

INDUSTRY
MACHINE TOOLS

APPLICATION
CNC MACHINES

PRODUCT
MEGALINEAR RPP8
WITH HP CORD



SITUATION/APPLICATION

In manufacturing, strict tolerances and high speed production capacity are a necessity. This is especially true in the machine tool industry where CNC (computer numerical control) machines are taken to the limit. CNC is the automated control of machining tools (drills, boring tools, lathes) by means of a computer. It represents a major advance in machining and is a vast improvement over non-computer type machining requiring manual control. The CNC machine processes material (metal, plastic, wood, composite, etc.) to precise specifications with a motorized maneuverable tool. It is controlled according to input delivered in the form of computer-aided design files transformed into a sequential program of machine control instructions. The drive systems used by CNC machines to actuate the tools must deliver smooth, precise movement to ensure high precision while possessing the ability to resist high temperature, shock loads and chemicals. They must transmit high levels of power at high speed with consistent, repeatable performance.

Widely used in CNC machinery, linear actuators create motion in a straight line, in contrast to the circular motion of an electric motor. They translate rotary motion to linear motion and are normally enclosed within an aluminum body. Belt driven linear actuators are special types used in push-pull and lift applications. It is a belt and pinion device that forms a telescoping beam or column member to transmit traction and thrust. It moves dynamic loads by increasing or decreasing the center distance between driver and driven pulley and can be considered as a rack and pinion device with a flexible rack.

THE PROBLEM

A machine tool manufacturer experienced problems with a belt driven linear actuator on a CNC machine. The synchronous belts from a competitor suffered from elongation and did not deliver the necessary, highly accurate positioning that is essential in machining operations. They required frequent tensioning and were also susceptible to breakage due to shock loading. The application required a high degree of reliability and repeatability over extended time periods with high acceleration and high thrust demands. A low maintenance, cost effective, lightweight, quiet and efficient system was desired. The belts from a competitor were not delivering acceptable performance.

THE SOLUTION

After analyzing the drive, the Megadyne Application Engineering team provided Megalinear RPP8 open end synchronous polyurethane belt with HP (High Power) tensile member cords. The extra strength HP zinc-coated steel cords allow the actuator to achieve maximum traction load and breaking strength with minimum elongation. The S+Z twist construction of the steel high power cords ensures that the belts track straight while The 92 Shore A hardness thermoplastic polyurethane lightweight belt body provides exceptional wear resistance and durability with excellent flexibility.

THE RESULT

Megalinear RPP 8 with HP cords eliminated the elongation and corrected the positional inaccuracies. It also contributed to longer life as it did not suffer from the frequent breakage experienced with the competitive belt. It further enhanced the drive performance with low maintenance as it did not require frequent re-tensioning.

Megalinear RPP8 HP was the ultimate choice for the belt-driven actuator on this CNC application. Its durability and efficiency provided the optimal balance of performance, life and cost.

