



Howden products and services

High integrity fans, heat exchangers and compressors for key industries which demand the highest levels of efficiency, reliability and availability.

Centrifugal fan



Axial fan



Rotary heat exchanger



Compressor



Cooling fan

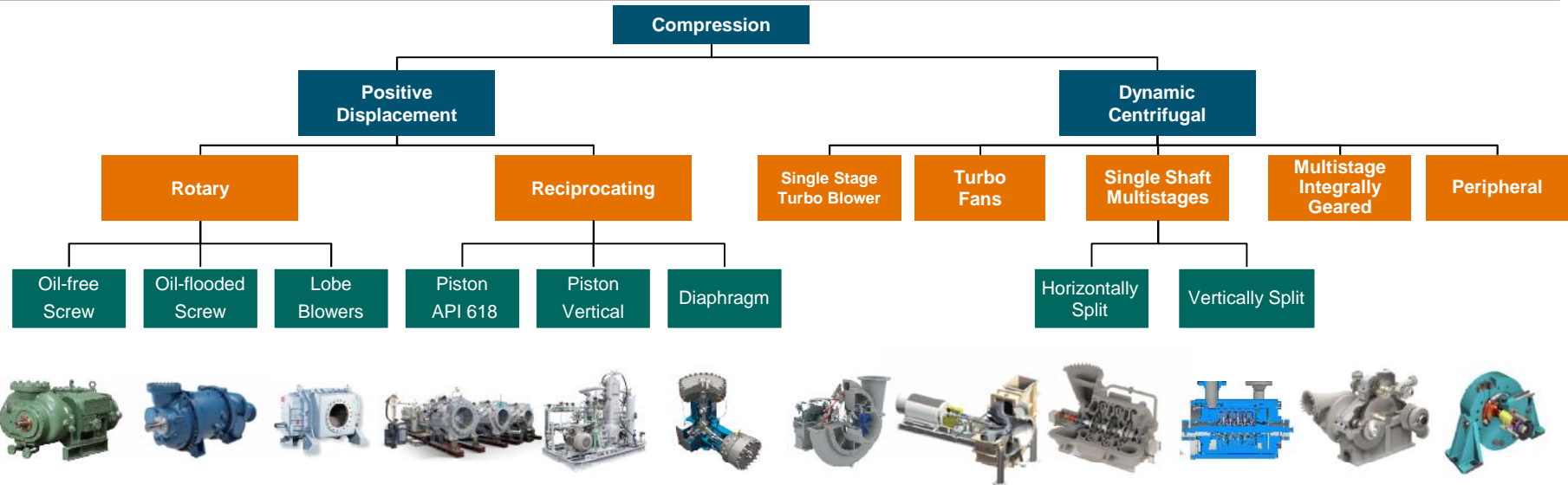


Special and local products



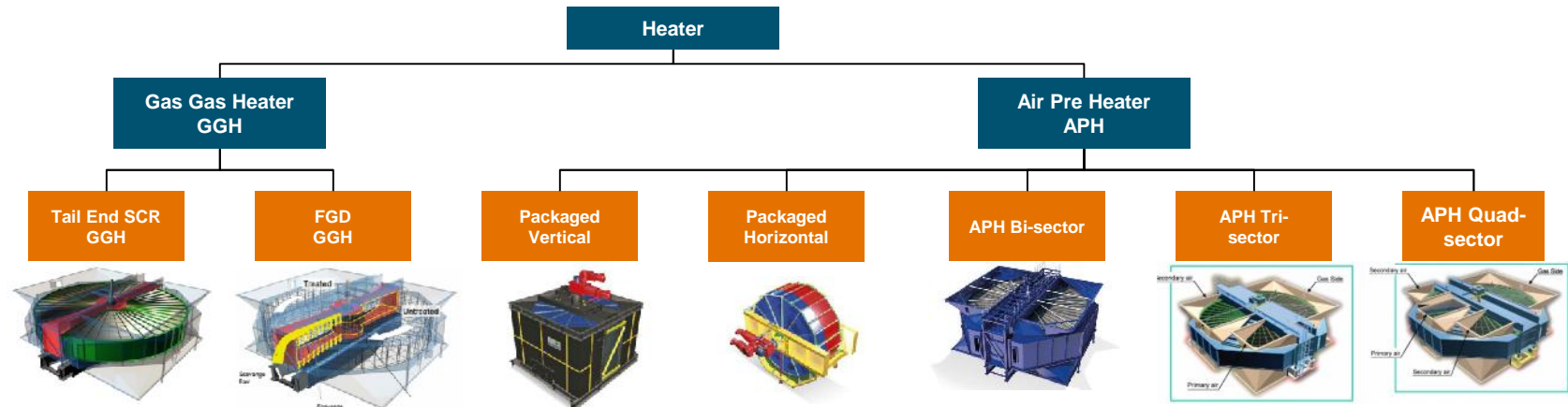
Howden Compressors

Range & Legacy Names



Design	API 619 Standard	API 619 & Standard	Standard	API 618	Standard API 618	Standard API 618	API 617 – 672	Standard API 673	API 617	API 617	API 617	Standard API 617
Flow	16,000 m ³ /hr	28,500 sm ³ /hr	10,710 m ³ /hr (Small) 120,000 m ³ /hr (Large)	34 000 m ³ /hr	1,600 m ³ /hr	1,200 m ³ /hr	353,000 Nm ³ /hr	160 m ³ /sec	480,000 m ³ /hr Roots 340 000 m ³ /hr CKD	22 000 m ³ /hr	130,000 Nm ³ /h	20,000 m ³ /hr
Pressure	15 bar	21 bar XRV 50 bar WRV 75 bar GTV	15 psig (Small) 35 psig (Large) 28" Hg (Vacuum)	600 bar	450 bar	3,000 bar	2.0 bar(g)	1 bar rise	40 bar 5 bar A rise	200 bar	200 bar(a)	350 bar
Other	4,000 kW 15,000 rpm	7.5 MW 5,000 rpm XRV 4500 rpm WRV 3600 rpm GTV	Custom design for higher performance	Lub and Oil free 33 MW 1,800 kN Rod load	Lub and Oil free	1.3MW 750 rpm	5 MW Tip 450 m/s 1 stage	-	2, 3, 4 Stages High efficiency Isothermal construction available	25 MW	1 – 8 Stages Variable speed	Variable Speed 1000-6000 rpm
Brands	Howden	Howden	Roots	Thomassen CKD Burton Corblin	CKD Burton Corblin	Burton Corblin	Howden Roots Donkin	ExVel	CKD Roots	CKD	CKD	Periflow

Performance values are indicative. Consult Howden and get equipment performance based on your specific site operating conditions.



	Tail End SCR GGH	FGD GGH	Packaged Vertical	Packaged Horizontal	APH Bi-sector	APH Tri-sector	APH Quad-sector
Use	<ul style="list-style-type: none"> Power Flue Gas Heating Before Tail End SCR. Iron & Steel Flue Gas Heating Before Tail End SCR in Sinter Plant 	<ul style="list-style-type: none"> Power Flue Gas Reheat after FGD plant. Iron & Steel Flue Gas Reheat after FGD in Sinter Plant 	<ul style="list-style-type: none"> Industry-Iron Steel-Refinery Air for combustion Power (heat recovery) 	<ul style="list-style-type: none"> Industry-Iron Steel-Refinery Air for combustion Power (heat recovery) 	<ul style="list-style-type: none"> Gas & oil fired Coal firing Main & Mill Bio-Gas & Waste (All > 100MW) 	<ul style="list-style-type: none"> Coal fired plant PA & SA streams combined in one heater 	<ul style="list-style-type: none"> Coal fired plant PA at high pressure bounded by SA sectors on each side. Oxy-firing applications with oxygen in the centre
Feature	Very large diameter deep heaters – air heater temperatures with extreme fouling potential. (Usually Single Stream)	Large diameter shallow heaters for highly corrosive environment – sulphuric acid or sulphuric acid + seawater Single Stream	Flue gas mass flow from 50 to 200 Tons/hr	Flue gas mass flow from 50 to 200 Tons/hr	Twin or Single Stream (1000MW & 600MW respectively)	Twin or Single Stream (1000MW & 600MW respectively)	Twin or Single Stream (1000MW & 600MW respectively)
Design	Vertical Cold end at Bottom or at Top	Vertical Cold end at Bottom or at Top Flake Glass lining	Pre-engineered and pre-assembled Vertical	Pre-engineered and pre-assembled. Horizontal	Vertical Up to 37 (24m Dia) Cold end at Bottom Horizontal 28 max (10m Dia)		
Size	Up to 37 (24m Dia)	Up to 37 (24m Dia)	Size Range 15-21.5 (5-10m)	Size Range 15-21.5 (5-10m)	Up to 37 (24m Dia)	Up to 37 (24m Dia)	Up to 37 (24m Dia)
Elements	2 or 3 Deep Tiers of HC Possibly HCP at CE Typical Deep enamelled CE	Single tier of HC / HS8 or possibly HCP All enamelled	1 or 2 tiers of typically HC	1 or 2 tiers of typically HC	2 – 3 tiers of typically HC	2 – 3 tiers of typically HC	2 – 3 tiers of typically HC
Cleaning	Fully or Semi retractable steam sootblowers On-load Cold End HPWW Off-load Hot End LPWW	Fully retractable multi fluid (air or steam and LP & HP water) sootblowers All on-load except LP water	Fully or Semi retractable steam sootblowers Offload LP water fixed pipe	Fully or Semi retractable steam sootblowers. Offload LP water fixed pipe	Fully or Semi retractable steam sootblowers On-load Cold End HP Water Washing (Enerjet) Off-load Hot End LP Water Washing		
Leakage Reduction	Labyrinth multiple seals Actuated HE sectorplates	VN Sealing, Purge and Scavenge Leakage Reduction Systems,	Single or double radial & double axial seals (Non-Actuated)	Single or double radial & double axial seals (Non-Actuated)	Labyrinth multiple seals Optional actuated HE sectorplates		Labyrinth multiple seals Optional actuated HE sectorplates
Fire	Fire Detection & Fighting	None Required	Fire Detection & Fighting (if required)	Fire Detection & Fighting (if required)	Fire Detection & Fighting		
Drive Type	Centre drive system with inverter speed control	Centre drive system with inverter speed control	Central or Peripheral	Central or Peripheral	Centre drive system with inverter speed control		

Howden Heaters

Element Types – Howden Superack Elements® HS, HC Element TM & HCP Element TM



Model	HS6 NF6 HS6e NF6e (Enamelled)	HS7 2.78 DU HS8 2.8 DU HS8e 2.8 DUe (Enamelled)	HS9 9.5/3 CU HS9e 9.5/3 CUe (Enamelled)	HS20 FNC	HC7 Element™ HC9 Element™ HC11 Element™ HC12 Element™ HC15 Element™ HC Element™ Enamelled	HCP Element™
Label	Notched flat (NF)	Double Undulated (DU)	Corrugated Undulated (CU)	Flat Notched Crossed (FNC)	HC	HCP
Use	Cold end applications in APHs	Hot and Cold end APHs & GGHs (2.8DUe) HS7 was main standard element before HC was developed. HS7 cannot be enamelled.	Cold end in APHs Cold end elements in heaters prone to cold end fouling.	Hot and Cold end in APHs particularly gas fired or applications with reduced fouling.	Hot and Cold end APHs & GGHs (enamelled)	Dual profile element combining cold end and intermediate elements profile in a one tier element. Suitable for air preheaters with severe CE fouling and gas-gas heaters
Construction	Combination of notched plate with a flat plate	Combination of notch-undulated with an undulated sheet. HS8 & HS8e have more rounded notches – primarily to enable enamelling.	Combination of a corrugated sheet with an undulated sheet.	Combination of a two notched sheets with the notches crossing over, (no undulations).	Transverse herringbone pattern of undulated sheet paired with a corrugated sheet. The higher the number the larger the corrugations and more cleanable.	Corrugated sheet paired with a sheet with two different profiles. Hot end of the sheet transverse herringbone, CE castellated flats.
Thermal	Low performance	HS8 High performance HS7 marginally higher perf. vs HS8	Medium performance	Highest thermal performance	High performance	High performance (but lower than HC for same depth)
Pressure drop	Minimum pressure drop	HS8 High pressure drop HS7 Little higher drop vs HS8	Medium pressure drop	High pressure drop	High pressure drop	High pressure drop (but lower than HC for same depth)
Fouling Propensity	Totally closed channels in the profile, highly cleanable.	Undulations running in one direction creates cold corner problems and skew flow within each container. This exasperates fouling. However cleanable with steam sootblowing and Enerjet.	Ease of cleaning Corrugation allow penetration of soot blower jets and Enerjet.	No clear path through the elements – not good for high fouling applications.	Eliminates cold corner problems and skew flow within each individual channel, (hydraulically closed). Superior fouling and pluggage resistance – highly cleanable.	Benefits of HC but with an even more cleanable CE for severe CE fouling applications. Even higher cleanability than HC.

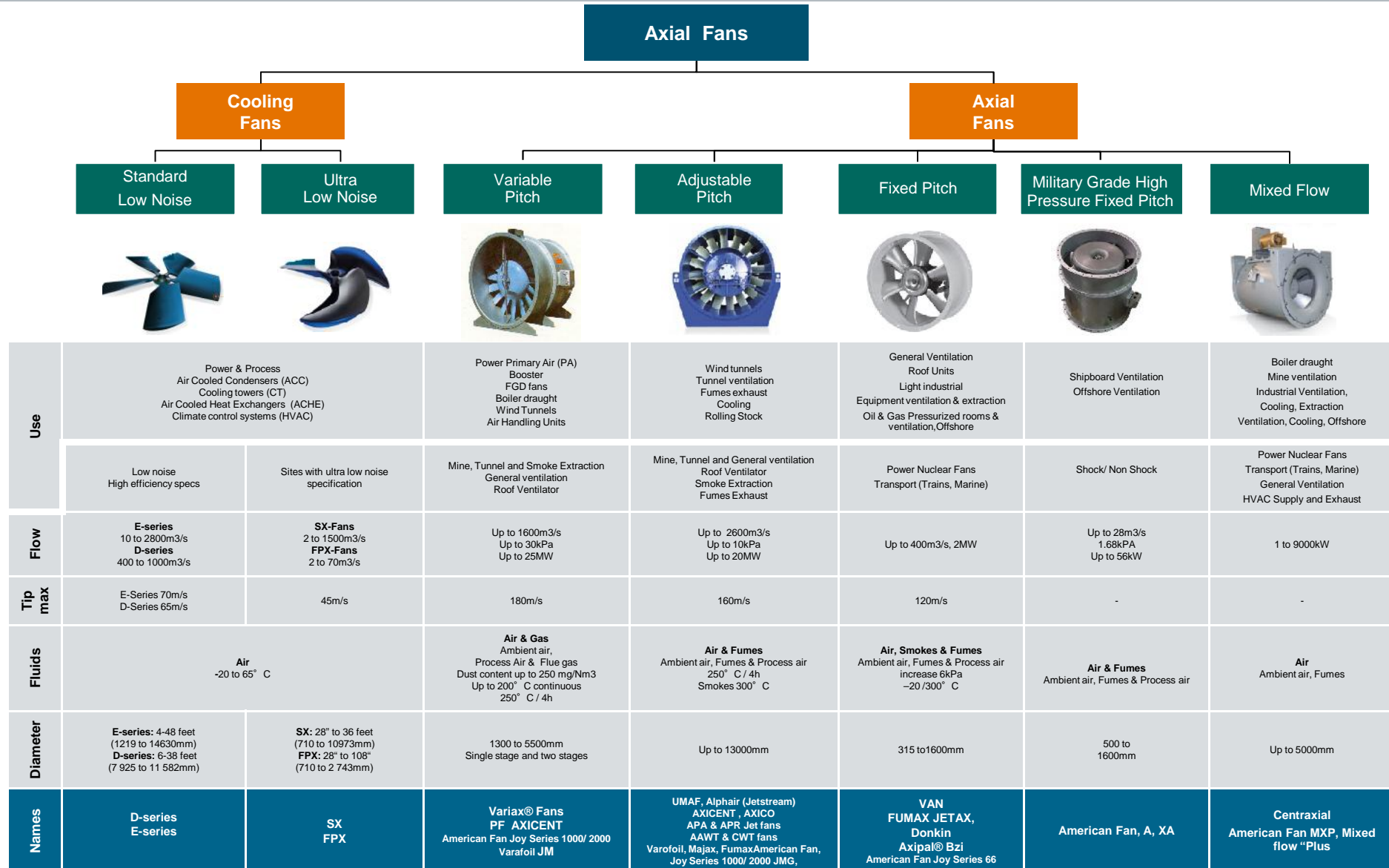
CARBON STEEL - LOW ALLOY CORROSION RESISTANT STEEL (CORTEN) - ENAMEL COATED STEEL
 Enamelled versions for corrosion resistance, also the smooth surface reduces the adhesion of surface deposits and helps their removal.

Howden profiles can perfectly replace any existing profile in the market such as
 2.5 DU, 3.5 NP, 5.5 NP, 3.5 NU, 5.5 NU, UNFoe, AFNC, 12/3 CU, 9.5/3 CU



Howden Fans

Range & Legacy Names



Howden Fans

Range & Legacy Names



Centrifugal Fans

Turbo Fans



Engineered Fans

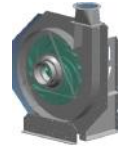
Heavy duty & Core process



Medium duty & Auxiliary Process



Europe Codes & Standards



North America Codes & Standards



General Blowers

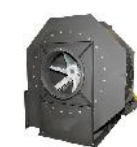


Configured Fans

Plug Fans



Industrial Exhausters



Use	API 673 MVR Chemical	Power and steel Cement Mining Other industries	Construction & Facility Vehicles Navy ships Submarines Rail transportation	All industries ISO/EN /IEC motor	Aeration, Forced draft, Exhaust, Air handling, Process cooling, Clean room, Explosion proof process, General HVAC, Filtration systems AMCA / ASME IEEE / OSHA / NEMA motor	Fume exhaust, General ventilation	Air curtains Dryers Freezers High temperature Kilns, Ovens Product cooling Recirculation Spray booths	Material handling Dust collection Exhaust applications
	Standard	API, ATEX Oil & Gas Petrochemicals	Nuclear Other industries		Air pollution control, Dust collection, Drying applications, Pneumatic conveying, Combustion air, Moisture blow off	All industries ASME IEEE / OSHA / NEMA motor	All industries ASME IEEE / OSHA / NEMA motor	All industries ASME IEEE / OSHA / NEMA motor
Flow	160m ³ /s	Up to 560m ³ /s Up to 50kPa Up to 12MW	Up to 50m ³ /s Up to 25kPa Up to 500kW	Up to 50m ³ /s Up to 25kPa Up to 200kW	Up to 47m ³ /s Up to 100 IWG Up to 300 BHP	Up to 2.3 m ³ /s	Up to 42.4m ³ /s	Up to 18.8m ³ /s
Tip max	277m/s (1000km/h)	260 m/s	130 m/s	130 m/s	122 m/s (400 ft/s)	-	-	-
Fluids	Air 1 bar rise 1 stage construction	Air (Chemicals, Dust, Liquid droplets, Solid particles) Temperature up to 1000° C	Air (Chemicals, Dust, Liquid droplets, Solid particles) Temperature up to 700° C	Air (Chemicals, Dust, Liquid droplets, Solid particles) Temperature up to 350° C	Air (Chemicals, Dust, Liquid droplets, Solid particles) Temperature up to 540° C	Air SMB – Up to 82° C SC - Up to 49° C Up to 1 kPa	Air Up to 1093° C Up to 3kPa	Air Up to 538° C Up to 5.7kPa
Diameter	-	800 to >5000mm	250 to 1600mm	315 to 1600mm as per Eurovent series	203 mm to 1676 mm	96 mm to 381 mm	191 mm to 2384 mm	309 mm to 1461 mm
Names	ExVel	Core Range Technopal Covent, TLT range Rotorique Donkin, VRE	Centripal, Fougai µPal Technopal Carbon Fiber Wheels VR, Donkin	Solyvent Centripal EU	American Fan N OVP BC AVP Turbo Pressure AF Cast Aluminum RB Fan BCS , BCA Backward Inclined	American Fan SC, SMB Donkin BCC/HBC	American Fan , PBCA, PBCS Garden City RF2, FF, PF2 Donkin BCC/HBC	American Fan, IEAH , IEMH Donkin RB/HRB/HPLV