

A new die lip can change your profits

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It's humorous many times to observe a million dollar line turning out marginal quality film for the lack of a good set of die lips. The old lips are warped, distorted, nicked, hammered, filed, etc. and the product contains gauge variations and die lines all over the place. New lips in terms of return on investment are exceptional, and yet we are so reluctant to proceed along those lines.

The first question is what kind of lip. In general, most lips are too short for good uniformity indexes, so they can be lengthened by 25% and the gap can be opened a few thousandth's to maintain the same pressure drop, if required. This requires individual review to establish where you are and where you would like to be. Depression zones can also be incorporated if there are bad spider lines. If your back pressures are 5-7000 psi you naturally don't want to be any higher. The resin suppliers have a lot of know-how on specific die gaps to fit their resins and it is available for the asking. You may already know from your own experience and you just procrastinate about ordering the new lips.

What type of steel? You want a high strength, minimum distortion type steel. Here is a good one to consider. Buy a 17-4 PH stainless steel made by Armco in condition A which is treated so it can be machined. It machines beautifully in this condition with a carbide tool.

Finish your part and allow .002 to .004" for final grinding depending upon size. Refer to Armco Bulletin S-6c. (They are in Baltimore. Maryland.) Liquid Nitride to Rockwell C 42-44 which is obtained by condition H900.

You will find that by treatment in this manner, the distortion is almost nil and the result is a glass-hard surface. This gives your lip extreme permanence. I personally found that shrinkage from treatment to be less than other hardenable tool steels. With a little experience you can easily predict the amount to leave for final grind and try to keep it to a minimum. It is a very good performer in that treatment gives a repeatable performance.

With small medical tubing dies, i.e. 1/2 to 1" we finished it completely and just polish it after the liquid nitride. No scale is formed. Threads also become hardened and you have no fear for galling. On threads we allow .001" to .002" extra clearance.

One other important point is that it is a magnetic stainless and can be held magnetically to a surface grinder for doing flat surfaces. That's it, with your tip for the day.

- Paul Limbach

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