Copper's development on roof & façade generally

The normal surface development for copper begins with a shiny copper colored metal surface that will oxidize with atmospheric contact. This oxide layer will vary from grey to almost black, yet the most common color is brown. In time, copper minerals will develop on the oxidized surface and the material will turn green. The amount of moisture (rain or mist) together with impurities in the air the surface will get over time is a key factor for patina development. Subsequently a roof typically displays a faster rate of change than a façade and some difference may even be observed between a South facing wall and a North facing one.

As copper is a natural product, when it is exposed and begins to weather further changes to the surface will occur due oxidization and patination. The rate of change is dependent upon the location of the copper and the building and the prevailing weather conditions.

Copper's use on ceilings

If the copper is installed as facing down the surface won't get the normal washing effect of the rain. Thus the color of the copper may and probably will differentiate from other areas of the building as the patina cycle is affected by the lack of rain. Also water condensation may cause color differences. Furthermore copper on ceilings close to the sea shore calls for special attention already at design stage. This because of drifting and staying chlorides from the sea will heavily react with copper.

Leaching of the other materials on copper

When using copper below or in conjunction with mortar, cedar/trees, cement and other materials which can leach acids. Leaching acids may disclour oxide and patina as well retard the forming of the protective oxide layer on copper.

Organic acid fumes from the tree may cause slight colour difference even in a same facade

Runoff

The natural weathering of copper results in the formation of copper salts at the surface of a copper sheet. These salts are then mixed with rainwater and if allowed to run on to other materials will cause the characteristic greenish/blueish staining. To prevent such stains, the use of longer overhangs, sloping of copper surfaces away from other materials, gutters, and drip edges are all recommended.

Example of copper staining on cement