The first consideration for trimming aluminum is the fact that slivers are produced in cutting the material. As can be seen in the following figure, the cutting action creates compressive strains in various areas through the section. As the cutting action continues, the strains are reversed to tensile forces, finally resulting in a shear and break through the thickness of the material.

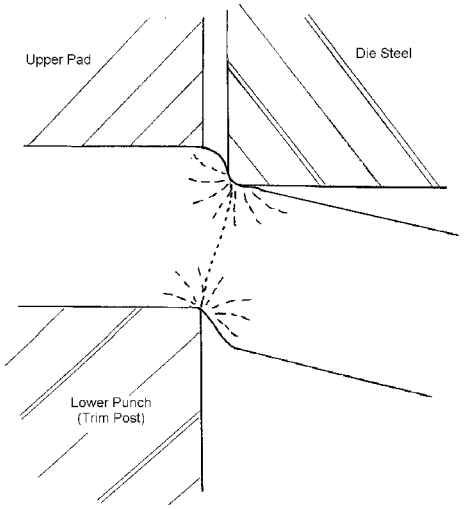

Figure 4-15. Action of Cutting

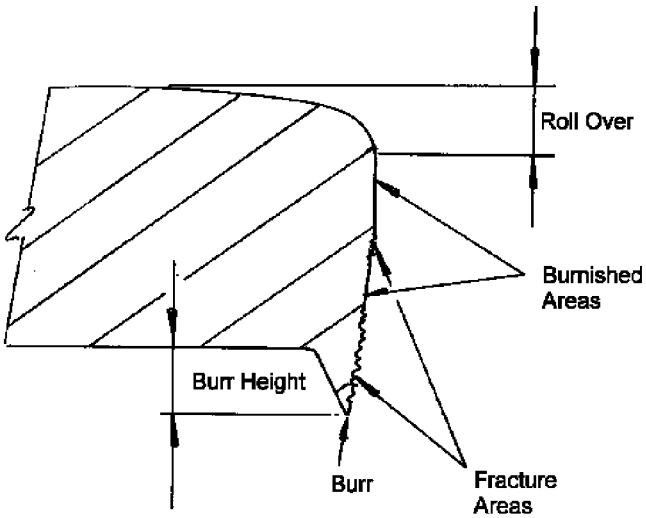

Figure 4-16. Section View of Trim Edge

The above figure shows a typical section view. As can be seen, the top surface exhibits rollover which is followed by a burnished area, which leads to the first of two fractures, caused by tensile strains across the cutting edges of the die and punch steels. These are separated by a small secondary burnish area. Finally, there is a burr hanging down in the direction of the cutting action.

Aluminum work hardens, and the action of trimming results in hardened pieces (slivers) breaking off as the burr is formed. The slivers can vary in size, but can be up to several millimeters long. These slivers create contamination in the die, and cause problems for cosmetically sensitive parts, as they result in "pimples" on the outer surface of the aluminum. These pimples are caused by the slivers remaining stuck to the panel by the lubricant that is applied to the blank prior to the drawing operation. When the panel is placed on to the restrike post (punch), the applied pressure embeds the sliver into the back of the panel, showing a raised pimple on the show surface.

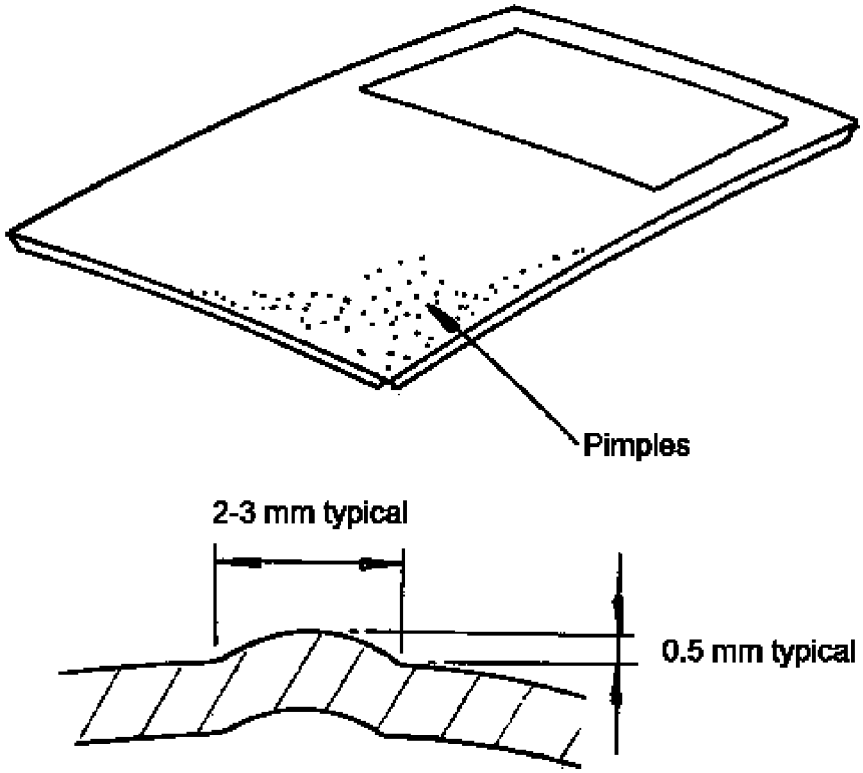

Figure 4-17. An Example of Pimples on an Outer Panel