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Superseding MA4872

Paint Stripping of Commercial Aircraft - Evaluation of Materials and Processes

N32

RATIONALE

This document has been determined to contain basic and stable technology which is not dynamic in nature.

STABILIZED NOTICE

This document has been declared "Stabilized" by the SAE AMS J Aircraft Maintenance Chemicals and Materials Committee and will no longer be subjected to periodic reviews for currency. Users are responsible for verifying references and continued suitability of technical requirements. Newer technology may exist.

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FOREWORD

This document outlines the requirements to be used in the evaluation of materials and processes for stripping organic finishes from commercial aircraft. It contains technical requirements only, and is valid for thermal, mechanical, and chemical stripping processes. However, the fundamental purpose of this document is to establish economically, environmentally, and occupationally feasible processes for the removal of coatings from aircraft. The OEMs were directly involved in the development of the requirements and test methods. The OEMs will reflect the intent of this document in their maintenance documentation.

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1. SCOPE:

   a. This document details the technical requirements to be used in the evaluation of materials and processes developed for use in stripping organic finishes from fixed wing commercial aircraft.

   b. The requirements herein are intended to ensure that the materials and processes used are not detrimental to the commercial aircraft when used as specified. These requirements are not intended to judge performance of the stripping method.

   c. These requirements are intended to cover the use of both single and duplex processes involving mechanical, chemical, or thermal means, which include the following:

      (1) High pressure water blasting (with/without use of chemical paint softeners)

      (2) Dry media blasting (e.g., wheat starch, plastic media blast (PMB), etc.)

      (3) Wet media blasting (e.g., sodium bicarbonate)

      (4) Ice-pellet blasting (e.g., CO_2 or water, with/without use of chemical paint softeners)

      (5) Chemical paint stripping (e.g., with/without a dedicated or strippable layer in the paint system)

      (6) Thermal paint stripping (e.g., with/without the use of ice pellet stripping)

      (7) Other processes, may require different or additional requirements as determined necessary by the user and OEM

   d. The requirements are based on the materials and finishes present on the aircraft at the time of delivery. If the materials, finishes or the processing are changed subsequent to delivery, the individual user may require that additional or different tests be included in any evaluation.

   e. The means of compliance with the requirements of this document will have to be negotiated between the user and the relevant regulatory authorities.

   f. The test methods defined in this document constitute a recommended means of compliance.

   g. The final responsibility for safety, health, environmental consequences, the selection of a process for stripping and the number of stripping cycles rests with the user.

   h. It is the responsibility of the user to verify that all testing has been accomplished to the requirements of this specification. This includes verification of laboratory capabilities.

   i. A formal instruction and training program for material and equipment operators, to include operator certification, shall be established and maintained by the user.

1. (Continued):

   j. These requirements are not intended to cover repair materials. The individual user shall incorporate process control procedures and inspection to ensure damage to repair materials has not occurred. Repair material guidelines are located in Annex K.

   k. Evaluation of strip processes may be performed on metallic and/or composite substrates for use on representative structure as defined by the user. Process limitations shall be well documented by the end user.

2. NORMATIVE REFERENCES:

The following publications form a part of this document to the extent specified herein. The applicable issue of all publications shall be the issue in effect on the date of the purchase order. In the event of conflict between the text of this document and references cited herein, the text of this document takes precedence. Nothing in this document, however, supersedes applicable laws and regulations unless a specific exemption has been obtained. See Annex M for addresses to obtain documents listed below.

2.1 ASTM Publications:

ASTM A 109	Steel, Carbon, Cold Rolled Strip
ASTM D 792	Specific Gravity (Relative Density and Density of Plastics by Displacement)
ASTM D 1193	Reagent Water
ASTM D 1781	Climbing Drum Peel Test for Adhesives
ASTM E 4	Load Verification of Testing Machines
ASTM E 466	Conducting Constant Amplitude Axial Fatigue Tests of Metallic Materials, 1988
ASTM E 647	Measurement of Fatigue Crack Growth Rates
ASTM E 1150	Standard Definition of Terms Relating to Fatigue
ASTM F 483	Total Immersion Corrosion Test for Aircraft Maintenance Chemicals
ASTM F 519	Mechanical Hydrogen Embrittlement Testing Of Plating Processes And Aircraft Maintenance Chemicals
ASTM F 1110	Sandwich Corrosion Test
ASTM F 1111	Corrosion of Low Embrittling Cadmium Plate by Aircraft Maintenance Chemicals
ASTM STP 588	Manual on Statistical Planning and Analysis for Fatigue Experiments, 1975

2.2 Commercial Aircraft Manufacturer Publications:

2.2.1 AIRBUS Publications:

AIMS 03-04-011	Material Specification, Aluminum Alloy (2024), Solution Treated and Naturally Aged (T3) Clad Sheet and Strip, $0.2 \leq a \leq 6.0$ mm, Special Surface Quality
TN A007.10028	External Paint System With Intermediate Coat

2.2.2 Boeing Publications:

BAC 5317	Fiber Reinforced Composite Parts
BAC 5317-1	Carbon and Aramid Fiber Reinforced Composite Parts, 350F (177C) Cure
BAC 5317-2	Manufacture of Low Temperature Autoclave Cured Epoxy Structural Parts
BAC 5317-3	Manufacture of High Temperature Resistant Epoxy Structural Parts
BAC 5317-4	Advanced Composite Laminate and Honeycomb Sandwich Structural Parts - 350F (177C) Cure
BAC 5317-5	Manufacture of Advanced Composite Structural Parts, 250F Cure
BAC 5335	Application of Expanded Metal Foil Lightning Strike Protection in Composite
BAC 5578	Manufacture of Advanced Carbon Fiber Reinforced Advanced Composite Structure with Toughened Epoxy Systems, 350F Cure
BMS 5-154	Adhesive for Composite Bonding (350F Cure)
BMS 8-79	Glass Fabric Preimpregnated Epoxy Resin Low Temperature Curing
BMS 8-139	Glass Fabric Preimpregnated High-Tempertaure-Resistant Epoxy Resin
BMS 8-168	Epoxy Preimpregnated Graphite Tapes and Woven Fabrics - 250F (121C) Cure
BMS 8-212	Epoxy Preimpregnated Graphite Tapes and Woven Fabrics - 350F (177C) Cure
BMS 8-218	Aramid Fabrics Preimpregnated with Epoxy Resin (350F Curing)
BMS 8-219	Aramid Fabrics Preimpregnated with Epoxy Resin (250F Curing)
BMS 8-256	Controlled Flow Epoxy Preimpregnated Graphite Tapes and Woven Fabrics - 350F
BMS 8-276	Advanced Composites - 350F Cure Toughened Epoxy Preimpregnated Carbon
BMS 8-336	Expanded Metal Foil for Lightning Strike Protection of Composite Parts

2.2.3 Fokker Publications:

TH 33.0155	Intermediate Coat for Use in Selectively Paint Systems

2.2.4 McDonnell Douglas Publications:

DMS 1926	Epoxy Resin “B” Stage, Cloth Reinforced
DMS 2202	Epoxy Resin “B” Stage, Fabric Reinforced-Heat Resistant
DMS 2224	Carbon Epoxy Prepreg, Impact Resistant
DMS 2288	Fiber Reinforced Epoxy, Prepreg. 250F Cure
DMS 2302	Shielding, Expanded Fail
DMS 2387	Fiber Reinforced Toughened Epoxy Prepreg. 350F Cure

2.3 European Standards:

EN 2334	Aerospace Series Acid Chromate Pickling of Aluminum Alloys
EN 2101	Aerospace Series - Chromic Acid Anodizing of Aluminum and Aluminum Alloys

2.4 ISO Publications:

ISO 2409	Paints and Varnishes - Cross Cut Test, 1992
ISO 4783/1	Industrial Wire Screen and Woven Wire Cloth - Guide of Choice of Aperture Size and Wire Diameter Combinations - Part 1: Generalities

2.5 SAE Publications:

AMS 2470	Anodic Treatment of Aluminum Alloys, Chromic Acid Process
AMS 2475	Protective Treatments Magnesium Alloys
AMS 4037	Aluminum Alloy, Sheet and Plate 4.4Cu 1.5Mg 0.6Mn Solution Heat Treated
AMS 4041	Aluminum Alloy, Sheet Plate, Alclad 4.4Cu 1.5Mg 0.60Mn Alclad 2024 and 1-1/2% Alclad 2024, -T3 Flat Sheet; 1-1/2% Alclad 2024-T351 Plate
AMS 4049	Aluminum Alloy, Sheet and Plate, Alclad, 5.6Zn 2.5Mg 1.6Cu 0.23Cr Solution and Precipitation Heat Treated
AMS 4202	Aluminum Alloy, Plate, 5.7Zn 2.2Mg 1.6Cu 0.22Cr, Solution Heat Treated, Stress Relieved by Stretching, and Precipitation Heat Treated
AMS 4375	Sheet and Plate, Magnesium Alloy 3.0Al 1.0Zn 0.20Mn, Annealed and Recrystallized
AMS 4376	Plate, Magnesium Alloy 3.0Al 1.0Zn 0.20Mn, Cold Rolled and Partially Annealed
AMS 4911	Titanium Alloy, Sheet, Strip, and Plate, 6Al 4V, Annealed
AMS 6350	Steel Sheet, Strip, and Plate, 0.95Cr 0.20Mo (0.28-0.33C)
AMS 6454	Steel Sheet, Strip, and Plate 1.8Ni 0.80Cr 0.25Mo (0.38-0.43C) Consumabale Electrode Melted

2.6 U.S. Government Publications:

MIL-A-8625	Anodic Coatings, for Aluminum and Aluminum Alloys
MIL-C-5541	Chemical Conversion Coatings on Aluminum Alloys
MIL-C-85285	Coatings: Polyurethane, Aliphatic, Weather Resistant, Low Infra Red (IR)
MIL-H-6875	Heat Treatment of Steel, Process For
MIL-P-23377	Primer Coatings - Epoxy, Polyamide, Chemical and Solvent Resistant
MIL-R-81294	Remover, Paint, Epoxy, Polysulfide and Polyurethane Systems
MIL-S-13165	Shot Peening of Metal Parts
MIL-STD-401	Sandwich Constructions and Core Materials; General Test Methods
QQ-P-416	Plating, Cadmium (Electrodeposited)
NAS 1097	Rivet, Solid 100 Deg, Flush Shear Head, Aluminum Alloy, Titanium Columbium Alloy
MS 24693-10	Screw, Machine, Flat Countersunk Head, 100 Deg, Cross Recessed, UNC-2A and UNF-2A (in/mm)
AN 315-3R	Nut, Plain, Airframe

3. DEFINITIONS:

For the purpose of this international standard, the following definitions apply:

3.1 CHEMICAL PAINT STRIPPER:

A chemical capable of removing the paint by chemical attack.

3.2 DRY MEDIA:

Abrasive media which does not include liquid e.g. plastic media, wheat starch media.

3.3 DUPLEX PROCESS:

A two stage or combination of stripping processes, e.g. paint softening plus wet or dry media blasting.

3.4 LONGITUDINAL MODULUS:

The slope of the straight line in the tensile stress/strain diagram through the points corresponding with tensile strains at 500 microstrain and 2500 microstrain.

3.5 MASKING MATERIAL:

Any tape, foil or part required to protect the surface.

3.6 MECHANICAL STRIPPING PROCESS:

Any process that uses mechanical means to remove paint (e.g., abrasion, erosion, grinding, etc.).

3.7 PAINT SOFTENER:

A chemical used to loosen or soften paint prior to removal.

3.8 SHEAR STRENGTH:

The shear strength is the shear stress at failure.

3.9 SLURRY:

A solid media-liquid mixture used to remove paint, e.g., sodium bicarbonate and water, plastic media and water, etc.

3.10 STRIPPING:

Any process (mechanical, chemical, duplex, etc.) used to remove organic or inorganic layers.

3.11 TENSILE STRAIN:

The tensile strain is the variation in the longitudinal distance between gauge marks on the test specimen gauge length, produced by a tensile load and expressed with respect to the initial distance between the gauge marks.

3.12 THERMAL STRIP PROCESS:

Any process that uses a heat or light source or increases or decreases the temperature of the coating and/or the substrate during a stripping operation.

3.13 USER:

Maintenance repair station, approved by the relevant airworthiness authority.

3.14 WET MEDIA:

A slurry or other liquid media such as water.

4. TECHNICAL REQUIREMENTS:

a. Each process shall be evaluated in accordance with the test methods outlined in Section 5 as required by Table 1.

b. A detailed test report and process specification as specified in Annex E and F shall be prepared, controlled, and maintained by each user.

c. For the evaluation of the process, the complete process, including worst case parameters within the proposed process specification, shall be applied on test specimens to be stripped. Worst case parameters shall consider combinations of process parameters which are not prohibited by process limitations and restrictions, as well as reasonable or likely operator induced deviations from optimum process parameters.

d. For duplex processes, the requirements of each process shall apply. When testing in accordance with 5.12, ±45 Laminate Tensile Test, the chemical component of the duplex process shall be tested alone.

TABLE 1 - Required Tests

Test	Substrates[1]	Chemical Strip Process	Mechanical Strip Process	Thermal Strip Process
Paint Adhesion (5.1)	M, C	X	X	X
Clad Penetration (5.2)	M		X	X
Residual Stress (5.3)	M		X	X
Fatigue Life (5.4)	M		X	X
Sandwich Corrosion (5.5.1)	M	X	X[5]	
Immersion Corrosion (5.5.2)	M, W	X	X[5]	
Dissimilar Metals Corrosion (5.5.3)	M	X	X[5]	
Hydrogen Embrittlement of High Strength Steels (5.5.4)	M	X	X[5]	X[6]
Crack Detectability (5.6)	M		X	X
Crack Propagation (5.7)	M	X[3]	X	X
Anodic Layer Cracking (5.8)	M		X	X
Surface Roughness (5.9)	M		X	X
Substrate Temperature (5.10)	M, C			X
AL Honeycomb Bondline (5.11)	M		X	X
±45 Laminate Tensile (5.12)	C	X		
Visual Inspection (5.13)	C, W	X	X	X
Mesh Peel Test (5.14)	W	X	X[2]	
Long Beam Flexure Test (5.15)	C		X	X
Flatwise Tensile (5.16)	C		X	
Wet Media Penetration Test (5.17)	C	X[4]	X[2,4]	X[4]

[1] M = metals; C = composites; W = wire mesh

[2] For wet strip processes only.

[3] For strip processes which fail sandwich corrosion and/or immersion corrosion tests.

[4] For strip processes using pressure rinsing.

[5] For wet strip or water soluble media processes only.

[6] Required only for processes which generate hydrogen gas during decomposition.

4. (Continued):

   e. The qualified number of stripping cycles shall be equal to the number of stripping cycles applied during testing, the minimum of which shall be five.

   f. During evaluation testing, separate test panels shall be prepared in accordance with 5.1, Paint Adhesion Test, to check paint adhesion before each stripping cycle and after reapplication of paint.

   g. Mechanical testing machines shall be verified in accordance with ASTM E 4 to an accuracy of ±1% within the test loading range. The testing machine shall be equipped with a means for making autographic recordings of load versus deflection.

4.1 Requirements for Metals:

The requirements are applicable to all metals and heat treatments. The metal alloys for the OEM's aircraft being stripped shall meet the following requirements for chemical, mechanical, and thermal strip processes.

   a. Stripped parts shall exhibit no penetration through the clad layer of aluminum alloys when tested in accordance with 5.2, Clad Penetration Test.

   b. Residual stress specimens shall not result in an arc height greater than 150 µm (0.006 in) when tested in accordance with 5.3, Residual Stress Test. Materials of 3.2 mm (0.125 in) thickness and greater do not require this test.

   c. The maximum surface roughness reading taken from any clad aluminum specimen shall not exceed 3.2 µm (125 µin) Ra for any strip cycle when tested in accordance with 5.9, Surface Roughness Test.

   d. Stripped parts shall be analyzed to determine if removal or cracking of an anodic layer has occurred when tested in accordance with 5.8, Anodic Layer Cracking Test.

   e. The stripping process shall not produce pitting, etching, or corrosion products when:

      (1) Tested for sandwich corrosion in accordance with 5.5.1, Sandwich Corrosion Test.
      (2) Tested for immersion corrosion in accordance with 5.5.2, Immersion Corrosion Test.
      (3) Tested for dissimilar metals corrosion in accordance with 5.5.3, Dissimilar Metals Corrosion Test.

      NOTE: Masking shall be incorporated to protect areas if the requirements of (e) are not met.

   f. The stripping process shall not introduce hydrogen embrittlement in high strength steel when tested in accordance with 5.5.4, Hydrogen Embrittlement of High Strength Steels Test.

      NOTE: Masking shall be incorporated to protect areas if the requirements of (f) are not met.

4.1 (Continued):

g. No reduction in crack detectability is allowed when tested in accordance with 5.6, Crack Detectability Test.

h. The fatigue life of parts/components to be stripped shall reveal no reduction in fatigue life for Type II specimens when tested in accordance with 5.4, Fatigue Life Test.

i. No increase in crack propagation is allowed when tested in accordance with 5.7, Crack Propagation Test.

j. No reduction in the peel strength of thin skinned aluminum honeycomb bondlines is allowed when tested in accordance with 5.11, Aluminum Honeycomb Bondline Test.

k. Substrate temperature shall not exceed +80 °C (180 °F) or be less than -55 °C (-65 °F) when tested in accordance with 5.10, Substrate Temperature Test.

l. Paint adhesion shall not rate greater than "zero" for dry adhesion and "1" for wet adhesion when tested in accordance with 5.1, Paint Adhesion Test.

4.2 Requirements for Composites:

The requirements are applicable to all solid laminate and sandwich composites (e.g., glass/aramid/carbon fiber reinforced resin systems). The composite materials in Annex B, for the OEM's aircraft being stripped, shall meet the following requirements for chemical, mechanical, and thermal strip processes.

a. Paint adhesion shall not rate greater than "zero" for dry adhesion and "1" for wet adhesion when tested in accordance with 5.1, Paint Adhesion Test.

b. Substrate temperature shall not exceed +80 °C (180 °F) or be less than -55 °C (-65 °F) when tested in accordance with 5.10, Substrate Temperature Test.

c. The average longitudinal modulus shall not be reduced by more than 5% with respect to the control values when tested in accordance with 5.12, ±45 Laminate Tensile Test.

d. There shall be no evidence of swelling, fiber damage, microcracking, or pitting on bare composite surfaces when inspected visually at 10X magnification in accordance with 5.13, Visual Inspection Test.

e. The average ultimate load at failure and the P/Y shall not be reduced by more than 5% with respect to the control average when tested in accordance with 5.15, Long Beam Flexure Test.

4.2 (Continued):

f. The average flatwise tensile strength shall not be reduced by more than 5% with respect to the control average when tested in accordance with 5.16, Flatwise Tensile Test.

g. There shall be no evidence of liquid ingress when tested in accordance with 5.17, Wet Media Penetration.

4.3 Requirements for Lightning Protection Materials on Composites:

The requirements are applicable to all mesh lightning protection systems on composite substrates. The configurations defined in 5.13 and 5.14 and Annex C, for the OEM's aircraft being stripped, shall meet the following requirements for chemical, mechanical, and thermal strip processes.

a. There shall be no degradation of the mesh when visually inspected at 10X magnification when tested in accordance with 5.13, Visual Inspection Test.

b. When testing materials from Annex C, there shall be no exposed mesh from embedded mesh configurations when tested in accordance with 5.13, Visual Inspection Test.

c. The average peak load in peel shall not be reduced by more than 25% from the control average and no single test value shall be less than 50% of the control average when tested in accordance with 5.14, Mesh Peel Test.

5. TEST METHODS:

5.1 Paint Adhesion Test:

1. Principle
   a. To check for proper paint adhesion.
2. Apparatus
   a. See ISO 2409.
3. Test Panels and Preparation
   a. Metallic test panels shall be 100 mm x 150 mm x 1.0 mm (4 in x 6 in x 0.040 in) 2024-T3 clad aluminum.
   b. Composite test panels shall be 100 mm x 150 mm x 1.25 mm (4 in x 6 in x 0.050 in) laminates using five plies of composite material specified in Annex B and C for the OEM's aircraft being stripped.
   c. Prepare, paint and age specimens in accordance with Annex A.

5.1 (Continued):

4. Method

a. Dry Adhesion Test

(1) Conduct test in accordance with ISO 2409.

b. Wet Adhesion Test

(1) Immerse the test specimen in 23 °C ± 2 °C (75 °F ± 5 °F) ASTM D 1193 Type IV water for 14 days.

(2) At the end of the 14 days, remove the specimen from the water and wipe the surface dry with clean cheesecloth or equivalent, and conduct test in accordance with ISO 2409.

NOTE: Each specimen shall be tested immediately after drying.

5. Expression of Results

a. Express results in accordance with ISO 2409.

6. Test Report

a. Report results in accordance with Annex E.

5.2 Clad Penetration Test:

1. Principle

a. To determine if damage penetrates through the cladding layer and into the base material.

2. Apparatus

Not Applicable

3. Test Panels and Preparation

a. Metallic test panels shall be 100 mm x 150 mm x 1.0 mm (4 in x 6 in x 0.040 in) 2024-T3 clad aluminum.

b. Prepare, paint and age specimens in accordance with Annex A.

5.2 (Continued):

4. Method

a. Solvent clean the area to be tested.

b. Mask off damage to prevent staining of adjacent areas by test solution.

c. The solution used for determining penetration through the cladding and into the base material shall consist of the following proportions:

(1) Potassium nitrate (KNO_3): 200 g
(2) Sodium hydroxide (NaOH): 100 g
(3) Water to make 1 liter of solution

d. Apply one drop of cladding penetration test solution with a sharp point of a toothpick to the deepest point of the damage. Use the minimum amount of test solution necessary to penetrate to the bottom of the damage. Do not allow this caustic solution to contact any other area than that to be tested.

e. When the bottom of the damage reveals a distinct black indication, the damage has penetrated the cladding to the base material. Immediately water rinse the test area thoroughly after observing the black indication.

f. If no black indication occurs after 3 min, then the damage has not penetrated through the cladding to the base material. Immediately water rinse the test area thoroughly.

5. Expression of Results

a. A black indication shall be reported as a “fail”.

b. No black indication shall be reported as a “pass”.

6. Test Report

a. Report results in accordance with Annex E.

5.3 Residual Stresses Test:

1. Principle

a. To determine the amount of residual stress imparted due to paint stripping process.

2. Apparatus

a. Test specimen holding fixture shall conform to MIL-S-13165.

b. Measurement gauge shall conform to MIL-S-13165.

5.3 (Continued):

3. Test Panels and Preparation

   a. Flat within 0.04 mm (0.0015 in).

   b. Made of material 2024-T3 and the thickness of the specimen shall be 1.2 mm ± 0.1 mm (0.051 in ± 0.001 in).

   c. Size of the Almen strip shall be 20 mm x 80 mm (0.75 in x 3.0 in). The material grain direction shall be in the longitudinal direction of the strip.

   d. The Almen test strip shall be finished with the chemical conversion coating and paint system as used on the commercial airplane. Pretreat, paint, and cure the test specimens in accordance with Annex A.

4. Method

   a. Hold in position with the holding fixture.

   b. Strip specimens. Refinish and cure test specimens as above. Repeat procedure four times.

   c. After stripping the specimens five times, measure the arc height.

5. Expression of Results

   a. Results shall be expressed in mm.

6. Test Report

   a. Report results in accordance with Annex E.

5.4 Fatigue Life:

1. Principle

   a. This test method shall be conducted to determine impact of stripping method on fatigue life.

2. Apparatus

   a. Not Applicable

5.4 (Continued):

3. Test Panels and Preparation

a. The specimen designs are shown in Figure 1. Actual specimen dimensions will depend on test machine constraints.

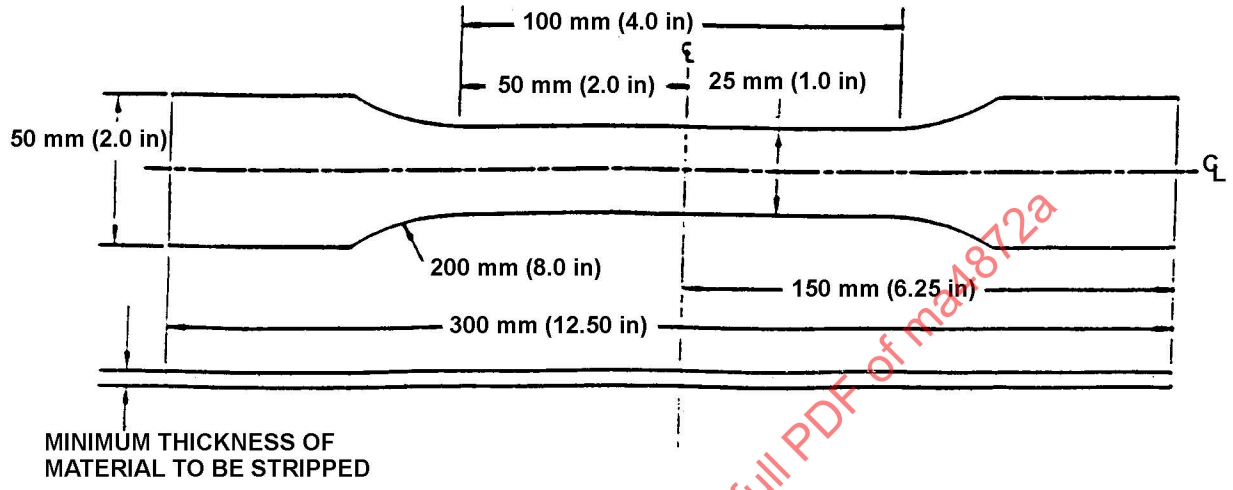


FIGURE 1 - Fatigue Life Test Specimen

b. Alloys shall be selected in accordance with Annex D.

c. Ten control specimens and 10 test specimens shall be tested for each alloy. Use a confidence interval analysis at 90% confidence level to analyze the data. See ASTM STP 588.

d. Fabricate and finish 320 mm x 600 mm (12 in x 24 in) minimum size test panels; a minimum of one for evaluating the stripping method and a minimum of one for baseline control specimens. Both panels, test, and control shall be from the same sheet of material.

e. Paint age and strip the specimens a minimum of five times before fatigue cycling in accordance with Annex A. Prime the back (nontest) side of the test and control specimens before tests and prime the stripped side after the final strip to minimize mechanical damage during testing and machining. After the panels are stripped a minimum of five times, cut the fatigue specimens from the panels and finish machine in accordance with Figure 1. Use care to prevent overheating and distorting the specimens when cutting and machining to final dimension. Hand finish the specimen edges to a 0.8 µm Ra (32 µin Ra) or better surface finish. Do not scratch the specimens perpendicular to their longitudinal axis.

5.4 (Continued):

4. Test Method

   a. Testing is to be conducted under constant amplitude loading at a test frequency of 10 Hz. Loading is to be set to give a stress ratio (R) of 0.1 with maximum stress levels in the range 200 to 350 MPa with the aim of producing failures of the control coupons at lives between 10^4 and 5 x 10^5 cycles. Testing is to be carried out at a minimum of three different maximum stress levels. A material S-N curve for notched specimens can be used for initial guidance (terminology in accordance with ASTM E 1150).

   b. The test is invalid and shall be repeated if panels that have been stripped and repainted five times experience crack propagation times significantly lower than what was observed for the unstripped control specimens.

   c. No reduction in fatigue life is allowed.

5. Expression of Results

   a. Results shall be expressed in percentage of difference from control specimens.

6. Test Report

   a. Report results in accordance with Annex E.

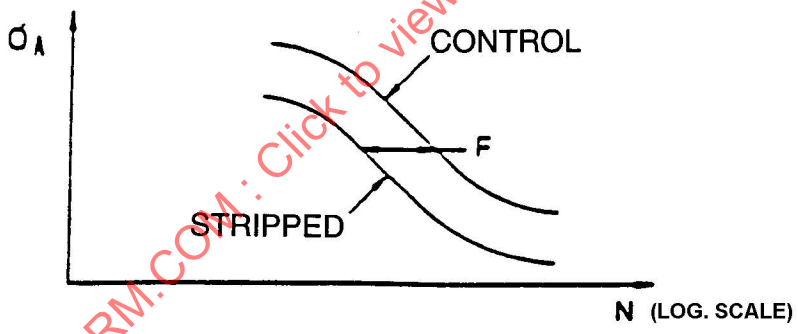


FIGURE 2 - Fatigue Life Factor "f"

5.5 Corrosion Tests:

5.5.1 Sandwich Corrosion Test:

1. Principle
   a. To determine the corrosion potential of the paint stripping process when entrapped in a faying surface.
2. Apparatus
   a. Refer to ASTM F 1110.
3. Test Panels and Preparation
   a. Refer to ASTM F 1110.
4. Test Method
   a. Use ASTM D 1193 Type IV water.
   b. Run test in accordance with ASTM F 1110.
   c. Rate panels in accordance with ASTM F 1110.
5. Expression of Results
   a. Specimens showing a rating worse than one, and/or worse than ASTM D 1193 Type IV water, shall be reported as a “fail”.
6. Test Report
   a. Report results in accordance with Annex E.

5.5.2 Immersion Corrosion Tests:

1. Principle
   a. To determine the corrosion potential of the paint stripping process on different alloys.
2. Apparatus
   a. Refer to ASTM F 483.
3. Test Panels and Preparation
   a. Substrates are identified in Table 2.
   b. Prepare specimens in accordance with ASTM F 483.

TABLE 2

Test Panel		Weight Change (mg/cm^2) 24 h
AMS 4037	Aluminum Alloy anodized per AMS 2470	0.2
AMS 4041	Aluminum Alloy	0.3
AMS 4049	Aluminum Alloy	0.3
AMS 4376	Magnesium Alloy, dichromate treated per AMS 2475	0.2
AMS 4911	Titanium Alloy	0.1
ASTM A 109	Carbon Steel, Temper #5	0.8
AMS 6350	Steel, Cadmium plated in accordance with ASTM F 111	0.3
ISO 4783/1	Bronze Mesh[1] (Product Reference 230/40)	1.2% from initial weight[2]
DMS 2302	Copper Alloy[3]	0.3

[1] Required when chemically stripping lightning strike wire mesh on Airbus aircraft only.

[2] Initial weight: approximately 10 g.

[3] Required when chemically stripping lightning strike wire mesh on McDonnell Douglas aircraft only.

5.5.2 (Continued):

4. Test Method

   a. Run test in accordance with ASTM F 483.

   b. Clean mesh following immersion to ensure all traces of oxide film and stripping medium are fully removed.

5. Expression of Results

   a. The action of the fluid shall neither cause corrosion nor a weight change of any test panel greater than the values specified in Table 2.

6. Test Report

   a. Report results in accordance with Annex E.

5.5.3 Corrosion Test for Dissimilar Metals:

1. Principle

   a. To determine the corrosion potential of the paint stripping process on dissimilar metal assemblies.

2. Apparatus

   a. Desiccator.

   b. Oven capable of being maintained at 40 °C ± 2 °C (104 °F ± 5 °F).

3. Test Panels and Preparation

   a. Test panels are 75 mm x 100 mm (3 in x 4 in) and of any convenient thickness unless specified otherwise in Table 3.

TABLE 3

Quantity	Composition of Panel
Three each	Aluminum alloy 7075, T-6 condition, AMS 4049 (3.2 mm [0.125 in] thick)
Two each	Magnesium alloy, AMS 4376 (AZ318-H-26), cold rolled and partially annealed
Two each	Steel, MIL-S-7952, cadmium plated (0.013 mm [0.0005 in] nominal) in accordance with QQ-P-416
Three each	Titanium alloy, AMS 4911 (6Al-4V) (1.6 mm [0.063 in] thick nominal)

   b. Three aluminum panels and two titanium panels shall have holes drilled in accordance with Figure 3. Two magnesium, two steel and one titanium panel shall have holes drilled according to note 3 of Figure 3. The panels shall be cleaned and assembled in accordance with Figure 4 and as indicated below:

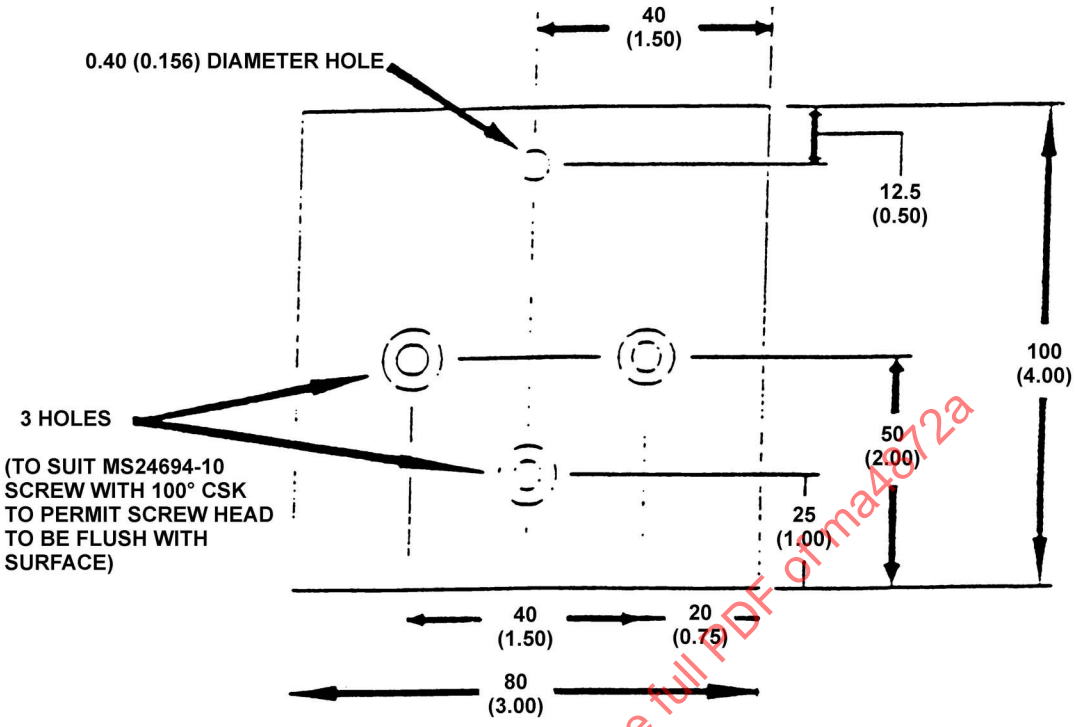
      (1) 7075-T6 aluminum alloy to magnesium alloy fastened with MS24694-10 screws (100° countersunk structure) heat treated in accordance with MIL-H-6875; nuts (AN315-3R); and washers (AN960-10). The screws, nuts, and washers shall be steel and each shall be cadmium plated in accordance with QQ-P-416.

      (2) 7075-T6 aluminum alloy to cadmium plated steel fastened same as (1).

      (3) 7075-T6 aluminum alloy to 6Al-4V titanium alloy fastened same as (1).

      (4) 6Al-4V titanium alloy to cadmium plated steel fastened same as (1).

      (5) 6Al-4V titanium to magnesium fastened same as (1).



NOTES:

1. Dimensions in millimeters (inches).
2. Tolerances, unless otherwise specified: dimensions shown shall be normal except that tolerances for the screw holes shall be within limits that will permit assembly of the panels as shown in Figure 3.
3. The three holes on second panel of couple shall be positioned to allow for 25 mm (1 in) overlap when connected. See Figure 4.

FIGURE 3 - Dimensions for Dissimilar Metal Test Panels

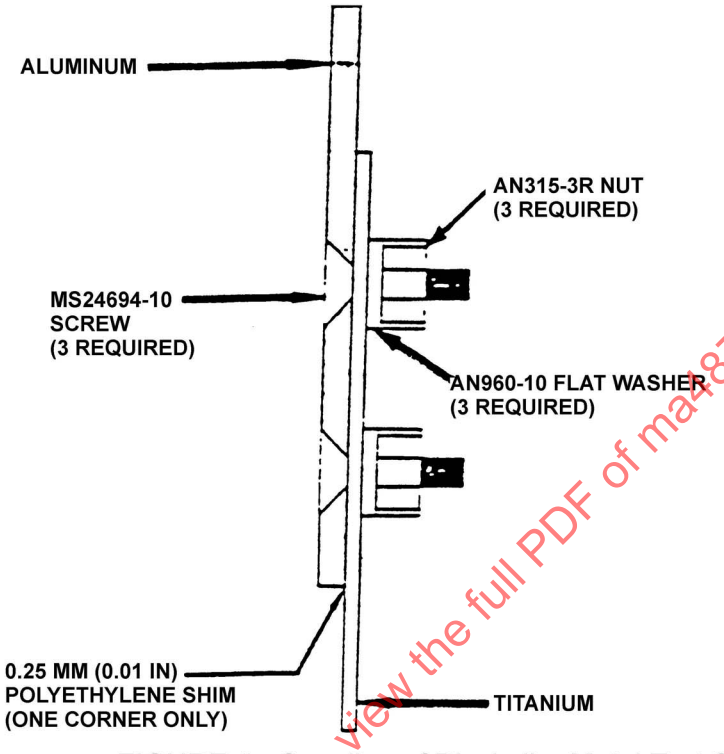


FIGURE 4 - Coupling of Dissimilar Metal Test Specimens

5.5.3 (Continued):

c. These dissimilar metal couples shall be joined with a 0.25 mm (0.01 in) polyethylene shim inserted under one corner. The fasteners shall be finger tight.

4. Test Method

a. The coupled panels shall be completely immersed in the softener/stripper. After 1 h, they shall be removed and placed in an oven maintained at 40 °C ± 2 °C (104 °F ± 5 °F) for a period of 48 h. The panels shall be removed and immediately suspended vertically for 48 h in a desiccator. Prior to the test, the desiccator shall be cleaned and the lower portion filled with ASTM D 1193 Type IV water after which it shall be closed. During the test, the desiccator shall be kept tightly sealed and in an area maintained at 23 °C ± 2 °C (75 °F ± 5 °F). At the end of the 48 h period, the panels shall be removed, disassembled, washed with water immersed in acetone and dried. The individual panels shall then be inspected for pitting, etching and corrosion products. For magnesium panels, slight etching under the washers, less than 3.2 mm (0.125 in) in diameter, shall not be cause for rejection.

5.5.3 (Continued):

5. Expression of Results

a. Panels that exhibit pitting, etching, and/or corrosion products shall be reported as a “fail”.

6. Test Report

a. Report results in accordance with Annex E.

5.5.4 Hydrogen Embrittlement of High Strength Steels:

1. Principle

a. To determine the potential of the paint stripping process to introduce hydrogen into high strength steels.

2. Apparatus

a. Refer to ASTM F 519.

3. Test Panels and Preparation

a. Use ASTM F 519 specimen type 1A, 1C, or 2A.

4. Test Method

a. Run test in accordance with ASTM F 519.

5. Expression of Results

a. Express results in accordance with ASTM F 519.

6. Test Report

a. Report results in accordance with Annex E.

5.6 Crack Detectability:

1. Principle

a. To determine if paint stripping process inhibits the ability to detect cracks.

2. Apparatus

a. Fatigue machine.

b. Electric discharge machining.

5.6 (Continued):

3. Test Panels and Preparation

a. Prepare, paint, and age 3 test coupons of 2024T3 clad aluminum that is 100 mm x 300 mm x 1.6 mm (4 in x 12 in x 0.063 in) in accordance with Annex A.

b. Drill a 3.2 mm (0.125 in) hole through the center of each coupon. Using electric discharge machining (EDM), cut two horizontally opposed notches that are 0.25 mm (0.010 in) wide and 5.0 mm (0.200 in) long. See Figure 5.

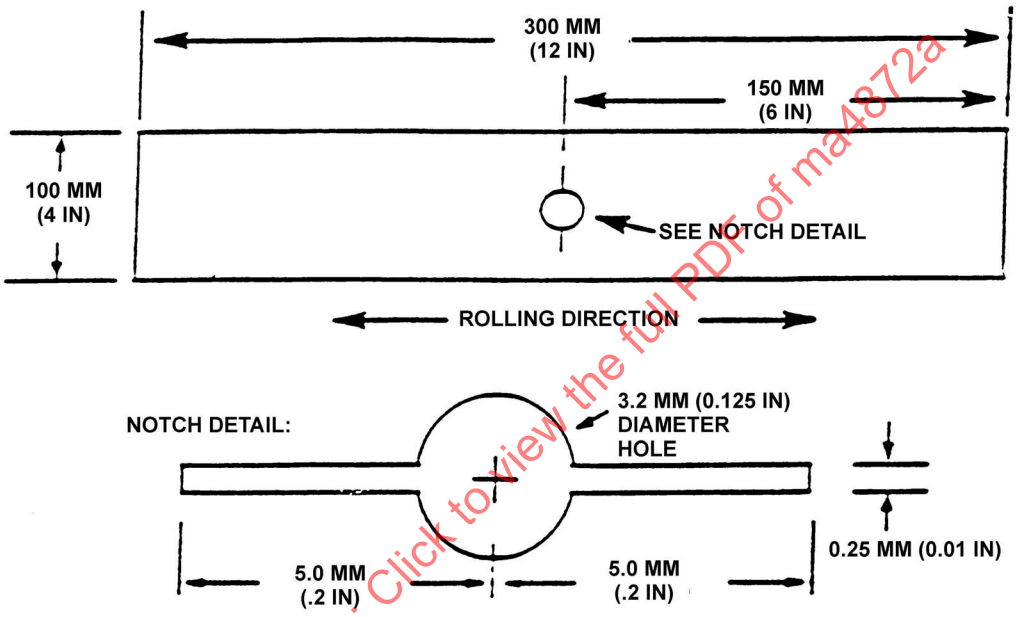


FIGURE 5 - Crack Detectability Specimen Configuration

c. Place each coupon in a fatigue machine and cyclically load the coupon in tension - tension at 25 Hz to propagate a fatigue crack. Grow the crack to a minimum length of 25 mm (1 in) from the end of each EDM notch. Inspect and record crack length. Recommended inspection method is high frequency eddy current.

5.6 (Continued):

4. Test Method

   a. Process each coupon using the paint stripping method, stripping under the worst case/most severe conditions.

   b. Using the same inspection method as previously used, inspect the crack for closure. Cross section optical microscopy should be performed to assess the degree of closure after accomplishing the above inspection.

   c. Repeat process (paint, age, and strip in accordance with Annex A) four additional times. Inspecting after each stripping cycle.

5. Expression of Results

   a. Any reduction in crack detectability shall be reported as a "fail".

   b. Any failure shall also report the degree of closure.

6. Test Report

   a. Report results in accordance with Annex E.

5.7 Crack Propagation:

1. Principle

   a. To determine if the paint stripping process increases the crack growth rate.

2. Apparatus

   a. See ASTM E 647.

3. Test Panels and Preparation

   a. Select alloy in accordance with Annex D.

   b. Use a minimum of 10 control and 10 test specimens for each alloy tested.

   c. Coupons for each alloy tested shall be precracked prior to testing to provide a sharp ended and straight crack of adequate size. Length of the precrack shall be 1.0 mm (0.04 in) and ΔKmax during precracking shall not exceed 6.534 MPa/m^2 (6 ksi/in^2). The half crack length after precracking shall not exceed 9.0 mm (0.353 in).

   d. Paint, age, and strip specimens in accordance with Annex A, a total of five times before testing. Perform a fatigue crack growth rate test for each material to establish a baseline growth rate for ΔK range of 6.534 to 17.4 MPa/m^2 (6 to 16 ksi/in^2). Testing shall be per ASTM E 647. All crack lengths shall be optically measured using a 30x traveling microscope (or equivalent measuring technique, equivalency to be proven by user).

5.7 (Continued):

4. Test Method

   a. The following data items are required for each alloy:

      (1) da/dn versus ΔK curves other than dk range of 6.534 to 17.4 MPa/m^2 (6 to 16 ksi/in^2).
      (2) Log plots of crack growth per load cycle (da/dn) as a function of ΔKmax.
      (3) Tabular data for half crack length versus cycle.

   b. Fatigue crack growth rate shall be calculated using incremental polynomial method. A statistical comparison between the baseline and test specimens using the Student-t test will be performed at ΔK values of 7.6, 8.7, 12.0 and 16.3 MPa/m^2 (7, 8, 11, and 15 ksi/in^2). An alpha of 0.1 shall be used.

   c. Specific values shall be obtained by curve fitting using the 7 point ASTM E 647 method. Select the nearest point to the desired ΔK values as the central point and three pits greater than and less than the value, to calculate a representative da/dn at the desired ΔK for the specimens.

5. Expression of Results

   a. Any increase in crack growth rate shall be reported as a "fail".

6. Test Report

   a. Report results in accordance with Annex E.

5.8 Anodize Cracking Test:

1. Principle

   a. To determine if paint stripping process causes the anodic layer to crack.

2. Apparatus

   a. Not Applicable

3. Test Panels and Preparation

   a. Prepare a chromic acid anodize (unsealed) 300 mm x 300 mm x 1.2 mm (12 in x 12 in x 0.04 in) 2024-T3 clad aluminum test panel in accordance with AMS 2470 or EN 2101.

   b. Paint and age panel in accordance with Annex A within 2 h of applying the anodize coating.

5.8 (Continued):

4. Test Method

   a. Strip panel.

   b. After each painting and stripping cycle prior to repainting the surface shall be visually inspected for cracks or removal of the anodic coating. Inspection shall be at 30X magnification or using an equivalent verification technique, equivalency to be proven by user.

   c. Report any cracks or removal of anodic layer.

   d. Repaint and age panels in accordance with Annex A. Repeat the process until a minimum of five strip cycles have been completed.

5. Expression of Results

   a. Any removal or cracks in anodic layer shall be reported as a failure and size quantified in mm (inches).

6. Test Report

   a. Report results in accordance with Annex E.

5.9 Surface Roughness:

1. Principle

   a. To determine if the paint stripping process changes the roughness of the surface.

2. Apparatus

   a. Surtronic 3 profilometer with a standard pickup probe Type 112/1503, cutoff 0.8/0.3 LS (long stroke) or equivalent.

3. Test Panels and Preparation

   a. Test specimen shall be 300 mm x 300 mm x 1.6 mm (12 in x 12 in x 0.063 in) 2024-T3 clad aluminum.

   b. Prepare panels in accordance with Annex A and measure the surface roughness prior to painting using a Surtronic 3 profilometer with a standard pickup probe Type 112/1503, cutoff 0.8/0.3 LS (long stroke) or equivalent.

   c. A minimum of 10 readings performed along different directions and different places in each panel. Record each of the 10 readings as the baseline for each specimen.

   d. Paint and age specimens in accordance with Annex A.

5.9 (Continued):

4. Test Method

   a. Strip specimen and clean if necessary to remove stripping residues.

   b. Measure the surface roughness. A minimum of 10 readings shall be performed along different directions and different places in each panel. Record each of the readings.

   c. Repeat the process until a minimum of five strip cycles have been completed.

5. Expression of Results

   a. Results shall be expressed in micrometers Ra (microinches Ra). Any reading greater than 3.2 µm (125 µin) shall be reported as a "fail".

6. Test Report

   a. Report results in accordance with Annex E.

5.10 Substrate Temperature:

1. Principle

   a. To determine the effect the paint stripping process has on substrate temperature.

2. Apparatus

   a. Thermocouples and temperature recorder with an accuracy to ±2 °C and a thickness no greater than 0.3 mm, capable of detecting temperature changes of the system under test.

3. Test Panels and Preparation

   a. Metals

      (1) Prepare a 300 mm x 300 mm x 1.2 mm (12 in x 12 in x 0.048 in) 2024-T3 clad aluminum panel in accordance with Annex A.

      (2) Centrally place one thermocouple on back of panel.

   b. Composites

      (1) When stripping composite materials, prepare a 300 mm x 300 mm x as near as possible to 2 mm (12 in x 12 in x 0.08 in) fully symmetric laminate of composite systems specified in Annex B for the OEM's aircraft being stripped. Thermocouples shall be laminated between the outer and adjacent of the test surface plies which shall be flat.

      (2) For thermocouple placement, see Figure 6.

   c. Paint and age test panel in accordance with Annex A.

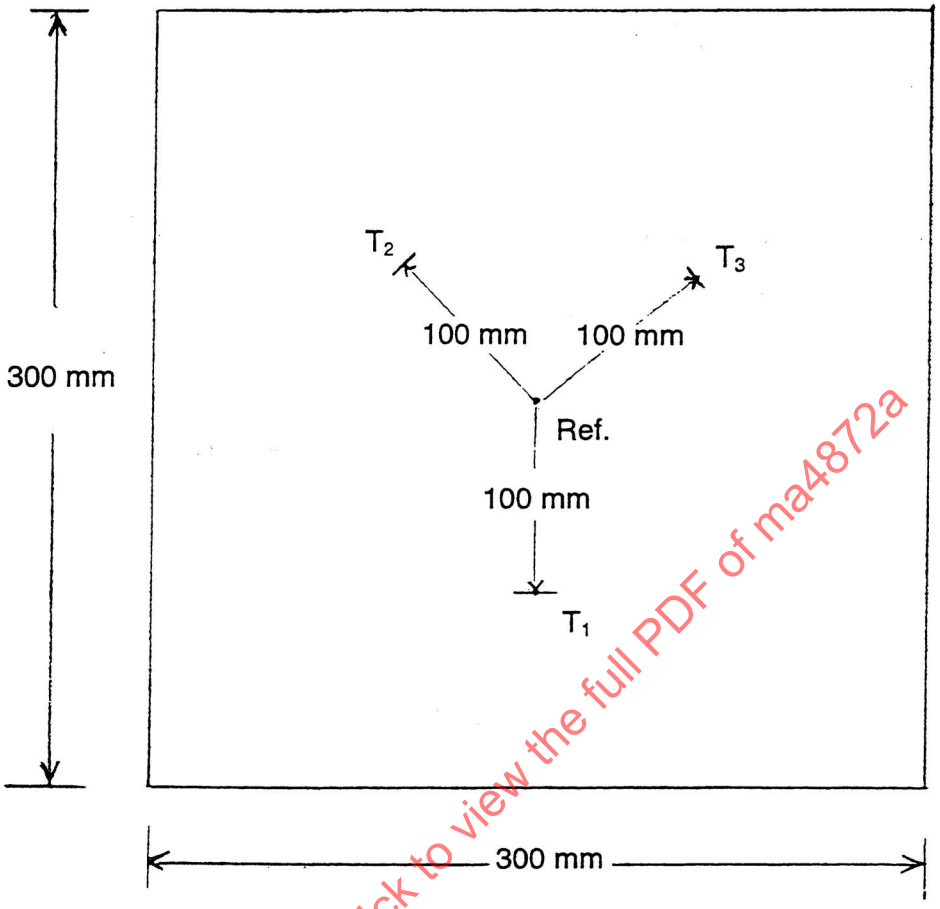


FIGURE 6 - Composite Thermocouple Location

5.10 (Continued):

4. Test Method

   a. Test shall be performed during one strip cycle.

   b. Continuously record temperature during test and record lowest or highest temperature reached as applicable.

5. Expression of Results

   a. Results shall be expressed in °C (°F).

5.10 (Continued):

6. Test Report

a. Report results in accordance with Annex E.

b. If an alternative method is used, it shall be included with the data in the test report.

5.11 Thin Skinned Aluminum Honeycomb Bondline Test:

1. Principle

a. To determine if the paint stripping process degrades the bondline strength in thin skinned aluminum honeycomb structure.

2. Apparatus

a. The peel apparatus shall consist of a flanged drum fitted with suitable clamps and flexible loading straps, or cables as shown in ASTM D 1781, a test machine and an autograph recorder.

3. Test Specimens and Preparation

a. Six control and 6 test specimens shall be tested for each alloy and adhesive system defined hereafter.

b. Surface preparations shall be PAA or CAA according to OEM specifications. Adhesive system to be tested are as follows:

Thermal stripping processes:

one 125 °C (250 °F) curing epoxy film adhesive system (areal weight $\geq$ 300 g/m^2) selected from OEM specification.

Mechanical stripping processes:

one 175 °C (350 °F) curing epoxy film adhesive system (areal weight $\geq$ 300 g/m^2) selected from OEM specification.

Specimen geometry shall be in accordance with ASTM D 1781

- skin to be peeled: 2024 T3 clad - 0.6 mm
- honeycomb: 6.4 - 127 kg/m^3 (1/4 - 7.9) - A1 5052 - 12.5 mm (1/2 in)

Bonding process shall be in accordance with OEM specification.

c. Paint, age, and strip specimens in accordance with Annex A, a total of five times before testing.

5.11 (Continued):

4. Test Method

   a. The test specimen temperature shall be 23 °C ± 2 °C (75 °F ± 5 °F). Before testing, zero the machine with the drum and test specimen suspended from the upper load bar. Mount the specimen in the testing machine so it is centered and with the peeling face panel attached to the drum. Apply a tensile load at a crosshead speed of 76 mm/min ± 7 mm/min (3.00 in/min ± 0.3 in/min), and make an autographic reading of the load.

   b. Calculate the peel value as follows:

$$P = (R_o - R_i)(L - C) \quad \text{(Eq. 1)}$$

   where:

   P = Peel strength in inch-pounds per 3 in of specimen width
   R_o = Radius of the flange, to the center of the strap
   R_i = Radius of the drum
   L = Average load, taken from the autographic recording corresponding to 5 in of peeling, after the first 2 in of facing have been peeled
   C = Correction for the load in pounds required to overcome the weight of the drum. Determine by placing a strip of fabric of negligible stiffness in place of the specimen and measure the load required to roll the drum upward.

5. Expression of Results

   a. Any reduction of more than 5% in peel strength (mean value comparison) in the test specimens from the control specimens shall be reported as a “fail”.

6. Test Report

   a. Report results in accordance with Annex E.

5.12 ±45 Laminate Tensile Test:

1. Principle

   a. To determine if the chemical paint stripping process causes resin matrix degradation of composite laminate structure.

2. Apparatus

   a. Tensile test machine with wedge action or hydraulic tension grips, accurate to within 1%, in the load range used.

   b. An extensometer (gauge length of 25 or 50 mm) to record strains, in terms of the load (gauges), accurate to within 1% in the load range used. This strain measurement instrument shall not mark the specimens in a way which may cause premature failures.

5.12 (Continued):

3. Test Panels and Preparation

   a. Five control specimens and 5 test specimens shall be tested using the composite materials specified in Annex B, for the OEM's aircraft being stripped.

   b. The test specimen may consist of either 4 plies of unidirectional tape or 2 plies of woven fabric. Panel layup for unidirectional tape shall be at a +45, -45, -45, +45° orientation with respect to the longitudinal axis. Panel layup for woven fabric shall be ±45°. The accuracy of fiber orientation shall be within ±1°. Test specimen dimensions are shown in Figure 7.

   c. The test panel shall be large enough to accommodate machining of 10 test specimens with a minimum of 25 mm trim around the perimeter of the panel. Precautions shall be taken to avoid notches, undercuts, rough or uneven surfaces after cutting. The process parameters such as bleeders, curing temperature and time, etc. shall be in accordance with the applicable Technical Specification.

   d. Beginning from one end of the panel, machined specimens shall be consecutively numbered 1 through 10. Odd numbered specimens shall be used for baseline testing and even numbered specimens shall be exposed to the chemical stripper.

4. Test Method

   a. Measure and record the thickness and width at three points in the nongripping area of the specimen. Use a micrometer for measuring thickness to an accuracy of 0.01 mm and a slide caliper or micrometer for measuring width to an accuracy of 0.1 mm.

   b. Test specimens shall be subjected to chemical stripper at 23 °C ± 2 °C for 5 exposure cycles prior to testing. The procedure for one cycle is as follows:

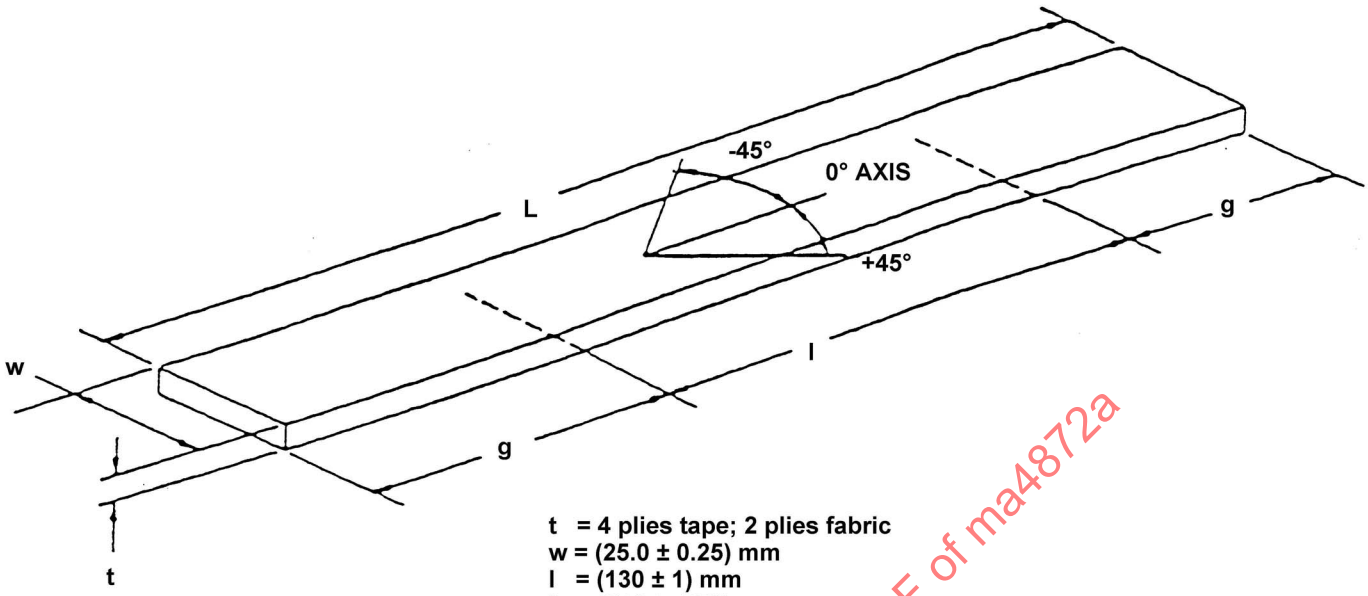
      (1) Brush apply chemical stripper to the nongripping area of the test specimen, including faces and edges.

      (2) The stripper shall be reapplied at 2 h intervals for a maximum of three times as applicable and then left undisturbed in an ambient environment for a total period as determined for aged paint in accordance with Annex A item 5.

      (3) Rinse specimens with tap water and dry for 2 h at 45 °C ± 5 °C. Cool specimens and maintain at ambient temperature for 12 to 16 h. Visually inspect specimens in accordance with 5.13.

      (4) Repeat steps (1), (2), and (3) for 3 additional cycles.

      (5) Repeat steps (1) and (2).



t = 4 plies tape; 2 plies fabric
w = (25.0 ± 0.25) mm
l = (130 ± 1) mm
L = (210 to 250) mm
g = (40 to 60) mm (gripping)

0 degree: main specimen axis in which load is applied
±45 degrees: fiber orientations

FIGURE 7 - ±45 Laminate Tensile Test Specimen Configuration

5.12 (Continued):

(6) Immediately rinse specimens with tap water to remove stripper and clean in accordance with the stripper manufacturer's instructions. Wipe until dry with a clean, soft cloth. Visually inspect specimens in accordance with 5.13.

(7) Perform the required tests 16 h after the cleaning procedure.

NOTE: Demonstration of satisfactory results after any period shorter than 16 h shall be indicated in the Process Specification (Annex F) and may be used as the timetable for repainting aircraft components. Otherwise, aircraft components shall not be repainted prior to 16 h.

c. Control specimens shall be exposed to the same cycle as in item b. above, except that the stripping medium shall be replaced by tap water. The nongripping area of the specimen shall be exposed by wrapping it with an absorbent material saturated with water.

d. Install the test specimen into wedge action or hydraulic tension grips of a servohydraulic testing machine. Test specimens shall be aligned in the test machine to avoid inducing bending loads. The gripping shall be on the areas of the specimens not subject to stripping. Prevent slipping of the specimen in the testing machine.

e. The tensile load shall be applied at a cross-head speed of 1 mm/min until 2% strain has been reached; the strain is recorded versus the load using the extensometer. Above 2% strain the cross-head speed is to be increased to 10 mm/min until failure (strain recording may be from constant chart movement during this period). The test temperature shall be 23 °C ± 2 °C.

f. Record the maximum load carried by the specimen during the test and the time to failure.

g. Determine the longitudinal modulus using the following equations.

Longitudinal Modulus

$$E = \frac{\Delta P}{w \times t \times \Delta \varepsilon} \ (N/mm^2) \qquad \text{(Eq. 2)}$$

where:

ΔP = Difference in tensile loads at strains of $(\varepsilon_o)_2 = 2500 \times 10^{-6}$ and $(\varepsilon_o)_1 = 500 \times 10^{-6}$ (N)
w = Average of the three width measurements per specimen (before chemical exposure) (mm)
t = Average of the three thickness measurements per specimen (before chemical exposure) (mm)
$\Delta \varepsilon = (\varepsilon_o)_2 - (\varepsilon_o)_1 = 2000 \times 10^{-6}$

NOTE: The above strain limits shall be used unless otherwise defined.

5.12 (Continued):

h. Determine the average longitudinal modulus for the control and chemically treated specimens, where:

E_C = Average of five longitudinal modulus measurements of control specimens
E_S = Average of five longitudinal modulus measurements of chemically treated specimens

i. Calculate and record the difference between the average longitudinal modulus of the control and test specimens.

5. Expression of Results

a. A 5% or greater reduction in the average longitudinal modulus with respect to the control shall be reported as a “fail”.

b. If a failure occurs, additional specimens may be tested and added to the original population of test specimens for calculation of an average value.

6. Test Report

a. Report results in accordance with Annex E.

5.13 Visual Inspection:

1. Principle

a. To determine if the paint stripping process has damaged the fibers or lightning protection mesh.

2. Apparatus

a. 10x magnification source.

3. Test Panels and Preparation

a. Bare Composites

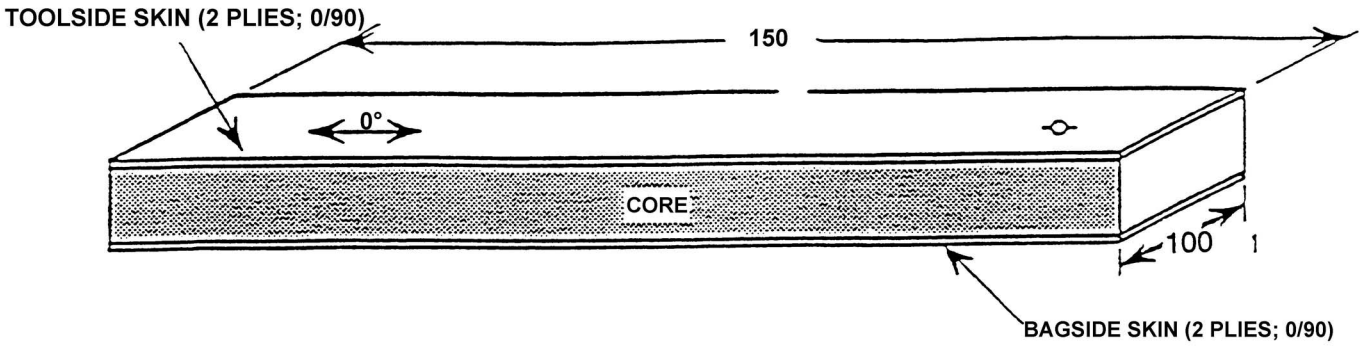
(1) Use specimens for tests in 5.12, 5.15, and 5.16.

b. Lightning Protection Materials

(1) For chemical or wet media stripping processes, use specimens for tests in 5.14.

(2) For mechanical or thermal strip processes

(a) Prepare a generic test panel of the materials and configuration specified in Figure 8. The test panel shall be large enough to accommodate machining of three specimens 100 mm x 150 mm (4 in x 6 in). The process parameters such as bleeders, curing temperature and time, etc., shall be in accordance with the applicable Technical Specification.



NOTES:

1. Toolside and Bagside Skin: Composite Designation G1 from Annex B
2. Honeycomb Core: Nomex, 4.75 mm (3/16 in) cell size, 12.5 mm (1/2 in) thick, 64.0 kg/m^3 (4.0 lb/ft^3)
3. Mesh on Toolside Skin:
   a. Aluminum mesh cured at room temperature with DPM 5535-1 adhesive
   b. In accordance with Annex C

FIGURE 8 - Generic Test Panel for Visual Inspection

5.13 (Continued):

(b) Paint and age test specimens in accordance with Annex A.

(c) If requirement for above generic panel is not fulfilled for five strip cycles, prepare specific test panels of the lightning protection materials specified in Annex C for the OEM's aircraft being stripped and the configuration defined in Figure 9. The test panel shall be large enough to accommodate machining of three specimens 100 mm x 150 mm (4 in x 6 in). The process parameters such as bleeders, curing temperature and time, etc., shall be in accordance with the applicable Technical Specification. Paint and age test specimens in accordance with Annex A.

4. Test Methods

a. Bare Composites

(1) When testing bare composite materials in accordance with 5.12 and 5.15, visually inspect at 10x magnification on test specimens after each strip cycle. Low incident light may be used to aid in the examination of the substrate surface.

(2) Look for evidence of swelling, fiber damage, microcracking and pitting.

b. Lightning Protection Materials

(1) For chemical or wet media stripping process

(a) When testing lightning protection materials on composite substrates using a chemical stripping process or wet media in accordance with 5.14, visually inspect at 10x magnification after each strip cycle, prior to testing in accordance with 5.14. Low incident light may be used to aid in the examination of the substrate surface.

(b) Look for evidence of mesh exposure or damage.

(2) For mechanical or thermal strip processes

(a) Strip test panels. Visually inspect at 10x magnification. Look for evidence of mesh exposure or damage.

(b) Repaint, age, and strip panels in accordance with Annex A for four additional cycles. Visually inspect at 10x magnification after each strip cycle.

(c) If panels do not fulfill requirement for five strip cycles, continue tests using panels prepared in accordance with 5.13.3.b.(2)(c).

5. Expression of Results

a. Any damage as described above shall be reported as "fail". Record physical description of damage and dimensions as applicable.

6. Test Report

a. Report results in accordance with Annex E.

5.14 Mesh Peel Test:

1. Principle

   a. To determine if a chemical paint stripping or wet media process degrades the bond strength of the mesh on a lightning protected substrate.

2. Apparatus

   a. Tensile test machine with wedge action or hydraulic tension grips, accurate to within 1% in the load range used.

3. Test Panels and Preparation

   a. Five control specimens and 5 test specimens shall be tested using the materials and configuration specified in Figure 9. Perform tests on configuration A, B, C, and D. Configuration D need not be tested if the requirement is fulfilled on Configuration C.

   b. The test panel shall be large enough to accommodate machining of ten specimens 25 mm x 300 mm (1 in x 12 in). The process parameters such as bleeders, curing temperature and time, etc., shall be in accordance with applicable Technical Specification.

   c. Beginning from one end of the panel, machined specimens shall be consecutively numbered 1 through 10. Odd numbered specimens shall be used for baseline testing and even numbered specimens shall be exposed to the chemical stripper.

4. Test Method

   a. Test specimens shall be subjected to chemical stripper at 23 °C ± 2 °C for 5 exposure cycles on the unpainted mesh surface prior to testing. The procedure for one cycle is as follows:

      (1) Brush apply chemical stripper to the mesh surface of the test specimen.

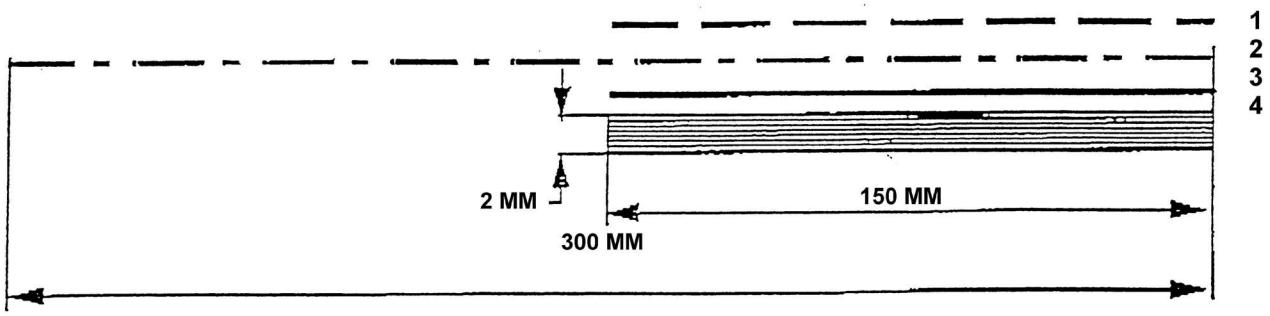
      (2) The stripper shall be reapplied at 2 h intervals for a maximum of three times as applicable and then left undisturbed in an ambient environment for a total period as determined for aged paint in accordance with Annex A item 5.

      (3) Rinse specimens with tap water and dry for 2 h at 45 °C ± 5 °C. Cool specimens and maintain at ambient temperature for 12 to 16 h. Visually inspect specimens in accordance with 5.13.

      (4) Repeat steps (1), (2), and (3) for 3 additional cycles.

      (5) Repeat steps (1) and (2).

      (6) Immediately rinse specimens with tap water to remove stripper and clean in accordance with the stripper manufacturer's instructions. Wipe until dry with a clean, soft cloth. Visually inspect specimens in accordance with 5.13.



Rep	Materials	A	B	C	D
1	Surfacing film	N/A	N/A	N/A	FM 300
2	Mesh	Alumesh 90 g/m^2 Ciba 1454	Alumesh 90 g/m^2 Ciba 1454	Bronze mesh 230 g/m^2	Bronze mesh 230 g/m^2 SNCU 6.2
3	Interleaving material	N/A	N/A	Ciba 914 film	Glass prepreg 120GF/8552
4	Skin	Aramid Ciba 1454/914	Hybrid (G+C) Ciba 913/973	Carbon Ciba G803/914	Carbon 8552/AS4 (C3)

N/A: Not applicable

FIGURE 9 - Mesh Peel Testing

5.14 (Continued):

(7) Perform the required tests 16 h after the cleaning procedure.

NOTE: Demonstration of satisfactory results after any period shorter than 16 h shall be indicated in the Process Specification (Annex F) and may be used as the timetable for repainting aircraft components. Otherwise, aircraft components shall not be repainted prior to 16 h.

b. Control specimens shall be exposed to the same cycle as in item a. above, except that the stripping medium shall be replaced by tap water.

c. Fold the excess wire mesh back at an angle of 180° to a position above the stripped surface and grip the excess mesh in a suitable tensile test machine.

d. Test specimens at a test temperature of 23 °C ± 2 °C. Load specimens at a constant crosshead speed of 50 mm (2 in) per minute until failure.

e. Record the numerical average of the peak loads for each test performed.

f. Determine the average of the peak loads for the control and test specimens and the percent difference between them.

5. Expression of Results

a. If the average peak load in peel is reduced by more than 25% from the control average and/or a single test value is less than 50% of the control average, the result shall be reported as a "fail".

6. Test Report

a. Report results in accordance with Annex E.

5.15 Long Beam Flexure Test:

1. Principle

a. To determine if the mechanical or thermal paint stripping process causes resin matrix degradation of the composite sandwich structure.

2. Apparatus

a. Testing machine, accurate to within 1%, in the load range used, capable of operating at a crosshead speed of 12 mm/min.

5.15 (Continued):

3. Test Panels and Preparation

   a. Five control specimens and 5 test specimens shall be tested using composite systems specified in Annex B for the OEM's aircraft being stripped.

   b. Prepare test panels of the configuration shown in Figure 10, large enough to accommodate machining of 15 specimens (i.e., 5 control specimens, 5 test specimens, and 5 spares) with a minimum of 25 mm trim around the perimeter of the panel. Precautions shall be taken to avoid notches, undercuts, rough or uneven surfaces after cutting. The process parameters such as bleeders, curing temperature and time, etc. shall be in accordance with the applicable Technical Specification.

   c. Two-ply toolside skins and three-ply bagside skins and adhesive, if required, are as specified in Annex B for the OEM's aircraft being stripped. The honeycomb core shall be made of aramid fiber with phenolic resin (Nomex), 4.75 mm (3/16 in) cell size, 12.5 mm (1/2 in) thick, and 64.0 kg/m^3 (4.0 lb/ft^3) for K1, K2, G1, and G2 composite systems and 3.2 mm (1/8 in) cell size, 12.5 mm (1/2 in) thick and 128.0 kg/m^3 (8.0 lb/ft^3) for C1, C2, and C3 composite systems.

   d. Cut panel to accommodate machining of 5 specimens from both the control panel and test panel with a minimum of 25 mm trim around the perimeter of the panels. (NOTE: Core ribbon direction parallel to the long direction.)

   e. Paint control and test panels in accordance with Annex A. Protect edges of the panels with the appropriate moisture resistant tape (e.g., self-adhesive aluminum foil). Overlap of tape on the panel surface shall not exceed trim allowance. Paint shall be applied to the test surface (i.e., 2 ply, toolside surface).

   f. Age control and test panels in accordance with Annex A.

4. Test Method

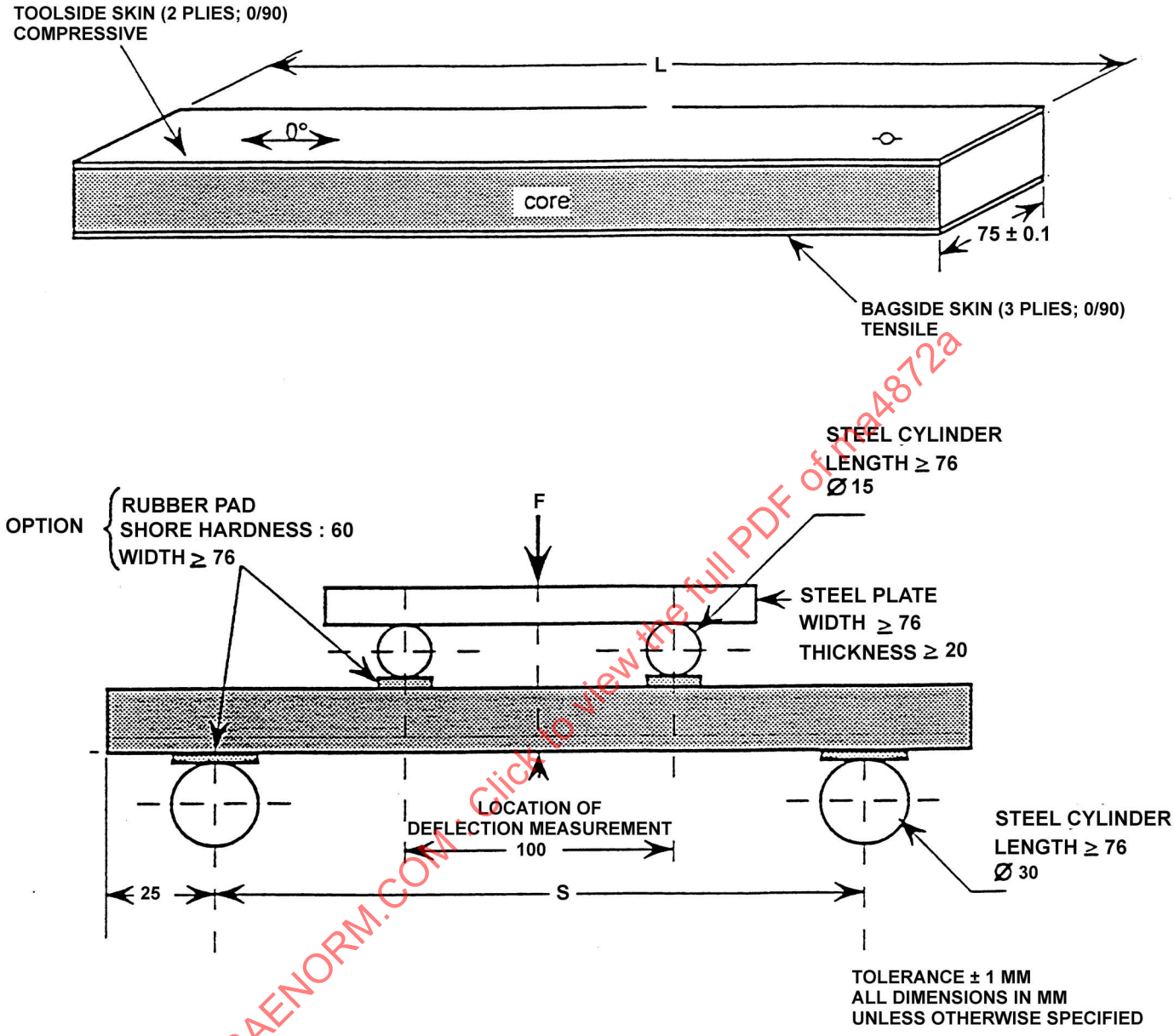
   a. Strip and visually inspect test panels in accordance with 5.13.

   b. Repaint and age test panels in accordance with Annex A.

   c. Repeat steps a. and b. for a total of 5 strip cycles.

   d. Remove tape from edges of test panels.

   e. Machine long beam flexure specimens in accordance with the standard dimensions shown in Figure 10, with core ribbon direction in parallel to the long direction.



S : Span: to be determined in accordance with 5.15
L : Length: S + 50 mm

FIGURE 10 - Long Beam Flexure Specimen and Test Fixture

5.15 (Continued):

f. In order to determine the ultimate strength of a sandwich face, it is necessary, depending on the facing materials to select an adequate span length so that a moment sufficiently high to obtain failure is generated at a load that can be carried by the core in shear.

The appropriate span for a given composite designation is given in Table 4.

TABLE 4

Material Group	Span (mm)
K1	225 ± 1
K2	225 ± 1
G1	225 ± 1
G2	225 ± 1
C1	375 ± 1
C2	375 ± 1
C3	375 ± 1

g. Test specimens at a test temperature of 23 °C ± 2 °C with the stripped toolside skin in compression. Load specimens as shown in Figure 11 at a constant crosshead speed of 12 mm/min until failure occurs.

h. Record the ultimate load at failure and P/Y for each specimen. P/Y is the slope of the tangent to the initial portion of load deflection curve.

i. For determining facing strength, the test should produce failure by direct compression or tension of the facing between the load points. Because the toolside skin is relatively thin, localized wrinkling of the facing at load points or reactions may occur.

j. If the test produces failure in the sandwich by shearing the core or by shearing the bond between the core and facings, the outer spans are too close. Adjust the spans accordingly to produce the appropriate mode of failure.

k. Calculate and record the difference between the average ultimate load at failure and P/Y of the control and test specimens.

5.15 (Continued):

5. Expression of Results

a. A 5% or greater reduction in the average ultimate load at failure with respect to the control average shall be reported as a “fail”.

b. If a failure occurs, additional specimens may be tested and added to the original population of test specimens for calculation of an average value.

6. Test Report

a. Report results in accordance with Annex E.

5.16 Flatwise Tensile Test:

1. Principle

a. To determine if the thermal or mechanical paint stripping process degrades the skin to core bond strength of composite sandwich structure.

2. Apparatus

a. Tensile test machine accurate to within 1% in the load range used.

b. Metallic fixing blocks made of any aluminum alloy which will be coupled to the test machine by means of two cylindrical pins.

c. Vernier caliper accurate to the nearest 0.1 mm.

3. Test Panels and Preparation

a. Five control specimens and 5 test specimens shall be tested using composite systems specified in Annex B for the OEM's aircraft being stripped.

b. Prepare test panels of the configuration shown in Figure 11, large enough to accommodate machining of 15 specimens (i.e., 5 control specimens, 5 test specimens, and 5 spares) with a minimum of 25 mm trim around the perimeter of the panel. Precautions shall be taken to avoid notches, undercuts, rough or uneven surfaces after cutting. The process parameters such as bleeders, curing temperature and time, etc. shall be in accordance with the applicable Technical Specification.

c. Two-ply toolside skins and three-ply bagside skins and adhesive, if required, are as specified in Annex B for the OEM’s aircraft being stripped. The honeycomb core shall be made of fiberglass with phenolic resin, 4.75 mm (3/16 in) cell size, 12.5 mm (1/2 in) thick, and 64.0 kg/m^3 (4.0 lb/ft^3) for K1, K2, G1, and G2 composite systems and 128.0 kg/m^3 (8.0 lb/ft^3) for C1, C2, and C3 composite systems.

5.16 (Continued):

d. Cut panel to accommodate machining of 5 specimens from both the control panel and test panel with a minimum of 25 mm trim around the perimeter of the panels.

e. Paint control and test panels in accordance with Annex A. Protect edges of the panels with the appropriate moisture resistant tape (e.g., self-adhesive aluminum foil). Overlap of tape on the panel surface shall not exceed trim allowance. Paint shall be applied to the test surface (i.e., 2 ply, toolside surface).

f. Age control and test panels in accordance with Annex A.

4. Test Method

a. Strip and visually inspect test panels in accordance with 5.13.

b. Repaint and age test panels in accordance with Annex A.

c. Repeat steps a. and b. for a total of 5 strip cycles.

d. Remove tape from edges of test panels.

e. Machine flatwise tensile specimens in accordance with the standard dimensions shown in Figure 11. The tolerance on the length and width of the specimen shall be ±0.5 mm.

f. The surface of the metallic tension blocks shall be pretreated with chromic acid anodizing applied in accordance with MIL-C-8625 or chromic, sulfuric acid pickel applied in accordance with EN 2334 before bonding to prevent failure at the block faces.

g. Select an appropriate adhesive system for bonding specimens to the metallic blocks to prevent failure at the block faces during room temperature testing.

h. The bonding jig used shall provide the means of aligning the metallic blocks and the test specimens as well as for applying pressure to the joints between the metallic blocks and the test specimen.

i. Cover the sides of the test specimen with adhesive tape to prevent the adhesive from escaping from the joint and enhancing the bond between the honeycomb core and the toolside skin, which would lead to misleading results.

j. Load the tension blocks and the bonded test specimen in the testing machine in such a way that bending stresses are avoided during load application.

k. Test specimens at a test temperature of 23 °C ± 2 °C. Tensile load shall be applied at a constant crosshead speed of 1 mm/min.

5.16 (Continued):

l. Record the following of each specimen:

(1) Area of the specimen to the nearest ±0.25 mm.

(2) The method of attaching the specimen to the load blocks.

(3) The ultimate load ±100 N.

$$\text{Flatwise tensile strength} = \frac{\text{Ultimate Load}}{L \times W} \qquad \text{(Eq. 3)}$$

where:

L = Length of the specimen
W = Width of the specimen

(4) Description of failure: record failure mode (i.e., in the facesheet, core, adhesive or cohesive skin/core failure). Failure occurring between the specimen skin and tension blocks are unacceptable.

m. Calculate and record the difference between the average tensile strength of the control and test specimens.

5. Expression of Results

a. A 5% or greater reduction in the average flatwise tensile strength with respect to the control average shall be reported as a "fail".

b. If a failure occurs, additional specimens may be tested and added to the original population of test specimens for calculation of an average value.

6. Test Report

a. Report results in accordance with Annex E.

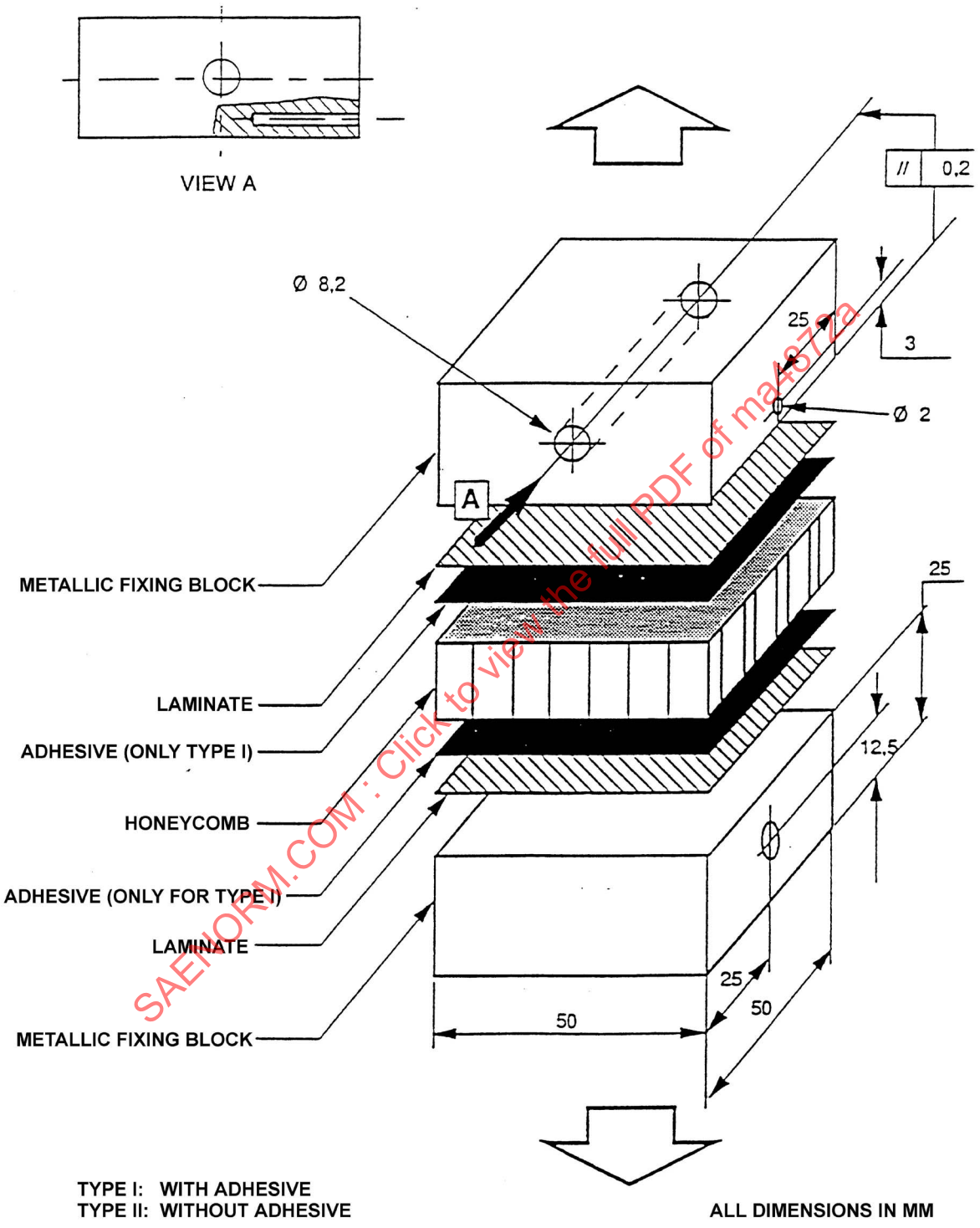


FIGURE 11 - Flatwise Tensile Specimen With Test Fixture

5.17 Wet Media Penetration Test:

1. Principle

   a. To determine if the paint stripping process has caused wet media to penetrate into the core of the composite structure.

2. Apparatus

   a. Not Applicable

3. Test Panels and Preparation

   a. Use specimens for tests in 5.15 if thermographic inspection is to be used.

   b. If thermographic equipment is unavailable, prepare an additional test panel using the materials and configuration defined in Figure 10. The test panel shall be a minimum of 300 mm x 300 mm (12 in x 12 in) in dimension.

   c. Protect the edges of the panels with the appropriate moisture resistant tape (e.g., self-adhesive aluminum foil).

4. Test Method

   a. Thermographic inspection

      (1) Perform thermographic inspection after the first strip cycle prior to repainting.

   b. Destructive Inspection

      (1) Perform the pressure driven wet media process on the unpainted panel surface for a period equivalent to twice the time required to remove the paint to the appropriate level.

      (2) Manually peel the treated composite skin from the honeycomb core within 30 min of wet media processing. It may be necessary to cut the core to initiate the peel.

      (3) Apply colored, absorbent woven cloth or equivalent to the inner surface (next to core) of the peeled skin. Visually inspect cloth for evidence of moisture.

      (4) Place a second piece of colored, absorbent woven cloth or equivalent over exposed core and invert panel. Wait for a period of 1 to 5 min, remove core, and visually inspect cloth for evidence of moisture.

5.17 (Continued):

5. Expression of Results

   a. Any evidence of moisture shall be reported as a “fail”.

6. Test Report

   a. Report results in accordance with Annex E.

ANNEX A
TEST PANEL PREPARATION

1. PRETREATMENT:

   a. Metallic test panels shall be degreased and have a chromate conversion coating applied in accordance with MIL-C-5541 or chrome sulfuric pickle in accordance with EN 2334.

   b. Prior to paint, clean the surface to remove residual mold release and manually abrade the toolside surface of the composite panel with 150 grit or finer abrasive paper. Remove sanding residue by wiping clean with cheesecloth. Surface cleanliness shall be demonstrated by water-break-free conditions. Immediately prior to coating application, solvent clean using TL-52, MEK, MIBK, or other OEM approved cleaning procedure.

2. PAINT SYSTEM:

2.1 Standard:

   a. The paint system shall consist of a layer of MIL-P-23377 epoxy primer and a layer of MIL-C-85285 polyurethane enamel (or primer and enamel in accordance with equivalent commercial aircraft specifications).

   b. When painting bare fiberglass/epoxy composite panels (G1 configuration from Annex B), apply a layer of anti-static coating next to the substrate.

   c. The dry film thickness of primer and antistatic coating shall be 15 to 20 µm (0.6 to 0.8 mils) and the enamel shall be 40 to 60 µm (1.6 to 2.4 mils).

2.2 Barrier/Intermediate Coat System:

   a. The paint system shall consist of a layer of primer, barrier or intermediate coat, and polyurethane enamel in accordance with TNA.007.10028 or TH33.0155 (or equivalent commercial aircraft specification).

   b. The dry film thickness of the primer shall be 10 to 20 µm (0.4 to 0.8 mils), the barrier coat shall be 10 to 30 µm or the intermediate coat shall be 8 to 12 µm (0.3 to 0.5 mils), and the enamel shall be 40 to 60 µm (1.6 to 2.4 mils).

3. APPLICATION:

   a. The paint system shall be spray applied at 23 °C ± 2 °C (75 °F ± 5 °F) and 50% ± 5% RH.

   b. Allow each coating to dry in accordance with the supplier's recommendations prior to overcoating.

   c. Test panels shall be cured 23 °C ± 2 °C (75 °F ± 5 °F) and 50% ± 5% RH for a minimum of seven days before artificial aging or testing.

4. ARTIFICIAL AGING:

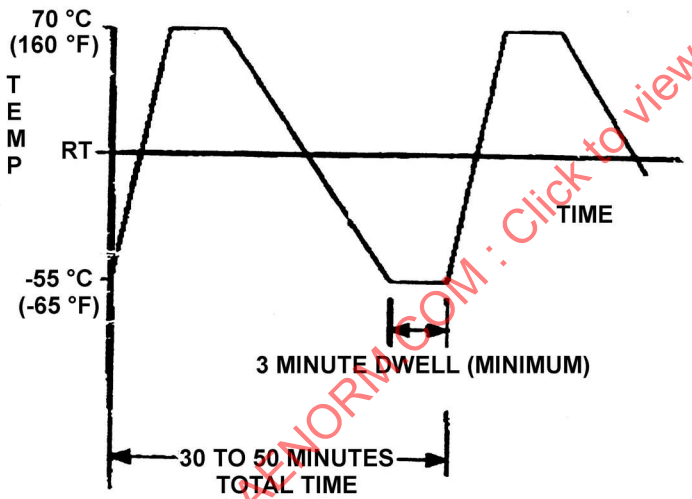
   a. Preliminary Screening Tests:

      (1) Age panels for 750 h ± 10 h (approximately 31 days) at 50 °C ± 2 °C (122 °F ± 5 °F) and 90 to 98% RH

   b. Qualification Tests:

      (1) Age panels in accordance with Figure A1

   c. Test panels shall be cooled to ambient temperature prior to being stripped.



1. PRECONDITION PANELS FOR 12 h AT 50 °C ± 2 °C (120 °F ± 5 °F) AND 95% ± 5% RELATIVE HUMIDITY.

2. DISCONTINUE HUMIDITY CONTROL, DECREASE TEMPERATURE TO -55 °C ± 2 °C (-65 °F ± 5 °F), AND HOLD FOR 1 h MINIMUM.

3. THERMALLY CYCLE PANELS FROM -55 °C ± 5 °C TO 70 °C ± 2 °C (-65 °F ± 5 °F TO 160 °F ± 5 °F) FOR A TOTAL OF 400 CYCLES AS SHOWN AT LEFT. THE HEATING AND COOLING RATE SHOULD BE 6 TO 10 °C/min (10 TO 19 °F/min). THIS CONSTITUTES ONE BLOCK.

4. RETURN CHAMBER TO AMBIENT TEMPERATURE, AND REPEAT STEPS 1 TO 3 ABOVE, FOR A TOTAL OF 2 BLOCKS.

FIGURE A1 - Thermal Cycle Artificial Aging

5. PAINT REMOVAL:

   a. Strip the paint from the test panels using the appropriate stripping method under evaluation.

   b. Remove the finishes to the appropriate level (e.g., barrier coat, primer layer, or substrate). The degree of paint removal for qualification shall be specified in the test report as required in 3d of Annex E.

      NOTE: Test specimens should be supported by a uniform, rigid plate to ensure stability and uniform pressure from specimen to specimen.

   c. Determine and record the total time to remove the paint scheme aged in accordance with 4b.

      NOTE: Operations 2 through 6 constitute one strip cycle.

6. REAPPLICATION OF PAINT:

   a. The painting, stripping, and aging process shall be repeated until the panel has been stripped a minimum of five cycles unless otherwise specified by the appropriate test method.

   b. Reapply the paint system in accordance with operations 3 and 4. Conversion coating application shall be reapplied to metallic substrates except when the primer layer is left intact.

ANNEX B
BARE COMPOSITE SUBSTRATE MATERIAL SELECTION

COMPOSITE MATERIAL SELECTION:

1. Composite designations are listed in Figure B1 which describes the type of fiber reinforcement, resin type, and cure temperature.

2. Refer to Tables B1 to B3 for material selection of the appropriate OEM's aircraft being stripped.

3. In Tables B1 to B3, the appropriate adhesive for each composite systems in a honeycomb core sandwich configuration, if required, is provided in parentheses.

COMPOSITE DESIGNATION	FIBER REINFORCEMENT	RESIN MATRIX
K1	Aramid fabric, Style 285	Epoxy Resin (120 °C curing)
G1	E-glass fabric, Style 181	Epoxy Resin (120 °C curing)
C1	Carbon fabric, Plain weave (195 g/m^2)	Nontoughened Epoxy Resin (120 °C curing)
K2	Aramid fabric, Style 285	Epoxy Resin (180 °C curing)
G2	E-glass fabric, Style 181	Epoxy Resin (180 °C curing)
C2	Carbon fabric, Plain weave (195 g/m^2)	Nontoughened Epoxy Resin (180 °C curing)
C3	Carbon fabric, Plain weave (195 g/m^2)	Toughened Epoxy Resin (180 °C curing)

FIGURE B1 - Description of Composite Material Designations

TABLE B1 - Material Selection for Airbus Aircraft

	Applicable Composite Systems and Adhesives Aramid Fabric Style 285 120 °C K1	Applicable Composite Systems and Adhesives Aramid Fabric Style 285 180 °C K2	Applicable Composite Systems and Adhesives E Glass Style 181 120 °C G1	Applicable Composite Systems and Adhesives E Glass Style 181 180 °C G2	Applicable Composite Systems and Adhesives Carbon Fabric PW 195 g/m^2 120 °C C1	Applicable Composite Systems and Adhesives Carbon Fabric PW 195 g/m^2 180 °C C2	Applicable Composite Systems and Adhesives Carbon Fabric PW 195 g/m^2 180 °C C3
Composite (Adhesive)	Brochler 1454 (None)	Nonapplicable	Brochler 1454 (None)	Acceptability of G2 based on results of G1 for nonchemical processes	Ciba 913 (AF 163-2) Acceptability of C1 based on results of C2 for nonchemical processes	Hexcel F263 (FM 300) or (PL795-1)	Hexcel F593 (FM300) or (PL795-1)
Composite (Adhesive)	Ciba 6268 (None)	Nonapplicable	AIK EHG250 (None)	Acceptability of G2 based on results of G1 for nonchemical processes	Ciba 913 (AF 163-2) Acceptability of C1 based on results of C2 for nonchemical processes	Hercules 3501-6 (FM300) or (PL795-1)	Ciba 6376 (FM300) or (Ciba 319)
Composite (Adhesive)	AIK EHA250 (None)	Nonapplicable	Stesalit EP112 (None)	Acceptability of G2 based on results of G1 for nonchemical processes	Ciba 913 (AF 163-2) Acceptability of C1 based on results of C2 for nonchemical processes	Ciba 914 (Redux 322)	Fiberite F977-2 (FM300) or (Ciba 319)
Composite (Adhesive)	Hexcel ES36D (None)	Nonapplicable	Hexcel ES36D (None)	Acceptability of G2 based on results of G1 for nonchemical processes	Ciba 913 (AF 163-2) Acceptability of C1 based on results of C2 for nonchemical processes	Hexcel EH25 -285 g/m^2 (Redux 322)	Hercules 8552 (FM300) or (PL795-1)

NOTES:

All prepreg systems in one column are alternatives, select one for testing.

For thermal and mechanical processes:

If K1 fulfills the requirements also G1/G2 shall be acceptable without further tests. Perform tests on C2 and C3.
If K1 does not fulfill the requirements perform tess on G1, C2, and C3.

For chemical processes: Test one composite system for each column.

TABLE B2 - Composite Material Selection for Boeing Aircraft[1]

Applicable Composite Systems K1	Applicable Composite Systems G1	Applicable Composite Systems C1	Applicable Composite Systems K2	Applicable Composite Systems G2	Applicable Composite Systems C2	Applicable Composite Systems C3
BMS 8-219 Style 285 per BAC 5317-5	BMS 8-79 Style 1581 or 7781 per BAC 5317-2	BMS 8-168 Type II Class 2 3K-70-PW per BAC 5317-5	BMS 8-218 Style 285 per BAC 5317-1 (BMS 5-154) Grade 3	BMS 8-139 Style 1581 or 7781 per BAC 5317-3 (BMS 5-154) Grade 3	BMS 8-212 Type II Class 1 Grade 95 per BAC 5317-1	BMS 8-276[2,3] Type 35 Class 1 Grade 190 per BAC 5578
					BMS 8-212 Type II Class 2 3K-70-PW (BMS 5-154) Grade 3	
					BMS 8-256 Type IV Class 2 3K-70-PW per BAC 5317-4 (BMS 5-154) Grade 3	

NOTES:

[1] Any degradation to these materials up to the limits specified in 4.2 has been accounted for in the applicable design allowables.

[2] Test with chemical strip processes only.

[3] Acceptability for mechanical or thermal stripping of BMS 8-276 shall be based upon results of BMS 8-212 testing.

Mechanical Strip Processes: Test the material from the K1 column first. If the requirements are fulfilled, no additional testing is required. Otherwise, test one composite system for each of the remaining columns. Any supplier's material from the Qualified Products List of the applicable BMS may be tested as the representative of the columns.

Chemical and Thermal Strip Processes: Test one supplier's material from the Qualified Products List from each of the BMS composite systems for all columns. For column C2, test the BMS 8-212 Type II, Class 1, Grade 95 material.

TABLE B3 - Material Selection for Douglas Aircraft

Applicable Composite Systems K1	Applicable Composite Systems G1	Applicable Composite Systems C1	Applicable Composite Systems G2	Applicable Composite Systems C2	Applicable Composite Systems C3
DMS 2288 DMS 1926	DMS 2288 DMS 1926	DMS 2288	DMS 2202	DMS 2224	DMS 2387