

TECHTALK DESIGN ADVICE SERIES

3 MISCONCEPTIONS ABOUT THIN-WALLED BUSHINGS



In most instances, when something is thicker, it's usually better – a thick, juicy piece of steak, especially thick socks to keep your feet warm on a cold day, or a shiny, thick coat of paint on a brand new car all come to mind. However, when it comes to plain bushings,

thick-walled isn't necessarily better than thin-walled.

First, it's important to understand the basic difference between a thin-walled plastic bushing and a thicker-walled bronze bushing. Thick-walled bronze bushings feature a standard wall thickness between 0.0625 and 0.156 inches. In comparison, the wall thickness of a plastic bushing is much thinner, typically anywhere from 0.0468 to 0.0625 inches. Due to its thin wall, a plastic bushing not only offers a number of benefits, it also performs equally as well, if not better than a thick-walled bushing.

There are a number of instances where an application would benefit from using a thin-walled plastic bushing in place of a thick-walled bronze bushing.



YOUR CONTACT



Tom Miller

Bearings Unit Manager,
North America

TMiller@igus.com

>> [Subscribe to e-newsletter](#)

>> [Contacts in your location
\(on-site within 24-48 hours\)](#)

>> [Request catalogs / free
samples](#)

>> [myigus](#)

>> [myCatalog](#)

igus Inc.

PO Box 14349

East Providence, RI 02914

P. 1-800-527-2747

F. (401) 438-7270

sales@igus.com

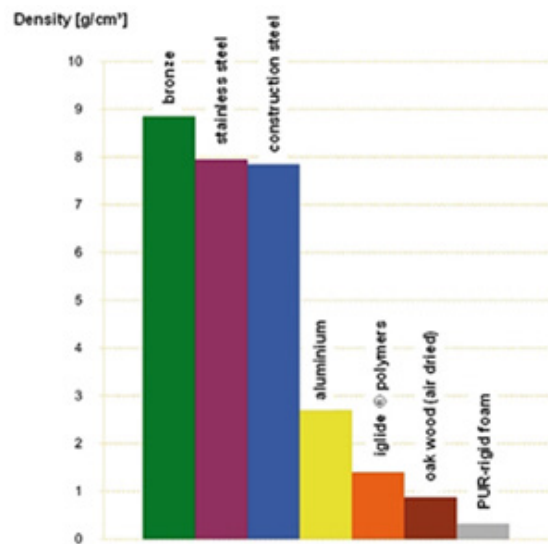
www.igus.com

For example, igus® iglide® plastic bushings are designed with a thinner wall to allow for better heat dissipation. Heat buildup can increase the amount of wear on a bushing and it is crucial that the heat be able to dissipate through the shaft and the housing. With a thick-walled bronze bushing, excessive heat build is much more likely.

The better the heat dissipation of the bushing, the higher the permissible PV value will be. A higher PV value enables the bushing to handle an increased combination of speeds and loads.

In addition, a thin-walled plastic bushing is able to hold tighter tolerances. They also have less chance of becoming deformed, which can be common with a thicker-walled bushing.

Finally, for applications where weight and fuel economy are an issue, for example in racing bikes, snowmobiles, automobiles, and motorcycles, a thin-walled plastic bushing is ideal. Image compares the weights of different bushing materials.



Common misconceptions

Now that we have compared the performance of these two types of bushings, there are a couple of misconceptions that I'd like to tackle.

1. **A thin-walled plastic bushing is not as robust as a thick-walled bronze bushing.** The wall thickness of either bushing does not directly correlate to its strength. Other factors that are more important and should be taken into consideration include the weight, coefficient of friction and wear capabilities of the bushing.
2. **Due to its thin wall, the surface pressure of a press-fit plastic bushing will be negatively affected.** The surface pressure of a press-fit bushing is defined in pounds per square inch (PSI), which is calculated by load using the formula pounds / (inside diameter x length) and is not dependent on wall thickness. Whether a thin-walled plastic bushing or a thick-walled bronze bushing is used, the surface pressure is solely based on the calculated PSI.
3. **A thin-walled plastic bushing has a shorter life than its thick-walled bronze counterpart.** It is reasonable to assume that since a plastic bushing has less material (a thinner wall); it will not last as long as a thick-walled bronze bushing. This is incorrect because the thin wall of a plastic bushing helps to dissipate any heat buildup, which actually prevents wear.

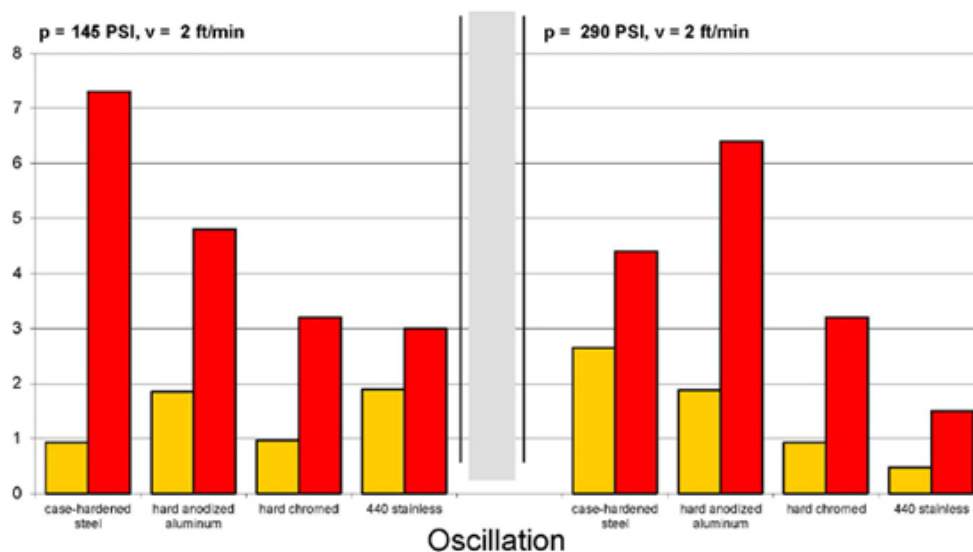
Bronze bushings are designed with a thicker wall to compensate for wear, but even with the added material, the bushing surface is still susceptible to wear. In high-rotation applications,

continually re-lubricating the bushing will help prevent wear. However, if a bronze bushing is being used to facilitate other types of motion; excessive wear can lead to added clearance between the shaft and the bearing. If this happens, a number of problems will arise.

It is important to remember that wear is dependent on the makeup of the bushing material and not on the wall thickness (also refer to misconception 1). For this reason, igus® is constantly developing new plastic materials, which minimize wear and provide a long-lasting, maintenance-free solution for a variety of applications.

Bronze vs. iglide® J on Different Shaft Materials

■ Bronze thick-walled bushing ■ iglide® plastic thin-walled bushing



Useful Links and Tools

[Learn more about iglide® plastic bushings](#)

[Find out more about how plastic bushings can replace bronze bushings](#)

[Use the iglide® Product Selector to choose the best iglide® plastic bushing for your application](#)

[Watch the video A Day in the Life of an iglide® Plastic Bearing](#)

[Click here to read an archived edition of TechTalk to learn the five major benefits of plastic bearings](#)

