

LIGHT-GREY → BLACK PISTON RINGS VERSUS SHINY METAL PISTON RINGS

EXAMPLE PICTURE RING SET



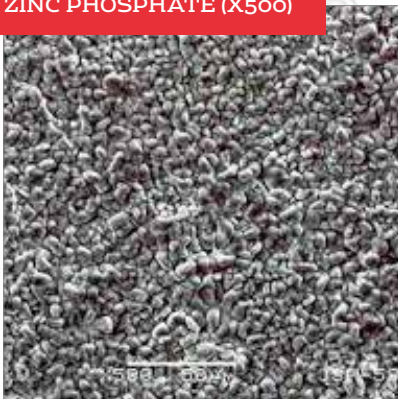
The light grey → black color on some of the FP Diesel piston rings are the result of a phosphate coating procedure. There are two phosphates that we use on piston rings, as well as other engine parts:

- Zinc phosphate
- Manganese phosphate

They both offer similar benefits, though the manganese phosphate has slightly better inherent lubricity. Phosphating improves the oil retention of the surface of the ring, which results in maximum corrosion protection when oiled.

Phosphate coatings can vary in color from light gray to black. The choice of which coating is used depends on which process is available at the plant that manufacture the rings.

ZINC PHOSPHATE (X500)



TECHNICAL DETAILS:

Thickness- Typically 1 – 3um (per Federal-Mogul Standard) but can be higher.

Phosphating is a conversion coating. Conversion coatings form a chemical bond through a reaction between the metal substrate and the solution.

BENEFITS:

1. Rust protection for storage
2. Reduce the likelihood of scuffing
3. Promote quicker break-in



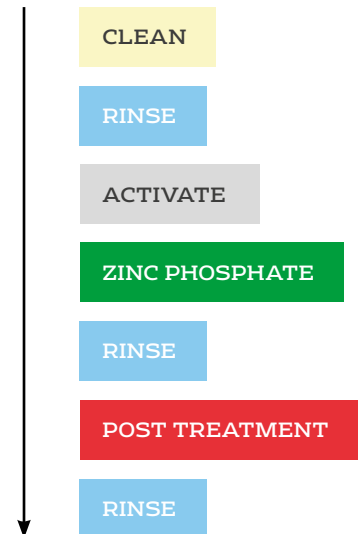
GENERAL PROCESSES:

Zinc Phosphate

1. Cleaning
2. Water rinse
3. Zinc phosphate solution
4. Water rinse
5. Post treatment
6. Deionized water rinse
7. Drying

Manganese phosphate

1. Clean (dip)
2. Water rinse (spray)
3. Water rinse (dip)
4. Grain refiner (dip)
5. Manganese phosphate bath
6. Water rinse (spray)
7. Hot water rinse (dip)
8. Rust inhibitor (dip)
9. Hot air dryer



The finished product is typically oiled after these processes and before further handling and packaging.