



APPLICATION

Quench / tempering air

A quench or tempering-air fan delivers high-velocity, uniform cooling air onto hot metal or glass — hardening steel on a heat-treatment line, tempering a glass sheet, or holding a controlled cooling rate through a recirculating furnace. The air is clean, but the duty is exacting: velocity uniformity across the nozzle bank decides hardness and residual stress, the curve must stay stable as dampers move through the cycle, and on tempering furnaces the return air comes back hot.

Capability envelope

quench / tempering-air service

PARAMETER	STANDARD RANGE	ON APPLICATION
Volume flow	up to 2,25,000 CMH	higher on enquiry
Static pressure	up to 2,000 mmWC	glass-temper plenums typically 600–2,000 mmWC
Air temperature	ambient (fresh-air quench)	up to 400 °C on recirculated tempering return
Static efficiency	high static efficiency	higher on high-efficiency airfoil builds
Sound level	<85 dB(A) @ 1 m	<75 dB(A) with acoustic enclosure
Drive power	up to 425 HP	our largest drive delivered to date
Speed	600–1,800 RPM typical	per duty + sound limits
Balance quality	ISO 21940 G6.3	G2.5 / G1.0 on application

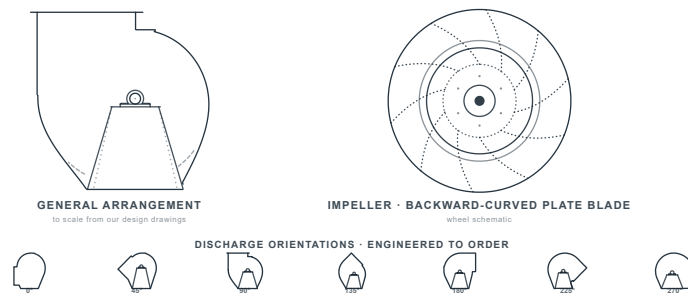


FIG. 1 Representative arrangement — a Jitmitra Backward-Curved Plate fan, the family most often applied to this duty. The exact family and wheel are engineered to your operating point.

Construction & materials

documented on your GA

- **Impeller geometry** — Backward-curved or backward-inclined for a stable, clean outlet profile at high static efficiency on standard duty; airfoil-bladed for higher efficiency on large continuous heat-treat lines where the run hours and the uniformity demand justify it.
- **Outlet & plenum match** — The fan is sized to feed the plenum, not just to hit a duty point — outlet velocity, easé and diffuser matched to the plenum inlet so pressure is even at every nozzle. Where the customer sets the target nozzle velocity, we work back to fan static and flow from it.
- **Control — VFD as default** — Quench cycles need repeatable ramps and setpoint changes between soak, quench and hold. VFD speed control gives that directly and avoids the throttling loss of a damper at part-load; inlet vane dampers remain available for retrofit into an existing control scheme.
- **Hot-return handling** — For recirculating tempering service at 200–400 °C, casing upgraded to IS 2062 or SA 516 Gr 70, shaft sized for thermal growth, bearings selected for sustained 80–100 °C housing temperature, and a heat slinger / cooling disc fitted where the return runs to the top of the band.

How a Jitmitra Quench / tempering air 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) — selected by drive, access and temperature.
Width / inlet	SWSI (single width, single inlet) default for quench duty; DWDI (double width, double inlet) for high flow at moderate pressure on wide nozzle banks.
Wheel type	Backward-curved or backward-inclined (default, stable outlet profile and best efficiency on clean air) / airfoil-bladed (highest-efficiency, large continuous heat-treat lines).

SPECIFICATION FIELD	OPTIONS
Class (by pressure / outlet velocity)	Class I / II / III selected from the duty point on the pressure-vs-outlet-velocity limits; glass-temper high-static duty typically lands at the higher classes for tip speed and pressure.
Materials of construction	Mild steel + epoxy coating (standard, clean-air quench) / stainless steel where humid or corrosive / IS 2062 or SA 516 Gr 70 casing for recirculated tempering heat / aluminium impeller for ATEX Zone 2 where an adjacent process calls for it.
Drive	Direct-coupled / V-belt / VFD (default for cycle ramp and setpoint control). Drive up to 425 HP across the envelope; speed typically 600–1,800 RPM.
Discharge & rotation (AMCA orientation)	Rotation CW or CCW (viewed from drive side) with discharge angle per AMCA — e.g. TH/BH/UB/DB — set to match your plenum take-off and installed footprint.
Accessories & thermal scope	Inlet vane damper or VFD control; easé / diffuser matched to the plenum inlet for even nozzle pressure; heat slinger / cooling disc and expansion joints for recirculated-tempering heat; inlet and outlet silencers with acoustic-lagged casing (down to <75 dB(A)); drain and inspection doors.

Where the Quench / tempering air runs

IRON & STEEL / METALS Air-quench and controlled-cooling fans on strip, bar, wire and plate heat-treatment lines.	FURNACES, OVENS & HEAT TREATMENT Batch and continuous heat-treat lines — air quench, tempering-furnace recirculation, controlled-cooling zones.
GLASS & CERAMICS Flat-glass and container tempering — high-static nozzle-bank blowers for uniform quench stress.	AUTOMOTIVE Component hardening and tempering — gears, shafts, fasteners and forgings on in-line heat-treatment.
FORGING & FASTENER Post-forge cooling and temper-air recirculation on continuous forging and fastener lines.	WIRE & CABLE Patenting-line and controlled-cooling air for wire heat-treatment.
ALUMINIUM & NON-FERROUS Solution-anneal quench and age-hardening cooling air for extrusion and rolled product.	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.