KRUGER

MXC Series

INLINE CENTRIFUGAL MIXED FLOW FAN

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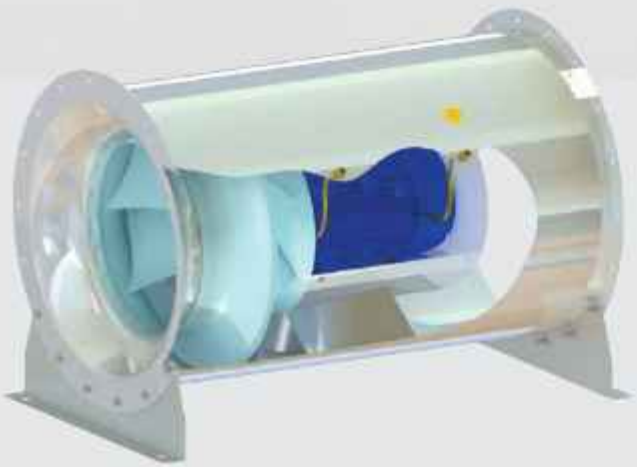
A GLOBAL POWERHOUSE - THE MIXED-FLOW (MXC)

The two most popular types of fan categories are "axial" and "centrifugal" and both offer unique characteristics which are great for certain applications, but a mixed-flow is basically a combination of the two.

- An axial fan provides high amounts of air volume, but it cannot handle high pressure applications
- A centrifugal fan performs really well in high pressure applications, but it does not provide as much air volume as an axial fan
- A mixed-flow fan borrows from both technologies to make a fan that can provide higher air volume than a typical centrifugal fan, but higher pressure than an axial fan

In almost any inline-fan application, the mixed-flow fan is the best option. Also, mixed-flow fans have great sound characteristics. In pressure applications above 250 Pa, they have better sound quality and they are quieter.



The Engineering Team

When the S&P Kruger Team (Thailand) dives into the research and development of a key new product line, they dive *all* the way in.

To do this, the S&P Kruger Team (Thailand) focused the core of the development in Asia at the Thailand R&D center, which boasts several impressive features on their own:

- 3 AMCA 210 chambers, 2 AMCA 300 Reverberant Sound Rooms, and one AMCA 250 Thrust Force Test Unit
- Mechanical Engineers led by management with several years of fan experience, and a lead engineer with a PHD in aerodynamics.

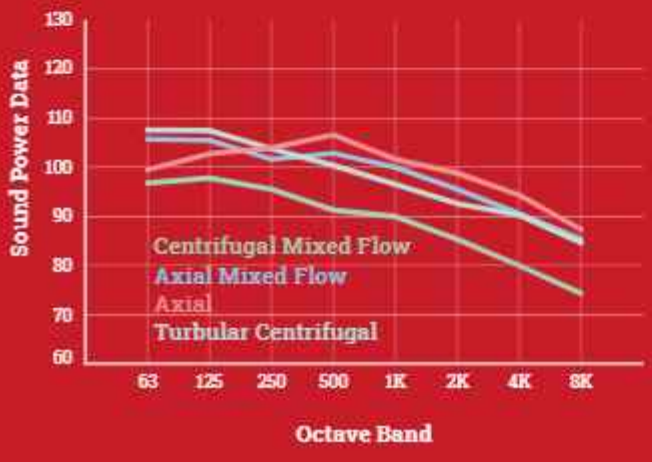
Then the S&P Kruger Team (Thailand) sought input and assistance from other global engineering teams who were able to collaborate with Thailand to supply any local or regional requirements that Thailand might not already know. Those teams are spread throughout the world and boast around 100 fan design engineers in several countries, and an additional 4 AMCA laboratories in Spain, The United States, Mexico, and Brazil. S&P knows that global unity and collaboration leads to the very best products due to a wealth of knowledge and a shared sense of accomplishment when completing something as a global team.

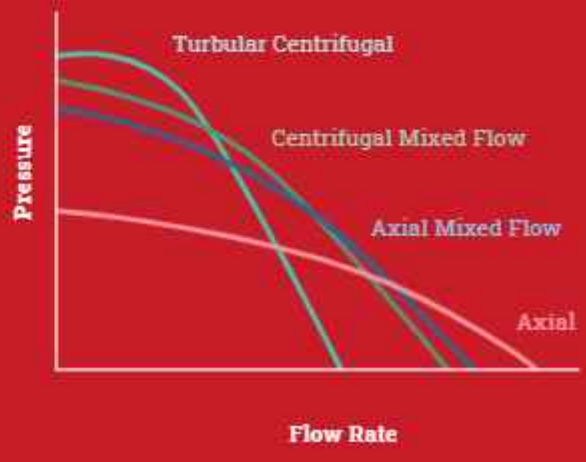
Why the MXC?

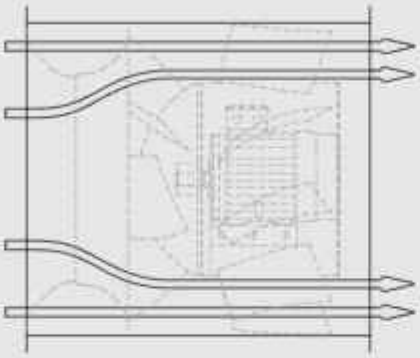
Soler & Palau (S&P) has unique global experts, technology, and teamwork that results in the best designs that can meet the requirements of any regional or local requirements. These unique abilities have led to the best mixed-flow fan in the global ventilation industry.

This great design results in lower upfront costs and lower energy consumption for the end user.

Finally, this unique fan type is perfect for so many applications, that ultimately using mixed-flow fans makes things easier for designers, installers, and end users.

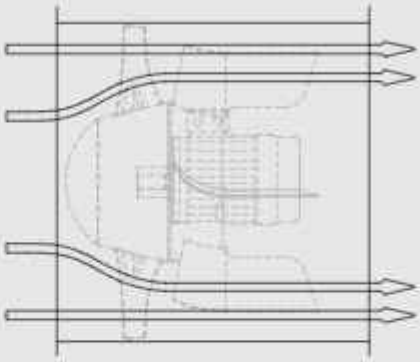






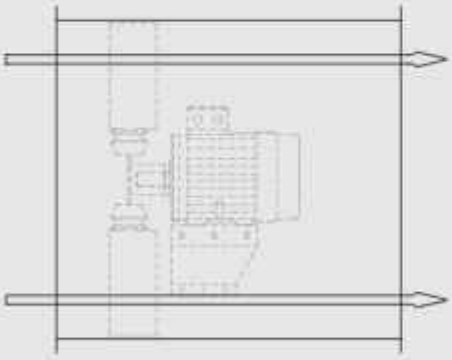
CENTRIFUGAL MIXED FLOW

- Smooth air flow direction through mixed flow impeller
- High pressure characteristic close to centrifugal fan at lower fan speed
- Lower noise at same fan size of traditional axial and centrifugal fan



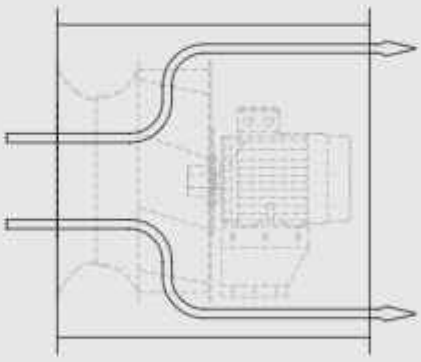
AXIAL MIXED FLOW

- Unique designed axial mixed flow fan impeller
- Air flow through the impeller in both axial and radial direction
- High pressure characteristic close to centrifugal fan
- Axial air path suitable for installation



AXIAL

- Straight through air flow
- High flow rate, medium pressure characteristic
- Lower efficiency at high pressure region



TURBULAR CENTRIFUGAL

- Two 90° bend in airflow direction
- High pressure characteristic at the same fan speed

Application

General ventilation and smoke extraction in various commercial, industrial and kitchen exhaust application where moderate pressure, high efficiency, and high airflow volume with quiet operation are required.

Range

Size: 315 - 2000
Capacity: up to 230,000 CMH
Static pressure: up to 2,000 Pa

Operating Temperature

- Normal Ventilation: -20°C + 55°C
- High Temperature Application in accordance with EN12101-3 up to 400°C
- Kitchen Exhaust Application up to 200°C

Construction

Double flanged casing is produced in mild steel or galvanized steel with mixed flow wheels. Shafts are manufactured from C45 carbon steel. Bearings used are either deep groove ball bearing type with an adapter sleeve, or spherical roller bearings sealed at both sides. All wheels are statically and dynamically balanced to ISO21940. All fans after assembly are trim-balanced to ISO14694/AMCA 204.

Finish

Zinc rich primer and polyester powder coating or galvanized finishing are available for all mild steed parts.

Motors

Totally Enclosed Class 'F' or 'H', with a min. IP55 protection are fitted as standard.
Motors 3.0kW and above are star/delta starting.
Motor of other specification are available upon request.

Airflow Direction

Air flow from impeller to motor is fitted as standard.

Certification

Kruger Ventilation Industries Asia Co., Ltd Certifies that the **MXC series** shown herein is 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 by **TÜV SÜD** which is a leading international service organization focusing on consulting, testing, certification and training.

MXC series was tested in accordance with EN12101-3.

Class	Temperature (°C)	Minimum functioning period (minutes)
F_f 250	250	120
F300	300	60
F_f 300	300	120
F400	400	120

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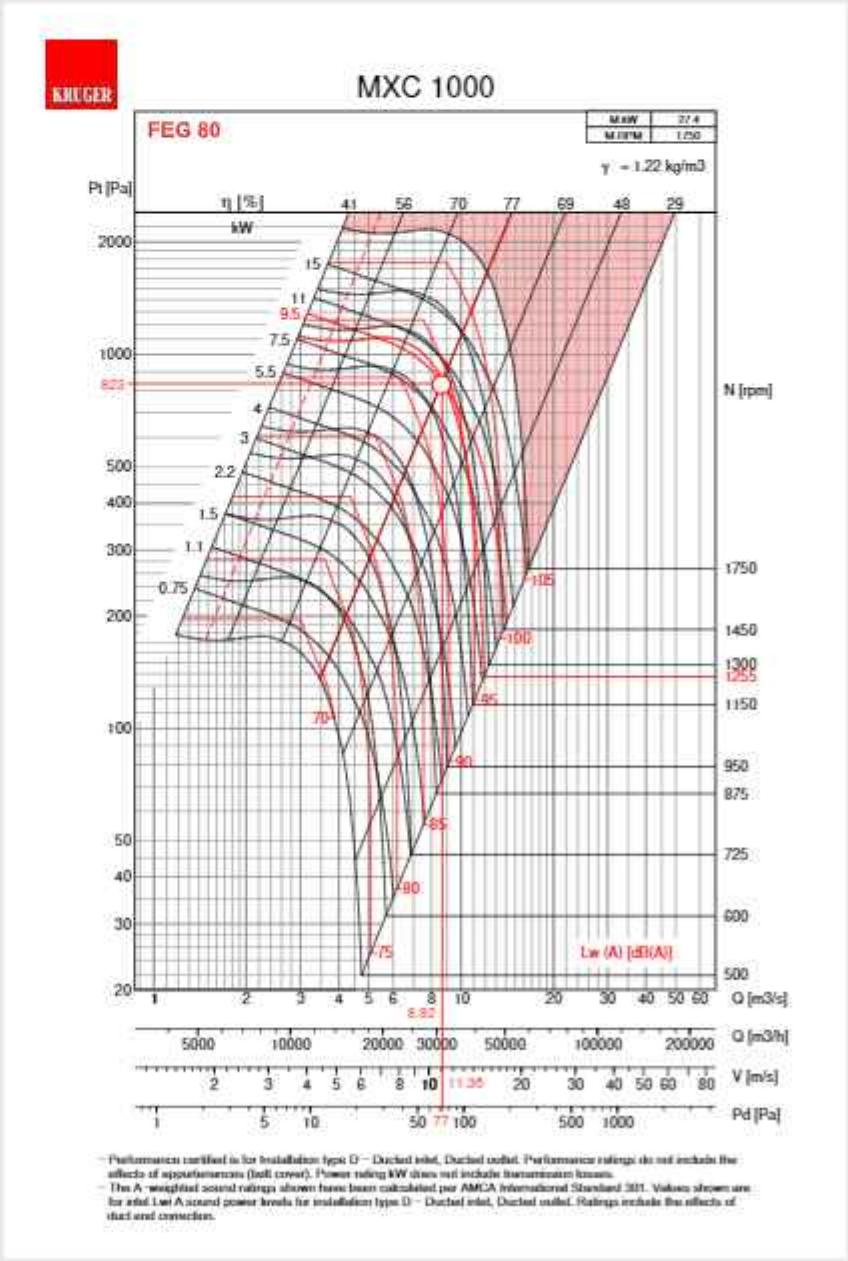
Nomenclature

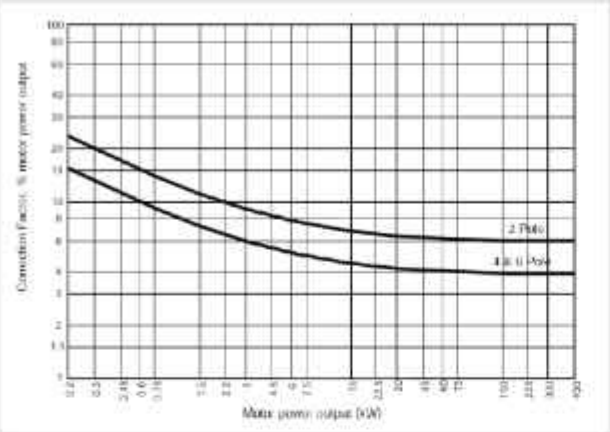
MXC 1000 - D - N

- **N** — Fan Design - N = Normal Application; S = High Temperature Application; K = Kitchen Exhaust Application
- **D** — Drive type - D = Direct Drive; B = Belt Drive
- **1000** — Nominal Fan Diameter
- **MXC** — Fan Model

Example of Selection

Air Volume	Q = 32115 m³/h
Outlet Velocity	V = 11.36 m/s
Dynamic Pressure	Pd = 77 Pa
Total Pressure	Pt = 823 Pa
Fan Speed	N = 1255 rpm
Absorbed Power	W = 9.52 kW
Total Efficiency	η = 77.1%
Sound Power Level	Lw(A) = 94 dB(A)





Motor Selection

The power curves shown on each performance graph represent the absorbed power at the shaft of the fan measured in kW.

To determine the power of the motor to be installed, a correction factors should be applied to compensate for transmission losses.

For conversion to horsepower (HP), use multiplying factor 1.34.

Performance

The performance data shown on each diagram is derived from tests conducted in accordance to AMCA Standard 210- Figure 12 - Installation type D (Ducted inlet, Ducted outlet).

Ratings refer to standard air density with the total pressure as a function of the air volume, using logarithmic scale.

It is essential that the same installation type and test standards are used at all time when comparing fan performance.

According to AMCA 205, MXC series can be classify up to FEG 80 based on fan peak efficiency. The following is the explanation of FEG classification:

Fan size is the impeller diameter in mm.

The fan peak efficiency shall be calculated from the fan (total) pressure.

If this method is used for a direct driven fan, the fan efficiency is the impeller efficiency.

The FEG label for a given fan size is assigned when the fan peak efficiency is equal to or lower than the efficiency at the grade upper limit, and higher than the efficiency at the grade upper limit of the next lower grade for the fan size.

For any fan sizes larger than 1016 mm, the values of the grade upper limits are the same as for a size of 1016 mm.

No labels are considered for the fans with the fan peak total efficiency below FEG 50.

The values of efficiencies are calculated for fan sizes in the preferred R40 Series.

Not all available fan sizes are shown.

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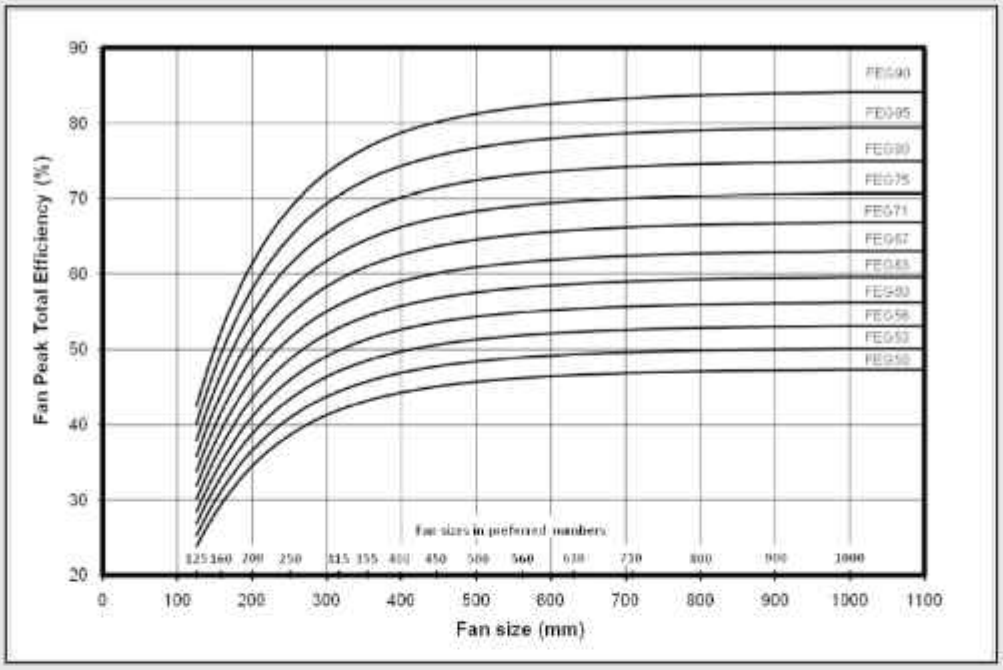
Fan Efficiency Grades (FEG) for Fans without Drives (SI) – AMCA 205



Noise

The noise levels shown on each graph refer to the "A-weighted" sound power values and the data on the inlet side has been measured in accordance with AMCA Standard 300 Fig. 2, Installation Type "D". The noise levels of the fans are determined as follows :

Sound power level - ("A" scale): Lw (A) as catalogue

Octave band spectrum: Lw = Lw(A) + Lw rel. dB [refer to Kruger for more details]

Sound pressure level:

a) free field conditions
$Lp(A) = Lw(A) - (20\log_{10}d) - 11$

b) room conditions
$Lp(A) = Lw(A) - (20\log_{10}d) - 8$

where d = distance from fan (m)