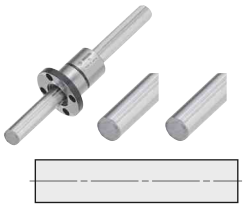
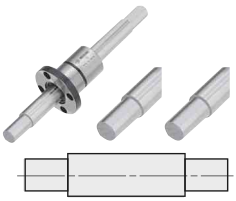
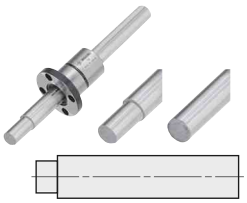
Ball Splines / Miniature Ball Guides

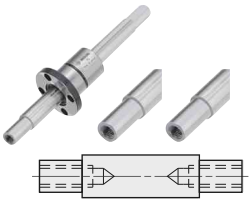
Ball Splines



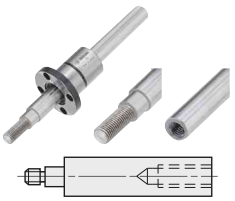
Product Name	Ball Splines - Standard	Both Ends Tapped	One End Tapped
Page	341	343	345

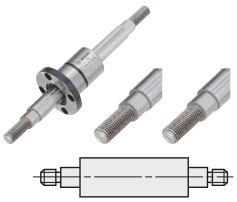


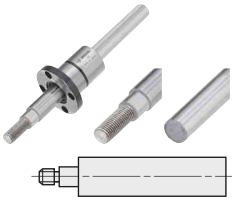




Both Ends Stepped	One End Stepped	Both Ends Stepped and Tapped
347	349	351







One End Stepped and Threaded, One End Tapped	Both Ends Stepped and Threaded	One End Stepped and Threaded
353	355	357

Miniature Ball Guides

Product Name	Miniature Ball Guide Sets - Compact	Standard	With Retaining Ring
Page	362	361	363

Shafts for Miniature Ball Guides - Straight	One End Machined / Both Ends Machined	Bushings for Miniature Ball Guides	Ball Sliders
363	364	365	366

High Rigidity Needle Guide Set

Product Name	Needle Guide Set
Page	368

■Characteristics Comparison List

Product Name	Torque Transmission	Rotary Motion	Feature
Ball Splines  P.341~	○	×	Single shaft-based ball splines are useful in many machine applications requiring transmission of linear motion / rotational torque and movement free from misalignment toward rotary motion for space saving, cost, weight, parts reduction advantages.
Miniature Ball Guides  P.361~	×	○	Since balls are aligned in a staggered arrangement, Miniature Ball Guides are useful for linear/rotary compounded motion.

○: Available ×: Unavailable

Ball Splines - Overview

Features

1 Capable of Highly Accurate Linear Motion

Shafts and nuts are offered as sets. This ensures accuracy with rotational clearance adjustment allowing for highly accurate linear motion.

2 Capable of Transmission of Torque

Rotary motion of balls on grooves fine-grinding machined into spline shaft in R Shape makes ball spline capable of linear motion while transmitting torque.

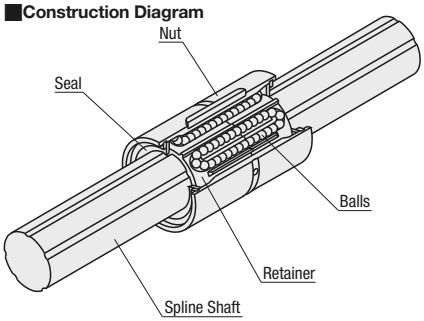
3 Enables Compact Designs

Rotary motion of balls along the line of groove allows for linear motion of ball spline without generating misalignment of nuts toward rotary motion even based on a single shaft.

4 High Load Capability and Long Life

High load capacity and long running life due to presence of R-shaped grooves of splines tailored to ball dia. on the rolling surface where loads are applied.

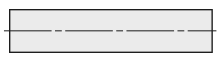
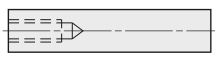
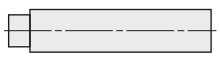
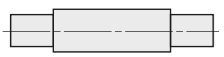
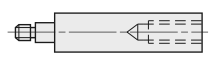
■Construction Diagram



(P)Balls do not fall out even if the spline shaft is pulled out.

Lineup

27 variations (3 Nut Shapes x 9 Machined Shaft End Shapes)

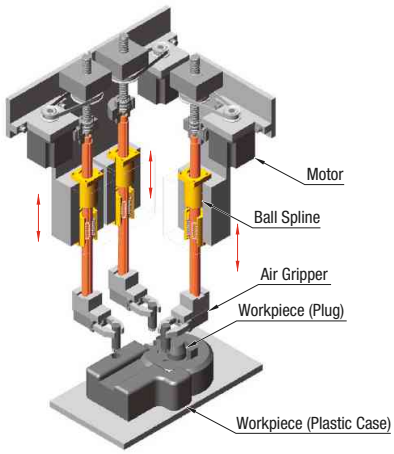
Nut Shape	Shaft End Shape		
	Straight (P.341)	One End Tapped (P.345)	Both Ends Tapped (P.343)
Straight			
	One End Stepped (P.349)	Both Ends Stepped (P.347)	Both Ends Stepped and Threaded (P.351)
Round Flange			
	One End Stepped and Threaded (P.357)	One End Stepped and Threaded, One End Tapped (P.353)	Both Ends Stepped and Threaded (P.355)
Compact Flange			

×

Application Examples

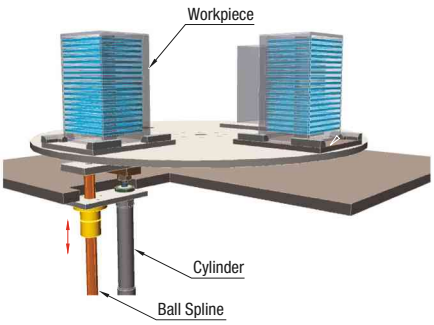
1 Pick and Place Application Unit

When linear motion on each axis is needed in limited spaces, ball splines that can be used in single shaft configuration are effective.



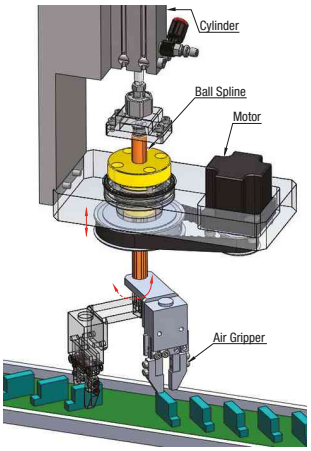
2 Magazine Lifter Mechanism

Space saving is enabled as there is no misalignment of nuts toward rotary motion even based on a single shaft.



3 Pick and Place Application Unit

Since ball splines can also provide torque transmission, linear motion and rotary motion in one axis is enabled by providing rotation mechanism.



In addition, ball splines are used in many machines, such as coil winders, honing machines, optical measuring instruments, loaders, automatic filling machines, industrial robot arms, etc.