JENA TEC NEWS...

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XLF Ballscrews Extend Machine Tool Life

Ball Screws are mechanical devices for converting rotary motion into linear motion and vice versa. Ball Screws have become an integral part in modern machine tools due to their positional accuracy, load bearing characteristics and low friction when compared with lead screws, however little has changed in design since the first use of the ball screw in machine tools some decades ago. A common misconception is that to improve a ball screw all that is necessary is to improve lead accuracy, whilst improvement in lead accuracy is important, there are many areas in which design improvements can have significant impact on overall machine performance.

Therefore, the ball screw cannot be considered in isolation but as one element influencing servo loop performance. In developing their new *XLF™* range ball screws, Jena Rotary Technology Ltd have recognised the importance of the ball screw in servo loop performance, and designed a ball screw to meet the demands of modern machine tool controls. One important factor to consider is reversal error, (reversal error occurs when lost motion is apparent during change of rotational direction in the ball screw) which can affect positioning and surface finish in the work piece. The reaction of the mechanical elements in a system can have a significant effect on reversal error.

The unique design of the *XLF™* has produced a ball screw with extremely low coefficient of friction whilst retaining high system rigidity and eliminating reversal error. Due to the design and materials used, it has also been possible to reduce the preload in the ball nut whilst retaining rigidity. Ball Screw life, and wear accuracy have also been significantly improved, the ball screw is also extremely quiet compared with traditional designs. Another benefit is thermal stability of the assembly due to the reduced preload, improved rigidity and low coefficient of friction, producing a ball screw with extraordinarily low levels of heat generation.

These improvements have been achieved using hybrid materials and changes in the design of the raceway profile in the ball screw and the ball nut, the changes are not noticeable to the eye with the exception of the blue/grey appearance of the ball screw, and the reduced preload and super smooth run can be felt when the ball nut is turned by hand.

Clearly these benefits are not restricted to the machine tool industry; any applications where high accuracy, extended life and low levels of noise are required would benefit from the advantages the XLF™ range ball screws offer.

For more information on the Jena Tec range of ballscrews, spindles and linear motion products and services, contact our sales team on +44 (0)1623 726010 or sales@jena-tec.co.uk