

**Industry:** Mining

**End User:** Mining Company located in Quebec, Canada

**Application:** Mining Dump Wagons - Pneumatic Cylinders

**Thordon Grade:** Thor-Flex

**Date of Original Installation:** 2018

### Challenge:

When a mining company was having issues with the rubber seals on the cylinders for their unloading mining dump wagons, they began looking for a durable solution. The mining company typically equipped each wagon with two pneumatic air cylinders on each side. In this application, the cylinders operate at a pressure of 861 kPa (125 psi), under highly abrasive conditions. Each cylinder relies on two seals for operation, one 711 mm (28 in) in diameter, and the other 635 mm (25 in) in diameter. In this case, the original rubber seals were wearing so badly that the pistons were damaging the cylinders. In addition to damaging the cylinders, the rubber seals were only lasting about 2 years due to the tough operating conditions.

### Why Thordon?

Having used Thor-Flex seals in similar pneumatic cylinder applications, Thordon's authorized distributor in Quebec, RMH Industries, suggested them to the mining company as an improved replacement option for rubber. Thor-Flex offers superior yield strength compared to other seals on the market, including rubber, and has a high resistance to permanent deformation. These seals operate safely in temperatures from  $-50^{\circ}\text{C}$  to  $90^{\circ}\text{C}$  ( $-60^{\circ}\text{F}$  to  $195^{\circ}\text{F}$ ), and at pressures up to 103,421 kPa (15,000 psi). They work well in abrasive, corrosive environments at high levels of humidity and resist high-impact loads. Thor-Flex seals do not require pre-loading, O-ring reinforcement or other adjustments. As a result, Thor-Flex provided an opportunity to significantly reduce seal damage, extend the life and improve the function of the cylinders for these mining wagons.

### Result:

The refurbishment of the 28 pneumatic cylinders was completed at RMH's headquarters in 2018. Not only did Thor-Flex provide a significantly longer life, but it also offered a better seal than conventional materials. The mining company reduced their maintenance costs and improved wagon performance as the Thor-Flex seals were projected to last much longer than the original rubber seals and reduce damage to the cylinders. As of 2023, the seals in these cylinders are still operating well with Thor-Flex and have not required replacement seals.



*Pneumatic cylinders installed on the mining dump wagons*



*Pneumatic cylinders fitted with Thor-Flex seals, ready for distribution and installation*



*A close-up view of the Thordon Thor-Flex seals installed in a refurbished pneumatic cylinder*