CACRC overview and participation benefits

J. Popp | DXB-UM3 | 24.10.2018
When was the last time you discussed a composite issue with an engineer from another airline?
When was the last time you discussed composite issues with an OEM representative?
Do you know what new composite documents your regulatory agency is currently working on?
When was the last time you discussed composite issues with a member of your regulatory agency?
Do you have the feeling they are listening to your opinion?
CACRC participation and benefits

Benefits

- Network

- Sharing of material in case of zero stock

- Input on regulatory documents
  - AC20-107 / AMC 20-29
  - BRSLP
  - NPA 2018-11

- Input on standards

- Links to other committees, e.g. CMH-17, SOBR
CACRC participation and benefits

LHT use of CACRC standards

LHT uses CACRC standards

- in internal SOP
- as a guideline for repair development
- as a guideline for tooling development
<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>LHT Handbook</td>
<td></td>
<td>Lufthansa Technik</td>
</tr>
<tr>
<td>Processes, Materials, Testmethods</td>
<td></td>
<td></td>
</tr>
<tr>
<td>LHT-Process Performing Technical Quality Check of Incoming Glue IQM 1655502 Films and Proppers</td>
<td></td>
<td></td>
</tr>
<tr>
<td>LHT-Process Tools and Equipment Engineering IQM 613161</td>
<td></td>
<td></td>
</tr>
<tr>
<td>LHT-Process Authorizing Personnel of the Maintenance Organisation IQM 70019 (145 Part M)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.2 Informational</td>
<td></td>
<td></td>
</tr>
<tr>
<td>AIPS06-02-005 Manufacturing of Metalic Sandwich Parts Bonding Process</td>
<td></td>
<td></td>
</tr>
<tr>
<td>AIPS06-02-007 Bonding Metal/Metal Parts</td>
<td></td>
<td></td>
</tr>
<tr>
<td>AIPi 09-01-002 Cleaning with Liquid Non Aqueous Agents</td>
<td></td>
<td></td>
</tr>
<tr>
<td>BAC5614 Common Bonding Requirements for Structural Adhesives</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Boeing SRM Repair General - Aluminum Skin/Aluminum Honeycomb ATA 51-70 Panel Repairs</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Boeing SOPM General Cleaning Procedures</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ATA 29-30-03</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Airbus SRM Repair of Composite and Metallic Sandwich Structures ATA 51-77-13</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Airbus SRM Material Handling and Preparations ATA 51-77-11</td>
<td></td>
<td></td>
</tr>
<tr>
<td>SAE AIR 5431</td>
<td></td>
<td></td>
</tr>
<tr>
<td>SAE AIR 4844B Composites and Metal Bonding Glossary</td>
<td></td>
<td></td>
</tr>
<tr>
<td>FMH-17 Composite Material Handbook 17</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.3 Qualification</td>
<td></td>
<td></td>
</tr>
<tr>
<td>The design data contained in this specification is approved under the authority of LHT Design Organization Approval No. EASA 21.10.019. Moment Certification Project Number 00145290_001</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
1 Scope und Application

This process specification describes the technical and quality requirements as well as procedures for the handling of composite raw material, bonding of composite made parts and manufacturing of fiber reinforced plastics.

The process applies only, when called up in a LHT-DO document (e.g. EBR, SUP, etc.). It is not solely approved.

The responsibility of appropriate application remains with the engineer referencing the specification.

Specific requirements for each material system are contained in the applicable LHT-DO document. In case of conflict, the requirements of the LHT-DO document should govern.

Lufthansa Technik AG process specifications are intended for internal use only.

Unless otherwise specified, always use the latest issue of this document.

2 References

<table>
<thead>
<tr>
<th>Reference</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>SAE AIR 8431</td>
<td>Repair Tooling</td>
</tr>
<tr>
<td>SAE AIR 4844B</td>
<td>Composites and Metal Bonding Glossary</td>
</tr>
<tr>
<td>ARP4916</td>
<td>Masking and cleaning of epoxy and polyester matrix thermosetting composite materials</td>
</tr>
<tr>
<td>ARP4977</td>
<td>Drying of thermosetting composite materials</td>
</tr>
<tr>
<td>ARP4991A</td>
<td>Core Restoration of Thermosetting Composite Components</td>
</tr>
<tr>
<td>ARP5143A</td>
<td>Vacuum Bagging of Thermosetting Composite and Metal bond Repairs</td>
</tr>
<tr>
<td>ARP5144A</td>
<td>Heat Application for Thermosetting Resin Curing</td>
</tr>
<tr>
<td>ARP5319</td>
<td>Impregnation of Dry Fabric and Ply Lay-Up</td>
</tr>
<tr>
<td>CMH-17 Rev. G</td>
<td>Composite Material Handbook 17</td>
</tr>
</tbody>
</table>

NOTE: Accessing SAE ARP and AIR documents:
open the web page `https://saemobilus.sae.org/search` out of the LHT Intranet
PMT P-6.01.07  Drying of Composite Parts

1 Scope and Application
This process specification describes the procedure for the removal of absorbed moisture from composite parts.
The process applies only when called up in a LHT-DD document (e.g. EBR, SUP, etc.). It is not to be approved.
The responsibility of appropriate application remains with the engineer referencing the specification.
Specific requirements for a part can be contained in the applicable LHT-DD document. In case of conflict, the requirements of the LHT-DD document should govern.
Lufthansa Technik process specifications are intended for internal use only.
Unless otherwise specified, always use the latest issue of this document.

2 References
2.1 Normative
PMT 1.01 Definitions and Rules for Preparation, Approval and Distribution
PMT P-8 General Storage General
PMT P-6.01.08 Specification for the Controlled Contamination Area (CCA), Equipment and Adhesive System Storage Facilities
PMT P-6.01.09 Vacuum Bagging and Thermoplastic Placement for Bonding Repairs
PMT P-6.01.06 Masking and Cleaning for Bonding Repairs
PMT T-6.01.03 Ultrasound Inspection
LHT Process IGM 216681 Managing Tools and Equipment
LHT Process IGM 813181 Tools and Equipment Engineering
LHT Process IGM 70019 Authorizing Personnel of the Maintenance Organization

2.2 Informational
Boeing SRM Repair General - Aluminum Skin/Aluminum Honeycomb
ATA 81-70-10 Panel Repairs
Airbus SRM Repair of Composite and Metallic Sandwich
ATA 81-77-13 Structures
Airbus SRM Material Handling and Preparation
ATA 6977-11 Drying of Thermosetting Composite Materials

2.3 Qualification
The design data combined in this specification is approved under the authority of LHT Design Organization Approval No. EASA 2.1 2016. Material Certification Project Number 09145300_001.
CACRC participation and benefits
LHT use of CACRC standards

- in internal SOP
- as a guideline for repair development
- as a guideline for tooling development
- as a Baseline for training (practical and theoretical training courses)
- for manufacturing of NDI reference and training standards
AEROSPACE INFORMATION REPORT

(R) Teaching Points for a Class on
“Critical Issues in Composite Maintenance, Repair and Overhaul”

RATIONALE
This document provides a list of learning objectives and teaching points which can be used to establish and/or evaluate a course or training in the areas of maintenance, modification and repair of composites.

TABLE OF CONTENTS

1. SCOPE .................................................................................................................. 3
1.1 Purpose ................................................................................................................. 3
1.2 Field of Application ............................................................................................... 3
1.3 Form ....................................................................................................................... 3

2. Applicable documents .............................................................................................. 3
2.1 SAE Publications .................................................................................................. 3
2.2 Other Industry Publications .................................................................................. 4

3. BASIC KNOWLEDGE ......................................................................................... 4
3.1 Basics of Composite Materials ............................................................................. 4
3.2 Basics of Composite Materials Safety Issues, Maintenance and Repair .............. 5
3.3 Research and Industry Developments ................................................................. 5
AMC 20-29

AMC 20-29 Effective: 26/07/2010
Annex II to ED Decision 2010/003/R of 19/07/2010

AMC 20-29
Composite Aircraft Structure

0. TABLE OF CONTENTS
1. PURPOSE
2. OBJECTIVE

A certification approval of this substantiation should be retained in accordance with regulations to support any subsequent maintenance activities.

d. Damage Detection, Inspection and Repair Competency

(1) All technicians, inspectors and engineers involved in damage disposition and repair should have the necessary skills to perform their supporting maintenance tasks on a specific composite structural part. The continuous demonstration of acquired skills goes beyond initial training (e.g., similar to a welder qualification). The repair design, inspection methods, and repair procedures used will require approved structural substantiation data for the particular composite part. Society of Automotive Engineers International (SAE) Aerospace Information Report (AIR) 5719 outlines training for an awareness of the safety issues for composite maintenance and repair. Additional training for specific skill building will be needed to execute particular engineering, inspection and repair tasks.

(2) Pilots, ramp maintenance, and other operations personnel that service aircraft should be trained to recognize and report damage as it occurs.
Composite Awareness WBT

Introduction
Composite Awareness Course Introduction

Training Content

- Chapter 1 - Introduction to Composites
- Chapter 2 - Fibre Reinforcements
- Chapter 3 - Matrix
- Chapter 4 - Composite Design
- Chapter 5 - Damage to Composite Structures
- Chapter 6 - Documentation and Reporting
- Chapter 7 - Maintenance and Repair
- Chapter 8 - Handling and Storage
- Chapter 9 - Health and Safety

Awareness is a key factor in safety when providing support or servicing on or around composite structures. Its content is in accordance with EASA AMC 20-29 for maintenance personnel that work on the aircraft.
CACRC participation and benefits

- It is an ongoing effort to keep management and employees informed
  - Internal MoM and debriefing after the meetings
  - use of the CACRC newsletter
  - Use of internal platforms to share information
  - Sharing CACRC success

- Result shows the effort is worth doing it: increased participation from 2 to 6 attendees from different departments over the years