

Identification of Laser Cut and Punched Parts

Van's Aircraft Reference Document

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Identification Overview

- There are certain characteristics that are unique to each of the two manufacturing processes (punch-press and laser-cut)
- This document provides information and visual reference to guide the person who is identifying parts in a kit
- Parts can be inspected in a variety of locations when working to identify whether a part was fabricated on a punch press or laser machine
 - Tooling holes
 - Lightening holes
 - Other edges

NOTE: We will be adding information to this document over time including examples in the future. We welcome feedback which can be sent to support@vansaircraft.com.

Laser Cutting Process and Terminology

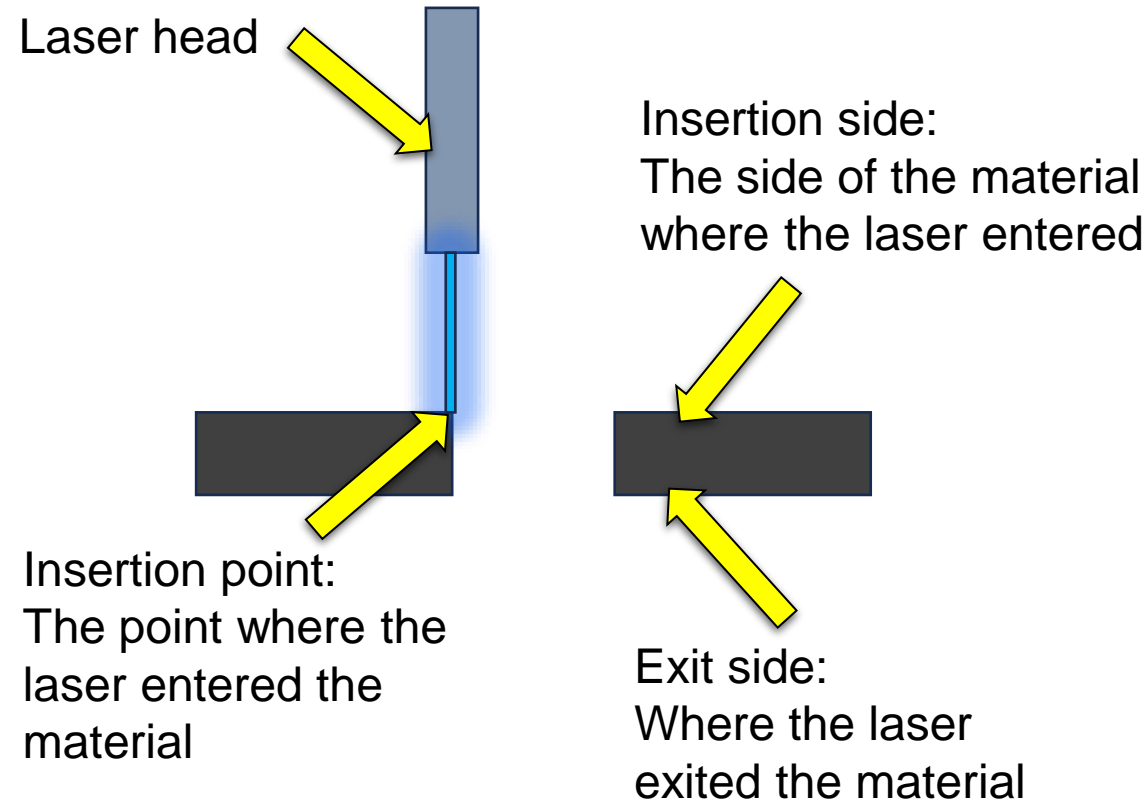
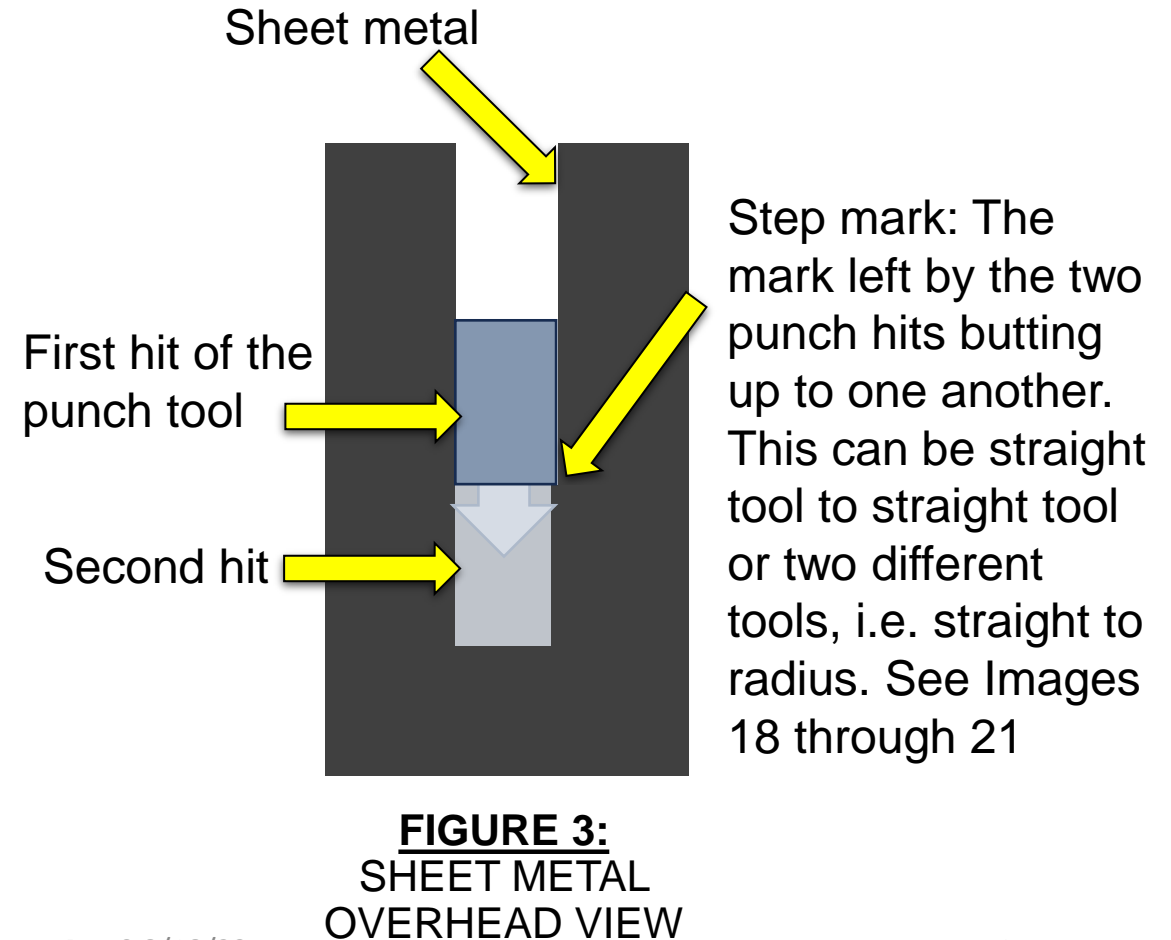
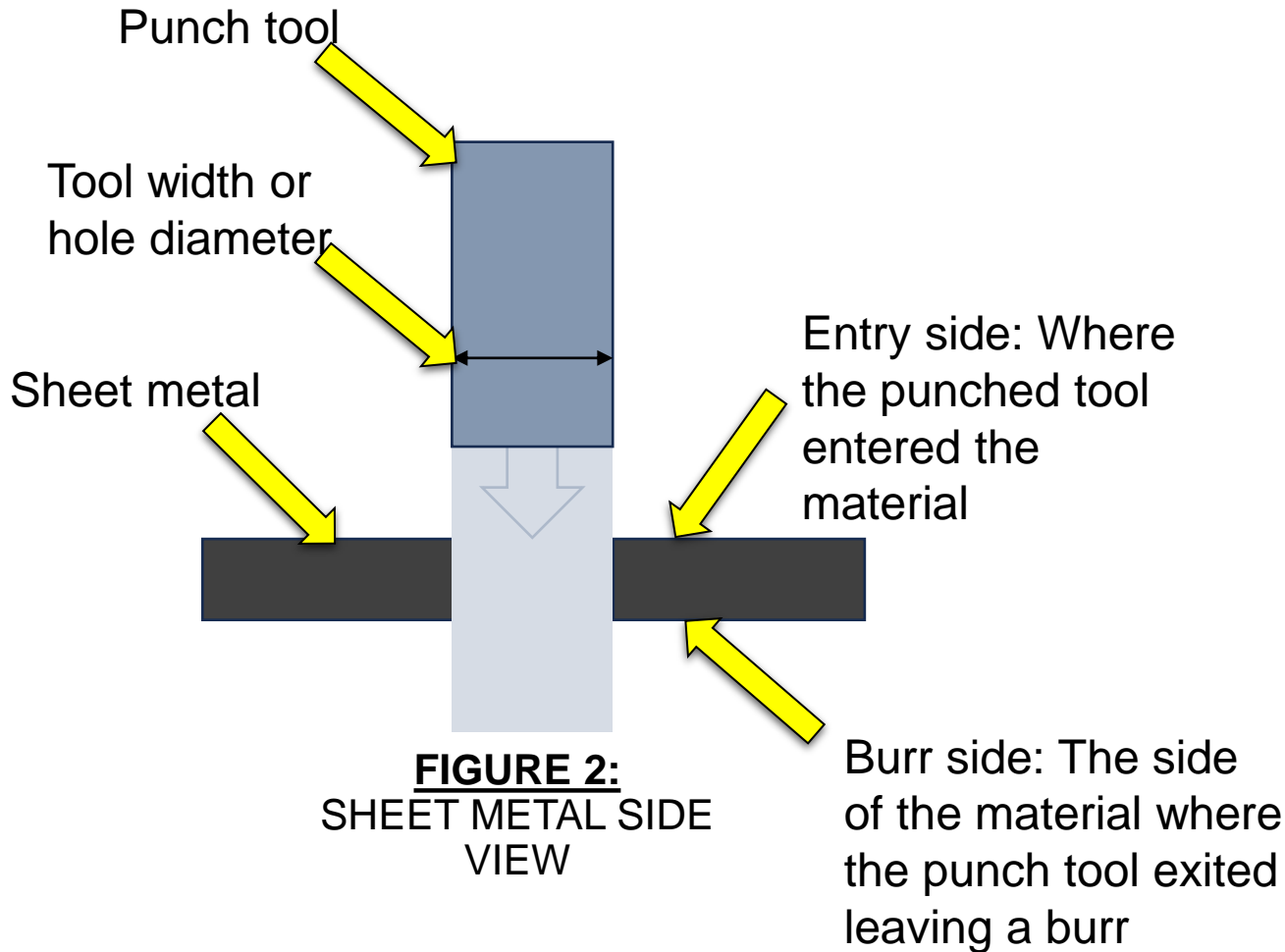


FIGURE 1: SHEET METAL SIDE VIEW

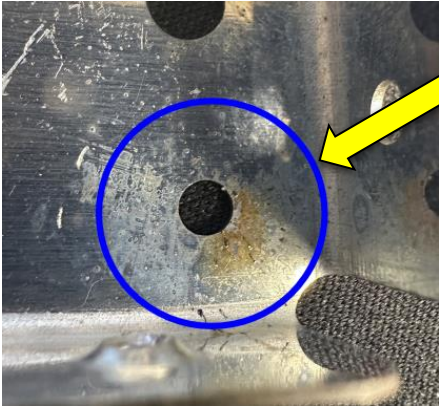
Punch Process and Terminology



Laser Cut Part Identification

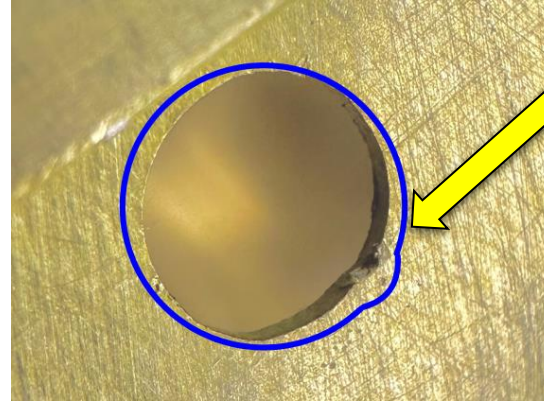
Visual Identification of Laser Cut Holes

Image 1



Scorch marks & material splatter are key identifying factors of laser cut parts.

Image 2



View shown from the insertion side:

Material displaced along the perimeter of the hole, often more present on the entry side of the material.

See Image 6 for exit side view.

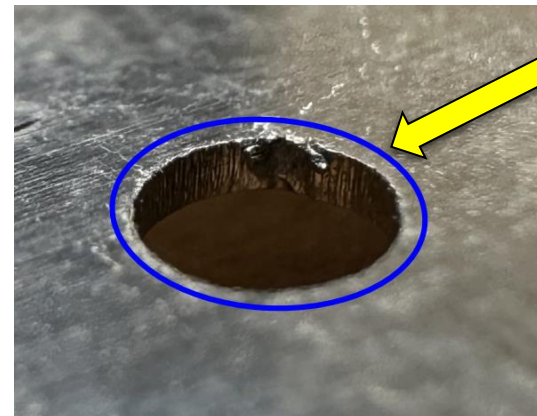
Image 3



View shown from the insertion side:

Displaced material is more pronounced on the insertion side of the material. See image 4 for additional example.

Image 4

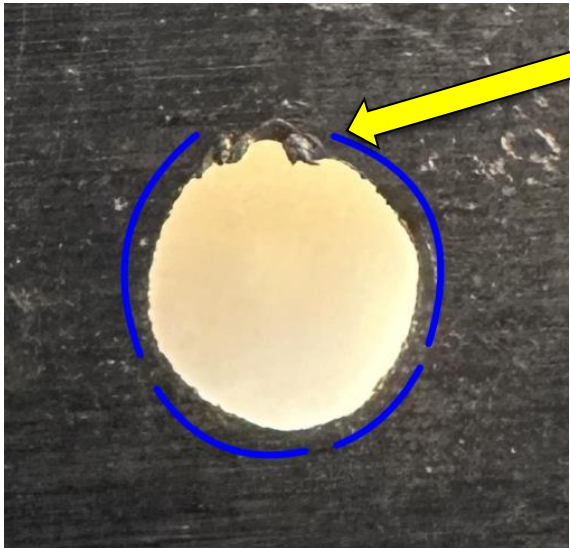


View shown from the insertion side:

Waviness/striations (vertical lines) can be present through the thickness.

Visual Identification of Laser Cut Holes

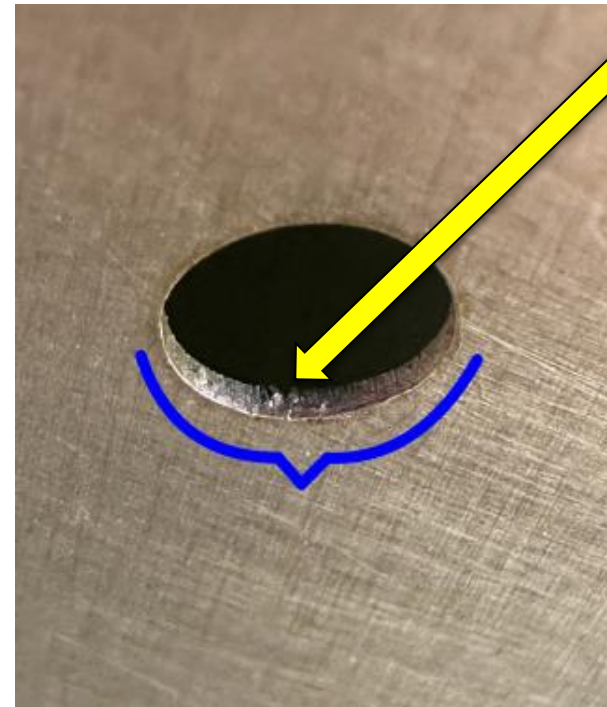
Image 5



View shown from the
Insertion side of the
material:

Displaced material and a
lack of roundness due to
the laser cutting path.

Image 6



View shown from the
exit side of the material:

Note that the displaced
material is more
prominent on the
insertion side.

Visual Identification of Laser Cut Edges

Image 7

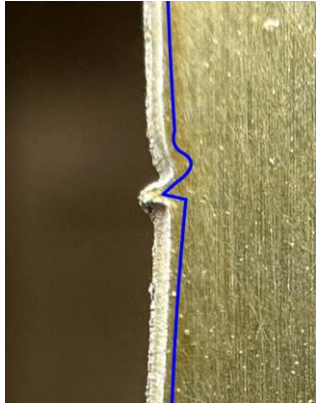
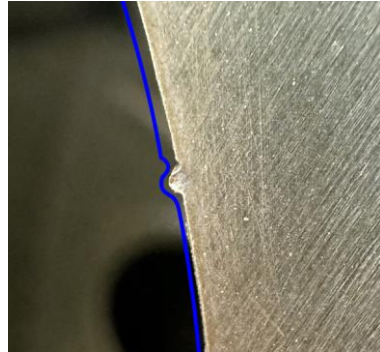


Image 8



Images 7 through 10 depict a variety of laser cutting paths. A pronounced feature of each is a tab of material that is then followed by a notch into the edge of the part.

This should not be confused with the repetitive punch step marks. See Figure 3 and Image 18

Image 9

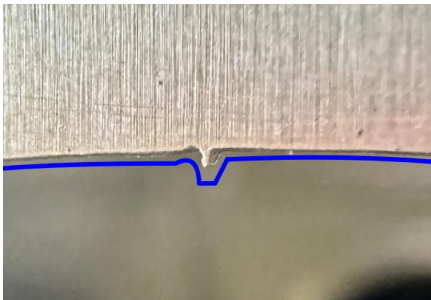


Image 10

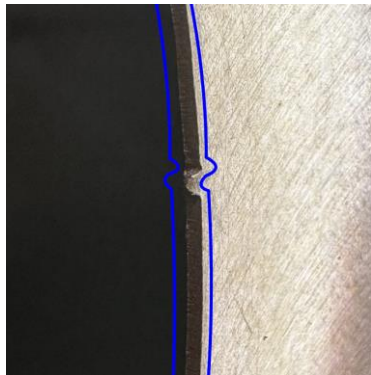


Image 11

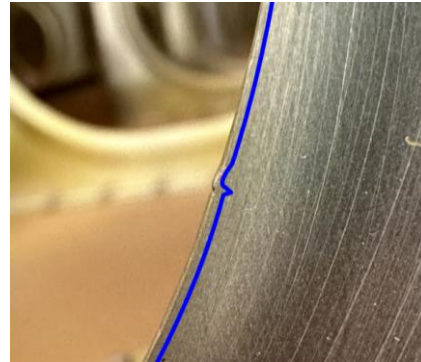


Image 12

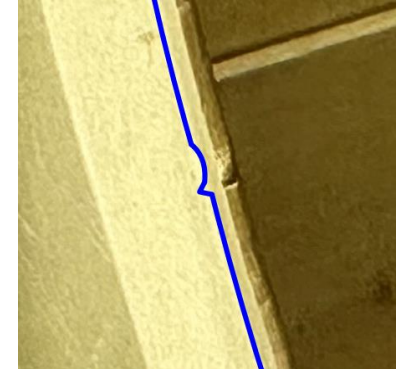
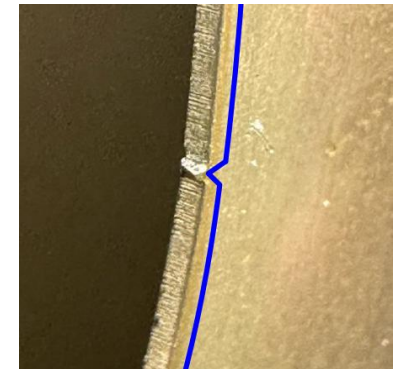


Image 13



Images 11 & 12 depict deburred examples of a tab of material that is then followed by a notch into the edge of the part.

Image 13 depicts a tab of a material. This will look like a tab with little to no notch following.

Punched Part Identification

Visual Identification of Punched Holes

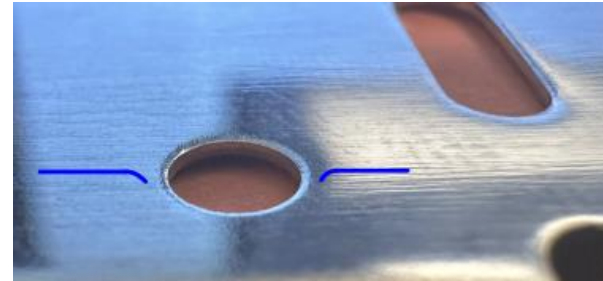
Image 14



View shown from the entry side of the material:

Image depicts rounding of the edge into the hole from where the punch tool entered.

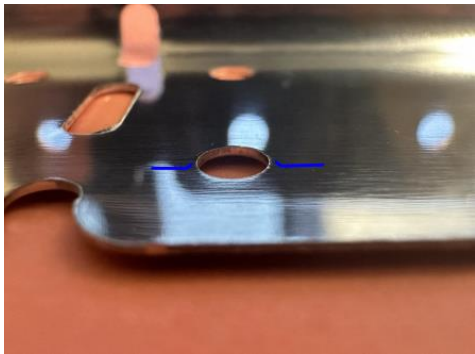
Image 15



View shown from the entry side of the material:

Different angle of the punch rounded edge.

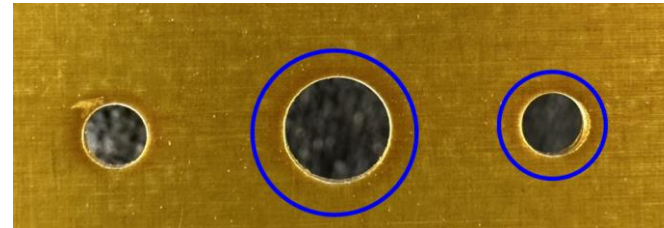
Image 17



View shown from the burr side of the material:

Depicts the reverse of image 14 and 15. Material is now being pushed out of the hole causing the burr.

Image 16



View shown from the entry side of the material:

Rounded edge may cause a change in how the part reflects at a certain angle.

Visual Identification of Punched Edges

Image 18

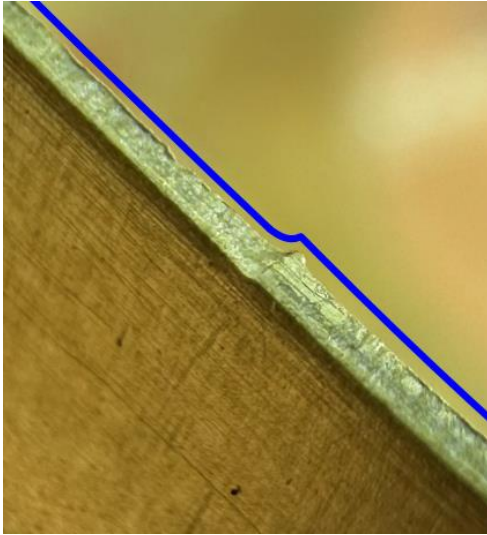


Image 19

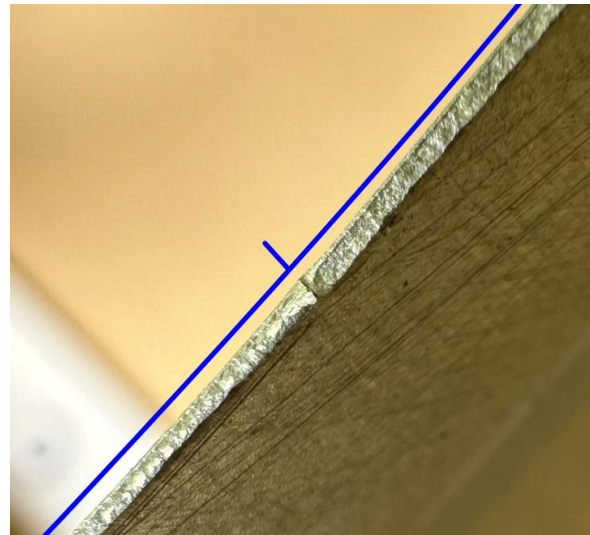


Image 20



Image 20

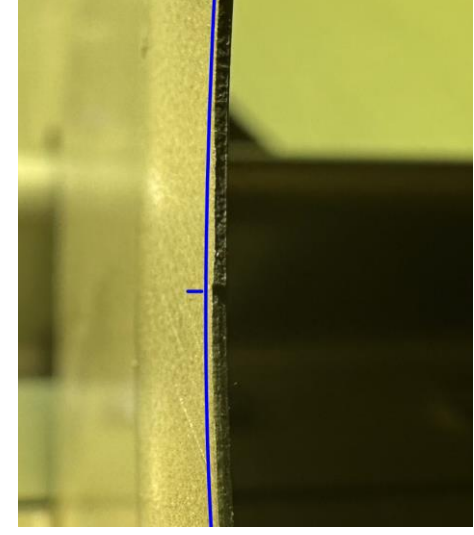


Image 21

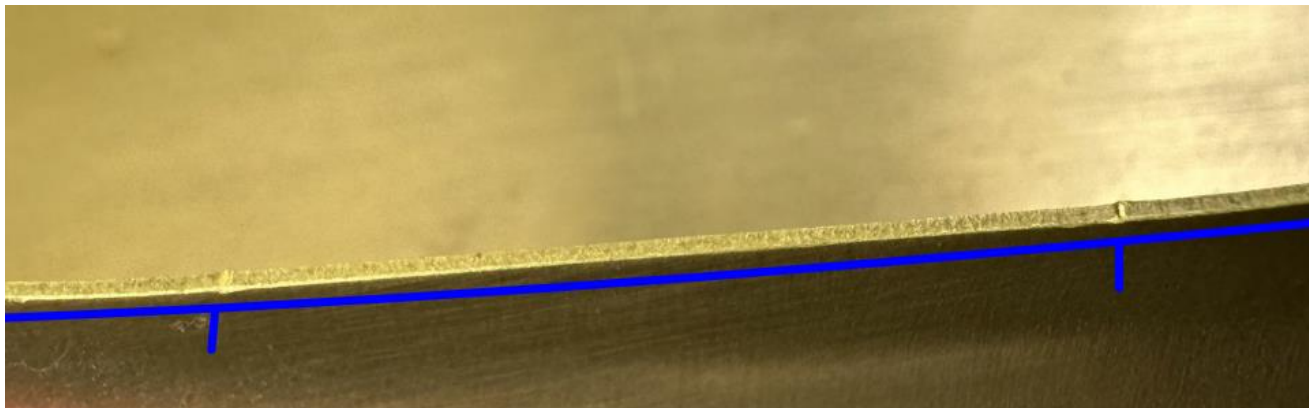


Image 18 through 21 depict examples of step marks created as the punch tool uses multiple cuts to form a larger shape. Blue lines added for visual emphasis of the marks.