



Wallwork Cambridge Ltd Requirements for PVD/CVD Coating Processing

Suitable materials:

Stainless steels, tool and high-speed steels tempered above 520°C, carbides, titanium, nickel alloys. Under certain circumstances, oxygen-free copper and aluminium alloys may be coated. If in doubt, or if exceptions to your components apply – including unknown heat treatment steps prior to coating – please contact your sales representative first.

Steels with lower-temperature tempering can still be coated, but may be susceptible to further tempering and dimensional changes. Discuss this with your sales representative.

The Nitron 100 duplex process can only be applied to titanium and titanium alloys.

Components must not contain, be plated with, or have braze alloys containing magnesium, cadmium, zinc or tin.

In very limited cases, non-conductive materials such as glass or plastic may be coated, but will require a very specific tailored process, or DLC, which is applied with an RF bias, and can therefore cope with a wider range of non-conductive materials. Discuss this with your sales representative.

Surface condition:

All surfaces must be bright, clean and free of any contaminants.

All surfaces must be free from oxide, rust, paint or varnish – including those surfaces that may not need coatings.

Components must be deburred prior to coating, unless deburring is agreed within the scope of treatments at Wallwork.

Nitrided components should be free from white layer, unless blasting and/or polishing is agreed within the scope of treatments at Wallwork.

Passivated components may experience poor adhesion, and may require pre-process treatments (ion sputtering, wet/dry blasting) prior to coating.

Wallwork coatings are highly conformal, so an appropriate surface finish must be applied prior to shipment, unless blasting and/or polishing is agreed within the scope of treatments at Wallwork.



Components for DLC coatings must have a surface finish of $Ra \leq 0.1\mu m$ to obtain optimum coating adhesion – speak to your sales representative.

All inserts must be removed and components fully disassembled. Cooling channels, waterways and bores must be free from swarf, coolant, debris, polishing compounds and media, heat treatment salts. Any labels, paints, glues or epoxy must not be present.

Part handling

Electrical conductivity must be maintained through the coating process. Consideration must be given to locating a contact wire, bolt or fixture that will locally prevent coating deposition. DLC coatings are applied by seating components on a platen and applying an RF bias, so the standing face may be part- or fully masked from the coating process – but this process is applicable to non-conductive materials.

Part masking is possible for components that require selective coating in specific areas. Preferably, such masking will be bespoke, aid fixturing, and have a coefficient of thermal expansion close to the component itself. The masking must be conductive. Wallwork can provide ad-hoc single-use foil masking, but note that witness marks and transitions from uncoated to coated areas may not be as clean as bespoke masking.

Large or heavy parts must have an appropriate number of threaded holes for safe handling and work holding during the coating process. Speak to your sales representative for specific advice.

Cleaning

Ferrous, nickel, titanium and cobalt-chrome components will undergo routine aqueous ultrasonic cleaning. Any additional surface preparation – pre-clean vapour degreasing, wet / dry blasting, polishing – may incur additional costs.

Alternative materials may need different cleaning steps that may incur additional costs.

Coating limitations

PVD coatings are generally a line-of-sight deposition method, and coating build-up is slightly faster on sharp corners, and in areas facing coating sources.

Through-bore coating range is approximately twice the diameter. Closed bores may be as low as one diameter. In both cases, the thickness will diminish quickly when measured from the hole / bore opening to the extent of the coating.

Single-layer coatings will not provide a good level of corrosion resistance. Speak to your sales representative about the specific benefits of multilayer coatings.



Packaging

As coatings are routinely applied to finished components, it is highly recommended that components are packaged in appropriate, bespoke containers that minimise the risk of movement or metal-to-metal contact during transit.

If no specific packaging is supplied, Wallwork will endeavour to pack components as securely as possible. Note that in some limited instances, parts may be immersed in Crocell or de-watering oil, or may be wrapped in VDI paper. If either of these methods are not acceptable, discuss this with your sales representative.

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