PC Fans & Cooling Buying Guide Quick Reference Handout

Cooling is crucial in computer builds to prevent overheating, which can cause throttling, component degradation, or failure. Modern gaming and high-performance PCs require advanced cooling solutions to manage powerful components

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Understanding cooling basics

What is CPU cooling?

A CPU cooler is designed to help keep your computer's CPU running optimally by cooling it down to a proper operating temperature

-Choices between air and liquid cooling

-Every cooler has a TDP (Thermal Design Power) rating, which tells you how well it can handle heat, measured in watts

Without appropriate cooling, you run the risk of overheating, throttling performance and/or damaging components long term.

Types of cooling options

Air cooling is a traditional, affordable, and low-maintenance cooling method, but it can be bulky and may struggle in warmer environments, potentially limiting its effectiveness.

Liquid cooling is ideal for high-performance PCs, offering quieter and more efficient cooling with a smaller footprint, especially in warmer environments. However, it is more complex to install, requires more maintenance, and carries a small risk of leaks, though quality systems minimize this risk.

- All-in-one (AIO) cooling is a pre-assembled system that offers easier installation and lower maintenance compared to custom loop cooling, functioning similarly to radiant flooring in a home.
- Custom loop cooling is ideal for advanced PC users, offering flexible tubing for customized cooling and the ability to target specific components. It's also a future-proofing option, allowing for system expansion to accommodate additional components.

Types of PC fans

- CPU Fans: Mounted directly on the CPU cooler, these fans use static pressure to push heat away from the heatsink.
- Case Fans: Placed anywhere in the case to maximize airflow, typically with intake fans at the front to bring in cool air and exhaust fans at the rear to expel hot air; some fans have arrows to indicate optimal airflow direction.
- Radiator Fans: Used in liquid cooling setups, these fans provide high static pressure and are mounted on the radiator in either a "push" (blowing air through the radiator) or "pull" (drawing air through the radiator) configuration.

Features to Consider

Fit: Solution needs to fit inside your case and have enough room for motherboard and its components, including not blocking PCIe slots

Power: You might need a stronger Power Supply Unit (PSU). Check that your PSU and motherboard can handle the cooling system's needs.

Motherboard compatibility: Ensure proper compatibility with your motherboard and ability to cool CPU

Compatibility: Ensure motherboard compatibility with CPU and other peripherals. Confirm the board type, slot number, and size fit your case.

Proper clearance : If you have extra GPU and PSU hardware, make sure there's enough room for the cooler to fit, especially if using a cooling system with a radiator

Additional Features: Check USB slots, network connectivity, VRM capabilities and availability to hook up extra Power Supply unit if required

Some advanced cooling recommendations for 2024

Corsair iCue series
NZXT Kraken Series
Coolermaster Masterliquid Series
ASRock X670E series