

VPP Material Candidate Selection for Aerospace and Space Programmes

Screening against mission requirements without implying airworthiness or space qualification

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Highlights

- FAA/FAR, EASA, ECSS and NASA documents identify possible requirements, not automatic qualification.
- Outgassing, flammability, radiation and ESD claims require exact grade, specimen, method and report.
- Untested mappings are labelled candidate-selection guidance.
- HDT is not continuous-use, cryogenic or re-entry qualification.
- No single resin family is claimed to cover every aerospace or space function.

Abstract

Aerospace and space material screening starts from programme-, mission- and part-specific loads, environments, failure modes and authority requirements.

Reference to a FAR/EASA, ECSS or NASA document does not constitute compliance. Test severity, conditioning, specimen, acceptance and configuration control require programme definition.

Product numerical anchors are retained only with current grade-specific controlled reports. Final-part and mission qualification remain separate from material selection.

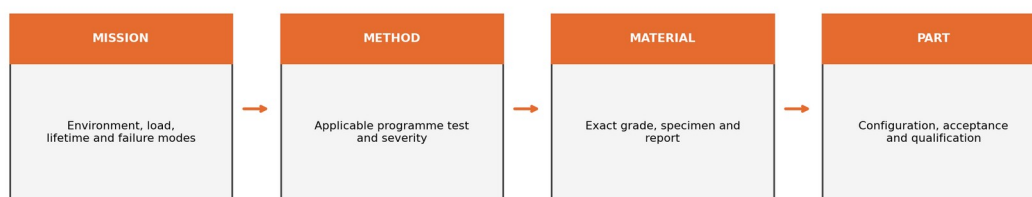
Keywords aerospace · space · outgassing · flammability · radiation · qualification

Source use. Product evidence is in [1]; programme authorities and methods are selected from [2–6].

1. Mission-led requirements

The record defines temperature/time, vacuum, radiation, fluids, flammability, electrical function, loads, lifetime and failure consequences.

- Identify authority/programme documents.
- Define severity and acceptance.
- Control configuration and traceability.



Release requires traceable evidence at every gate; a catalogue label cannot bypass the chain.

Figure 1. WP-43 evidence gates from controlled material description to final acceptance.

2. Material screening evidence

Every outgassing, flammability, radiation, thermal or ESD mapping identifies exact grade, specimen preparation, conditioning, method and report.

- Label untested routes as candidates.
- Do not infer continuous use from HDT.
- Challenge ageing and cycles.

3. Qualification boundary

Material data are inputs to part- and programme-specific verification; they are not airworthiness, ECSS or NASA qualification.

4. Minimum controlled evidence before release

Control field	Required record	Release interpretation
Mission	Environment, load, lifetime and failure modes	Catalogue description only until evidence is linked
Method	Applicable programme test and severity	Control process variables and change triggers
Material	Exact grade, specimen and report	Report method, result, uncertainty and limits
Part	Configuration, acceptance and qualification	Apply final acceptance and responsibility boundary



Description ≠ measured result ≠ certification or finished-device approval

Figure 2. WP-43 separates catalogue positioning, measured evidence and final application decisions.

KEY INSIGHT

Precise product or application language is retained only when the exact formulation, method, processed specimen and controlled evidence can be traced.

5. Limitations

- Reference to a standard is not qualification.
- No unsupported aerospace envelope is retained.
- HDT is not service temperature.
- NASA and ECSS are not interchangeable regimes.
- Final-part mission qualification remains required.

6. Conclusions

- FAA/FAR, EASA, ECSS and NASA documents identify possible requirements, not automatic qualification.
- Outgassing, flammability, radiation and ESD claims require exact grade, specimen, method and report.
- No single resin family is claimed to cover every aerospace or space function.
- This corrected candidate remains local and on HOLD until series-wide scientific, metadata and visual release checks are complete.

Revision note

Version 5.5 separates screening from qualification, removes unsupported thermal/material envelopes and requires exact programme, grade, specimen, method and report traceability.

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Disclosure. Dr. Juan Segurola is founder and Scientific Director of 3Dresyns by Resyner Technologies S.L., the supplier of the materials discussed.

References

- [1] 3Dresyns. Current aerospace/space candidate TDS and controlled reports.
- [2] 14 CFR / FAA regulations and applicable airworthiness requirements; exact provision to be selected by programme.
- [3] EASA Certification Specifications; applicable specification and amendment to be selected by programme.
- [4] ECSS standards applicable to the defined space programme and material/part.
- [5] NASA-STD-6016 and programme-selected NASA material/process requirements, where applicable.
- [6] ASTM E595. Total mass loss and collected volatile condensable materials from outgassing in vacuum.