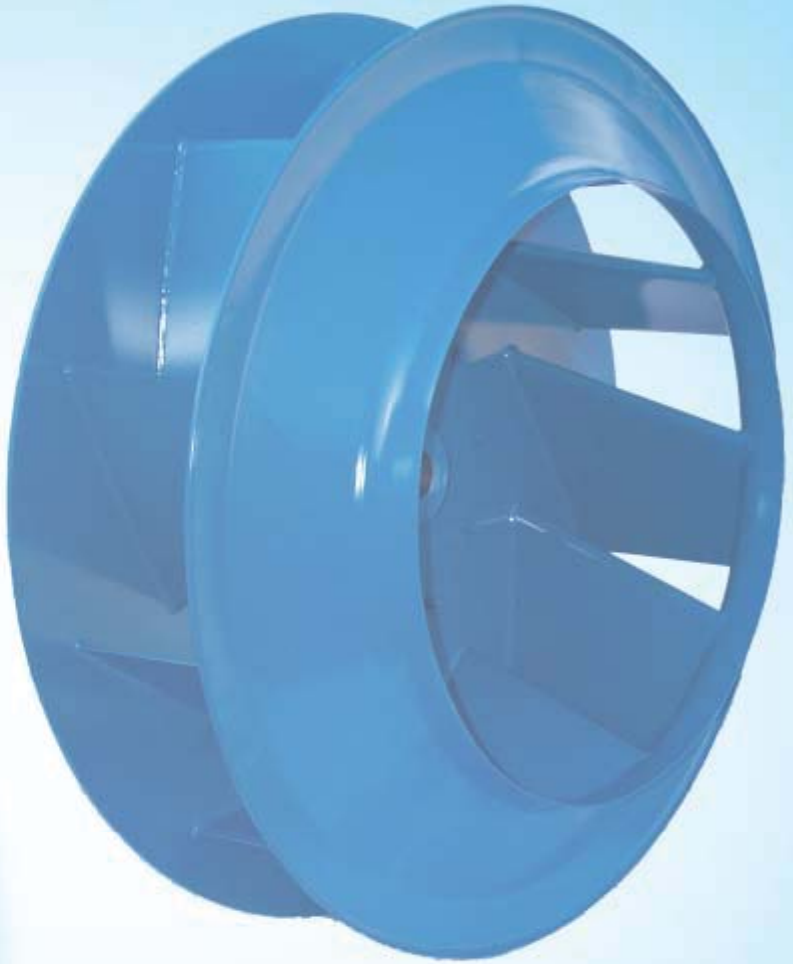
comefri

The *New* COMEFRI Plenum Wheel:

NPA

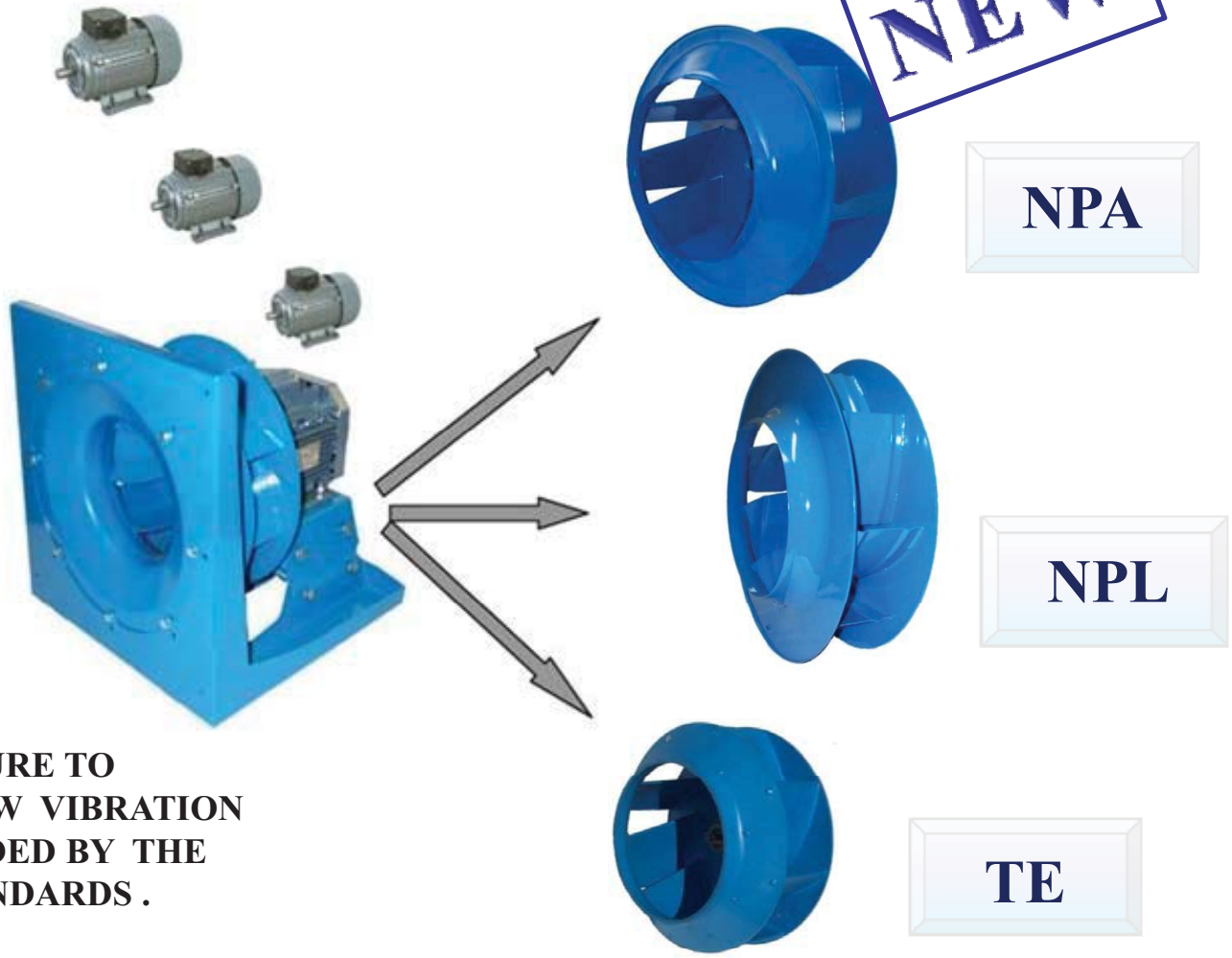


NPA PLENUM FAN

With the launch of the NPA Plenum Wheel, COMEFRI has taken a further significant step forward in the evolution of our Plenum Fan Range

UNPARALLELED FLEXIBILITY:

- DIFFERENT MOTOR SIZES ON THE SAME FRAME
- ONE STRUCTURE FOR THREE IMPELLER TYPES



A WELDED STRUCTURE TO ACHIEVE VERY LOW VIBRATION LEVELS AS DEMANDED BY THE RELEVANT ISO STANDARDS .

comefri

NPA PLENUM FAN

The COMEFRI family of Plenum Fan's!

NPA - NPL - TE

TE: Comefri's polyamide wheel (up to 450 mm diameter)

NPL: A top-performer with its diffuser and BC blades.

and now...

NPA: The Low-Noise & High-Performance solution!

comefri

NPA PLENUM FAN

The NPA impeller replaces the existing PEAF wheel.

The NPA wheel is dimensionally fully interchangeable, using the same mounting structure, but with significantly improved performance.

Today NPA is the only high –performance plenum airfoil wheel with rotating diffuser available in the World!

NPA PLENUM FAN

NPA: Comefri New Airfoil Plenum Wheel. “An innovative product”.

The combination of Airfoil blades with a unique rotating diffuser sets a new standard for plenum wheel design.

comefri

NPA PLENUM FAN

The facts:

Available sizes:	315 – 1400 mm (nominal blade diameter)
Materials:	Steel impeller, continuously welded, high quality paint finish.
Hubs:	Taper-lock , die-cast aluminium , or machined steel hubs are available.
Arrangements:	Direct driven, Arr. 4 and Arr. 5 Belt driven, Arr. 3

comefri

NPA PLENUM FAN

The Data:

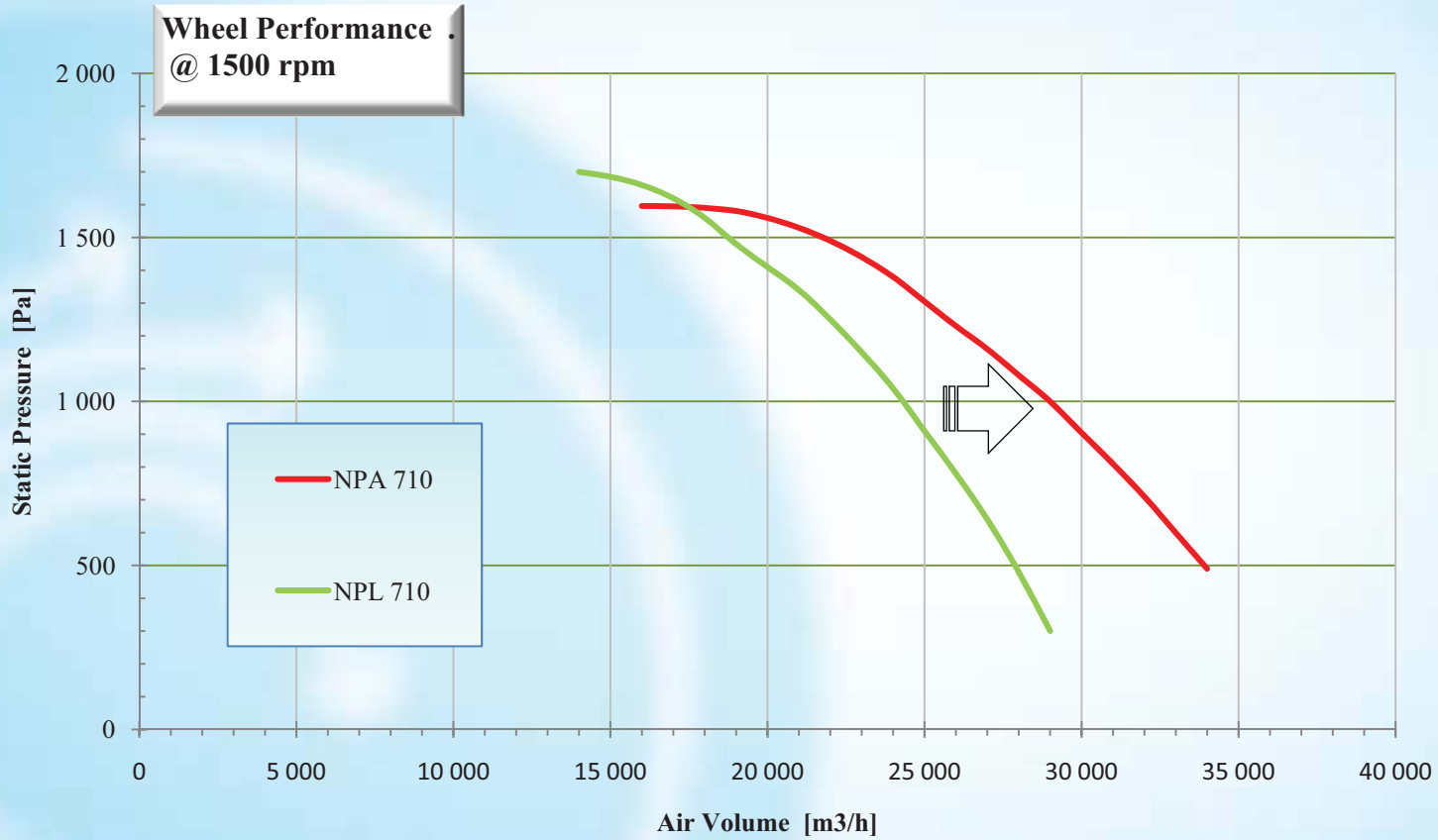
Air Volume:	up to 150,000 m^3/h.
Static Pressure increase:	up to 2750 Pa in standard configuration
Static Efficiency:	up to 76% with Class 1 tolerance (in accordance with DIN 24166 & ISO Standards)

comefri

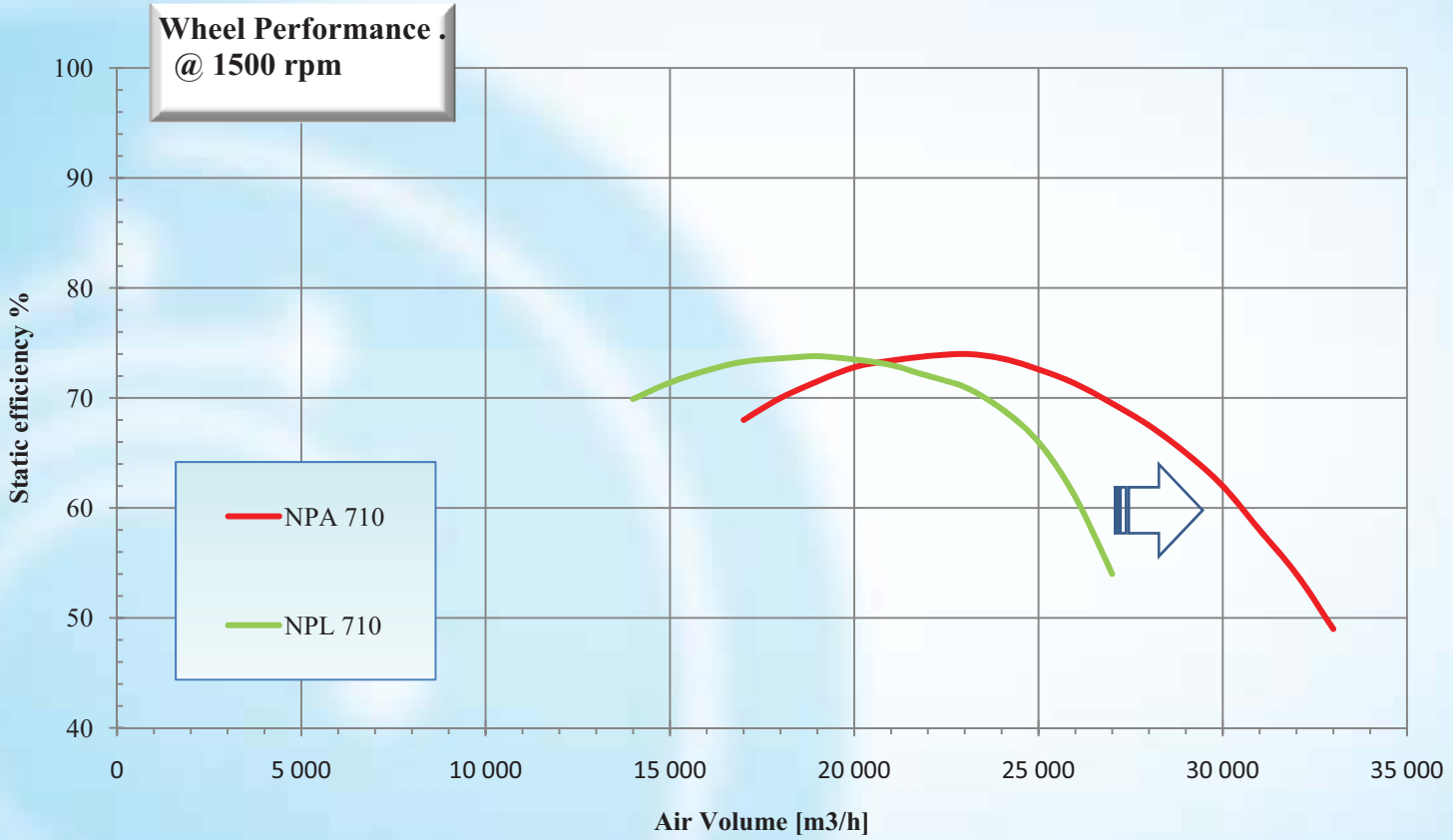
NPA PLENUM FANS

Our R & D efforts have been directed to optimise the NPA Plenum fan wheels ability to deliver greater air volumes, with increased efficiency, whilst maintaining the same impeller diameter.

NPA PLENUM FAN



NPA PLENUM FAN



comefri

NPA PLENUM FANS

The new NPA wheel is therefore capable of delivering higher air volumes than the corresponding size NPL fan, whilst maintaining very high efficiency levels. In turn, significant improvements are obtained in acoustic performance, through the utilisation of Airfoil blades.

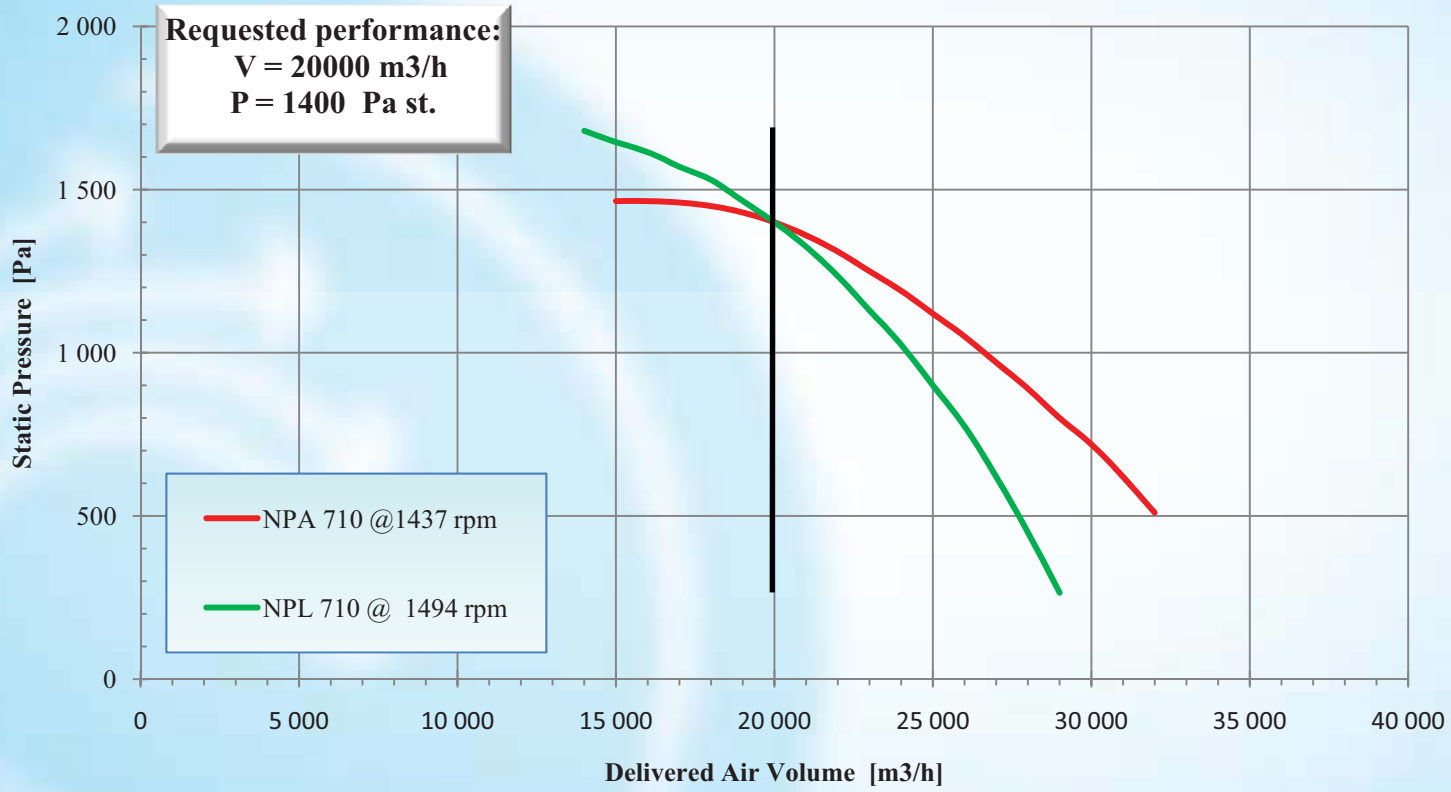
NPA is therefore a perfect choice for acoustically sensitive projects.

Focusing on this aspect, let's now consider a typical Air Handling Unit manufacturer's requirement:

- **Delivered air volume: 20,000 m3/h**
- **Static pressure : 1400 Pa**
- **Air temperature: 20 °C**

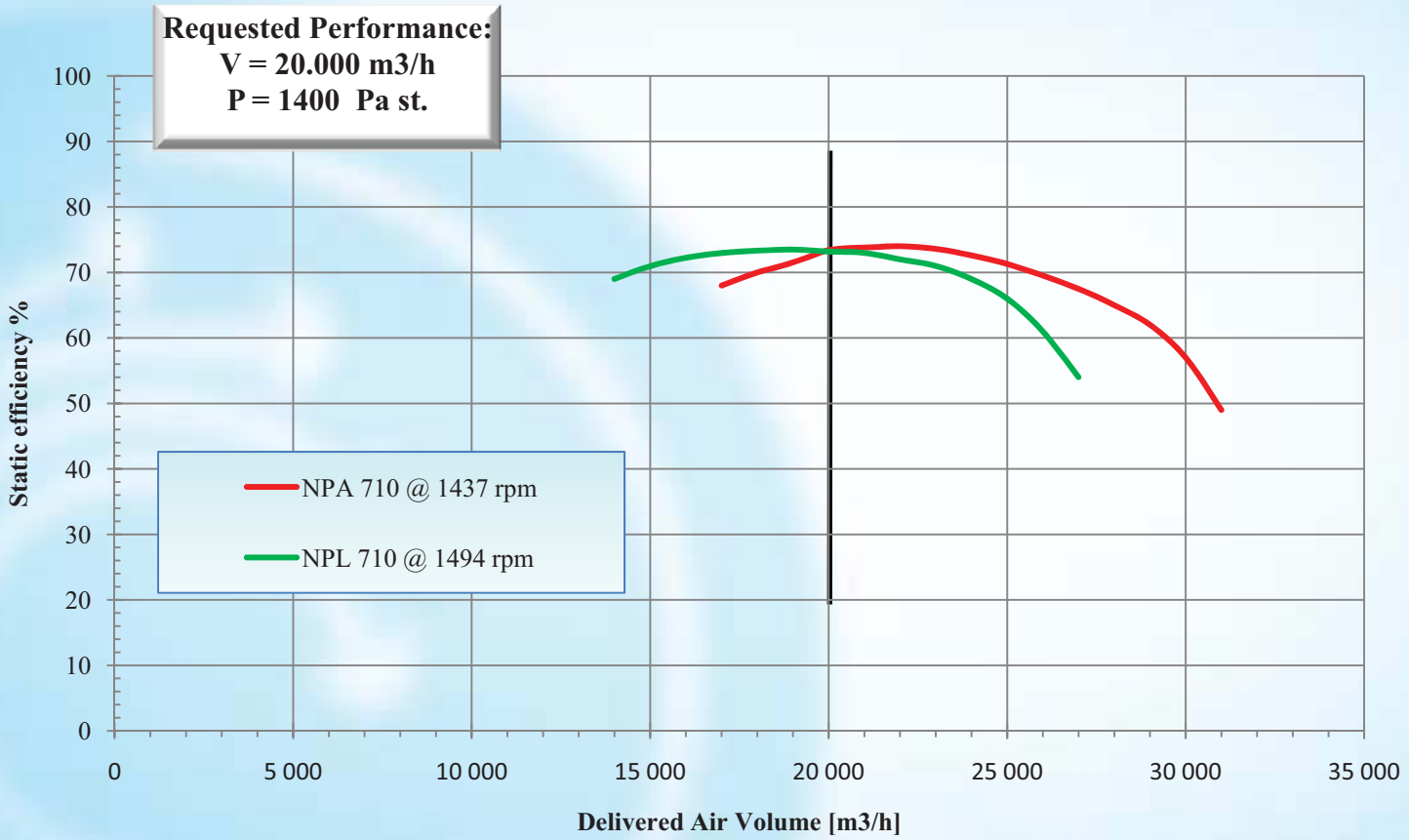
NPA PLENUM FAN

Same Working Point:



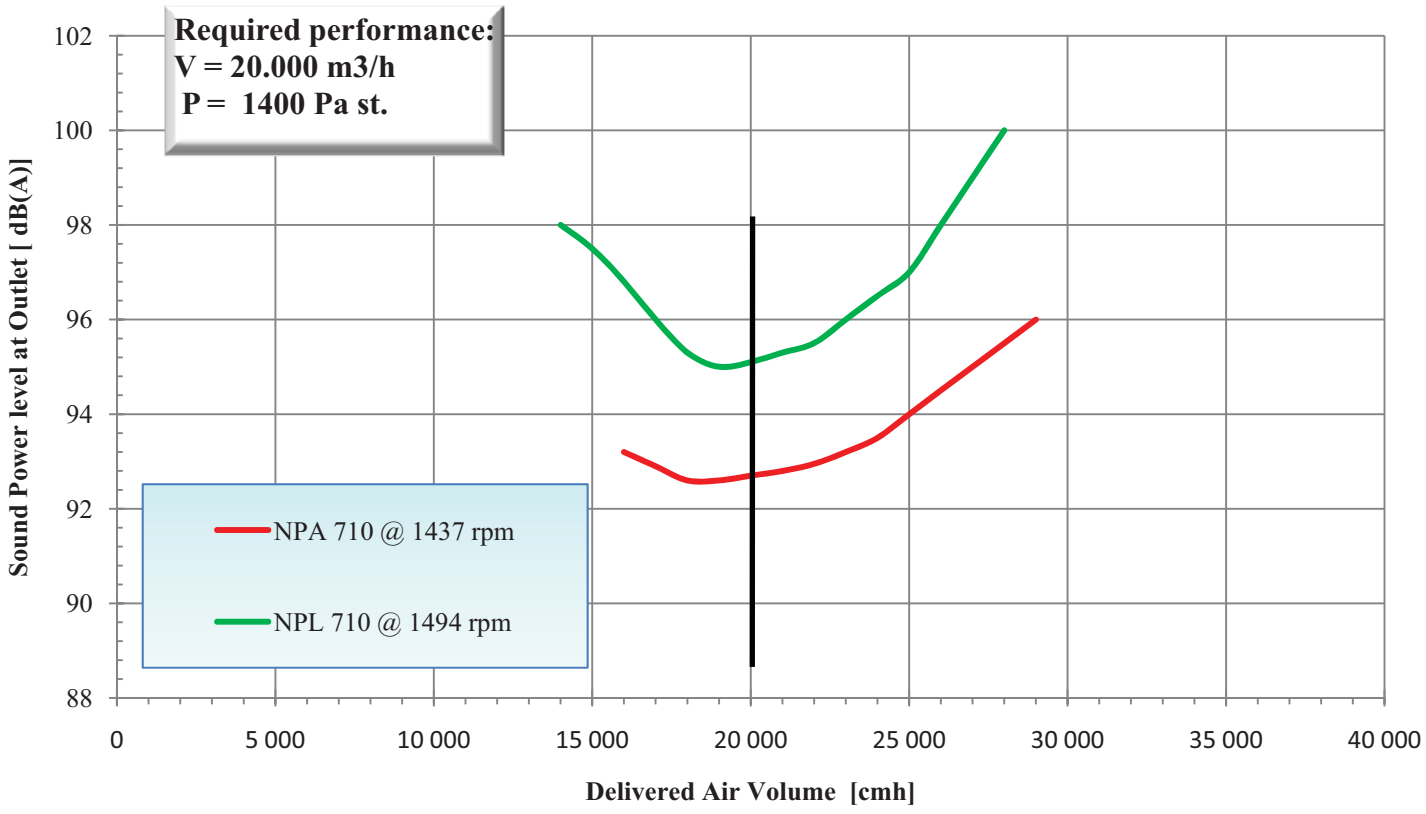
NPA PLENUM FAN

Same Working Point:



NPA PLENUM FAN

Same Working Point:



comefri

NPA PLENUM FAN

Lowest rpm, highest efficiency, reduced sound level.

These are the outstanding characteristics of the NPA!

comefri

NPA PLENUM FAN

‘In general, how is fan performance data presented to the market’?

‘Do the performance ratings published by other manufacturers represent the full and accurate aeraulic and acoustic performance of the fan’?

Fan Efficiency

Fan efficiency derives from several factors:

a) Geometrical dimensions

It is well known that larger impellers are able to reach higher efficiencies than smaller impellers.

b) Impeller rpm

For the same impeller dimensions, the faster the impeller operating rpm, the higher will be its efficiency.

Fan Efficiency (continued)

In conclusion, impellers of a greater size, and running at higher speeds, being more efficient in transferring energy to the air, are able to achieve higher efficiencies.

Therefore it is necessary to test several different sizes of impeller, at different speeds, in order to obtain accurate data.

Fan Efficiency (continued)

Between a small (250 mm) and a larger (1400 mm) diameter impeller, the results show differences of up to 6 - 8 points in maximum efficiency.

The same impeller, when running at maximum allowable speed and when running at 33% of max speed, can show differences of up to 4 points on the measured efficiency.

These two effects combined, can result in over 10 points difference.

Fan Efficiency (continued)

Other manufacturers tend to declare the same level of efficiency on their complete fan range and choose to say nothing about the relationship between size, efficiency and speed.

NPA PLENUM FANS

DIN 24 166 standard has the following maximum deviations, for each "class of tolerance":

Parameter	Limit of deviation for:	
	Class 1	**Class 2**
Volume flow rate, V	+/- 2,5 %	+/- 5 %
Pressure increase, Δp	+/- 2,5 %	+/- 5 %
Power, P	+ 3 %	+ 8 %
Efficiency , η	- 2 %	- 5 %
Sound Power Level , Lw (A-weighted)	+ 3 dB	+ 4 dB

All published COMEFRI performance data are in line with Class 1 tolerance.

Noise

Another important aspect is the published fan noise data.

The majority of fan noise is generated by the wheel and its main contributory factor is the 'blade tone', or 'tonal noise', at a well defined spectrum position (the so-called "blade passing frequency").

$$\textit{Blade passing frequency} = (z \times n)/60$$

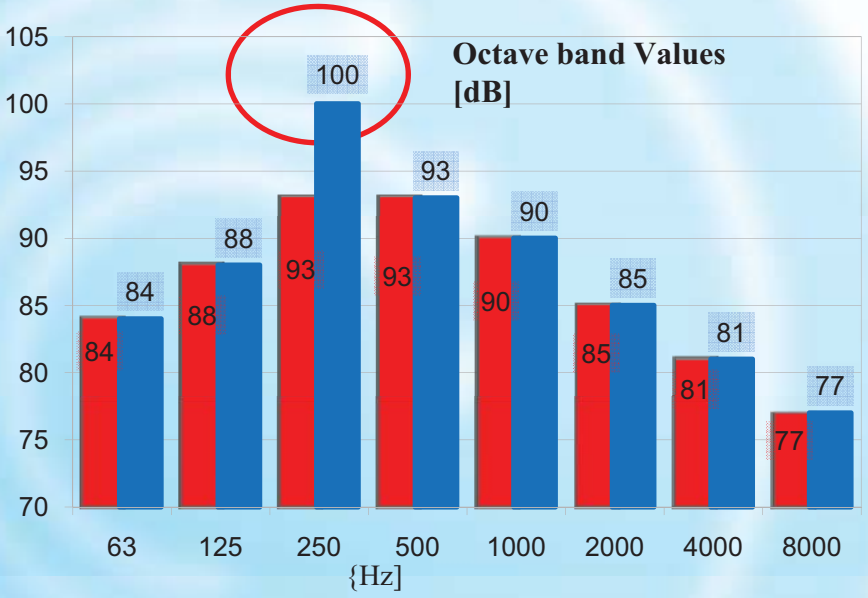
Where: z = number of blades
n = wheel revolutions, per minute

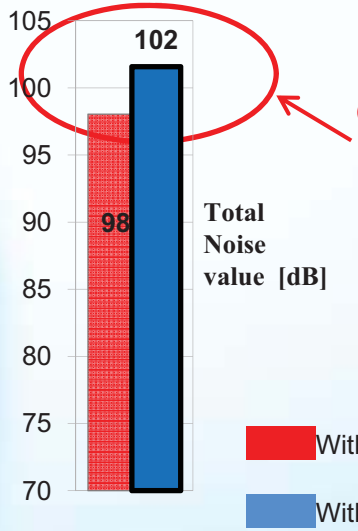
Noise (continued)

Therefore, it is absolutely vital that tonal noise be considered to enable an accurate calculation of the ambient noise level !!

Noise (continued)

This graph represents the difference between octave band spectrums, with and without Tonal Noise, calculated for a blade tone of 250 Hz:





4 dB of difference on the total value, more than twice the level !!!

Without Tonal Noise

With Tonal Noise

NPA PLENUM FANS

Noise (continued)

Some manufacturers, however, publish their sound data without the tonal noise included.

This approach is misleading, so that other manufacturers often prefer to clarify their published data by stating;

... “without removing the blade frequency”, or

“the octave band spectrum includes blade frequency”!!!

COMEFRI consistently publishes the full noise levels, blade frequency included.

Conclusions

With the NPA /NPL COMEFRI has designed a top-class plenum wheel family.
Comefri has carried out extensive tests prior to release and has complete confidence in the reliability of the data published.

You can select NPA / NPL with confidence:
- compare it with other products on the market and then.....

Choose the winner !!!