

## The Life of a Threshold: More Exciting than You Think

by Dan White

Hey, down here at the bottom of the door frame... no, not the welcome mat. It's me, the threshold! I bet not many of you notice me as you go about your day-to-day business, but I've led a more exciting life than you realize.

To start out, where did the name threshold originate? It's a common term we hear every day without even thinking about what threshold and holding even have to do with doors. The word "threshold" has been with us since the 1500s. It is commonly understood that the term comes from the reeds or rushes, thresh, that were thrown on the floors of simple dwellings in those times. A piece of wood would be installed in the doorway to keep the thresh from falling out of an open door - thus threshold.

The accuracy of this "common knowledge" is unclear, and linguists assert the source of the term comes from the Old English term *therscold* or *threscold*. "Thers" or "thres" meant "to stamp with the feet, to stomp noisily," which is exactly what people do at the threshold - some things never change. Of course, keeping rushes on our floors has changed, and the purpose of thresholds has evolved as well.

Thresholds are no longer just pieces of wood shoved into a doorway. I, a modern threshold, began life a long way from this door frame. In fact, I'm typically made from the element aluminum, which means technically I've been around since the beginning of time. Aluminum is one of the most common elements on the planet, but much of it is found in the mineral bauxite which is difficult to process. That means that until the late 19th Century, aluminum was extremely rare and valuable (even surpassing gold in the 1850s).

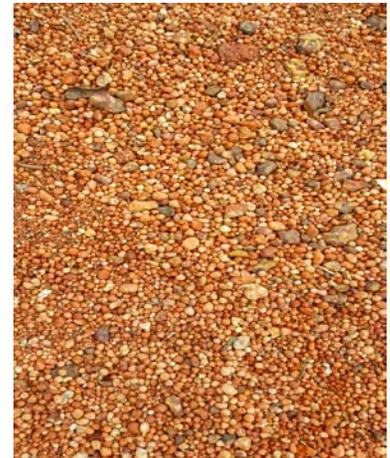
A little history tidbit - the Washington Monument is topped with a nine-inch, 100-ounce aluminum pyramid. Its main purpose is lightning protection, but when the monument was first built in 1884 aluminum was \$1.10 an ounce, so I believe

aesthetics played a big part in the choice of that expensive lightning rod.

However, back to my story. I was mined as bauxite, a reddish clay rock that makes up about 8 percent of the Earth's crust. The name bauxite comes from a French town, Les Baux, where geologist Pierre Berthe first discovered the ore and its high aluminum content. Usually found in tropical areas, the biggest producers are Australia, China, India and Guinea. There are some bauxite reserves in Arkansas, Alabama and Georgia, but very little mining occurs in the U.S.

Over 160 million tons of bauxite are mined every year, but it is estimated that there are 55-75 billion tons on the planet. Much of the aluminum we use is also recycled, so we won't be running out of aluminum any time soon! Bauxite is located in the topsoil layer and removed via strip mining, although this isn't the high-impact strip mining you might envision because bauxite is located so close to the surface. There are global efforts in place to ensure the topsoil is retained and returned to the ecosystem, reducing the impact of bauxite mining - about 80 percent of bauxite mines are returned to native vegetation.

The bauxite is processed to become aluminum oxide via the Bayer Process. This process was invented in 1888 by Carl Josef Bayer, an Austrian chemist working for a Russian textile factory whose job was to extract aluminum oxide as a fixative for dyeing cotton. The standard procedure used acid extraction; he switched to alkaline extraction, and the rest is history.



A brief description of this chemistry-heavy process is that the bauxite and sodium hydroxide are heated to 150°-200° F in a pressurized vessel, filtered, and crystallized. The result is aluminum oxide, which is then subjected to electrolysis to extract purified aluminum.

Aluminum production in the past was expensive due to high melting temperatures (2000°F) and the cost of electricity required to generate that amount of heat. In present day, electricity is much cheaper to produce, and additives like cryolite are used to reduce the melting temperature.

These improvements in processing have transformed aluminum from once being displayed as "the new precious metal" at the 1855 Paris Exhibition (next to the French Crown Jewels, I might add), to the point where it can be found in kitchens, in construction, and even right here at the bottom of your door frame.

After "becoming" aluminum, next came the fun part - extrusion. Molten aluminum can be extruded into a huge variety of shapes; its mix of strength and flexibility makes it perfect for foil, cans, airplane parts, and of course thresholds

(to name just a few). The extrusion process forces the aluminum through a die, and the results are cooled, cut and processed into their final products. The whole system involves a hydraulic press, heating and cooling elements, and even more electricity. The diagrams for these presses are very complicated, but they can be thought of as a more complex version of a Play-Doh® press.

There are a few different die shapes that create thresholds; different shapes serve different purposes. The standard type is a saddle threshold. The u-shape allows it to be mounted in a door frame and provide a barrier between the interior and exterior of the doorway. The threshold typically is one-half-inch tall, which complies with ADA requirements while also providing a barrier to dirt, air flow, sound, etc.



Varying heights are available for most thresholds, depending on the type of extrusion dies used. Different finishes and patterns can also be impressed into the surface to provide extra grip. Other styles beyond the simple saddle threshold are also available. A panic or ADA threshold has a protrusion with a rubber gasket that juts from the surface. This provides a better seal in the doorway.



Thresholds are also able to perform more complex functions. A thermal barrier threshold has a PVC spine encased within the middle of the extruded aluminum, connecting two separate pieces. The rubber transmits less heat than a solid aluminum piece and thus keeps the exterior temperature, low or high, from being transferred to the interior of a building.



You now know all about my life as a threshold. My job is to block drafts and dirt, provide a sound barrier, and even act as fire and smoke protection. I've come a long way since I simply held reeds in medieval dwellings. I may be underfoot, but I hope I'm never overlooked.



DAN WHITE is the Product Development Manager for Hager Companies. He can be reached at [dwhite@hagerco.com](mailto:dwhite@hagerco.com).

