

Euclid Universal Reduces Cycle Time 40% with New Helical Turning Insert

About Euclid

Euclid Universal Corporation (Euclid), an Ohio manufacturer of gear motors and power transmissions, has successfully served a variety of industries since 1948 by providing the highest quality parts in the shortest amount of time. Euclid engineers custom designed solutions—both for new design innovations and adaptations of standard designs to meet customer requirements. Euclid, a member of the Kinetek Group of Companies, manufactures all parts on site to offer customers flexibility, personalized service, and quick turnaround time.

Euclid's Tooling Efficiency Challenge

Euclid's core gear and shaft products encountered long, costly rough-turning cycles that did not meet Euclid efficiency standards. To increase efficiency, it was determined that a tooling upgrade was necessary.

The Heliturn LD Solution

Euclid turned to Iscar for a tooling recommendation that would meet their needs. Iscar proposed a newly designed turning tool that features an 80 degree rhombic insert—the Heliturn LD. The design offers many of the features of the original Heliturn TG family of tools, but uses lay-down R-clamping instead of traditional clamping. The advantage of this new method is edge position repeatability and a very sturdy hold on the insert while machining. R-clamping is an ideal solution for Euclid's costly rough-turning applications.

The CNMX 542-HTW Heliturn LD inserts feature a positive radial, helical cutting edge, positive rake angle for reduced cutting forces, and increased metal removal rates. It offers up to 10% lower cutting forces and a 50% improvement in tool life making it ideal for rough turning operations. The surface quality of machined surfaces using Heliturn LD is much higher than traditional rough turning tools. For even higher surface finish, the 88 degrees corner angle Heliturn LD can be used—offering increased strength and a wiper configuration to achieve very high surface finish even at high feeds.

Efficiency Improvement at Euclid

Euclid uses 20Hp CNC lathes to machine parts out of 4140 and 8620 steel. After testing the CNMX 542-HTW Heliturn LD inserts, Euclid increased the cutting speed from 500 to 650 surface feet per minute, and doubled the feed rate—from 0.010 inches per revolution up to .020 inches per revolution. "The doubling of the feed rate really impressed us," said (insert actual name, if possible). "We increased the inches per revolution by 200% and surface quality improved".

While machining under these conditions, Euclid was also able to increase tool life from 100 pieces per cutting edge up to 150 pieces per cutting edge. This 50% improvement also helped reduce overall cycle time by reducing the number of times the machine needed to be stopped in order to replace a worn tool. The Heliturn LD also provided a more reliable cut—eliminating broken edge tool failure—which had been a problem with previous tooling.

These tooling upgrades made it possible to reduce cycle time on two minute operations to one minute, 20 seconds; three minute operations to one minute, 45 seconds; and one minute, 40 second operations to one minute.

The unique corner design of the Heliturn LD produced a much smoother cut over Euclid's previous tooling making it possible to reduce or eliminate any subsequent finishing operations. With the upgraded tooling, Euclid reduced cycle time by 40% and increased tool life by 50%—creating a much more efficient process.