



APTICOTE 480A
ADVANCED NICKEL COMPOSITE
ULTRA LOW-FRICTION COATING

POETON
— EST. 1898 —



A REVOLUTIONARY NEW SURFACE COATING

APTICOTE 480A is a precision metal-polymer composite coating. It offers the ultimate non-stick and low-friction properties of a fluorocarbon polymer with the hardness, wear resistance and corrosion protection provided by electroless nickel.

KEY BENEFITS



LOWER ENERGY
REQUIREMENTS



EXCEPTIONAL
MOULD RELEASE



INCREASED
SERVICE LIFE



FASTER
PRODUCTION



FOOD
COMPLIANT



REDUCED
WEAR

APPLICATIONS



FOOD
PRODUCTION
MOULDS



MEDICAL
PIVOT PINS



CLUTCHES &
SPLINES



GEARBOX
LEVERS



PUMP
BEARINGS



PHARMACEUTICAL
MOULD TOOLS



SCREW
ADJUSTERS



CIRCUIT
BREAKERS



MACHINE
TOOLS

THE POETON DIFFERENCE

We do everything possible to make it possible for you

Today, designers, engineers and manufacturers like you are pushing conventional materials to their limit. Finding the right surface treatment solution is critical if your components are to succeed in new, challenging or extreme operating conditions.



Here to help

We have the desire, expertise and capability to deliver the solutions to meet the most complex surface treatment challenges. Whether you already know the treatment required, need some help choosing or a completely bespoke solution, **Poeton will make it possible.**

Research & Development

For years we have been developing the latest surface treatments to offer you unique performance benefits. Our Apticote range offer performance improvements over standard treatments and have been used to solve countless engineering challenges.



120 Years of Experience

From humble beginnings plating bicycle components, to processing key war-time components, and the development of advanced problem-solving composite coatings, we have always been at the forefront of surface engineering innovation.

SPECIFICATION

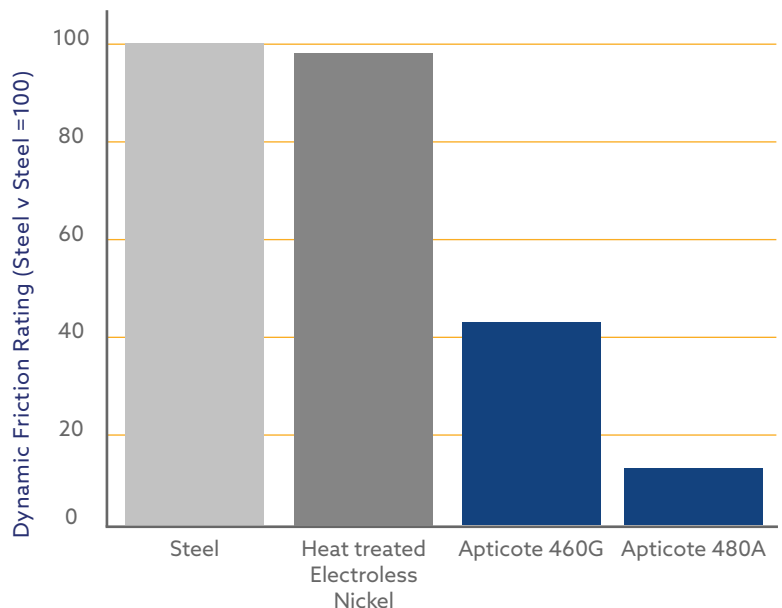
LOW FRICTION

Apticote 480A has a co-efficient of friction of 0.05, 90% lower than standard electroless nickel and uncoated steel.

Reducing friction provides benefits in a wide range of situations including lower energy and torque requirements in moving pistons and in sliding or turning applications.

This ultra low co-efficient of friction is also extremely stable over time, providing a long-term, reliable solution. In tests it varied by only ± 0.001 from the original coefficient of friction measure.

The static friction of Apticote 480A



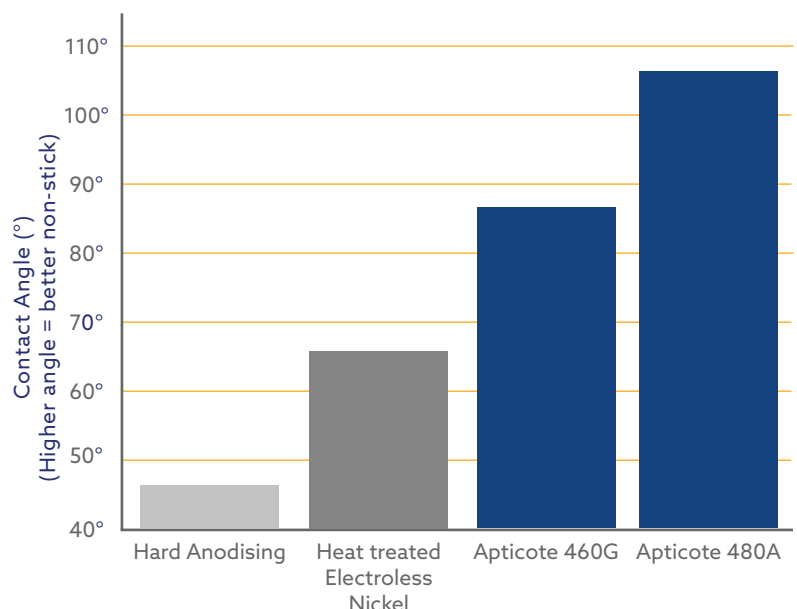
is also rated as 0.05 so there is no 'stick/slip' and the characteristic 'squeak' that can accompany it.

NON-STICK

The non-stick properties of Apticote 480A make it the ideal choice for mould release applications. The coating has significantly better non-stick properties than similar treatments and also ensures less energy is required to remove material from the surface and is easier to remove contaminants from mould tools.

Whilst difficult to measure non-stick, with no standard method, the contact angle of a water droplet on the surface is a good indication. The greater the angle the better the non-stick, with any angle greater than 90° being considered non-stick.

Apticote 480A displays a contact angle of 109° , where as a standard electroless nickel coating would only display around 67° .

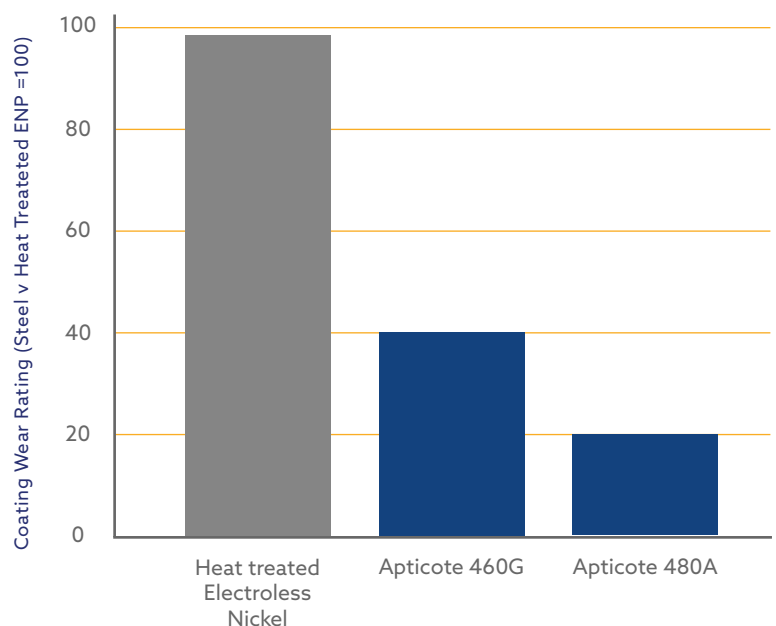


ADHESIVE WEAR RESISTANCE

Benefit from improved service life, reduced in-service inspection and less machine downtime thanks to the excellent adhesive wear resistance of Apticote 480A.

The coating shows an 85% reduction in wear when compared to heat treated standard electroless nickel in pin-on-disc tests in the Poeton laboratory.

Additionally, the coating, by virtue of its non abrasiveness, produces no measurable wear on the counter face (in this case, a hardened steel pin).



CORROSION RESISTANCE

With a minimum of 1000 hours salt spray resistance, a 50µm coating of Apticote 480A comfortably outperforms standard, medium phosphorous electroless nickel.

Even at half this thickness it will provide 500 hours resistance, compared to only 100 hours for phosphated steel and 10 hours for alloy steel.

Additionally, the surface layers of the coating are electrically insulating and will reduce the risk of galvanic corrosion forming when in contact with other metallic components.

The cured surface of the coating is inert and therefore has good resistance against a range of commonly used chemicals.

HARDNESS

Apticote 480A has a bulk hardness of 800-900Hv although softer at the surface.

Although the coating is hard, as it is relatively thin, its load-carrying capacity will be limited, particularly if the component is made in a soft material, such as aluminium alloy.

However, the coating is significantly more durable under heavy loads than similar Nickel Polymer coatings.

FOOD COMPLIANT

Apticote 480A uses a combination of materials and polymers which are FDA approved. This means the final coating is full compliant with FDA regulations and suitable for use in food related applications.

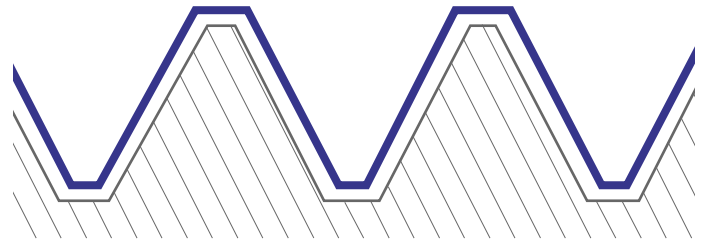
THICKNESS & COVERAGE

The standard thickness range of Apticote 480A is 15 - 50µm depending on the application.

- 15-20µm - Low friction & mould release
- 25-30µm - General corrosion resistance
- 45-50µm - Optimum corrosion resistance

Coverage of the coating is incredibly even and complex geometries will be replicated.

Areas that do not require coating can be masked, but will add to the cost and should be avoided.



Near perfect replication of a thread form

Through holes with greater than a 1:1 depth to diameter ratio are difficult to cover, as are blind recesses.

To coat down a blind hole, including the base, may require bespoke tooling, which Poeton can advise on the feasibility and cost.

FRETTING

Fretting occurs in contact situations where there is low amplitude sliding or vibration. Typical examples are couplings, splines or bolted parts, with oxide wear debris creating an accelerating cycle of abrasion and adhesive wear. Apticote 480A is an excellent anti-fretting coating, with soft, non-oxidising wear products.

APPEARANCE

Light golden-brown coloured, smooth, non-reflective surface, slippery to the touch.

The coating replicates the underlying surface finish.



SPECIFYING APTICOTE 480A

When placing an order for Apticote 480A, be sure to specify your requirements, specifically:

Base material: its composition and hardness.

Surface to be coated: provide a drawing, including masking requirements, but all over coating is always encouraged. Specify where the part can be held when jiggling.

Functional requirement: usually low-friction or non-stick, but may include a need for wear or corrosion resistance.

Required thickness: Maybe dictated by a need for corrosion protection or because the loading is high.

Any stress relieving or de-embrittlement requirement:

On rare occasions, this might apply after an Electroless Nickel coating step.

SUBSTRATES

Apticote 480A can be applied to a wide range of base materials, including aluminium, steels, stainless steels, copper alloys and titanium.

Temper-sensitive tool steels and higher strength aluminium alloys may be unsuitable due to the 340°C processing temperature.

Poeton will advise on the feasibility of coating cast aluminium alloys.

OPERATING TEMPERATURES

Apticote 480A is suitable for use from -115°C to a maximum continuous operating temperature of 205°C. Above that, the low friction and non-stick properties will begin to deteriorate.

CLEANING

If any product remains on the surface, use a soft approach to cleaning, with a gentle water jet or mild alkaline wash. Avoid abrasives; they will degrade the non-stick properties.

MACHINING & FINISHING

The coating is used as applied. It should not be finished in anyway, including painting. If dimensions are critical, Poeton will advise on how to size the part ready for coating.

ENVIRONMENTAL APPROVALS

Apticote 480A does not use any materials currently listed as an SVHC under EU REACH legislation.

PHYSICAL PROPERTIES

Density	7.9gm/cc
Melting Point	890°C
Electrical Resistivity	60-75 micro-ohm/cm
Thermal Conductivity	0.012 cal/cm/sec/°C
Thermal Expansion	13x10 ⁻⁶ cm/cm/°C

MECHANICAL PROPERTIES

Tensile Strength	800-900MPa
Ductility (Elongation)	3-5%
Elastic Modulus	50-60MPa



APTICOTE[®]
FROM POETON

Developed in-house at our R&D centre, the Apticote range of treatments offer a wide array of performance improvements and benefits over standard treatment alternatives, solving engineering challenges such as corrosion, wear, friction, fretting, and thermal stability.

There are 12 treatments within the Apticote range, view them all at:

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