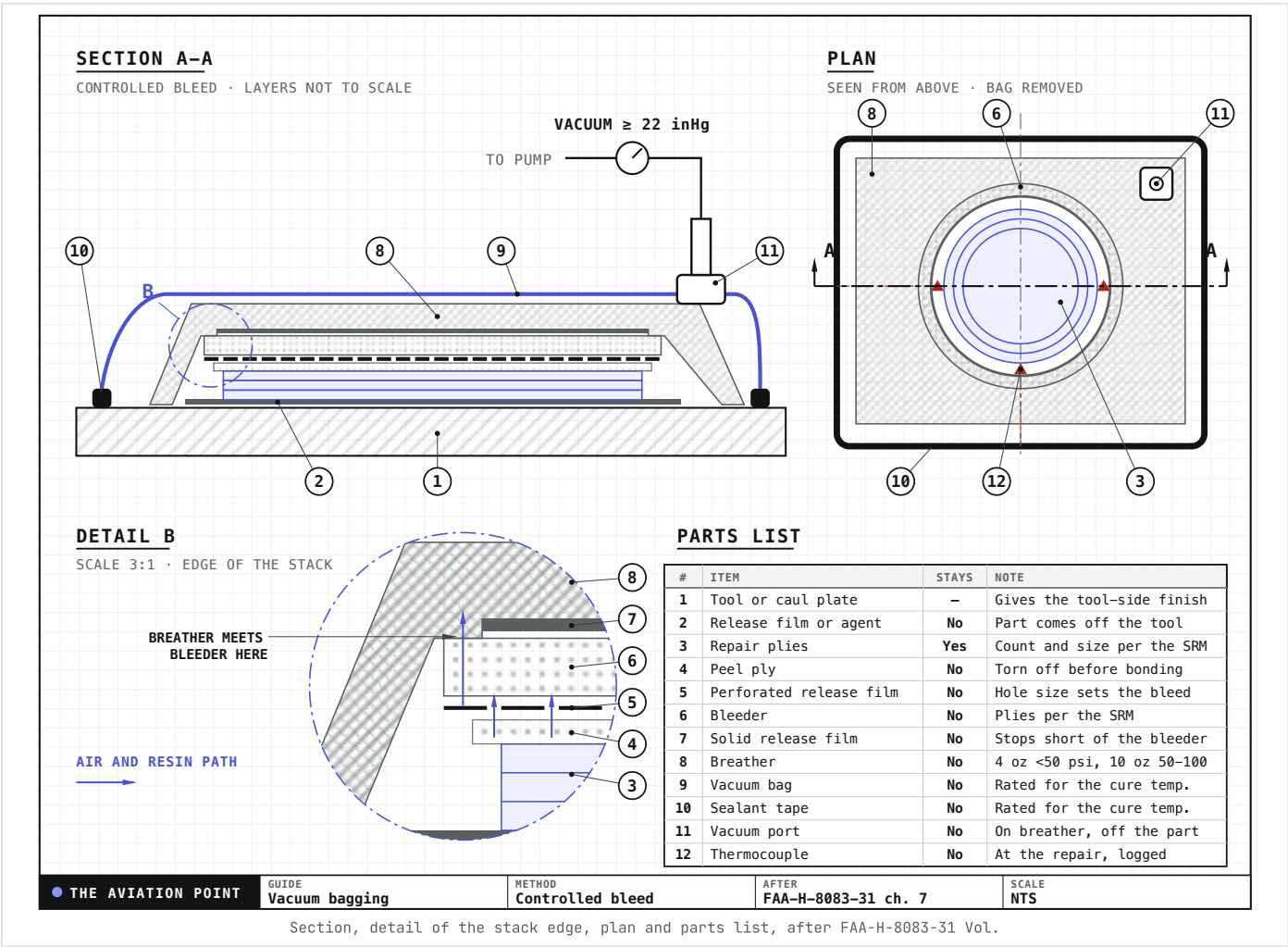


Vacuum Bagging: Every Layer and What It Does

Controlled-bleed stack, layer by layer • bleed methods • bagging steps



Each layer: job, material, when it changes

#	Layer	What it does	Usual material	Changes when
1	Tool or caul plate	Holds the shape and gives the tool-side finish. A thin caul on top evens the pressure under a heat blanket.	Aluminium caul, mould, tooling board	Curing on the aircraft: the structure itself is the tool
2	Release agent or solid release film	The cured part comes off the tool.	Mould release; FEP or similar solid film	Never left out on a tool
3	Repair plies	The structure. The only layer that stays.	Prepreg or wet layup fabric	Set by the SRM ply table
4	Peel ply	Cures with the part and is torn off just before the next bond or paint, leaving a clean, textured surface.	Heat-set polyester (preferred), nylon, FEP, coated glass	Leave it off only where nothing will be bonded or painted later
5	Perforated release film	Lets air, volatiles and some resin through its holes; stops the bleeder sticking to the part.	Film with holes of a set size and spacing	No-bleed prepreg: a solid film instead
6	Bleeder	Soaks up the excess resin and gives the air a path. More plies take more resin.	Glass cloth, nonwoven polyester, perforated PTFE-coated glass	No-bleed prepreg and edge-bleed wet layups: none
7	Solid release film	Stops the resin at the bleeder, so the breather stays dry and keeps breathing; protects a heat blanket.	Solid film	Bleedout method: left out (bleeder and breather are one)
8	Breather	Carries the vacuum over the whole bag to the port. It has to touch the bleeder.	Polyester felt: 4 oz below 50 psi, 10 oz for 50 to 100 psi	Autoclave pressure: the heavier weight
9	Vacuum bag	The airtight skin the atmosphere pushes on.	Nylon or similar film rated for the cure temperature; reusable silicone	Complex shapes: pleats in the bag, or a silicone bag
10	Sealant tape	Seals the bag to the part or the tool.	Tacky tape rated for the cure temperature	Envelope bag: the bag is sealed to itself
11	Vacuum port	Connects the pump. Sits on the breather, not on the repair.	Through-bag valve; hose that will not collapse	Two ports when a gauge reads the bag separately

Which bleed method

Method	Use it for	Over the plies	What goes wrong
Bleedout	Wet layups and high-resin prepregs that need excess resin out	Perforated release film, then bleeder/breather	Too much bleed: dry, resin-starved laminate
Controlled bleed	Most heated repairs where the SRM gives bleeder plies	Perforated film, a counted number of bleeder plies, solid film, breather	Too many bleeder plies: resin-starved. Too few: resin-rich, heavy
No bleed	Prepregs with 32 to 35 % resin content (most high-strength prepregs)	Solid film taped at the edges with small gaps for air, then breather	Any bleed at all leaves the laminate short of resin
Edge (horizontal) bleed	Small room-temperature wet layups	No film on top; a 2 in edge breather strip around the repair	Squeegee left out: air and excess resin stay in the plies

Key points

- **Only the repair plies stay.** Every other layer comes off after cure.
- **Peel ply** on every surface to be bonded or painted later; tear it off just before the bond. Heat-set polyester preferred.
- **Breather must touch the bleeder**, or the vacuum stops at the solid film.
- **Breather weight:** 4 oz below 50 psi, 10 oz for 50 to 100 psi.
- **Vacuum:** at least 22 inHg through the cure (typical cycle); the SRM may ask for more.
- **Temperature rating:** bag film, sealant tape and hoses rated for the cure temperature.
- **Too many bleeder plies** leave the laminate resin-starved.

Step by step

1. Cut every layer before mixing resin or thawing prepreg.
2. Clean the surface; lay sealant tape outside the breather, backing on.
3. Plies, peel ply, perforated film, bleeder (count per SRM), solid film, breather.
4. Port on a doubled breather pad, off the repair.
5. Bag loose, pleats at corners and contours, no wrinkles across the tape.
6. Pull vacuum, close the valve: a falling gauge means a leak. Fix it before gel.
7. Cure to the manual's schedule with thermocouples at the repair; log time, temperature, vacuum.

SOURCES • FAA-H-8083-31, AMT Handbook – Airframe, Volume 1, Chapter 7

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