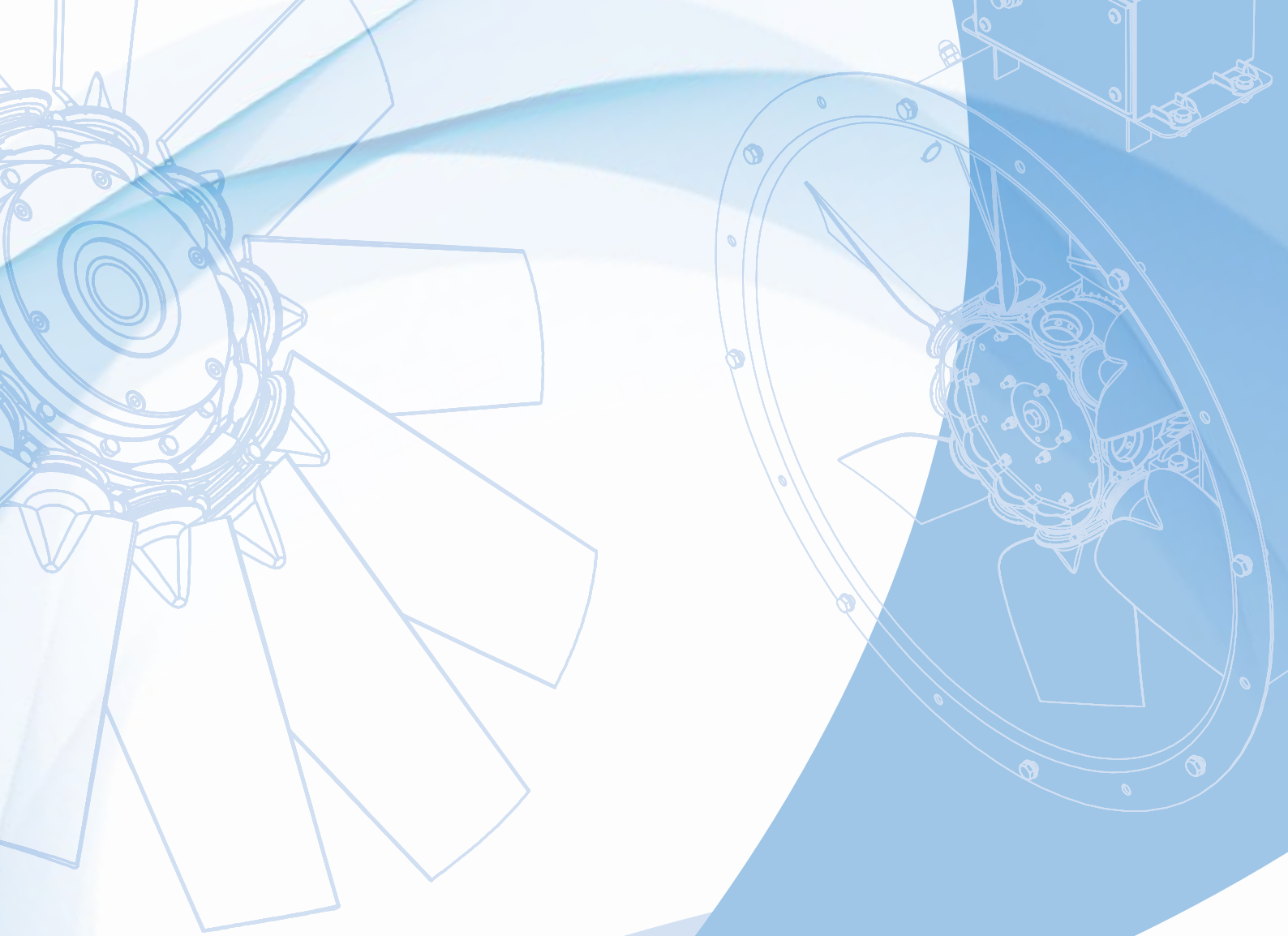


HW VENTILATION

AXIAL IMPELLERS,
AXIAL FANS AND
VENTILATION ENGINEERING
SERVICES

100% MADE IN ITALY

www.hwventilation.it

HW Ventilation - Italian heart, global mind

HW ventilation is a leading Italian producer of axial impellers and fans for industrial applications. With four decades of experience in the market, we commit to providing our customers with innovative and tailor-made products and solutions. 70% of the company's revenues comes from export. We sell throughout the world either directly or through a network of selected distributors and agents.

Engine cooling systems, compressors, industrial fans, snow cannons, hovercrafts are just few examples of the multitude of applications where our products can be found. We aim at offering our customers high quality, efficient, and fairly priced products, made with the best materials provided by rigorously selected suppliers. Our products and their components are **100% made in Italy**. We offer a full range of **advisory and engineering services**, which include the design of new products, the performance testing of products and prototypes, the design, construction and erection of test chambers.

Corporate mission and vision

HW Ventilation is expert of anything related to air moving. We offer our customers products and solutions that exceed their expectations and help them comply with the most stringent regulations. Our solutions, totally developed in Italy by our engineers, come with the highest level of customization and innovation, in a cost effective and timely manner. We strive to develop innovative products and offer high-value engineering services that help our customers succeed in their businesses. We aim at strengthening our position globally, consolidating our leadership in our traditional markets, and expanding worldwide through a solid network of trustworthy agents and distributors. We view ourselves as 360° technological partners. We are focused on offering tailor-made, efficient solutions that contribute to a more sustainable planet.

Team and facilities

HW Ventilation is headquartered near Milan, Italy. The company facilities consist of a workshop, a warehouse, an assembly area, an AMCA 210 test chamber, a showroom and several offices. A 20.00KWp photovoltaic plant powers our factory and contributes to the sustainability of our operations. Our team of motivated, highly-skilled professionals is expanding year over year to better meet the needs of our customers and offer an unparalleled level of service.

PRODUCTS

Impellers

Our impellers are suitable for highly efficient, low noise machineries, and can achieve optimal performance levels even in the hardest environments. Thanks to their stretched shape, the airfoil profile blades can generate higher levels of static pressure. The sickle profile blades can reach higher pressures at lower rpm, while reducing the noise emissions. The twisted design of our blades provides a homogeneous airflow, while the leading edge and the trailing edge are designed to provide low turbulence and low noise. Our blades can have a fixed pitch angle, or a variable pitch angle. Our blades are available in a huge variety of materials, like techno polymers (glass-reinforced polypropylene and polyamide), aluminum, stainless steel, ATEX.

The hubs of our fans are entirely made of aluminum and are highly resistant to mechanical stress and to extreme temperatures. Our hubs are machined and adapted to suit their final application. The hubs can be coupled with highly customized bores. Impeller diameters range from 230 mm to 1530 mm.

Industrial fans

Our MAV series fans are highly efficient duct fans, designed to deliver excellent airflow performances and low noise emissions. Our standard fans have diameters ranging from 300 mm to 1250 mm. The fans normal working temperatures range from -40° C to +120° C, but can reach up to 300° C with customized solutions. MAV series fans that are used for high-temperature environments are totally made of aluminum. Such special configurations have been successfully tested by Applus accredited laboratories, according to international standard EN 12101-3:2002. The fan under test successfully resisted at a temperature o f 200°C for two hours, and at 300°C for two hours. We also offer a series of ATEX fans dedicated to industries like oil&gas and very demanding working conditions. Our ATEX fans are designed, built and tested according to ATEX 2014/34/UE directive. All the procedures followed to construct the fans are listed in the HW Ventilation Technical File and filed with TÜV Rheinland.

Product design - The process

Concept definition

Our engineers work closely with customers to agree upon the features of the new product.

Material selection

We select the right materials to suit the customer's needs, and make sure they carry all the relevant certifications and comply with existing regulations (i.e. ATEX, UL94, etc.)

CAD/CAM and FEM analysis

In the industrial design phase, our engineers perform CAD/CAM drawings and FEM simulations to find possible issues, refine the concept and design a prototype.

Prototyping and testing

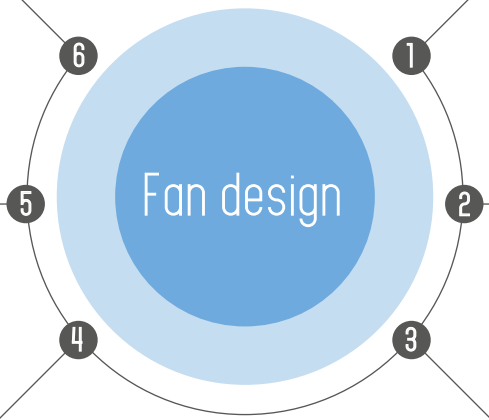
If simulations and drawings give the expected results, a polypropylene prototype of the product is created and its performance levels are tested to put in place corrective actions.

Final design

Once the product final design is ready, it is utilized to create its molding tools and start producing samples. Samples are tested to verify efficiency, noise emission levels, and compliance with existing regulations.

Production

The customer has the chance to outsource production of their products to HW Ventilation. HW Ventilation is an ISO 9001 certified company, and operates in compliance with the highest quality standards.



Innovative materials

Materials are key in the manufacturing process of new products. Our R&D department keeps testing new materials. Chosen materials can be anti-static, anti-explosive, self-extinguishing, high temperature resistant, corrosion proof, light weighed, or simply cheaper, performance data being equal. Many products are manufactured with ATEX-compliant materials.

Material	Description	Color	Applications	Op. temperature
PP	Polypropylene (PP)	Yellow	TS	Da -10°C a +80°C
PPG	Glass-reinforced Polypropylene (PP 30% glass)	Orange	TS, TM, SR, C, Q	Da -20°C a +85°C
PAG	Glass-reinfoced Polyamide (PA6)	White	TS, TM, SR, C, Q	Da -40°C a +120°C
PAS	Glass-reinforced Polyamide (PA6)	Dark grey	SR	Da -40°C a +120°C
ALU	Aluminum		C	Da -80°C a +300°C
RYT	Ryton	Brown	TS, TM, Q	Da -50°C a +200°C
PAA	Antistatic Polyamide	Black	TS, TM, Q	Da -40°C a +120°C
PAX	Antistatic, Self-extinguishing PA	Black	TS, TM, Q	Da -40°C a +120°C
PAM	Antistatic, Self-extinguishing, Magnetically-shielded PA	Black	TS, TM, Q	Da -40°C a +120°C
PAT/PAU	Glass-reinforced Polyamide for Rail Applications*	Black	TS, Q	Da -40°C a +120°C

* PAT/PAU are special glass reinforced polyamides, certified against the main international standards of fire resistance and smoke opacity – EN 45545, NF F16-101/102, NFPA 130 (PAU).

Sampling for testing and analysis

Customers can request samples of our products and are free to test them directly on their final applications. Sampling is part of our commitment to establish long-lasting relationships with our customers and represents a cornerstone in the process of designing new products in strict connection with our customers.

ENGINEERING AND TESTING

Our test chamber

Designed according to **ANSI/AMCA 210-16 and ISO 5801 standards**, our test chamber can perform several types of performance testing on fans, impellers and machineries that employ fan-motor systems. Having in-house testing enables us to accelerate the design of new products, and makes it easier to test the performance of prototypes and products under development. Our test chamber is also available to our customers for testing their products and generating detailed test reports.

Main characteristics of our chamber:

- **AMCA Fig. 15 – inlet chamber**
- **Max airflow: 36000 m3/h**
- **Axial fans max Ø: 1250 mm**
- **Max static pressure: 1000 Pa**

Products we can test: **axial fans and impellers, centrifugal fans, radiators, filters, fan-motor systems, etc.**

APPLICATIONS

Radiators/Engine cooling systems

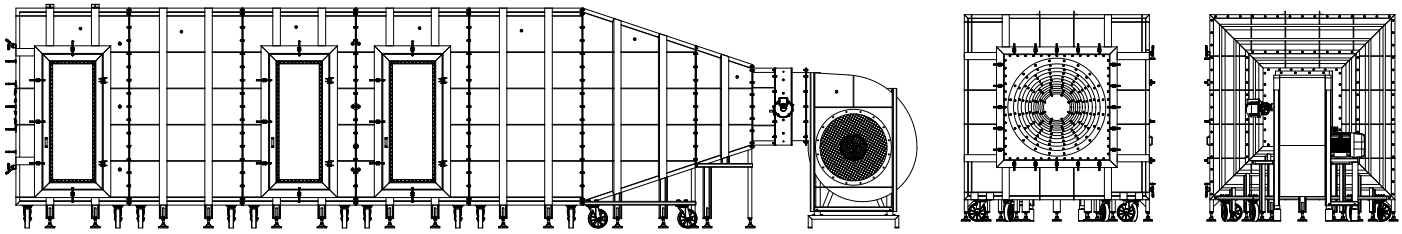
Compressors

Industrial fans

Oil&gas

AMCA test chambers design and construction

We support our customers in the design, construction and erection of AMCA 210 / ISO 5801 test chambers. Test chambers are very accurate tools to measure the performance of any air moving products, like impellers, ventilators, and "fan-using" products (engine cooling systems, HVAC, etc.), and the performance of passive products/parts (filters, dampers, etc.) through an airflow. Our engineers are here to accommodate all the specific requirements of our customers and provide highly customized solutions.



Qualyfan selection software

Qualyfan contains a complete archive of data of all HW Ventilation product series, whose performance levels have been tested and recorded through our test chamber. Our selection software is made available to our customers as a tool to support the development of their products. Qualyfan has an extremely user-friendly, intuitive interface. Performance data and info about energy efficiency are easily accessible and utilizable by the user. Qualyfan is freely downloadable at www.hwventilation.it.

Livestock ventilation

Dryers and kilns

Other applications

- Cooling towers
- Agricultural sprayers
- Agricultural machines and tractors
- Lift trucks
- Hovercrafts
- Snow cannons
- Filters

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