Working With Punch Press Tonnage

Last month, we wrote an article on tonnage and provided some in-depth formulas to determine punch force. Of course there are less complicated formulas that are often referenced, but with the amount of exotic materials that are being used today, we knew that a more comprehensive formula is sometimes required to establish an accurate answer.

For those of you looking for a basic formula, this is a good one to use:

- Punching Force (US tons) = Punch Perimeter (inches) x Material Thickness (inches) x 25 x Material Multiplier
- Punching Force (Metric tons) = Punch Perimeter x Material Thickness x 0.0352 x Material Multiplier

<table>
<thead>
<tr>
<th>Material Type</th>
<th>Material Multiplier</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aluminum (soft)</td>
<td>0.3</td>
</tr>
<tr>
<td>Aluminum (half hard)</td>
<td>0.4</td>
</tr>
<tr>
<td>Aluminum (full hard)</td>
<td>0.5</td>
</tr>
<tr>
<td>Copper (rolled)</td>
<td>0.6</td>
</tr>
<tr>
<td>Brass (soft)</td>
<td>0.6</td>
</tr>
<tr>
<td>Brass (half hard)</td>
<td>0.7</td>
</tr>
<tr>
<td>Mild Steel</td>
<td>1.0</td>
</tr>
<tr>
<td>Stainless Steel</td>
<td>1.5</td>
</tr>
</tbody>
</table>
Once you have determined the required punch force, you need to know if your machine has enough force to get the job done. So, is there such a thing as max tonnage? It’s a very common question to ask (or to overlook) - What should I consider the maximum tonnage on my machine to be? I have a 30-ton machine; does that mean I can always punch 30 tons with every tool?

It would be nice if the answer was an easy “yes”, but that is not necessarily correct. The actual tonnage required depends on many factors. Material type, material thickness, punch geometry, machine type, and machine speed all play a role in determining what the true “maximum tonnage” is for each situation. The number of hits also plays into your max tonnage - if you are only doing a few, you might be able to get away with it, but if you are planning on running the same hit many times, maxing out your machine’s tonnage might cause problems. And of course, every tool has its limitations as well.

Also, keep in mind that over time, machines tend to lose the ability to hit the maximum tonnage because of hydraulic leaks or other machine factors. It is a good practice to stay a few tons below the maximum if possible.

*Risks of excessive tonnage and possible solutions:*

**Risk:** Tool Breakage  
**Solution:** Use a larger station. Change tool shape to improve its strength.

**Risk:** Machine Damage  
**Solution:** Reduce hole size. Put a shear on the punch.

**Risk:** Stripping Problems  
**Solution:** Use correct die clearance. Too big or too small of a clearance affects the punching tonnage, stripping pressure and quality of the hole.

For more information on tonnage, please call Glen Shuldes at 651-286-6144 or Scott Tacheny at 651-286-6171.

**Exacta is now Wilson Tool Canada!**

Wilson Tool acquired Exacta Precision and Exacta FabTool in late 2010 in a merger designed to increase product offerings, expand manufacturing capabilities and enhance customer service and support to customers in Canada. Following the merger the company has made significant improvements to the quality of its products and level of service. The new name more accurately represents the integration of the two Canadian divisions into Wilson Tool operations.

Moving forward customers of Wilson Tool Canada will enjoy the following benefits:

- No broker fees.
- Reduced shipping costs.

Less is more.

A fraction of the size of standard punches, [EXP™ punch technology](#) from Wilson Tool
Local support, service and manufacturing.
Faster delivery times for replacement components.
Invoices in Canadian dollars.

Learn more here

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Faces of Wilson Tool

Tim Merth
Press Brake sales desk

![Image of Tim Merth]

Years at Wilson Tool: 25

What is your favorite aspect of your job?
I really enjoy conversing and joking with the people who work for our customers. The diversity and commonality of the people across North America is really interesting. It makes my day when I can help a customer solve a problem.

What do you enjoy doing in your free time?
Listening to music, training and playing with our dog, hunting, fishing, bowling, cooking and watching Minnesota sports. Yes, I am a lifelong suffering Vikings fan.

What is something that people would be surprised to learn about you?
I taught 5th grade, after school religion, called and managed bingo at St. Philip’s Catholic school and church in Bemidji, Minnesota.

If you had to eat only one food item for the rest of your life, what would it be?
Pizza! Give me a special with sauerkraut. Yeah, yeah I know what you are thinking. It did not sound good to me either, and then I tried it. Wow!

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International® is more productive, more durable and more affordable than any other punch press tooling. 4x faster setups result in less downtime. Ultima® tool steel makes EXP punches last 2x longer. Standard holders with universal punches make it practical to replace only the punch. Smaller punches mean you can stock more shapes in less space. EXP punches also require significantly less material to produce, resulting in less waste.

Expect more for less. EXP punch technology is simply better tooling for less money.

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Wilson Tool Launches Portuguese-Language Website

We are happy to announce the availability of a Portuguese-language version of wilsontool.com for our Portuguese-speaking customers. The website offers easy navigation to engaging, meaningful content on tooling solutions and services available locally. The Portuguese site will serve not only our Wilson Tool customers but also customers of Milling Puncionadeiras through one easy-to-use location.

Click here to view the Wilson Tool/Milling website

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Upcoming Events

Fabrication Forum
April 11th - FULL
Where is the most interesting place you have been?

Why?

That is a tough question to answer. Mt. Rushmore is an awesome engineering feat. Charlotte, S.C. is a beautiful city with a fascinating history. But probably because it is here and I can visit it at will I would have to say the Minneapolis Institute of Arts. The carved jade collection is absolutely unbelievable. It is hard to fathom how many hours were spent making some of those sculptures. Along with the hundreds of other items I really enjoy the whimsical modern art exhibits like the one called “Rejects from the Bat Factory.”