



Beam couplings for robotics

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Ruland beam couplings are machined from a single piece of aluminum or stainless steel with several spiral cuts for higher torsional stiffness and torque capabilities than single beam couplings. The multiple-beam pattern allows these couplings to accommodate higher amounts of parallel misalignment than single beam couplings while also allowing for high angular misalignment and axial motion.

Medical and surgical robots often combine a stepper or servo motor to a lead screw or encoder, requiring a zero-backlash coupling for precise motion control. These systems have limited torque requirements; however, they may need high responsiveness and flexibility, making a beam coupling a suitable choice. These four-beam style couplings (P- and MW-series) have a more compact design that is paired best with light-duty applications such as servo motor to encoder connections. The six-beam style coupling (F-series) has increased torque capacity and is well suited for light-duty power transmission applications such as connecting a motor to a lead screw.

The multiple-beam couplings are manufactured with a balanced design for reduced vibration at speeds up to 6,000 rpm. Clamp-style F-series couplings are supplied with Ruland's proprietary Nypatch anti-vibration coating. Nypatch ensures that the hardware stays in place through intense vibration and movements over time, whereas untreated hardware may back out from harsh vibrations.

The beam couplings are offered in clamp and set screw styles with inch, metric, and inch to metric bore combinations ranging from 3/32-in. (3 mm) to ¾-in. (20 mm). They are available in 7075 aluminum for lightweight and

low inertia or 303 stainless steel for higher torque and torsional stiffness. Special designs such as anodizing, non-standard bore sizes, and special tolerances are available upon request.

All Ruland zero-backlash beam couplings are manufactured from select North American bar stock in the company's factory in Marlborough, Massachusetts, under strict controls using proprietary processes.

Summary:

- Higher torque and torsional rigidity than single beam couplings
- Balanced design for reduced vibration at up to 6,000 rpm
- Accommodates parallel misalignment, angular misalignment, and axial motion
- Zero-backlash for precise motion control
- RoHS3 and REACH compliant

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