



PRODUCT INFORMATION

MARTRON INC.® P O BOX 309, MONROE, NC 28111 PH: (704) 289-1934 FAX: (704) 283-7400

DATE: JUNE 28, 2014

EMERGENCY - MARTRON 704-289-1934
CHEMTREC 800-424-9300

REF. # MFC-002523

MARTRON MAG 630

Manganese Phosphate Coating

Section 1: DESCRIPTION

The **Martron MAG 630** process produces an oil-absorptive, crystalline manganese phosphate coating for mating steel surfaces with coating weights up to 5000 mgs/square foot by the immersion method.

Martron MAG 630 is used almost exclusively on ferrous surfaces, principally for wearing and moving surfaces, although it does impart some rust proofing characteristics, particularly under oil. The coating has a dark-grey-to black color.

Section 2: FUNCTIONS OF MARTRON MAG 630 COATING

1. To act as a solid lubricant until the two wearing surfaces can form matched mating surfaces.
2. To act as a porous base for liquid lubricants.
3. To provide corrosion resistance in conjunction with oils.

Section 3: OPERATIONS

1. To a tank filled with clean water add 10% by volume **Martron MAG 630**.
2. Heat the solution to 200°F.
3. The cleaned parts can then be processed.
4. Maintenance of the Total Acid - Free Ratio at greater than 8:1 should occur normally. But long periods of heating with no processing can cause an increase in Free Acid. If this should occur, the Free Acid can be lowered by the use of soda ash.

Section 4: SPECIFICATIONS

Physical Form	Greenish solution which may contain traces of solid
Specific Gravity at 60°F	1.31 minimum
Pounds/Gallon	10.9 minimum
Concentration	10% by volume in water
Time	5 to 60 minutes
Temperature	200° to 210°F
Operating Range:	
Total Acid	8 to 15 Total Acid points (2.0 ml sample)
Free Acid	1/8 Total Acid points, minimum
Conversion	1.25 pts = 1% (2.0 ml sample)
Coating Weight	Average – 3000 mgs/square foot

Section 5: TYPICAL CYCLE

Clean	Alkaline, Spray or Dip 1 to 5 minutes
Rinse	Overflow Water 30 seconds Cold or Hot
Martron MAG 630	Immersion 20 to 60 minutes at 200 – 210°F
Rinse	Overflow Water 30 seconds Cold or Hot
Soluble Oil	Spray or Dip Heated to Dry 30 seconds
Or Final Rinse	Martron Techniseal Rinse: Spray or Dip, temperature at 150°F max. heat to dry

The foregoing is a minimum sequence for treatment. In many cases where stubborn soils, rust, or scale are encountered, pre-cleaners and acid pickle operations may be added.

Section 6: CLEANING

Prior to phosphating, all metal should be cleaned and free from any surface contamination such as oil, smut or rust. Cleaning methods are the most influential factors in controlling the coating weight and crystal size, particularly strong alkaline cleaners or acid pickles. The following are cleaning methods that might be utilized prior to the **Martron MAG 630** treatment.

1. Solvent wipe
2. Vapor degrease
3. Emulsion or diphase cleaners
4. Light-duty alkaline cleaners

Section 7: WATER RINSING

Rinse tanks should be overflowed continuously at a rate that will keep them clean and free of extensive contamination. Rinse time should be at least 30 seconds.

Section 8: PICKLING

Any acids are satisfactory, but phosphoric acid is preferred to reduce contamination. Inhibitors should **NEVER** be used. Some wetting agents can be satisfactory, but others may inhibit reaction, and therefore, must be selected with care.

Section 9: PHOSPHATING

The normal coating produced is black in color. Its weight and crystal size are greatly influenced by pre-treatment steps. Strong alkaline cleaners and pickling increase both weight and crystal size; whereas, emulsion cleaners, solvents, and hand wiping procedures tend to reduce crystal size and coating weight.

In order to produce satisfactory coatings, it is very important to maintain the concentration and temperature at constant levels. In addition, the bath should contain 2 to 4 grs/L of ferrous iron. This latter material can be introduced by processing scrap steel, steel wool, or iron powder. Without ferrous iron in the solution, unsatisfactory coatings are formed.

The type of steel as well as its condition (machined, forged, cast, etc.) also influence the type of coating produced and, in addition, influence the time of immersion. The time of immersion must be experimentally determined for each steel type and condition with respect to the required coating weight.

Section 10: FINAL PASSIVATION

If the part treated is to be used primarily for wear resistance, it is customary to use a water emulsifiable oil as a

final rinse.

Section 11: ANALYSIS PROCEDURE

Determination of Total Acid

1. Pipette a 2 ml sample of working solution in an Erlenmeyer flask.
2. Add 5 drops of Phenolphthalein indicator solution.
3. Titrate with 0.1N sodium hydroxide to a permanent pink colored endpoint
4. Calculate the Total Acid content:
Total Acid (Points) = ml of 0.1N sodium hydroxide used
One (1) pound of **Martron MAG 630** per 100 gallons of bath will increase the total acid by 0.1 points.

Determination of Free Acid

1. Pipette a 2 ml sample of working solution into an Erlenmeyer flask.
2. Add 2 drops of Methyl Orange Xylene Cyanole indicator.
3. Titrate to a green colored endpoint with 0.1N sodium hydroxide.
4. Calculate the Free Acid content:
Free Acid (Points) = ml of 0.1N sodium hydroxide used
A solution having a normal 12-point Total Acid content will have a Free Acid level of 2.0-2.2 ml. To lower the free acid by 0.1 points, add 4 oz/100 gallons (0.3 g/l) of soda ash. Soda ash should not be added directly to the tank without first mixing it with water. The soda ash solution should be poured over the surface of the solution and the bath mixed thoroughly. Too high a Free Acid level is indicated by work that is unusually rough, has a loose coating or continues to gas after 15 minutes of processing time. Keeping the temperature of the bath at the processing temperature for long periods without processing any work generally causes a high Free Acid.

Determination of Iron

1. Pipette a 10 ml sample of working solution into an Erlenmeyer flask.
2. Add 10-20 drops of 50% sulfuric acid.
3. Titrate to a persisting pink color with 0.18N potassium permanganate.
4. Calculate the iron content:
Each ml of 0.18N potassium permanganate is equivalent to 0.10% iron.

To lower the iron by 0.05%, add 8 fl. oz./100 gallons of bath (0.625 ml/l) of 35% hydrogen peroxide (130 volume) diluted with an equal volume of water. Never add more than 8 fluid ounces of hydrogen peroxide at one time.

CAUTION: Use extreme caution when handling hydrogen peroxide. It is a very strong oxidant and can cause severe burns. Refer to the Safety Data Sheet (SDS) for additional precautions. The addition of hydrogen peroxide causes the iron to be partially precipitated. This causes an increase in Free Acid content that must be adjusted to within the operating limits.

Section 12: SAFETY PRECAUTIONS

Always read the Safety Data Sheet (SDS) for any chemical product to ensure familiarity with the methods of safe handling and the health hazards associated with the product.

Section 13: NON-WARRANTY

The data contained in this bulletin is believed by **Martron Inc.** to be true, accurate and complete. Since, however, final methods of use of this product are in the hands of the customer and beyond our control, we cannot guarantee that the customer will obtain the results described in this bulletin, nor can we assume any responsibility for the use of this product by the customer in any process which may infringe the patents of third parties.