

comment 1 comment by: *AOPA Sweden*

Comments from AOPA Sweden

No comments on this MOC

AOPA Sweden
Fredrik Brandel
Member of the board

response **Noted.**

comment 2 comment by: *Wingcopter GmbH*

ASTM 3298-19 sections 6.5.1, 7.11.3, 7.12.6.1, 9.4.3, and 16.3 rather refine the requirement or impose new requirements and safety factors e.g., section 9.4.3, without any rationale and need. An MoC rather provide some means to demonstrate compliance rather than refining the requirement or adding new requirements.

response EASA acknowledges that the clauses of the standard F3298 utilized by the MoC provide sometimes generic / non-prescriptive indications on how to comply. However, taking the example of 6.5.1 mentioned in the comment, the standard indicates that “the applicant shall determine the minimum number of operational motors required to maintain normal operation”, which cannot be considered “new requirements” (as per comment) and, even if judged a “refinement of the requirement” (which definition EASA does not share), still provide information on top of the requirement on what the applicant should do as part of the substantiation. Industry should also consider that this MoC is in not provided for pure declarative purposes: being utilized in the frame of design verification projects, the applicant and EASA will have the opportunity to agree on more prescriptive criteria and / or pass / fail conditions as considered appropriate. EASA in cooperation with industry may publish in the future more prescriptive criteria to comply with the requirement (similar approach as for CS23 amendment 5 where less prescriptive AMC based on ASTM standards are provided in alternative to more prescriptive AMC based on previous versions of CS23 and their AMC).

comment 6 comment by: *DGAC FR*

	Entire document	1-2	General comment: according to the compliance matrix established by EASA linking the design related OSOs and the SC Light UAS, Light UAS.2405 and 2410 requirements are linked to OSO #4, which has a Low level of robustness for SAILs III and IV. The low	NA

		<p>assurance criterion for this OSO is the one provided in section 9 of Annexe E to AMC1 to the article 11: « The applicant declares that the required level of integrity has been achieved » and « Supporting evidence may or may not be available ». On the other hand these MoCs state that they are expected to be demonstrated within the frame of SAIL IV DVR, through compliance demonstration to the relevant SC Light-UAS paragraphs. Does EASA intend to ask and review evidence for compliance (or directly, compliance documents) to these MoCs? This would not seem consistent with the current integrity level of the OSO in our opinion. However, if EASA does not intend to review the evidence of compliance to these MoCs, we see a risk that the level of compliance and efforts made to demonstrate compliance will vary greatly from one applicant to another. It could indeed be difficult for the applicants to appreciate what is expected from them because the standards sometimes use evasive and undefined terms (such as significant change, minimal failure, satisfactory, adequate).</p> <p>More generally, the activities required by these ASTM standards are closer to certification processes and do not seem compatible with a low level of robustness. It would be a good idea to clarify this apparent inconsistency in order for the applicants to better understand what is expected from them.</p>	
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response

Please consider that at the moment in which we act within a DVR or TC project, the context is by definition not declarative. EASA, within SAIL IV DVR, will still consider the SORA indications and, where the integrity of the OSO that could be linked with the requirement is low, will keep its level of involvement low and, where the MoC agreed for application is considered sufficiently comprehensive, may simply accept a declaration on the MoC (still reserving to ask evidence where for any reason this would be needed). This may not be the case for this MoC for the reasons pointed out in the answer to comment 1. Additionally, the matrix of compliance should be improved (as a matter of fact, there are requirements like 2500 that are not even traced)

comment 7

comment by: DGAC FR

	2, reference to ASTM section 6.5.1	2	Are tests expected/necessary? Or is an analysis sufficient?	NA

response It depends. For a new design, tests are most likely necessary. For derivatives, in case of similarity, an analysis or simulation might be acceptable.

comment 8 comment by: DGAC FR

	2, reference to ASTM section 7.11.3	2	7.11.3.4: is damage tolerance expected ?	NA

response Yes.

comment 9 comment by: DGAC FR

	2, reference to ASTM section 16.3 (with regard to 16.3.3.3, 16.3.3.4, 16.3.3.5)	2	Not found in the standard... Did you mean 16.3.3, 16.3.4, 16.3.5?	NA

response Yes, will be corrected.

comment 10 comment by: DE-LBA

LBA has no comments.

response Noted.

comment	11	comment by: <i>Drone Alliance Europe</i>
	All references to the ASTM standard made throughout the proposed MoC, including the Introductory Note, should include the relevant version: F3298-19.	
response	Agreed.	
comment	12	comment by: <i>Drone Alliance Europe</i>
	Given that ASTM F3298-19 utilizes terminology specific to the FAA, it is essential that EASA either adapts the relevant terms or, at a minimum, clarifies their significance and use / applicability / interpretation within the EASA framework. This will prevent any potential misinterpretations by DVR applicants not familiar with the FAA terminology.	
response	Terminology used in ASTM F3298-19 is not FAA specific and refers to "nation's CAA" instead.	
comment	13	comment by: <i>Drone Alliance Europe</i>
	There is a typo in the referenced 16.3 subsections; they should be corrected as follows: 16.3.3, 16.3.4, 16.3.5.	
response	Yes, will be corrected.	
comment	14	comment by: <i>Drone Alliance Europe</i>
	Beyond the standard referenced sections requiring adaptation / clarification of the FAA-specific terminology, it is considered essential that EASA incorporates supplementary guidance into the MoC specifically addressing the demonstration of the integrity of the Lift / Thrust / Power system.	
response	See response to comment 2.	
comment	15	comment by: <i>Drone Alliance Europe</i>
	Recall to full par. 7.12.6 Powerplant and Rotor/Vertical lift system compatibility, including the subpar. 7.12.6.1 (compatibility of powerplant and rotor system with UAS) and 7.12.6.2 (Compatibility demonstration with 100h flight testing). Par. 7.12.6 is recalled also in MoC L-UAS.2410 Lift/Thrust/Power System Endurance and Durability.	

SubPar. 7.12.6.2, even though is aimed to demonstrate compatibility, should be addressed only in MoC L-UAS.2410 (Endurance/Durability) rather than in Compatibility.

response

Compliance demonstration to Light-UAS.2410 can be referred to if appropriate.

comment

16

comment by: UAVDACH

0 The MoC should provide clear and concise requirements on how to show compliance; the current draft provides more guidance than means of compliance. In particular, pass/fail criteria (as mandated by the Guidelines on Design verification for UAS operated in the 'specific' category, Issue 2) are missing.	Revise all sections. Provide pass/fail criteria.	Requested
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response

Pass/fail criteria need to be defined in the test planes prepared by the applicant.

comment

17

comment by: UAVDACH

0 The ASTM Standard F3298-19 is a certification specification and could be used as an alternative to SC.Light UAS with more details and additional requirements to comply with, but it does not provide testable means of compliance with pass/fail criteria.	Do not use ASTM F3298-19 as MoC at all.	Requested
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response

See response to comment 2.

comment

18

comment by: UAVDACH

2 The ASTM Standard assumes the following: - extremely improbable $\leq 1E-6/FH$ - extremely remote probability $\leq 1E-$	The MoC should either explicitly provide a translation or acknowledge these definitions.	Requested
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5/FH - remote probability $\leq 1E-4/FH$ - improbable $\leq 1E-2/FH$ - probable \leq has a reasonable likelihood of occurring, or can be envisioned to occur (7.2.2.1. (1))		
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response Agreed to add explanation because the above mentioned numbers are not used in the context of SC Light-UAS.

comment 19 comment by: UAVDACH

2 The ASTM Standard is intended for lightweight UAS with a gross weight of less than 25kg (4.1+4.2.1); weight limit may be exceeded (1.3)	The MoC should either explicitly state that the weight limit is accepted to be exceeded and provide a rationale.	Requested
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response Accepted to be exceeded as this MoC does not refer to aspects of the standard which are obviously applicable only for limited MTOM. EASA reserves anyway to accept or reject this MoC for UAS with MTOM > 25 Kg.

comment 20 comment by: UAVDACH

In 7.12.6: use of unquantified terms "satisfactory manner", "satisfactory operation"; MoC should provide clear pass/fail criteria	Provide pass/fail criteria	Requested
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response Pass/fail criteria need to be defined in the test planes prepared by the applicant.

comment

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comment by: UAVDACH

In 9.4.3 a factor of safety is given but no means to show compliance for design	Provide pass/fail criteria	Requested
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response

Pass/fail criteria need to be defined in the test planes prepared by the applicant.

comment

22

comment by: UAVDACH

References to 16.3.3.3, .4 and .5 incorrect; there is no 16.3.3.4; assumed to refer to 16.3.3, 16.3.4 and 16.3.5	Correct references	Requested
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response

Yes, will be corrected.

comment

23

comment by: UAVDACH

16.3.4 (here 16.3.3.4) "The propulsion system shall be shown to support normal operations throughout the anticipated lifecycle of the system." - This may hold true for small UAS (as in the scope of 3298-19) but for larger UA it may be assumed that the propulsion system has its own lifecycle.	Clarify that "lifecycle of the system" means "lifecycle of the propulsion system" or equivalent	Requested
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response

This needs to be agreed between applicant and agency.

comment

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comment by: Volocopter-Policy & Regulatory Affairs

EASA is not referring to a dedicated version of the linked ASTM Standard. ASTM Standard strongly refer to American language and FAA-like wordings; there is a risk for applicants who are not familiar with FAA language and intent to be confused when applying to EASA MoC. To avoid misunderstanding for applicants to this MoC, EASA should not just be listing the ASTM Standard's references within this requirement. More guidance is needed from EASA on how "how to do the validation" by using the ASTM Standard to achieve SAIL IV in this matter.

response See response to comments 2 and 12.

comment 25 comment by: FOCA (Switzerland)

Thank you very much for the opportunity to comment. We have no remarks to add to this document.

response Noted.

comment 26 comment by: LHD

It seems that several referred sections of ASTM F3298-19 is including only a reference to a general activity of demonstration by the applicant (e.g. "determine the minimum number of operational motors required to maintain normal operation" or "Propellers shall be designed to have adequate structural strength, static strength, and fatigue life.") without any indication of suitable MOC. It is suggested to include recommendation for acceptable means of compliance (analysis, laboratory test, ground test, flight test, etc..).

Section 7.11.3.6 of ASTM includes reference to extremely remote occurrence of failure and within the same standard a quantitative definition is provided for such an event. Does it mean that EASA is requiring a quantitative assessment? This seems not in line with 2510 MOC approach. Please clarify.

Specific reference to 16.3 lower level sections should be revised in 16.3.3, 16.3.4, 16.3.5.

response See response to comments 2.

comment 27 comment by: DELAIR

"When all sections are complied with, Light UAS.2405 can be considered fully covered."

- This document might not fully cover the fixed wing drones.

- Should the fixed wing drone show compliance only to sections 7.11.3, 9.4.3 and 16.3 for the Light UAS 2405 to be considered fully covered?

response Yes, Light UAS.2405 can be considered fully covered when the applicable sections are complied with.

comment 28 comment by: DELAIR
Referring only to particular points in other document without covering the scope, limitations and definitions at the EU level could cause confusion in understanding several points.

response See response to comment 2.

comment 29 comment by: DELAIR
Sections 16.3.3.3, 16.3.3.4, 16.3.3.5 are not available in ASTM standard F3298-19

response Yes, will be corrected.

comment 30 comment by: DELAIR
It is preferable not to refer and quote from closed documentation, especially for proposals. This will add a high cost on all the involved stakeholders who will be obliged to buy every document referred to, just to be able to access or read the sections used, which in turn could also limit the number of participants and feedback received.

response Reference to Standards developed by standardization bodies like e.g. ASTM, SAE or EUROCAE is common praxis because copyrights need to be respected.

comment 31 comment by: JEDA
The MoC should provide clear requirements on how to show compliance; the current draft provides more guidance than means of compliance. In particular, pass/fail criteria are missing. Please update and add criteria and definitions.

response **Pass/fail criteria need to be defined in the test planes prepared by the applicant.**

comment 32 comment by: JEDA

The ASTM Standard F3298-19 is a certification specification and could be used as an alternative to SC.Light UAS with more details and additional requirements to comply with, but it does not provide testable means of compliance with pass/fail criteria. Is it useful to refer on AST Standard F3298-19?

response **See response to comment no. 2 and 31**

comment 33 comment by: JEDA

ASTM Standard is intended for lightweight UAS with a MTOM of less than 25 kg. This weight limit may be exceeded. Please clarify.

response **Accepted to be exceeded as this MoC does not refer to aspects of the standard which are obviously applicable only for limited MTOM. EASA reserves anyway to accept or reject this MoC for UAS with MTOM > 25 Kg.**

comment 34 comment by: JEDA

In 7.12.6: use of unquantified terms "satisfactory manner", "satisfactory operation"; MoC should provide clear pass/fail criteria

response **See response to comment no. 20.**

comment 35 comment by: JEDA

16.3.4 (here 16.3.3.4) "The propulsion system shall be shown to support normal operations throughout the anticipated lifecycle of the system." - This may hold true for small UAS (as in the scope of 3298-19) but for larger UA it may be assumed that the propulsion system has its own lifecycle.

Please clarify that "lifecycle of the system" means "lifecycle of the propulsion system" or equivalent

response **See response to comment no. 23.**

