

AIPS
Airbus Process Specification
Adhesive tape bonding

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1 Scope

This Airbus Process Specification defines the requirement for non-structural bonding with adhesive tapes.

This specification does not give detailed instructions; these are given in the Process Instructions (PI) / Airbus Process Instruction (API) 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 of the Management of Hazardous Substances
AIPS06-01-007	Etching of fluoropolymer adherends prior to adhesive bonding
AIPS09-01-002	Cleaning with liquid non aqueous agents
AP2253	Validation and Technical Qualification of Manufacturing Processes
EN9103	Aerospace series - Quality management systems - Variation management of key characteristics
ISO10365	Adhesives – Designation of main failure patterns
ISO4578	Adhesives – Determination of peel resistance of high-strength adhesive bonds – Floating roller method
ISO4587	Adhesives – Determination of tensile lap shear strength of rigid to rigid bonded assemblies
ISO8510-2	Adhesives – Peel test for a flexible bonded to rigid test specimen assembly – Part 2: 180° peel

3 Definition, applicability and limitations

3.1 Definition

3.1.1 Pressure sensitive adhesive

Adhesives, which in a dry state are permanently tacky at room temperature and readily adhere to surfaces under light and brief pressure. Pressure sensitive adhesives are used for the manufacture of pressure sensitive adhesive tapes. The adhesive is neither cured nor its consistency changed during adhesion.

3.1.2 Heat activated adhesive

Adhesive, which is given its adhesive power (is activated) by heat.

3.1.3 Adhesive tape

An adhesive tape is a carrier material coated with an adhesive. The adhesive can be applied on one or on both sides (double-faced application) of the carrier material. A distinction is made between pressure sensitive adhesive and heat activated adhesive.

3.1.4 Transfer tape

An adhesive tape having two available pressure sensitive surfaces without the need of a carrier and with a release liner separating the adhesive surfaces. The adhesive can contain reinforcing material.

3.1.5 Double sided adhesive tape

A double sided adhesive tape is covered on both sides of the carrier with an adhesive.

3.1.6 Carrier

A carrier is a flat shaped material, which carries the adhesive and can consist of different materials (foils, fabric, etc.). The carrier can be reinforced with e.g. filaments.

3.1.7 Protective paper

A protective paper is a release paper or foil, covering the adhesive side of the adhesive tape, which can be removed easily without any aids.

Synonym: Liner

3.2 Applicability

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 AIPS06-02-009 is required, it shall be invoked on the drawing.

This specification is applicable for the non-structural bonding with adhesive tapes.

3.3 Limitations of the process

This specification shall not be used for manufacturing of components for structural applications, if not agreed otherwise.

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

4.1.1 Materials

Only specified, qualified and approved adhesive tapes shall be used.

The storage conditions for each specific material shall be those indicated in the corresponding Material Specification, Individual Product Specification or Process Instruction. All limited life materials shall be used within their useful life time (storage life and work time).

After storage at temperatures deviating from the shop temperature, the adhesive tapes shall be stored in the workshop until the materials have reached the workshop temperature.

4.1.2 Ancillary materials

Only ancillary materials and cleaning agents that do not adversely affect the material / part properties shall be used.

4.1.3 Facilities

The facilities for storage of the adhesive tapes shall be capable/fitted/adapted to ensure the necessary product specific storage conditions.

The facilities for adhesive tape bonding (workshop) shall be free of contaminations, well ventilated/illuminated. The bonding environment shall have controlled temperature and humidity as required for the specific product to prevent degradation of the adhesive bond.

4.1.4 Equipment and tools

All equipment and tools shall be tested, clean and approved prior to use.

4.1.5 Process

The process shall be able to reproduce parts in a defined quality using qualified materials, manufacturing aids and production equipment.

Pretreatment of adherend

The surface of areas, which have to be bonded, shall be cleaned according to AIPS09-01-002 or, if required, pretreated according to AIPS06-01-007.

Adhesive tape application

The application procedure shall ensure a void and bubble free applicated adhesive tape. After removing of the liner a contamination of adhesive layer with fat, oil, dust or other foreign substances has to be prevented before bonding.

4.1.6 Rework

Defects in parts may be reworked provided that the technical properties are not affected thereafter. Rework procedures shall be defined in the relevant Process Instructions and / or in the relevant drawings.

4.1.7 Health, Safety & Environment

The manufacturing shop shall apply the local safety regulations.

4.2 Other requirements**4.2.1 Quality requirements**

The Quality Assurance Authority shall ensure compliance with the technical requirements defined in chapter 4.1 as well as with those included in the relevant drawing and applicable technical documents.

4.2.2 Personnel

All the work steps of the manufacturing procedure shall be carried out by authorized, trained and competent personnel recognized by an approved training programme.

4.2.3 Inspection procedures

All facilities, tooling and equipment used in the manufacturing process shall be certified and calibrated. Inspeption schedules shall be established in Quality Assurance documents or in the Process Instructions.

For all parts to be manufactured, process control means and schedules shall be established and defined in the relevant documents such as Process Control Document.

4.3 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

No.	Product Key Characteristic		Sub. - No.	Process Key Characteristic	
	Designation	Requirement/ Limit		Designation	Requirement/ Limit
1	Bonding strength	As defined in the relevant adhesive Material Specification (MS) / Individual Product Specification (IPS)	1.1	Adherend pre-treatment	As defined in chapter 4.1.5
			1.2	Adhesive tape application	<ul style="list-style-type: none">• void free• bubble free
2	Position	As defined by drawing	2.1	Positioning of adhesive tape	As defined by drawing
3	Appearance	Continuous bubble free and wrinkle free adhesive tape shall be visible after bonding	3.1	Assembly of adhesive tape	-

5 Technical qualification

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

5.1 Qualification test program

The Qualification Test Program (QTP) describes the tests required to define, whether the manufacturing process instruction complies with the requirements defined in the Process Specification and/or additional requirements. The Qualification Test Program is supplied to the workshop to be qualified.

The qualification shall be made on test specimen (adhesive tape / adherend material type) as defined by the Manufacturing Shop Group.

The qualification tests shall be at least the following:

- Visual inspection (pretreatment, defects, etc.)
- Determination of bond strength (e.g. peel resistance according to ISO4578/ISO8510-2, tensile lap shear strength according to ISO4587)
- Determination of failure pattern according to ISO10365

5.2 Qualification Test Report

The Qualification Test Report (QTR) shall summarize and analyze the results of all tests carried out in the qualification of the manufacturing process of the manufacturing shop. In case of failure or deviation, reasons shall be documented.

6 First part qualification

Not applicable.

7 Series production inspection

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

8 Rework

Defects in parts may be reworked provided that the technical properties are not affected thereafter. Rework procedures shall be defined in the relevant Process Instructions and / or in the relevant drawings.

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).

RECORD OF REVISIONS

Issue	Clause modified	Description of modification
1 12/96		New standard
2 04/10	4.3	Definition of Key Characteristics (KC) has been added