

PROK

PROK POLYURETHANE DISC ROLLER

TECHNICAL SPECIFICATION

PROK has significant experience in designing conveying solutions that are safe, reliable and enable maximum productivity levels. PROK specialise in products for the future of mining.

The PROK Return Poly Disc rollers operate by utilising high abrasion resistance and high Hydrolytic stability polyurethane discs, positioned at regular intervals along the roller to effectively eliminate conveyor belt carry back build up. This is done by breaking up the material on the return side of the conveyor belt which is normally concentrated in the centre of the belt. The discs are bunched together at either end of the roller to provide support and protection to the belt edges.

The poly discs avoid the build up of material that can be deposited onto the roller surface which can cause the roller diameter to develop an irregular worn surface and change shape. This is often a major cause of belt mistracking.

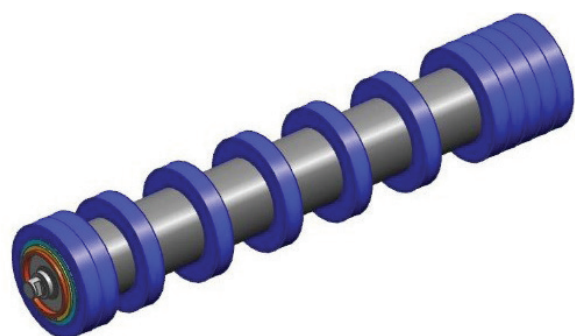
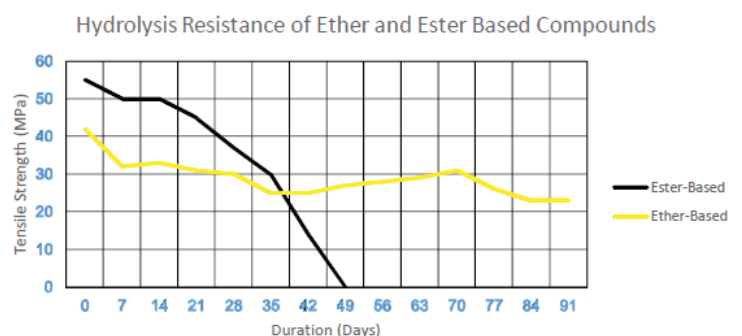
Highly effective, PROK Poly Disc rollers are a reliable and simple maintenance solution to this common belt conveyor problem.

PROK polyurethane disc return rollers can be expected to yield a minimum life increase in the range of 100-300% over steel in areas of high wear (typically head/tail ends, shuttle/take-up areas and convex curves).

KEY PROPERTIES OF POLYURETHANE DISCS

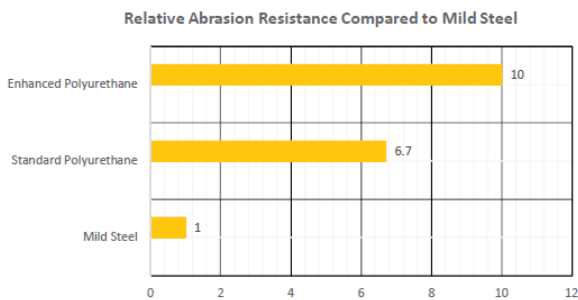
- **Premium grade polyurethane** with market leading physical properties including optimum hardness leading to lower rolling resistances (especially when compared with poly-ester based compounds) and higher performance across many varied applications

- **Proven quality and performance** with some PROK installations in for greater than 15 years of service in some of the toughest environments
- **Unaffected by high humidity and high temperatures** as poly-ether based compounds with high hydrolysis resistance last much longer than a poly-ester based compounds. Reduction in tensile strength over days of operation for poly-ester and poly-ether based compounds is shown in the graph below. While the poly-ester based compound degrades in tensile strength from 55 MPa to close to 0 MPa over 50 days the poly-ether based compound is only reduced to 64% of its initial tensile strength over the same time period of 50 days.
- **The greater the hardness of the polyurethane compound the greater the hydrolytic stability.**



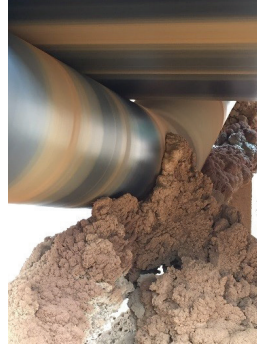
TESTING RESULTS

A R&D National Bureau of Standards (NBS) test to ASTM D1630 standard was conducted to test the standard polyurethane, enhanced polyurethane and mild steel materials. The PROK standard polyurethane roller wore 4.5 times slower than a standard steel shell and the enhanced polyurethane wore 8.5 times slower than a standard steel shell. The ASTM D1630 test comprised of a drum with grit being rotated and the wear of the sample material monitored. Three samples of the same material were tested in different positions with the weight of the arm, number and speed of the drum the same. In the bar graph, mild steel, standard polyurethane and enhanced polyurethane are plotted showing relative abrasion resistance.



CASE STUDIES

Mine Studies have been conducted on conveyors head ends to address the significant amount of carry back causing significant wear on the plain steel rolls and reducing considerably the operating life of the rollers. With the Poly Disc Vee Return Rollers installed the carry back on these rollers was shown to be considerably reduced in comparison.



Carry back before Poly Disc Rollers



Carry back after Poly Disc Rollers installed

MATERIAL DATA

Property	Nominal Value	Standard
Tensile Strength	38 MPa	ASTM D412
Elongation	460%	ASTM D412
Hardness	95 ± 3 Shore A	ASTM DD2240

AVAILABLE DIAMETERS & BEARING SIZES

BRG	127	152	178
6205	✓		
6307		✓	✓
6308		✓	✓

PROBLEM

Return roller wear due to excessive carryback

RESULT

Frequent downtime to replace rollers, excessive shell wear (roller failure) and possible belt damage

PROK SOLUTION

Polyurethane disc return roller designed to dislodge carryback and extend roller life

FOR MORE INFORMATION

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