

MATERIAL SELECTION



- INDUSTRIAL
- HAZARDOUS AREAS
- DATA ICT
- RESIDENTIAL COMMERCIAL

Material Selection Guide

Things to consider when selecting the right material

At B&R, we believe that selecting the right material can maximise the longevity of the enclosure. One of the most influential factors in selecting the right enclosure material is location. To assist you we have created this guide.

Indoor location with no gas, chemical contaminants or fine dust present.

Generally any enclosure material would be suitable -- an enclosure choice would be based more on the type of equipment going inside and the IP rating (protection from dust and water ingress) rather than the material used. Base on cost, the most appropriate material would be plastic or zinc coated steel.

Indoor location with gas, chemical contaminants or fine dust.

If the location is exposed to gas or other chemical contaminants 316 stainless steel is generally suitable however, chemicals can react differently to various materials. If the enclosure is exposed to fine dust 316 stainless steel would be the most suitable option to avoid possible corrosion.

If the area is classified as hazardous (potentially explosive atmosphere) an explosion-proof or increased safety enclosure may be required. These are typically made from high grade stainless steel but you will need to ensure the enclosure is certified for hazardous areas.



Outdoor location with no gas, chemical contaminants or fine dust.

An aluminium or zinc coated steel enclosure could be suitable. Plastic enclosures can also be used in an outdoor environment, although there is often a discolouration of the plastic due to UV exposure however, this will not affect the structural integrity of the enclosure.

Outdoor location with high salt deposition (non-coastal).

These areas are typically related to mining regions. These areas are subject to a high risk of corrosion which can dramatically affect mild steel and even lower grade stainless enclosures. A 316 stainless steel enclosure would be recommended for these areas.

Coastal Location with high salt deposition.

The use of metal enclosures along the Australian coast is common and often incorrect materials are selected on price and fail due to corrosion. Typically the corrosion is caused by chloride attack from salt water. This can dramatically affect mild steel and even lower grade stainless steel enclosures.

316 stainless steel is the best and most suitable for coastal areas, but this will be dependent on the salt deposition of a particular area.

AS2699.1 specifies that stainless steel should be used for structured areas where there is salt deposition of over 60mg/m²/day. Stainless steel enclosures should be mounted in positions to maximise the washdown effect of rain. If this cannot be achieved regular cleaning is required.

Aluminium also offers a high degree of corrosion resistance but does not offer the same level of protection from tea-staining as stainless steel.



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What materials we use

At B&R, we choose only the best materials when manufacturing our enclosures. This superior quality ensures you can trust the product and us.

316 Stainless Steel

The main benefits of using stainless steel are its structural strength, aesthetic appeal and high level of corrosion protection due to naturally occurring chromium-rich oxide film formed on the surface of the steel.

Grade 316 stainless steel can be used successfully in coastal locations where many other grades may experience corrosion due to the higher levels of chloride present in the environment. It is also the preferred material used in food processing applications, it can be easily cleaned and resists many organic chemicals, dyes and a wide variety of inorganic chemicals.

B&R Enclosures use only the highest quality 316 stainless steel materials, manufacturing and finishing techniques and are accredited by the Australian Stainless Steel Development Association (ASSDA).

For more details on ASSDA visit www.assda.asn.au.

Surface Finish

We finish our stainless steel products in a way that is aesthetically pleasing and also ensures superior protection. We apply an N4 surface finish, with a maximum Ra of 0.4µm. This Ra rating is a key factor in the corrosion protection and 'cleanability' of our products.

Surface corrosion, often referred to as 'tea staining' is common along the coast fringe and high salinity areas of Australia. Tea staining is a discolouration of the metal surface which is unsightly, but does not affect the structural integrity of the enclosure.

For more details on tea staining visit [www.brenclosures.com.au/PDFs/Tea Staining.pdf](http://www.brenclosures.com.au/PDFs/Tea%20Staining.pdf)

B&R Enclosures continuously undertake manufacturing improvement programs. Some of the process outlined above may change without notice.



Zinc Coated Steel

We use primarily zinc coated steel for our B&R branded products. This is a matte, hot dipped, zinc iron alloy which when combined with chemical pretreatment and powdercoat finish offers the best possible corrosion protection for enclosure systems.

Pretreatment

A B&R branded zinc coated steel enclosure is punched, bent, welded and ground on the way through our factory. Following fabrication it goes through an automated process which consists of the following:

- Alkaline cleaner
- Reticulated freshwater rinse
- Iron phosphate coating
- Reticulated freshwater rinse
- Demineralised water with polymer additive

Titration tests are also conducted to ensure that the material meets the required specifications.

Powdercoat Finish

The powdercoat paint is applied at an average coating thickness of 100µm for a ripple finish and 70µm for a gloss. The minimum coating thickness is 60µm on the exterior of the enclosure and 25µm on the interior (conforms to AS/NZS 4506:1998).

Testing

The powdercoat paint finish is tested extensively to the following standards ensures consistent paint finish in terms of both quality and colour across our range of enclosures.

- Powdercoating thickness test (AS1580.108.1:1994)
- Cure Test, solvent resistance method (AS/NZS4506:1998)
- Adhesion, cross cut test (AS/NZS 1580.408.4:1993)
- Paint colour comparison test (AS2700:1996)



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