Emerald™ Paint-Prep 380 NP

The Emerald Paint-Prep 380 NP system is phosphate-free with no regulated heavy metals. It is specially formulated for use in the treatment of steel, zinc and aluminum surfaces for 4 to 7-stage spray washers. It is designed to help reduce energy costs by providing a very effective conversion coating that can be applied at temperatures ranging from 70°F to 110°F, resulting in lower energy costs. Since Emerald Paint-Prep 380 NP is phosphate-free, sludge is reduced to the minimum while waste treatment costs and other effluent issues are greatly diminished.

The Emerald Paint-Prep 380 NP system provides a microcrystalline surface in the nanometer (10^{-9}m) range and this in a very short contact time of 15 to 30 seconds. Conventional iron phosphate coatings are usually in the micrometer (10^{-6}m) range and it requires at least a 45 to 60 seconds contact time. The “nanocrystals” formed with Emerald Paint-Prep 380 NP increases the surface area of the substrate thus enhancing paint adhesion, corrosion protection and consequently salt-spray results. Typical coating weights vary depending on the substrate, application temperatures, and method of application. Emerald Paint-Prep 380 NP generally operates from 2 to 4% by volume, which is comparable to conventional iron phosphate products. Emerald Paint-Prep 380 NP should be preceded with a mild neutral pH type cleaner followed by one rinse stage or an alkaline cleaner followed by two rinse stages.

Features & Benefits

Economical	Low use cost, extra-long bath life
Convenient	Ease of handling and replenishment
High quality	Excellent base for paint
Performance	Excellent corrosion resistance

Operating Conditions

Appearance	Clear colorless liquid
Foaming ability	None
pH of 2% solution	2.4 – 3.0
Rinsing ability	Superior
Solubility	Excellent

Specific gravity	0.98 – 1.04

Recommended use
Emerald Paint-Prep 380 NP is recommended to be used at a concentration of 2 to 4% by volume, depending upon the metal substrate, the end application, and the desired coating weight. Upon initial make-up, the addition of a small amount of Sodium Hydroxide (caustic soda) or soda ash is required to balance the bath to its appropriate operating condition.

Process
Parts to be treated with Emerald Paint-Prep 380 NP must be pre-cleaned with a Hubbard Hall approved cleaning material according to the requirements and the appropriate Product Data Sheet. Depending on the washer type and the soil load, a mild pH type cleaner, such Hubbard-Hall's Emerald PD, followed by one rinse stage or an alkaline cleaner, such as Emerald Super Soak Plus followed by two rinse stages is recommended.

Bath make-up and operation
Fill a clean process tank ¾ full of clean water. Add 3% by volume of Emerald Paint-Prep 380 NP. Fill the tank to operating level and heat to operating temperature if required. Check the pH and adjust upward, if necessary, to a range of 3.8 to 4.4 for aluminum substrates and 4.4 to 5.0 for steel substrates with small quantities of Emerald pH adjuster. Check concentration by titration (see below) and make any necessary additions. Please note that pumps should be operated before making pH adjustments or final concentration additions.

Titration Method

Emerald Paint-Prep 380 NP is controlled by titration for its total acidity and it is based on an operating pH parameter of 3.5 to 5.0:

1. Obtain a 100 mL sample.
2. Add approximately 5 drops of Phenolphthalein indicator to the sample.
3. Add 0.1 N Sodium Hydroxide (0.1N NaOH) to the sample using a burette.
4. Record the number of mL needed to turn the test solution from clear to light pink.
5. Compare the number of mL to the table below.

mL of 0.1N NaOH	% Concentration
0.6	0.5
1.4	1.0
2.0	1.5
2.6	2.0
3.2	2.5
4.0	3.0
4.6	3.5
5.2	4.0
5.8	4.5
6.6	5.0
7.2	5.5
7.8	6.0
8.4	6.5
9.2	7.0

Test Kit Method

1. Add 10 mL of Emerald Paint Prep 380 NP solution to the flask using a 10 mL syringe.
2. Fill flask ¼ full of water.
3. Add 3 to 5 drops of Phenolphthalein indicator to the flask.
4. Add 0.1 N Sodium Hydroxide dropwise to the flask until solution turns from colorless to pink.
5. Record number of drops used.

Calculation

Concentration = # Drops 0.1 N NaOH x 0.128

Caution

All products listed in this Technical Process bulletin should be stored in a cool dry area. Store away from incompatible substances and see issued SDS for each product.

Please refer to the labels and SDS's information for all warnings, recommendations for safety equipment, and other regulatory information. Copies of the Safety Data Sheets are available from Hubbard Hall Inc.

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For more information on this process,
please call us at 203.756.5521 or email: techservice@hubbardhall.com

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