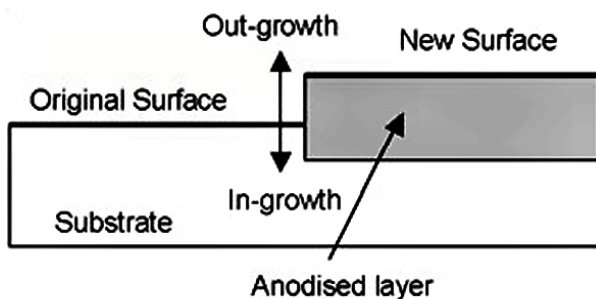


Designing for coatings

At Poeton, our philosophy is that the need for a functional coating should be anticipated at the component design stage, in tandem with the choice of material, the manufacturing route and the tolerances. Too often, we are asked for coatings as an 'add on', with insufficient tolerances, difficult materials and awkward processing demands. The result is extra cost – cost that can be greatly reduced if we work together from the onset.



Did you know how anodising changes the size of the part?

Where can we help you save cost?

Reduced material and manufacturing cost

Tell us what you want in the way of performance and we will suggest the best and cheapest substrate/coating combination. Why use expensive substrates, or complex machining and heat-treatment? Let the coating do the work.

Eliminate the need for costly finishing steps after coating

If we agree the right dimensions and tolerances at the onset, Poeton can provide precision coatings – chrome, electroless nickel or anodising – with no need to post-finish.

Reduce costs arising from rejects and expensive quality testing

By agreeing tolerances and design features, we can ensure that your part can be coated effectively, with a 100% pass rate. How are we going to hold it? Can we avoid threads and holes that could cause problems? Can we minimise the need for expensive masking steps? Such questions should be discussed at the start, not when the part has been made.

Saving you time and cost – that's our objective

Towards a successful application

Co-operation from the start, in a logical series of initiatives; that's how we work – towards the optimum coating solution to your problem.

1 Understanding your application

Establishing what problem you are looking to solve – wear, friction, non-stick, corrosion protection, looking at your base materials, loads and environment.

2 R&D

If necessary, we will perform trials in our laboratory, simulating the operating conditions, measuring parameters such as wear rate, friction or corrosion. We can support that with in-depth surface analysis, including optical and scanning electron microscopy. (Also, see over.)



3 Test samples

Your parts processed individually, overseen by our laboratory under 'sample' procedures, so you can evaluate proposed coatings.

4 Design support

Establishing sizes, finishing, coating thickness, holding points, manufacturing sequence, optimum materials.

5 First articles

Simulated production, ironing out issues of jiggling, masking and timings, leading to firm price estimates.

6 Pre-production, into full production

Establishing batch sizes and production sequencing, with quality and inspection procedures.

Two examples

1 Sizing – anticipating the coating step

It's easy to make a mistake, forgetting that the coating has tolerances on thickness, or that an anodised layer adds only 50% of its own thickness to the component dimensions.

Case history – no room for tolerances

You are making stainless steel shafts for contact with an abrasive seal. They need to be super-finished and corrosion resistant, 25.000 ± 0.005 mm diameter. You will ask Poeton to apply electroless nickel for increased hardness. You make them, turned and super-finished, at great expense, to 24.945 - 24.955mm diameter, in anticipation that Poeton will apply 0.025mm (25 microns, 50 microns on diameter) of electroless nickel.

But we have some tolerances as well! We can apply 25 ± 2.5 microns, but no tighter, which could put the final dimension outside your tolerance range, with a high reject rate – after all that expense!

The answer is to fine-turn the shafts to 24.960 - 24.980mm, greatly reducing the cost. Then we apply 25 to 30 microns of electroless nickel (taking the diameter to a minimum of 25.010 mm) and leave the super-finishing step to the end. Costs related to unnecessary precision and finishing are eliminated, and quality control is greatly simplified. Everyone's a winner!

2 Manufacturing history

We need to know everything about the part – its heat-treatment history, its manufacturing route, the exact specification of the alloy. Too often we can be blamed for errors that could have been avoided if we'd know the pitfalls.

Case history – an omission

We were asked to hard anodise a 6082 aluminium alloy component to a thickness of 50 ± 1.5 microns. It was presented in impeccable condition, accurately sized in readiness for a 50% growth of the anodised layer thickness, with a polished surface

Yet we could not anodise it. The thickness would not progress beyond 5 microns. It should have been straightforward – 6082 is excellent for anodising.

The customer had omitted to tell us that, prior to polishing, the part had been spark-eroded. Spark erosion changes the structure of the near surface, blocking the transport of oxygen and greatly inhibiting the anodising process.

To anodise such a part, we have to etch away the surface layer, removing 10 microns. And that means starting again as far as the pe-sizing is calculated.

R&D and Training

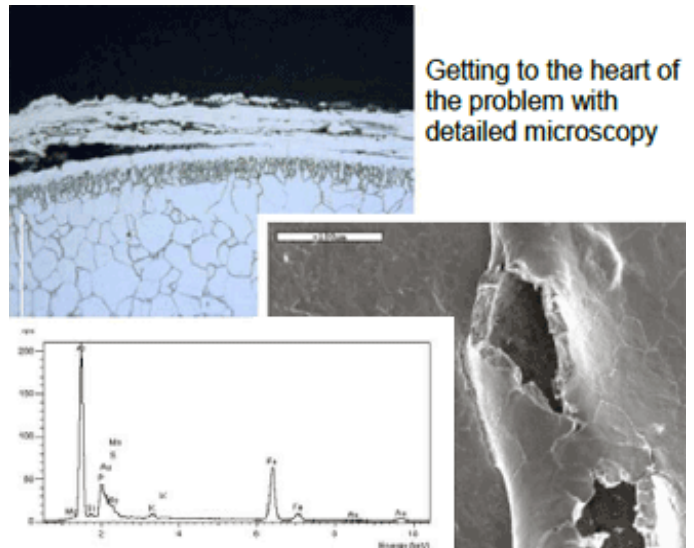
We have fully equipped laboratory, not just for support of our coating processes, but also for the tribological and corrosion evaluation of treated parts.

Contracted R&D

- Wear testing – abrasive and adhesive
- Friction and adhesion (sticking) evaluation
- Corrosion testing (salt mist)
- Coating trials – simulated conditions
- Support for new coating development
- Component/coating development trials

Failure Analysis Projects and Coating Characterisation

- Optical Microscopy
- Scanning Electron Microscopy
- Metallography
- Chemical analysis
- Atomic Absorption technique
- Benchmarking



Training

We can offer on-site or in-house (our Gloucester site) training courses for engineers

- Application and selection workshops
- Process training
- Tribology and corrosion

More information

For your free advice, please contact our **Design Support Team** on (designsupport@poeton.co.uk), or by telephone on (+44) 1452 300500



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NADCAP Accreditation is held by Poeton Industries Ltd with Poeton (Gloucester) Ltd Accredited for Plasma Spray (coatings) and Chemical processing, and Poeton (Cardiff) Ltd Accredited for Chemical Processing and NDT

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