AIPS
Airbus Process Specification

Installation of compound-filled pressure seals

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1 Scope

This Airbus Process Specification defines the Engineering requirements for the installation of compound-filled pressure seals.

This specification does not give detailed instructions; these are given in the Process Instructions (PI) / Airbus Process Instruction (AIPI) and the Work Instructions.

This specification shall not be used as an inspection document.

It shall be applied when mentioned in the relevant standard, material specification or Definition Dossier.

2 Normative references

Only normative references cited in the text are listed hereafter.

The latest issue of the publication referenced shall be used.

A1091	Airbus requirements for the management of hazardous substances.
ABS0122	Seal, pressure, for electrical cables compound filled.
AIMS04-05-001	Airbus Industrie Material Specification – Sealants – General Purpose – Material Specification.
AIPS03-06-003	Airbus Process Specification – Locking using wire.
AIPS05-05-003	Airbus Process Specification – Surface protection of fasteners and sealants by application of varnish.
AIPS05-05-008	Airbus Process Specification – Application of low adhesion sealants.
AIPS07-01-001	Airbus Process Specification – Manufacturing and installation of cable harnesses.
AIPS07-01-004	Airbus Process Specification – Tightening procedures for electrical equipment.
AIPS07-01-009	Airbus Process Specification – Attachment of cables in backshell of connectors.
AIPS09-01-003	Airbus Process Specification – Cleaning with aqueous cleaning agents.
EN2591-101	Aerospace series – Elements of electrical and optical connection, Test methods – Part 101: Visual examination.
EN2591-312	Aerospace series – Elements of electrical and optical connection, Test methods – Part 312: Air leakage.
EN9103	Aerospace series – Quality management systems - Variation management of key characteristics.
NSA934710	Seal – bundle, electrical wire.

3 Definition, applicability and limitations

3.1 Definition

Not applicable.

3.2 Applicability and limitations

This Airbus specification is applicable when invoked by the drawing directly or through another document for the purpose given in the scope. When processing to AIPS07-05-007 is required, it shall be invoked on the drawing by the words “AIPS07-05-007 – Installation of compound-filled pressure seals”.

This document is applicable for the installation of compound-filled pressure seals NSA934710 and ABS0122.

Only the practice defined in this document is authorized.

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4 Engineering requirements

Engineering requirements are minimum requirements specified by Responsible Engineering to ensure optimal performance of the manufacturing process.

All Engineering requirements have to be met and controlled in production.

4.1 Performance requirements

The installation shall ensure a permanently pressure tight seal with a leakage rate less than defined in table A.1 in annex A.

Individual technical specifications of involved components shall not be adversely affected by the applied installation and manufacturing processes.

4.2 Process requirements

Seal fittings can be compound-filled on a bench when assemblies are produced ready for installation on aircraft, or on aircraft when, for example, several bundles routed trough the same bulkhead seal fittings are grouped together.

4.2.1 Use of compound and solvents

The use of solvents and sealing compounds requires the following precautions.

- Work in aerated and ventilated premisses, if necessary in confined zones.
- Do not smoke.
- Weear appropriate rubber gloves.
- Wrap-around goggles must be worn.
- For work in wing box, it is mandatory to wear a breathing mask with filtrating cartridge or a mask with ventilation, connected to a network of compressed air with active carbon filter.
- In case of projection of solvent or sealing compounds into the eyes, wash thoroughly and go to the medical department for any required complementary care.
- Wash hands befor eating or smoking, with special attention to finger nails.

4.2.2 Assembly

During the installation the harness shall be free from loom ties within 75 mm of each side of the pressure seal.

Component surfaces and wiring shall be perfectly clean, degreased and dry before adhesive is applied. Refer to AIPS09-01-003.

The helical spacer shall be used in accordance with the Definition Dossier.

The length of the spacers shall be less than the overall length of pressure seal to allow the spacers to be contained inside the seal.

The cables of AWG20 and bigger shall fitted into one helical spacer. For cables of AWG22 and AWG24 it is preferable to fit two cables into one helical spacer.

If a PTFE conduit shall be used for harness modification, the both side of the conduit must be closed and sealed with an approved sealant in accordance to the Definition Dossier.

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The conduit length outside the pressure seal shall be 60 mm on both ends to provide two repairs.

Before filling cables, helical spacers and insides of half shells shall be pre-treated with approved adhesive.

Observe the venting time of the adhesive prior to filling with sealants. The cables should be spread apart during this time to prevent them from sticking together. If the adhesive becomes contaminated, clean off and repeat the process.

Only sealants according to AIMS 04-05-001 and defined on Definition Dossier shall be applied.

The filling with the sealant shall be done in a way which avoid air inclusions.

After filling of compound the curing time shall be respected.

During the filling and curing process for NSA934710 the half shells shall be perfectly matched together.

Use an aid (eg. masking tape) to ensure a tidy convex shape to the end of the seal NSA934710. The aid shall be complete removed after the curing time

When specified in definition dossier, apply a protective varnish to the cured sealant in accordance with AIPS05-05-003.

ABS0122 can be used with backshells according to Definition Dossier.

For further details refer to to AIPS07-01-009 and applicable product standard,

The cables shall not have lateral or tensile load applied to them at any time.

4.2.3 Installation of seal bundle NSA934710 onto the structure

The flange plate of the pressure seals shall be installed on the pressurized side and shall be sealed with sealant in accordance with AIPS05-05-008.

Refer to AIPS07-01-004 for mounting of seal.

For the nut tightening torques refer the applicable product standard.

When the seal bundle and flange plate have been installed to the structure, the attachment holes of the grommets shall be sealed with sealant in accordance with AIPS05-05-008.

4.2.4 Installation of seal bundle ABS0122 onto the structure

The O-ring shall be properly positioned in the flange groove.

Refer to AIPS07-01-004 for mounting of the seal.

If required in installation drawing the seal shall be secured according to AIPS07-01-001 after attachment to structure.

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4.3 Other requirements

- Only personnel adequately trained shall perform the application of sealant.
- Periodic inspection and calibration of tools.
- Tidiness and adequate lighting of workplaces.
- Take care the hygiene and safety instructions during the application and curing of filling compounds for pressure seals.

4.4 Key Characteristic

Key Characteristics acc. to EN9103 are defined by responsible engineering based on a risk analysis for parts manufactured by this process. Key characteristics shall be defined on product level and if necessary also on process level.

They shall be subject to variation control by production organization according to EN9103.

Key Characteristics do not relieve the production organization from meeting all engineering requirements defined in this document.

Table 1: Key Characteristic

Product Key Characteristic			Process Key Characteristic		
No.	**Designation**	**Requirement/ Limit**	**Sub.-No.**	**Designation**	**Requirement/ Limit**
1	The installation shall be pressure tigth	Leakage rate in accordance to Annex A	1.1	Surface preparation	According to AIPS05-05-003 (see subclause 4.2.2)
			1.2	Filling	According to relevant IPS
			1.3	Curing time	According to relevant IPS

5 Technical qualification

The Technical Qualification shall be performed, according to the relevant Airbus Procedure.

Table 2: Test methods

Test	Designation of test	Details
EN2591-101	Visual examination	Initial examination: examination of pressure seals. Details to be examined : – Identification. – Appearance. – Marking. – Surface finish. Final examination: no loosening of parts, no cracks, no excessive wear, no damage on cables. Sealant is visually adhered to the housing and cables. Wires do not have lateral or tensile loads applied to them.
EN2591-312	Air leakage	The pressure seal shall be tested according method A. The max. limit of the leakage rate shall be in accordance to Annex A.

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6 First part qualification

Not applicable.

7 Series production inspection

The shop shall perform the following series production inspections under serial conditions.

7.1 Pre-operation check:

- Verify the sealant storage instructions were observed.
- The preparation instructions for sealants are fullfilled.

7.2 Inter-operation checks:

- The half shells are perfectly matched together.
- The aid ensure a tidy convex shape to the end of the seal NSA934710.
- The half shells are completely filled with compound.
- Wires do not have lateral or tensile loads applied to them.

7.3 Final-operation checks:

- Surplus sealant has been removed.
- The aids are completely removed.
- Sealant is visually adhering to the housing and cables.
- The half shells and flange plates are assemblied in a appropriate order.
- Wires do not have lateral or tensile loads applied to them.
- Apply a pressure test. The test shall be performed in a test rig when the pressure seal is assembled on a bench or during testing of the aircraft cabin (total leakage rate) when the pressure seal is assembled on the aircraft.

8 Rework

- Ensure a complete removal of the sealant.
- Cables and supports shall be cleaned with a solvent (as per AIPS09-01-003)
- A perfectly clean surface condition is essential for a strong adherence.

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9 Environment, health and safety

The manufacturing process shall be in line with Airbus Health and Safety and ecoefficiency policies.

Compliance with A1091 shall be ensured for all materials, substances and/or articles implemented during process. In particular, targeted substances according to A1091 shall not be used, if a safer alternative is available.

Uses made of all substances involved in the process shall be documented in Safety Data Sheet as required by REACh regulation (Registration Evaluation and Authorization of Chemicals)

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Annex A
(normative)
Leakage rate

A.1 Leakage rate

According to table A.1.

Table A.1: Leakage rate

Standard	**Required pressure** (mbar)	**Test time** (min)	**Max. leakage rate** (l/h)
NSA934710	610±5	20	60
ABS0122	645±5	20	51

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RECORD OF REVISIONS

Issue	Clause modified	Description of modification
1 09/99		New standard.
2 02/11		Global change of AIPS.

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