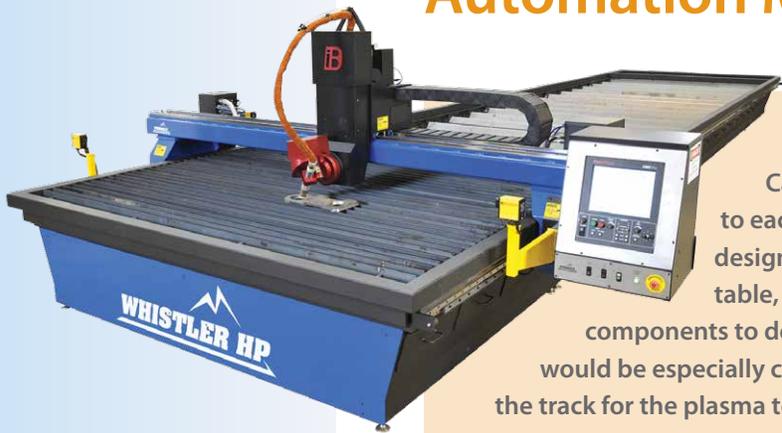


## Case Study

**Organization:**  
Pinnacle

# Nexen Roller Pinion System Increases Efficiency of Pinnacle Industrial Automation Machine



Pinnacle Industrial Automation, located in Ontario, Canada, builds plasma-cutting machinery tailored to each of its steel industry customers. When it began designing and developing the Whistler HP, a plasma-cutting table, Pinnacle engineers knew it would need reliable components to develop the top-of-the-line, multipurpose cutter. That would be especially crucial for the linear drive system, which would serve as the track for the plasma torch.

The goal was to create a reliable, productive, fully zoned downdraft table that could cut clients' custom-designed equipment components for mass-production. Since the table would be suitable for a range of industries and needs, Pinnacle also wanted to make the table modular, allowing customers to adjust table sections to customize its length.

To achieve smooth, accurate and reliable functioning, designers would ultimately incorporate linear drive systems, AC brushless digital servo drives, high precision gear boxes and dual drive technology, powered by the newest CNC controllers and the most precise, cost effective plasma cutting torch available.

Pinnacle did not opt for a traditional rack and pinion system to move the plasma torch along the cutting table. To develop the machine, Pinnacle used Nexen's Roller Pinion System, a rack and pinion alternative that is designed to eliminate backlash and increase accuracy for linear motion applications.

The Roller Pinion System has proven durable enough for Pinnacle to introduce a 5-year warranty, specifically to cover its most dependable plasma-cutting components.

"Pinnacle introduced the EMT Warranty Package this year because the Nexen Roller Pinion System is extremely dependable," said Paul Silva, Pinnacle's Co-Owner.

Instead of utilizing pinion teeth to control the rack's movement and positioning, the Roller Pinion System uses bearing-supported rollers within a stability-oriented design that minimizes backlash, maintenance downtime and equipment wear. The rollers do not require any clearance within rack's profile as the teeth of a rack and pinion system do.

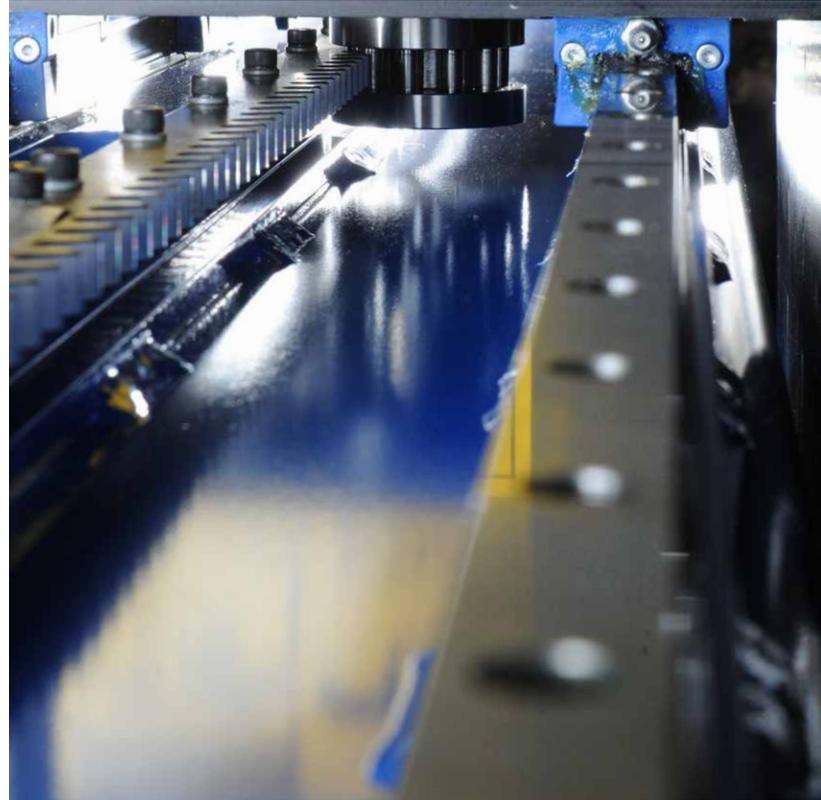
### Nexen Group, Inc.

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Pinnacle knew it could not place the burden of finding, installing, calibrating and operating a counterbalancing system for a problem that should not have existed in the first place. The Roller Pinion System—with its low-friction operation—enabled optimum efficiency for the Whistler HP. It does not lead to the jams that are prone to traditional rack and pinion operations, which are the result of a single pinion tooth pushing off one side of a rack tooth and then immediately moving to the next side of the tooth.

This problem does not exist with the rolling movement of Nexen's Roller Pinion System, because the pinions simultaneously engage several tooth flanks in opposing directions. It also allows clearance between the other teeth. This unique design ensures continuous, smooth motion and minimizes production loss that results from equipment jams and the time and resources it would take to compensate for traditional linear motion control errors.

"The Nexen roller pinion is impressive. It offers extreme motion, it's accurate, it's smooth," said Dave Jones, Pinnacle's Co-Owner. "A top-of-the-line plasma cutter needs to meet high standards, so this worked out really well for us." "It's incredible just how fast and accurate the roller moves along the rack. You would think it would eventually get out of position after some time—or require a lot of lubrication—but it doesn't," Paul Silva said. "It's a big reason why we stand by the Whistler's durability with the five-year warranty."



Because of the Nexen Roller Pinion System's low friction operation, it has an unlimited run length. Lack of friction means heat is not generated, which usually leads to component wear. This provides a long equipment life span and low maintenance needs. In most cases, it only needs lubrication every two million pinion revolutions, or approximately six months. In certain applications, it can even operate without lubrication, leading to minimal sacrifice in life.

"We couldn't be happier with it," said Dave Jones. "It really is something we don't have to worry about, which is hard to find for heavy-duty industrial equipment."

