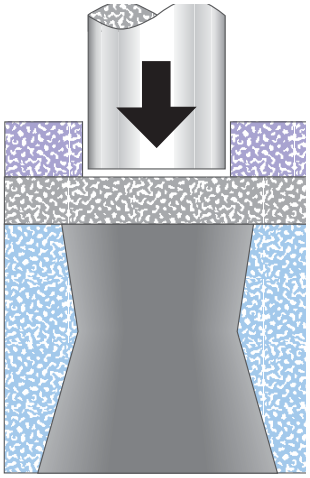
Mate Slug Free® Dies

Eliminate Slug Pulling

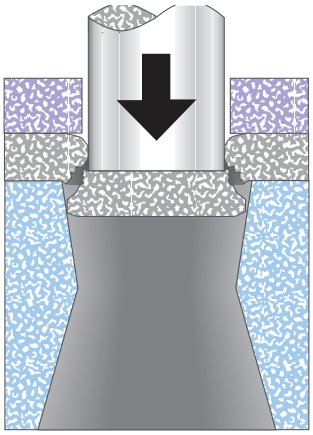
Mate Slug Free® dies eliminate slug pulling. Slug pulling is a condition where the slug returns to the top of the sheet during the stripping portion of the punching cycle. The slug comes between the punch and the top of the sheet on the next cycle. This causes damage to the piece part and the tooling. Slug Free dies eliminate this problem.

- **Eliminate slug pulling**
- **Reduce tool breakage**
- **Improve tool life**
- **Increase quality**

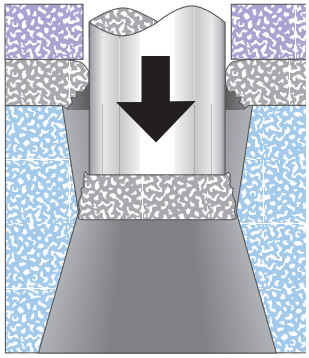
The Slug Free die has been designed with an opening that has a constriction point below the surface so the slug cannot return once it passes through this point. Once the slug is separated from the punch, it is free to fall away from the punching area. Slug pulling is eliminated.



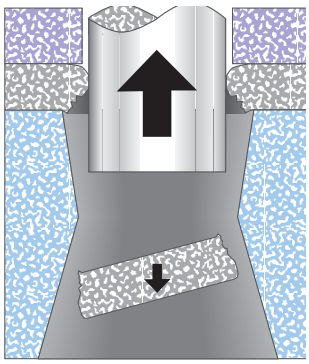
Material held securely by stripper before punch makes contact.



Punch penetrates the material. Slug fractures away from sheet.

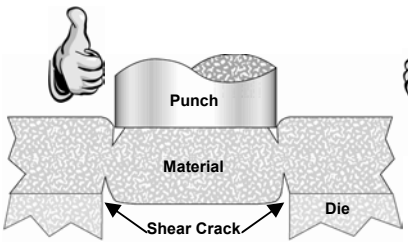


Pressure point constricts slug. Punch stroke bottoms out as slug squeezes past pressure point.

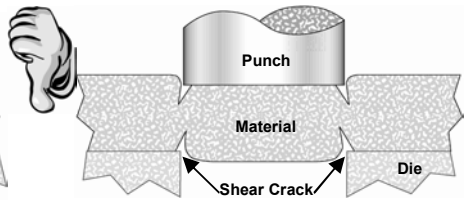


Punch retracts and slug is free to fall down and away through exit taper of the Slug Free® die.

Die Clearance—Die clearance is equal to the space between the punch and die when the punch enters the die opening. It is always expressed as the TOTAL Clearance or TC. Using the correct die clearance increases tool life and improves piece part quality.



Optimum Clearance—shear cracks join, balancing punching force, piece part quality and tool life



Clearance Too Small—secondary cracks are created, raising punching force and shortening tool life

Recommended Die Clearance

Die Clearance in terms of % of material thickness;

❑ Minimum Life clearance	15%
❑ **Optimum Clearance**	**20-25%**
❑ Extended Life Clearance	30%
❑ Heavy Duty Clearance	30%

Visit mate.com to download a die clearance chart

Mate Precision Tooling • 1295 Lund Boulevard • Anoka, Minnesota 55303 USA • Phone 763.421.0230 • 800.328.4492 • Fax 763.421.0285 • 800.541.0285

Dimensions in Inches(millimeters) mate.com

Mate Slug Free Light™ Dies

Exceptional Thin Sheet Performance

New!

Introducing….

Mate Slug Free Light™ Dies for Thin Sheet Metal.

Mate Slug Free Light™ thick turret dies are designed to eliminate slug pulling when punching thin sheet metal material, where the recommended die clearance is less than 0.008(0.20).

The Mate Slug Free Light die works by introducing a series of small protrusions around the edge of the slug. Each protrusion is created by a small angled notch cut into the die opening (See photo 1). As the slug passes through the die, the position of the protrusion relative to the notch changes slightly. This change creates slight pressure between the slug and the die land, which traps the slug into the die and eliminates the possibility of the slug being pulled back through the die. By eliminating slug pulling with every punch cycle, the piece part quality is improved and tool life is increased.

Material Type	Maximum Suggested Material Thickness Inches(millimeters)
Stainless Steel	0.032(0.80)
Mild Steel	0.040(1.00)
Aluminum	0.048(1.20)

Photo 1: Mate Slug Free Light notches are cut at an angle to create a series of protrusions on the slug. As the slug moves through the die, the protrusions become trapped against the die land to prevent the slug pulling back on to the sheet. (Image enhanced for additional clarity)

Mate Slug Free Light dies are available for all shapes and are produced using advanced electro-discharge-machining technology (See photo 2). The wire EDM manufacturing process delivers the exceptional accuracy required for tooling components moving at high speed with minimal clearance.

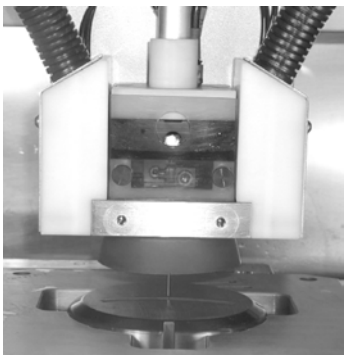


Photo 2: Advanced wire EDM machine producing a shaped thick turret die.

Mate Slug Free Light dies are available to suit thick turret tooling and are suggested for use when the die clearance is no greater than 0.008(0.20).

Contact your customer service representative today.

- **Eliminate slug pulling on thin sheet metal**
- **Increase piece part quality**
- **Reduce tool breakage**
- **Improve tool life**

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