

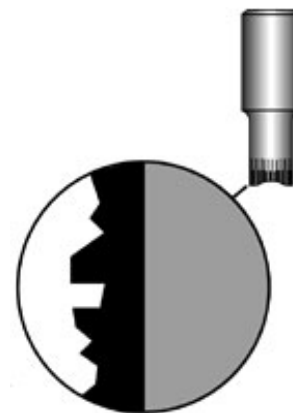


## COATINGS AND TREATMENTS HELP INCREASE TOOL LIFE AND ENHANCE PERFORMANCE

### THE PROBLEM:

Materials can be harsh on tool life and performance. Certain, more ductile materials are more prone to galling, such as stainless steel, galvanized steel or aluminum. Caused by the pressure and heat of the punching process, galling is when the metal being punched adheres to the punch tip (*illustration, right*). Galled punches produce inferior parts, and you need to stop the press, remove the punch and clean it with a fine stone before you can resume punching. They also wear more quickly.

Other materials, such as fiberglass, are more abrasive and wear out the punch, sometimes fairly quickly. In such environments, punches must be replaced more frequently to maintain desired performance and quality. Mate offers a couple of solutions to help combat these issues: Maxima™ coating and nitride treatment.



### THE MATE SOLUTION:

#### **Maxima™ Coating:**

Maxima is Mate's premium tool steel coating formulated exclusively for punch press tooling applications. Hard, wear-resistant and lubricious, Maxima is a multilayer Zirconium Titanium Nitride coating. When applied to the surface of Mate's premium tool steel punches, Maxima acts as a barrier between the punch and the sheet metal. With its exceptional lubricity, Maxima greatly improves stripping by reducing the friction that occurs during this portion of the punching cycle. Since less friction means less heat build up, that means there's less galling and longer tool life. Maxima is particularly good for adhesive wear tooling applications. In real life tests, Maxima has increased tool life between 2 to 10 times.

#### **Nitride Treatment:**

Nitride is a heat treatment feature for abrasive and adhesive wear environments when punching thin materials. It becomes an integral component of the structure of the punch material, extending tool life. Nitride treated punches are recommended for punching abrasive materials (e.g., fiberglass) or materials that cause galling (e.g., stainless steel, aluminum) and for high speed punching.





## APPLICATION RECOMMENDATIONS:

Select Maxima or Nitride based on the punch size and material being punched (refer to the charts below):

	3000 & 5000 Series Aluminum	Galvanized Steel	Stainless Steel	Stainless Steel Under 14 ga.	Vinyl Coated Materials	Pre-painted Materials Under 16 ga.	Cold Rolled Steel Under 12 ga.	Fiberglass
Maxima™	•	•	•		•	•		
Nitride	•			•		•	•	•

Shape	Minimum punch size suitable for <b>Maxima™ Coating</b>	Minimum punch size suitable for <b>Nitride Treatment</b>	Minimum punch size suitable for <b>Nitride when nibbling</b>
Round	Minimum diameter = 0.098(2,50)	Minimum diameter = 0.158(4,01)	Minimum diameter = 0.500(12,70)
Rectangle	If length is >0.250(6,35) The minimum width is 0.060(1,50) If length is <0.250(6,35) The minimum width is 0.098(2,50)	Minimum width = 0.158(4,01)	Minimum width = 0.500(12,70)
Oval	If length is >0.250(6,35) The minimum width is 0.060(1,50) If length is <0.250(6,35) The minimum width is 0.098(2,50)	Minimum width = 0.158(4,01)	Minimum width = 0.500(12,70)
Square	Minimum width = 0.098(2,50)	Minimum width = 0.158(4,01)	Minimum width = 0.500(12,70)
Others	Consult a Mate application specialist		

## CUSTOMER EXPERIENCE:

A leading global manufacturer of finned pack heat exchangers for the HVAC industry uses automated punching as their key process. Their product requires tight hole tolerances for the air conditioning coils and they follow a very structured punching process. With normal use, a cluster punch will typically average 500,000 hits before sharpening is required. By using the strict processes, this customer was getting up to 2 million hits before sharpening; they wanted to see if they could go further, so Mate recommended treating a replacement cluster with Maxima coating. The result: **4.1 million hits without sharpening all while maintaining hole quality!**



Photos of the actual Maxima treated tool that racked up over 4.1 million hits without sharpening.

# SOLUTION BULLETIN



## RESTRICTIONS:

- Maxima coating may be applied to M2, M4PM and DuraSteel™ tool steels only
- Nitride treatment may be applied to M2 or M4PM tool steels only

## OTHER MATE PRODUCTS TO CONSIDER:

- Eliminator™ (patents pending) punch tip lubrication pads
- Soft stone (STO29911) for removing galling from punches