Organic Finishing Techniques for Aerospace Applications

Graham Armstrong FIMF
Sales & Technology Mentor
Overview

Company Established in 1978

Birmingham, UK Based

Coatings Supplier
Accreditations

AS 9100

ISO 9001

ISO 14001

AS9100C & BS EN ISO 9001:2008 – Accredited by NQA
ISO14001:2004 – Accredited by ISOQAR
Customers & Approvals

BAE Systems
Mission Systems

Airbus Helicopters
Magnesium Sealants
Intumescent Systems

Safran Group
Wheels & Brakes
Aero Engines
Under Carriages

MBDA Missile Systems
Electronic Controls
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<td>Wheels &amp; Brakes</td>
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Customers & Approvals

Sikorsky
Magnesium Sealants

GE
Aero Engines
Electronic Controls
Propellers

Pratt & Whitney
Aero Engines

Finmeccanica
AgustaWestland
Magnesium Sealants
Aerospace Finishing

Anti-Corrosive Primers
Polyurethane Finishes
Flexible “Wing” Coating
Erosion Resistant Coatings
Structural Primers
High Performance “Engine” Coatings
Fluid Resistant Coatings for Wheels & Brakes
Anti-Corrosive Systems on Undercarriage
Interior Coatings

More Complicated Than is Thought!!
Basic Construction

An Aircraft is a Multitude of Components!
The Majority Require Surface Engineering or Coatings!
A High Proportion Use Organic or “Paint” Systems
An Increasing Variety of Materials are Used in Manufacture
Reduced Maintenance “Down Time“ is an Increasing Requirement

The Implications of REACH
Paints for Airframe

- Structural Primers
- Anti-Corrosive Primers
- PU Finishes
- Flexible Wing Paints
- Erosion Resistant
Structural Primers

Used on the Basic Structure of the Airframe & Wings (typically 2024T3 Aluminium Alloy)

Required to Give Maximum Corrosion Protection on Areas of High Stress With Limited/No Access on Overhaul

Universally Chromate Containing 2 Component Epoxy

No Desire/Experience to Change to Chromate Free

REACH Authorisation
Anti-Corrosive Primers

Used on external surfaces and those readily accessible (typically 2024T3 Aluminium Alloy)

Required to Give Corrosion Protection in Conjunction with Polyurethane Finish; Used both on OEM and MRO

Benefit in Ability to Inspect/Repair on Overhaul

Originally Chromate Containing 2 Component Epoxy, But Now Chrome Free Alternatives Being Introduced
Finish Coats

Need Good Initial Gloss & Retention for up to 7 Years

Typically “Hard” 2 Component Polyurethanes

Temperature Variance Capability (-50°C to +50-60°C)

Fluid Resistance a Requirement

Originally 1 Coat Finishes, But Now Moving to “Automotive Style” Clear over Base Systems

Increasing Use of Bold Designs and Metallic/Pearl Finishes
How it’s done!!!
Aero Engine & Engineering Coatings
Aero Engine Coatings
Aero Engine Coatings

- Diffusion Coatings
  - PL134
  - IP1041
- Rockhard Chromate Baking Epoxy Primer
  - 700-155-003
- Sacrificial Aluminium Slurry Coatings
  - Ipcote
  - Ipscatal
- Silicone Epoxy Melamine Erosion Coating
  - IP9188
- New Elastomeric on Carbon Fibre Fan Blades (in development)
- Flexible Elastomeric
  - IP9212
- Dry Film Lubricants
  - MOS₂: Graphite: Boron Nitride
  - PL237-R2
  - IP9136-R3
  - IP181
- High Temperature Backing Ceramic
  - Modified Epoxies
  - IP9029-R3
- Two Component Urethanes
  - Baking Modified Epoxies
  - Silicone Epoxy Melamines
  - IP6 Range
  - 985 Range
  - IP9188
Aero Engine Coatings
Engineering Coatings
Undercarriages

Sacrificial Aluminium Slurry Coatings (to Replace Cadmium Plating)

Chrome/Chrome Free Anti-Corrosive Epoxy Primers

Erosion Resistance Finishes
Wheels & Brakes

Fluid Resistant Chrome Free Anti-Corrosive Epoxy Primers

Fluid Resistant Polyurethane Finishes
Magnesium Components (Gearboxes etc)
Aluminium Engineering Components

Baking Epoxy Sealants
Baking Chrome/Chrome Free Epoxy Primers
Baking Epoxy Finishes
Thank You!!
Any Questions??

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