



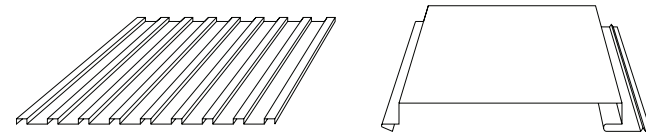
ARCHITECT'S BOARD

Oil Canning: Causes and Prevention

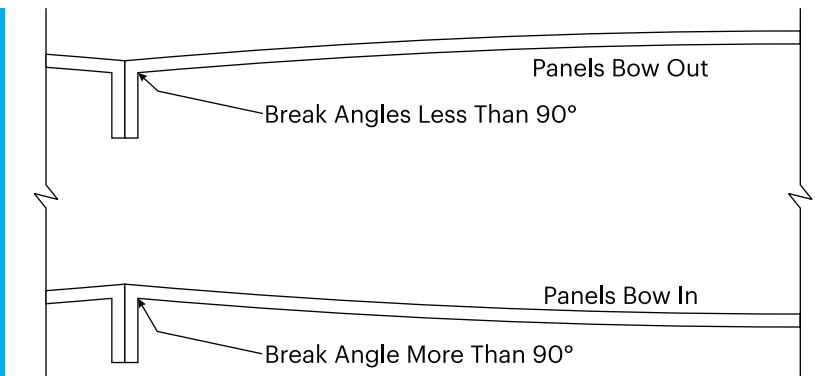
Oil canning is unwanted surface ripples in panels, usually metal, that are supposed to be smooth and flat. It is unfortunately common in roofs and facades fabricated or installed by unskilled workers, or contractors seeking to reduce costs below what is reasonable.

Like any architectural element, metal panels require support. The greater the span between supports, the more rigid the panel must be to retain its shape. Without proper support, sagging due to gravity or strain created during installation will cause oil canning. There is a common myth that perforated panels or matt finishes will hide oil canning, but they will not. A matt finish may make it less noticeable, but it is no substitute for preventing the problem from the start, and perforated metals are more challenging than solid. Punching holes in the material compromises its rigidity and introduces its own stresses. Therefore, perf requires more support than solid sheet.

Proper support can mean a lot of different things, and getting it right can reduce costs. Often forming angles, ridges or corrugations can add a decorative enhancement while simultaneously making sheet goods more ridged. Such shaping makes the panel somewhat self-supporting, so it can be thinner. Corrugations are not possible where an uninterrupted flat plane is the design intent, but panels can still have pan-formed edges, out of sight in the seams, to add stiffness.



Brake forming can add rigidity to help prevent oil canning, but only if it is done correctly. Over or under bending will create panels that aren't flat, and a brake that is poorly adjusted or too weak for the metal being bent will result in corners that are not the same angle for their entire length. Without skill and the right equipment, the resulting panels will be warped.

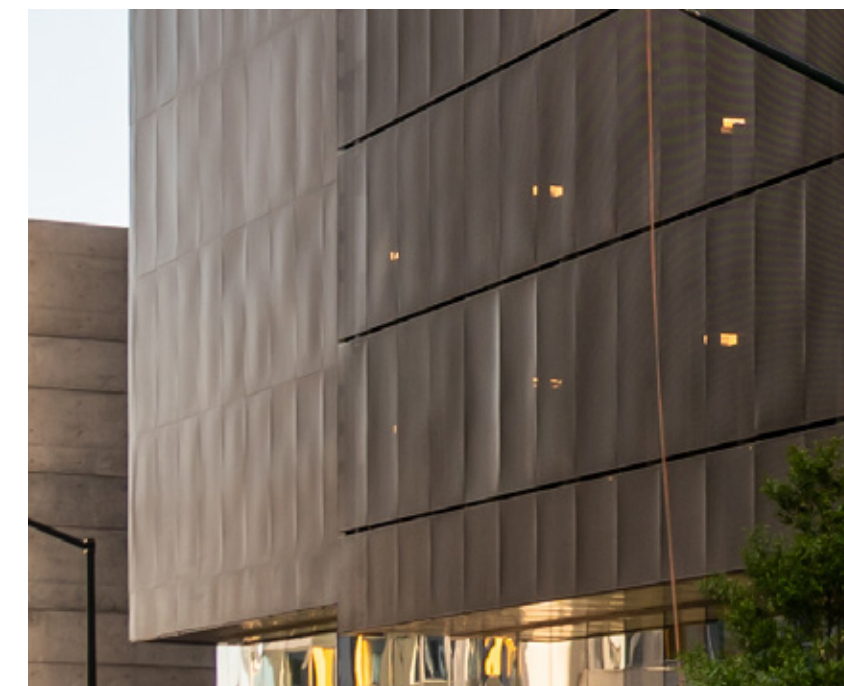


Welding can also cause oil canning by introducing stresses in the metal as it is heated and cooled. Heavy sheet can be welded 'gently,' but on thin sheet, or if thick sheet is welded too deeply, no amount of structural support will hide the damage. Sometimes, it is better to use structural adhesives rather than welding for whatever fixed assembly is required. Unfortunately, such adhesives cannot survive the temperatures involved in powder coated or Kynar finishes, which are often the best choices for a given application.

Even Minor Irregularities Will Stick Out Like A Sore Thumb

Oil canning can also be introduced by putting the panel under tension during the final installation. Forcing a sheet into a space slightly too large or small for it or twisting it to reach misaligned anchor points will create unwanted surface deformations.

It is remarkable how little a 'flat' panel has to be distorted to appear obviously wrong. Especially when small imperfections are repeated in panel after panel. These are exactly the sort of patterns that the human eye is good at noticing, and even minor irregularities will stick out like a sore thumb.



The good news is all these problems are avoidable. Using material appropriate to the panel size, and adequate flush and true supports prevents warping. Panels can be shaped to add rigidity, and stiffeners can be attached to the second surface to increase stiffness. Where mounting surfaces are irregular, adjustable mounting hardware allows the flexibility to install a flat panel on an uneven structure. Good design, the right equipment, and skilled fabricators prevent self-inflicted surface irregularities due to forming and welding errors, and proper surveys and skilled installers prevent the field-warping of well-designed panels.

Choosing the correct material thickness is always a balancing act. The thicker it is, the less likely you'll have oil canning, but overdoing it adds unnecessary cost. Making the most of support and stiffening techniques will allow a thinner sheet and a better bottom line. Ensuring surveys, fabrication, and installation are spot on keeps that sheet looking good after it's bolted in place.