

MILL FINISH ALUMINUM RAIL: CONSIDERATIONS, HANDLING, CARE & MAINTENANCE

Demand For Anodized Rail Options

Through the late 2010's, clear, anodized rail for solar racking was the preferred rail finish for solar contractors. The additional cost associated with the process of anodization was deemed proportionate to the benefits. These benefits are mainly derived from superior corrosion protection, and the clean, finished look that anodization provides (see [Tech Tip: The Importance of Anodization](#)).

As the solar industry scaled, more solar organizations became comfortable with the finish and performance limitations inherent in unfinished, bare aluminum. An inflection point was reached where the de facto choice for rail finish went from anodized (or clear) rail, to unfinished, mill rail. The demand for black rail finish, however, has remained consistent over time.

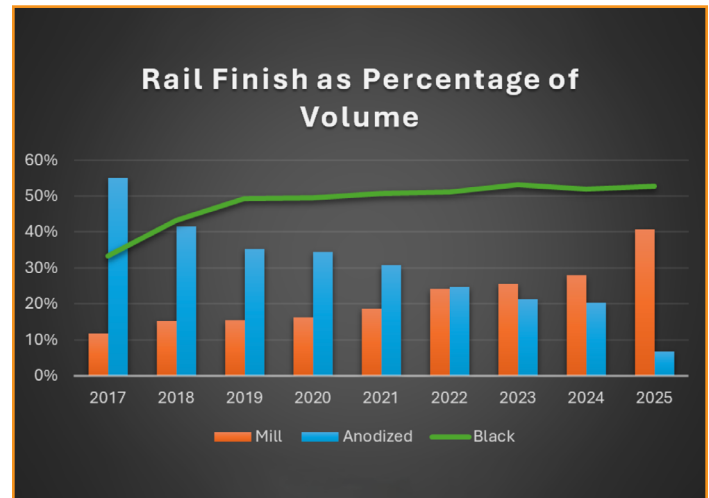


Chart comparing mill vs. anodized rail volumes over time.

Understanding Unfinished Aluminum

Unfinished aluminum oxidizes over time, with a light white powder the manifestation of this oxidation process. Oxidization is accelerated under moist, acidic and/or salty conditions, with a pitted surface resulting from these environmental exposures. These pitted surfaces are susceptible to the retention of dirt and stains.

The oxidation process does not have a significant structural or mechanical impact on the integrity or performance of the aluminum, nonetheless, IronRidge does not recommend the use of non-anodized rail in high corrosion environments. An understanding of these natural processes is important when setting an expectation with the customer. Proper handling and storage processes should be employed to minimize the effects of exposure of the rail to the environment.



Spotches showing on an unfinished, mill stick of aluminum rail.

Handling Mill Aluminum Rails

Key Differences

- When comparing mill aluminum to anodized, mill is more economical due to reduced production costs.
- Both mill and anodized rail have the same great structural integrity. Mill rails, however, can be hard to clean and susceptible to oxidation. Hardware also doesn't glide as easily in mill rails.

Check For Defects

- Inspect rail deliveries for any defects.
- Keep in mind that mill rail, without a protective anodized layer, is susceptible to splotches due to oxidation, staining, scratches and black marks/lines.

Keep Sheltered

- When able, store rail deliveries indoors. If unable, ensure the rail is protected by a tarp and placed under a cover structure.
- Mill rails exposed to the environment are susceptible to the natural oxidation process that will affect the appearance of the product.

Cleaning Options

- Remove loose dirt and grease with a mild detergent (dish soap) and water.
- Tarnish and oxidation can be removed using an acidic solution like white vinegar (or a paste of cream of tartar) and water.
- If dirt and stains persist, use a dedicated commercial aluminum cleaner.
- Always thoroughly rinse and dry with a clean, dry cloth. Dry completely.
- Avoid harsh chemicals and abrasive pads.



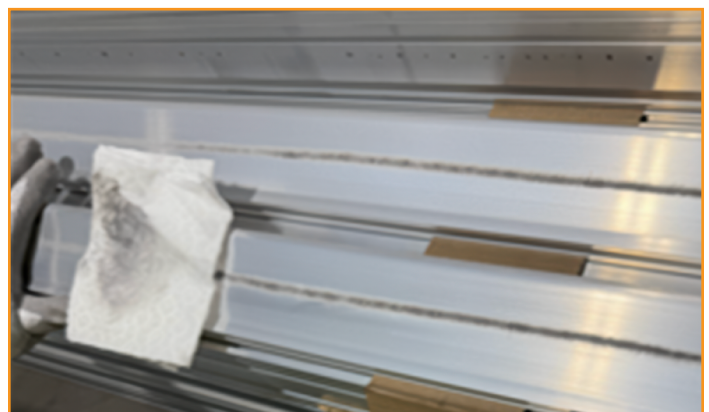
Examples of different surfaces in rails used for solar module mounting.



Visible stains on mill rails.



Rails stored inside warehouse.



Cleaning soot and smudges off of sticks of mill aluminum rail.