



# In search of the perfect aluminium extrusion

A buyer's guide to finding the right extrusion and finishing partner

## Contents

**Finding the right extrusion partner. 2**

**Extrusion do's and don'ts. 4**

**Anodising. 6**

**Powder coating. 8**

**Polishing. 11**

**Plating. 14**

**What next?. 16**

## Finding the right extrusion partner

We pulled this guide together to help companies looking to use extrusion within the design and development of their products, and to give them the confidence to find the most appropriate extrusion partner.

# In search of the perfect aluminium extrusion

The reality is there are lots of things that you need to consider before getting into a relationship with an extrusion provider. With an accumulated 40 years of experience, we think we've got something to offer.

Five things we think you should be asking questions about at the outset of any project are:-

1. Does your partner have experience of your application?
2. Can they advise on the right profile for your application?
3. Do they have the in-house design capability to bring the concept to life?
4. Can they offer a wide range of suitable finishes?
5. Can they deliver what you need, when you need it?

We hope you find this document useful and would love to hear what you think.

Dana - Orgbar Aluminium

Dave - Badger Anodising

## Extrusion do's and don'ts

Here's our twelve-point checklist to help you get the best from your extrusion partner.

### Do's

- Do your homework. Get recommendations within the industry. Use the Internet to find credible partners.
- Do provide drawings with the right technical information to help your extrusion partner provide the best advice.
- Do know the application you want the extrusion to be a part of – what is it for?
- Do know how the extrusion is going to be used.
- Do know the operating environment i.e. temperature, pressure – where is it being used?
- Do know if it is 'on display' or acting as a hidden component – does it need finishing?

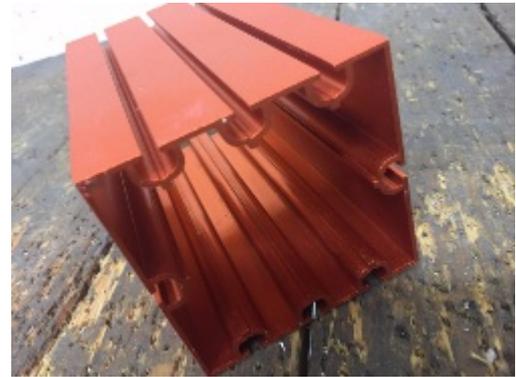
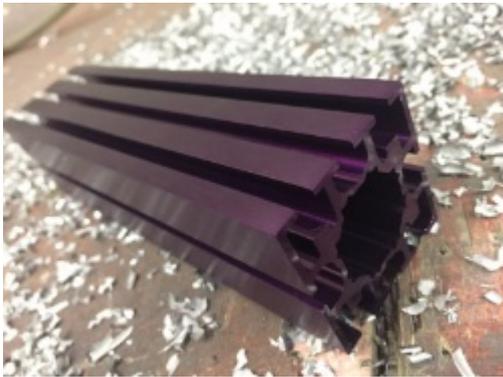
## Don'ts

- Don't select more than 3-4 specialist companies to provide a response. Any more than this and it becomes an auction and everyone in the industry will become aware of it.
- Don't leave out any information to 'test' potential partners. It just means you get an incorrect recommendation.
- Don't leave out your finishing requirements.
- Don't be unrealistic when it comes to finding the balance between having it quickly, inexpensively or at a high quality. You can generally only have any two of these.
- Don't forget to advise drop dates and locations so logistics can be factored into the project timelines.
- Don't buy only on price. You'll pay twice.

## Anodising

Does your extrusion partner really understand the anodising process?

Anodising is an electrochemical process that converts a metal surface into a decorative, durable, corrosion-resistant, anodic oxide finish. Aluminium is ideally suited to anodising, although other nonferrous metals, such as magnesium and titanium, also can be anodised.



## How?

Anodising is achieved by dipping an aluminium component into an acid electrolyte bath and passing an electrical current through the medium. A cathode is mounted to the inside of an anodising tank.

The aluminium acts as an anode, so that oxygen ions are released from the electrolyte to combine with the aluminium atoms at the surface of the part being anodised.

## When?

A unique anodised finish is the only one in the metals industry that satisfies each of the factors that must be considered when selecting a high-performance aluminium finish.

[Client to add a couple of applications/sectors here]

## Why?

There are several benefits to using anodising in your extrusion process.

**Durability.** Most anodised products have an extremely long life span and offer significant economic advantages through maintenance and operating savings. Anodising is a reacted finish that is integrated with the underlying aluminium for total bonding and unmatched adhesion.

**Color Stability.** Exterior anodic coatings provide good stability to ultraviolet rays, do not chip or peel, and are easily repeatable.

**Ease of Maintenance.** Scars and wear from fabrication, handling, installation, frequent surface dirt cleaning and usage are virtually non-existent. Rinsing or mild soap and water cleaning usually will restore an anodised surface to its original appearance. Mild abrasive cleaners can be used for more difficult deposits.

# In search of the perfect aluminium extrusion

**Aesthetics.** Anodising offers a large increasing number of gloss and colour alternatives and minimizes or eliminates colour variations. Unlike other finishes, anodizing allows the aluminium to maintain its metallic appearance.

**Cost.** A lower initial finishing cost combines with lower maintenance costs for greater long-term value.

**Health and Safety.** Anodising is a safe process that is not harmful to human health. An anodised finish is chemically stable, will not decompose, is non-toxic, and is heat-resistant to the melting point of aluminium (1,221 degrees F.) And the anodising process is non-hazardous and produces no harmful or dangerous by-products.

## Powder coating

Does your extrusion partner really understand the powder coating process and when to recommend it?

Powder coating is a dry finishing process that has become extremely popular since its introduction in North America over in the 1960s.

Representing over 15% of the total industrial finishing market, powder is used on a wide array of products.

# In search of the perfect aluminium extrusion

## How?

Powder coatings are based on polymer resin systems, combined with curatives, pigments, leveling agents, flow modifiers, and other additives. These ingredients are melt mixed, cooled, and ground into a uniform powder similar to baking flour.

A process called electrostatic spray deposition (ESD) is typically used to achieve the application of the powder coating to a metal substrate.

This application method uses a spray gun, which applies an electrostatic charge to the powder particles, which are then attracted to the grounded part.

After application of the powder coating, the parts enter a curing oven where, with the addition of heat, the coating chemically reacts to produce long molecular chains, resulting in high cross-link density.



## When?

More and more companies specify powder coatings for a high-quality, durable finish, allowing for maximized production, improved efficiencies, and simplified environmental compliance.

Often applied to a wide of consumer products ranging from cars to washing machines, powder coating is used as functional (protective) and decorative finishes, powder coatings are available in an almost limitless range of colours and textures, and technological advancements have resulted in excellent performance properties.

## Why?

There are a number of benefits to using powder coating within your finishing process.

**Durability.** Powder coating is a high-quality finish found on thousands of products you come in contact with each day. Powder coating protects the roughest, toughest machinery as well as the household items you depend on daily. It provides a more durable finish than liquid paints can offer, while still providing an attractive finish.

**Resistance.** Powder coated products are more resistant to diminished coating quality as a result of impact, moisture, chemicals, ultraviolet light, and other extreme weather conditions. In turn, this reduces the risk of scratches, chipping, abrasions, corrosion, fading, and other wear issues.

**Greener than other methods.** In addition to being durable, powder coating is an attractive choice due to environmental advantages.

## Polishing

Surface finishing, or polishing, is a broad range of industrial processes that alter the surface of a manufactured item to achieve a certain property.

### How?

Finishing processes may be employed to: improve appearance, adhesion or wettability, solderability, corrosion resistance, tarnish resistance, chemical resistance, wear resistance, hardness, modify electrical conductivity, remove burrs and other surface flaws, and control the surface friction.

In limited cases, some of these techniques can be used to restore original dimensions to salvage or repair an item. An unfinished surface is often called *mill finish*.

# In search of the perfect aluminium extrusion



To achieve a #8 Finish (mirror quality) it requires polishing and buffing compounds, polishing wheels and high speed polishing machines or other machine tools that can be used for polishing, like an electrical drill.

When buffing there are two types of buffing motions: the *cut motion* and the *colour motion*. The cut motion is designed to give a uniform, smooth, semi-bright surface finish. This is achieved by moving the workpiece against the rotation of the buffing wheel, while using medium to hard pressure. The colour motion gives a clean, bright, shiny surface finish.

## When?

Polishing may be used to enhance and restore the looks of certain metal parts or object on cars and other vehicles, handrails, cookware, kitchenware, and architectural metal.

# In search of the perfect aluminium extrusion

In other applications, such as pharmaceutical, dairy, and specialty plumbing, pipes are buffed to help prevent corrosion and to eliminate locations where bacteria or mould may reside. Buffing is also used to manufacture light reflectors.

Polishing cutlery is known as fine glazing or blue glazing. Sand buffing, when used on German silver, white metal, etc., is technically a buffing operation because it uses a loose abrasive, but removes a significant amount of material, like polishing.

## Why?

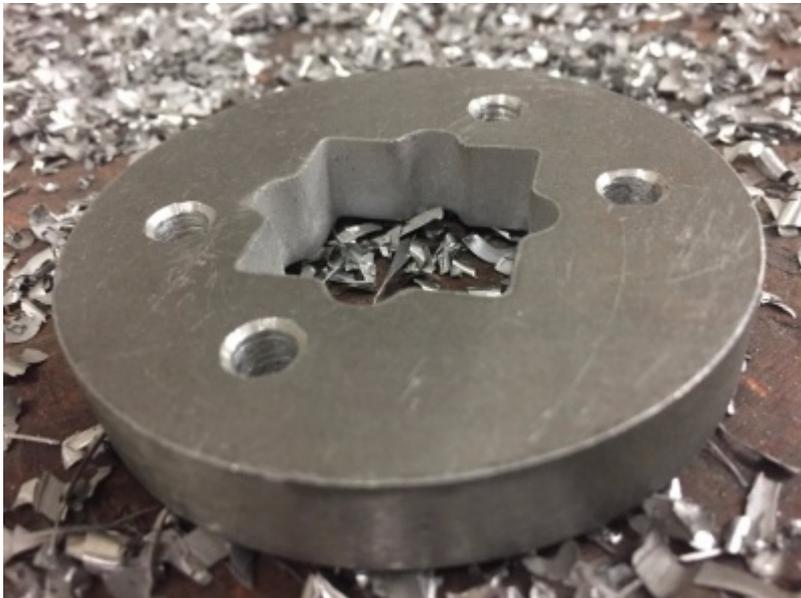
Surface finishing processes can be categorized by how they affect the workpiece:

- Removing or reshaping finishing
- Adding or altering finishing

Mechanical processes may also be categorized together because of similarities the final surface finish.

## Plating

Plating is a surface covering in which a metal is deposited on a conductive surface. Plating has been done for hundreds of years; it is also critical for modern technology. Plating is used to decorate objects, for corrosion inhibition.



## How?

There are several plating methods, and many variations. In one method, a solid surface is covered with a metal sheet, and then heat and pressure are applied to fuse them (a version of this is Sheffield plate).

Other plating techniques include electroplating, vapor deposition under vacuum and sputter deposition. Recently, plating often refers to using liquids. Metallizing refers to coating metal on non-metallic objects.

## When?

[Client to add a couple of applications/sectors here]

## Why?

Plating in extrusion terms improves solderability, hardens, improves wearability, reduces friction to improve paint adhesion and other purposes. Jewellery typically uses plating to give a silver or gold finish. Thin-film deposition has plated objects as small as an atom, therefore plating finds uses in nanotechnology.

## What next?

If you're searching for the perfect aluminium extrusion

You need to make sure you find the right extruding and finishing partner for the job

[Orgbar logo]

[www.orgbar.com](http://www.orgbar.com)

+44 (0)1564 700 007

[Badger logo]

[www.badgeranodising.co.uk](http://www.badgeranodising.co.uk)

+44 (0)121 622 1850