

Hammered Metal Case Study

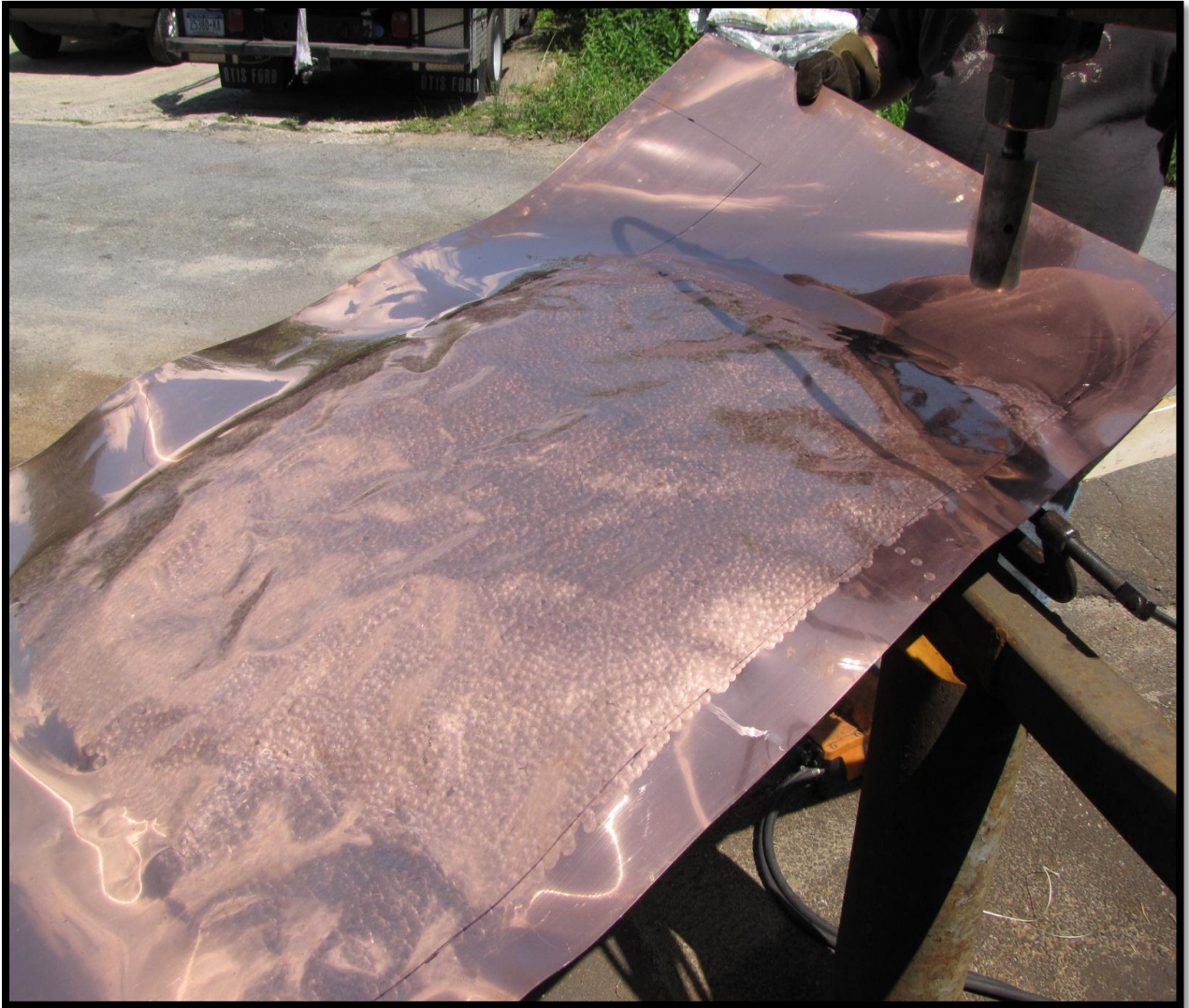
One of the more common requests that Spirit Ironworks, Inc. receives is for textured metals in various thicknesses and sizes. The possibilities for this material are endless. They can be used as decorative panels, signs, range hoods, railing panels and table tops. These textured metals impart a hand crafted sensibility and an interesting detail to both interior and exterior metalwork. This will show some of the approaches we take to create hammer textured metals as well as their applications.



One of our experienced smiths has set up our power hammer to recreate the effect of a hand hammer's blow. The sheet itself is aluminum and is over 5' long. The smith starts by creating overlapping hammer blows with a top die that we made for this purpose. This material is 1/8" thick, which was chosen so that the effect of the hammer would be obvious.



This is an example of how we hammer thin copper sheet. We custom built a pneumatic air hammer which strikes about 500 blows per minute. The hammer is controlled by a foot pedal which enables the operator to hold the sheet at the same time. Here you can see how much the metal distorts during the hammering process.



Here is a close up of the finished copper sheet after being hammered.



In order to flatten the thicker aluminum, we use a hydraulic press. We flatten the aluminum between 2 thick plates of steel known as platens. Since aluminum is very soft, we protect it by sandwiching the metal between 2 pieces of wood. This prevents the harder steel plates from being marring the softer aluminum.



This sheet is so large, that it requires 2 people to flatten it.



After hammering and pressing the material, it becomes work hardened. By heating it to a certain temperature, it becomes workable again which will enable us to continue the flattening process.



The final stage is to focus on areas that need to be further refined. We used a large wooden mallet on top of our largest steel anvil to remove little dips and ripples that can't be flattened by using the press. This particular tool is modeled after an antique wooden mallet used to drive spikes for circus tents. The mallet is made from wood to stop the material from nicks and dings while it is hammered.



Hammering the metal will cause it to compress and become thinner. The areas where the hammer directly contacts the material will stretch, however the areas that are missed will not. Due to the nature of this process, the metal will never be completely flat. These irregularities add to the overall character of the piece.



Here is an example of how the hammered copper sheet was used. This sheet was laminated and wrapped around $\frac{1}{2}$ " thick plywood to create a unique ceiling medallion for a private residence in Southampton, NY.



For this entertainment unit, the copper sheet was laminated and nailed to a wood top using decorative hammer textured nails. As you can see, the top has a beautiful irregular patina that was achieved when the copper was heated for flattening. We call this particular patina "fire scale".



Here is another example of the copper being used as a skin for a stainless steel canopy.



This custom range hood is made from hand hammered copper sheet and silicon bronze flat bar. The sheet is attached to the straps by using bronze rivets. The corners of the hood is particularly challenging because of the domed shape. This is achieved by hammering the sheet into a leather bag filled with steel shot and smoothing the surface with polished hammers over tools called stakes. We are the only shop in the region that keeps this sort of tooling on hand.



This beautiful custom built sign was designed by Integrated Sign and Graphic Inc. in Lexington, KY. We provided the raw hammered aluminum sheet which formed the body of the sign.



These thick copper panels are an integral design element for this art and crafts style railing. The marriage of these hand hammered panels with a mortise and tenon frame provides a unique way to comply with the spacing requirements found within NYS residential building code. Care was taken to insulate the copper from the steel to prevent a galvanic reaction by using stainless steel attachment points.



The original design for this balcony rail called for the entire piece to be made of bronze. This was not possible given the project's budget restraints. As an elegant solution, we added ¼" thick hand hammered architectural bronze panels within the frame. These bronze elements serve as a focal point which highlights the entire railing.