



APPLICATION

Lab / fume-hood exhaust

A laboratory exhaust fan pulls chemical fume-hood and lab air through the duct, holds the whole run under negative pressure so nothing leaks into the building, and discharges it high and fast off the roof so the plume clears the intakes instead of drifting back in. The air is not dirty — it is corrosive: acid vapour, solvent fume, occasional radionuclide or biohazard-rated exhaust.

Capability envelope

laboratory / fume-hood exhaust service

PARAMETER	STANDARD RANGE	ON APPLICATION
Volume flow	2,000–50,000 CMH typical	up to 2,25,000 CMH for manifolded lab blocks
Static pressure	up to 1,000 mmWC	up to 2,000 mmWC incl. high-plume stack loss
Gas temperature	ambient to 80 °C	up to 500 °C where the lab exhausts a hot process
Airstream	clean but corrosive — acid / solvent vapour, chlorides	radionuclide / biohazard on application
Construction (corrosion)	FRP-lined / 316L flow path	higher alloy / FRP-rubber-ebonite lining on application
Discharge (plume)	exit velocity ≈15 m/s	bypass-air induced-dilution nozzle on application
Drive power	up to 425 HP	our largest drive delivered to date
Balance quality	ISO 21940 G6.3	G2.5 / G1.0 on application

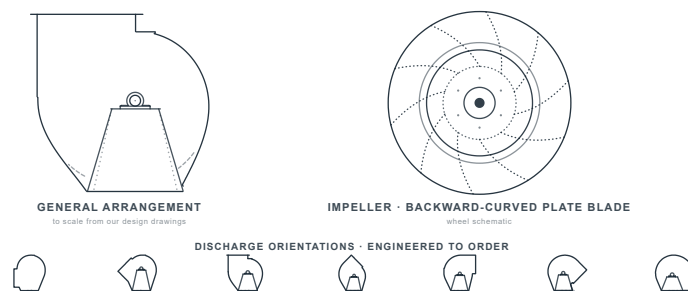


FIG. 1 Representative arrangement — a Jitamitra Backward-Curved Plate fan, the family most often applied to this duty. The exact family and wheel are engineered to your operating point.

Construction & materials

documented on your GA

- **Material of construction** — Flow path matched to the fume: FRP lining for wet acid vapour, 316L or higher alloy for mixed solvent/acid, FRP-rubber-ebonite lining on a steel casing where a full resin build is not viable. Special coatings and gel-coat finishes selected against your stated chemistry — the wetted surface is the whole design here.
- **Containment & leak-tightness** — Purged or double-lip shaft seal, welded and gasket-sealed casing joints, and the fan kept on the negative-pressure side of the plume stack where layout allows. High-containment (radionuclide / biohazard) duty gets a bag-in/bag-out serviceable flow path and a pressure-decay leak test to a stated leakage class.
- **High-plume discharge** — Discharge engineered for exit velocity around 15 m/s and above so the plume clears the roof and downwind intakes; a bypass-air (induced-dilution) nozzle option lifts effective exit velocity and dilutes the plume. The stack pressure loss is built into the fan static, not left for the system to absorb.
- **Pressure-drop, control & redundancy** — Sized to hold constant hood face velocity as sashes open and close across the lab — VFD default so the fan tracks demand and holds capture velocity instead of over- or under-exhausting. N+1 duty/standby with automatic changeover on critical labs, so a single fan trip never drops containment.

How a Jitamitra Lab / fume-hood exhaust fan is specified

AMCA conventions

SPECIFICATION FIELD	OPTIONS
Arrangement (AMCA 99)	Arr. 1 (overhung, fan bearings) / Arr. 4 (direct, motor on base) / Arr. 8 (overhung on common base) / Arr. 9 (overhung, motor side) / Arr. 10 (overhung, motor inside base) — upblast roof mounting is the common lab configuration, selected by drive, access and containment.

SPECIFICATION FIELD	OPTIONS
Width / inlet	SWSI (single width, single inlet) default for lab exhaust; DWDI (double width, double inlet) for higher flow on manifolded multi-hood lab-block extraction.
Wheel type	Backward-curved / backward-inclined (default — clean corrosive air, high efficiency, low noise) / airfoil (large continuous manifolded duty) / plug / plenum (in-line roof-plenum discharge where a scroll is not wanted).
Materials of construction	FRP lining (wet acid vapour) / 316L or higher alloy (mixed solvent / acid) / FRP-rubber-ebonite lining on an MS casing / special coating & gel-coat finish selected against the stated fume chemistry — corrosion resistance is the primary selector, not wear.
Containment scope	Purged or double-lip shaft seal, welded and gasket-sealed casing joints, negative-pressure fan position; on radionuclide / biohazard duty a bag-in/bag-out serviceable flow path and pressure-decay leak test to a stated leakage class.
Discharge / plume scope	High-plume upblast stack engineered for exit velocity ≈ 15 m/s and above; bypass-air (induced-dilution) nozzle option to raise effective exit velocity and dilute the plume clear of downwind intakes; no rain-cap that would suppress the plume.
ATEX scope	Zone 22 self-declared (Cat 3D) per 2014/34/EU where combustible solvent vapour or metal dust is present — non-sparking impeller, bonded earthing, anti-static coatings, T-class bearing control, combined with spark-resistant construction.
Drive	Direct-coupled / V-belt / VFD (default for constant-hood-velocity and sash-tracking control). N+1 duty/standby with automatic changeover on critical labs. Drive up to 425 HP across the envelope.
Accessories & acoustic scope	Bypass-air induced-dilution nozzle; drain and washdown ports on the FRP-lined casing; leak-tight isolation dampers for duty/standby changeover; inlet and outlet silencers with acoustic-lagged casing (down to <75 dB(A)) for rooftop-adjacent occupied space; inspection doors and corrosion-resistant flexible connections.

Where the Lab / fume-hood exhaust runs

PHARMACEUTICALS QC and R&D fume-hood exhaust, solvent-fume extraction, containment-suite and potent-compound lab discharge.	CHEMICALS & PETROCHEMICALS Acid-vapour fume-hood exhaust, corrosive process-lab extraction, high-plume rooftop discharge over dense plant.
SEMICONDUCTOR & ELECTRONICS Wet-bench and acid-etch exhaust, solvent and acid-fume scrubber-inlet fans, FRP-lined flow path for HF and chloride fume.	DEFENCE & NUCLEAR Radionuclide and high-containment lab exhaust, bag-in/bag-out serviceable flow path, pressure-decay leak-tested build.
RESEARCH & ACADEMIC LABS Teaching and research fume-hood manifolds, variable-sash constant-velocity control, low-noise rooftop installation.	BIOTECH & LIFE SCIENCES Biosafety-cabinet and containment-lab exhaust, leak-tight construction, duty/standby N+1 redundancy on critical suites.
SURFACE COATING & PLATING Plating-line and acid-tank fume-hood exhaust — wet corrosive vapour, an FRP coating or lining, high-plume discharge.	YOUR DUTY POINT Send us flow, static pressure and the air / gas condition — we size the wheel to it and quote in 3 to 5 working days — 5 to 7 working days for ATEX and special projects.

Standards & conformity

PERFORMANCE Tested to the IS 4894 / ISO 5801 / AMCA 210 method, in-house on our 200 HP VFD rig. Tested-to-method — not AMCA-certified.	QUALITY SYSTEM ISO 9001:2015 — third-party certified (our only third-party certification).
CE CONFORMITY Self-declared per 2006/42/EC + 2014/35/EU . Not a notified-body certificate.	ATEX CONFORMITY Self-declared, spark-resistant (SR), Zone 2/22 Cat 3 per 2014/34/EU , where area classification requires.
BALANCE & VIBRATION Balance ISO 21940 (G6.3 std, G2.5 on request); fan vibration acceptance ISO 14694 , measurement ISO 14695 .	WELDING & HEAVY DUTY ASME Sec IX welders + WPS; API 673 available as project-specific scope for oil & gas.

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Figures indicate family capability; every fan is engineered to the customer's duty point and confirmed on the approved GA drawing.