



AEROSPACE

COATING SOLUTIONS FOR VICTREX™ PEEK MATERIAL

FOR AEROSPACE APPLICATIONS



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SURFACE COATING VICTREX™ PEEK

VICTREX™ PEEK polymer is a high performance engineering thermoplastic which finds uses across a broad range of industries including aerospace. Combined with fibres, such as carbon, the material becomes stronger and stiffer and can be used in semi-structural and structural components in the form of injection moulded compounds and composite materials.

Surface treatments can be an important consideration for aesthetics, or adding protection against galvanic corrosion. PEEK compounds and composites can be coated using coatings and techniques to provide the required colour, finish, and protection.

COATING GUIDELINES

1. Cleaning of surface

Impurities must be removed from the surface by solvent cleaning, such as isopropyl alcohol (IPA).

2. Surface preparation for adhesion

Keying the surface using 400 grit abrasive paper enables good adhesion as does abrasive grit-blasting to provide surface texture. Alternatively it may be more preferred to treat the surface with plasma for smaller and intricate parts.



A selection of painted PEEK/carbon plaques with various topcoats

3. Primers

Use an appropriate primer. Primers such as AERODUR* Barrier Primer, AEROWAVE* 2001 Epoxy primer and AERODUR HS 2118 by Akzo Nobel Coatings International BV have been demonstrated to possess excellent adhesion to carbon fibre filled VICTREX™ PEEK, although other products may also be available. Please refer to product datasheets found on www.anac.com for details on specific primers.

PRIMER	TYPE	APPLICATION AREA	SPECIFICATIONS
AERODUR 37045	Epoxy	Interior	AIMS 04.04.002
AEROWAVE 2001	Epoxy	Interior	AIMS 04.04.001/003/004/038/040/042
AERODUR HS 2118	Epoxy	Interior	SAE AMS 3095A

4. Topcoats

Topcoats such as AERODUR C 21/100, AEROWAVE 3003, ECLIPSE*, and Cabin Topcoat by Akzo Nobel Coatings International BV have been applied with the above primer combinations. Please refer to product datasheets found on www.anac.com for details on specific topcoats. Other products may be available.

TOPCOAT	TYPE	PRIMER	APPLICATION AREA	SPECIFICATIONS
AERODUR C21/100	Poly-urethane	37045	Interior/ exterior	AIMS 04.04.003/040/041
AEROWAVE 3003	Epoxy	HS2118	Interior	AIMS 04.04.003/040/045
ECLIPSE	Poly-urethane	HS2118	Exterior	BMS 10-72 Ty IX
Cabin Topcoat	Aqueous	No primer	Interior	ABD0031 D6-51377

COATING SOLUTIONS

The presented coating guidelines may be applied to the following surfaces:

- ▲ Injection moulded VICTREX™ PEEK 150CA30, VICTREX™ PEEK 450CA30, VICTREX™ PEEK 650CA30 and VICTREX™ PEEK 90HMF40.
- ▲ VICTREX PEEK and PAEK composites comprising unidirectional and woven carbon fibres.

Adhesion test

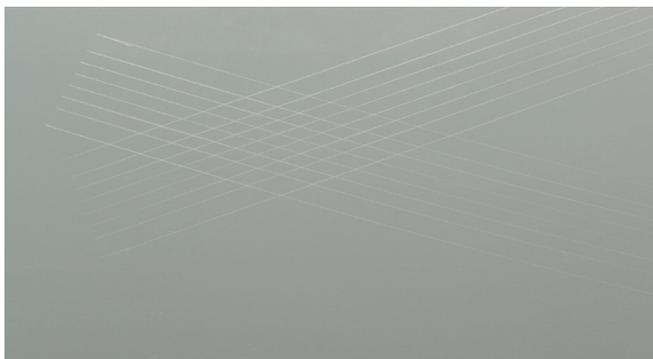
The adhesion of coatings has been tested with the so called Gitterschnitt adhesion test (ISO2409) in which the specimen is scratched in a regular pattern with a specific inter-distance. These scratches must be in the coating not in the substrate. A 3M adhesion tape (Scotch™) is applied on the scratch pattern and subsequently removed by peeling. Well adhered coatings will not be removed with the tape. Poor adhesion will result in separation of the coating from the substrate. The degree of separation is visually quantified.

Test criteria:

- ▲ Scratch distance – 1 mm inter-distance.
- ▲ Scratch depth – only coating not the substrate.
- ▲ Adhesion test with 3M adhesion tape (Scotch™)

Result:

- ▲ Gitterschnitt Adhesion Test. BS/ISO/DIN class 0
- ▲ Including – 24-hr water test.



A typical scratch pattern for a Gitterschnitt adhesion test exemplifying excellent adhesion of the primer and topcoat

PEEK METALLISATION

Metallising a polymer surface is an excellent method for electromagnetic / radio frequency shielding, corrosion resistance, lowering electrical resistivity, adding strength and wear resistance, adding electrical circuitry, and for appearance finishing.

METALLISING GUIDELINES

1. Cleaning of surface

Surfaces which are to be metalised should be clean, dry and free from grease and other contamination before the application of the metal coating.

2. Surface preparation for adhesion

Surface treatments are used to increase the surface energy and improve metal adhesion. Depending on the deposition method, there are a number of in-line and independent treatment methods such as abrasive roughening, acid etching, plasma treatment and Surface Activation™.

* Surface Activation™ is a proprietary process and a trademark of Surface Activation Technologies, LLC.

3. Metal deposition

3.1 Physical Vapour Deposition (PVD) - Victrex materials may be used as substrates in PVD metallisation processes such as vacuum metallising or sputtering. Additional care should be taken for any post metallisation processing such as injection moulding or machining to ensure a good surface finish, as any imperfections will be replicated in the thin metallic coating.



VICTREX™ PEEK plaque metallised via Surface Activation™ technology

3.2 Plating - Plating is a logical choice when converting from metal to plastic parts. Victrex materials can be electrolytic and electroless plated with a variety of metals such as nickel, gold, silver, copper, and other metals and alloys.

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For more than three decades, Victrex has collaborated with customers to help turn their toughest challenges into tangible benefits. Our proactive approach in monitoring the trends of the Aerospace industry and engaging in open dialogue with industry leaders enables us to deliver what is required to maximise performance today and tomorrow. This philosophy has led to Victrex solutions flying on more than 15,000 aircraft today.

A company with cutting-edge polymeric solutions, streamlined production facilities, application development expertise, unmatched technical support and a presence across the globe – that's a future performance partner.

* Use of any particular primer, topcoat or metal deposition method named in this publication or used in these laboratory tests does not constitute a recommendation nor an endorsement of the corresponding product or method. Other primers, topcoats and metallisation methods may be available. The performance of a surface treatment is a function of many variables including sample and surface cleaning, preparation, and application and may not be representative of material or coating performance in real applications. AERODUR, AEROWAVE, and ECLIPSE are registered trademarks of Akzo Nobel Coatings International B.V. Coating instructions regarding specific handling, mixing of components, surface preparation, spray instructions, drying and safety instructions are provided by the AKZO TDS (Technical Data Sheets) and can be found on AkzoNobel Aerospace and Defense coatings website: www.anac.com together with the Material Safety Data Sheets. This document does not replace or override such Technical Data Sheets or Material Safety Data Sheets.



ABOUT VICTREX

Victrex is an innovative world leader in high-performance polymer solutions with products sold under the brand names of VICTREX™ PEEK, VICOTE™ Coatings, APTIV™ film and VICTREX Pipes™. With production facilities in the UK and USA backed by sales and distribution centers serving more than 40 countries worldwide, our global sales and technical support services work hand-in-hand with OEMs, designers, and processors offering assistance in the areas of processing, design and application development to help them achieve new levels of cost savings, quality, and performance.

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