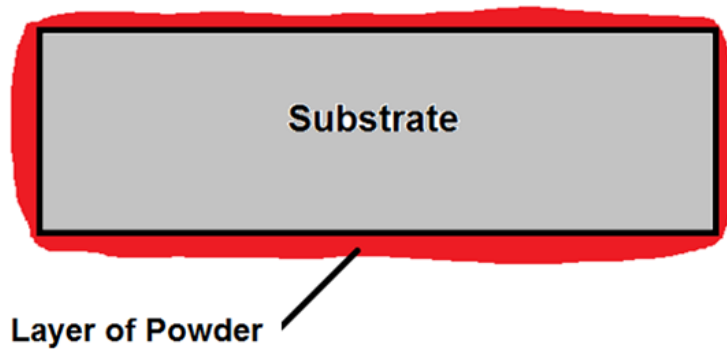


Edge Coverage with Powder Coating

INTRODUCTION

It has long been understood that the flattest and most accessible surfaces of a product being powder coated will have the strongest electrostatic attraction and will build powder film more easily than sharper edges. In addition to electrostatic factors, the edges will have limited surface for the powder to build onto. The resulting coverage is illustrated below. The flat surfaces have normal coverage of around 2.0 mils whereas the corners have very limited film thickness.



Image

The limited edge coverage may not provide sufficient resistance to moisture penetration to the substrate and corrosion protection may be inadequate. Note in the photo below how the sharp edge is where the corrosion began.



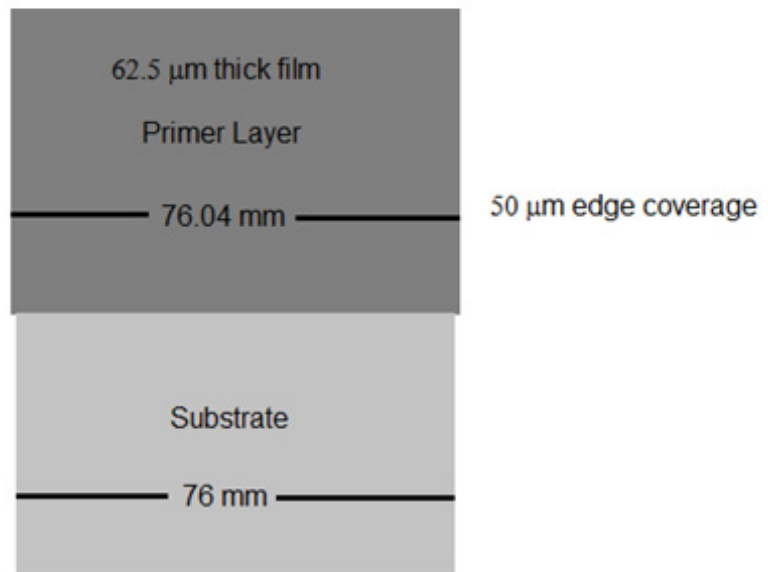
Image

Edge Coverage with Powder Coating

MEASURING EDGE COVERAGE

Film thickness on the edge of a part cannot be accurately measured with a thickness gauge due to the lack of surface for a reading. It can be measured on a panel using a caliper with a resolution of at least 0.01mm and accuracy of at least 0.03mm. The preferred panel is an ACT aluminum 6061 4" x 6" x 0.032 test panel. The raw panel width is measured before coating and then the panel is measured again after coating. The resulting difference shows how much film built on the edge.

The illustration below shows a panel that has one layer of primer. The film thickness is an average of 62.5 micron (2.5 mils). The width of the raw panel is 76 mm. The powder added to the panel width by the primer layer is 76.04 mm. The added powder has added 50 micron (2.0 mils) to the width so each of the edges has 1.0 mils of powder thickness.

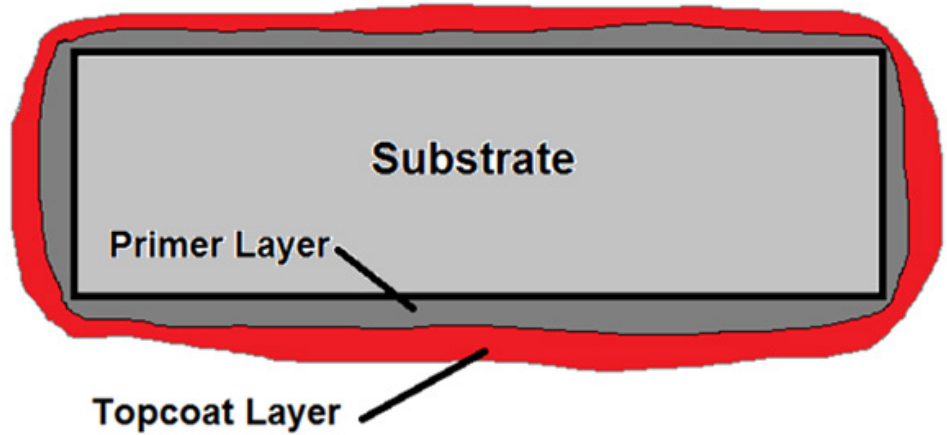


Image

The sharpness of the edge has a profound impact of the thickness of the coverage. Any radius on the sharp edge will add some surface and therefore add to the film build on that area. Removal of sharp burrs or edges will help with coverage and improve corrosion protection of the part.

In cases where the edge coverage is inadequate for the needed corrosion protection and it is not possible to add sufficient radius to build powder a second layer of powder is recommended. The first layer creates some radius as seen in the illustration below. The second layer now has some additional surface to build on and the coverage on the edge is significantly improved.

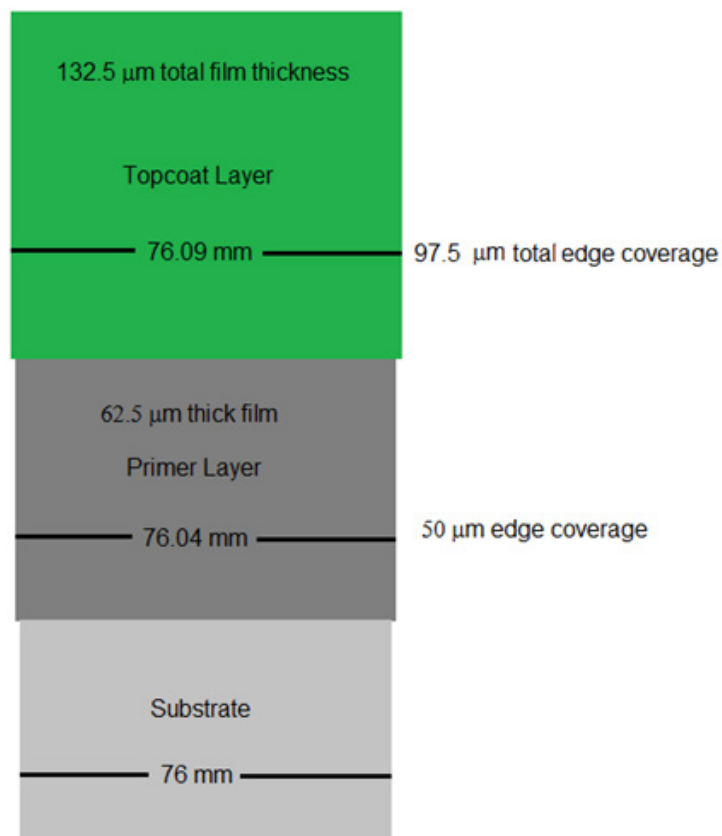
Edge Coverage with Powder Coating



Image

The two layers can be the same topcoat product or a layer of primer with a second layer of topcoat. Both will improve the edge coverage; the primer layer will add to corrosion resistance.

The panel illustration below shows how the measured edge coverage changes with the addition of second layer of powder.



Image



Edge Coverage with Powder Coating

The additional powder added to the edges is 0.05 mm for addition of 47.5 micron or 0.95 mil additional coating on each edge. All of these numbers are for illustration and actual numbers can be measured and adjusted according to the needed overall thickness.

CONTRIBUTORS

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