

Successful powder coating starts with good design.

In common with most elements of construction or manufacture the appearance and performance of the powder coating is influenced by considering the design and manufacture at an early stage of a project.

We keep ourselves up to date with best practice, techniques and industry knowledge through formal and informal training. We encourage you to consult us in the early stages to discuss the advantages and disadvantages of various design techniques. We hope to be several pages ahead in *the manual* to give you the best advice to achieve the finish you want.

Useful standards & information

Powder coating on aluminium. BS EN 12206-1.

Powder coating on galvanized steel. BS EN 13438 and BS EN 15773

Galvanizing. BS EN ISO 1461

Design considerations for protective paint systems. BS EN ISO 12944 – 3

Galvanizers Association design guide. Equally applicable to aluminium fabrications.

Sharp edges are commonly caused by laser, water and plasma cutting.

In galvanized steel, sharp edges have been shown to cause fracturing of the zinc and localised thinning of the powder coating around the edge for up to 10mm.

Sharp edges and perforations in aluminium cause local thinning of the coating and may contain slithers of protective plastic which if not fully removed can lead to incomplete pre-treatment of the surface.

Sharp edges should be “broken” by either, (a) chamfering the edge (good) or (b) making a 5mm radius (best) to allow the zinc and powder coating to grow and flow around the edge. An additional benefit of chamfering the edges is that they are much more comfortable to handle and safer to use, especially in balustrade components.

Pre-assembled fabrications

Most powder coating will allow for a significant amount of pre-assembly such as welding, riveting or threaded fasters. Care must be taken to avoid too much overlapping material where liquids can become trapped and then boil out during the coating process.

Seen faces

The design should identify the significant faces of the finished product. These are categorised as “Primary faces” – highly visible in use. “Secondary faces” – not visually important but do require complete coverage. “Unseen faces” – not visually important. Identification of these faces using a clear notation on any drawings will enable the powder coater to hang the parts from locations which will enable the important faces to be covered.

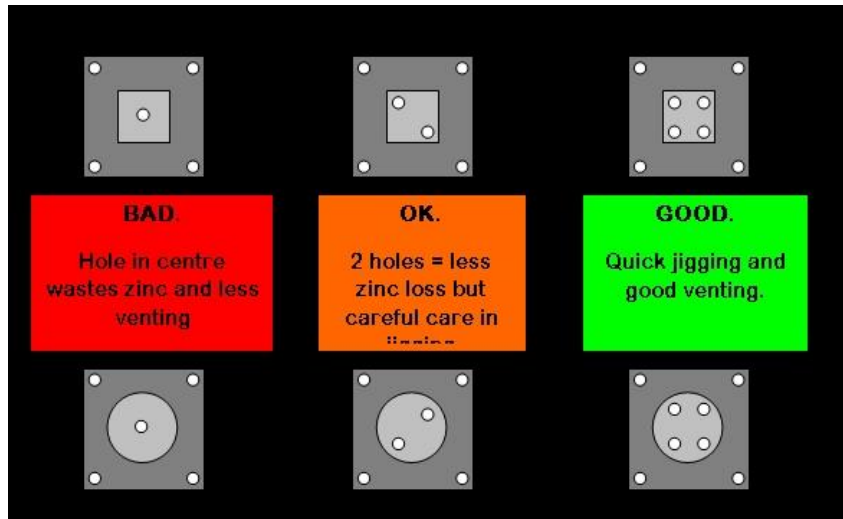
Suspension points

Suspension points AKA hanging or jig points should be included in design review to ensure that they are in the correct location for powder coating and can't be seen when installed. Guarantees may be affected if the suspension points are incorrectly located.

Ventilation and drainage

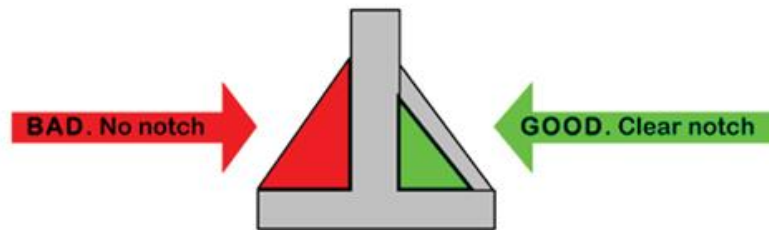
Incorrectly vented fabrications are the most common fault of a **galvanized fabrication** and the most important to get right. Molten zinc is 93% of the specific gravity of steel, which means it's difficult to sink. A small amount of air trapped in a hollow steel section could mean that the fabrication will float and not galvanize correctly. This will leave a burned surface, incomplete internal protection and poor surface finish.

Examples of a typical hollow section post with a base plate are shown below. The principles apply to all hollow sections. **Aluminium sections** with sealed voids must also include ventilation to avoid pre-treatment entrapment.



Flow

Surface coatings including zinc and pre-treatment must be free to flow easily over the material to cover the surface thoroughly and completely. Avoid blind holes that trap air and prevent the entry of liquids. Consider the installed orientation to avoid water, dirt or salt traps which can't easily be cleaned.



Surface Contamination

Contaminants such as, lubricating oils, cutting fluids, grease, dirt, swarf and silicon are well known to affect the powder coating process.

Most powder coating companies will have a pre-treatment that removes loose surface contamination, light oils etc, although there are situations where even the best system will not remove heavy contamination.

Contamination can be caused by poor storage in the form of surface corrosion which can't always be removed and may result in a rough or pitted surface which will result in a poor powder coated finish.

Common causes of contamination are:

Food – crisps, snacks and fast-food : hand cream : anti-spatter spray : WD40 : permanent marking inks
high tack tape residue : fats used in grinding : swarf : aerosol paint : poor storage.

Surface condition

Powder coating will highlight poor surfaces. Aluminium extrusion marks, impacted swarf and die pick-up (comet tails) may not be covered by powder coating.

Hot rolled steel surfaces may contain impacted mill-scale which is unsightly and leads to incomplete coating.

Zinc dross after galvanizing is usually the result of poor drainage and poor design or manufacture. Like mill-scale dross will result in poor coating.

Marine & Industrial environments

The applicator is required to process material through an enhanced system for harsh environments, the designer must also address the following:

Joints and water & dirt traps must be kept to a minimum, they must be sealed on site.

Narrow gaps and blind crevices should be avoided as these areas will have a reduced coating thickness.

There must be no exposed bare metal edges.

Surfaces should be free draining.

Design should allow for inspection, maintenance and cleaning.

Project specific advice

Warranty

Warranties for correctly designed and maintained components are:

For C2 and C3 environments: 25-year warranty for gloss, colour and adhesion is offered as standard.

For C4 and C5I & C5M environments: Guarantees are conditional on project location, environmental conditions and pre-contract approval.

Warranties are offered in conjunction with Powdertech standard terms and conditions and a documented cleaning and maintenance programme.

Please note

This document is for guidance only and should be read in conjunction with other data sheets where applicable

This document forms no part of a contract. Any warranty is subject to individual review.