



## APPLICATION

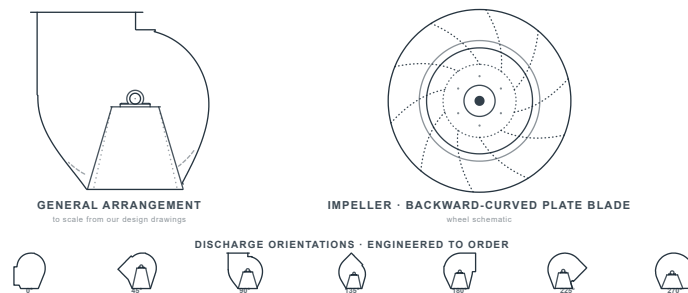
## Clinker / product cooling

A clinker-cooler fan forces large volumes of ambient air up through a bed of hot clinker or product on a grate cooler — quenching it, recovering heat back to the kiln, and dropping the product to a handleable temperature. The air going in is clean, but what comes back down through the grate is dust-laden and abrasive, and the fan sits close enough to the bed to see elevated temperature.

### Capability envelope

clinker / product cooling service

| PARAMETER                  | STANDARD RANGE                                  | ON APPLICATION                                  |
|----------------------------|-------------------------------------------------|-------------------------------------------------|
| Volume flow                | up to 2,25,000 CMH                              | higher on enquiry                               |
| Static pressure            | 300–900 mmWC typical undergrate                 | up to 2,000 mmWC on high-resistance beds        |
| Air / near-bed temperature | ambient inlet; up to 500 °C near-bed rating     | wheel and casing metallurgy chosen for the duty |
| Return dust loading        | re-entrained clinker dust, abrasion-aware build | heavy loading with enhanced wear protection     |
| Static efficiency          | high static efficiency on undergrate duty       | higher on the cleaner high-efficiency builds    |
| 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 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

- **Impeller geometry** — Backward-inclined or backward-curved for the highest static efficiency on the cleaner undergrate duty; radial-tipped where re-entrained clinker dust is heavy and self-cleaning matters more than peak efficiency.
- **Wear protection** — Hard-faced (chrome-carbide) leading edges and AR400 bolted-in wear plates at the volute throat and outlet, with hinged access doors for in-place replacement. Sized to the abrasiveness of the return dust, not a default — clean-air positions upstream of the grate need little of it.
- **Control** — **VFD as default** — Cooling-air demand tracks clinker production rate and bed depth, and each grate compartment wants its own air split. VFD holds airflow per compartment as the bed moves and is our default; inlet vane dampers remain available for legacy grate-cooler retrofit.
- **Temperature handling** — Where the fan runs hot near the bed the inlet air may sit well above ambient — casing upgraded to IS 2062 or SA 516 Gr 70, shaft sized for thermal growth, shaft cooling disc fitted above 400 °C, and bearings selected for sustained 80–100 °C housing temperature.

### How a Jitamitra Clinker / product cooling 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 near-bed temperature. |
| Width / inlet         | SWSI (single width, single inlet) default for undergrate compartment duty; DWDI (double width, double inlet) for high flow at moderate pressure on large single-fan installations.                                                |
| Wheel type            | Backward-inclined or backward-curved (default, best efficiency on the cleaner undergrate air) / radial-tipped self-cleaning (heavy re-entrained clinker dust) / straight-radial (severe grit and build-up).                       |

| SPECIFICATION FIELD                                | OPTIONS                                                                                                                                                                                                                                                                                                                                                               |
|----------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Class (by pressure / outlet velocity)</b>       | Class I / II / III selected from the duty point on the pressure-vs-outlet-velocity limits; higher class = heavier construction for higher pressure and tip speed.                                                                                                                                                                                                     |
| <b>Materials of construction</b>                   | MS with AR400 bolted wear plates (re-entrained clinker dust) / chrome-carbide-faced wheel (severe abrasion) / IS 2062 or SA 516 Gr 70 casing for hot near-bed positions / 304 / 316L SS where the air is humid or corrosive.                                                                                                                                          |
| <b>Drive</b>                                       | Direct-coupled / V-belt / VFD (default for per-compartment airflow control). Drive up to 425 HP across the envelope; speed typically 600–1,800 RPM.                                                                                                                                                                                                                   |
| <b>Discharge &amp; rotation (AMCA orientation)</b> | Rotation CW or CCW (viewed from drive side) with discharge angle per AMCA — e.g. TH/BH/UB/DB — set to match your undergrate duct take-off and installed footprint.                                                                                                                                                                                                    |
| <b>Accessories &amp; wear/thermal scope</b>        | Inlet vane damper or VFD control; bolted-in AR400 wear plates and hinged access doors for in-place replacement; shaft cooling disc (above 400 °C near-bed duty); casing upgrade to IS 2062 or SA 516 Gr 70 for hot positions; expansion joints where the fan sees thermal growth; inlet and outlet silencers with acoustic-lagged casing; drain and inspection doors. |

## Where the Clinker / product cooling runs

|                                                                                                                                             |                                                                                                                                                                                                                   |
|---------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>CEMENT &amp; LIME</b><br>Grate-cooler undergrate fans, clinker-cooler bank fans, clinker-transport and de-dusting air on kiln lines.     | <b>IRON &amp; STEEL / METALS</b><br>Sinter-strand and cooler cooling air, DRI and pellet-cooler air, hot-product cooling on casting and forging lines.                                                            |
| <b>GLASS &amp; CERAMICS</b><br>Cooling and quench air for glass, refractory and ceramic product leaving the kiln or lehr.                   | <b>MINERALS &amp; AGGREGATES</b><br>Cooler air on rotary-kiln lime, alumina and mineral-calcination lines.                                                                                                        |
| <b>FOUNDRY &amp; CASTING</b><br>Sand-cooler and casting-cooling air where the product-laden return air is hot and abrasive.                 | <b>FERTILISER &amp; CHEMICALS</b><br>Granulation and product-cooler air on granular fertiliser and chemical-product lines.                                                                                        |
| <b>POLLUTION CONTROL / APC OEM</b><br>Cooling-air packages supplied to grate-cooler and kiln-line builders — interface documented up front. | <b>YOUR DUTY POINT</b><br>Send us flow, static pressure and the air / gas condition — we size the wheel to it and quote in <b>3 to 5 working days</b> — <b>5 to 7 working days</b> for ATEX and special projects. |

## Standards & conformity

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