Slit couplings for robotic systems

Marlborough, MA, July 2021. Ruland offers slit couplings for robotic systems. Slit couplings are zero-backlash, lightweight, and manufactured with intermittent slit cuts, making them an ideal starting point for designers of robotic systems. While they are visually similar to Ruland multiple beam couplings, the slit cut design gives them higher torque and torsional stiffness capabilities and multiple length options in the same outer diameter, allowing coupling performance to be tailored to system requirements.

Slit couplings have torque comparable to that of a single disc coupling, torsional stiffness similar to a stainless steel beam coupling, and misalignment consistent with an aluminum beam coupling. This combination of features allows a slit coupling to be used in-place of one of these styles which all have limitations such as no accommodation of parallel misalignment in a single disc coupling. The proprietary slit pattern with radiused (as opposed to squared) edges reduces stresses that build up during misalignment and under torque loads, increasing effective service life and allowing for better performance when compared to other slit couplings available in the market. Along with low mass and inertia, these characteristics make slit couplings a good choice for robotic systems.

Robotic applications such as those found in medical, surgical, factory and warehouse environments often require a zero-backlash coupling with high torque, torsional rigidity and speed. These robots can start, stop and reverse constantly, necessitating the use of a responsive coupling. Along with other performance benefits, slit couplings have a moderate amount of dampening, which is useful in robots that require vibration control, such as material handling and articulating robots.

Slit couplings are offered in RL- and RS-series for a range of outer diameter and length combinations. RL-series couplings have longer lengths, allowing for greater parallel misalignment capabilities, increased torsional stiffness and greater distances between shafts. RS-series couplings are designed to fit in compact spaces and offer parallel misalignment capabilities, an upgrade to the single disc coupling, which has comparable torque but no

accommodation for parallel misalignment. Both series accommodate all forms of misalignment with low bearing loads and have a balanced design allowing for speeds up to 70,000 rpm.

Slit couplings are available in clamp screw and set screw designs with inch, metric and inch to metric bore sizes ranging from 1/8 inch to 3/8 inch and 1.5 mm to 12 mm. They are manufactured by Reliance Precision at their manufacturing facility in County Cork, Ireland. Ruland inventories and rebores couplings in Ruland's factory in Marlborough, Massachusetts for fast turnarounds and no minimum order quantities. Full product specifications including free downloadable CAD files, installation instructions with videos and application examples can be found at www.ruland.com.

Summary:

- Lightweight, low inertia coupling capable of speeds up to 70,000 rpm
- Manufactured from 7075 aluminum for low mass and inertia
- High-performance coupling with a balance of torque, torsional stiffness and misalignment
- Single piece design with no moving parts for a long, zero-backlash life
- Sizes starting at 1.5 mm for applications with small shaft sizes and high speeds
- Long styles for added torque and misalignment capabilities
- Short styles for compact installations
- RoHS3 and REACH compliant
- Large inventory in Ruland's Marlborough, Massachusetts location and available for immediate delivery

Product Link:

Slit Couplings

Picture:

Ruland inventories and supplies a wide range of slit couplings from Reliance Precision

About Reliance Precision:

Reliance Precision Ltd. is an independent family-owned company based in Huddersfield, West Yorkshire, UK. Reliance offers tailored engineering services for the design, manufacture and test of precision components, assemblies and full instruments across a diverse range of global markets. The business maintains a program of investment to keep at the forefront of modern manufacturing and precision engineering. More information at www.reliance.co.uk.

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.