



## What to Know Before Getting Started

**1. The first step of troubleshooting a door out-of-plane with the frame face is to loosen the perimeter seals to determine if the seal adjustment is influencing the door seating out of plane.**

**2. NOTE: The door cannot be hung in the frame to collect accurate measurements of surface flatness. There are several variables that can be influencing the flatness of the door in the installed condition:**

- Frame installation clearances
- The NC3/NC3S/NC10/NC12 perimeter seal adjustment
- Hardware connection points



### We're Here to Help

At Krieger, we understand every project is unique. If after reviewing this guide, you have any questions or concerns about installing, adjusting, or maintaining your Krieger product, our engineering department is here to help.

Please call us at **562-695-0645** or reach out to your regional sales representative. Visit [kriegerproducts.com/contact/](http://kriegerproducts.com/contact/) for more information.

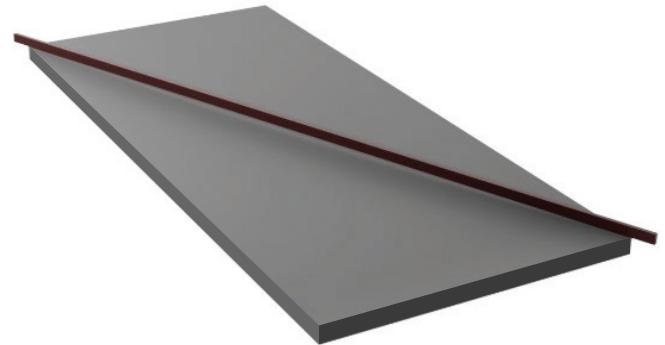
## Surface Flatness

- HMMA 865-13 (Guide Specifications for Sound Control Hollow Metal Door & Frame Assemblies) Section 2.04.A.2.E (Manufacturing Tolerances) defines a tolerance =  $\frac{1}{8}$ " (3.17 mm) maximum for steel door surface flatness.
- NAAWS (North American Architectural Woodwork Standards) Section 9.4.6 defines a tolerance =  $\frac{1}{4}$ " (6.35 mm) maximum for wood core door surface flatness.
- HMMA 841-13 (Tolerances and Clearances for Commercial Hollow Metals Doors and Frames) illustrates the required methods to measure for surface flatness, edge flatness, and door twist; See Figures 1-4.

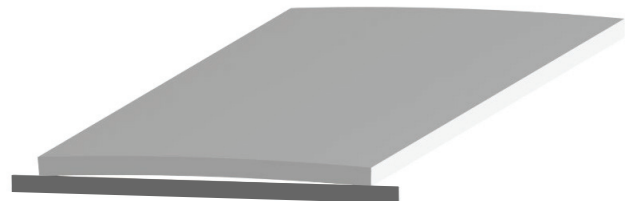
*Figure 1*



*Figure 2*

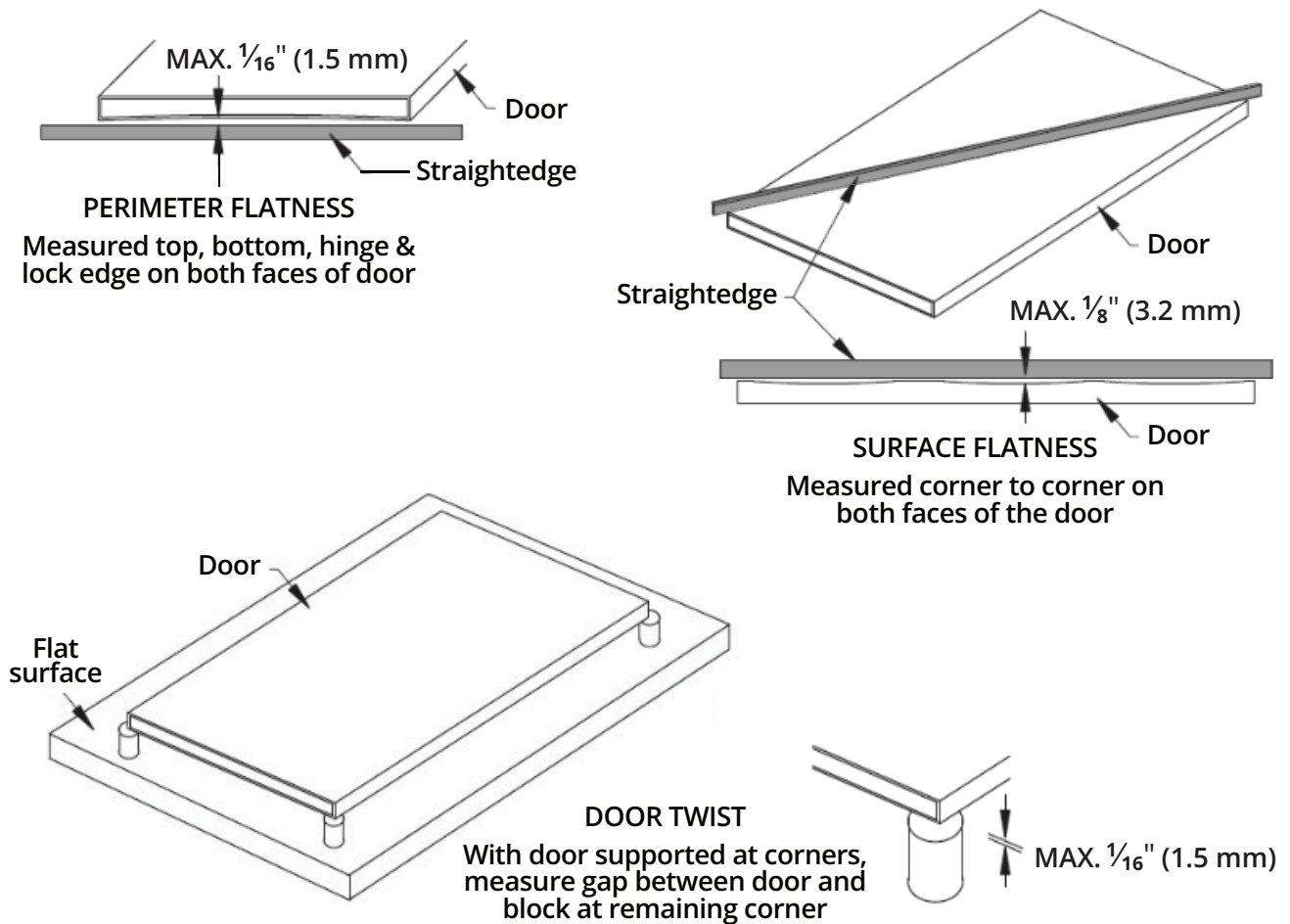


*Figure 3*



**NOTE:** The door must be laid on a flat surface and measured with a level long enough to be extended past the edge corner-to-corner as illustrated in Figure 4.

*Figure 4*

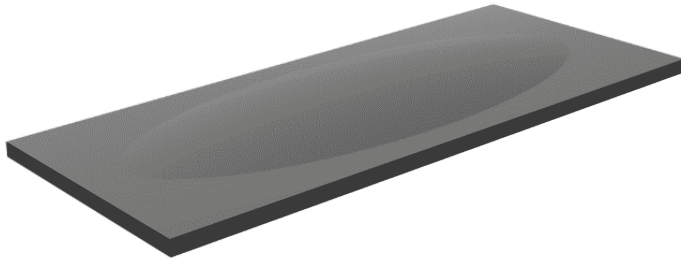


## What Is “Pillowing”?

Pillowing (or a “belly”) is a separation of the door skin sheet steel only in the center zone, inside and away from the flat perimeter edge channels. It is often mistaken for “twisting” or “warping,” which are generalized/informal descriptions and should not be used during installation trouble shooting for clarity.

- Pillowing does not affect the function or performance of the assembly.
- Racking a door will not correct for pillowing.
- Wood core doors do not pillow; See Figures 5 and 6.

*Figure 5*



*Figure 6*



- Pillowing is not a manufacturing defect and not an indication that the surface flatness of the door is out of tolerance.
- Pillowing is an inherent characteristic of high-performance steel acoustical doors that is not currently addressed in HMMA guidelines because pillowing is an aesthetic feature, not a functional or performance-based feature.
- Krieger’s workmanship guarantee for pillowing is that the door is capable of being adjusted to be in plane with the frame faces.
- The degree to which the door skins “pillow” should not exceed ½”.
- Installation adjustments such as blocking and clamping the lock edge to bring the door into plane with the frame faces are within the installer’s scope of responsibility.

End Instructions