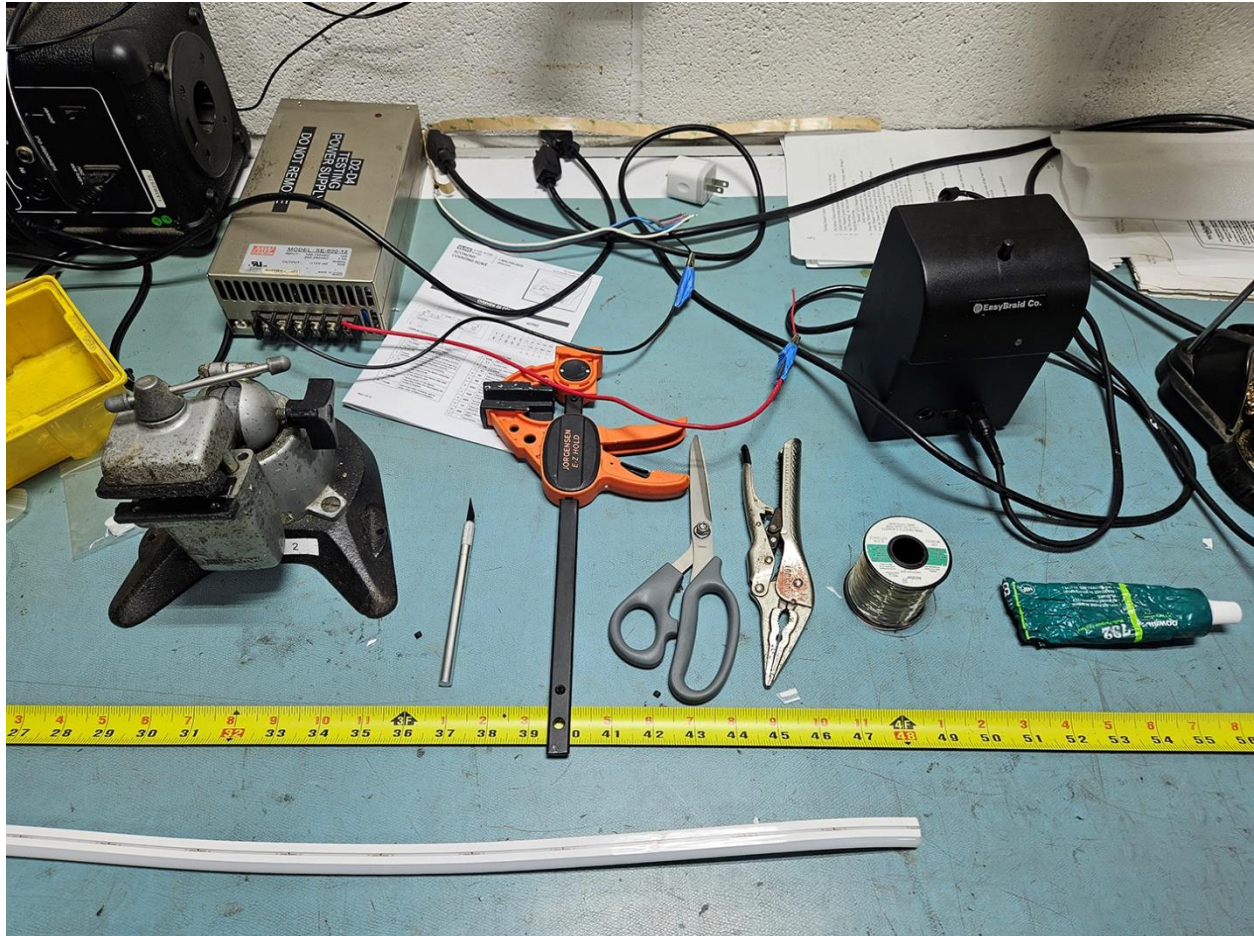


Figure 3: Tools Needed for Soldering QolorFLEX NuNeon

The tools you need include:

- **24V Power Supply** - For Testing
- **Sharp scissors or cutting tool** (a box cutter, Exacto knife, etc.) - To cut ONLY on marked cut points
- **Vice grips or gripping tool** - To hold silicone shell open
- **Weight or vice** - To hold tape in place
- **Clamp or vice** - To hold end while silicone cures
- **Exacto knife** or fine bladed knife
- **Tape measure or ruler**
- **Solder**
- **Soldering iron**
- **Silicone sealant** (i.e. QolorFLEX NuNeon Silicone, White, P/N NU1040)
- **QolorFLEX NuNeon Wire** - To run back wire. Options:
 - QolorFLEX NuNeon Lead Wire, **Two** Wire, 40cm (P/N N914-03)
 - QolorFLEX NuNeon Lead Wire, **Four** Wire, 40cm (P/N N914-04)
- **QolorFLEX NuNeon End Caps** - To finish the ends. Options:
 - QolorFLEX NuNeon End Cap **with Strain Relief**, Pack of 10 pc (P/N N914-01)
 - QolorFLEX NuNeon End Caps, pack of 10 (P/N N914-02)

City Theatrical How To: Soldering QolorFLEX NuNeon

QolorFLEX NuNeon Wire can be ordered to create consistency, or your wire of choice can be used.

The original tails can be used by carefully removing and reattaching them. Cut your end-most segment away on the cut points, then carefully slit the bottom of the QolorFLEX NuNeon tube with your fine blade. Remove the segment, and desolder the wires. If you're a soldering beginner, wire insulation is likely to melt and cause bridging if you use this option.

Removing the wires can be done without cutting away a segment, but due to the construction of the new style QolorFLEX NuNeon, which has windows on its side walls to reveal the cutting points, it is more difficult.



Figure 4: The original tails can be used by carefully removing and reattaching them

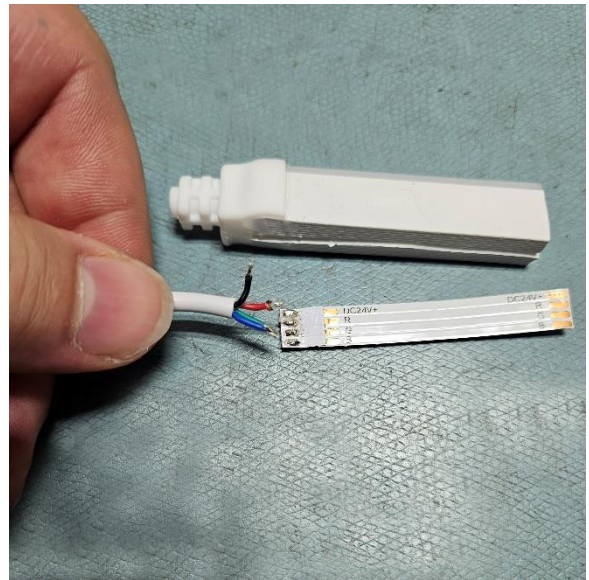


Figure 5: Remove the end two-inch segment, by cutting on the cut point nearest to the end

If your intended segment length is less than the full 5-Meter reel length, the easiest way to create a fresh end to work on for creating your backfeed is to simply remove the end two-inch segment, by cutting on the cut point nearest to the end.

III. Measuring and Cutting

Lay out your QolorFLEX NuNeon on a work surface, ideally long enough to spread it out flat for your intended length.

Make sure you are careful to align the end of your QolorFLEX NuNeon where the wires terminate and the End Cap with Strain Relief is, to the “Zero” point of your measuring tool.

City Theatrical How To: Soldering QolorFLEX NuNeon

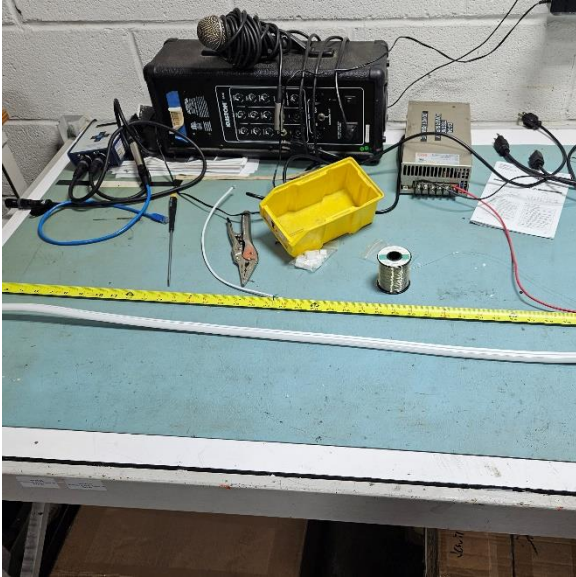


Figure 6: Lay out your QolorFLEX NuNeon to prepare for measuring and cutting

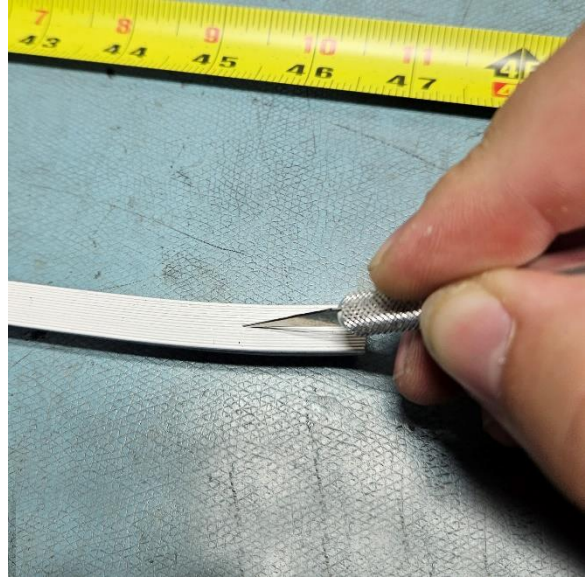


Figure 7: Sharp scissors, a box cutter with a fresh blade, or an exacto knife will cut through QolorFLEX NuNeon cleanly. Make sure your cut is clean and precise.



Close up on the new QolorFLEX NuNeon feature: the clear window built into the side

Using the clear window built into one side of the QolorFLEX NuNeon, locate the nearest cut point to your intended length, and carefully cut on the black line marked. Sharp scissors, a box cutter with a fresh blade, or an exacto knife will cut through cleanly. Make sure your cut is clean and precise.

For a backfeed, the easiest way is to cut away the end most segment to clear your way to the solder points, which will give you a flat edge to work on. The End Cap Strain Relief is filled in with silicone for solidity and waterproofing, so clearing it away requires delicate cutting, and leaves silicone on the end most contact pads.

IV. Accessing the Contacts

Use a fine blade or exacto knife to cut a slit one to one and a half inches into the flat bottom of the QolorFLEX NuNeon, along the line of or just behind the run of the tape inside.

City Theatrical How To: Soldering QolorFLEX NuNeon

Use a clamp or vice grip on one edge of the silicone, using it to pull back and hold the flap open, while the weight is used to keep the QolorFLEX NuNeon flat on your work surface.

Make sure the copper pads are easily accessible in any orientation you care to work.



Figure 8: Use a clamp or vice grip onto one edge of the silicone



Figure 9: Make sure the copper pads are easily accessible

Use your exacto knife to cut away a portion of the interior plastic window strip very carefully inside the QolorFLEX NuNeon. It is too stiff to allow you to easily form the silicone around a wire. To get a good seal, part has to be removed.

Make a cut to slice through the plastic, then carefully slide the blade behind the plastic. This is to free it from the silicone, without cutting through the silicone completely.

City Theatrical How To: Soldering QolorFLEX NuNeon



Figure 10: Use your exacto knife to cut away a portion of the interior plastic window strip carefully



Figure 11: Slice through the plastic, then carefully slide the blade behind the plastic to free it from the silicone

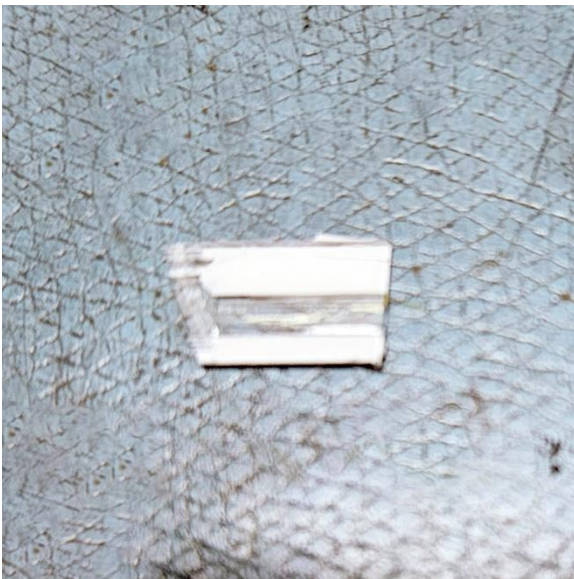


Figure 12: A piece of the window plastic strip removed

V. Soldering

Using your soldering iron, lightly “tin” the pads, coating them with a small amount of solder.

Tin the leads of your wire with a similar, light coating of solder.

City Theatrical How To: Soldering QolorFLEX NuNeon



Figure 13: Using your soldering iron, lightly “tin” the pads



Figure 14: Coat the pads with a small amount of solder

If you are using City Theatrical QolorFLEX NuNeon Wire (N914-04/N914-03 [4 wire lead wire/ 2 wire lead wire]), the wire leads should be $\frac{1}{2}$ " to $\frac{3}{4}$ " long running inwards on the white silicone strip. The height of the strip itself is a good rough measure so all wire leads are sealed inside the silicone once its capped.

Gently, so you can be as sure as possible that you don't create bridging between the contact pads, heat the wire end to melt the solder into place. The wires can be removed and resoldered so long as the pad is intact, so mistakes are fixable, if tricky. We recommend starting from the innermost pad – “Blue” in this image, so that each wire after does not get in its own way.

Make sure that the wire ends and the solder holding it in place are not in contact with each other, or individual colors will not show distinctly.

City Theatrical How To: Soldering QolorFLEX NuNeon

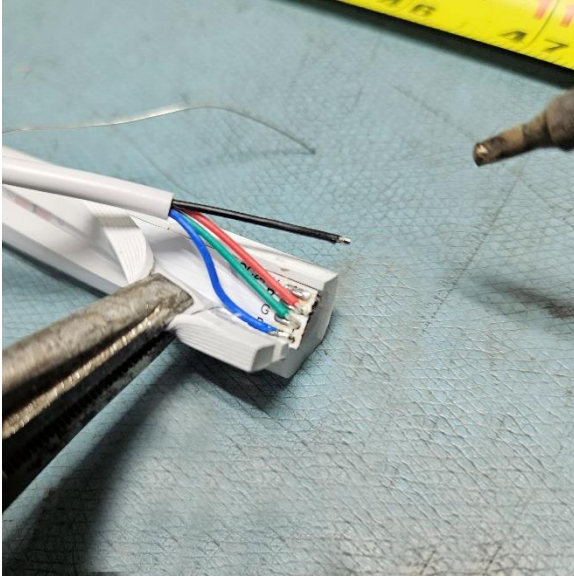


Figure 15: Wire leads should be $\frac{1}{2}$ " to $\frac{3}{4}$ " long running inwards on the white silicone strip

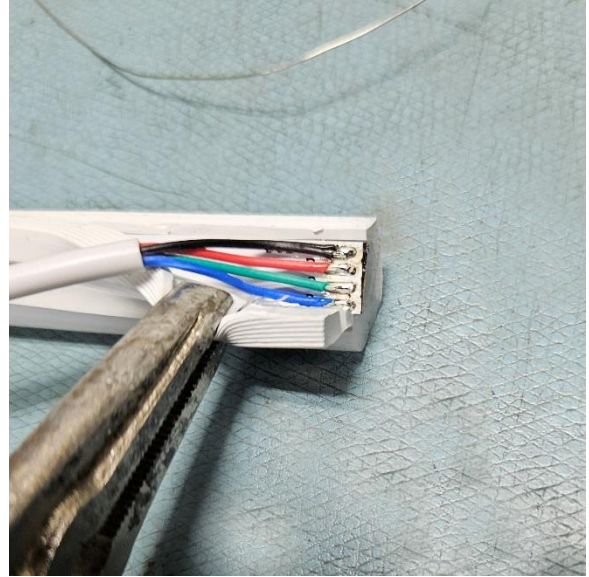


Figure 16: Hold the wire ends and solder in place so that they are not in contact with each other



Figure 17: Carefully bend the main body of the wire to your desired angle

Once your leads are in place, carefully bend the main body of the wire to your desired angle, making sure not to pull or put too much pressure on the ends of the wires. Pads can separate from the tape, and are very hard to fix if they do.

City Theatrical How To: Soldering QolorFLEX NuNeon

For a visually clean finished product, a small amount of the white insulation on City Theatrical wires should fall inside the white silicone tube of the QolorFLEX NuNeon, approximately $\frac{1}{8}$ " to $\frac{1}{4}$ ".

VI. Shaping

Using your exacto blade again, carefully cut a small, half circle notch into each side of the white silicone, where the white insulation of the wire will rest. This relieves strain and will allow the silicone to close fully around the wire, without creating a bulge.

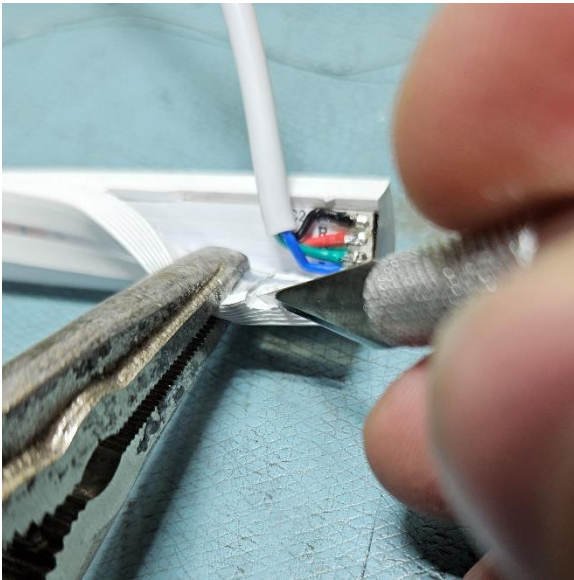


Figure 18: Carefully cut a small, half circle notch into each side of the white silicone (first notch)

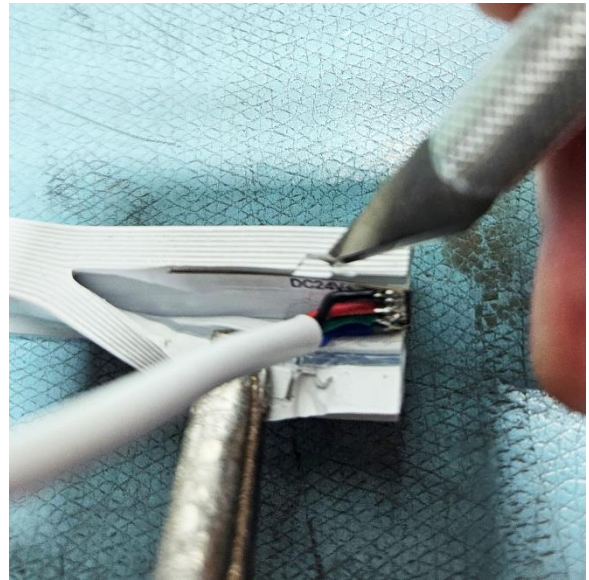


Figure 19: Carefully cut a small, half circle notch into each side of the white silicone (second notch)

VII. Sealing

Using clear or white silicone, fill the cut as well as possible, spreading a small amount back down the length of the cut. Try to make sure the silicone stays on the back side of the LED tape inside, so it will not interfere with the light.

Fill one QolorFLEX NuNeon End Cap (P/N N914-02) with silicone, spreading it around the inside of the cap to ensure full coverage and good seal.

City Theatrical How To: Soldering QolorFLEX NuNeon



Figure 20: Use silicone to fill in the cut as well as possible



Figure 21: Fill one QolorFLEX NuNeon End Cap with silicone

Stretch the cap over the end of the QolorFLEX NuNeon, wiping away any silicone that runs out the edge. For a tight, clean seal, use a clamp or vise to close the end of the QolorFLEX NuNeon, applying pressure to the cut along its length, and allowing the silicone sealant to dry. Leave the clamp in place, overnight or for as long as the silicone needs to dry completely. Wipe away any silicone that has managed to squeeze out of the joint, cap, and cut. Use a finger or your tool of choice to smooth the silicone over the gap and cut, and around the wire.

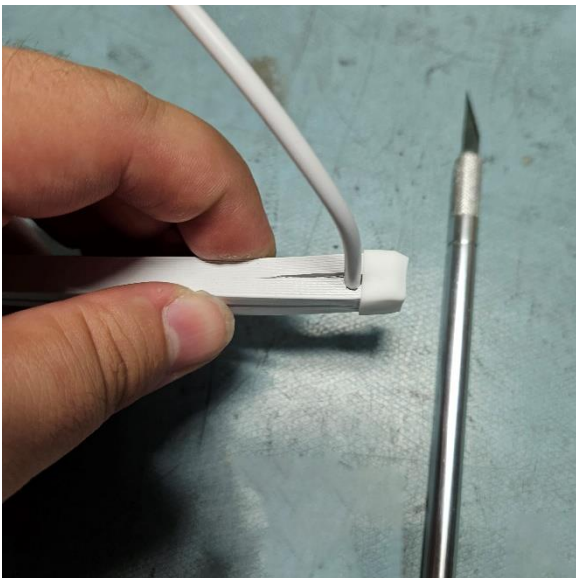


Figure 22: Apply pressure to the cut along its length, and allow the silicone sealant to dry

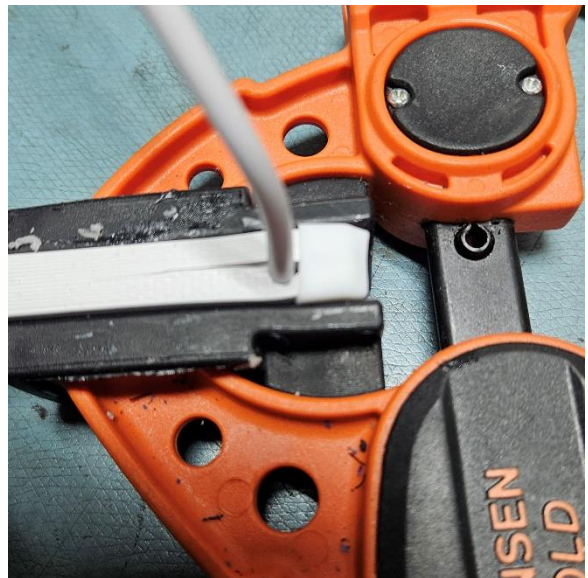


Figure 23: Leave the clamp in place overnight for the silicone to dry

City Theatrical How To: Soldering QolorFLEX NuNeon

VIII. The Finished Product

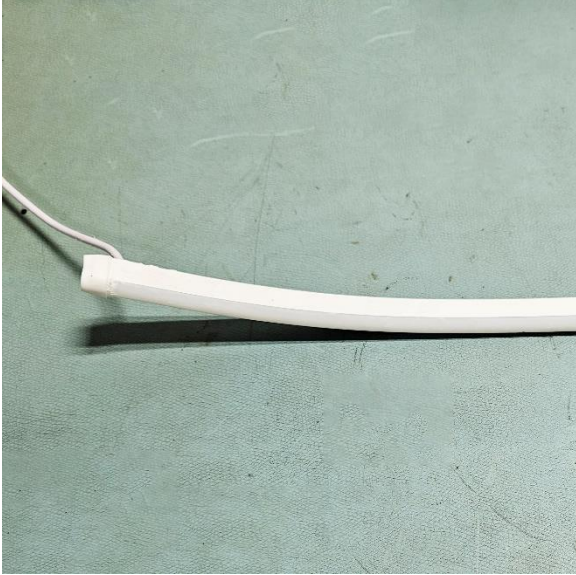


Figure 24: Soldered QolorFLEX NuNeon, unlit



Figure 25: Soldered QolorFLEX NuNeon, lit

For more information, visit: <https://www.citytheatrical.com/soldering-qolorflex-nuneon>