

Why You Probably Don't Need a Pancake Motor

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A pancake motor not only sounds like an appealing choice, but it looks like the ideal motor. In fact, in a runway show of motors, axial flux motors (also referred to as pancake or disc motors) would probably steal the show. And with good reason.

Although they vary in functions, they tend to sport many of the following characteristics:

1. Low inertia
2. Heightened potential for low heat production
3. Low noise production (because they are often used to replace gearmotors)
4. Limited or zero cogging
5. High precision potential, depending on the motor
6. High starting torque
9. Flat, compact design



Clearly, they do their jobs well, so why does the title of this post imply that they might not be the best fit for your application?

IT COMES DOWN TO TWO WORDS: PRACTICALITY AND AFFORDABILITY.

Flat motors are undeniably useful in applications with limited space and odd orientations. However, depending on the specifics, you might also be able to use a right angle planetary gearbox to help with spacing limitations. However, beyond the size issue, many other DC, AC, Brushless, and Universal motor types can be customized to perform with similar characteristics of these flat motors. “Normal” radial flux DC motors can achieve the same high starting torque. Brushless motors are used for their long lifespans, high efficiencies, and high performance to weight ratios. Groschopp Universal motors begin on a non-standard, customization level, so noise and heat production can be specific design factors for engineers to work around in the creation process.

In essence then, it's only the combination of everything with the size (and shape) that makes this pancake motor so valuable. Valuable would be the correct word, since this type of motor tends to be significantly more expensive than its less-compact counterpart. Various components of flat motors—such as their commutators and brushes—are made from precious metal. This material allows them to function with the above-stated characteristics, but at the same time, it raises the price index an excessive amount.

So unless you specialize precision-driven, small capacity high-torque, low-speed applications such as service robots or aerospace and defense automatons, your ideal motor probably won't need precious metals to function or a NASA price tag.

