Advisory
Circular

NIGERIA CIVIL AVIATION AUTHORITY **NCAA-AC-AWS066**

Subject: **PAINTING REQUIREMENT FOR AIRCRAFT**

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TABLE OF CONTENTS

SECTION	TITLE
1.0	General
2.0	Purpose
3.0	Applicability
4.0	References
5.0	Definitions
6.0	General Overview of Aircraft Painting
7.0	Safety Requirements
8.0	Facility Requirements and Painting Conditions
9.0	Environmental Effects On Unpainted Surfaces
10.0	General Documentation Requirements

1.0 GENERAL

i) The Nigeria Civil Aviation Authority Advisory Circulars (AC) contains information about standards, practices and procedures that the Authority has found to be acceptable for compliance with the associated Regulations.

ii) Consideration will be given to other methods of compliance which may be presented to the Authority.

iii) When new standards, practices or procedures are found to be acceptable they will be added to the appropriate AC.

2.0 PURPOSE

The purpose of this AC is to outline the necessary procedures, standards, and requirements for the exterior painting of aircraft to ensure that all painting activities are conducted in a manner that maintains the airworthiness and safety of the aircraft while complying with applicable regulations. This AC aims to promote uniformity in practices across the industry and enhance the overall quality of aircraft painting.

3.0 APPLICABILITY

This Advisory Circular applies to all Nigeria registered aircraft, aircraft operators and Approved Maintenance Organizations (AMO) engaged in the exterior painting of aircraft within and outside Nigeria. It is relevant to all types of aircraft, including commercial, general aviation, aerial work, and should be followed by all personnel involved in the painting process.

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4.0 REFERENCES

i) Nigeria Civil Aviation Regulations (Nig. CARs) Part 5
ii) Nigeria Civil Aviation Regulations (Nig. CARs) Part 6
iii) Nigeria Civil Aviation Regulations (Nig. CARs) Part 9

5.0 DEFINITIONS

For the purpose of this Advisory Circular, the following definitions apply:

a) Aircraft Painting: The process of applying paint or coatings to the exterior surfaces of an aircraft for protection, aesthetics, and identification.

b) Airworthiness: The condition of an aircraft being fit for safe operation in accordance with applicable regulations.

c) **Approved maintenance organisation (AMO). An organisation approved by the Authority, in accordance with Part 6 of these regulations, to perform specific aircraft maintenance activities by the Authority. These activities may include the inspection, overhaul, maintenance, repair and/or modification and release to service of aircraft or aeronautical products.**

d) **Adhesion:** How well the paint sticks to the surface.
e) **Corrosion:** Deterioration of metal from chemical reactions.
f) **Primer:** Base coat that helps paint stick and protects against corrosion.
g) **Topcoat:** Final layer of paint for color and protection.
h) **Viscosity:** Thickness of the paint.
i) **Mil**: Unit of measurement for paint thickness (0.001 inch).
j) **Orange Peel**: Uneven paint surface that looks like orange skin.
k) **Runs/Sags:** Paint that drips or sags during application.
l) **Solvent Pop:** Bubbles in the paint caused by solvents evaporating.
m) **Dry Spray**: Rough, powdery paint finish due to improper application.
n) **Surface Preparation:** Cleaning, sanding, and treating the aircraft surface before painting.
o) **Masking**: Covering areas that shouldn't be painted.
p) **Etching**: Using chemicals to prepare metal surfaces for painting.
q) **Alodine/Chromate Conversion Coating**: Chemical treatment to prevent corrosion and improve paint adhesion.
r) **Electrostatic Painting**: Applying paint with an electrical charge for better coverage and less waste.
s) **HVLP (High Volume Low Pressure):** Spray gun that uses a high volume of air at low pressure for efficient paint application.
t) **VOC (Volatile Organic Compounds):** Chemicals in paint that evaporate and can be harmful.
u) **MSDS (Material Safety Data Sheet):** Document with information about the safety and hazards of a material.
v) **Paint Curing**: Process of paint hardening and drying.
w) **Pot Life:** Time during which a mixed paint remains usable.
x) **Induction Time**: Time required after mixing paint components before it can be used

6.0 GENERAL OVERVIEW OF AIRCRAFT PAINTING

Exterior painting of aircraft serves several purposes, including protection against corrosion, improving aerodynamics, and enhancing the visual appeal of the aircraft. The painting process must consider factors such as the choice of paint, application methods, and environmental conditions to ensure the longevity and effectiveness of the paint job. Proper planning, execution, and documentation are essential to achieving a successful painting project.

The aircraft painting process typically involves the following steps:
1. Surface Preparation: Thoroughly clean and prepare the aircraft surface to remove contaminants, old paint, and corrosion. This may include sanding, stripping, and washing.
2. Primer Application: Apply a suitable primer to enhance adhesion and provide a protective layer against corrosion.

3. Paint Application: Use appropriate techniques (e.g., spray painting, electrostatic application) to apply the selected paint in accordance with manufacturer specifications.

4. Curing and Finishing: Allow the paint to cure properly and apply any necessary protective coatings or finishes.

6.1 Aircraft Painting Requirements for Aircraft Requiring a Certificate of Release to Service

Aircraft Painting is considered a maintenance activity and when doing so instructions provided by the TC holder must be followed. The owner/operator, approved maintenance organization (AMO) or its Continuing Airworthiness Management Organization (CAMO) must ensure that the aircraft is placed under the control of an approved maintenance organization as appropriate for the aircraft. This organization will be responsible for the painting process and any associated maintenance, ensuring the task is completed in accordance with approved data and subsequently to issue the Certificate of Release to Service.
In addition, painting a complete aircraft requires that different maintenance tasks need to be performed in addition to painting the aircraft (towing & preparation, placing the aircraft in the right configuration for the painting operation like protection of the pitot probes, jacking, paint-stripping, removal of flight surfaces, balancing, reinstallation, weighing, which are maintenance activities). This type of activities requires a base maintenance environment and an appropriate type rated certifying staff qualified in accordance with Nig. CARs Part 2 and AMO Approval would be needed.

6.2 Competence of Paint Shop Personnel

A comprehensive competence assessment of paint shop personnel should be undertaken, including but not limited to, knowledge and experience of Tasks Common to Aviation Painters;
The tasks listed below were made as generic as possible to accommodate the largest amount of work environments and equipment / tools but do not necessarily cover all tasks individuals should be assessed on.

Block A — Safety
Task 1 – Demonstrates Safe Working Practices and Techniques

Block B — Planning
Task 2 – Estimates / Scopes Work
Task 3 – Orders / Selects Materials
Task 4 – Organizes Staff / Work Schedules
Task 5 – Prepares Work Area for Job
Task 6 – Prepares Ground Support Equipment such as Stands, Scissor Lifts, Scaffolding, Ladders and Dollies

Block C — Preparation of Surface
Task 7 – Cleans Aircraft, Parts and Components for Inspection
Task 8 – Strips Surface of Aircraft, Parts and Components
Task 9 – Sands Surface of Aircraft, Parts and Components
Task 10 – Detail Strips and Cleans Aircraft, Parts and Components
Task 11 – Removes Minor Surface Corrosion on Aircraft, Parts and Components Task 12 – Fills Dents in Aircraft, Parts and Components

Task 13 – Blends out Scratches on Aircraft, Parts and Components
Task 14 – Applies Sealer to Seams and Joints
Task 15 – Etches Metal and Applies Chemical Conversion Coatings

Block D — Application of Coatings
Task 16 – Masks Aircraft, Parts and Components for Application of Coatings
Task 17 – Prepares Coating Materials
Task 18 – Blows and Tacks Surface to Remove Dusts Prior to Coating
Task 19 – Applies Coatings

Block E — Equipment Maintenance
Task 20 – Maintains and Repairs Coating Application Equipment

Task 21 – Verifies Operation of Ground Support Equipment
Task 22 – Verifies Operation of Ventilation Equipment
Task 23 – Verifies Operation of Compressed Air Source
Task 24 – Maintains Personal Protective Equipment
Task 25 – Verifies Operation of Fresh Air Breathing System

Block F — Test Panel Production
Task 26 – Identifies Test Panel Requirements

Block G — Quality Control
Task 27 – Records Coating Documentation of Preparation and Application
Task 28 – Evaluates Finished Product and Completed Job According to Customer Specifications

In the absence of formal qualification for aircraft painters, it is incumbent on the Quality System of the organization responsible for the release to service of the aircraft, following painting, to ensure the competence of involved personnel is established and controlled to a standard that ensures all TC holder's requirements are met and consequently allows the organization's Certifying Staff to be satisfied that the painting tasks have been carried out to the required standard prior to issue of the CRS.

7.0 SAFETY REQUIREMENTS

7.1 Personal Protection Equipment (PPE)

Because painting, stripping, sanding, refinishing, touching up and blasting exposes aircraft painters to chemicals, vapors, mist, dust or airborne debris and other materials that may be hazardous, it is important and necessary to use Personal Protection Equipment (PPE). Standard PPE includes chemical resistant gloves, goggles and clothing – a Tyvek suit – as well as a charcoal filtered respirator. In tight spaces a helmet might be necessary.

Respirators should provide a tight seal over the nose and mouth to prevent inhaling any dust from sanding and the vapors, fumes, mist and/or overspray from the application of paints.

Respirators have filters – cartridges or canisters – that remove contaminants from the air by passing the ambient air through the air-purifying element before it reaches the user. The user will know that it is time to change the filters when he/she experience breathing irritation in his/her nose or throat, if the user detects an odor inside the mask or if there is a change in breathing resistance. Even when using a

respirator then the operator should still make sure that the working environment is well ventilated. If for any reason the user starts to feel nauseous or dizzy, he/she should immediately and carefully leave the area and relocate to an area where he/she can breathe fresh air.

Goggles should be splash and vapor resistant to protect the eyes from splatter, vapor and/or fumes. The goggles need to provide a tight seal and should be fog resistant. Wearing goggles, when cleaning the equipment, is also important, especially when cleaning with solvents. Face and eye protection especially when spraying any paint product is essential. Thousands of people a year are blinded from work-related eye injuries.

Rubber gloves should be worn whenever any strippers, etching compounds, solvents, paints or coatings are being used. When stripping paint with Methylene Chloride based paint strippers it is recommended that butyl or neoprene gloves be used. The standard solvent resistant gloves will not stand up to Methylene Chloride's aggressive chemical characteristics.

Forced air breathing systems should be used in place of charcoal filter respirators whenever spraying coatings that contain isocyanates or chromates. They should also be used when using chemical strippers that contain

Methylene Chloride or when stripping using an abrasive blasting method. Forced air breathing systems provide constant fresh air from a high capacity electric air turbine. Most systems come with 200 feet of hose through which fresh air flows from the turbine air pump intake that is to be placed where fresh air can be accessed.
The organization shall sure that all electrical equipment provided is explosion proof. Many of the materials used when painting, if not all, are flammable. Anything that causes a spark can ignite liquid and vapor chemicals. Keep all areas free of flames.

7.2 Material Storage

All chemicals and hazardous materials in general, must be kept in a cabinet intended for flammable material storage that protects them from sources of heat or flames. The products used to paint an aircraft are, more often than not, flammable in their liquid state. Check the SDS to note which materials are compatible to store in the same area. Avoid storing with incompatible or reactive materials. Also make sure that the area where the chemicals are kept is well ventilated and the ambient temperatures won't fall below freezing or exceed 95°F/35 °C. Most paints and paint components have a shelf life. Check the technical data or the label to view the shelf life for a particular product. It is important to note that the manufacturer may extend the shelf life if contacted before the material expires and are able to sample in order to ensure that the material is still usable.
All materials that are liquid and/or are considered hazardous (except distilled water) that are being used and stored should be accompanied by an MSDS (Material Safety Data Sheet) that is to be kept in proximity to where the product is being used.

7.3 Hangar/Paint Shop Safety

Painting should be performed in a Hangar/booth that has an acceptable ventilation system. The ventilation must be capable of exhausting toxic air while pulling in sufficient fresh air. Furthermore, a proper Hangar/booth has a ventilation system where the flow of air reduces overspray and dust from collecting on the newly painted substrate. Hangar/Booths should be properly illuminated so that no

shadowing occurs on the parts being painted and all lighting systems and bulbs should be covered and protected against breakage. Electric fans and motors must be explosion proof and properly grounded to eliminate sparks.

Regardless of whether the organization has a properly ventilated Hangar/booth and/or the perfect paint shop conditions, Personal Protection Equipment (PPE) is still extremely important. In cases where highly toxic chemicals or solvent based coatings are being used, it is important to use forced/fresh air breathing systems in the painting process. All PPE is not just exclusive to the application process but also needs to be utilized when mixing or handling.

Given the type of materials being used the proper size and number of class C fire extinguishers need to be available in the area for spray operations. All extinguishers need to be certified as required to be sure that they work in case of an emergency. Usually a 6-month checkup by a certifying company is standard in the industry. Lidded containers that are fireproof need to be available for disposing of excess paint and solvent/paint soaked rags.

7.4 Label Requirements

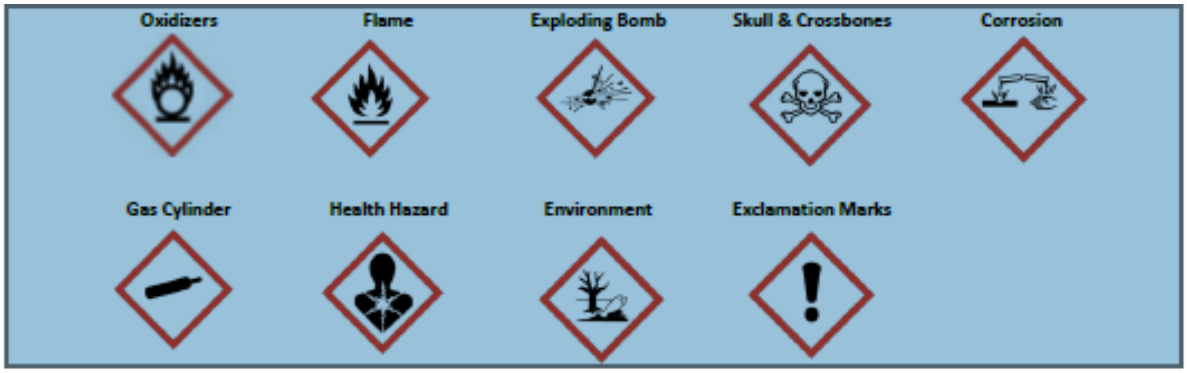
The Global Harmonized System (GHS) and the Department of Transportation require that all chemical products have labels that include, but are not limited to, 6 pieces of information.

1. Product identification/ingredient disclosure: It is important to confirm that the product name on the label matches the product name in the SDS. The SDS will be covered in the next section.

2. Signal word: When required, signal word indicates the severity of the hazard of the chemical – "**Danger**" for severe and "**Warning**" for less severe.

3. Hazard statement: Standard phrases describe the nature and degree of the hazard. They will differ based on the type of product. i.e. **Flammable Liquid**, **Corrosive**, **Vapor** etc.

4. Pictograms: A black symbol on a white background with a red border which conveys information about the hazards of a chemical.



5. Precautionary statement: Standardized phrases that describe the recommended measures that should be taken to minimize or prevent adverse effects that result from exposure to the chemical, or from improper handling or storage.

6. Supplier identification: Name, address and telephone number of the chemical manufacturer, importer or other responsible party.

7.5 Material Safety Data Sheets

The Safety Data Sheet (SDS) provides comprehensive information for chemical use and chemical management in the workplace. Employers and workers should use the SDS as a tool to identify hazards and safety precautions. Each SDS is product specific but not workplace specific. However, the SDS

information enables the employer to develop an active program of worker protection measures, including training, which is specific to the workplace as well as measures that may be necessary to protect the environment. The SDS also provides a source of information for others that are involved in the transport

of the material, emergency responders, poison centers and anyone else that comes in contact or stores the material
There are sixteen headings and that should be included on every SDS. Below are listed those headings. An SDS should be included and each heading needs to fill out;

1. Identification of the substance or mixture and the supplier
2. Hazard identification
3. Composition/information on ingredients
 Substance
4. Mixture
5. First aid measures
6. Firefighting measures
7. Accidental release measures
8. Handling and storage
9. Exposure controls/personal protection
10. Physical and chemical properties
11. Stability and reactivity
12. Toxicological information
13. Ecological information
14. Disposal considerations
15. Transportation information
16. Regulatory information
17. Other information including information on preparation and revision of the SDS

7.6 Handling and Transportation Considerations

Proper handling techniques are essential to prevent tire damage during movement and transport. Tires should not be dragged or rolled on rough surfaces, as this can cause cuts and abrasions. When lifting tires manually, personnel should avoid gripping the bead area to prevent deformation. If mechanical equipment such as forklifts or hoists is used, it should be fitted with non-damaging supports to prevent structural damage.

During transportation, tires should be secured in a stable position to prevent shifting and potential damage. If transported in stacked configurations, care should be taken to ensure they are not exposed to sharp impacts or excessive compression forces.

7.7 Volatile Organic Compounds (VOC)

Users of paint products must be mindful of the VOC content of those products. VOC is an acronym that stands for **Volatile Organic Compounds**. VOC's are organic chemical compounds that have high enough vapor pressures under normal conditions to significantly vaporize and enter the earth's atmosphere. Volatile organic compounds are numerous and varied. Government toxicologists have determined that most of them are considered harmful or toxic, particularly when sprayed. VOC's, or

subsets of the VOCs, are often regulated. With that in mind, it is of maximum importance that the Organization applies products according to state and/or local government regulations.

7.7 Health, Safety and Environment (HSE) LEGAL REQUIREMENTS

Following these standards ensures safety, environmental protection, and regulatory compliance in aircraft painting processes.

1. ICAO Standards: Compliance with ICAO Annex 6 (Operation of Aircraft) and Annex 16 (Environmental Protection) for safety and environmental aspects.
2. OSHA Standards: Following OSHA guidelines for workplace safety, hazard communication, and personal protective equipment (PPE).
3. REACH Compliance: Meeting REACH (Registration, Evaluation, Authorization, and Restriction of Chemicals) regulations for chemical usage and safety.
4. ISO Standards: Implementing ISO 45001 (Occupational Health and Safety Management Systems) and ISO 14001 (Environmental Management Systems) for systematic management of HSE aspects.

National Policy On Occupational Safety And Health 2006 of Nigeria

When contracting an organization outside Nigeria, Owners/Operators must also be aware of Local Legislation and Codes of Practice which may affect the HSE obligations, remembering that where the organization is licensed, and where it does business, can impact upon which rules it is governed by.

8.0 FACILITY REQUIREMENTS AND PAINTING CONDITIONS

Aircraft Painting facilities must meet specific requirements to ensure safety and compliance. These include:

1. The evaporation of solvents and the presence of spray dust necessitate current -free ventilation in paint shops.
2. The temperature should, generally, be maintained between 15 degrees Celsius and 25 degrees Celsius, with a relative humidity below 75%, however some paints require closer or more specific control of the temperature and humidity levels, necessitating approved technical data be closely adhered to. Temperature and humidity should be checked at frequent intervals.
3. Ventilation may be provided by extractor fans and filtered air inlets, but the most satisfactory method of maintaining the required conditions is by filtering and cooling the incoming air to a sufficiently low temperature to remove excess moisture, then re-heating the air before passing it into the paint shop.
4. The air conditioning system should be capable of changing the air in the paint shop continuously and it is recommended that the paint shop should be maintained at a slight positive pressure in order to prevent dust and draughts from entering through doors and windows.
5. Consequently, and especially during the painting process, access to the facility should be controlled. This may include signage prohibiting the opening of entrance doors during the time actual painting is being undertaken.
6. Cleanliness is essential to a good standard of paint finishing. Paint shop floors should be sealed to prevent “dusting” and should be swept at frequent intervals to ensure the air is largely free from dust. Dried paint and spray dust presents a serious fire hazard and these should be removed frequently.

7. When the paint shop is also used for pre-treatment, stripping and flatting, drainage should also be provided, so that rinsing water can be quickly removed and the floor dried before commencement of painting.

8. The surface to be painted must be adequately illuminated hence portable flame proof lamps may be necessary when painting the under surfaces of wings and fuselage. The provision of suitable scaffolding or working platforms will be necessary with large aircraft to ensure the correct application of paint.
9. Precautions must also be taken to prevent the possibility of fire by removing naked

8.1 Air Distribution System Configurations for Paint Hangar Bays

The following four basic configurations of air flow were considered in this study for use in large aircraft hangar bays:

1. **Horizontal or laminar flow:** Horizontal flow systems employ full face wall air supply with return either in full face wall or in floor trenches. When full face wall return is used, the flow is termed "laminar".
2. **Vertical laminar flow:** Vertical laminar flow systems employ full ceiling air supply and full floor return.
3. **Downdraft flow:** Downdraft flow systems employ ceiling air supply with return through floor trenches or low wall returns or a combination of the two methods. The primary air supply may be concentrated in slots over the planform of the aircraft, with a secondary "entrained air" supply through the remaining celling area to prevent overspray reaching the ceiling, where it would be entrained with the primary air supply and delivered to newly processed surfaces.
4. **Mixed flow or hybrid systems:** Mixed flow, or hybrid. Systems employ a downdraft flow system over fuselage, wing, and tail. With an additional horizontal air supply introduced along the leading edges of wings. Return air may be taken through either floor trenches or low wall returns or a combination of the two methods. Entrained air supply from areas of the ceiling not over the aircraft planform may be employed in conjunction with the primary air supply.

8.2 Paint Removal – Metal and Composite Surfaces

Before stripping a plane and regardless of the coating method it is necessary to first consult the airport authorities to see what they allow. Also, to preserve the surrounding environment in case of spills, it is crucial to contain stripped paint and other chemicals from running off into drains. Therefore, at a minimum, ground containment should be set up.

 Tip – *For smaller aircraft, the organization can roll the plane onto thick gage plastic that stretches past the ends of the wings, nose and tail of the aircraft. A sandbag dam should be set up under the edges of the plastic when using chemical strippers to prevent runoff. Laying down plastic, especially with a dam, contains contaminants very well and provides an easy method of clean up and disposal.*
 Tip – *Larger aircraft should always be stripped in an approved facility where they are set up to safely and legally handle hazardous waste generated from the operation.*

There are 3 traditional methods to remove paint from an aircraft –
a) Sanding,
b) Plastic bead blasting and
c) Chemical stripping.

The most time consuming method is to sand down the painted surface until the metal substrate is reached. This method is labor intensive, time consuming, expensive, dusty and generally not

recommended. The sanding method is usually employed when the painter is trying to remove the top coat, enable adhesion between old and new paint or where the primer has failed and is no longer adhering to the metal substrate. Using this method requires that the primer have good adhesion over the majority

of the aircraft. Where adhesion has failed it is important to sand the lifting or cracked primer and expose the metal.

 Tip – *As a general rule, the area where the primer is lifting plus 20% on all sides should be sanded until only primer is seen with good adhesion and clean metal. Once that is done, the areas can prime-d where metal is exposed before applying the polyurethane topcoat.*

Sanding to prepare the surface for painting is common for composite surfaces as well. It shall Begin with 100 grit sand paper. The operator shall take all measures not to scratch the composite substrate when sanding off all the paint and primer. Once the top coat has been sanded away and the primer is visible, the operator should switch to a finer grit of sand paper to prevent damage – 240 grit or 320 grit.

Plastic media blasting is quick but requires expensive equipment and containment to prevent environmental contamination due to paint chips and dust flying through the air. Commonly, plastic media blasting is performed by a professional with the proper equipment in a debris containment facility. This method is effective on most surfaces and has been shown to produce less visual damage on composite surfaces than sanding.

Chemical stripping is the third de-painting method. Chemical Stripping demands proper masking to prevent damage to components sensitive to abrasive chemicals. Substances such as: rubber, silicone, glue, adhesive, plastic, composites and electronic or avionic components like radar equipment and antennas need to be protected. Standard masking tape and paper will not suffice.

 Tip – *use* ***only*** *tape and masking material that is intended for use with chemical strippers or media blasting.*

For aircraft, protective masking materials are applied to the windows, windshield frame, composites, vents, static ports, rubber seals, tires and applicable flight controls. All openings are sealed. A similar procedure should be followed with other equipment. Once stripped, the substrate should be cleaned and rinsed with fresh water. Masking materials are then removed while the paint is fresh or tacky.

9.0 ENVIRONMENTAL EFFECTS ON UNPAINTED SURFACES

Environmental conditions can pose a variety of problems for metals and composite materials that are not properly coated or are left uncoated. Those problems differ depending on the material used. The three major materials used are steel, aluminum and composite substrates.

The safety of pilots and passengers may be compromised due to corrosion of metals, rusting of steel, the degradation of polymers in composites and the rotting of wood when used as a structural member in

fabric planes. Geography obviously affects the potential for the degradation of the materials. For example, the salt air in Southern California, the extreme heat of the Mojave Desert or the humidity in the Gulf States may cause the materials used to construct the plane to degrade at a faster rate than a warm dry climate.

This makes coating the plane one of the most important parts of preserving its structural integrity. Below are listed the effects to various substrates when exposed to the elements.

9.1 Alloys (Aluminum & Steel)

Corrosion is the disintegration of an engineered material into its constituent atoms due to chemical reactions with its surroundings. Many structural alloys corrode merely from exposure to moisture, salts and other chemicals/minerals in the air or surrounding environment. Corrosion, most often referred to simply as “rust,” can be concentrated locally to form rust, a pit or eventually a crack. Or, it can extend across a wide area more or less uniformly corroding the surface.

 Aluminum is an alloy that has proven to be extremely resistant to corrosion. Aluminum is actually a very active metal, meaning that its nature is to oxidize very quickly forming a protective film. While a weakness for most metals, this quality is actually the key to its ability to resist corrosion. When oxygen is present (in the air, soil, or water), aluminum instantly reacts to form aluminum oxide. This aluminum oxide layer (protective film) is chemically bound to the surface, is impervious to oxygen, and it seals the core aluminum from any further reaction. Aluminum’s oxide film is tenacious, hard, and instantly self-renewing. According to the US Army Corps of Engineers, “Aluminum has excellent corrosion resistance in a wide range of water and soil conditions because of the tough oxide film that forms on its surface. Therefore, it is an outstanding material for aircraft. When corrosion does affect the integrity of aluminum it usually occurs in the form of pits. This is how to determine whether there’s a corrosion problem. The conditions most likely to cause corrosion commonly occur in environments where UV light, salt and moisture are prevalent. Paints and other coatings are critical to the prevention of corrosion and to preserving the integrity of the structural members of whatever is being coated. For these reasons a system of coatings which allows materials such as metal to maintain their strength and properly perform to their intended specifications needs to be developed.

9.2 Composite Degradation

Corrosion is not limited to metals. Corrosion can occur in ceramics or polymers, although in this context, the term degradation is more commonly used. Owners of composite aircraft should be careful to avoid what is called composite degradation. Composite or Polymer degradation is present where there is a change in the properties of the composite – changes in tensile strength, color or shape are the most common. Degradation occurs due to the influence of one or more environmental factors such as heat, light or chemicals such as acids, alkalis and some salts. These changes include cracking and depolymerisation of products which will lower the molecular weight of a polymer. The changes in properties are often termed "ageing". Polymeric molecules are very large (on the molecular scale), and their unique and useful properties are mainly a result of their size. Any loss in chain length lowers tensile strength and is a primary cause of premature cracking. This cracking often occurs during use and over a period of time can lead to a lack of integrity in the composite. This process severely increases the chance of substrate failure.

10.0 GENERAL DOCUMENTATION REQUIREMENTS

Proper documentation is essential for ensuring the safety, mass and balance, and regulatory compliance of aircraft painting. Owners/Operators, approved maintenance organizations AMO must maintain accurate and up-to-date records of all aircraft painting related activities, including procurement, inspection reports, guidelines, and maintenance log detailing the painting process and any issues encountered.

10.1 Paint/Chemical Procurement and Acceptance Records All acquired paint/chemical must be accompanied by the following documents:

a) Material Safety Data Sheet (MSDS): Information on the chemical used, including safety precautions and handling procedure
b) Shipping and receiving inspection records verifying paint specifications, batch number, and condition upon delivery.
c) Storage and shelf-life records ensuring compliance with manufacturer-recommended storage conditions.

10.2 Inspection and Maintenance Records To ensure continued airworthiness, each aircraft painting must have a documented history of inspections and maintenance, including:

a) Surface preparation
b) Painting guidance and procedures
c) Inspection reports and quality control check
d) Damage and defect reports encountered, including any corrective actions taken.
e) Post-painting weight report

10.3 Record Retention and Accessibility All paint-related documentation must be retained for a period specified by regulatory authorities or as required by operational procedures. Records should be stored in a secure and accessible manner, either in physical or electronic format, to facilitate audits, traceability, and regulatory oversight.

a) Operators must ensure that maintenance personnel, quality assurance teams, and regulatory inspectors have access to tire maintenance records when required.

b) Any discrepancies, non-conformities, or rejected tires must be documented and retained for regulatory review.

By adhering to the guidance provided in this Advisory Circular, aircraft owners/operators and approved maintenance organizations can ensure that their exterior painting practices are safe, compliant, and effective in maintaining the airworthiness and aesthetic integrity of their aircraft.