

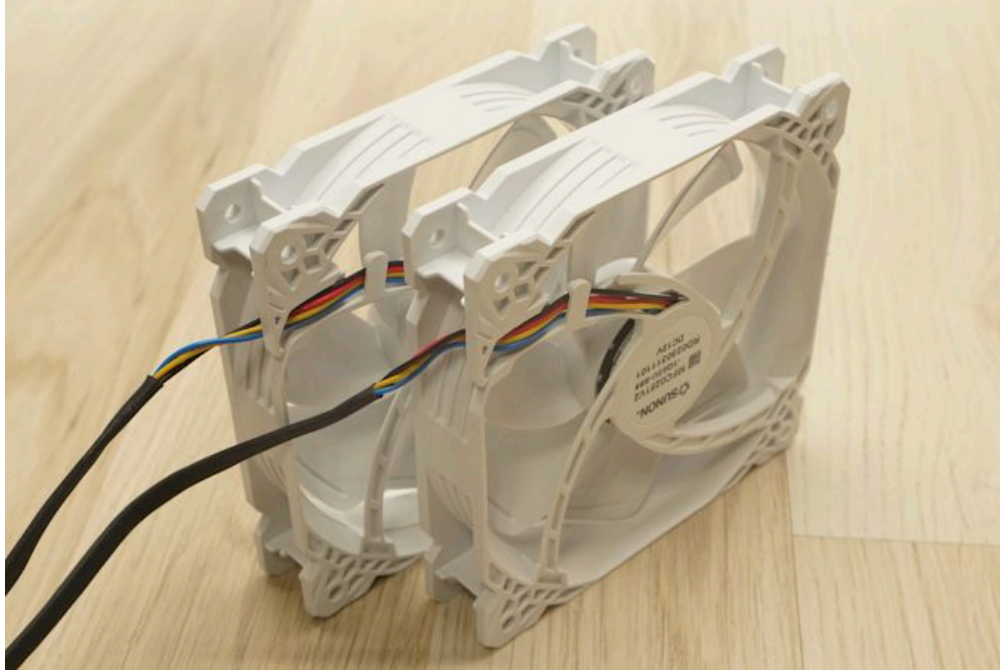


Original Link: <https://www.anandtech.com/show/21376/capsule-review-sunon-maglev-120mm-fan>

Capsule Review: Sunon Maglev 120mm Fan

by [E. Fylladitakis](#) on May 17, 2024 1:00 PM EST

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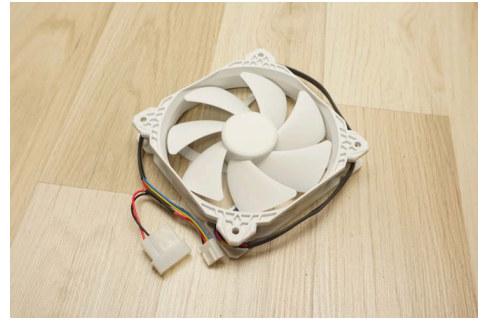
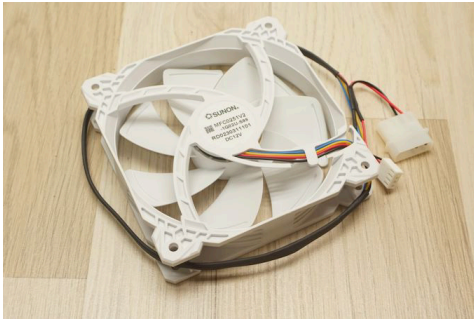


Founded in 1980 and headquartered in Taiwan, Sunon (aka Sunonwealth Electric Machine Industry Co., Ltd.), stands out as a prominent global producer of fans, blowers, and thermal management systems. The company has made a name for itself in the fan industry with a comprehensive product line that includes DC brushless fans, micro blowers, CPU coolers, and various other cooling technologies. They are one of the oldest and most renowned fan manufacturers on the world – and not just for PC applications, but for just about anything in need of something smaller than a ceiling fan, spanning from IT to automotive and industrial sectors.

Within the PC space, the company is best known for its proprietary MagLev (Magnetic Levitation) technology, which uses magnetic forces to levitate the rotor shaft, drastically reducing friction and wear. This innovative design improves the durability and performance of their fans, particularly in reducing operational noise and improving high-temperature performance. Sunon introduced the patent and their first MagLev products all the way back in 90s.

The 120mm Sunon MagLev fan that we are reviewing today – MFC0251V2-1Q02U-S99 – is a new, high-performance fan engineered primarily for PC applications, with an emphasis on longevity and functionality. It features Sunon's advanced Vapo-Bearing MagLev Engine, which allegedly ensures a quieter operation and longer lifespan by minimizing friction. This particular fan has a maximum speed of 1900 RPM and all of the bells and whistles of advanced cooling fans, including a wide range PWM speed control (10-100%). Distinguished by its crisp white color and unique frame design, this fan is aimed PC builders going for a clean and modern aesthetic. The "gaming" designation by the manufacturer clearly divulges their intentions regarding their targeted audience. By default, these fans have both a 4-pin connector and also a Molex connector for their direct connection to the PSU.





Fan Testing Methodology

We are testing fans using an Extech HD350 differential manometer, an Extech AN200 velocity meter, and a custom 3D printed apparatus designed for this specific purpose. The apparatus features a simple but effective shutters mechanism that allows us to test the unobstructed (maximum) volume flow of a fan, the fully obstructed (maximum static) pressure of the fan, and multiple points in between, allowing us to compose the actual P-Q performance chart of any fan. The RPM reading is taken with the fan unobstructed (maximum flow), as the fan speed varies depending on the airflow impedance in conjunction with the design of the fan's blades.

For noise measurements, we are using an Extech HD600 high sensitivity SPL meter. The noise of the fan is measured from 15 centimeters away, not one meter as IEC certifications require, as that would be far too great a distance to measure differences between nearly silent products. Note however that we are measuring the noise level of a fan with its flow unobstructed and the fan, to the best possible degree, uncoupled from the environment. The addition of fan grills, the installation on a cooler, and any other form of obstruction will increase the generated noise, as both aerodynamic and vibration noise will be added into the environment.

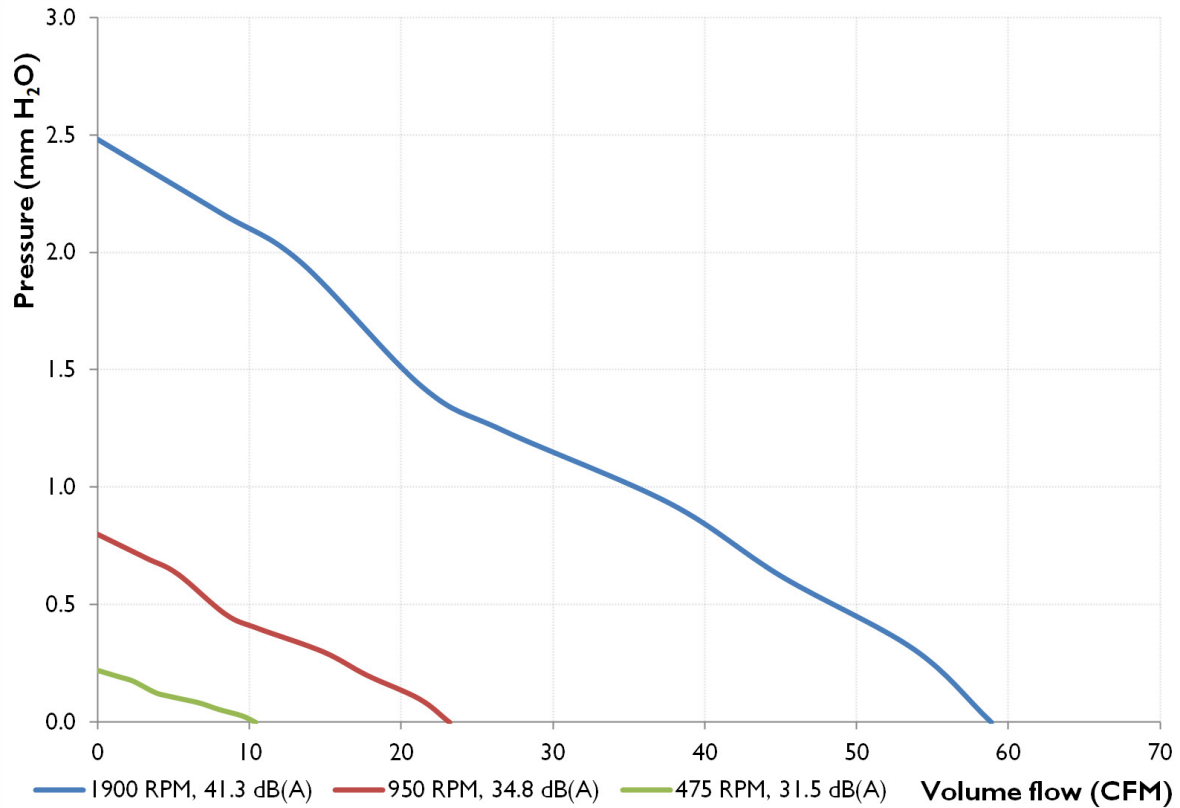
Test Results & Conclusion



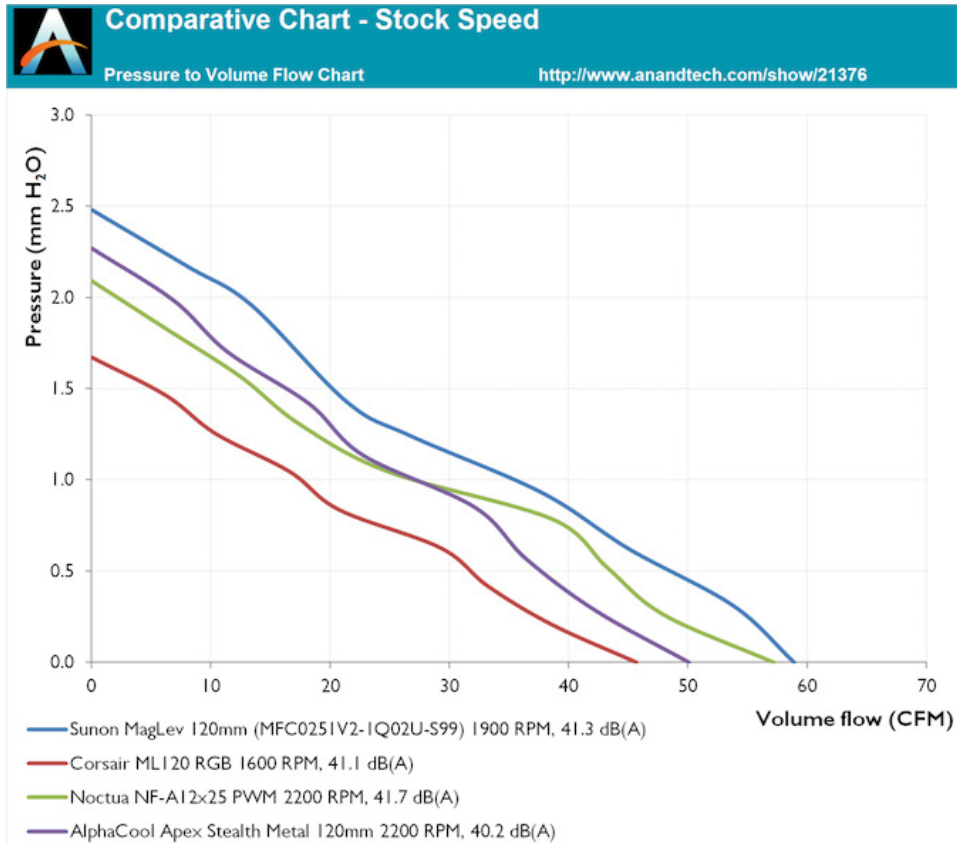
Sunon MagLev 120mm (MFC0251V2-1Q02U-S99) - 1900 RPM

Pressure to Volume Flow Chart

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The Sunon MFC0251V2-1Q02U-S99 is a robust performer across the entirety of the performance chart. At its maximum speed of 1900 RPM, it offers an airflow of 58.9 CFM and a static pressure of 2.48 mmH₂O. However, that performance comes with a noise output of 41.3 dB(A), which is quite noticeable and, in most cases, not really ahead of its competition. When compared to the Corsair ML120, another fan with a magnetic levitation engine, the Sunon model tends to offer significantly better performance by running about 300 RPM faster while generating about the same level of noise.



However "used correctly" is the operative term, as the MagLev engine makes the fan particular about its orientation. In short, these fans are not meant to be installed with the engine facing upwards, as this can jeopardize the integrity of the Vapo mechanism. As a result, Sunon's MagLev fan is really only good for horizontal airflow – front and back air intake/exhaust – and shouldn't be used for vertical airflow at the top and bottom of computer cases.

Despite that, the 120mm MagLev fan does excel when it's in its niche, especially at its price. The biggest hurdle, in that case, is just acquiring a fan, as Sunon is primarily geared up to target the bulk OEM market and doesn't sell their fans in individual retail units. So prospective buyers will need to skip the Neweggs and Amazons of the world, and look instead at electronic and industrial suppliers like [Digikey](#).