FINEBLANKED PARTS

THE ENGINEER'S FINEBLANK COST ESTIMATOR

Why should you consider designing for fineblanking? When the edges of your part, or walls of holes, have a function in your design. When the projected volume can justify a tooling cost between $10K and $15K. Generally, fineblanking does not compete against conventional stamping (which is cheaper), but rather as a lower cost alternative for parts that would otherwise be machined, cast, or ground. Most metals can be fineblanked, excepting those that are hard or of extremely high tensile strength.

The following is a list of process steps that a fineblanked part can go through to make the finished part, listed in order of increasing complexity and cost. In each case we note the reason for the additional step and its approximate cost. The assumption for these examples is a part with a maximum length between 1" and 3", and a thickness between .050 and .250.

1. ***MATERIAL.*** Start with $.05 to $.10 per part for steel and $.20 to $.30 for stainless steel or aluminum. A more accurate approximation is to calculate weight times the current price/lb of the specified metal. To determine volume find the smallest rectangle that encloses the part, call the shorter side the progression (p), the longer side the width (w), and the thickness (t). Then multiply (p+2t)x(w+3t)x(t). Curved parts can sometimes be nested to save material.
2. ***FINEBLANKING.*** Use $.10 to $.15 per part. At this point you have a part with all planar dimensions +/- .001, flat and parallel within .005. Holes will have a slight taper, approximately .0002 per .10 of thickness. One side of the part will have the edge rolled off, the "die roll side", the other side will be sharp with a burr, "burr side". If there are semi-pierced holes, the protrusion should be designed for the burr side.
3. ***DEBURRING.*** Tumble, sand, or brush to remove the burrs and break the sharp edge. Use $.05 to $.15, the latter if the part has many holes in it. This step is the last one for the simplest possible part or it can be done after one or more of the steps listed below.

ADDITIONAL PROCESS OPTIONS

1. ***DOUBLE DISC GRIND.*** If you want the part flat and parallel to .0005", add this operation.The price varies from $.10 for a symetrical part to $.30 for an asymetric thick part.
2. ***HEAT TREAT TO HARDEN.*** Use either nitriding to harden the surface, or quench and temper for greater case depth. Nitriding has the advantage of causing minimum part distortion. It also works well on most 300 series stainless steel. It costs $.20 per part (individual racking is required). Use $.05 per part for standard heat treating.
3. ***MACHINING.*** This may be required to ream holes to tolerances closer than +/- .0005", tap threads, or to cut slots, angles or counterbores. If the design has placed holes too close to an edge, this is where the penalty is paid. There is no "generic" price for this work. It depends on the amount of material to be cut and the number of setups required.
4. ***BROACHING.*** This is a technology that is occasionally a cost saver for parts having sharp interior corners. It can also create outlines almost impossible to do in conventional machining. Cost varies widely depending on how extensively the job is tooled; use $.20 to $1.00 per part for estimating.
5. ***LAPPING.*** This comes into play when one surface needs to be very flat, better than .0003" and down to .00001" in extreme cases. Or when the surface finish needs to be better than 32 RMS and down to a mirror finish. Prices range from $.15 for the easier tolerances up to several dollars for the extreme tolerances.
6. ***CREEPFEED GRINDING.*** If a very accurate profile shape, +/-.0004" truth of form, is desired on either the top or bottom surface of the part, this technology is excellent. Cost is in the $1.00 per part range.
7. ***PLATING.*** The major cost variable is whether the parts can be tumble plated or must be individually racked. Prices range from $.05 up to $.50 per part for the more expensive coatings and handling.

We hope this quick summary will help you test the applicability and cost of fineblanking for your part. Petersen Precision is always ready to discuss your specific requirements and to provide detailed quotes for your unique part.

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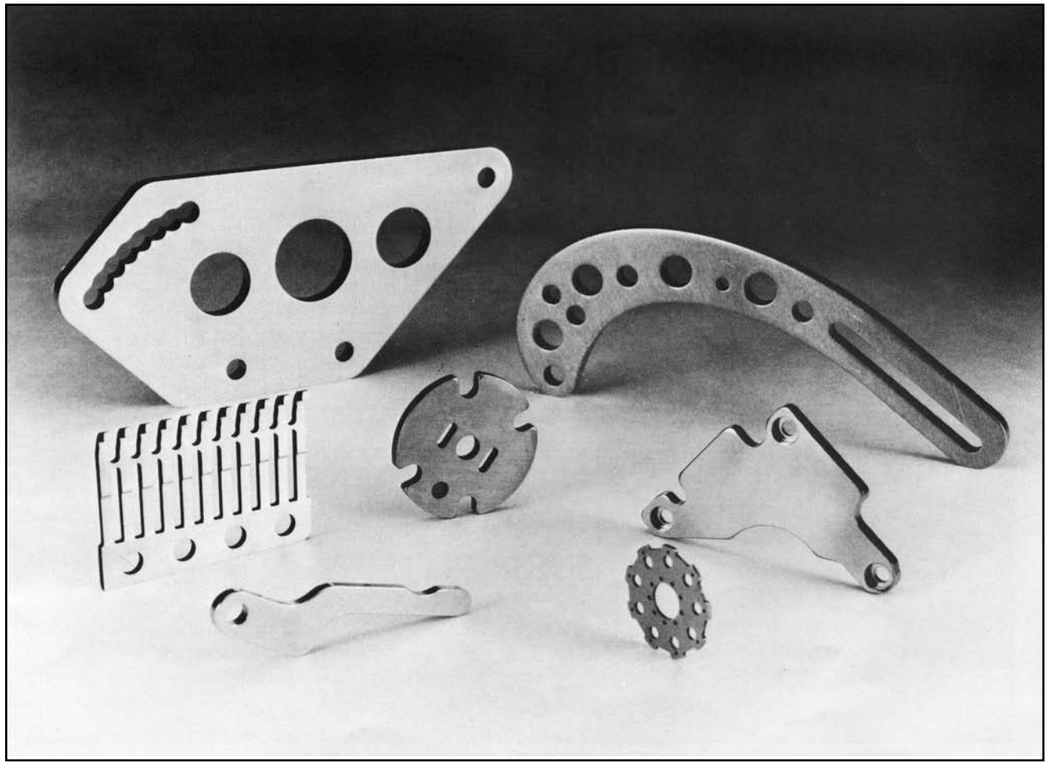
Fineblanking is a part blanking process developed in Europe to avoid the pitfalls of conventional stamping. Through the special design of the press and dies, the part is blanked without the severe roll-off found in stampings, and with edges which have a surface finish similar to machining. Part accuracies, including profile, holes and other such details, are more exact than conventionally stamped parts.

Petersen Precision offers fineblanking on its Feintool/Osterwalder and Hydrel presses, and our toolroom is specially equipped and staffed to produce and service fineblanking dies. All Petersen fineblanking dies are designed, built and serviced in-house.

— SEE DESCRIPTION OVER –

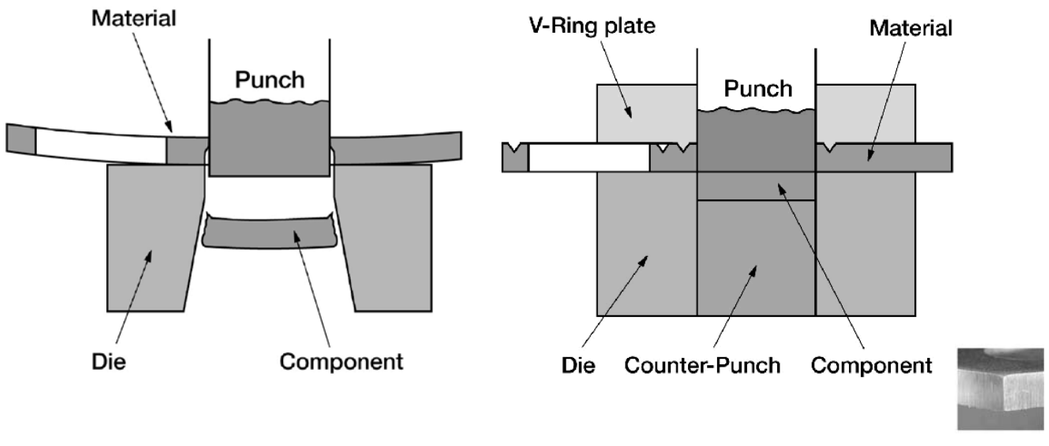


FINEBLANKING

A COMPARISON WITH CONVENTIONAL STAMPING

In conventional metal stamping a 2-part punch and die set is used (see left drawing). Fineblanking adds two more elements: a clamping or "stinger" plate to prevent die roll-off and a counter punch to control deformation as the punch pushes through the plate. Thus, the part is smoothly removed from the strip. The fineblanking process resembles an extrusion process rather than the shearing process of conventional stamping. This results in a part with superior flatness, smooth edges, less roll-off and tighter form tolerances. The improved tolerance control results from die to punch clearances of 1/5 or less than that of conventional stamping.

CONVENTIONAL STAMPING ***FINEBLANKING***



30% smooth edge Part

75%–100% smooth edge Part