Fused Loop-in-Loop Chains

From Antiquity through the Renaissance, jewelry makers around the world took rings made of gold or silver wire, bent them, and wove them together to form durable, flexible chains. These chains were used anywhere a metal string was desired including necklaces, hanging pendants from earrings, clasp connectors, and suspension chains for censers.

There are several styles of loop-in-loop chain that appear during multiple periods in the historical record: single, pinched, double, and two-way double.



Gold single loop-in-loop. Minoan, 2300-2100BC. Metropolitan Museum, New York: 26.31.419.



Silver two-way double loop-in-loop. Romano-British, 2nd century. British Museum: 1850,1106.1.

Materials

- 20 gauge fine silver wire
- 18 gauge sterling silver wire for clasp (optional)
- round nose pliers
- ³/₈" wooden dowel or steel rod
- fine tip scissors or wire cutters
- butane micro torch
- soldering surface
- tweezers and bowl of water (optional)



Gold single loop-in-loop. Spain, 4th-7th century. Musee de Moyen Age, Cluny: Cl. 2879.



Gold double loop-in-loop. Sweden, 1st-4th century. Swedish History Museum: 109064.



Gold single loop-in-loop. Sweden, 1350-1499. Swedish History Museum: 42294.



Gold single loop-in-loop. Western Greek (Italy), 2nd century BC. British Museum: 1914,1016.1.

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Weaving Single Loop-in-Loop

To make a link:

- 1. Insert both tips of the pliers into a fused ring. Pull them apart, stretching the loop into an oval. If there is a small blob of metal where the ring was fused, orient the loop so that the blob is partway between an end and the middle.
- 2. With both tips of the pliers on the outside of the ring, pinch the middle of the ring together to form a bow tie.
- 3. Place the center of the bow tie under one of the plier tips, and use your fingers to bend the bow tie upwards into a U shape.



Silver single, pinched, and double loop-in-loop. Sweden, 9th-11th century. Swedish History Museum: 111793.

To join links:

- 1. Ensure that the top of the U shape is open enough that you can thread it through the chain. Use your fingers or the pliers to spread it open if needed.
- 2. Insert one loop of the new link through both loops of the link at the end of the chain. NOTE: The chain is symmetrical, so you can add links at either end.
- 3. Pull the loop through until the bottom of the U of the new link is centered in the loops of the previous link. Your pliers may be easier to use than your fingers.
- 4. Gently push the two loops at the top of the U together. You're now ready to add another link.

The more uniform your links are, the more uniform your chain will be. However, you can reshape woven links, at least somewhat, using your pliers.













Making Fused Rings

Fusing is the process of heating metal just to its melting point such that any surfaces that are touching will flow together, making an invisible join.

- 1. Wrap wire tightly around the mandrel to form a coil.
- 2. Slide the coil off the mandrel and cut the links apart.
- 3. Line up the cut ends of each link. They need to be touching, and the more precisely they're aligned the better they'll fuse.
- 4. Lay out your rings on your soldering surface.
- 5. Using the butane torch, heat each ring until it fuses. The ring will turn dull gray, then rosy pink, then liquid silver. You want to get *just* to the liquid silver phase and then move on to the next ring. If you apply heat for too long, the wire will break and then melt into a ball. Keep the flame moving around the ring to heat it evenly and reduce the chance of breaking and balling.
- 6. After you have fused all of the rings, wait for them to cool or use tweezers to transfer them to a bowl of water to quench.

IMPORTANT: Hot metal looks the same as cold metal. Use tweezers and a bowl of water to quench your rings, or wait until you are *certain* the rings are cool enough to handle.

Copper and copper alloys do not fuse well. 22+ karat gold and pure (fine) silver fuse nicely. Sterling silver does not.



Silver pinched loop-in-loop. Greece, 14th-15th century. British Museum: AF.2824.



Silver double loop-in-loop. Denmark, 500BC-1050AD. National Museum of Denmark: DO-2381.



Gold pinched loop-in-loop. Portrait of Kunigunde of Austria. Anonymous Austrian artist, c. 1485. Museo Thyssen-Bornemisa: 1964.15.



Pinched loop-in-loop. Germanic Italy, 5th-6th century. British Museum: 1933,0405.10.

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Gold single loop-in-loop. Anglo-Saxon (Sutton Hoo), late 6th-early 7th century. British Museum: 1939,1010.4.



Silver double loop-in-loop. Sweden, 12th-15th century. Swedish History Museum: 41379.



Silver pinched loop-in-loop. Swiss, before 1477. Metropolitan Museum, New York: 17.190.360.

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