Ion-nitriding

Ion-nitriding is a thermal process by which nitrogen ions are diffused onto the surface of a metal. The process is done in a vessel called an ion-nitrider. The piece to be nitrided is placed inside the vessel. Air in the vessel is pumped out, and replaced with a nitrogen rich atmosphere. A negative charge is applied to the work piece, which causes nitrogen ions to bombard the work piece.

Ariel ion-nitrides cylinders, piston rods in the packing wear area, and variable volume clearance pocket stems.

Ion-nitriding increases the surface hardness of metals to improve wear resistance. The following table outlines the effect of ion-nitriding on the surface hardness of Ariel's piston rods and cylinder bodies.

Material	Component	Base Hardness, Rockwell C	Ion-Nitrided Hardness, Rockwell C	Thickness of Hardened Layer, in
ETD-150	piston rods	29	57-63	0.005-0.006
Gray Iron ASTM A278	cylinder bodies	<20	57	0.006
Ductile Iron 60-40-18	cylinder bodies	<20	57	0.006
416 SST	VVCP stems	<20	70+	0.005

Ductile Iron cylinders of 80-55-06 are not ion-nitrided.

17-4PH Piston Rods are chromium nitrided in the packing travel area to a hardness level of 2500 Vickers.

Tungsten carbide coating can be applied as an option on piston rods for packing travel.