

Oil Canning - Information Sheet

Wrinkling, distorting, pillowing, and breathing are amongst the descriptions that you will hear when oil canning is discussed. References to oil canning are not always negative and sometimes designers and architects might even refer to the material as having a natural and lively element. In most cases however, oil canning is an undesirable outcome and mitigation is the key.

There are numerous factors that contribute to oil canning and unfortunately fabricators and installers are not able to guarantee the total prevention on specific projects. The occurrence of oil canning is not considered to be a material fault and as a result it does not warrant grounds to reject the material.

What is Oil Canning?

Oil canning is the visible waviness or ripple effect seen in the flat areas of metal roofing and wall cladding products.

When oil canning occurs it is usually because of a change in conditions such as ambient temperature or the position of the viewing angle in relation to direct sunlight. In most cases the oil canning will disappear again. The example is demonstrated in the two pictures marked Figure 1(a) and 1(b).

Figure 1(a)



Figure 1(b)

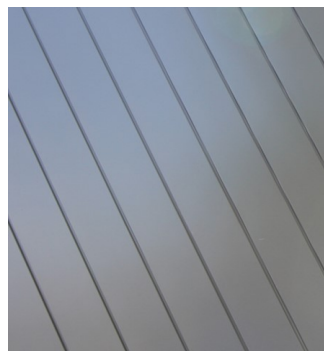


Figure 2(a) and 2(b) show three panels with differing reflective qualities, this demonstrates the visibility of imperfections on high gloss, standard paint and matt finishes. The same three panels are shown in both images with a slight change in the viewing angle.

Figure 2(a)

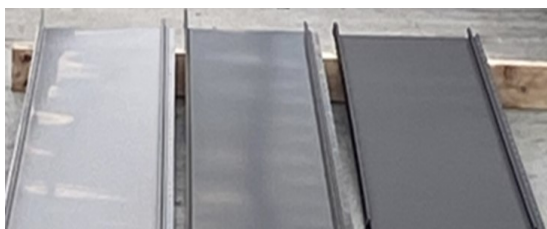
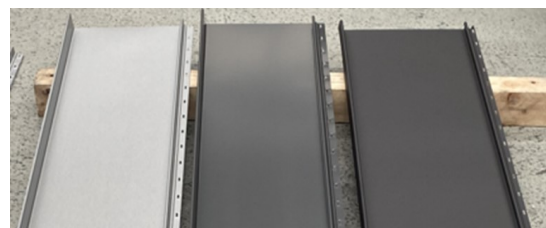


Figure 2(b)



What causes Oil Canning?

Fabrication

Varying tensions may be introduced into the material during the preparation stage, this can occur when rolling or slitting coils to the correct width prior to roll-forming. During the roll-forming process, traditional corrugated or multiple ribbed style profiles are formed from the middle of the sheet towards the outside forcing the material tension towards the outside of the finished product.

Architectural profiles have wider flat sections with high ribs that are tightly formed running down either side of the finished panels and as a result tension can be introduced or trapped in the centre or flatter areas of the finished products.

Modern well-maintained equipment and professional processes will help minimise the potential of issues arising during the fabrication process.

Handling

Finished product should be handled very carefully to avoid any undue stress or damage. Long panels should not be lifted from one end or a corner, be careful packing or unpacking bundled products, tilt panels carefully and do not carry panels flat. More than one person should be used during the transport loading and installation process to avoid unwanted twisting or flexing.

Installation

Experienced installers should be engaged and follow product installation guidelines.

The substrate must be square and plumb, any imperfections in the substrate or misalignment will usually be visible once the panels have been installed.

Make sure all materials are installed and fixed in a relaxed state, do not apply unnecessary force or flex to the finished product during installation as this could result in visible distortion once the material expands or contracts.

Make sure that all flashings, capping or fixings of accessories are not creating any points or areas that will restrict normal thermal movement of the panels.

Where expansion slots are used, take care not to over tighten fixings and make sure that screws are positioned correctly.

Minimise Oil Canning

Take care with your product and pay extra attention to the installation and detailing of the substrate and accessories.

Imperfections are more visible to the human eye on highly reflective or glossy surfaces. The perceived severity and position of oil canning can sometimes be influenced by the coating or type of finish that has been applied to the selected product, refer to examples shown in Fig 2(a) and 2(b). Consider using patterned finishes or designs or finishes that will reduce the level of reflectivity. Alternatively, using matt colours which have a unique ripple paint system that helps diffuse the reflected light can help reduce the visibility of oil canning.

Darker colours absorb more radiant heat and as a result more thermal movement occurs. As the product cycles through heating and cooling, the metal sheet will naturally want to expand or contract in all direction so any restriction or tension in the flat pan can then result in a slight and temporary deformation, the resultant changes create different angles to reflect light or cast shadows making the oil canning more visible.

Shorter and narrower panels experience a lesser amount of expansion and contraction and as a result are less likely to oil can. Striations or flutes rolled into the flat pans or increasing the base metal thickness of the architectural panels can also help reduce oil canning.

In some cases where architectural panels are fitted to a solid substrate such as a plywood backing, introducing a strip of backing rod or closed cell foam tape or laying the sheets over a breathable mesh style underlay will naturally create a slightly exaggerated bow or crown in the flat areas of the product. As the metal expands, each sheet is encouraged to deflect in the same direction making oil canning less obvious.

Architectural panels made from thin gauge materials have been around for a long time and remain popular in modern designs. By knowing a little more about what causes oil canning and understanding some of the precautions we can take will help when deciding which products and finishes would be best suited for your next project.



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