Howden

# Cooling fans for Oil and Gas and Chemical industries


Revolving Around You™

howden.com

# **Ultra-low noise fan** delivering high efficiency with low maintenance

**Howden has been at the forefront of cooling fan technology for over 60 years and continues to innovate through our centre of excellence and R&D facility based in the Netherlands.**

**Our fans lead the way in high efficiency and low noise operation.**

Our manufacturing facilities maintain the highest levels of excellence with modern equipment and strict quality controls accredited to international standards.

With over 50 operational sites globally we have the largest coverage for sales and service. This means we can respond swiftly to our customers' needs in the project stages as well as through the operational lifetime of equipment.


A full test capability based on mechanical, aerodynamic and acoustic criteria ensures confidence in the performance quality of each unit.



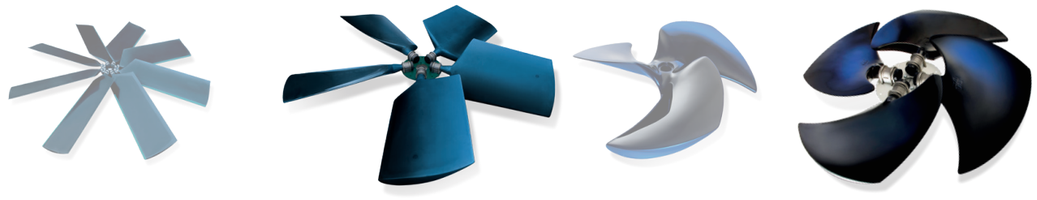
## The need for cooling

**The processing and refining of fossil fuels uses a range of high temperature processes from gas cracking and oil distillation to additional thermal methods to obtain final products.**

In many cases, equipment used within the value chain also generate high levels of heat such as compression within liquefaction or boosting for transportation. All such activities necessitate cooling systems as a result.

These cooling systems typically circulate liquids in order to transfer heat away from the process and incorporate cooling towers, air cooled condensers (ACC) or air cooled heat exchangers (ACHE) acting as condensers.

Howden's fans are used to ensure optimal volumes of air are passed through the cooling tower, ACC or ACHE.



D series | **E series** | FPX series | **SX series**

Fans serving a wide range of cooling needs based on noise, capacity and efficiency requirements

**Low to ultra-low noise performance** enabling reduced footprint or more capacity potential

**High efficiency** with greater flow at lower absorbed power

Single piece fan unit **for ease of installation**

**Large fan range** flexible to all application duties

# High performance configured to each application

**Howden's fans are axial type and designed to meet not only the required flow, but critically operate within the specified noise level permitted on each site, an increasing factor in environmental considerations.**

Our wide range of fans, from 3 ft to 50 ft (1.2m to 15.2m) in diameter, means that all levels of cooling system can be addressed.

Our models have varied profiles to enable customers to match or exceed the noise specification while maximising operating efficiency.

### Key features

- High efficiency
- Compact system design
- Ultra-low noise
- Precise control
- Easy integration
- Low maintenance
- Assured performance
- Wide range

## Applications

### LNG production

There is a high cooling capacity requirement for the liquefaction process. This is typically addressed with Air Cooled Heat Exchangers (ACHE) or potentially a Cooling Tower (CT).

Additional cooling is needed on site for utilities such as power. Howden has experience of supplying fans of a varying sizes and configurations to the meet the demands of these applications.

### Downstream processing

Gas plants, refineries and petrochemical complexes all have cooling requirements linked to heat rejection processes as well as utility cooling.

Process cooling systems can vary with the use of ACHE, CT or even Air Cooled Condensers (ACC). We supply numerous fans to customers for such plants as well as perform enhancements for operators within existing plants.

### Gas compression stations

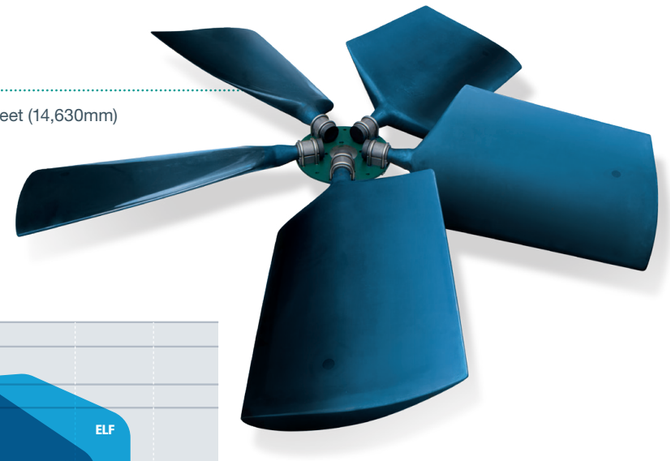
Compression and boosting the pressure of gas for pipeline transmission requires cooling for continued safe operation. Our fans are integrated into ACHEs supporting this application.



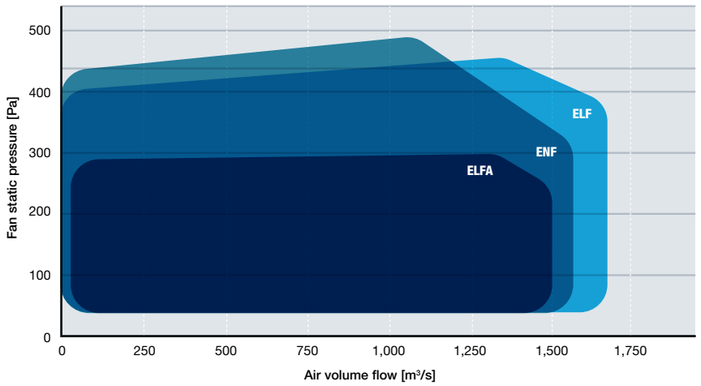
# Product range series

## E series fan

4 feet (1,219mm) to 48 feet (14,630mm)



## E series chart



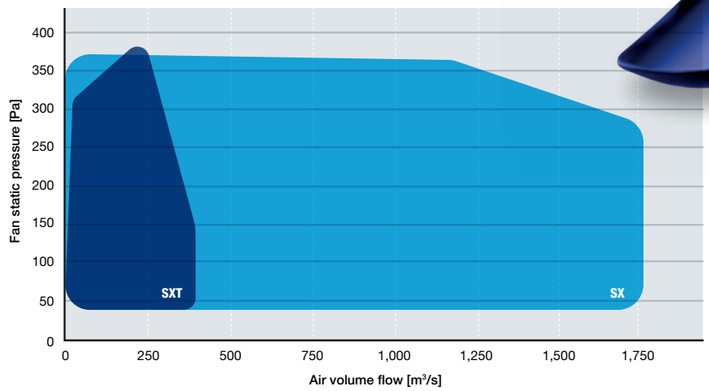

| | E Series | SX Series |
|---|---|---|
| **Manufacture and materials** | Between 3 and 10 blades manufactured with an integral shaft | Between 3 and 8 blades fitted with forward swept curved, adjustable pitch blade profiles on an integral shaft |
| | Three blade profiles (ENF, ELF and ELFA) | Two blade profiles (SX, SXT). SXT models equipped with air seal technology. |
| | Full composite technology - fibreglass reinforced polyester | |
| | Steel or polyester fan housing with bell inlet | |
| | Stiff single piece body | |
| | No components sensitive to corrosion | |
| | ATEX compliant | |
| **Sizing and duties** | Diameters from 48 in (1,219 mm) to 48 ft (15,850 mm) | Diameters from 28 inches (710mm) to 36 feet (10973mm) |
| | Operating temperatures from -20°C to 65°C (-4°F to 149°F) as standard (extendable on request) | |
| | Noise savings over standard fans of up to 10 dB(A) | Noise savings over standard fans of up to 20 dB(A) |
| | Available to 1,650 m³/s and 400 Pa | Available to 1750 m³/sec and 300 Pa |
| **Drive** | Suitable for high power drives up to 350 kW | |
| | Direct, belt or gearbox drives | |
| **Implementation** | Suitable for either vertical or horizontal configurations | |
| | Suitable for dry and wet, induced and forced draft configurations | |



## SX fan

28 inches (710mm) to 36 feet (10,973mm)

## SX series chart




## SXT fan

10 feet (3,048mm) to 18 feet (5,545mm)

Featuring Air Seal Technology which significantly reduces backflow and increases fan efficiency.

## Options

**Available supply options**

- **Impeller only**
- **Impeller with casing**
- **Impeller with casing and motor**

**Additional options**

- **Leading edge protection** - special layer to protect against erosion in wet applications
- **Optimised strength and temperature configurations** to reflect customer performance demands

# Aftermarket services

**Howden has a well-established global aftermarket network providing a permanent presence across every continent**

**With access to specialist engineers, we can bring quick resolutions to unexpected issues minimizing downtime and ensuring reliable long-term performance through expert operation and maintenance (O&M) services.**

Our services in support of our cooling fans range from servicing and parts supply through to performance upgrades and retrofits. The more advanced services can maximise the life of the fans in each system as well as keep their operation aligned to the latest technical parameters.


## Services to maintain reliable operation

- Maintenance and inspections
- Vibration analysis, alignment and balancing
- Spare part supply
- Troubleshooting and commissioning
- Service agreements
- In-house fan blade refurbishments
- On-site FRP fan repair
- Fan Scan

## Howden Uptime

**Howden Uptime gives our customers another option in optimising the performance of our fans throughout their lifetime of operation.**

Howden Uptime provides a unique and innovative platform for gathering, interpreting and analysing fan data on a real time basis.

The constant recording of operating parameters provides insight into the overall health status of the fans and prompts operational adjustments where beneficial to maximise performance.

### Services to improve performance

- Aerodynamic/acoustic measurements, and performance tests
- Upgrades and retrofit

### Services related to projects

- Turnkey installation works
- Supervision and turnkey project execution



Services are delivered either on-site or in our workshops depending on the nature of the service and customer requirement.

# Howden Experience

**Our cooling fans have a long history of supply going back multiple decades with over 50,000 within the oil and gas sector**

## Sample projects

### Golden Pass LNG, USA

The 3 liquefaction trains provide require substantial amounts of cooling along with the onsite power plant. As a result, the site incorporates a large number of coolers and condensers. Environmental interests around the site required noise levels to be kept within stringent boundaries.

Howden proposed multiple variants able to meet the design specification and was able to attend the performance tests in Korea for the system OEM as well as explain the performance of the fan to EPC technical managers.

The contract comprises more than 600 axial cooling fans. The fans selected are the SX model, which provide the ultra-low noise critical to minimising the impact of the LNG operation within the local environment.

### Schwechat Refinery, Austria

After 18 years of operation, the 24-cell cooling tower required the replacement of its rotating equipment, i.e. the 22 ft. diameter fans and drive trains.

The operator has a strict environmental impact policy meaning that revamps must lead to substantial noise reduction. Therefore, an independent acoustic consultant was engaged to provide comparative performance and sound testing between fan options.

The fan options considered were a classic straight bladed fan and the SX series fan with forward swept curved blades from Howden.

The results from this test showed a difference in noise level of 15 dB(A) between the ultra-low noise fan and the classic fan. This justified the required investment to proceed. Further testing carried out after installation and confirmed the low noise levels from various points in the surrounding populated areas.

### Ingolstadt Refinery, Germany

The operator has developed the refinery into one of the most efficient refineries in Europe through continuous investment in asset maintenance.
In line with this approach, the refinery required an improvement in the cooling performance as well as additional noise reduction.

Howden assessed the cooling system and offered a solution based on our E series cooling fan, in particular the ELFA. This was used to replace the air-cooler fans.

The resulting performance provides 30% more air and a 21% increase in plant production. Furthermore, noise output was reduced by 13 dB(A).



**Our customers supply a global market with the fans integrated in their cooling equipment.**

We also serve oil and gas industry operators directly through our aftermarket services.

**Howden**

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