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Healthy Hooves®
Solutions for Footbaths

PHOS-PREP SOLUTIONS

TECHNICAL DATA SHEET
PHOS-PREP PP 970M MANGANESE PHOSPHATE

1. GENERAL

PHOS-PREP PP970M Phosphate is designed to produce a crystalline phosphate coating on iron and steel surfaces and which possesses high oil absorbing properties. It is applied to steel surfaces as a lubricant or lubricant carrier. When oiled or a rust prevention compound is applied, the PHOS-PREP PP 970M imparts excellent rust proofing properties. The coating produced conforms to DEF STANDARD 03-11/CLASS 1.

PHOS-PREP PP970M phosphate is particularly recommended for applications on moving and wearing parts, and off shore oil industry sectors.

2. PLANT AND EQUIPMENT

The process tank and associated pipe work should ideally be constructed from stainless steel however mild steel can be used but with a limited life span.

Bath heating equipment is required and air agitation of the bath is recommended.

3. OPERATION

The MN-60 Phosphate is recommended for use as follows:

Stage 1	CLEAN/DEGREASE - PHOS-PREP PP 931
Stage 2	RINSE
Stage 3	PHOS-PREP PP 970M PHOSPHATE
Stage 4	RINSE
Stage 5	Dewater Oil / Seal PHOS-PREP PP DW33
	PHOS-PREP PP973

Parts to be processed through the PHOS-PREP PP 970M bath should be thoroughly cleaned through either a vapour degrease or a strong alkaline cleaner such as PHOS-PREP PP 931.

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4. PROCESS CONTROL

(a) Make-up.

Concentrations of between 60 and 120 ml/litre can be used depending on the weight of coating required. A typical make up of the PHOS-PREP PP970M Phosphate is by the addition of 60 litres per 1000 litres of working solution (60 ml/litre) that would yield a 30 point bath. The PHOS-PREP PP970M is added to a pre-heated bath containing water at about 65^{O}C.

When the optimum operating concentration is decided and the pointage set it should be maintained at around ± 3 points.

It is recommended that prior to its use the bath is "worked" for perhaps 1 hour, at its operating temperature of 95^{O}C, by immersing clean scrap steel.

(b) Operating Parameters.

Total acid pointage 30 to 60 maintained within ± 3 points of optimum.

Free acid pointage should be maintained in approximate ratio with the total acid.

TOTAL ACID : FREE ACID = 6 : 1

At an operating temperature of 85^{O}C to 99^{O}C the process time is 5 to 30 minutes.

5. LABORATORY CONTROL

The strength of the PHOS-PREP PP970M solution should be tested at regular intervals and replenished accordingly.

Total Acid Pointage: To a 10 ml sample of the bath add 50 ml clean water and a few drops of phenolphthalein indicator. Titrate against 0.1 Molar Sodium Hydroxide solution looking for a clear to pink end point.

TITRE = TOTAL ACID POINTAGE

For bath adjustment, 2 litres of PHOS-PREP PP970M per 1000 litres of working solution will raise the bath strength by 1 point.

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Free Acid Pointage: To a 10ml bath sample add 50 ml clean water and 3 to 4 drops of Bromophenol Blue indicator. Titrate against 0.1 M Sodium Hydroxide solution, looking for a yellow to blue end point.

TITRE = FREE ACID POINTAGE.

For adjusting the bath, adding 75% phosphoric acid will increase the free acid, and adding Sodium Carbonate will reduce the free acid.

Ferrous Iron Concentration: To a 10ml sample of the bath add 50 ml of clean water and about 1 ml of dilute sulphuric acid and titrate against 0.1N potassium permanganate to a persistent pink end point.

% FERROUS IRON = TITRE X 0.056

The ferrous iron content of a 30 point bath should be maintained in the range 0.2 – 0.4% if possible. To raise the ferrous iron content, dissolve clean scrap iron or steel wool in the bath. To lower the ferrous iron content, add 1 litre of 30% hydrogen peroxide per 1000 litres per 0.1% decrease required. It may then be necessary to add additional PHOS-PREP PP 970M to restore the balance of the bath.