HORUS AIR MOVING
和旭風機

RBA 系列—雙吸後傾式離心風機

Series RBA, Double Inlet Centrifugal Fans, with Backward Wheels

Horus Air Moving Co. Ltd. certifies that the RBA series fans 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. All the Centrifugal Fans described herein are licensed to bear the AMCA Seal, and their certified ratings are shown on pages 7 through 21.

和旭機械股份有限公司特此證明，此處所示 RBA 系列離心風機獲得了加蓋 AMCA 印章的授權。所示額定值系依據 AMCA 出版物 211 和 AMCA 出版物 311 所進行測試和程序確定並符合 AMCA 認證額定值計劃的要求。 這裡描述的所有離心風機都已經取得了 AMCA 印章，它們的認證數據見第 7 到 21 頁。

概述 Outline

本公司之風機採用後傾式離心葉輪，具有通用性強、效率高、噪音低、耗能少等特點。是各類中央空調機組及其它暖氣空調、淨化、通風等最佳選擇。

The ventilators are centrifugal fans with backward curved impellers. Some of the features and characteristics of these ventilators are: backward impeller blading, a wide range of applications, high efficiency, low noise, and low power consumption. These ventilators are ideal for use in central air conditioning systems, heating and ventilating air conditioning systems, and in purifiers. They are also suitable for use in a number of other ventilator applications.

產品型式 Type of Product

1. 旋向

此風機旋向可分爲左旋（LG）和右旋（RD）二種方式，以馬達一端正視，葉輪順時針旋轉的稱爲右旋風機、逆時針旋轉的稱爲左旋風機。皮帶輪可左右調向，因此不受左右方向的限制。

1. Direction of Rotation

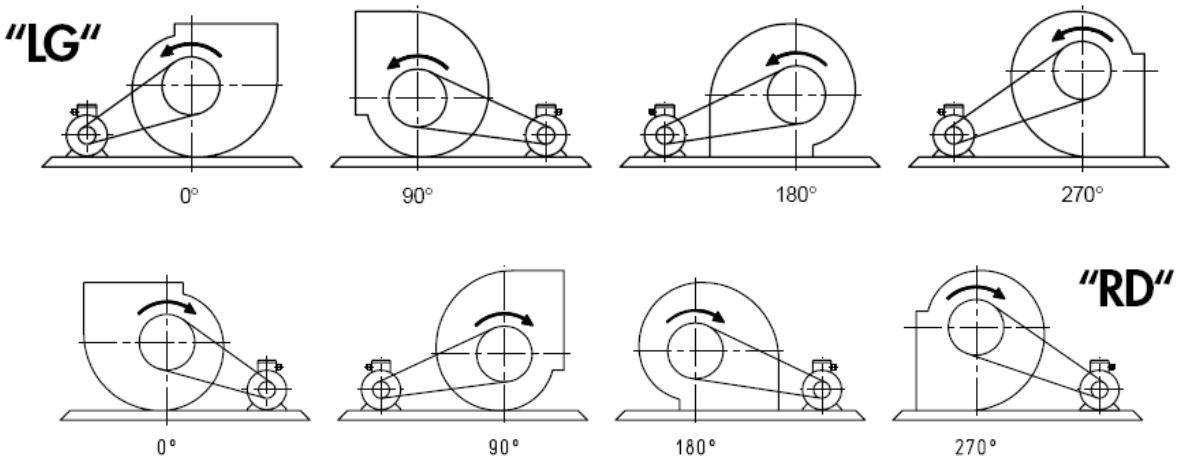
The ventilators can be applied with two directions of rotation, left hand (LG) and right hand (RD). If the impeller rotates in a counterclockwise direction when viewed from the drive motor side, it is designated as a left hand ventilator. If it rotates clockwise when viewed from the drive pulley can be mounted on either side of the ventilator, so there is no significant limitation on the ventilator directionality.

2. 出風口方向

風機可如下圖所示製成 0°、90°、180°、270° 四種出風方向。

2. Direction of Air Outlet

The following as shown, the ventilators can be arranged to provide four different air outlet directions, 0, 90, 180, and 270 degrees.



產品結構 Construction of Product

此風機主要由機殼、葉輪、框架、軸承、軸、出風口法蘭（常規配置不帶法蘭）構成。

The major components of the ventilators include the scroll, impeller, frame, bearings, shaft, and outlet flange.

1. 機殼

機殼基本採用鋼板烤漆製造，具有符合空氣動力的外形，蝸殼板採用焊接或“匹茲堡溝”咬合的方式與側板連接成一體。其它如不銹鋼材質或鍍鋅鋼板亦可採用。

1. Scroll

The scroll is basic made of painted steel sheet, and it is designed to provide an aerodynamically efficient flow path. The inlet is formed in one piece. The scroll plate is connected to the side plate by using welding or a “Pittsburgh lock” type of system. In addition, the stainless or galvanized steel material is also provided.

2. 葉輪

葉輪採用優質鋼板烤漆製成，葉片設計符合空氣動力的特定形狀，使得效率最高、噪音最低。葉片用焊接固定在中盤板及葉輪蓋板上，葉輪蓋板採用油壓伸抽一體成型，在最大功率連續運轉時，葉輪具有足夠的剛度。葉輪依據 ISO19 40-1 及 AMCA204 BV-4 的動平衡精度要求，按 G2.5 等級全檢合格。其它如不銹鋼材質或鍍鋅鋼板亦可採用。

2. Impeller

The impeller is made of high grade painted steel sheet, and it is configured to provide a highly efficient and low noise aerodynamic flow path. The blade is fixed to the central disk plate and shroud by welding. The shroud is made of hydraulic draw . The impeller strength is sufficient for it to operate continuously at maximum power. The impellers balance quality grades are G2.5 in accordance with ISO1940-1 and AMCA204, BV-4 application category. In addition, the stainless or galvanized steel material is also available.

3. 框架

框架由角鋼和扁鋼焊接製成，表面噴漆，以保證框架具有足夠的剛度和強度。

3. Frame

The frames use sections of steel to assure sufficient frame rigidity and they are finished with painting.

4. 軸承

此風機採用優質連座軸承，該軸承預先加潤滑油並有自動放正功能。

4. Bearings

For the ventilators, self-aligning pillow block ball bearings are used, and these bearings are supplied with lubrication fittings.

5. 軸

風機軸採用 S45C 棒剛粗加工、熱處理及研磨加工製成，嚴格控制軸徑尺寸公差及配合公差，每根軸均經過塗覆防鏽處理。

5. Shaft

The shafts are made of C45 carbon steel bars. The shafts are rough machined and then stress relieved before final machining. The shaft diameters are machined to very accurate tolerance levels and they are fully checked to assure precision fits. They are coated after assembly in order to provide corrosion resistance.

6. 出風口法蘭（選配）

法蘭採用鍍鋅鋼板製成，法蘭及法蘭與殼體的連接採用鉚釘或自攻螺絲，外觀精美，並具有足夠的剛度與強度。

6. Outlet Flange（Option）

The outlet flange is made of galvanized steel angle iron bars. The connections of the flange components to each other and to the scroll are made using rivet or self taping screw. This maintains a good flange appearance while also providing sufficient strength and rigidity.

風機定律 The Fan Laws

1st law :

$$\left[\frac{Q_c}{Q}\right]=\left[\frac{D_c}{D}\right]^3\left[\frac{N_c}{N}\right]\left[\frac{K_p}{K_{pc}}\right]$$

2nd law :

$$\left[\frac{P_{tc}}{P}\right]=\left[\frac{D_c}{D}\right]^2\left[\frac{N_c}{N}\right]^2\left[\frac{K_p}{K_{pc}}\right]\left[\frac{\rho_c}{\rho}\right]$$

3rd law :

$$\left[\frac{P_{vc}}{P}\right]=\left[\frac{D_c}{D}\right]^2\left[\frac{N_c}{N}\right]^2\left[\frac{\rho_c}{\rho}\right]$$

4th law :

$$\left[\frac{H_c}{H}\right]=\left[\frac{D_c}{D}\right]^5\left[\frac{N_c}{N}\right]^3\left[\frac{K_p}{K_{pc}}\right]\left[\frac{\rho_c}{\rho}\right]$$

5th law :

$P_{sc} = P_{tc} - P_{vc}$

Where P_{tc} and P_{vc} are established per the 2nd and 3rd FAN LAW.

6th law :

$$\eta_{sc}=\eta_{tc}\left[\frac{P_{sc}}{P_{tc}}\right]$$

Where P_{sc} is established using the 5th FAN LAW and P_{tc} is established using the 2th FAN LAW. In the above, subscript c denotes the new operating condition, and:

D = Impeller diameter
D_c = Impeller diameter, converted
N = Impeller rotational speed
N_c = Impeller rotational speed, converted
K_p = Compressibility coefficient
K_{pc} = Compressibility coefficient, converted
Q = Volume airflow rate
Q_c = Volume airflow rate, converted
P_t = Pressure, total
P_{tc} = Pressure, total, converted
P_v = Pressure, velocity
P_{vc} = Pressure, velocity, converted
H = Power
H_c = Power, converted
P_s = Pressure, static
P_{sc} = Pressure, static, converted
η_{sc} = Efficiency, static, converted
η_{tc} = Efficiency, total, converted

自由音場 Non-Directional Sound in a Free-Field

聲功率和聲壓之間的最簡單的關係爲一個非方向性聲源的自由音場，其關係如下列方程式所示：

The simplest relation between sound power level and sound pressure level is found for a free-field, non-directional sound source, as given by the following equation :

$L_p = L_{wi} - 20 \log_{10}(r) - k + T$

L_p = sound pressure level (dB) re 20 μ Pa

L_{wi} = sound pressure level (dB) re 10^{-12} watts

r = distance from the source in meters or feet

k = 11.0 dB for metric units and 0.5 dB for English units

T = correction factor for atmospheric pressure and temperature (dB) (since most industrial noise problems are concerned with air at or near standard conditions, T is usually negligible and, therefore, equals 0)

Example :

計算在自由音場中 110 dB 的聲功率距離聲源 10 英尺時的聲壓：

Consider a point source having a L_{wi} of 110 dB for a free-field . The sound pressure level at a distance of 10 feet from the source would be calculated as follows (since the source is found for a free-field, the equation for hemispherical radiation from a point source is used) :

$L_p = L_{wi} - 20 \log_{10}(r) - k$

therefore :

$L_p = 110 \text{ dB} - 20 \log_{10}(10) - 0.5 = 89.5 \text{ dB}$

範例 Example Of Curve Reading

風量

Air Volume Q=26500m^3/h

風速

Outlet Velocity V=11.55m/s

全壓

Total Pressure Pt=700 Pa

動壓

Velocity Pressure Pv=80 Pa

靜壓

Static Pressure Ps = Pt - Pv
=620 Pa

轉速

Fan Speed N=1200 rpm

軸功率

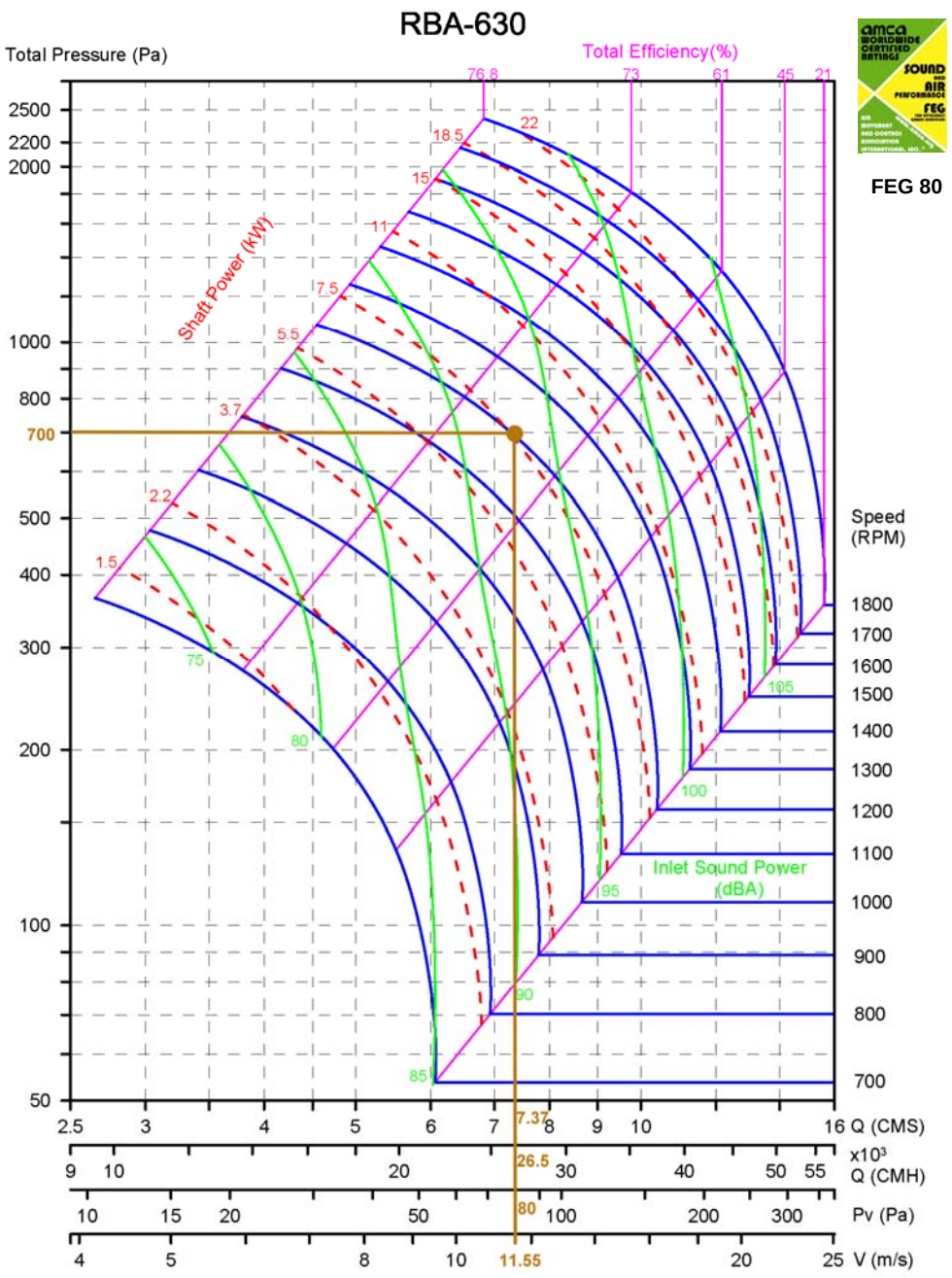
Shaft Power W=7.6 kW

聲功率

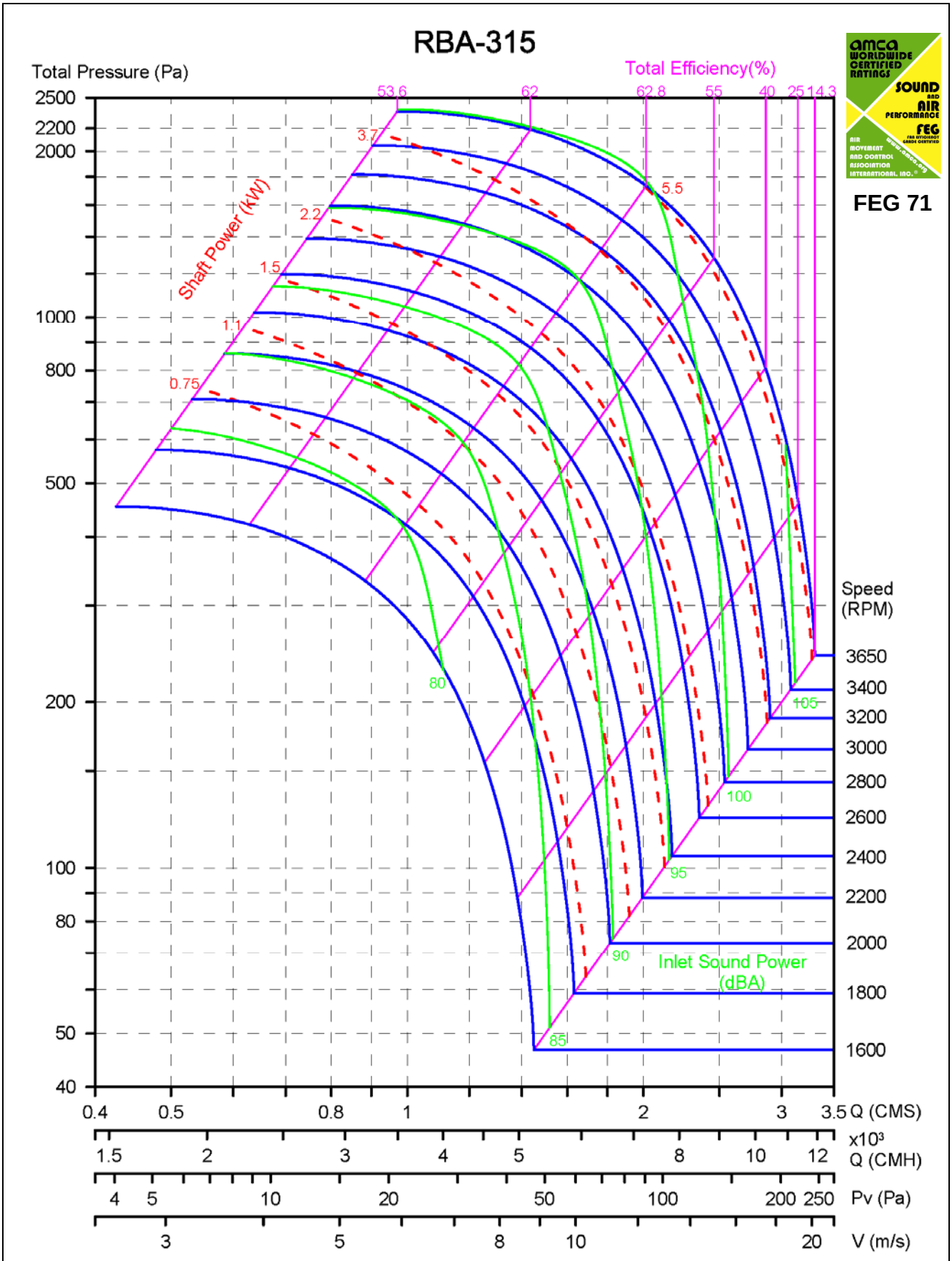
Sound Power L_{wi} A=93dB(A)

總效率

Total Efficiency η =66.5 %



Performance certified is for installation type B, free inlet, ducted outlet. Power rating (kW) does not include transmission losses. 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 inlet LwiA sound power levels for Installation Type B: free inlet, ducted outlet.



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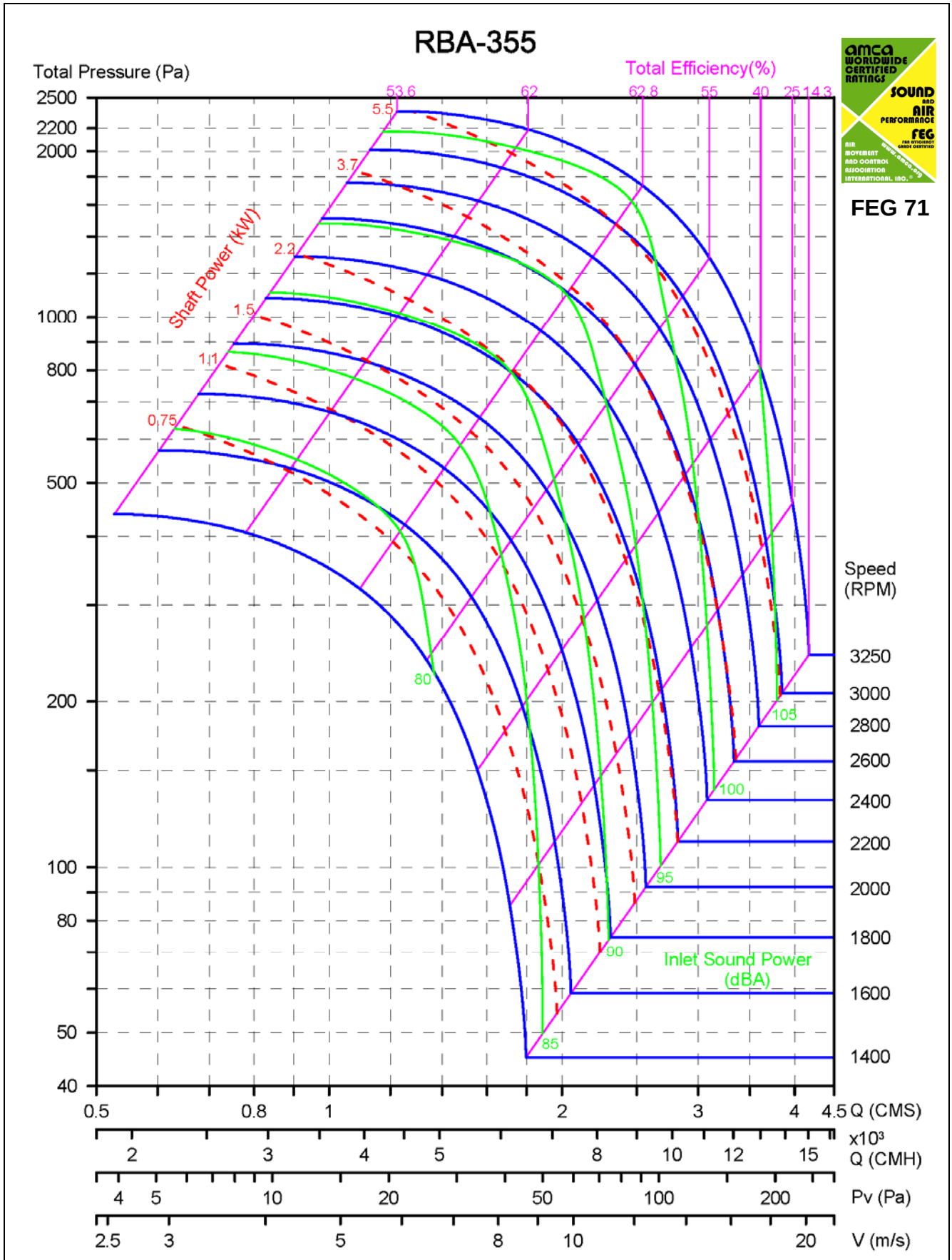

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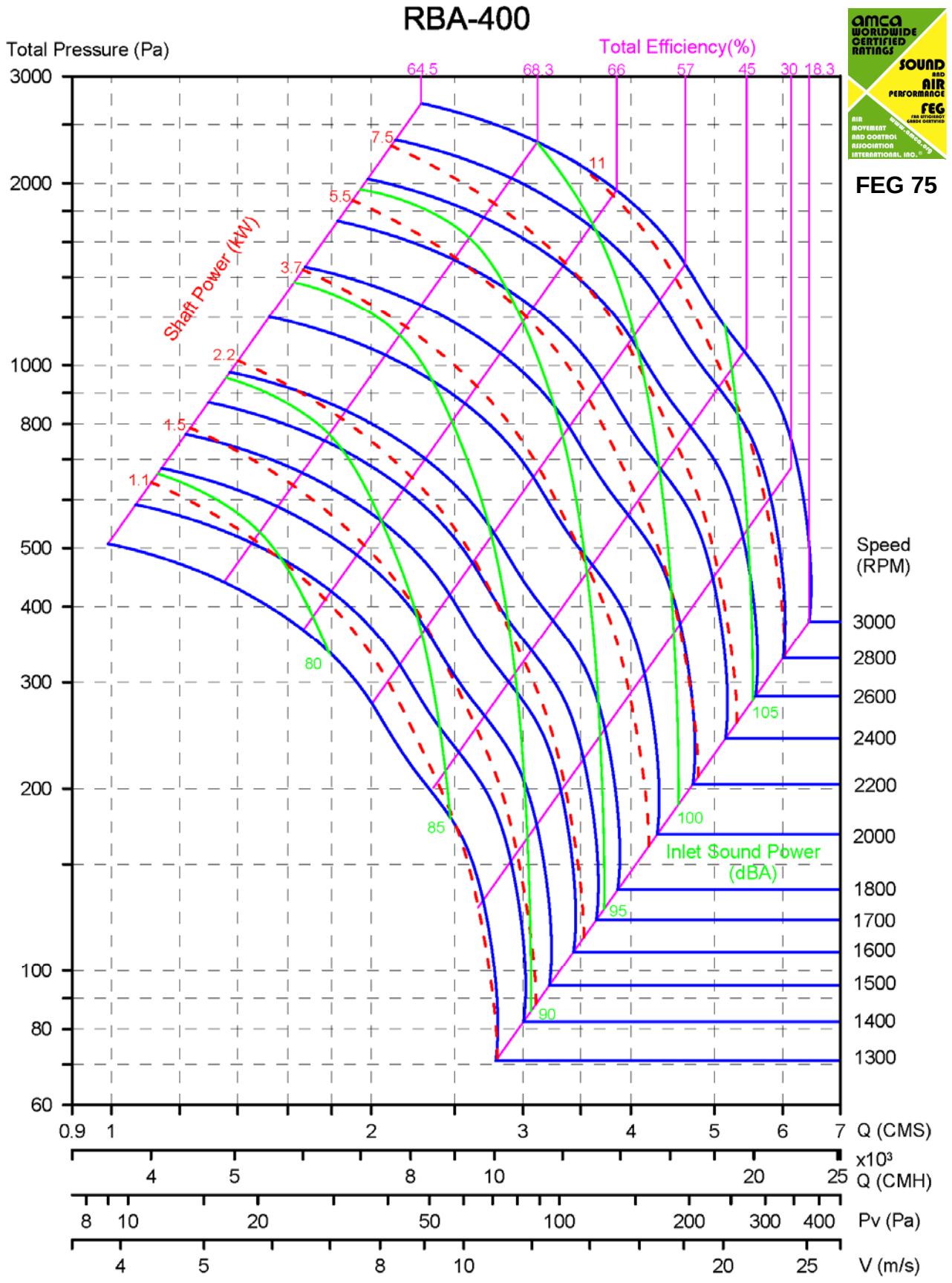

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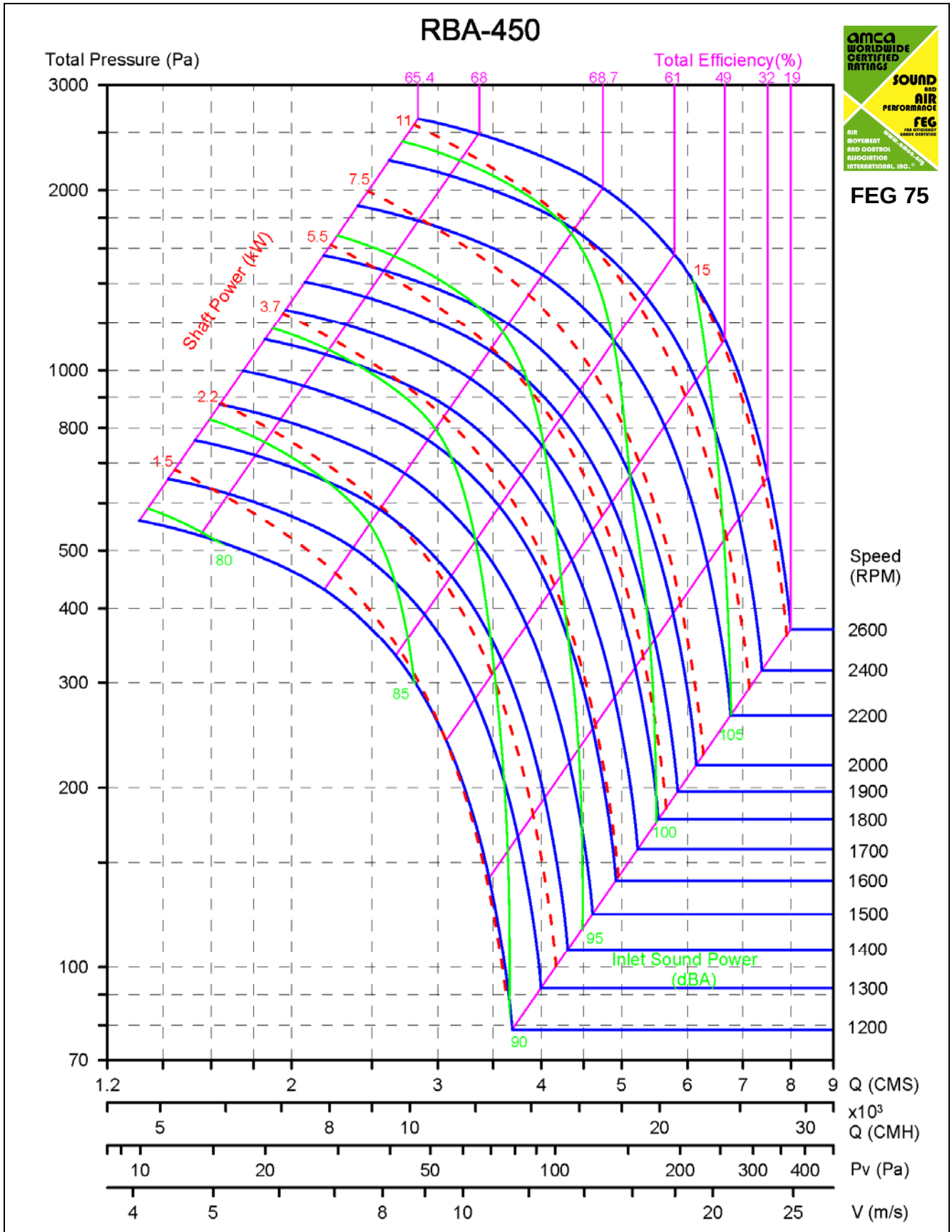

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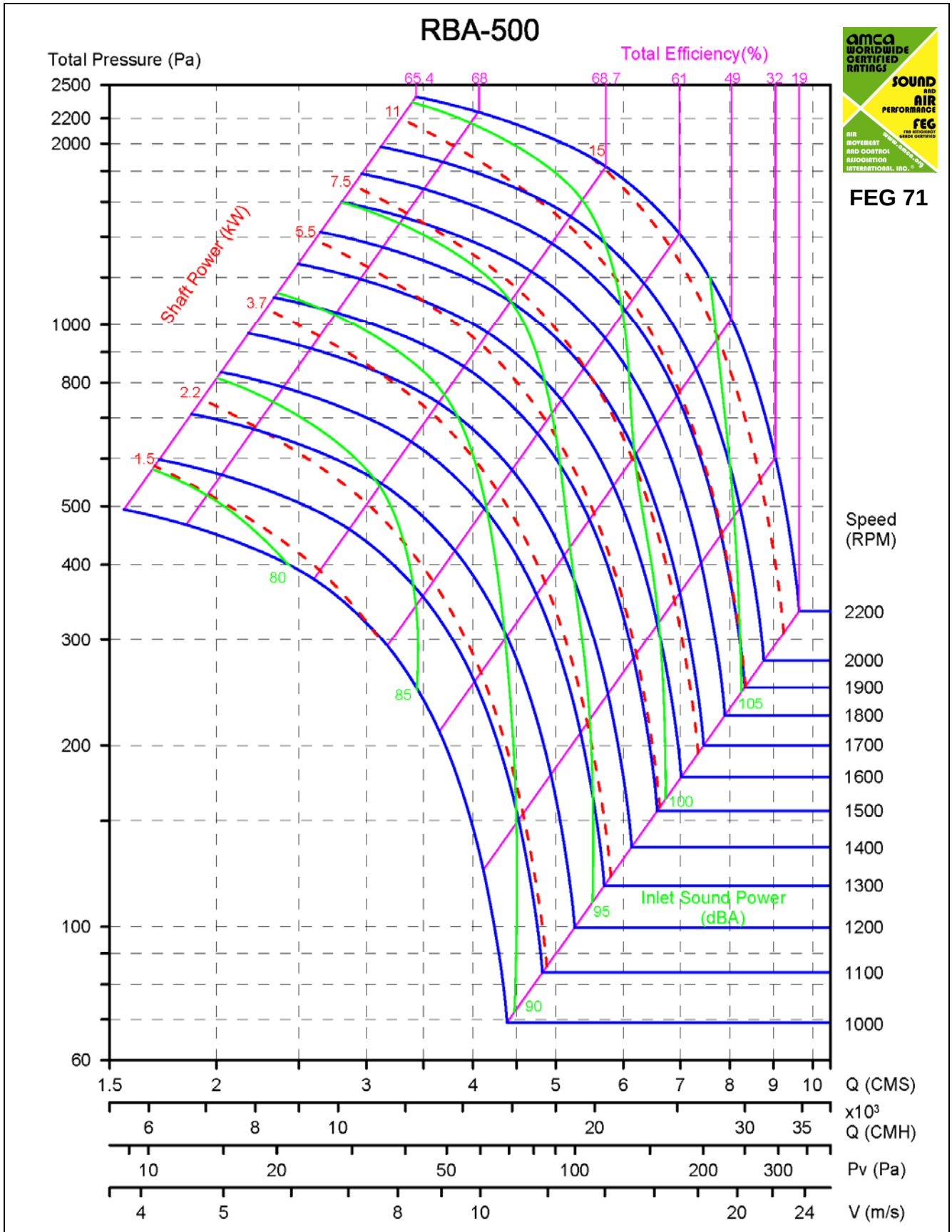

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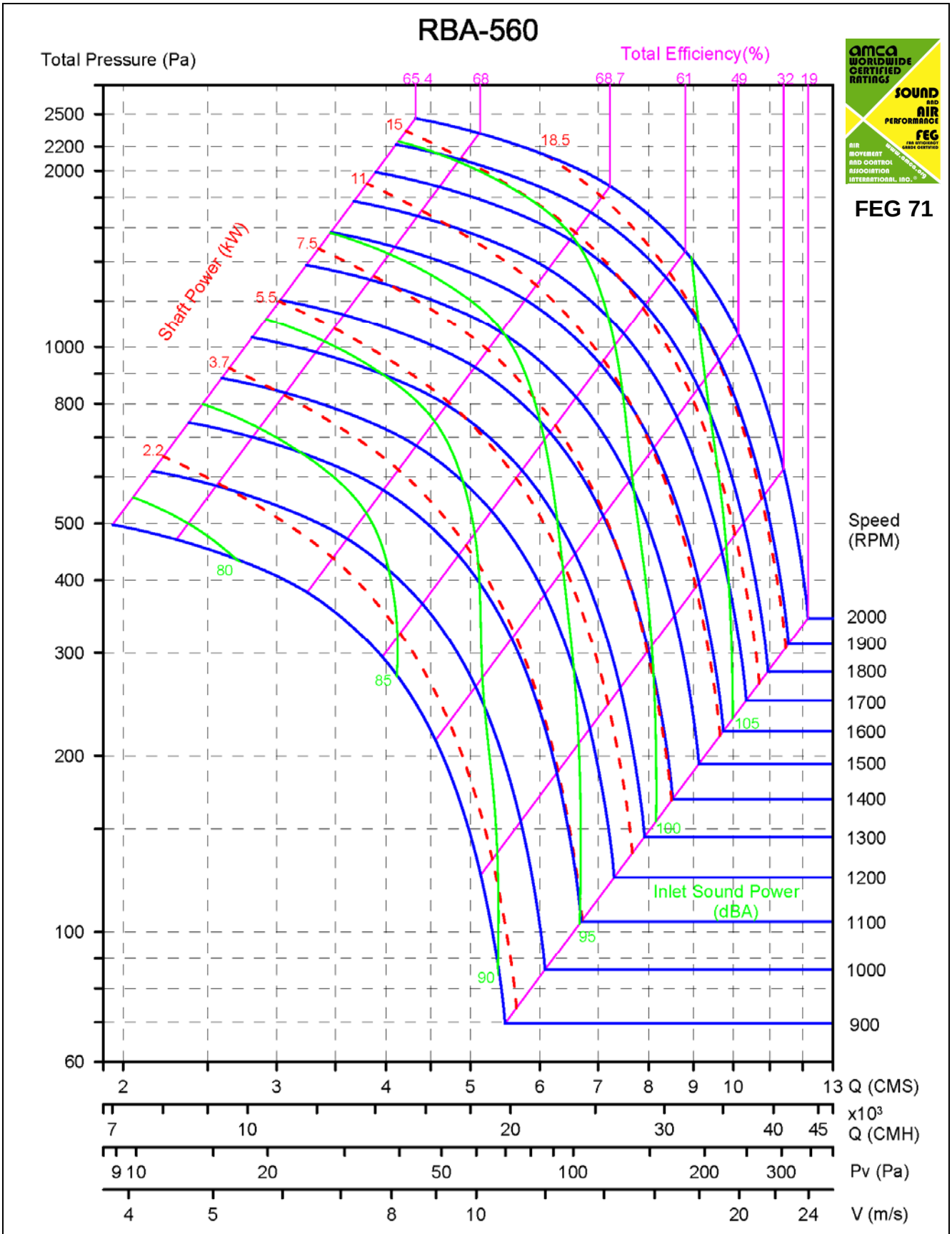

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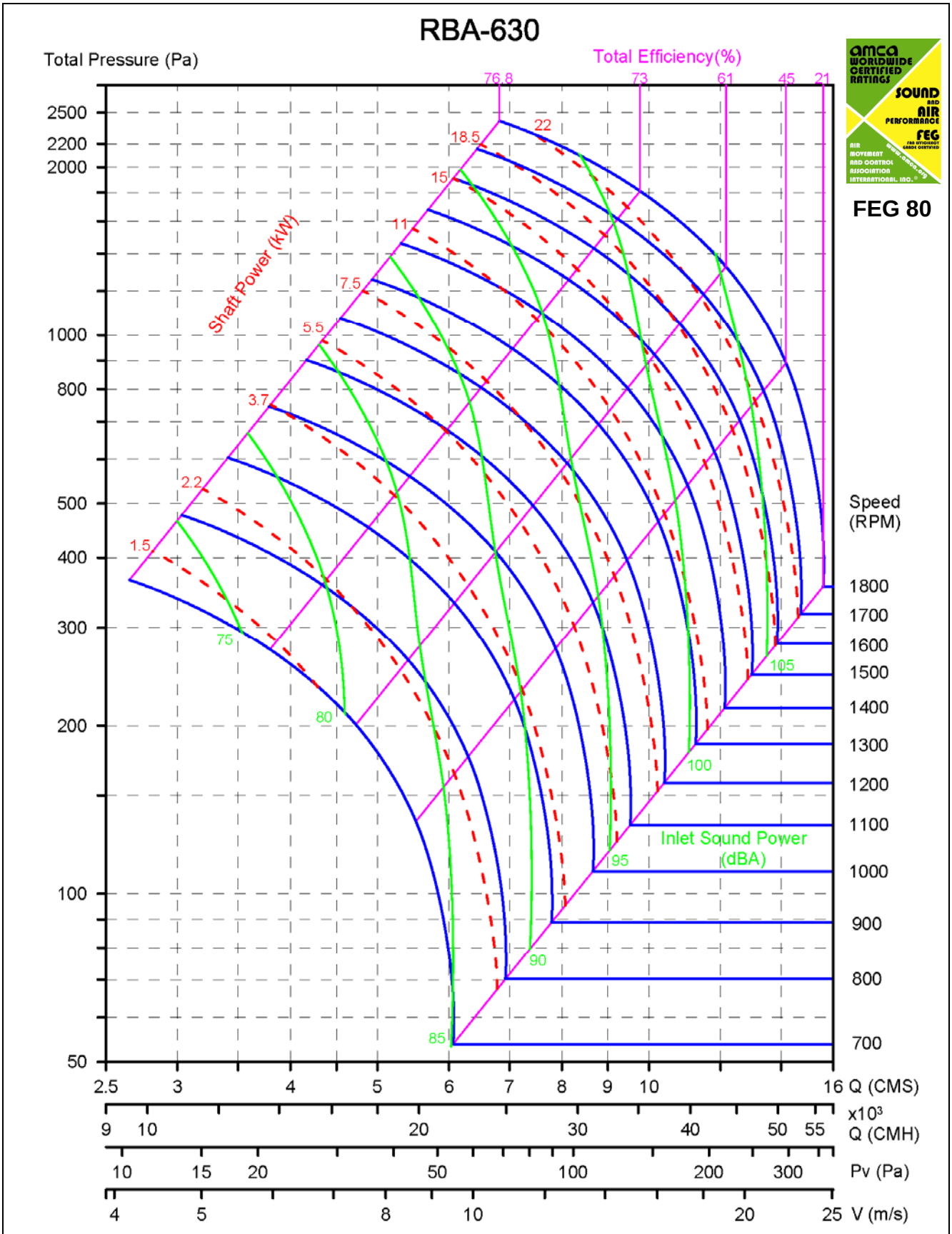

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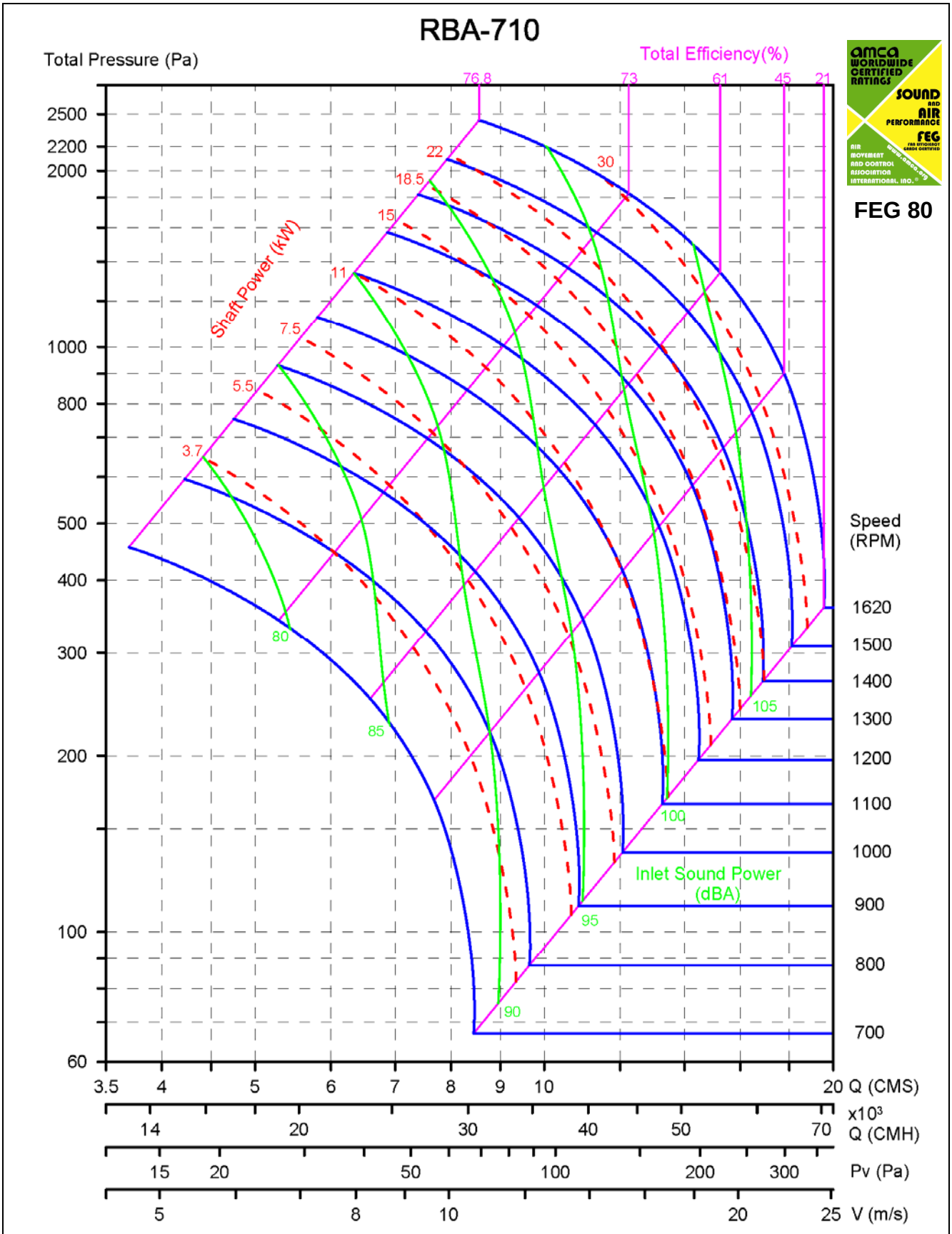

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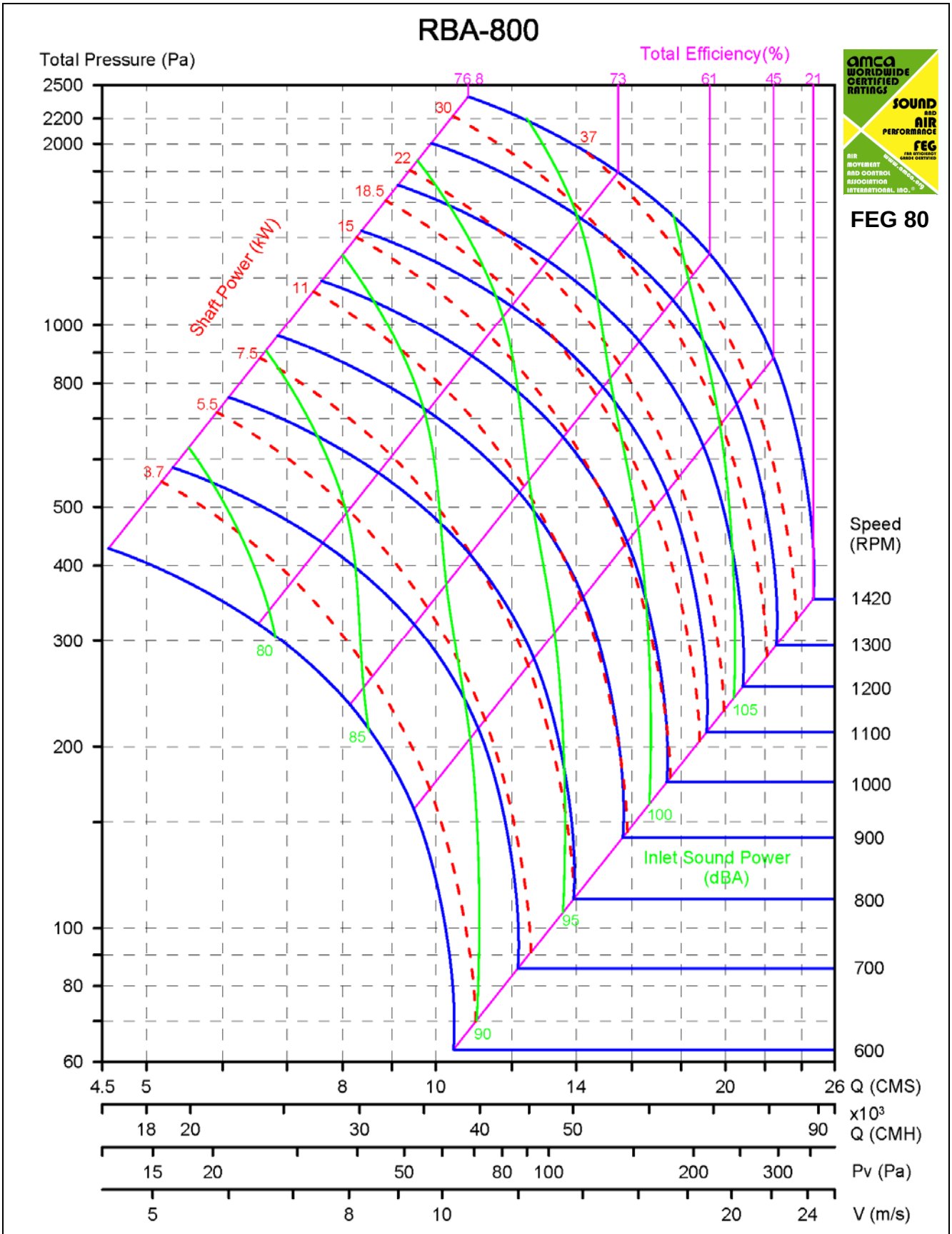

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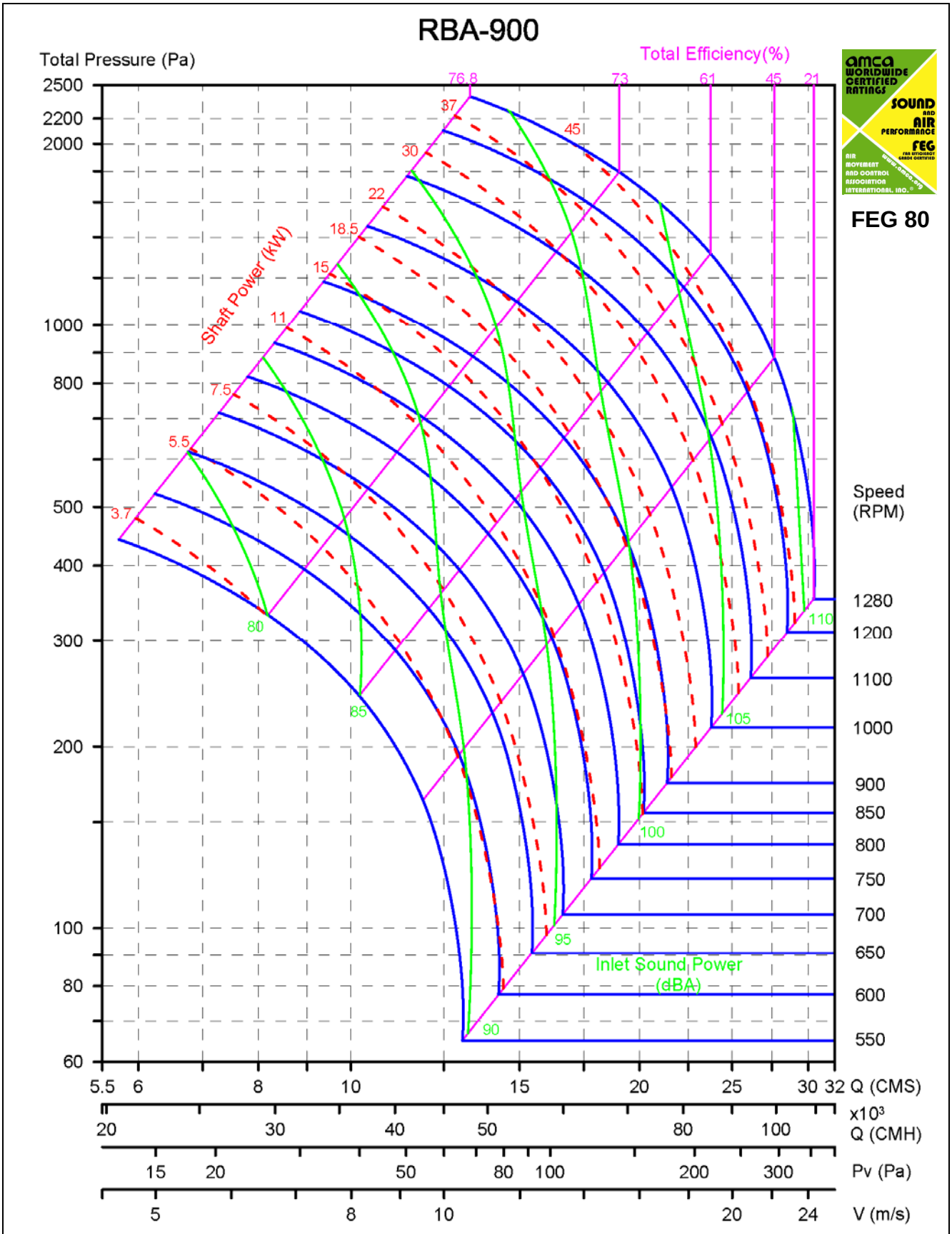

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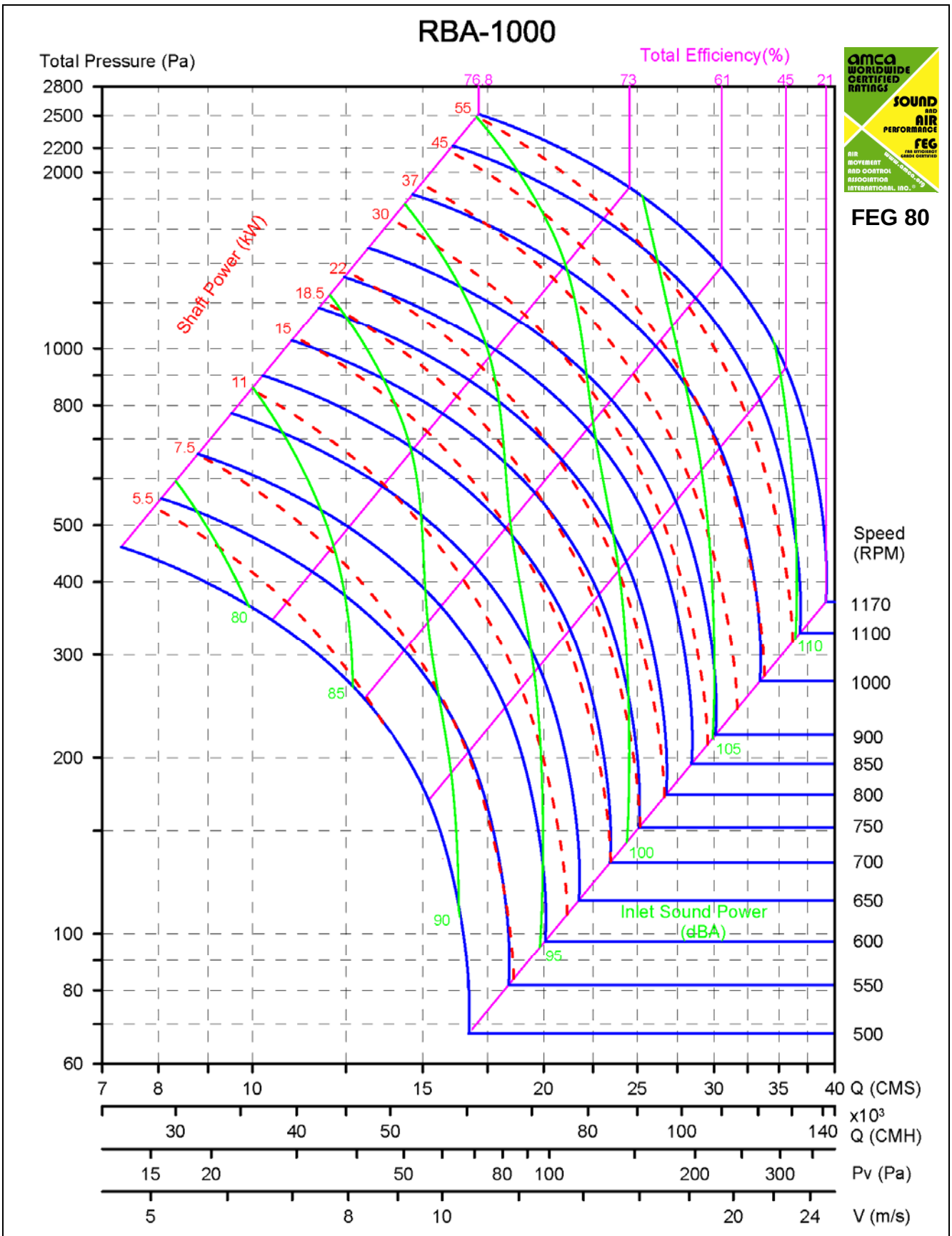

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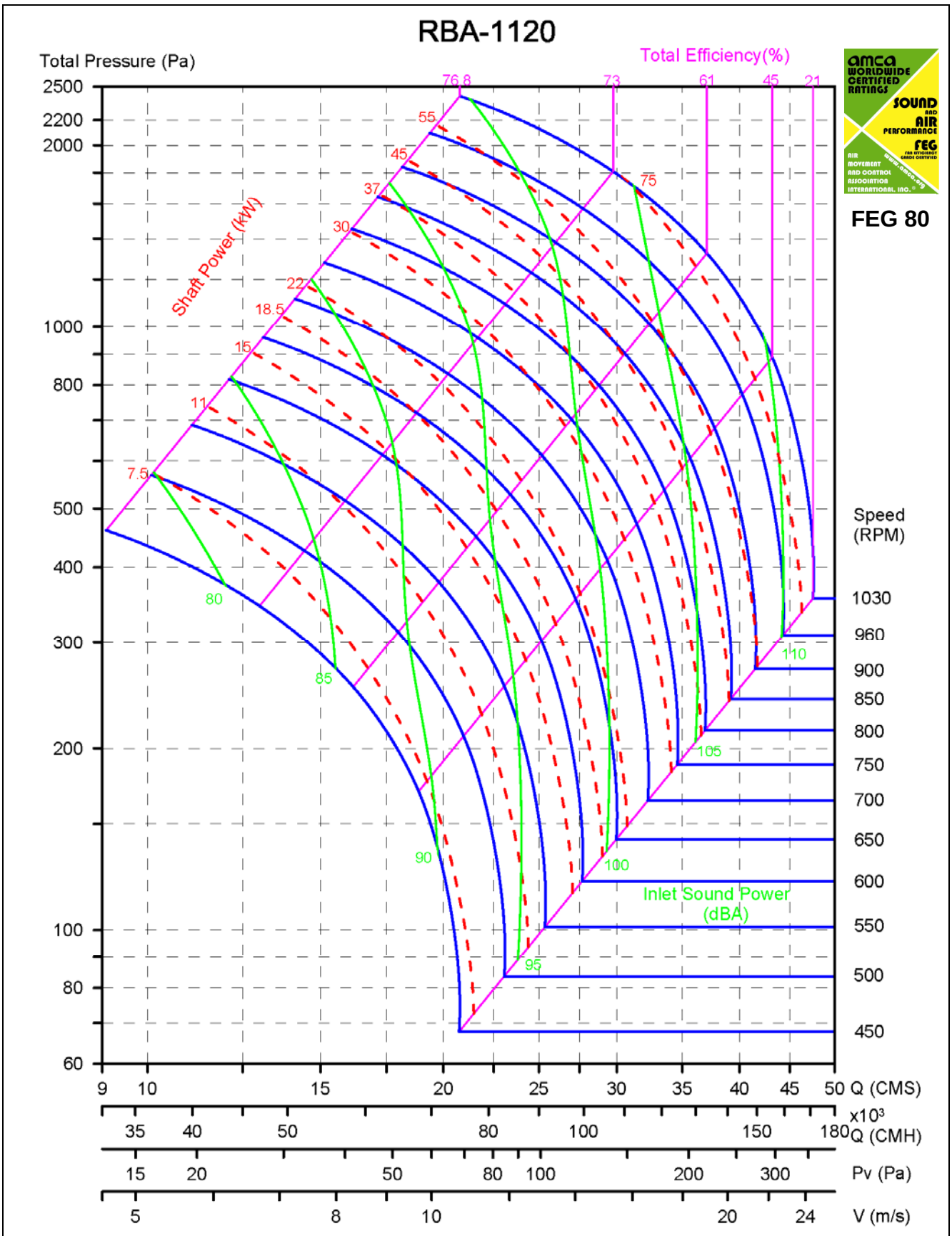

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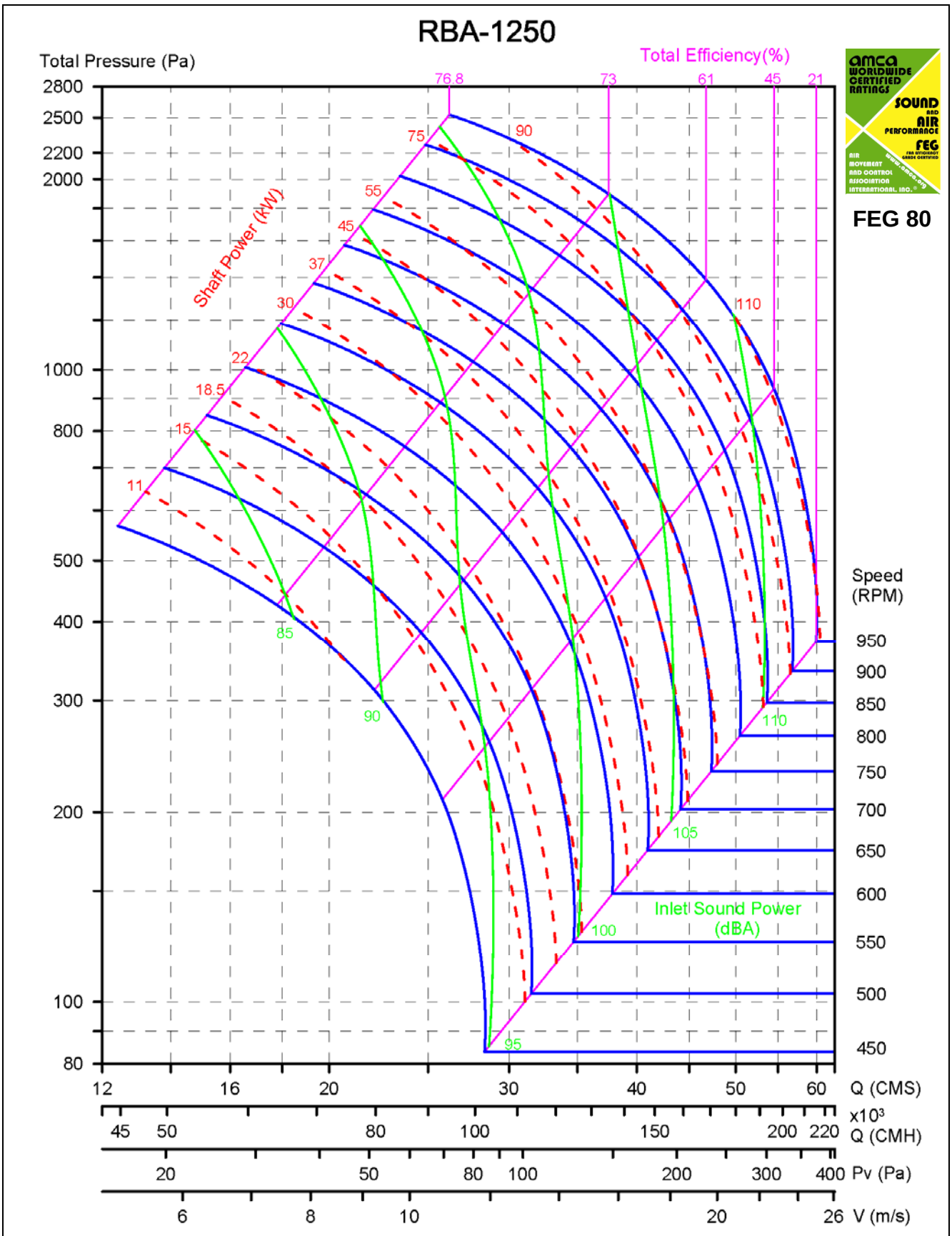

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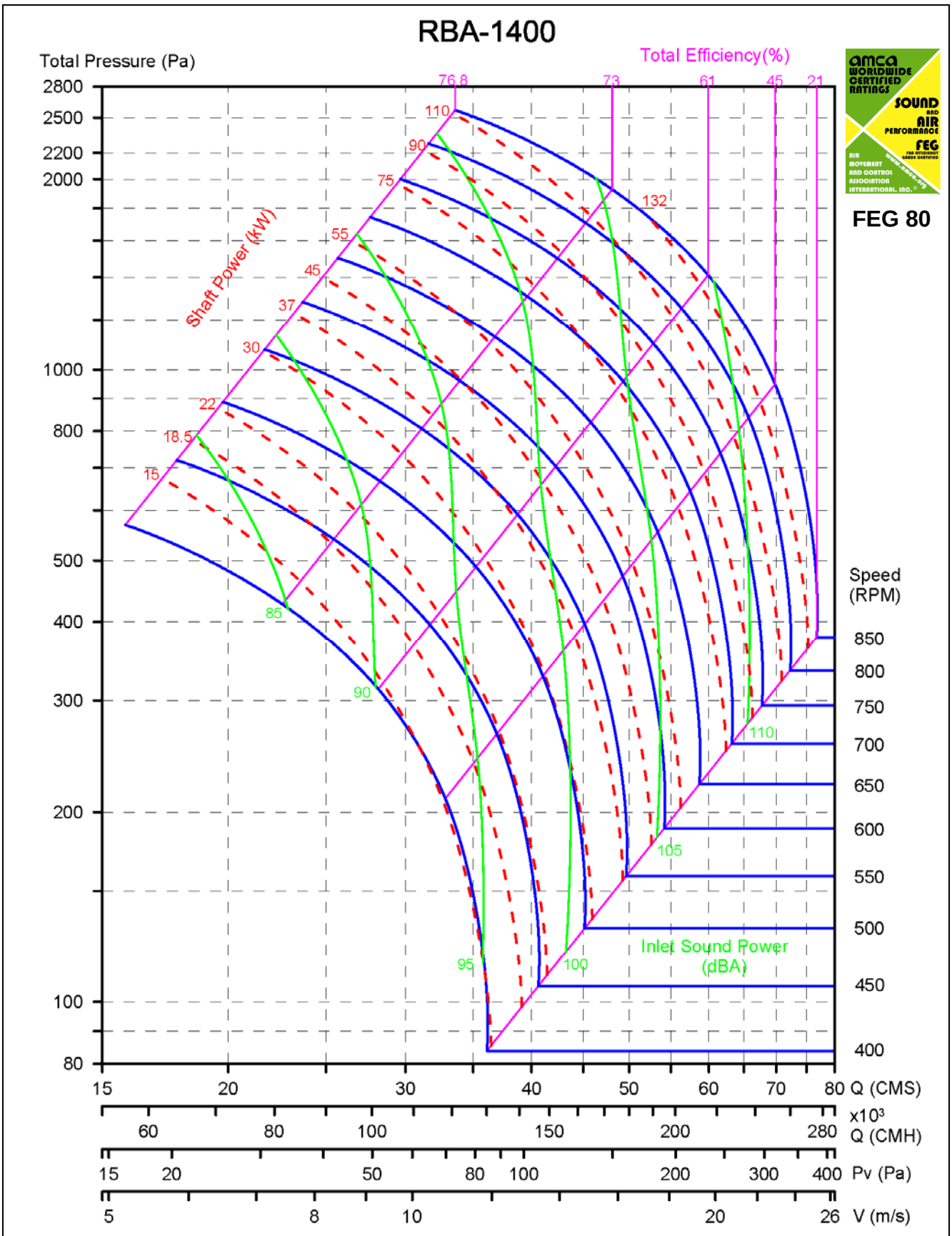

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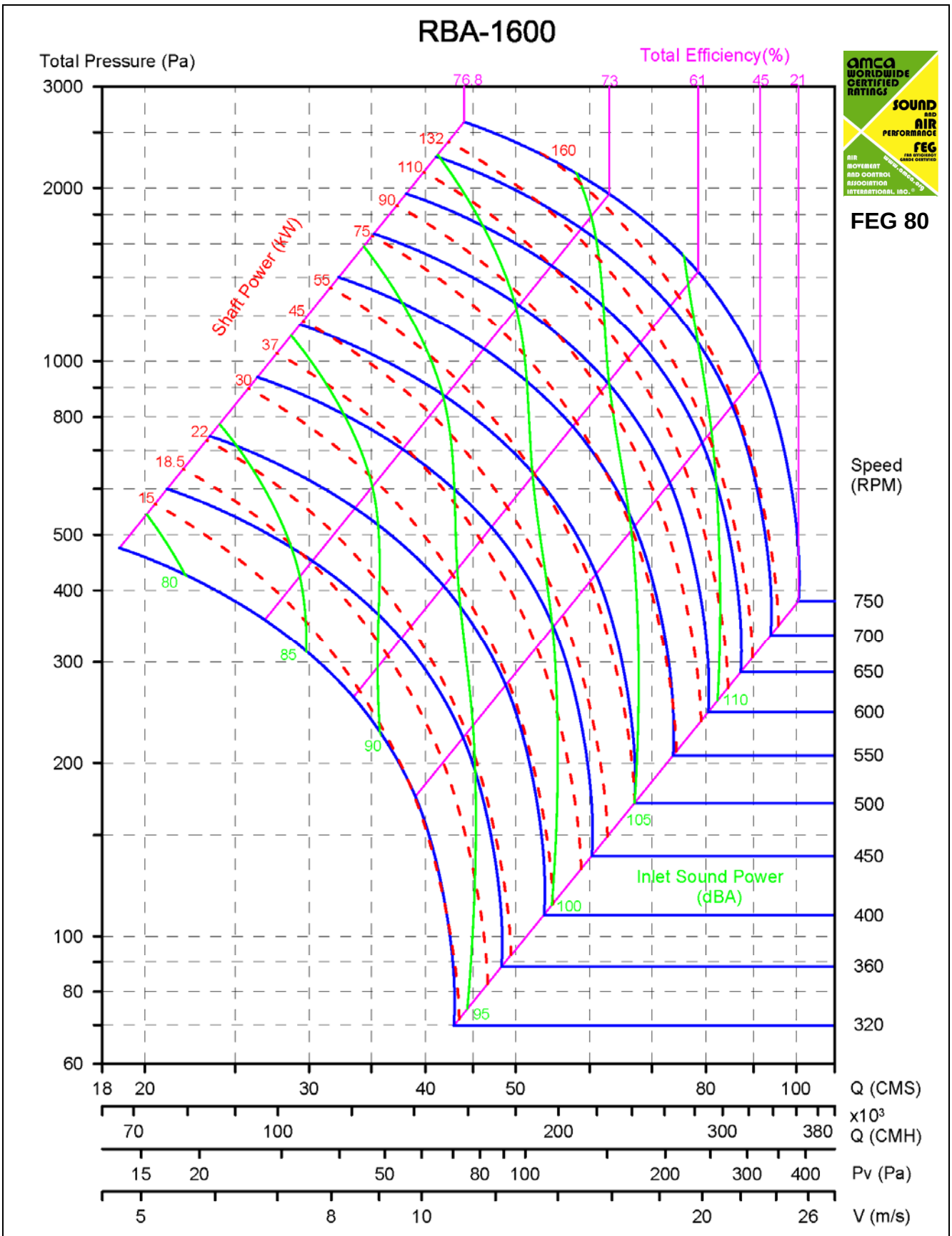

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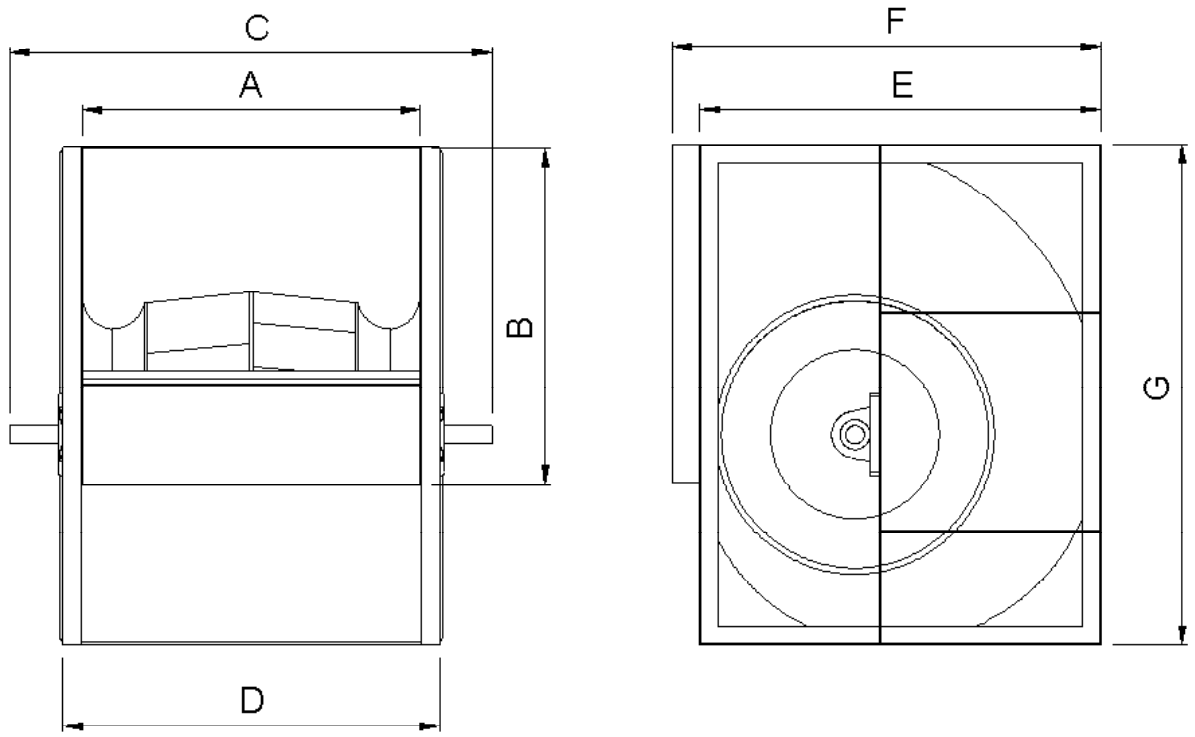
RBA 系列之外型尺寸 Overall Dimension - RBA Series



Model	A	B	C	D	E	F	G
315	403	403	625	469	488	523	596
355	453	453	685	535	544	579	665
400	505	505	750	590	610	645	743
450	565	565	850	652	686	721	837
500	635	635	920	720	754	807	926
560	710	710	1070	818	855	908	1050
630	800	800	1155	903	948	1015	1177
710	895	895	1290	1001	1066	1145	1331
800	1005	1005	1450	1110	1176	1254	1471
900	1125	1125	1570	1234	1337	1420	1668
1000	1260	1260	1700	1370	1471	1564	1830
1120	1410	1410	1840	1562	1752	1843	2138
1250	1540	1540	1940	1664	1923	2015	2380
1400	1765	1765	2280	1954	2260	2350	2663
1600	2012	2012	2510	2180	2545	2638	3025

Note：The data such as performance, dimension and etc. in this catalogue is subject to change without notice. Please contact with the manufacture for further information.

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新竹分公司：新竹市體育街6號
T：03-5618808 F：03-5618806
台中分公司：台中市西屯區台中港路三段38-9號
T：04-27082707 F：04-27003656
台南分公司：台南市仁德區後壁村民安路一段180號
T：06-2670899 F：06-2681995
高雄分公司：高雄市三民區民族一路560巷27號
T：07-3868066 F：07-390-6650

嘉義辦事處：嘉義縣水上鄉大堀尾50-20號
T：05-2686656 F：05-2682537
宜蘭辦事處：宜蘭市農權路11號
T：039-324607 F：039-323213
花蓮辦事處：花蓮市民德四街53號
T：038-350323 F：038-350851
中壢廠：中壢市中壢工業區合定路18號
T：03-4522088 F：03-4625821
中壢二廠：桃園縣中壢市中正路四段320號
T：03-4988609 F：03-4985947
上海廠：上海市松江區葉謝鎮車亭公路1296號
T：002-86-21-57801515~1517
F：002-86-21-57801518

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