



## BC12-5-3-A

Ruland BC12-5-3-A, 5/16" x 3/16" Bellows Coupling, Aluminum, Clamp Style,  
0.750" OD, 1.303" Length



### Description

Ruland BC12-5-3-A is a clamp bellows coupling with 0.3125" x 0.1875" bores, 0.750" OD, and 1.303" length. It is zero-backlash and has a balanced design for reduced vibration at high speeds. BC12-5-3-A is comprised of two anodized aluminum hubs and a stainless steel bellows. The bellows are able to flex while remaining rigid under torsional loads allowing for all types of misalignment to be accommodated. This bellows coupling is lightweight and has low inertia making it suitable for applications with speeds up to 10,000 RPM. Hardware is metric and tests beyond DIN 912 12.9 standards for maximum torque capabilities. Ruland BC12-5-3-A has five convolutions allowing for high torsional rigidity and making it an excellent fit for precise positioning stepper servo applications as well as encoders. It is machined from solid bar stock that is sourced exclusively from North American mills and RoHS3 and REACH compliant. BC12-5-3-A is carefully manufactured in our Marlborough, MA factory under strict controls using proprietary processes.

### Product Specifications

|                                     |                                                                                  |                                       |                                 |
|-------------------------------------|----------------------------------------------------------------------------------|---------------------------------------|---------------------------------|
| <b>Bore (B1)</b>                    | 0.3125 in                                                                        | <b>Small Bore (B2)</b>                | 0.1875 in                       |
| <b>B1 Max Shaft Penetration</b>     | 0.570 in                                                                         | <b>B2 Max Shaft Penetration</b>       | 0.570 in                        |
| <b>Outer Diameter (OD)</b>          | 0.750 in                                                                         | <b>Bore Tolerance</b>                 | +0.001 in / -0.000 in           |
| <b>Length (L)</b>                   | 1.306 in                                                                         | <b>Length Tolerance</b>               | +/- 0.030 in                    |
| <b>Hub Width (LH)</b>               | 0.410 in                                                                         | <b>Recommended Shaft Tolerance</b>    | +0.0000 in / -0.0005 in         |
| <b>Forged Clamp Screw</b>           | M2.5                                                                             | <b>Screw Material</b>                 | Alloy Steel                     |
| <b>Hex Wrench Size</b>              | 2.0 mm                                                                           | <b>Screw Finish</b>                   | Black Oxide                     |
| <b>Seating Torque</b>               | 1.21 Nm                                                                          | <b>Number of Screws</b>               | 2 ea                            |
| <b>Dynamic Torque Reversing</b>     | 10 lb-in                                                                         | <b>Angular Misalignment</b>           | 1.5°                            |
| <b>Dynamic Torque Non-Reversing</b> | 20 lb-in                                                                         | <b>Parallel Misalignment</b>          | 0.004 in                        |
| <b>Static Torque</b>                | 40 lb-in                                                                         | <b>Axial Motion</b>                   | 0.010 in                        |
| <b>Torsional Stiffness</b>          | 120 lb-in/Deg                                                                    | <b>Moment of Inertia</b>              | 0.003052 lb-in <sup>2</sup>     |
| <b>Maximum Speed</b>                | 10,000 RPM                                                                       | <b>Full Bearing Support Required?</b> | Yes                             |
| <b>Zero-Backlash?</b>               | Yes                                                                              | <b>Balanced Design</b>                | Yes                             |
| <b>Torque Wrench</b>                | <a href="#">TW:BT-1R-1/4-10.7</a>                                                | <b>Recommended Hex Key</b>            | <a href="#">Metric Hex Keys</a> |
| <b>Material Specification</b>       | Hubs: 2024-T351 Aluminum Bar<br>Bellows: Type 321 Stainless Steel                | <b>Temperature</b>                    | -40°F to 200°F (-40°C to 93°C)  |
| <b>Finish Specification</b>         | Sulfuric Anodized MIL-A-8625 Type II, Class 2 and ASTM B580 Type B Black Anodize | <b>Bellows Attachment Method</b>      | Epoxy                           |
| <b>Manufacturer</b>                 | Ruland Manufacturing                                                             | <b>Country of Origin</b>              | USA                             |
| <b>Weight (lbs)</b>                 | 0.038600                                                                         | <b>UPC</b>                            | 634529062586                    |
| <b>Tariff Code</b>                  | 8483.60.8000                                                                     | <b>UNSPC</b>                          | 31163018                        |

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| <b>Note 1</b> | Stainless steel hubs are available upon request.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| <b>Note 2</b> | Torque ratings are at maximum misalignment.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| <b>Note 3</b> | Performance ratings are for guidance only. The user must determine suitability for a particular application.                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| <b>Note 4</b> | Torque ratings for the couplings are based on the physical limitations/failure point of the metal bellows. Under normal/typical conditions the hubs are capable of holding up to the rated torque of the metal bellows. In some cases, especially when the smallest standard bores are used or where shafts are undersized, slippage on the shaft is possible below the rated torque of the metal bellows. Keyways are available to provide additional torque capacity in the shaft/hub connection when required. Please consult technical support for more assistance. |

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## Installation Instructions

1. Align the bores of the BC12-5-3-A bellows coupling on the shafts that are to be joined and determine if the misalignment parameters are within the limits of the coupling. (*Angular Misalignment: 1.5°, Parallel Misalignment: 0.004 in, Axial Motion: 0.010 in*)
  2. Fully tighten the M2.5 screw on the first hub to the recommended seating torque of 1.21 Nm using a 2.0 mm hex torque wrench.
  3. Before tightening the screw on the second hub, rotate the coupling by hand to allow it to reach its free length.
  4. Tighten the screw on the second hub to the recommended seating torque. Make sure the coupling remains axially relaxed and the misalignment angle remains centered along the length of the coupling.
  5. The shafts may extend into the relieved portion of the bore as long as it does not exceed the shaft penetration length of 0.570 in.
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