

## THE CHALLENGES OF DOOR HARDWARE IN EXTREME CONDITIONS

### Extreme heat, extreme cold, and yes, even bears!

by Jill Gile, CSI, CDT

If you've ever worked on LEED certifications, you will recognize that many of these "smart" building technologies will carry greater weight than simple door hardware. However, the importance of high-quality hardware, chosen with temperature extremes in mind and installed properly, cannot be overestimated.

**On a recent trip to Anchorage,** CBA Group Sales Representative Paul Patino noticed something funny about the hardware on the public restrooms.

"All the public restrooms in the parks around Anchorage had hospital push/pull hardware on them. I had to take a photo since this is the first time I'd ever seen this type of hardware used in this situation," he said. "I also had to ask about why this type of hardware was installed in such an odd place."

Hospital push/pulls operate with a simple push or pull motion, with a large handle to make it easier to use for people with reaching, grasping, manipulation, or physical disabilities. The large paddle also makes it easier for health care employees to operate the door if their arms are full of supplies or occupied in helping a patient.

So what are they doing in this public bathroom? The extreme cold weather of our northernmost state poses special challenges for door hardware, but this particular application focuses on another Alaska-specific problem—the wildlife!

Bears are very determined creatures, and quite clever to boot. They have figured out how to work standard levers that you often see on public buildings (including restrooms). To avoid a "fun" surprise while in the bathroom, these facilities in a public

park feature hospital push/pull hardware, which the local wildlife hasn't figured out how to operate—yet.

There are also quite a few buildings with knobs instead of levers, to combat this very same problem. Alaska certainly presents some interesting challenges for door hardware!

Of course, extreme temperatures are also a problem that faces the Alaskan market. A temperature of 100°F was recorded in 1915, and depending on location, winter temperatures can be 30°F to 80°F. With temperature variations like that, thermal expansion/contraction can pose a huge problem.

Mark McRae, Director of Engineering of Hager Companies, indicates that door closers pose a specific problem in relation to temperature extremes as they function through the use of hydraulics to control the speed of the door. In recognition of these common temperature issues, the BHMA Standard for Door Controls - Closers specifies that any closer intended for exterior or vestibule application is required to use a fluid with a "pour point" of -38°F or lower, ensuring that the fluid will not freeze and loss of door control occurs.

Another challenge facing Alaskan hardware is keeping the weather where it belongs—outside.

Arctic entries are an important design feature in climates like Alaska's. This is essentially a vestibule that allows for a gradual transition from the outside to the inside. Unlike a standard vestibule, the arctic entry may simply be an additional set of walls built around the exterior doors to block the wind and precipitation. They may have a set of latching or free-swinging doors that also block some of the cold temperatures. They can serve as a great place to shed a few layers before entering the building.

Other door hardware items that help combat extreme temperatures include gasketing and weatherstrip. Standard rubber will fail after a season or two, so heavy-duty, temperature-resistant materials need to be considered.

Herb Bindel, Supervisor, Technical Support and Master Keying at Hager Companies, recommends silicone or EPDM.

"Silicone gaskets characteristics include resilience, high-temperature stability, and general inertness," he says. "Solid silicone can be used with metal closures and requires good closure force. Silicone provides a number of advantages—it is waterproof and won't break down over time with exposure to water; it's flexible, so it won't crack at high or low temperatures, and it won't shrink over its lifetime."

EPDM is a closed cell sponge rubber material that exhibits good aging properties, compressibility, and resistance to ozone and oxidation. It is available in a number of densities exhibiting varying degrees of hardness. The characteristics of EPDM weatherproof gaskets have their own advantages. It can withstand high temperatures, from up to 250°F, and down to 60°F. It is also waterproof and can withstand many of the hazards of aging, such as UV, ozone, and oxidation.

The Fireweed Business Center in Anchorage is a great example of many of these building principles in action. This building was designed to meet LEED Silver qualifications, the first of its kind in south-central Alaska. The building takes advantage of its natural surroundings to help control temperatures within the building, with automated intelligent windows that are triple-glazed low-E units, on-demand heating and cooling, and daylight-sensing office lighting.

If you've ever worked on LEED certifications, you will recognize that many of these "smart" building technologies will carry greater weight than simple door hardware. However, the importance of high-quality hardware, chosen with temperature extremes in mind and installed properly, cannot be overestimated. The Fireweed Business Center has cold-weather closers, gaskets, and weatherstripping installed. You can also see in the photos that their beautiful lobby entrance could definitely qualify as an "arctic entry."

Should you find yourself in Alaska on business or for pleasure, the stunning natural beauty will certainly be the first thing you notice. Their state motto is North to the Future, but it could just as easily be called Land of 360° Views. While you are enjoying sweeping vistas and towering peaks, don't forget to spare a moment to investigate the innovative building designs that can also be found in abundance around you.

If you're very lucky—or, depending on your opinion of wildlife—very unlucky, you may even spot a bear trying (and hopefully failing!) to use the hospital push-pulls around the public parks.

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