Blackening Metal Parts

Model ship builders are quick to realize the advantages of chemically blackening metal parts. The process will not obscure any detail, and it affords the ultimate scale coating. Unfortunately, many attempts end in failure.

Bob Filipowski opened his presentation by explaining the three most common reasons for this. Proper surface preparation is probably number one on the list. Metals oxidize or they may have oily residue on them, which prevents the blackening agent from doing its job. Many modelers will burnish the surface of the part with fine steel wool, but this procedure doesn't always get into tiny crevasses. Also, fine photo-etched parts can be damaged if not handled carefully.

Bob recommended a product called SPAREX NO.2, which chemically etches the surface of non-ferrous metals such as silver, copper, and brass. Made by Krohn Technical Products Inc. of Carlstadt, New Jersey, this chemical has been popular with jewelry makers for years.

The membership was emphatically warned about the potential dangers of this product. Due to the fact that this material is a granular dry acid compound, personal protective equipment, which includes a dust mask (when mixing it), rubber gloves, and goggles or face shield are highly recommended. Certainly, it should always be stored in a safe place away from curious little ones.

An area where Bob has had problems in the past is the blackening agent itself. A number of years ago, Filipowski tried a product called Blacken-It, which is sold by many hobby shops and catalog supply houses. The results were less than adequate, and it wasn't until he tried another agent called Brass Black by Birchwood Casey that the procedure improved. The latter product is quite popular with gun collectors and model railroad enthusiasts. **Incidentally, both of these products are considered poisonous, and should be handled and stored with care!**

It was stated that some Shipwrights have actually achieved success with Blacken-It when it's diluted 50/50 with distilled water. Bob could not confirm this, but he surmised that the thinned solution afforded a much slower process, which improved the chemical reaction with metals. This brought the presentation to reason number three.

Poor blackening is often the result of a common attitude found among most human beings. (Mostly male.) "If a little works well, then a lot must work even better!" Well, nothing could be further from the truth. Bob pointed out that many modelers keep metal parts immersed in blackening solution for as long as 20 or 30 minutes. This allows the agent to actually form a thick crust on the surface of the part, which easily flakes away when handled. A short soaking time of approximately 20 seconds, followed by another 20 or 30 seconds out of the bottle is usually adequate for a first application. (If the pieces are too large to fit in the bottle, Birchwood Casey can also be applied with a paintbrush.) The solution is then carefully wiped from the part with a soft cloth. An old tee shirt works quite well for this purpose. If the darkened metal does not meet with your requirements, simply repeat the process.

As stated earlier, SPAREX NO.2 is an excellent agent for removing oxidation and oily residue from metal parts, but the concentration of the solution can impact its effectiveness. The manufacturer recommends dissolving a half pint can (10 ounces by weight) in a quart of water. Depending on the size and quantity of the parts you are working with, this may be overkill. For the demonstration, Bob used a small glass jar with approximately 2 ounces of water and 4 teaspoons of SPAREX mixed in. This seemed to work well.

It was pointed out that this agent works at room temperature, but heating it to about 140° improves its effectiveness. Filipowski had, what might be considered a somewhat primitive setup for achieving this temperature, but you couldn't argue with the results. The tools of choice were a candle, which had been melted down into a large jar lid, a coffee can with ¼" holes punched around its base and on top, and a thermometer. (Bob said to keep adding holes around the bottom, until the candle stopped going out!) Someone asked why he didn't use the kitchen stove for this process. Filipowski mumbled something about his wife and a sense of self-preservation on his part, and the discussion continued with no further interruptions.

When it comes to soaking the parts, the rule of thumb is to leave them in until they're shiny. The membership was cautioned about this process and photo-etched parts. If these thin fittings are left in the solution too long, they can actually start dissolving! When ready, thoroughly rinse the parts and allow them to dry. Do not handle them without clean rubber gloves or a towel. The oil from your hands can result in a blotchy finish. Bob likes to put the fittings under a lamp to ensure that they are dry before immersing them in the blackening agent. The slightly heated metal can also assist in the process.

There's one other interesting phenomenon concerning this procedure. Believe it or not, the blacking agent will continue to react with the metal unless it is completely neutralized and dried. If this is not done, the object will continue to exhibit moisture on its surface. One member stated that he experienced this problem almost a year after the parts had been blackened!

Once the fittings have been allowed to dry completely, they can be buffed to a very nice luster or left a dull black.