

MOTIVE ANTI-RUST COATING FOR STEEL SHAFTS AND ROTORS

Motive anti-rust coating for steel shafts and rotors has the highest hardness and superior corrosion and wear resistances of general phosphate coatings.

It can also be extensively employed to improve the sliding properties of gears. The use of this coatings for improved corrosion resistance can be found in virtually all branches of the metal working-industry. Typical examples mentioned here include motor vehicle components in brake and clutch assemblies, engine components, leaf or coil springs, drill bits, screws, nuts and bolts, washers, anti-vibration washers, tools, magnet cores, casting interiors and many other small items.

Manganese phosphate coatings for conferment of good corrosion resistance, whether a post-treatment such as oil application is to be used or not, are invariably applied by the immersion method. The processing sequence can be summarized as follows:

- Degreasing and cleaning
- Water rinse
- Pickling in mineral acid (where necessary)
- Water rinse (only after pickling)
- Activation
- Manganese phosphating
- Water rinse
- Final oven drying (optional)
- Lubricating with special oils or emulsions.

The degreasing and cleaning are usually done with strongly alkaline cleaners at concentrations of 1-5% and temperatures 65-95°C. Treatment times range from 5-15 minutes.

A highly effective activating pre-rinse has been developed for this coating which permits alkaline cleaning and pickling of the work, without the penalty of coarse-crystalline phosphate formation. This is based on a finely-dispersed manganese phosphate at concentrations 1-2 g/l.

The coating process is mainly by immersion. Treatment times range from 5-20 minutes, the optimum time depending on the surface condition. The bath operating temperature is around 95°C and only in special cases can satisfactory coatings be formed at temperatures around 80°C.

The phosphated components, after drying, are immersed in the oil or lubricant baths for 0.5-2 minutes, allowed to drain. The thickness of the resulting oil film depends on the oil used and its concentration.

This coating as a wear protection measure is widely used in the auto industry. Gearwheels in the gearbox, crown and pinion gears in the differential, camshafts, valves and valve-stems as well as pistons in larger diesel engines are frequently treated in this way. In other industries, the process is used to treat components in refrigerator compressors or oil pumps and their associated hydraulic rams for vehicle assembly plants.

