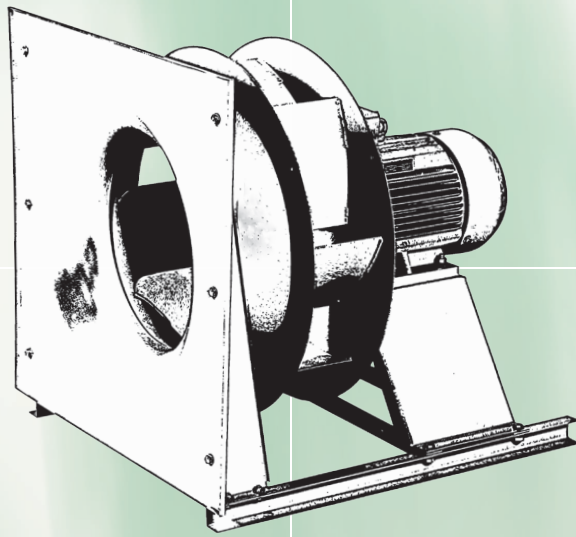


Plug Fans

- Aerofoil Impellers



Air in Motion.
Wolter Fans.

R15.PFA

wolter 

Symbols and technical formula symbols



Symbol	Meaning	Symbol	Meaning	Symbol	Meaning
	5-step transformer control		Speed control switch		Wiring diagram
	Continuously adjustable transformer control		Off-Switch		flame proof
	Continuously adjustable electronic control		Weight		Dimensions
	Motor protection switch		Protection class		Accessories

Symbol	Designation	Unit
A	Cross-section	m ²
C ₂	Flow speed	m/s
C _{400V}	Capacitor	μF
D ₂	Impeller diameter	m
d	Pipe diameter	m
d _g	Equivalent diameter	m
g	Gravitational speed acceleration	m/s ²
I _N	Rated current	A
I _A / I _N	Ratio of starting current to rated current	
ΔI	Current increase in component voltage area	%
l	Pipe or channel length	m
L _{PA}	Sound pressure level A-weighted	dB(A)
L _{WA}	Sound power level A-weighted	dB(A)
L _{WA}	Sound power level to surrounding	dB(A)
L _{WA}	Inlet sound power level induct	dB(A)
L _{WA}	Outlet sound power level induct	dB(A)
L _{WA5}	Inlet sound power level unducted	dB(A)
L _{WA6}	Outlet sound power level unducted	dB(A)
n	Speed	1/min (bzw. 1/s)
P ₁	motor power consumption	kW (bzw. W)
p _s (p _{st})	Static pressure	Pa
Δ p _{st}	Differential static pressure	Pa
Δp _{fa min}	min. required conter pressure	Pa
p _d	Dynamic pressure	Pa
p _{d2}	Dynamic pressure at fan outlet	Pa
Δ p _d	Differential dynamic pressure	Pa
p _t	Total pressure	Pa
Δ p _t	Difference of total pressures	Pa
T	Temperature in Kelvin	K
t	Temperature in Celsius	°C
t _R	max. permissable medium temperature	°C
u ₂	Circumferential speed of the impeller (outside)	m/s
Ṡ	Volume flow	m ³ /h (bzw. m ³ /s)
ρ	Density of medium	kg/m ³
η	Efficiency	-
φ	Volume number	-
ψ	Pressure number	-
ζ	Coefficient of drag	-
λR	Coefficient of friction of channel or pipe	-

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Subject to change without prior notice.

Technical Description

Impeller

The centrifugal plug fan impellers are made of steel with aerofoil blades. The impeller is aerodynamically designed for high efficiency and low power consumption. The maximum tip speed of the impeller is 70m/s. The impellers are optimized for stable performance and low noise and balanced according to G2.5 to DIN ISO 1940/1 or AMCA 204.

The impeller come with either GG-hub or precision-cast-aluminum alloy hub with steel insert for use with taper lock bushes. GG-hub or Precision-cast-aluminum alloy with straight bore hole are also available upon request. The blades are made of powder coated steel.

Inlet Cone

The inlet cone is made of powder coated / GI sheet steel. The inlet cone allows a uniform and stable airflow into the impeller assuring cataloged performance.

Overlap

The overlap distance is determined by empirical and airflow tests which take into account the aerodynamic characteristics of the impeller.

Assembly

The complete assembly consists of the motor, impeller and inlet cone. The mounting base is manufactured from galvanized steel sheet.

Sound levels

In order to make possible an assessment of sound projection adequate to the human ear the A-assessed description of sound levels has been chosen. The ascertaining of the sound power level follows the reverberant room method according to AMCA 300. The sound power levels shown on each performance curve, LwoA, refer to the overall sound power "A-Weighted" levels. The computed sound power levels were converted into A-Weighted levels using adjustments to the octave band spectrum as follows:

Centre Frequency Hz	63	125	250	500	1000	2000	4000	8000
A-Weighted Adjustment	-26.2	-16.1	-8.6	-3.2	0	1.2	1.0	-1.1

The overall sound pressure levels, LpoA, can be calculated from the overall sound power levels as follows:

1) Free Field Conditions: $L_{poA} = L_{woA} - (20 \log_{10} d) - 11$

2) Room Conditions: $L_{poA} = L_{woA} - (20 \log_{10} d) - 7$

Where: d = distance from fan in meters

Performance curves

The performance curves have been established using the inlet test method in the test chamber according to AMCA 210 installation Type A (free inlet, free outlet).

The curves indicate as a function of the volume flow:

▶ the static pressure increase p_s for constant speed (heave black lines)

▶ constant lines of shaft power P_w (red Lines)

▶ constant lines of sound power level LwoA (blue lines)

All values relate to an air density: $\rho = 1,2 \text{ kg/m}^3 \text{ at } 20^\circ\text{C}$

The dynamic pressure p_{d2} and the flow speed c_2 respectively stated in the diagrams refer to the outlet of impeller.

Delivery Options

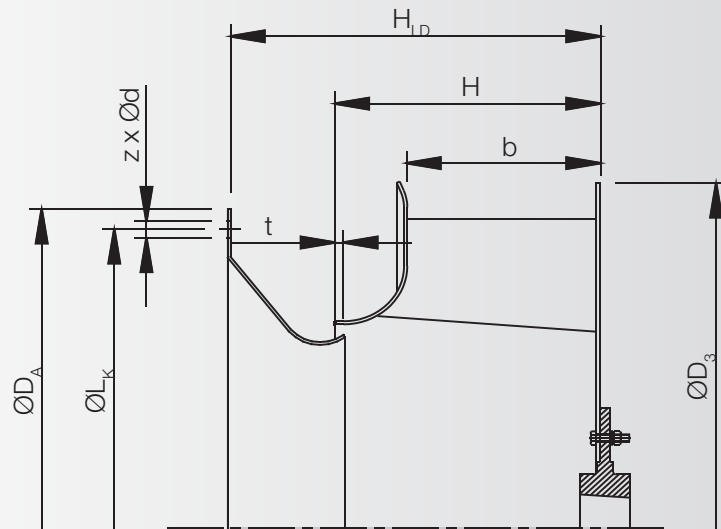
There are 3 different options:

- Impeller with inlet cone
- Impeller with inlet cone + Mounting assembly
- Impeller with inlet cone + Mounting assembly + Motor

Accessories

The following accessories are available:

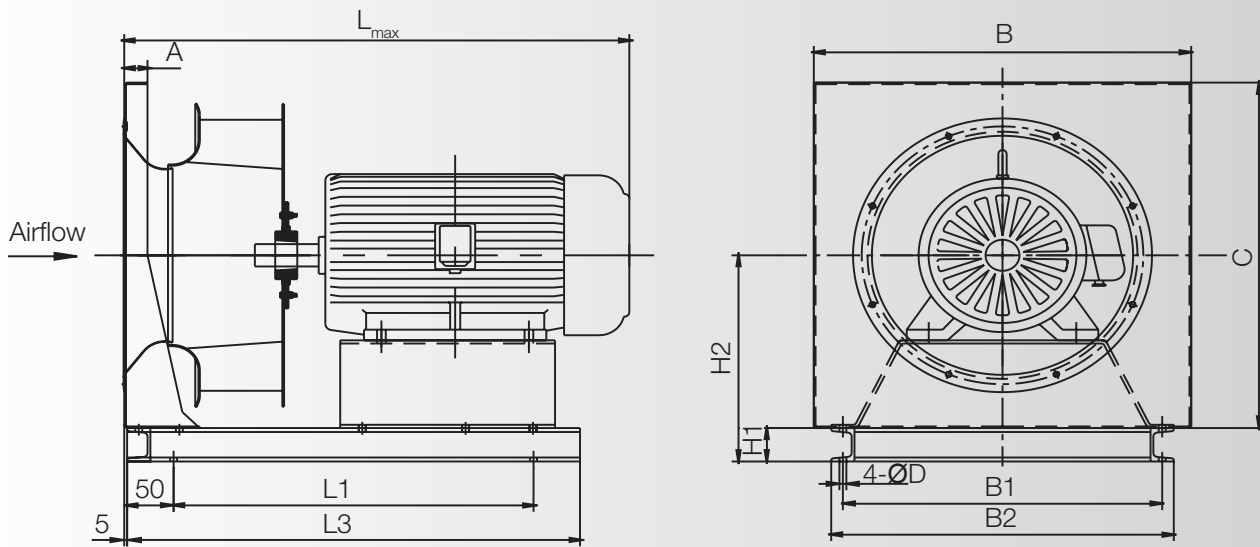
- Elastic Flexible connectors
- Damper
- Adjustable sliding (mechanical type) for air volume regulation and control
- Acoustic or single skin enclosure



Size	b [mm]	H [mm]	ØD _A [mm]	ØD ₃ [mm]	ØL _k [mm]	t [mm]	z x Ød [mm]	H _{LD} [mm]	n _{max} [1/min]
280	84	117	300	323	280	4	6 x 7	169	4840
315	92	126	355	360	325	5	6 x 7	178	4140
355	103	144	383	406	344	6	6 x 7	196	3720
400	116	160	423	456	386	7	6 x 7	220	3300
450	131	179	466	512	432	7	6 x 7	243	3000
500	145	200	515	570	485	8	8 x 9	277	2600
560	164	229	570	640	544	8	8 x 9	314	2340
630	184	253	635	720	605	9	8 x 9	353	2120
710	206	283	700	810	670	10	8 x 9	394	1830
800	233	320	778	912	750	12	12 x 12	447	1630
900	260	357	875	1023	844	14	12 x 12	503	1490
1000	291	400	980	1120	945	16	12 x 12	561	1320
1120	326	448	1044	1254	1080	16	12 x 12	639	1250
1250	366	502	1220	1400	1180	18	14 x 14	696	1130
1400	411	564	1360	1568	1310	18	14 x 14	796	1060

Note: We reserve the right to alter measurements without notice in case of technical improvements.

Dimensions



Size	A [mm]	B [mm]	B1 [mm]	B2 [mm]	C [mm]	D [mm]	H1 [mm]	H2 [mm]	L _{max.} [mm]	L1 [mm]	L3 [mm]	Mtr Frm Size
280	35	396	310	346	473	14	50	275	605	360	465	71-100
315	35	440	360	396	523	14	50	303	615	360	465	71-112
355	35	480	400	436	569	14	50	329	635	300 380	425 505	71-80 90-112
400	35	520	450	486	624	14	50	364	755	400 500	525 625	80-112 132
450	35	590	510	546	697	14	50	402	780	400 500	525 625	90-112 132
500	40	650	550	590	778	14	63	453	950	440 620	605 785	90-112 132-160
560	40	720	610	650	878	14	63	518	990	460 660	625 825	90-112 132-160
630	45	800	685	725	975	14	63	575	1025	510 700	675 865	112 132-160
710	50	880	770	810	1116	18	80	676	1125	600 740	805 945	112-132 160-180
800	50	1000	850	890	1250	18	80	750	1180	650 800	860 1010	132 160-180
900	50	1120	960	1000	1393	18	80	833	1240	700 900	910 1110	132 160-180
1000	50	1250	1080	1120	1536	18	80	911	1365	1000	1210	160-200
1120	60	1400	1210	1250	1864	18	100	1032	1650	1200 1400	1410 1610	200-225 250-280
1250	60	1560	1360	1400	2078	18	100	1139	1800	1300 1500	1510 1710	225-250 280-315
1400	60	1750	1500	1540	2330	18	100	1265	1950	1400 1600	1610 1810	250 280-315

Note: We reserve the right to alter measurements without notice in case of technical improvements.

AMCA - FEG Rating

Fan Efficiency Grade: PFA Series



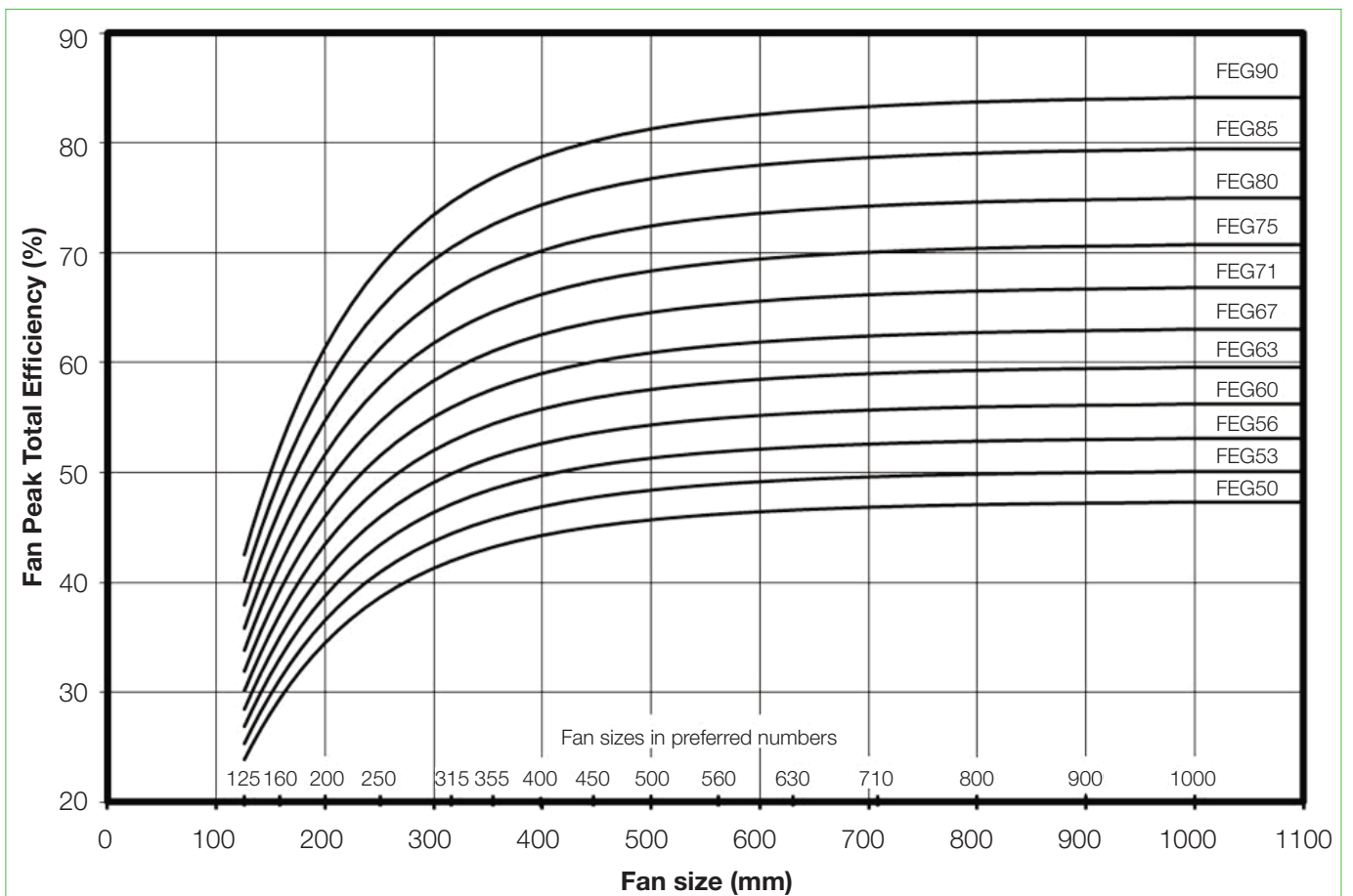
Dongguan Wolter Chemco Ventilation Ltd. certifies that the Series PFA shown herein are licensed to bear the AMCA Seal. The ratings shown are based on tests and procedures performed in accordance with AMCA Publication 211 and AMCA Publication 311 and comply with the requirements of the AMCA Certified Ratings Program.



Certified FEGs are determined in accordance with AMCA 205 Energy Efficiency Classification for fans. In conjunction with AMCA 211 Certified Ratings Program, Product Rating Manual for Fan Air Performance. This classification is based on total peak, or optimum, fan efficiency for a given fan speed, impeller diameter and test application category (test configuration). For the purpose of energy classification, the peak efficiency shall be determined at a speed that is lower than the fan's maximum design speed.

The AMCA Certified Ratings Seal applies to the Fan Efficiency Grade (FEG) for PFA series Inline Centrifugal Plug Fan model PFA 280 to PFA 1400 as shown in the table below.

Fan Model No.	Max. Fan Speed (rpm)	Fan Outlet Area (m ²)	Fan Efficiency Grade (FEG)	Fan Model No.	Max. Fan Speed (rpm)	Fan Outlet Area (m ²)	Fan Efficiency Grade (FEG)
PFA 280	4840	0.0735	85	PFA 710	1830	0.4544	80
PFA 315	4140	0.0929	85	PFA 800	1630	0.5748	80
PFA 355	3720	0.1163	90	PFA 900	1490	0.7250	80
PFA 400	3300	0.1474	80	PFA 1000	1320	0.8859	80
PFA 450	3000	0.1856	85	PFA 1120	1250	1.1119	80
PFA 500	2600	0.2266	85	PFA 1250	1130	1.3862	80
PFA 560	2340	0.2855	80	PFA 1400	1060	1.7373	80
PFA 630	2120	0.3608	80				





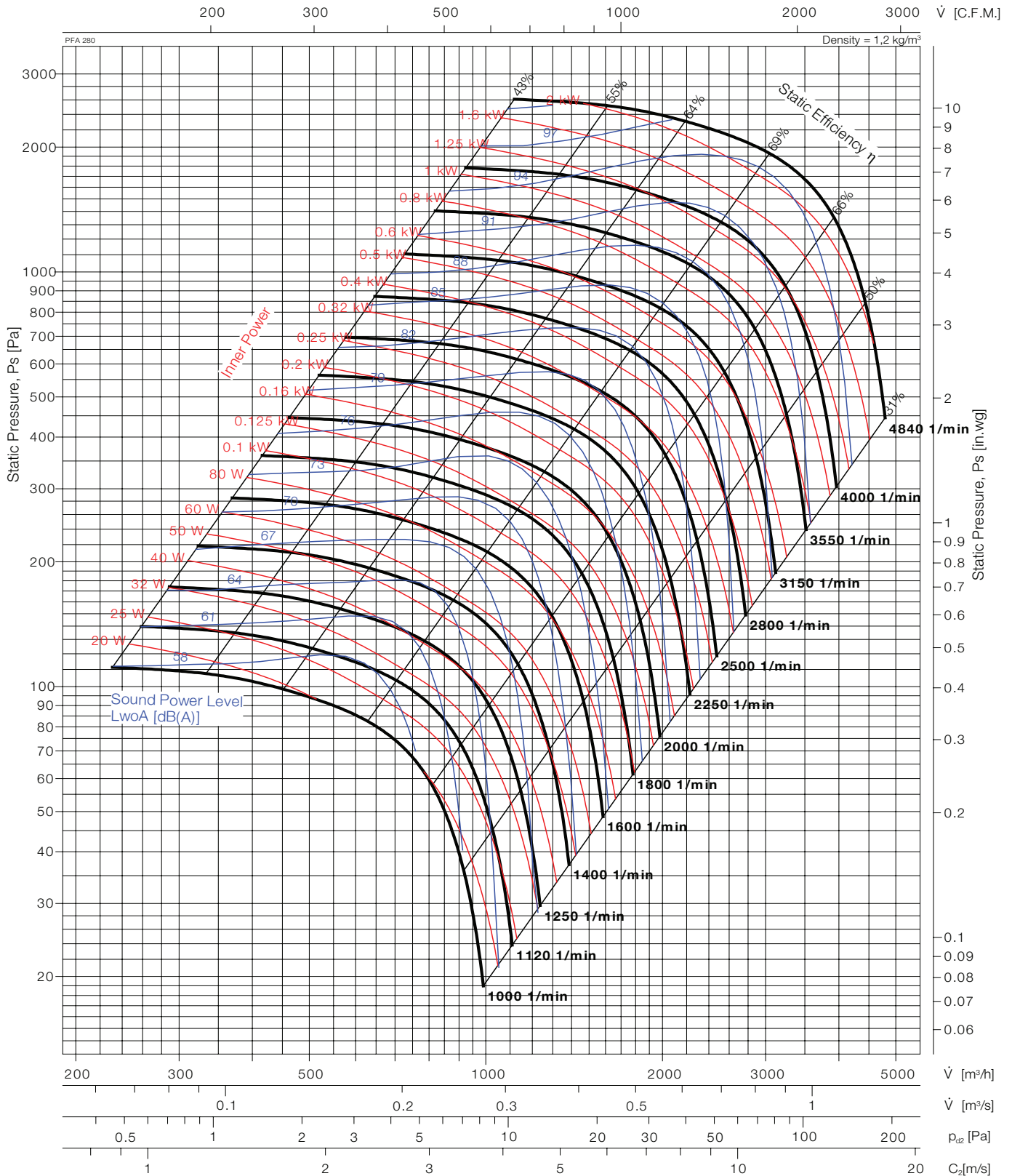
Performance Curve

PFA 280



Fan test laboratory AMCA 210 Test Chamber. Performance certified is for installation type A-Free inlet, Free outlet with partition. Performance ratings do not include the effects of apertures (accessories).

The A-weighted sound ratings shown have been calculated per AMCA International Standard 301. Values shown are for outlet L_woA sound power levels for installation Type A: Free inlet, Free outlet with partition.



Typ	Art.Nr.	█ [kg]	Typ	Art.Nr.	█ [kg]	Wheel diameter	D =	289	mm
PFA 280		30				Number of blades	z =	6	
						Outlet Area	A =	0.0735	m ²
						Moment of inertia	J =	0.056	kg·m ²
						Speed limit	n _{max} =	4840	1/min

Explanation of symbols see page II



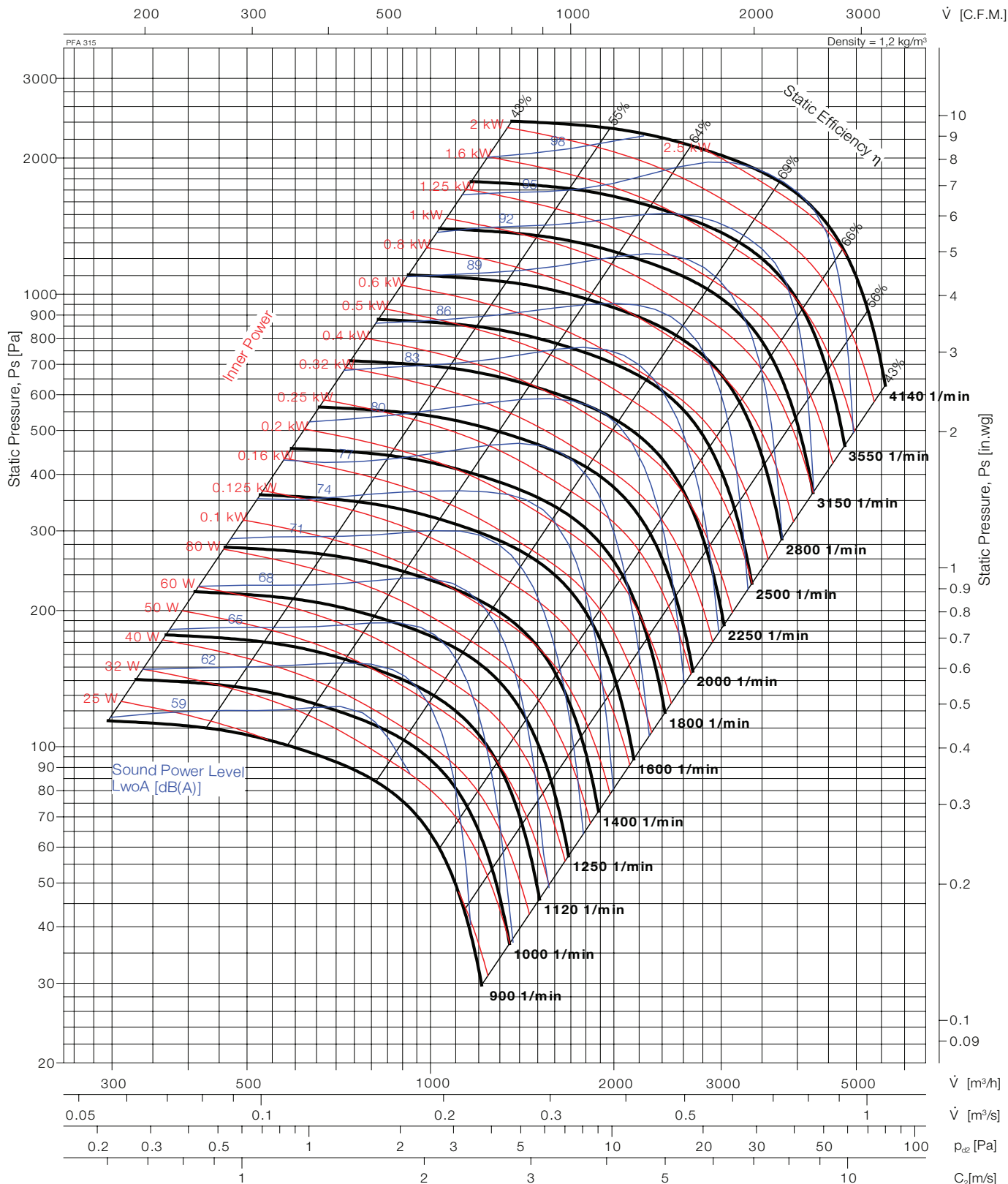
Performance Curve

PFA 315



Fan test laboratory AMCA 210 Test Chamber. Performance certified is for installation type A-Free inlet, Free outlet with partition. Performance ratings do not include the effects of appurtenances (accessories).

The A-weighted sound ratings shown have been calculated per AMCA International Standard 301. Values shown are for outlet LwoA sound power levels for installation Type A: Free inlet, Free outlet with partition.



Typ	Art.Nr.	█ [kg]	Typ	Art.Nr.	█ [kg]	Wheel diameter D = 325 mm	
PFA 315		40				Number of blades z = 6	
						Outlet Area A = 0,0929 m²	
						Moment of inertia J = 0.076 kg·m²	
						Speed limit n_{max} = 4140 1/min	

Explanation of symbols see page II



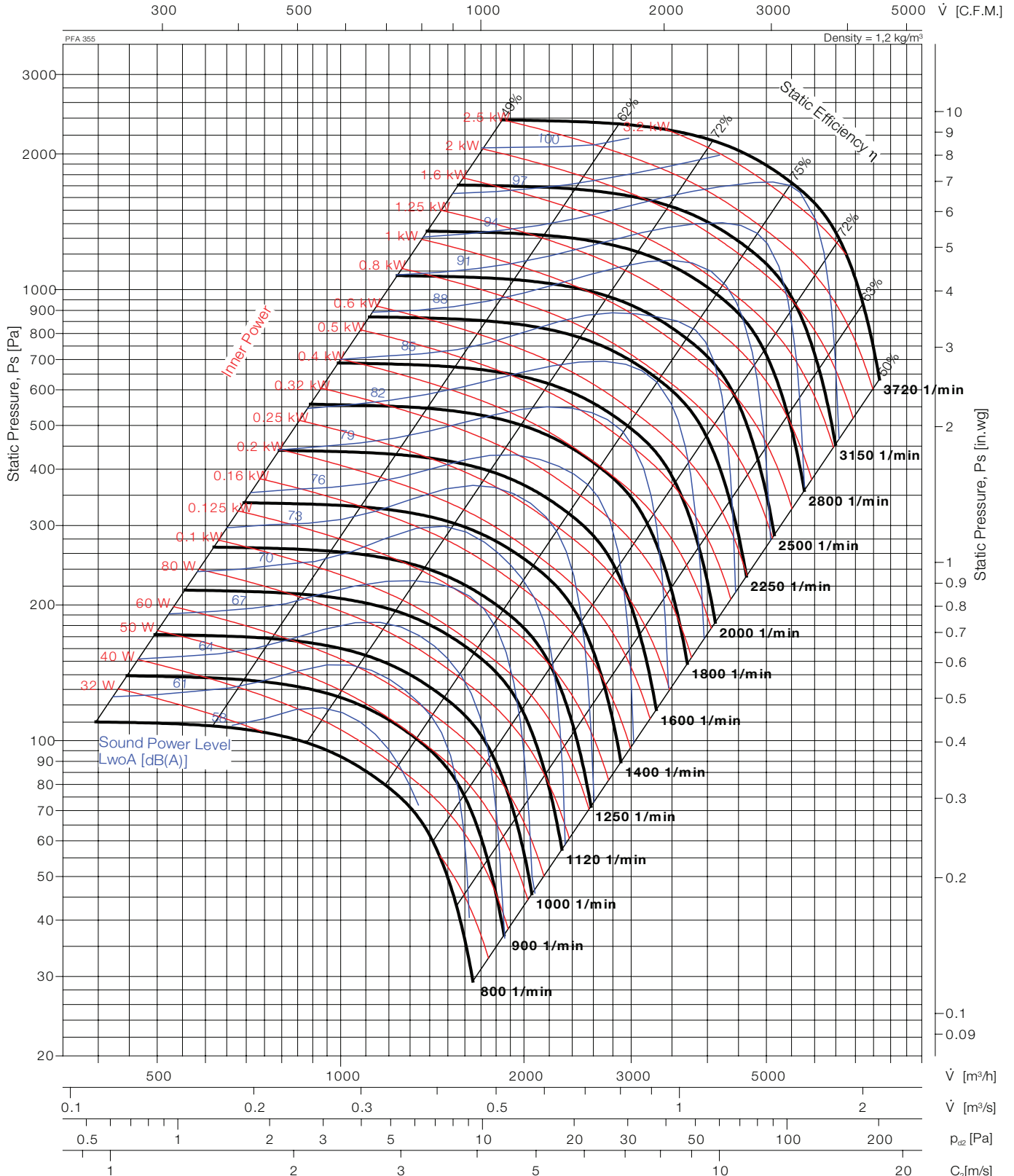
Performance Curve

PFA 355



Fan test laboratory AMCA 210 Test Chamber. Performance certified is for installation type A-Free inlet, Free outlet with partition. Performance ratings do not include the effects of apurtenances (accessories).

The A-weighted sound ratings shown have been calculated per AMCA International Standard 301. Values shown are for outlet LwoA sound power levels for installation Type A: Free inlet, Free outlet with partition.



Typ	Art.Nr.	█ [kg]	Typ	Art.Nr.	█ [kg]	Wheel diameter	D =	363	mm
PFA 355		45				Number of blades	z =	6	
						Outlet Area	A =	0.1163	m²
						Moment of inertia	J =	0.136	kg·m²
						Speed limit	n _{max} =	3720	1/min

Explanation of symbols see page II



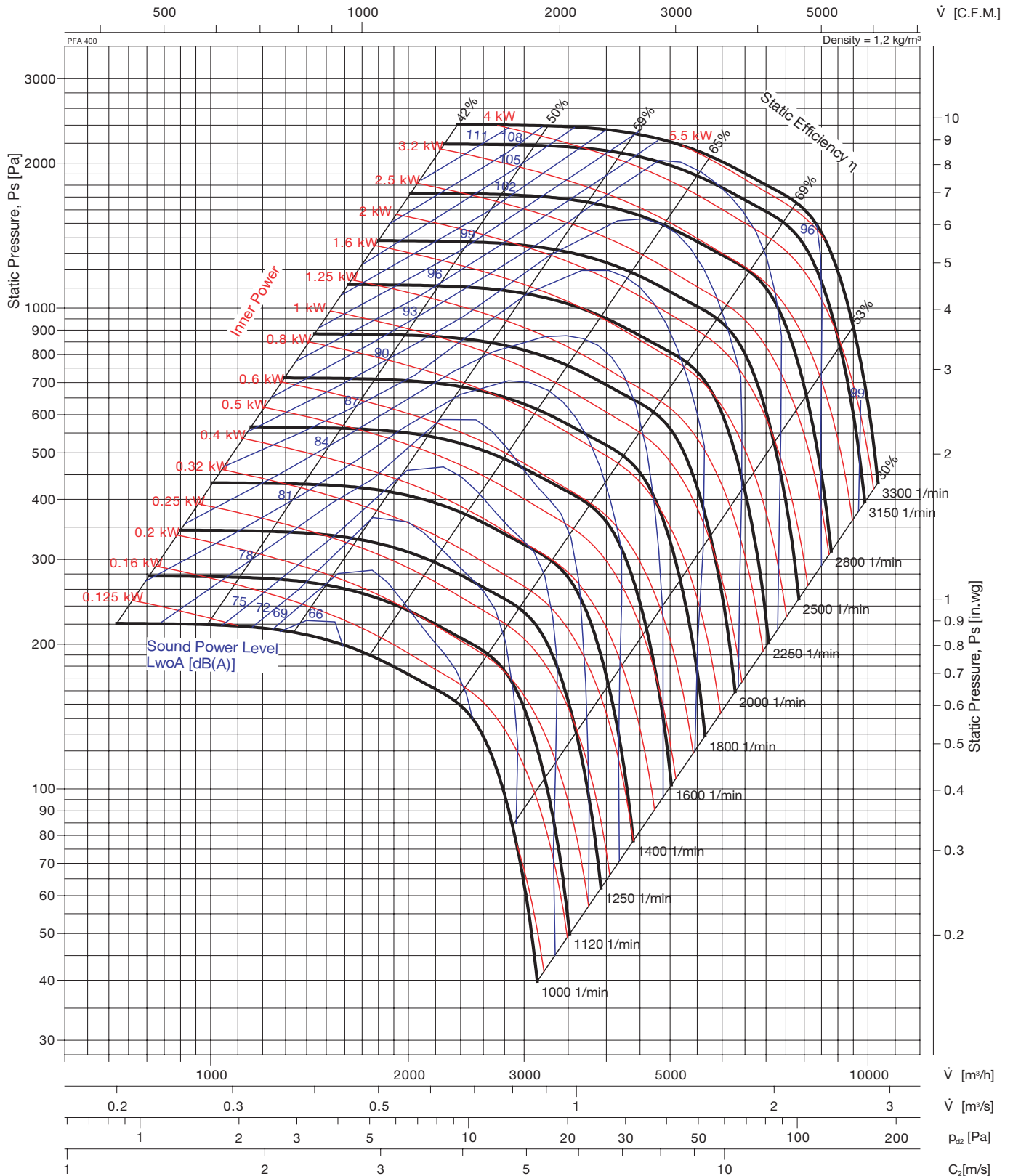
Performance Curve

PFA 400



Fan test laboratory AMCA 210 Test Chamber. Performance certified is for installation type A-Free inlet, Free outlet with partition. Performance ratings do not include the effects of appurtenances (accessories).

The A-weighted sound ratings shown have been calculated per AMCA International Standard 301. Values shown are for outlet LwoA sound power levels for installation Type A: Free inlet, Free outlet with partition.



Typ	Art.Nr.	█ [kg]	Typ	Art.Nr.	█ [kg]	Wheel diameter D = 396 mm	
PFA 400		55				Number of blades z = 6	
						Outlet Area A = 0.168 m ²	
						Moment of inertia J = 0.208 kg·m ²	
						Speed limit n_{max} = 3300 1/min	

Explanation of symbols see page II



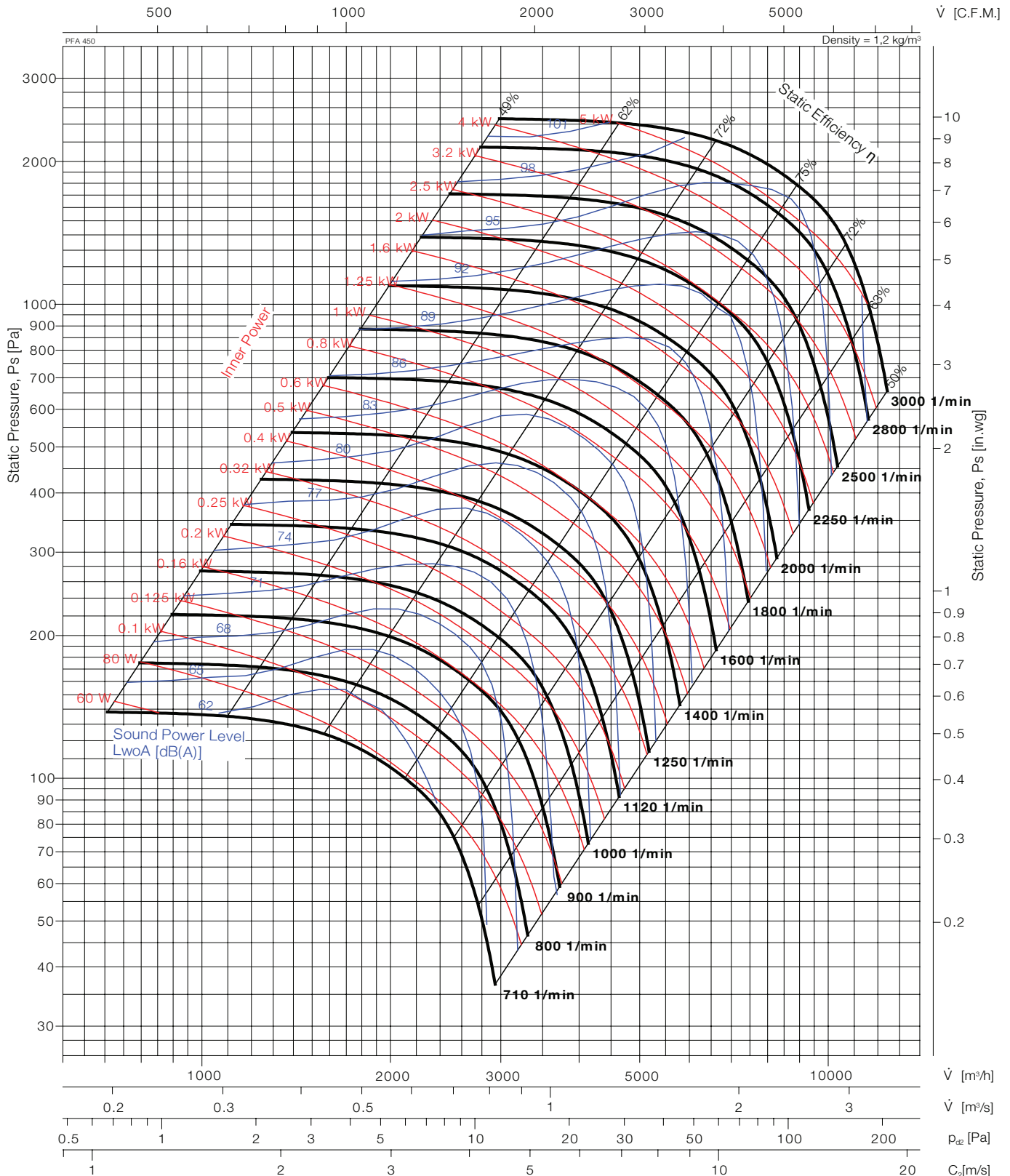
Performance Curve

PFA 450



Fan test laboratory AMCA 210 Test Chamber. Performance certified is for installation type A-Free inlet, Free outlet with partition. Performance ratings do not include the effects of apurtenances (accessories).

The A-weighted sound ratings shown have been calculated per AMCA International Standard 301. Values shown are for outlet LwoA sound power levels for installation Type A: Free inlet, Free outlet with partition.

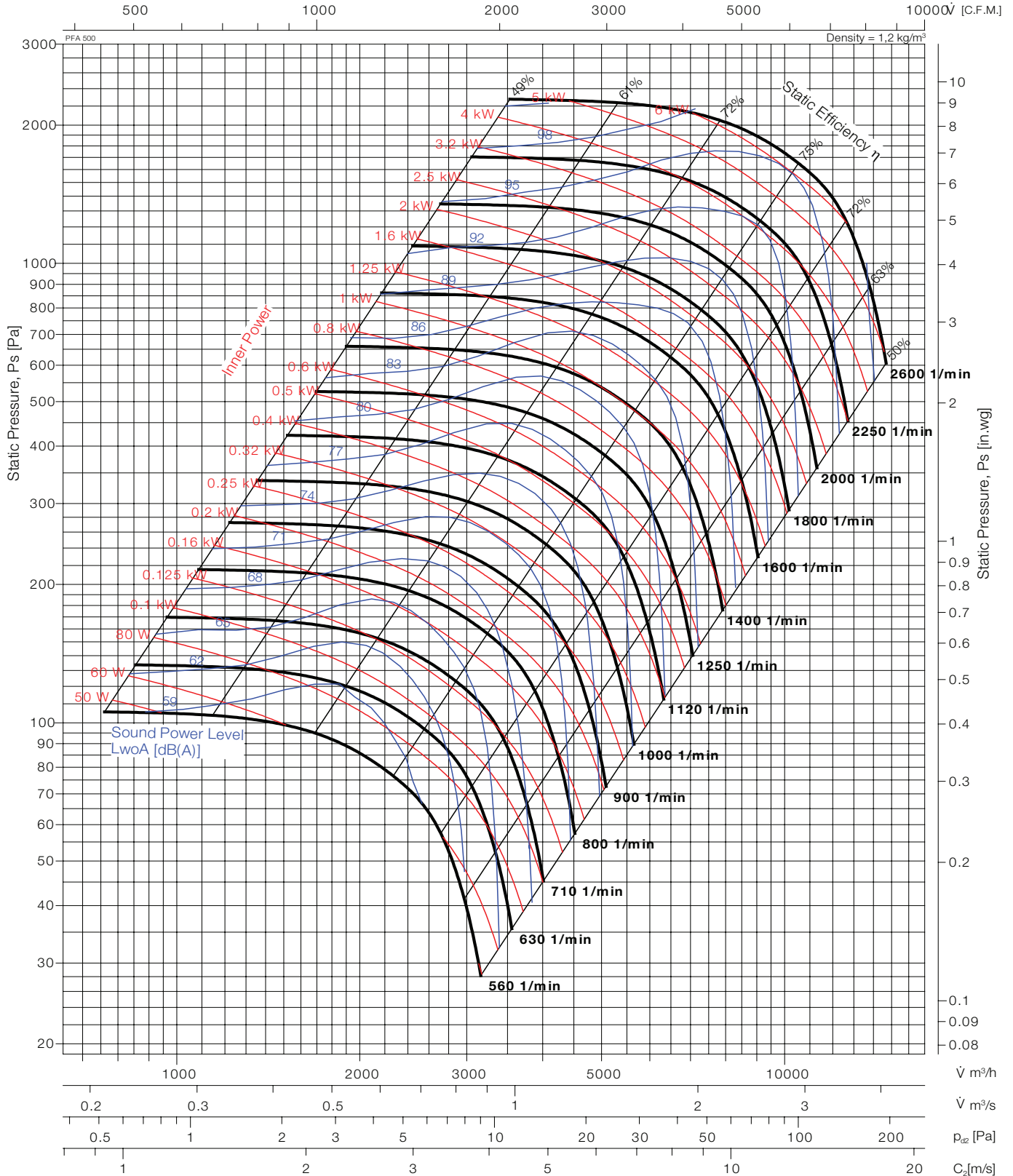


Typ	Art.Nr.	█ [kg]	Typ	Art.Nr.	█ [kg]	Wheel diameter	D =	458	mm
PFA 450		65				Number of blades	z =	6	
						Outlet Area	A =	0.1856	m²
						Moment of inertia	J =	0.393	kg·m²
						Speed limit	n _{max} =	3000	1/min

Explanation of symbols see page II

Fan test laboratory AMCA 210 Test Chamber. Performance certified is for installation type A-Free inlet, Free outlet with partition. Performance ratings do not include the effects of appurtenances (accessories).

The A-weighted sound ratings shown have been calculated per AMCA International Standard 301. Values shown are for outlet L_{woA} sound power levels for installation Type A: Free inlet, Free outlet with partition.



Typ	Art.Nr.	⚖ [kg]	Typ	Art.Nr.	⚖ [kg]		
PFA 500		80				Wheel diameter	D = 508 mm
						Number of blades	z = 6
						Outlet Area	A = 0.2266 m ²
						Moment of inertia	J = 0.567 kg·m ²
						Speed limit	n_{max} = 2600 1/min

Explanation of symbols see page II



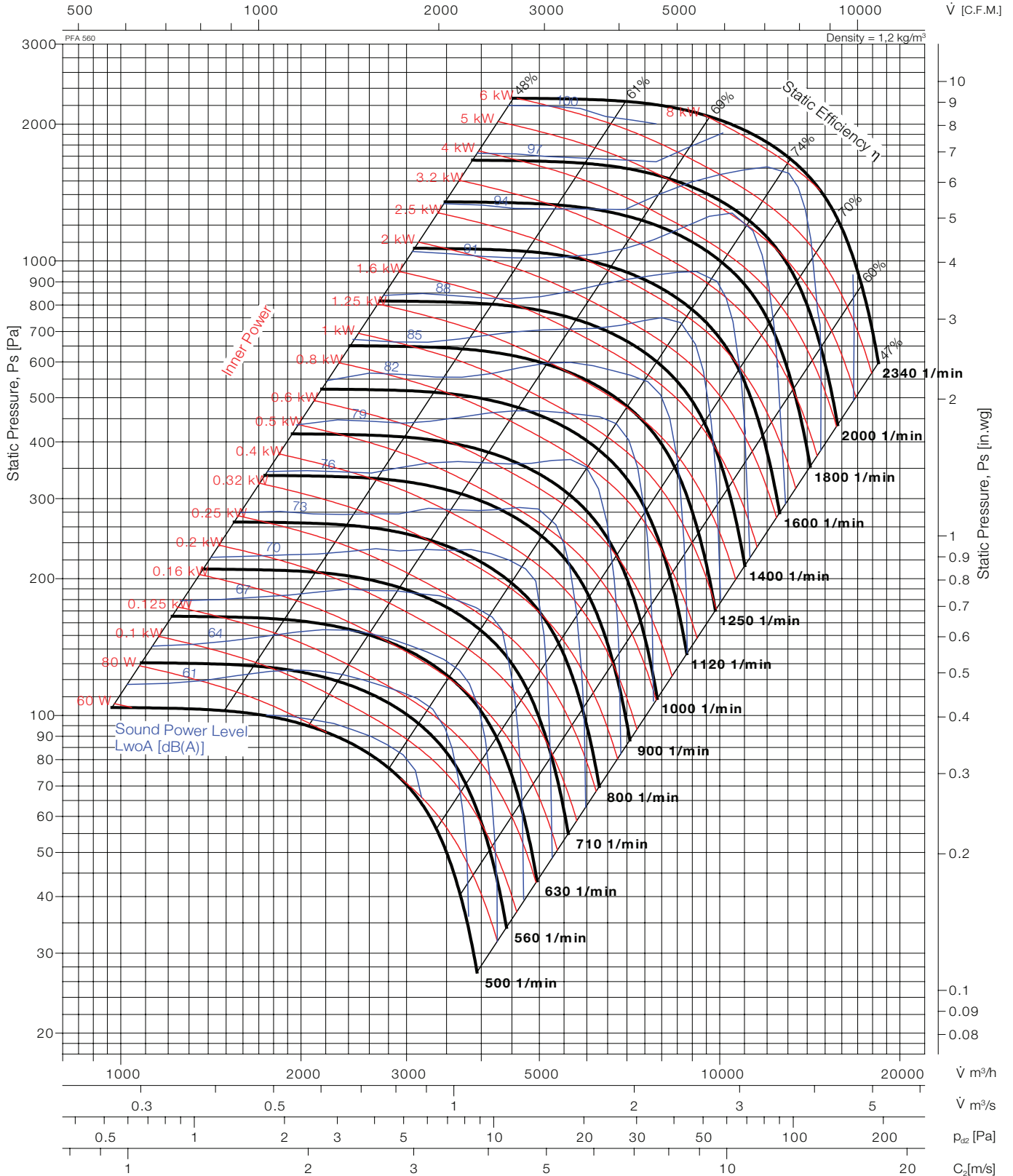
Performance Curve

PFA 560



Fan test laboratory AMCA 210 Test Chamber. Performance certified is for installation type A-Free inlet, Free outlet with partition. Performance ratings do not include the effects of apurtenances (accessories).

The A-weighted sound ratings shown have been calculated per AMCA International Standard 301. Values shown are for outlet LwoA sound power levels for installation Type A: Free inlet, Free outlet with partition.



Typ	Art.Nr.	█ [kg]	Typ	Art.Nr.	█ [kg]	Wheel diameter	D =	568	mm
PFA 560		90				Number of blades	z =	6	
						Outlet Area	A =	0.2855	m²
						Moment of inertia	J =	0.992	kg·m²
						Speed limit	n _{max} =	2340	1/min

Explanation of symbols see page II



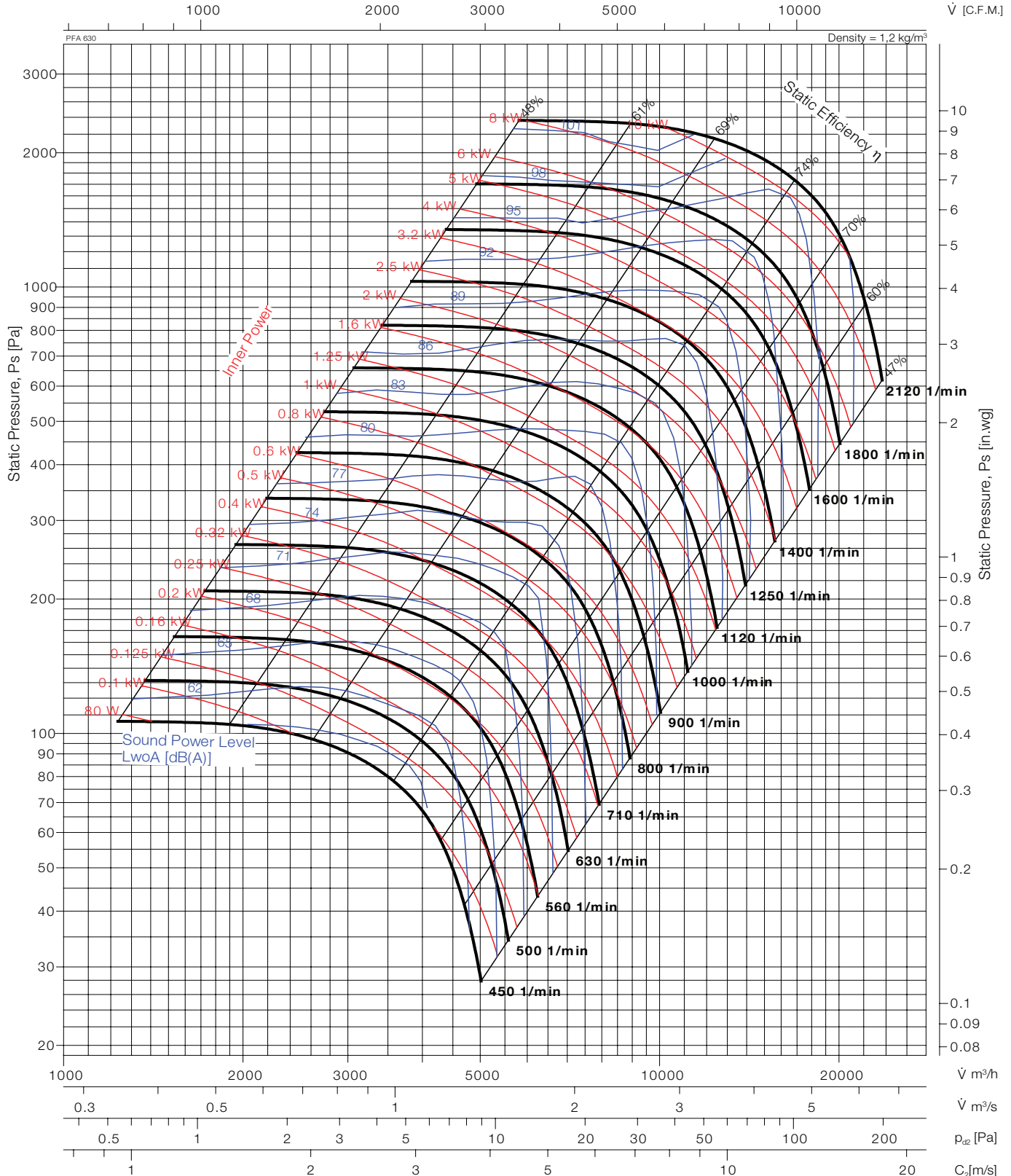
Performance Curve

PFA 630



Fan test laboratory AMCA 210 Test Chamber. Performance certified is for installation type A-Free inlet, Free outlet with partition. Performance ratings do not include the effects of appurtenances (accessories).

The A-weighted sound ratings shown have been calculated per AMCA International Standard 301. Values shown are for outlet LwoA sound power levels for installation Type A: Free inlet, Free outlet with partition.



Typ	Art.Nr.	█ [kg]	Typ	Art.Nr.	█ [kg]	Wheel diameter D = 638 mm	
PFA 630		110				Number of blades z = 6	
						Outlet Area A = 0.3608 m²	
						Moment of inertia J = 1.602 kg·m²	
						Speed limit n_{max} = 2120 1/min	

Explanation of symbols see page II



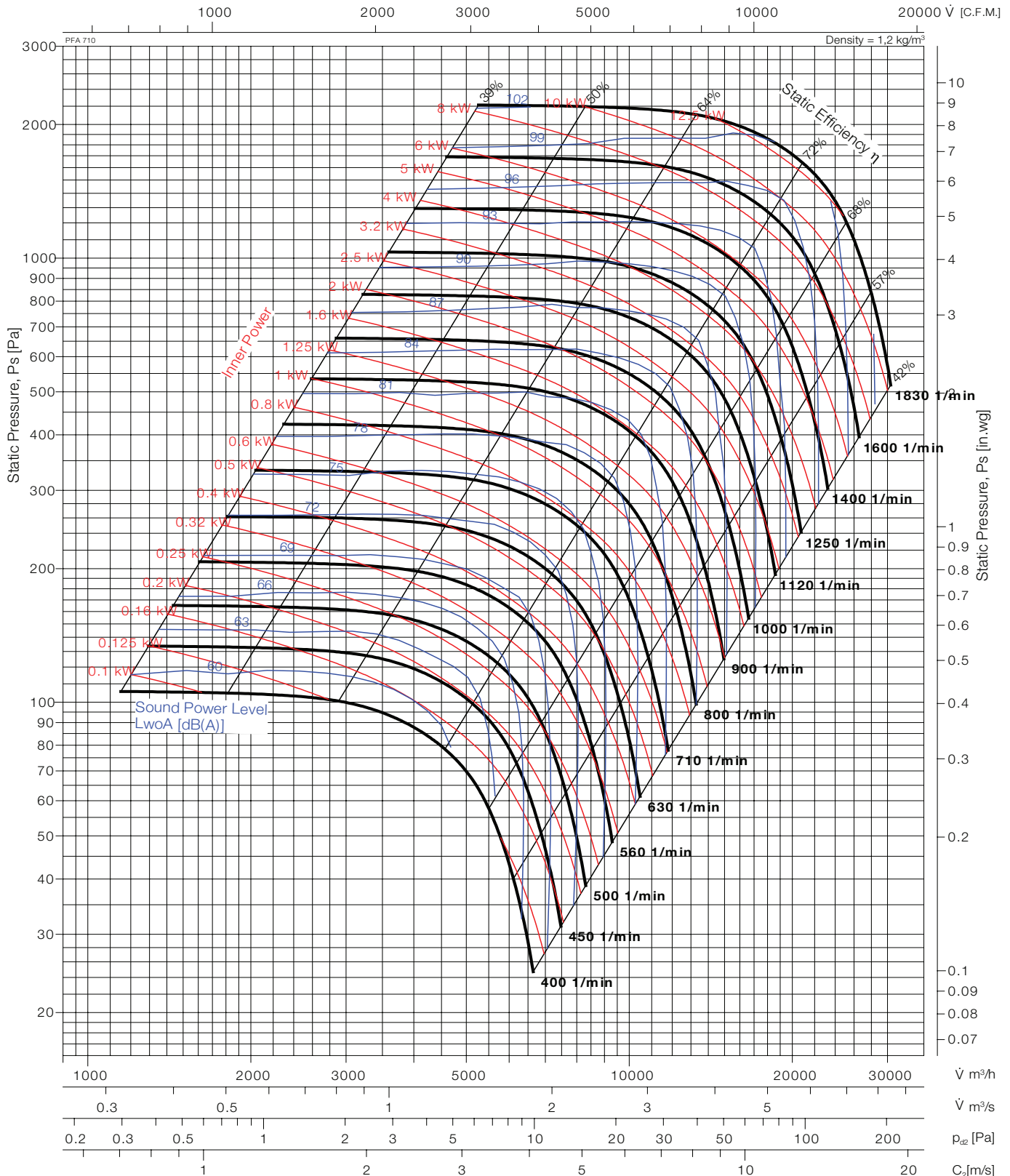
Performance Curve

PFA 710



Fan test laboratory AMCA 210 Test Chamber. Performance certified is for installation type A-Free inlet, Free outlet with partition. Performance ratings do not include the effects of apertures (accessories).

The A-weighted sound ratings shown have been calculated per AMCA International Standard 301. Values shown are for outlet LwoA sound power levels for installation Type A: Free inlet, Free outlet with partition.



Typ	Art.Nr.	█ [kg]	Typ	Art.Nr.	█ [kg]	Wheel diameter	D =	716	mm
PFA 710		140				Number of blades	z =	6	
						Outlet Area	A =	0.4544	m²
						Moment of inertia	J =	2.723	kg·m²
						Speed limit	n_{max} =	1830	1/min

Explanation of symbols see page II



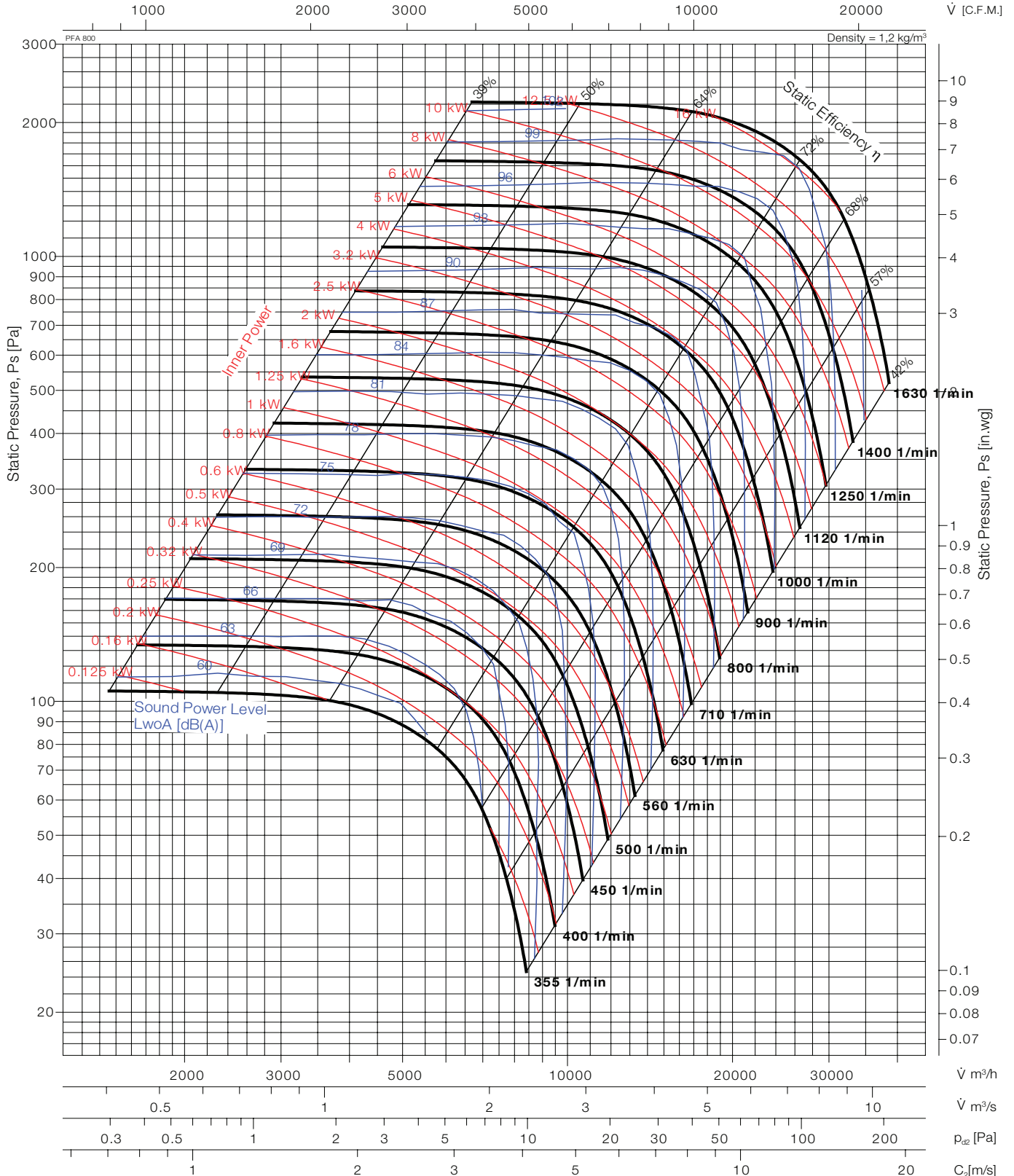
Performance Curve

PFA 800



Fan test laboratory AMCA 210 Test Chamber. Performance certified is for installation type A-Free inlet, Free outlet with partition. Performance ratings do not include the effects of appurtenances (accessories).

The A-weighted sound ratings shown have been calculated per AMCA International Standard 301. Values shown are for outlet LwA sound power levels for installation Type A: Free inlet, Free outlet with partition.



Typ	Art.Nr.	⚖ [kg]	Typ	Art.Nr.	⚖ [kg]		
PFA 800		210				Wheel diameter	D = 806 mm
						Number of blades	z = 6
						Outlet Area	A = 0.5748 m²
						Moment of inertia	J = 5.034 kg·m²
						Speed limit	n_{max} = 1630 1/min

Explanation of symbols see page II



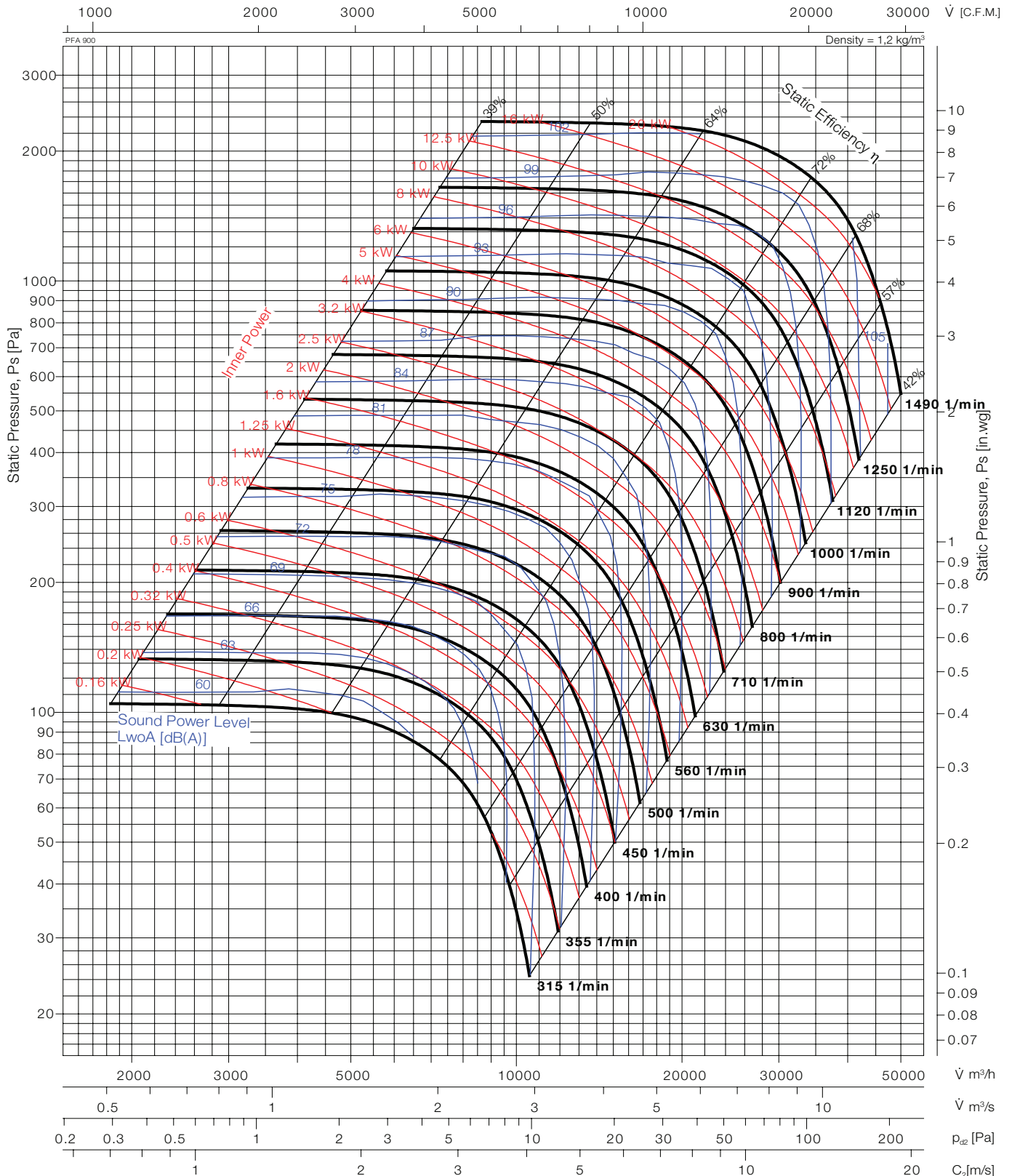
Performance Curve

PFA 900



Fan test laboratory AMCA 210 Test Chamber. Performance certified is for installation type A-Free inlet, Free outlet with partition. Performance ratings do not include the effects of apurtenances (accessories).

The A-weighted sound ratings shown have been calculated per AMCA International Standard 301. Values shown are for outlet LwoA sound power levels for installation Type A: Free inlet, Free outlet with partition.



Typ	Art.Nr.	█ [kg]	Typ	Art.Nr.	█ [kg]	Wheel diameter	D =	905	mm
PFA 900		300				Number of blades	z =	6	
						Outlet Area	A =	0.7250	m²
						Moment of inertia	J =	9.214	kg·m²
						Speed limit	n _{max} =	1490	1/min

Explanation of symbols see page II



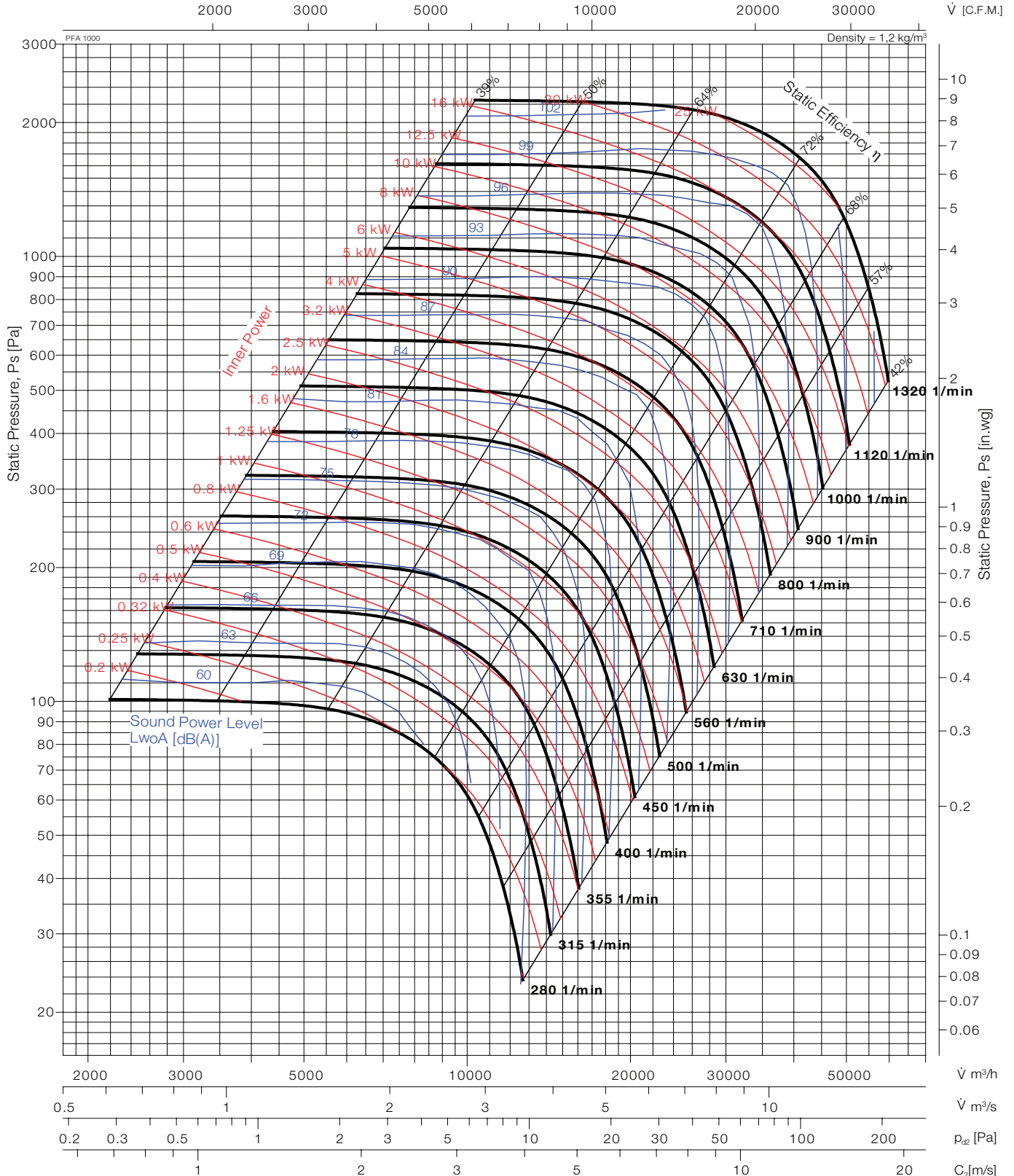
Performance Curve

PFA 1000



Fan test laboratory AMCA 210 Test Chamber. Performance certified is for installation type A-Free inlet, Free outlet with partition. Performance ratings do not include the effects of appurtenances (accessories).

The A-weighted sound ratings shown have been calculated per AMCA International Standard 301. Values shown are for outlet LwA sound power levels for installation Type A: Free inlet, Free outlet with partition.



Typ	Art.Nr.	█ [kg]	Typ	Art.Nr.	█ [kg]		
PFA 1000		350				Wheel diameter	D = 1000 mm
						Number of blades	z = 6
						Outlet Area	A = 0.8859 m ²
						Moment of inertia	J = 14.37 kg·m ²
						Speed limit	n_{max} = 1320 1/min

Explanation of symbols see page II



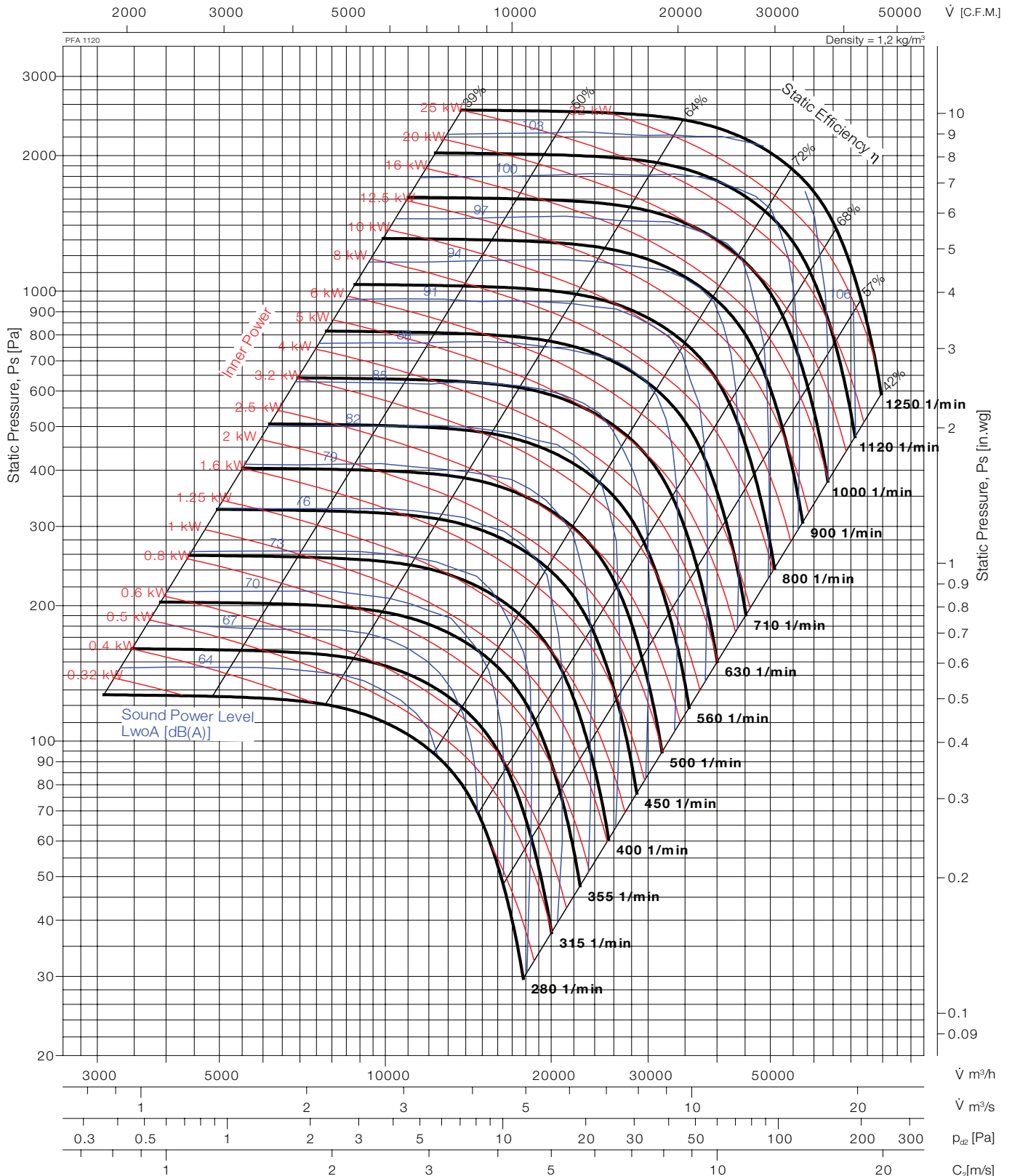
Performance Curve

PFA 1120



Fan test laboratory AMCA 210 Test Chamber. Performance certified is for installation type A-Free inlet, Free outlet with partition. Performance ratings do not include the effects of apertures (accessories).

The A-weighted sound ratings shown have been calculated per AMCA International Standard 301. Values shown are for outlet LwoA sound power levels for installation Type A: Free inlet, Free outlet with partition.



Typ	Art.Nr.	█ [kg]	Typ	Art.Nr.	█ [kg]	Wheel diameter	D = 1120 mm
PFA 1120		410				Number of blades	z = 6
						Outlet Area	A = 1.1119 m²
						Moment of inertia	J = 23.52 kg·m²
						Speed limit	n _{max} = 1250 1/min

Explanation of symbols see page II



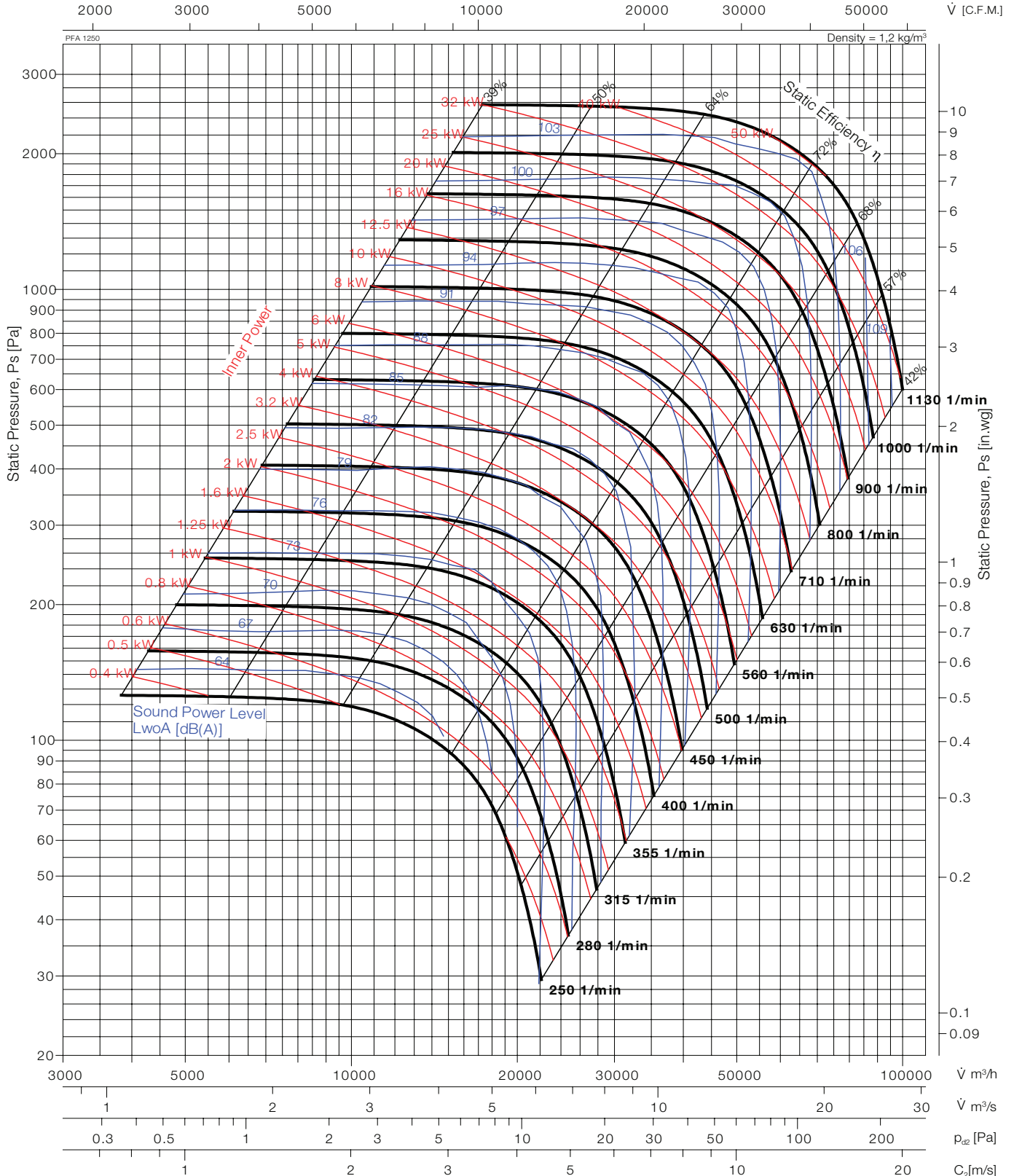
Performance Curve

PFA 1250



Fan test laboratory AMCA 210 Test Chamber. Performance certified is for installation type A-Free inlet, Free outlet with partition. Performance ratings do not include the effects of appurtenances (accessories).

The A-weighted sound ratings shown have been calculated per AMCA International Standard 301. Values shown are for outlet LwA sound power levels for installation Type A: Free inlet, Free outlet with partition.



Typ	Art.Nr.	█ [kg]	Typ	Art.Nr.	█ [kg]	Wheel diameter D = 1250 mm	
PFA 1250		650				Number of blades z = 6	
						Outlet Area A = 1.3862 m ²	
						Moment of inertia J = 37.11 kg·m ²	
						Speed limit n_{max} = 1130 1/min	

Explanation of symbols see page II



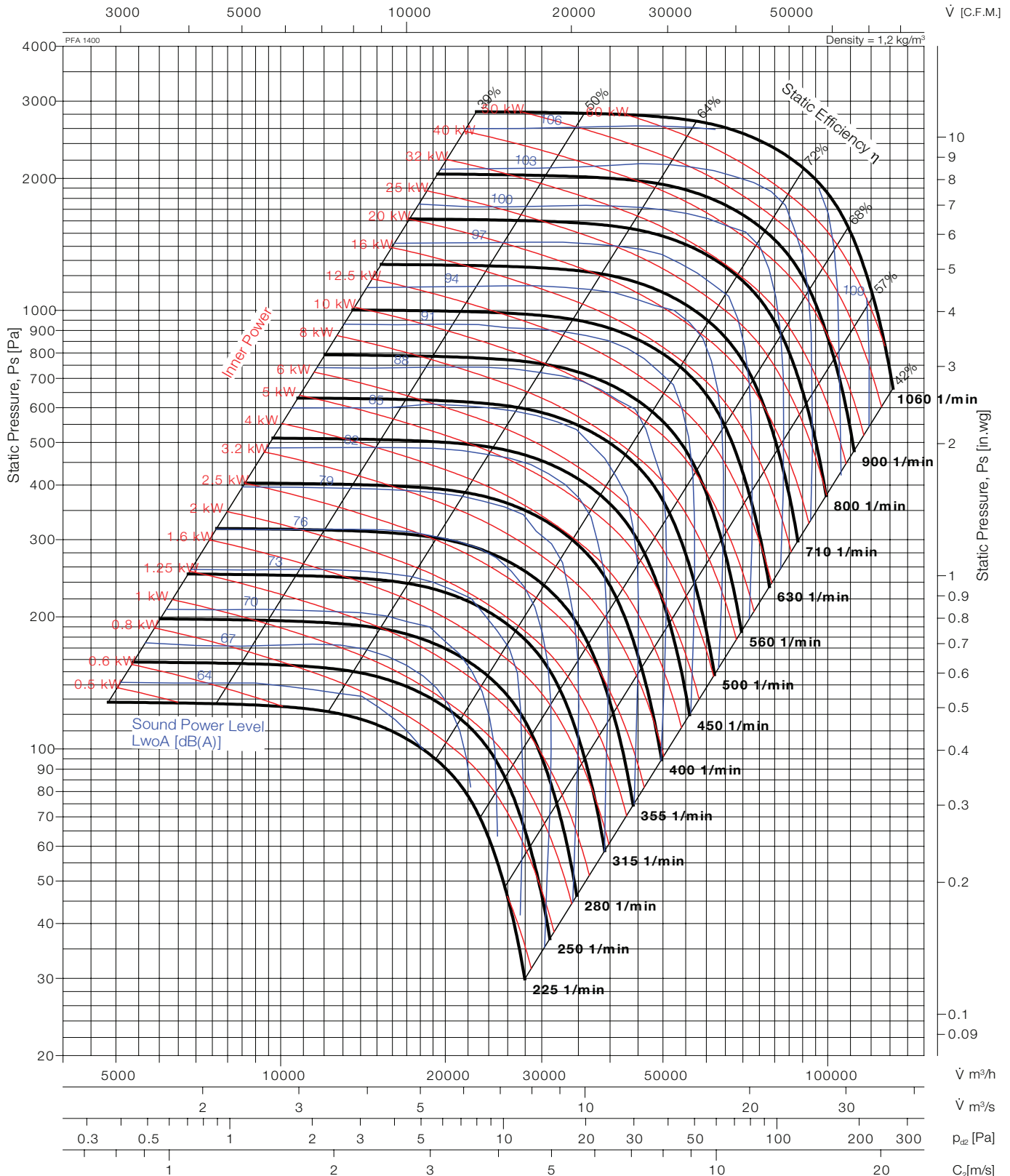
Performance Curve

PFA 1400



Fan test laboratory AMCA 210 Test Chamber. Performance certified is for installation type A-Free inlet, Free outlet with partition. Performance ratings do not include the effects of apertures (accessories).

The A-weighted sound ratings shown have been calculated per AMCA International Standard 301. Values shown are for outlet LwA sound power levels for installation Type A: Free inlet, Free outlet with partition.



Typ	Art.Nr.	█ [kg]	Typ	Art.Nr.	█ [kg]	Wheel diameter	D = 1400 mm
PFA 1400		790				Number of blades	z = 6
						Outlet Area	A = 1.7373 m ²
						Moment of inertia	J = 56.32 kg·m ²
						Speed limit	n _{max} = 1060 1/min

Explanation of symbols see page II

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