

# Back to Basics for Profile Extrusion

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What happens to a professional golfer when he finds himself slipping? Well he goes back to his teacher to review basics. The same thing should apply to profile extrusion. This article is directed to the small and medium size shop where management cannot justify buying sophisticated equipment.

So, go out in the shop and observe any one of the lines—check the basic functions from the compound to the finished profile at the table.

Some materials going into the extruder must be dried and preheated. How about preheating material where moisture isn't a problem? Warm material dropping onto the screw can be compared to adding length to your screw and barrel. Try preheating.

Extruder output—is it up where it should be? Between resin suppliers, the extruder manufacturer, and other converters, you should have a good idea on what your machine(s) should do. Assuming you have a correctly designed screw and heat profile, does the screw and barrel show any wear? A little wear can cause a slip in output. It can also cause overheating of the melt. Rigid PVC usually needs an oil cooled screw. Try varying the oil temperature (slowly) both ways and measure the profile output.

Are your dies in good shape? Inroads are being made in plating and also in the treatment of tool steels, offering extended life with abrasive materials.

Cooling the profile with water—make certain the water is moving (good circulation) in the tank. Otherwise, a laminar condition (in the water) will result in poor cooling. An efficient method of cooling is to use a water spray if it can be done uniformly. There's nothing wrong with running the pro file through water first and then follow with spray.

Water—do you throw it away? Even if you have your own well, it is wrong. Give thought to a close loop system. (In my first enclosed system, I used washing machine pumps to push the water around.) With a closed system, you can have a higher quality water. If yours is soft to begin with, you're lucky. If it's not soft, consider a softener. Additives are O.K. but some will plate out. There's nothing wrong with rain water. In one plant, I used a still and made my own soft water. With a closed loop, you can easily pipe the heated water through a car radiator (in the winter) in the foreman's office. It is no problem to run your system through a chiller.

The puller looks like an innocent machine, but don't take it for granted. Provide a guard at the belts. If you're running a profile at a good rate, all hell can break loose if the profile breaks. Why not provide a panic button at the puller. I mounted a simple push button switch and connected it to a loud horn on the wall. (110 volt system) It worked well.

Cutting the profile—make certain you have the best designed saw blade or knife. Refinements have been made on carbide tipped thin blades. Like the puller, use a guard in the cutting area.

Marking is necessary on some profiles. The biggest headache of the marker is the mess from the ink. You must clean the marker often. This will make for better marking. Keep the floor clean. A shallow aluminum pan on the floor will help. Don't be stingy with marking equipment. Good marking reflects quality. Provide removable guards around the moving marker parts. Very little can be said on the product table since this will vary with the particular profile.

Are you stocking spares? Some parts may cost too much to keep on the shelf. In this case, make certain that you know what action to take in case of a breakdown—and how long you can afford to be down. Don't forget the nickel and dime items (spares). We lost half a shift in downtime for lack of a 25¢ fuse for the lift truck! After you have reviewed your line (s) and supporting equipment, test yourself with the "What If" theory.

The final word on basics - DISCIPLINE. If your foreman and operators are not serious with the operation, many bad things can happen—out of spec products, lower production, poor housekeeping, failing to keep up with spares, and lack of respect for management.

See also:

- Answers - preheating feedstock for extrusion
- Extrusion dies
- Extrusion evaluation through pressure and melt temperature analysis
- Precision profile extrusion
- Process uniformity
- Ten key principles of extrusion
- The importance of periodic audits of extrusion performance

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