The Ipcote Range of Sacrificial Aluminium Coatings

Indestructible
specialist coatings manufacture

The Ipcote range of sacrificial aluminium basecoats and sealcoats has been developed and refined over a number of years.

The range was originally introduced at the request of Rolls-Royce Aero Engines for use as a high corrosion resistant, high temperature resistant coating for use on compressor blades and allied engine parts as a commercially available alternative to a proprietary range of imported US products.

Subsequently, the coating range has been adopted by a large number of additional manufacturers of aero engines and industrial gas turbines, as well as being introduced as a cadmium replacement on undercarriages and fasteners.

Initially the range was purely based on inorganic technology, which by their very nature contained both trivalent and hexavalent chrome.

Recent introduction of environmental and safety legislation has highlighted the use of chrome containing products. Whilst the levels of hexavalent chrome in most of the products are minimal, in most cases below all current environmental limits, there are ongoing developments to remove all chrome compounds. We can now offer a single component chrome free coating, based on organic chemistry, and thus containing solvents, which has been tested to Rolls Royce MSRR 9253. In addition we are testing with clients, a chrome free inorganic basecoat.

Basecoats

Ipcote IP9183-R1

MSRR 9140; OMAT 7/46B; PCS2550; ITP SM-903 LB 598, GEA50TFI, CLASS E, Snecma - DMR74-052

The original sacrificial basecoat. This coating, when applied at film thicknesses of 50 microns will give in excess of 3000 hours corrosion resistance to ASTM B-117.

Used as a replacement / alternative to Sermetal W/WFX.

Can be cured using a variety of processes, but typically for 1 hour at 560°C to give a matt grey conductive film, or 1 hour at 350°C, followed by bead peening or polishing, to a bright silver conductive finish. Refer to our Ipcote Application Information Sheet for typical schedules. For application on temperature sensitive alloys, can be cured at temperatures as low as 260°C, but with longer dwell time.

IP9183-R1 contains only 37ppm hexavalent chrome.

Smoothcote IP9442

LB598; CPW88

A smooth surface alternative to IP9183-R1, manufactured using smaller particle size aluminium powder. Gives a denser, more erosion resistant product, with similar corrosion protection to IP9183-R1.

Is easier to apply and produce smooth surface finishes of typically 20-25µ-inches. Smoothcote is cured in the same way as Ipcote, typically RPS 666/1.

Used as an alternative to Sermetal 962/5380/5380DP.

IP9442 contains only 14ppm hexavalent chrome.

Ipthin IP9356

MSRR 9356; ITP SMM-919; Omat 7/167A

Thin film version of Ipcote, to allow easy application of film thickness of 12-25 microns. This is of use in areas where tolerances are critical, including intereference fit joints, flanges, bolts, engine mounts, fasteners and dovetails.

Ipthin is processed as standard Ipcote, and is an alternative to Sermetal 709/762/962. Refer to RPS 666/2 for a typical system.

Chrome Free Systems

IP9253-R2 Organic Chrome Free

MSRR 9253

Originally produced to meet the requirements of Rolls-Royce MSRR 9253, first production quantities, contained chrome anti-corrosive compounds.

Recently reformulated to be totally chrome free. Approved to MSRR 9253, and now under evaluation at Rolls-Royce to MSRR 9140, and by other engine manufacturers as an alternative to chrome containing Ipcote and Sermetal basecoats.

To meet the requirements of MSRR 9253, process in accordance with RPS 666/3. Can also be processed to RPS 666/1 system A to give coatings that pass MSRR 9140. Normally used with chrome free organic sealcoats

Sealcoats

Sealcoats provide an electrically non-conductive barrier coat to the aluminium surface. They have an added benefit of sealing any porosity that may be present in the conductive, sacrificial aluminium basecoat, without detracting from the sacrificial properties. This results in a smoother, harder coating which provides barrier against carbon deposits, etc, extending the useful life of the coating system. Additionally, the smoother surface enhances airflow characteristics, and therefore engine efficiency.

Ipseal IP9184 Green and Khaki

MSRR 9140; OMAT 7/168B/G; LB598; ITP SMM-903; PCS 2550; GEA50TF196, Class F

High temperature sealing compound used over Ipcote, Ipthin. For use at temperatures in excess of 600°C. Can also been used as a stand alone product, most recently as a one coat system on titanium to give protection against Skydrol at 250°C.

Available in green or khaki, the sealcoat gives a smooth, eggshell finish. Other colours can be manufactured; a black version has been produced for use on agricultural vehicle exhaust systems. Applied and processed typically as per RPS 666/3, to typical thickness of 6-8 microns.

Used as alternative to Sermetal 570A.

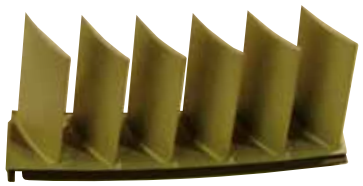
Ipseal contains less than 0.6% hexavalent chrome. Blue and black also available.

Smoothseal IP9444

MSRR 3010; OMAT 7/262

Very smooth, thin sealcoat, used over either Smoothcote or Ipcote as an alternative to Sermetal 5380/5380DP.

Gives a smooth, golden finish with excellent surface smoothness with resultant excellent airflow characteristics.



Applied and processed typically as per RPS 666/5. Note that Smoothseal is normally cured at 250°C to retain the golden finish. Normal film thickness 3-5 microns applied in 3-4 very thin coats.

Smoothseal contains less than 0.6% hexavalent chrome. Blue also available.

IP9447 Smooth Sealcoat Green

Ultra smooth sealcoat, developed to give a very fine surface finish.

Organic Sealcoat IP46-2125

Newly developed totally chrome free khaki coloured sealcoat, for use over any basecoat in the Ipcote range, but usually in conjunction with Organic Ipcote IP9253-R2.

Used as a chrome free alternative to Ipseal IP9184 and Sermetal 570A.

Applied as a thin seal, typically 4-8 microns. Processed as per RPS 666/3. Blue also available.

Organic Sealcoat Blue IP1949

PWA 595

Chrome free, heat and corrosion resistant sealcoat developed specifically for Standard Aero to give a very fine surface finish. Usually applied as a thin film and processed at 350°C (660°F) for 30 minutes.

Will also pass to CPW 563.

CF600

High Temperature Chrome Free Smooth Sealcoat

Recently developed high temperature (up to 600°C) clear sealcoat, Chrome free as an alternative to IPSEAL & Smoothseal. Recently tested over IP9442 smoothcote (560°C processed) to give a surface profile <15µin at 30 thou cut off. To be used in conjunction with both organic and inorganic chrome free basecoats as a totally chrome free smooth coat system.

Organic Sealcoat J900

CPW 563

Developed for use as a chrome free alternative sealcoat for use on Pratt & Whitney Canada range as an alternative to the 5380 range; Smoothseal.

Applied as a thin coat at typically 4-8 microns, J900 is processed at 190°C for 1 hour.

Diffusion Products

Allied to the Ipcote range, by nature of their basic chemistry, but used in areas where higher temperature and corrosion resistance are required.

Ipal IP1041

MSRR 1041; OMAT 7/129A

Aluminium Silicon Ceramic diffusion coating, formulated for higher temperature corrosion protection and excellent oxidation and sulphidation protection.

Used for example on turbine blades in aero engines and industrial gas turbines and nozzle guide vanes.

Approved alternative to Sermaloy J.

Applied and processed as per RPS 603, which includes diffusing under argon at 885°C, up to the solutioning temperature of the base metal.

CF IP DIFF

Recently developed Chrome Free Diffusion Coating, as an alternativeto IPAL and Sermalloy J. Processing is similar to current Chrome containing versions Currently undergoing field trials with several UK & European users

Organic Aluminium Diffusion Coating
IP43-2050A

Aluminium diffusion Coating, formulated to be Chrome Free, for use on steam and Industrial Gas Turbines running upto 650'c.
Can be diffused in Air; Does not need inert gas atmosphere.

Touch Ups

As with most industrial processes, it is sometimes necessary to touch up small areas of damage on parts treated with Ipcote or Ipseal.

It must be remembered that the touch up systems, whilst excellent coatings will not meet the high performance criteria of Ipcote / Ipseal, and consequently any areas to be touched up must be small, usually defined in the end user specification.

Touch Up for Process 'A' Ipcote PL177

MSRR 9141; OMAT 7/47; ITP SMM-914

Recently re-formulated to be chrome free and easy application, touch up for Ipcote; Smoothcote and Ipthin, where processing has been to type 'A', and the finish is matt grey.

Touch Up for Process 'B' Ipcote IP9138-R1

MSRR 9040; OMAT 7/22B; CoMat 07-038; MTU-MTS 1254

Air drying chemical and heat resistant coating in its own right, used as the touch up for process 'B' Ipcote which has been peened to a bright silver finish.

Routinely tested to 100 hours at 500°C; 100 hours in ester lubricant at 150°C and skydrol for 3 hours at 70°C.

Touch Up for Ipseal; PL270 Khaki/PL150-R1 Green

PL270

MSRR 9394; OMAT 7/169A; ITP SMM-915; GEA50TF200, Class B.

Recently re-formulated to be chrome free and easy application, air drying touch up for either Ipseal Khaki. Will operate at temperatures up to 650°C.

The khaki version can also be used as a touch up for Sermaseal 570A.

PL150-R1

MSRR 9041, OMAT 7/110B; OMAT7/169B, ITP-SMM-916; GE A50TF200, Class C.

Green Air Drying, Low Temperature cure Touch up for Ipseal Green

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Full technical information is available for all the products discussed on this information sheet. Please contact our sales office for further information.

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