

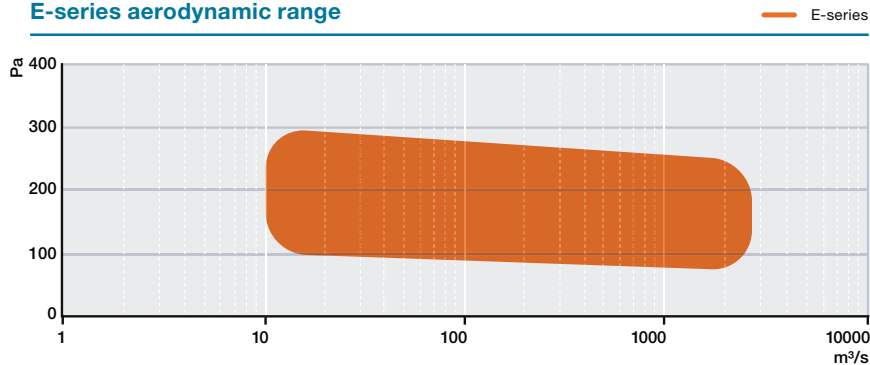
E-series fans

Optimised aerofoil designs for maximum efficiency and low noise performance.



 **E-series fan**
4 feet (1,219mm) to 48 feet (14,630mm)

E-series aerodynamic range



The greatest efficiencies are gained by designing a fan as an integral part of a cooling process rather than as a single device in isolation. By considering the whole system, we can design each fan for its specific situation, and thus optimise overall performance and economy for the operator.

D-series

The D-series covers a range of diameters from 26 to 38 feet (7,925mm to 11,582mm). Designed for horizontal operation, the fan can be fitted with up to 11 blades.

E-series

The E-series extends the size range, with a minimum diameter of 4 feet (1,219mm) and a maximum of 48 feet (14,630mm). The right choice for heavier duty situations, E-series fans can be installed either horizontally or vertically.

Blade profiles

Designed to offer the optimum balance of cost, efficiency and low-noise operation, the D-series is available in a choice of three blade profiles.

The DNF/DNM blade is fitted with Howden Aerotip technology, an innovative design feature that enhances aerodynamic performance while significantly reducing the pressure pulse created by the blade and transmitted to the fan ring.

The DLF/DLM blade profile has been designed to give excellent cooling performance with low noise.

The DVF/DVM blade profile reduces the noise level still further, offering the best acoustic performance of any straight-bladed cooling fan available.

All three are suitable for a wide range of operating temperatures from -20°C to 65°C (-4°F to 149°F) as standard, and this temperature range can be extended on request.

E-series axial fans features

Standard features

- Classic straight aerofoil (ENF), also available for low noise (ELF) and extra low noise applications (ELFA), designed for clockwise rotation in both the horizontal or vertical plane.
- Fan diameters range from 1,219 mm to 14,630 mm (3 ft. to 48 ft.)
- Standard operating temperature range from $-20\text{ }^{\circ}\text{C}$ to $+65\text{ }^{\circ}\text{C}$ ($-4\text{ }^{\circ}\text{F}$ to $+149\text{ }^{\circ}\text{F}$).
- Fibreglass reinforced polyester (FRP) fan blades.
- A mild steel, polyurethane coated, fan hub-plate with aluminium blade supports and stainless steel U-bolts, nuts and washers.

Optional features

- Polyurethane blade leading edge protection for wet cooling tower applications.
- Cast iron, polyurethane coated, coupling flange to suit the mating drive shaft with either a cylindrical bore or a tapered bushing connection.
- Material upgrade for sea water cooling tower applications.

Design advantages

- FRP blade material offers superior damping of mechanical vibrations and of structure borne noise compared with metal blades, prolonging the fan's lifetime.
- E-series blades have an integral shaft. This eliminates concentration of stress at mechanical joints, typical of blades with a bolted on shaft, which is a major cause of fan failures in operation.
- E-series fans can be selected for a wide range of duties, up to a load of 40 HP per blade.
- Howden E-series fans have excellent operating efficiencies, resulting in low power consumption.
- Reliable fan selection data reduces the need to reset the blade tip angle during start up.
- Simple field assembly and individual adjustment of the blade pitch.
- Chemical resistance of FRP blades.



Top: E-series fan
in a 32 ft. cooling tower

Bottom: E-series fan
in a complete fan-unit

Exploded view and part list

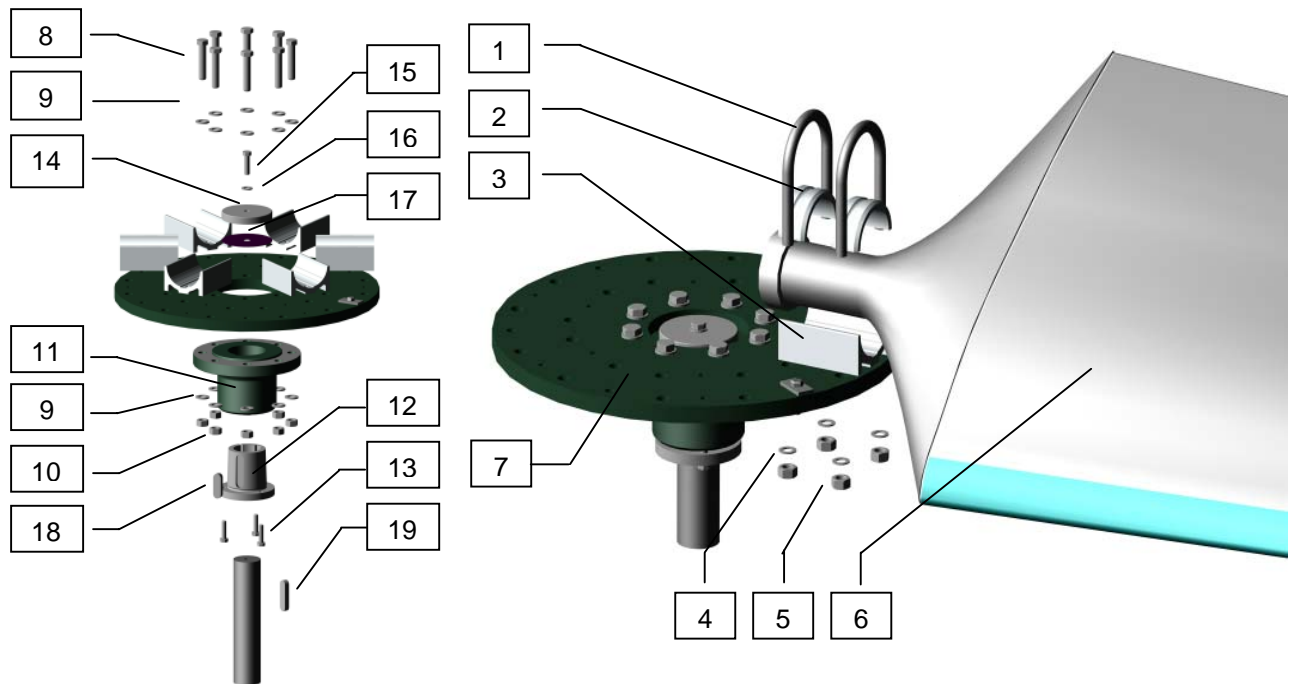


Figure 3

Figure 4

| Item | Description | Material (standard construction) | Quantity |
|------|--------------------------------|---------------------------------------|--------------|
| 1 | U-bolt | Stainless steel AISI 304 | 2 / blade |
| 2 | Upper clamping piece | Aluminium | 2 / blade |
| 3 | Lower clamping piece | Aluminium | 1 / blade |
| 4 | Washer | Stainless steel AISI 304 | 4 / blade |
| 5 | Nut | Stainless steel AISI 304 | 4 / blade |
| 6 | Blade | Fibreglass reinforced polyester | - |
| 7 | Hub plate | Polyurethane coated mild Steel | 1 |
| 8 | Coupling flange bolt | Steel class 8.8 electro-galvanised | 8 |
| 9 | Washer | Electro-galvanised | 16 |
| 10 | Nut | Electro-galvanised | 8 |
| 11 | Coupling flange | Nodular cast iron polyurethane coated | 1 |
| 12 | Split tapered bushing | Manufacturers standard | 1 (optional) |
| 13 | Cap screw | Manufacturers standard | 3 (optional) |
| 14 | Retaining plate | Polyurethane coated mild steel | 1 (optional) |
| 15 | Central bolt M16 or M20 or M24 | Steel class 8.8 electro-galvanised | 1 (optional) |
| 16 | Washer | Electro-galvanised | 1 (optional) |
| 17 | Gasket | Rubber | 1 (optional) |
| 18 | Key | - | 1 (optional) |
| 19 | Key | Not supplied by Howden | |

Table 2