

Jaw couplings for surgical robots

Marlborough, MA, March 2022. Ruland manufactures zero-backlash jaw couplings with a balanced design for reduced vibration and constant velocity in surgical robot applications that require demanding starts and stops. The dampening ability of Ruland's jaw couplings aid in reducing settling time and shock loads, making them an ideal option for precision positioning systems.

Jaw couplings are a three-piece assembly comprised of two aluminum hubs and an elastomeric element called the spider. The spider is made from complex polyurethane which reduces impulse loads that might cause shock to the motor and other sensitive equipment. Available in three durometers, the spider allows the user to tailor the jaw coupling's torsional stiffness, misalignment, and dampening requirements to their application.

Ruland jaw couplings feature a curved profile that press fits onto the spider ensuring zero-backlash operation. The curved jaw profile evenly distributes the forces to the center of the spider's limbs, improving the effectiveness of the elastomer material. Raised contact points on the spider limbs help maintain proper spacing between the two hubs, allowing for electrical isolation and full angular misalignment capabilities.

The designer can mix and match clamp or set screw hubs with inch or metric, and keyed or keyless bores. Bore sizes range from 1/8 inch to 1-1/4 inch and 3 mm to 32 mm. Spiders are available in 85 shore A for the best dampening ability, 92 shore A for a balance of dampening and torsional stiffness, and 98 shore A for the greatest torque and torsional stiffness. This combination of hubs and spiders gives designers a high level of customizability.

All Ruland zero-backlash jaw couplings are manufactured from select North American bar stock in Ruland's factory in Marlborough, Massachusetts under strict controls using proprietary processes. Full product information, 2D and 3D CAD files, installation videos, and more are available on ruland.com.

Summary:

- Balanced hub design to support higher RPM with reduced vibration
- Wide range of clamp and set screw style hubs with inch, metric, keyed, or keyless bores
- Spider dampens impulse loads while minimizing shock to sensitive equipment
- RoHS3 and REACH compliant
- Carefully made in Ruland's factory in Marlborough, Massachusetts and available for immediate delivery

Product link:

<https://www.ruland.com/servo-couplings/jaw-couplings.html>

Picture:

Jaw couplings from Ruland in different sizes with spiders available in three durometers

About Ruland:

Ruland Manufacturing Co., Inc. is a privately owned family company founded in 1937. Ruland has carefully and responsibly manufactured high performing shaft collars, rigid couplings, and motion control couplings for the past 40 years. Ruland's product line was recently expanded to include a variety of machine components from select manufacturers that align with Ruland's performance and quality standards.

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TPR International would be grateful for a copy of the publication with this article.