AM Design and Analysis WG Meeting

CMH-17 Fall Virtual Coordination Meeting

WG Session Agenda

- YP Negative Vote Reconciliation Plan on 11.1 and 11.2
- Discuss on section 11.3 Design
- Outline Chapter 12 Maintainability and Supportability
- Chapter 13 Applications and Lessons Learned content for next YP ballot

AM D&A SOW

CMH-17
COMPOSITE MATERIALS HANDBOOK

Volume 7
AM Outline Version

Coding for this column	Coding for this column
White - open item	In YP ballot
Approved YP item	Planned for next YP ballot
Closed item	Negatives in YP ballot

Main Chapter Title	% drafted	% approved (through YP)	Title/Description of Content	Planned YP Cycle/Due Date	Comments (status or author name)
DESIGN AND ANALYSIS (Design and Analysis)			**11.1 Introduction (Design and Analysis)**	Re-balloted YP2 2024	
	100	70	11.1.1 General Definitions and Terms	Re-balloted YP2 2024	
	100	70	11.1.2 General Process Flow of AM Parts	Re-balloted YP2 2024	
	100	70	11.1.3 When to Utilize AM	Re-balloted YP2 2024	
	100	70	11.1.4 Which AM Material/Process to Choose?	Re-balloted YP2 2024	
	100	70	11.1.5 AM Risk Assessment	Re-balloted YP2 2024	
	100	70	11.1.6 AM Decision Worksheet	Re-balloted YP2 2024	
			11.2 Definition of Requirements (Design and Analysis)	Re-balloted YP2 2024	
	100	70	11.2.1 Establishment of Design Requirements	Re-balloted YP2 2024	
	100	70	11.2.2 Guidance for Material and Process Specifications	Re-balloted YP2 2024	
	100	70	11.2.3 Considerations Related to Part Criticality	Re-balloted YP2 2024	
	100	70	11.2.4 Planning for Substantiation/Verification	Re-balloted YP2 2024	
	100	70	11.2.5 Data Collection and Categorization by Application Space	Re-balloted YP2 2024	
			11.3 AM Component Design and Analysis Considerations, Options, Methods (Design and Analysis)		
	50	0	11.3.1 Design for AM		
	100	100	11.3.2 Analysis for AM		
			11.4 Design Verification for Material and Component (Design and Analysis)		
	100	70	11.4.1 Point Design Verification Framework	Fall 2023 YP2	
	30	0	11.4.2 Material Allowable Part Verification		
MAINTAINABILITY AND SUPPORTABILITY (Design and Analysis)	0	0	**12.1 Inspection ability (Design and Analysis)**		
	0	0	**12.2 Damage and Damage Tolerance (Design and Analysis)**		
	0	0	**12.3 Repair (Design and Analysis)**		
	0	0	**12.4 Life limitations and Placards (Design and Analysis)**		
	0	0	**12.5 Substantiation Package for Certification (Design and Analysis)**		
APPLICATIONS, CASE HISTORIES, and LESSONS LEARNED (Design and Analysis)	20	0	**13.1 Applications and Lessons Learned (Design and Analysis)**		

11.1 Introduction and 11.2 Design Req. YP Ballot

Vote	Number
Affirmative	14
Affirmative w/ comment	3
Negative w/ comment	3 (10)
Abstain	4
Total	24 (34)

Some of the comments to incorporate:

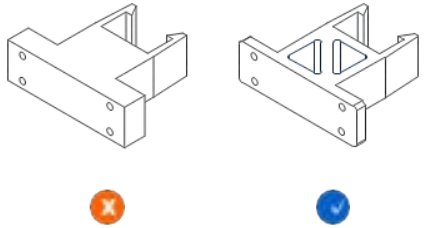
- Inclusion of part criticality to be more prevalent throughout section 11.1
- Review of Vol 3 Section 7.11 Rev H to align use of terms requirements vs criteria vs constraints
- Re-wording of our section on material and process specs, and making it more clear to the reader on how they affect design.
- YP Comment Reconciliation Path Forward:
  - WG chair take first cut at comments incorporation w/ traceability on comments through excel sheet.
  - Reconcile to author of comment first, before going to monthly WG meeting.
  - During monthly WG meeting show team changes and get an internal WG vote.
  - For better participation, send out agenda 2 days prior to WG meeting.
  - Secretariat has both final doc and ones with the track changes.

Section 11.3.1 Design Tasking

CMH-17
COMPOSITE MATERIALS HANDBOOK

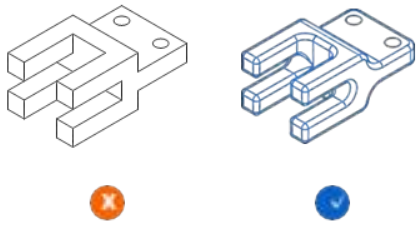
11.3.1	Design for AM					
	11.3.1.1	Characteristic of FFF		11.3.2.1	Characteristic of SLS	
		✓	General Description		✓	General Description
		✓	Material Characteristic		✓	Material Characteristic
		✓	Advantage /Disadvantage		✓	Advantage /Disadvantage
		O	Economics and Time Efficiency		O	Economics and Time Efficiency
	11.3.1.2	Design and Feature Considerations		11.3.2.2	Design and Feature Considerations	
		✓	Part Build Orientation		✓	Part Build Orientation
		O	Shrinkage/Warp (thickness considerations, aspect ratios)		O	Shrinkage/Warp (thickness considerations, aspect ratios)
		O	Fill Density		O	Packing Density and Line of Sight
		O	Overhangs and Supports		✓	Minimum and Max Thicknesses
		✓	Minimum and Max Thicknesses		O	Minimum Features (Holes, Threads, Bosses, Fillets, Text)
		✓	Minimum Features (Holes, Threads, Bosses, Fillets, Text)		✓	Tolerances (Thickness and Profile)
		O	Tolerances (Thickness and Profile)		✓	Surface Finish
		✓	Surface Finish		O	Inspection and Part Acceptance (control specimens)
		O	Inspection and Part Acceptance (control specimens)			
	11.3.1.3	Secondary Operations and Assemblies		11.3.1.3	Secondary Operations and Assemblies	
		O	Assemblies		O	Assemblies
		O	Fastening Hardware		O	Fastening Hardware
		O	Bonding		O	Bonding
		O	Finishing, Coatings, Paint		O	Finishing, Coatings, Paint

Example from Formlabs



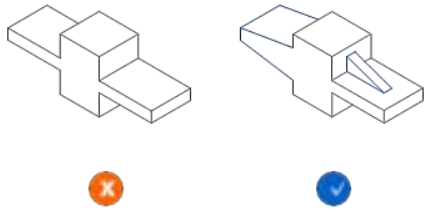
MAINTAINING UNIFORM THICKNESS

Where possible, keep the thickness of your parts relatively consistent. This will alleviate warping issues as parts cool. Consider shelling thicker parts to maintain a uniform thickness and save material.



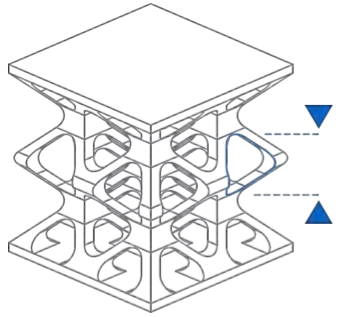
REDUCING STRESS CONCENTRATIONS

Parts can experience stress buildup at sharp changes in cross-section, such as thin extrusions from thick bases. Design gradual edge transitions instead of abrupt ones to reduce these stress concentrations.



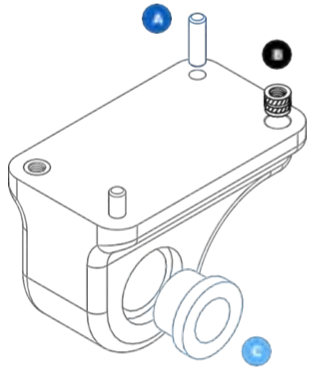
MANAGING ASPECT RATIO

Parts with a high aspect ratio are susceptible to warping. Features such as ribs or drafts can mitigate risk of warping on thin, extruded sections like cantilevers and wires.



DESIGNING LATTICES

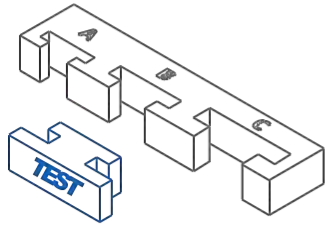
When designing a lattice structure, keep in mind that loose powders will need to be cleared from the lattice. To ensure easy powder removal in the Fuse Sift, design lattices with no smaller than **8 mm** gaps, and leave open faces in your lattice so that you don't trap powder inside.



INTEGRATING HARDWARE IN YOUR DESIGNS

Identify where it makes sense to integrate hardware into your printed designs. Here are some examples:

- Dowel pins as precise locating features
- Heat set inserts for durable threaded connections
- Bushings for concentric interfaces to shafts or rails



WHEN IN DOUBT, TEST!

If you are concerned about the success of a specific feature, create a small test print of the specific geometry in question. Isolate the feature and print the test part in the same intended orientation as the full part to get the best indication of design success.

Note: You might want to try printing multiple test pieces with different dimensions at once to test various fits before committing to a larger print.

Ch12 Maintainability and Supportability Outline

12.1	Inspection ability (in the field)
12.2	Damage and Damage Tolerance (?)
12.3	Repair
12.4	Life limitations and Placards
12.5	Substantiation Package for Certification (Design for maintenance, inspection methods/timelines)

12.1	Inspection ability (visual)
12.2	Part Repair pre requisites / Replacement
12.3	Substantiation (potentially, going to refer to Ch14 Rev H)

Discussion Notes:

- Design for Repair for larger parts (replace for small parts)
- What are the Pre-requisites for repair
- Reference EASA certification memo for examples on repair/replace criteria.
- Repair requirement will also be tied to the part criticality
- One example of repair is repair of fastener inserts on AM parts
- Take a look at SAE ARP 7520 and PMC Ch 14 to see what was done for composite repair and see if any methodologies are translatable to AM.

Chapter 13. Application, Historical Cases, Lesson Learned

CMH-17 COMPOSITE MATERIALS HANDBOOK

13.1.2 Fused Filament Fabrication (FFF) Applications

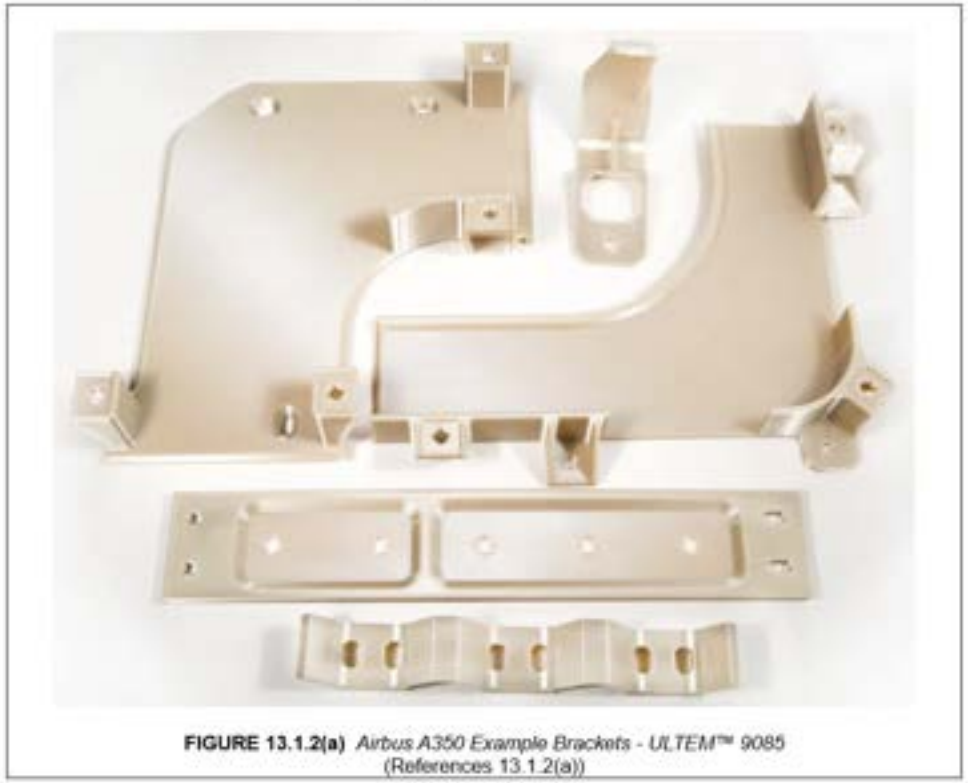


FIGURE 13.1.2(a) *Airbus A350 Example Brackets - ULTEM™ 9085* (References 13.1.2(a))

Fused Filament Fabrication (FFF) is currently employed on several commercial aircraft (Figure 4.2.1.2(b)) and spacecraft (Figure 4.2.1.2(c)). Many current FFF applications as well as other non-metallic AM technologies are considered intellectual property by their retaining companies. Because AM part fabrication for aerospace is relatively new, these applications are not publicly available to maintain industrial competitive advantage. This list of examples in Table 13.1.1 only portrays a small snapshot of what is currently used in the market.

[Author Note: Future content will be added to this section highlighting some of the pros/cons of a few popular application spaces for FFF]

Discussion Notes:

- Have we recorded the economic cutoff between AM and injection molding? Would like data on how many parts it took to be economical for example.
- We will focus on generic application direction because the evolution of AM is quick so by the time we collect data, it might be obsolete in terms of certification for example.
- Capture applications that didn't lend itself well to AM. Understanding what we shouldn't do with AM is just as important.
- Reference Draft Vol 3 Ch7.1 and 7.2 for alignment. See what terms are applicable.
- Received survey of what is in service of non-metallic and metallic parts.

Next WG Meeting

- Nov and Dec meetings will be cancelled. So next meeting is Jan 23rd
- Utilizing monthly sprint planning
- Vote on Thursdays from 9-10AM PST, does that still work for team?

AM Guidelines Working Group Meeting – Fall 2024 Virtual

Wednesday, 20 November 2024,
10:00am – 12:00pm EST

		Finish by
	CALL TO ORDER	10:00am
Content Preparation:		
Cole	Spring 2024 Yellow Pages 1 & 2 Results Review	10:15am
Cole	Chapter 1 – Section Status Review • Review status sections 1.1 through 1.8 • Section 1.6.1 Roadmap #3 – 1 remaining negative	10:30am
Deris / Cole	Chapter 2 – Section Status Review • Review status sections 2.1, 2.2, 2.3 • Discuss status of 2.4 Data Classes • Determine plan for 2.5 Qualification vs Equivalency vs Interchangeability • Discuss status of 2.6 Recommended Test Matrices	10:45am
Cole	Effects of Variability • Discuss minimum requirements for numbers of : Feedstock batches; AM machines; Build cycles; Specimens	11:30am
New Business:		
	TBD	
Cross-WG Coordination Activities:		
Deris / Cole	REMINDER: All WG Chairs to provide inputs on Symbols and Abbreviations for inclusion in Chapter 1 REMINDER: All WG Chairs to provide any new Definitions for inclusion in Chapter 1	
	ADJOURN	12:00pm

AM Guidelines Working Group Meeting – Fall 2024 Virtual

Spring 2024 Yellow Pages 1 & 2 Results Review

YP1 Results (1 vote is Boeing's 9 reviewers):

SECTION 1.5	
TOTAL VOTES	21
Affirmative	15
Affirmative with Comment	4
Negative with Comment	2
Abstain	0

SECTION 1.6	
TOTAL VOTES	23
Affirmative	17
Affirmative with Comment	3
Negative with Comment	2
Abstain	1

SECTION 1.9	
TOTAL VOTES	23
Affirmative	18
Affirmative with Comment	3
Negative with Comment	0
Abstain	2

SECTION 2.1	
TOTAL VOTES	22
Affirmative	17
Affirmative with Comment	5
Negative with Comment	0
Abstain	0

SECTION 2.2	
TOTAL VOTES	23
Affirmative	20
Affirmative with Comment	1
Negative with Comment	1
Abstain	1

YP2 Results (1 vote is Boeing's 9 reviewers):

SECTION 1.5	
TOTAL VOTES	24
Affirmative	16
Affirmative with Comment	6
Negative with Comment	0
Abstain	2

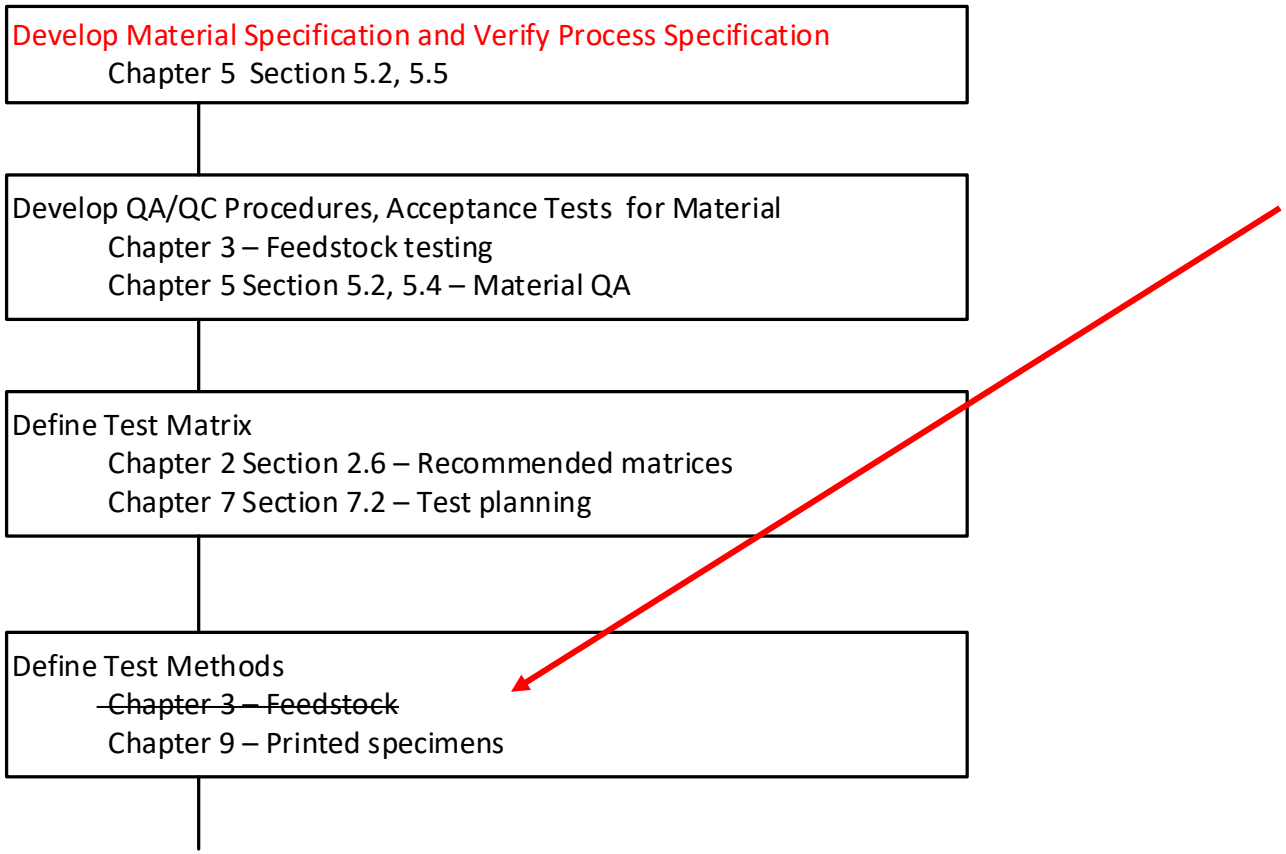
SECTION 1.6	
TOTAL VOTES	24
Affirmative	17
Affirmative with Comment	3
Negative with Comment	1
Abstain	3

Chapter 1 – Section Status Review

- Sections 1.1 through 1.5, and 1.7 - Accepted in March 2023 YP1 or YP3, or Spring 2024 YP1 or YP2.
- Section 1.6.1 (Roadmap #3) has 1 negative, to be resolved during this meeting.
- Sections 1.6.2 through 1.6.8 - Accepted in Spring 2024 YP1 or YP2.
- Section 1.8.1 Symbols and Abbreviations – Needs input from all WG's.
  >> Please capture symbols and abbreviations as you write your chapters, and forward them to Guidelines.
- Section 1.8.2 System of Units – Accepted in Spring 2024 YP1.
- Section 1.9 Definitions – Accepted in Spring 2024 YP1 at current state. Expecting future additions.
  - >> As you write your chapters, please bring any new definitions to Guidelines WG so we can coordinate with other WGs and decide if they should be included in Section 1.9.

Chapter 1 – Section 1.6.1 (Roadmap #3) Negative :

Roadmap #3: Development of Material Design Allowables



Spring 2024 YP2 Voter Concern :

Feedstock testing is not normally part of a Design Allowables test program (part of Material Qualification, but not part of Design Allowables).

Guidelines Chair response :

Agreed to delete “Chapter 3 – Feedstock” from “Define Test Methods”

If GUIDELINES WG Meeting Agrees :

Section 1.6 will be considered Accepted with this change.

Chapter 2 – Section Status Review

- Section 2.1 Introduction ... - Accepted in Spring 2024 YP1.
- Section 2.2 Sources of Variability –
  - Sections 2.2, 2.2.1, 2.2.2 - Accepted in Spring 2024 YP1.
  - Section 2.2.3 “Geometry” – Discussed with Spring 2024 YP1 negative voter and agreed to delete. Accepted and following sections renumbered.
  - Section 2.2.3, 2.2.4 - Accepted in Spring 2024 YP1.
  - Section 2.2.6 – Deleted in Fall 2023 YP1.
- Section 2.3 Building Block – Accepted in Fall 2023 YP1.
- Section 2.4 Data Classes – Not drafted >> See following slides on Effects of Variability.
- Section 2.5 Qualification vs Equivalency vs Interchangeability – Some inputs received >> Need volunteers.
- Section 2.6 Recommended Test Matrices – Not drafted >> See following slides on Effects of Variability.

Effects of Variability

Objective – Establish common understanding about variability issues across all non-metallic AM WGs, and gather inputs for Test Matrices section of Chapter 2.

Meetings held 3 September and 16 September 2024 to start to populate table :

Designation	Symbol	Description	Minimum Requirements				
			Feedstock Batches	AM Machines*	Build Cycles ***	Number of Specimens **	Total Number of Tests
Bxx	B	B-Basis – Robust Sampling	5	5	5	6	750
Bxx	b	B-Basis – Reduced Sampling	3	3	3	6	162
BPx	B	B-Basis – Pooling, Robust Sampling	5	5	5	6	750
BPx	b	B-Basis – Pooling, Reduced Sampling	3	3	3	6	162
M	M	Mean	-	-			
I	I	Interim	3	3	??	5	
S	S	Screening	1	1	??	5	

* Separate sites, non-sequential machine S/N.

** Coupons must be distributed within build volume (include information in another section?).

*** Number of separate build cycles for each feedstock batch / machine combination.

Blue numbers are PMC values. Not yet clear what to put in for AM.

Effects of Variability (cont'd)

- Meeting on 3 September agreed that no one needs or has A-basis properties at this time, so Volume 7 will not address them. This will be left for future revisions of Volume 7.
- Meeting on 16 September discussed build-to-build variability (same feedstock batch & AM machine) and whether there is enough variability to warrant including "Build Cycles" in table. Result : Uncertain.

>> Request : Try to find data on build-to-build variability in a single machine with a single batch of feedstock, and share it with AM Guidelines.

AM Guidelines Working Group Meeting – Fall 2024 Virtual

New Business

- TBD

Cross-WG Coordination

- REMINDER - All WG Chairs to provide AM Guidelines with inputs on Symbols and Abbreviations for inclusion in Chapter 1.
- REMINDER - All WG Chairs to provide AM Guidelines with any new Definitions for inclusion in Chapter 1.

Non-Metallic AM Material & Process WG

CMH-17 Non-Metallic AM Material & Process WG – Fall 2024 Joint Coordination Meeting

Thursday, November 21@ 10-12 EST

Material & Process WG group meets the 2nd Thursday of the Month @ **11am EST / 8am PST**

Next Virtual Meeting December 12th @ **11am EST / 8am PST**

Please contact info@chm17.org to be added to future AM M&P meetings.

Co-Chairs:

Eric K Moyer – Boeing – eric.k.moyer@boeing.com
Fei Liang – Gulfstream - fei.liang@gulfstream.com

Non-Metallic AM Material & Process WG

CMH-17 Non-Metallic AM Material & Process WG – Fall 2024 Joint Coordination Meeting

Thursday, November 21@ 10-12 EST

Material & Process Working Group Objectives:

- Provide the framework of the overall process flow for polymer AM material qualification, machine qualification, facility qualification and part qualification.
- Provide guidance on key performance variable (KPV) identification and necessary KPV controls for polymer AM material qualification, machine qualification, facility qualification and part qualification.
- Provide guidance on employee training and quality assurance procedures for polymer AM material qualification, machine qualification, facility qualification and part qualification.
- Provide guidance on the use and incorporation of CMH-17 AM volume published data and processes into a company's production system.
- Update sections accordingly when developments in new feedstock materials and/or new polymer AM fabrication processes become available and mature for use in regulated applications

Non-Metallic AM Material & Process WG

CMH-17 Non-Metallic AM Material & Process WG – Fall 2024 Joint Coordination Meeting

Thursday, November 21@ 10-12 EST

Material & Process Working Group Key Future Work:

- Writing content for Selective Laser Sintering section(s) – need volunteers
- Complete terminology, abbreviations & nomenclature section(s) for M&P

Non-Metallic AM Material & Process WG

CMH-17 Non-Metallic AM Material & Process WG – Fall 2024 Joint Coordination Meeting

Thursday, November 21@ 10-12 EST

Material & Process Working Group Planned Meeting Agenda:

- Introductions (15min)
- Review Chapter 4 Major Updates since Spring 2024 YP1 (10 min)
- Review summary for SLS content in AM handbook (20 min)
- Review proposal for pellet based extrusion terminology and content (20 min)
- Review M&P Chapter/Section progress tracker (10min)
- Review meeting summary for Fall Coordination closing (10min)

Non-Metallic AM Material & Process WG

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Non-Metallic AM Material & Process WG

CMH-17 Non-Metallic AM Material & Process WG – Fall 2024 Joint Coordination Meeting

Thursday, November 21@ 10-12 EST

Material & Process Working Group Planned Meeting Agenda:

- Introductions (15min)
  - Name/Company
  - How Long Have you been participating in CMH-17?
  - Favorite Pizza Topping(s)???

Non-Metallic AM Material & Process WG

CMH-17 Non-Metallic AM Material & Process WG – Fall 2024 Joint Coordination Meeting

Thursday, November 21@ 10-12 EST

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Non-Metallic AM Material & Process WG

CMH-17 Non-Metallic AM Material & Process WG – Fall 2024 Joint Coordination Meeting

Thursday, November 21@ 10-12 EST

Material & Process Working Group Planned Meeting Agenda:

- Review Chapter 4 Major Updates since Spring 2024 YP1 (10min)
  - Moved Section 4.1.2.3 to Section 4.1.2.2 – Reason: moved agnostic content to be contained in section covering general polymer AM topics
  - Added Content to 4.1.4 (Introduction to Powder Bed Fusion (PBF) Process) – Reason: created additional content based on pick-ups to coverage the PBF process at a high level and provide a process graphic (Figure 4.1.4).
  - Moved “Applications” content to Design & Analysis working group (will be added to 13.1.1) – reference document transfer to D&A

Non-Metallic AM Material & Process WG

CMH-17 Non-Metallic AM Material & Process WG – Fall 2024 Joint Coordination Meeting

Thursday, November 21@ 10-12 EST

Material & Process Working Group Planned Meeting Agenda:

- Introductions (15min)
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Non-Metallic AM Material & Process WG

CMH-17 Non-Metallic AM Material & Process WG – Fall 2024 Joint Coordination Meeting

Thursday, November 21@ 10-12 EST

Material & Process Working Group Planned Meeting Agenda:

- Review summary for SLS content in AM handbook (20 min)
  - Review/update and approve the goals/prompts for SLS content that needs authoring started at Section 4.1.4

Non-Metallic AM Material & Process WG

CMH-17 Non-Metallic AM Material & Process WG – Fall 2024 Joint Coordination Meeting

Thursday, November 21@ 10-12 EST

Material & Process Working Group Planned Meeting Agenda:

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- Review meeting summary for Fall Coordination closing (10min)

Non-Metallic AM Material & Process WG

CMH-17 Non-Metallic AM Material & Process WG – Fall 2024 Joint Coordination Meeting

Thursday, November 21@ 10-12 EST

Material & Process Working Group Planned Meeting Agenda:

- Review proposal for pellet based extrusion terminology and content (20 min)
  - Review fused granular fabrication (FGF) process summary
  - Discussion if content should be added and where? Proposal is to add within section 4.1.3
    - Reason: Eaton is developing material values with NCAMP for their FGF PEKK CF material. So there should be some "basic" content on FGF
  - No clear direction from other industry groups of an explicit term for "pellet" feed extrusion. FGF provides a clear definition of the process and aligns with similar process FFF which is also the defacto industry term for that process.

Non-Metallic AM Material & Process WG

CMH-17 Non-Metallic AM Material & Process WG – Fall 2024 Joint Coordination Meeting

Thursday, November 21@ 10-12 EST

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Non-Metallic AM Material & Process WG

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CMH-17
COMPOSITE MATERIALS HANDBOOK

CHM-17 Coordination Meeting: AM Testing Working Group

10/30/2024

Testing Working Group

- **Objective:** Give guidance on appropriate test methods and test conditions for use with AM materials while taking into account, material type, machine capabilities, process information, industry desired data, statistical analysis requirements, and available standards. Test standard creation and/or appropriate changes may be necessary by working with applicable industry leaders and standards organizations to ensure the test method is understood, usable, appropriate, and repeatable for use with AM materials. Working with other groups of the CMH17 AM community to ensure proposed test methods are applicable for their purposes and can help in harmonizing all aspects that control a data set prior to submission and inclusion into the CMH17 AM volume.

- **Working Group Chairs:** Royal Lovingfoss-NIAR, Brian Kitt-Spirit, Joe Costanzo-Boeing
- **Recap:**
  - **Sections 9.8 and 9.11 (Tensile testing and Shear testing) are in draft and will be headed to "internal" review by the group during the WG working group meeting. Tension test section is completed and sent for YP. Crystallinity section is complete and in final review, will go to YP in December of 2024. Shear testing is complete with first review. Sent back to working group for second review after corrections and additions.**
  - **Evaluation of Feedstock sections 3.1 to 3.2.1 are complete and sent to YP.**
  - **Joe Costanzo sent email on 4/26/2024 (Royal Lovingfoss forwarded) on "yield point" of neat polymer materials. For Testing Group discussion - Is there any interest in writing this up as a test method to include in Volume 7? No response yet, though looks like this will be added to volume 7, though not sure where yet. This is a topic of discussion for the virtual meeting in November.**
  - **If you would like the presentation on Modulus Calculations given by Rick Cole please request from Royal Lovingfoss.**

Testing Working Group

CMH-17
COMPOSITE MATERIALS HANDBOOK

- **Recap Continued:**
  - **Discussion of Rick Cole's modulus reporting proposal:**
    - **Most in room seem to "require" curve and equation, in addition to modulus (at RT and ETW?)**
    - **the scope of this proposal is for material with no fiber reinforcement**
    - **Stefan Kloppenborg, Statistics WG co-chair, suggested review of 8.6.1 for best practice curve fit procedure. This could possibly replace steps 2-5 of Cole method. Stefan offered to help write up how to do this curve fit in a way that simplifies the method**
    - **As far as curve fit, Frank Dixon asked if we could do a small study to review/compare the difference between linear or quadratic versus quartic curve fit. Maybe we can get something useful without higher order eqn curves**
    - **John Moylan, Element, has concerns with requiring curve fit using higher order polynomials. Called these two proposed methods the "linear method" and the "complicated method". He really doesn't like the "complicated method"**
    - **Comment regarding this method… it may be OK but you need to match the method to the usage. "quasi-static data, if the application is outside those bounds, is no good"**
  - **Sections 7.2.9 and 7.3 "data reduction and documentation" moved to DRWG**
  - **Introduction sections have been reviewed once, they will be reviewed during the virtual meeting to begin the revisions. Sections 7.1 through 7.2.4**

Testing Working Group

- Stephanie Svetlik-Haley offered to author a section on component testing (stephanie.svetlik-haley@fireflyspace.com)
- Question – what is in scope, only materials with published specs or best practice guidance? Answer - at this point in material/process maturity, we will cover both
- Group consensus that its OK to use "T.B.D." for sections not currently used (for example, unreinforced Polymer AM doesn't need OHC, so we won't write up the test method at this point)
- Member list updated. From Webex chat: new email for Tim Chavez – TCMK.timc@gmail.com and request to add Aziz Ahmed – AZIZ.AHMED@FAA.gov
- Outline updated with member responsibilities. Last update was September 2024.
- Confluence site has multiple folders, showing what is in draft, in revision, and complete.

- **Agenda:**
  - Go through YP comments on submitted content.
  - Review comments for Introduction and Shear Testing Sections.
  - OHC, FHC, and TMF will be TBD until industry decides these sections are needed, as of now they have been deemed not needed.