Subject: Re: SE - Copper would be cool!
Posted by Thermionic on Thu, 22 Dec 2005 10:00:21 GMT
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I'm a tool and die maker with literally thousands of hours of experience in machining plastics, especially when working for a company that produced robotic poultry processing machinery.As someone had noted, Teflon is very easy to machine when using a razor sharp end mill. Delrin is even easier to machine, and machines more accurately, but requires a bit more deburring in most cases. But unlike some plastics, both these plastics can be very easily deburred by lightly scraping the edge of a stainless steel 6" scale over the burr. PVC is brittle, and more difficult to deburr. There are many different Nylons available, but the common type 66 is easiest to work with.The feasibility/possibility of laser cutting plastics was mentioned. What you'd want to use is abrasive water jet cutting, where a fine garnet oxide abrasive is fed through stream of water under tremendous pressure. It cuts plastic like a hot knife through butter, and leaves a very clean edge except for the entry/exit point.For scratch resistant clear plastics, nothing beats Lexan polycarbonate. But unlike acrylic monomers (Plexiglas, Perspex, Acrylite, Lucite), any scratches cannot be polished out very easily at all. Scratches will come right out of Plexiglas with ease using Novus plastic polish, which is hands-down the best polish available. I used to machine 12" long bevels on these 18" wide, 2" thick Plexiglas plates, that had to be scratch-free, crystal transparent across the entire 12" x 18" area when done. I used some progressively fine sanding discs on a hand sander to work out the flycutter marks and then the coarse sanding marks, then I went to some jeweler's rouge on a cotton buffing pad to get a dull shine. Finally, I went down to the coarse and fine Novus polish on cotton pads. It looked absolutely perfect when I was finished. They had used jeweler's rouge in progressively finer grades on the original prototype part, but it proved less than satisfactory. I recommended the Novus polishing system, and that made all the difference. I'm also a welder, with 2 years of welding school, and some 24 welding certifications, but quit work as a welder years ago. Plastic welding was a subject in welding school. I was even offered a job welding plastic once at a company that made machines to deflux PC boards after soldering. Very few thermosetting plastics can even be welded successfully, and polypropylene and polyethylene are definitely the easiest, best candidates. The weld is performed using a heat gun and a filler rod, just like oxyacetylene or TIG welding, except there is no actual molten puddle. The plastic is just heated to a semifluid state a little below it's scorch point, and the rod laid in in a continuous bead.Thermionic