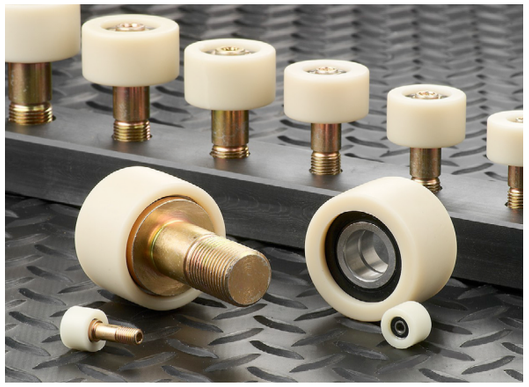
design FAQs

Choosing the Right Cam Follower

FREQUENTLY ASKED QUESTIONS



Q: Why do I need to choose a cam follower? Can't I just buy a standard part online?
A: Like any component in a system, cam followers can make or break the performance of your motion system, whether on a packaging machine, in a medical application, or on other industrial machinery. The wrong type of cam follower (or roller) can lead to frequent maintenance, reduced service life, contamination issues, and speed limitations. On the other hand, the right component will provide greater reliability, longer life, and smoother, faster motion.

Q: What is the most common cam follower being used today?
A: The go-to choice, in the past, has been a metal cam follower. As with any component selection, there are compromises (e.g., size, weight, performance, design, manufacturing cost, etc.). Yet, metal cam followers working below their load capacity will compromise your application through metal-to-metal wear, vibration, noise, metal particle generation, need for lubrication, potential contamination, need for grind and casehardened rail/cam surfaces, and heavy springs to maintain rail/cam contact at high speeds—to name a few.

Q: What other choice is there?
A: High-performance cam followers and guide rollers, with an engineered polymer outer racer, offer an excellent alternative to metal components. Component material specs, though, are very important. Consider that metal-on-metal contact results in excessive wear and galling and can take a similar toll on rails, which are much more expensive to replace. Plastic polymer components, on the other hand, eliminate this wear mechanism completely—and don't need to be lubricated. The right polymer, designed properly using some custom engineering, allows your cam follower to withstand enormous forces—up to eight tons.

Q: How do I optimize my application?
A: First, consider the load and the available space. The load on the cam followers often includes the working load (e.g., the force needed to extrude the neck on an Al can or lifting a five-gallon bottle through a filling machine); any spring load that may occur; and acceleration forces. Many off-the-shelf parts choose to incorporate a polymer load-bearing surface over a metal ball bearing or structural hub. Sized as drop-in replacements for standard metal rollers (imperial or metric) , a hybrid roller offers compelling technical advantages thanks to their material makeup. Most importantly, polymers facilitate high-speed, energy-efficient motion by reducing inertia, exhibit a lower rolling resistance than greased needle bearings found in traditional metal rollers, and eliminate resistance caused by viscous drag from lubricants or worn metal surfaces.

Q: What other technical advantages should I be looking for?
A: As alluded to above, the right polymer will self-lubricate, which puts an end to catastrophic failures and unscheduled down times that can occur when metal rollers and rails aren't regularly lubricated. This also means that the devices are cleaner, eliminating two sources of contamination—stray lubricant and particulates being expelled due to metal-on-metal contact. This makes them ideal for use in medical, food processing, packaging, semiconductor, and other clean-room applications. Self-lubricated polymers eliminate the time it takes to regrease moving components after aggressive washdown cycles as well.

Q: Is there a particular polymer I should consider?
A: Great question. There are a lot of companies using plastics these days and not all materials are the same. Each has its own formulation. For example, Intech has a proprietary polymer that is so stable that they can calculate the load capacity so that the product they deliver is exactly what your application requires. This ability is key when you want your equipment to operate effectively over its lifetime.

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Q: How does a polymer handle shock and vibration, which can distort metal components?
A: In any cam-follower application, the right polymer blend will absorb the damaging shock and vibration caused by reciprocating motion, without developing a flat. This prolongs the life of machine bearings, especially in high-speed applications. In roller applications, damping contributes to quiet motion as well. Overall, polymer rollers run about 10 dB quieter than their metal counterparts, due to precision roundness specifications available with some polymers. For example, total runout on a machined cam follower with a 1.5-inch OD would be less than ±0.001-inch. Such components will run smoothly for the life of your machine.

Q: How do these cam followers operate in harsh environments?
A: Fitted with stainless-steel bearings, rollers and cam followers made from the right polymer do not swell in moisture and are highly resistant to chemicals and temperature fluctuations. These characteristics make them well-suited to outdoor exposure, washdown applications, and other harsh environments or where corrosion is an issue for metal cam followers.

Q: Can I use polymer cam followers on case-hardened cams?
A: Yes you can. In fact, when designing new machines, the cams do not have to be case-hardened or ground. A good machine finish is sufficient. Further, with polymer cam followers, you will not need any springs to achieve full contact. Your supplier will be able to help with the design.

Q: What about the cost of using polymers versus metals?
A: As discussed earlier, the savings both in existing applications and in new machines can be substantial. In existing machines, polymer cam followers and guide rollers eliminate the costly downtime to replace worn rails and cams. They make it possible to build new machines more cost-effectively because polymers' wear characteristics make it feasible to use low-cost aluminum rails and cams rather than expensive case-hardened and ground steel. Machines run faster producing more output. ■

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