

COLOR: ALLOYS, PATINATION, AND GILDING

Background






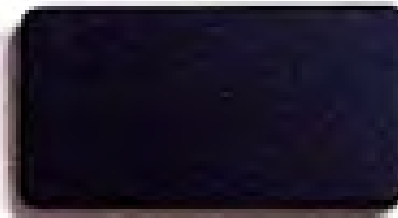




While Western metalwork has long depended on gemstones, enamel, or paint for added color, Japanese metalsmiths have focused on variation in color in the metal itself. In fact, in Japan it has been the custom to refer to the five metals most used for craft production by their colors; gold is “yellow metal,” silver is “white metal,” copper is “red metal,” iron is “black metal,” and tin is “green metal.” They have expanded this palette with alloys and patinas, and use gilding as one would paint.

Some people speculate that this difference in taste and focus comes from a relative lack of colored gemstones in Japan. Others theorize that it stems from the climate itself. In the mostly dry countries of Europe, rust and other forms of oxidation are seen as a disfiguring blemishes. In the damp climate of Japan, oxidation is inevitable. People saw the subtle colors they created as beautiful, and metalsmiths experimented with the deliberate oxidation or patination of metals, refining their techniques over the ages.

Unlike paint, if covered with a clear layer of wax or lacquer the colors from these methods remain unchanged, beautiful, and stable for a long time, even lasting several hundred years if well preserved.

Irogane

The specific techniques for coloring metals, irogane and niage-chakushoku were only developed in Japan. Irogane (iro – color, gane – metal) is an alloy of copper and some percentage of gold, silver, tin, lead, and/or zinc that achieves a specific color. Niage-chakushoku (niage – boiling, chakushoku – the development of color) is the method of coloring the irogane by boiling it in a chemical solution to form rokusho patina. The metal reacts with the chemicals to form an oxidized crust. The concentration of the chemical, the temperature of the solution, and the duration of boiling are different for all the metals.

	Raw Metal	Patina
Copper with Rokusho		
Copper with Hido		
Shakudo		
Shibuichi		
Bronze 70% Copper 30% Zinc		

Shakudo (shaku – red, do – copper) is an alloy of copper and pure gold with a purplish black glossy surface when oxidized. When the percentage of gold is 1–5% it is called ukin (black gold), and when it is 7–13% it is called shikin (purple gold).

Shibuichi (meaning one-fourth) is of 75% copper and 25% silver with traces of pure gold. Shibuichi turns grey when patinated. The effect is different from silver that has been deliberately treated to give it an ancient look. Its alternate name rogin (lit. ‘dusky silver’) comes from the distinctive appearance of the crystalline surface.

Kuromido contains 99% copper and 1% arsenic. This alloy is used as an alternate material to the more expensive shakudo. The color of kuromido is not the same as shakudo, but they both produce a lustrous deep black.

Preparing the Metal

The metal must be completely clean and free of oil. To achieve this, metal that has been polished with charcoal powder, scrubbed with baking soda on a hair brush, and rinsed is placed in a bath of daikon radish juice. To make this bath, the radish must be hand grated since a blender breaks down the enzymes.

Kinkeshi and Ginkeshi

Kinkeshi and ginkeshi are respectively, gold and silver fire gilding (kin – gold, gin – silver, and keshi – amalgam). This process consists of applying a mercury amalgam of precious metals as the base metal, then heating the piece, volatilizing the mercury and leaving the precious metal behind. Depending on how it is applied, this technique can produce a wide range of effects; it can look like pure gold has been applied to the surface – bold and bright, or it can seem as though just a shadow of the material is present.

Hido Patina

Hido patina is done to turn copper a rich, red color. This is achieved by heating the finished piece to a glowing color and then quickly cooling it in a bath of boiling water and borax. The color can vary slightly based on the temperature of the metal when it is put into the bath.



Hiroko Sato-Pijanowski, Brooch, *Cherry Blossom*, 1988. Fine silver, gold; uchidashi, kinkeshi, 1 x 2¼ x ¾ inches.



Kiyoko Fujie, Ornament, *Kadsura Japonica*, 2013. Metal: Bronze. Red nut: Hido (scarlet). Leaves and stems: Bronze. The white part on leaves: Silver (Flat inlay). The black part on leaf: Shakudo (Flat inlay). The brown part on leaf: Copper (Flat inlay). Small yellow dot: kinkeshi. Nut and stem are soldered. Leaves and stems are made of one sheet metal.