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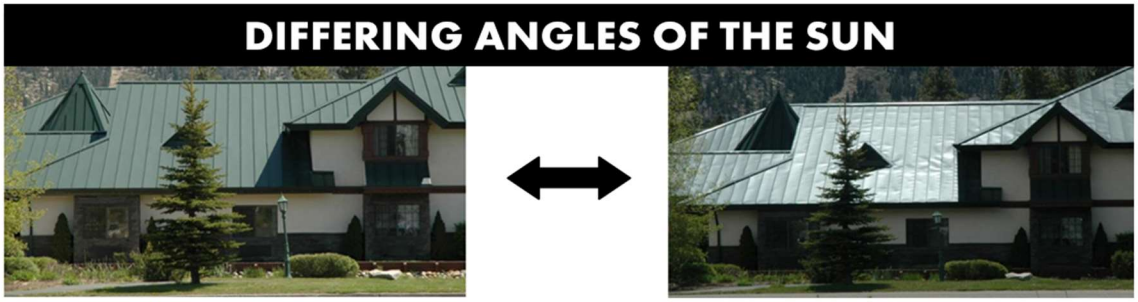
Understanding Oil Canning: What You Should Know

What Is Oil Canning?

Oil Canning is a visual phenomenon in which metal panels look wavy or somewhat distorted, particularly in flat areas of a metal roof or wall system. The visibility of the waviness varies quite a bit depending on the color, finish, time of day, time of year, and the angle the metal is viewed from.



Photos courtesy of the Metal Construction Association.

Oil canning is a natural characteristic of light gauge, cold rolled metal products due to metal's tendency to revert to its original shape. Fortunately, it is merely a cosmetic issue and does not affect the structural integrity of the panel system. Consequently, most warranties—including weathertight, substrate, or paint warranties—do not cover oil canning as a viable claim since oil canning alone does not pose any risk of causing the metal roof system to fail.

While there is no guaranteed method to prevent oil canning, being aware of its causes and taking preventative measures can help reduce its appearance.

Causes of Oil Canning

Color and gloss type

Oil canning tends to appear more on darker colors and high-gloss finishes than lighter colors and low-gloss finishes.

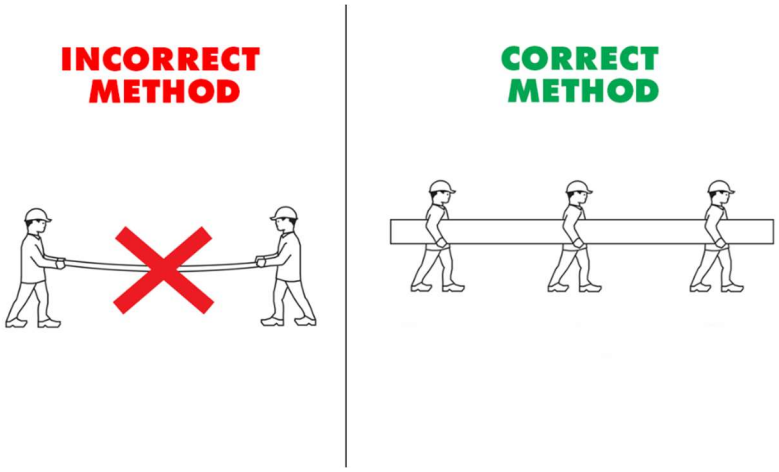
Incorrect fastener installation

Here are three common situations in which fastener installation could contribute to the development of oil canning:

- Over-driving fasteners can cause stress to the overlapping leg of the panel. This is especially present in standing seam metal roofing systems where the panels are connected directly to the support system.
- Driving in the fastener at an angle when attaching the panel to the roof deck can create unnecessary stress on the panel.
- Clips that are installed too tightly or too loosely against the underlapping rib of the panel can also create stress on the panel.

Improper handling of panels

When handling metal panels, installers should carry the panels perpendicular to the ground and ensure they are supported enough to prevent excessive bowing. Frequent movement, twisting, and handling of a panel can place stress on it, preventing the panel from settling into a relaxed position once installed.



Sketch courtesy of Sheffield Metals

Out of tolerance roof deck such as concave, convex, or uneven planes

Sagging or bowing rafters, moisture-expanded plywood, and wrinkled underlayment can contribute to oil canning.

Misalignment of panels

Precise measurement is a key component of proper installation. Misalignment of panels from ridge to eave can lead to stress on the metal when one end is adjusted to correct the discrepancy, thereby contributing to oil canning.

Restricting thermal movement of panels

Restricting the expansion and contraction necessary for proper thermal movement of a panel places stress on the metal. This often occurs when panels are pinned at both ends, preventing the center from moving during thermal expansion and contraction.

Ways to Minimize Oil Canning

Use Striations or Beads to minimize the flat space on a panel

Striations or Beads are indentations formed into the flat portion between the ribs of metal panels to add rigidity. While these indentations do not completely eliminate oil canning, they reduce the amount of flat surface, making any waviness less noticeable.

Use a thicker gauge

Thicker metal adds rigidity to the panel which helps to minimize oil canning.

Use panels with narrower widths

Oil canning is most noticeable in the broad, flat sections of a metal roof or wall system. Opting for narrower panel widths can help reduce these flat areas, thereby minimizing the visibility of oil canning.

Use a low-gloss finish to reduce reflectivity

The visibility of oil canning is greatly affected by the amount of light reflected from the surface of a metal roof or wall panel. Opting for metal with a low-gloss or matte finish can significantly reduce reflectivity and minimize the appearance of oil canning.

Install the metal panels on a leveled, consistent, and in-plane roof deck

An uneven roof deck, whether made of metal, plywood, or OSB, is a common cause of oil canning. Installing metal panels on a deck that bows or is inconsistent in its plane introduces stress into the metal as it adapts to the uneven surface. It is essential to inspect the roof deck for any concave or convex bowing, or uneven planes that could affect the metal panels.

Before attaching metal roof panels, lay them flat and loose on the roof deck. Observe the panels to ensure they are flat and free of any signs of oil canning.

Install a backer rod

Installing a backer rod under the flat sections of the metal panel introduces a slight bow, helping to minimize the appearance of oil canning.