

TANK PAINT LINE PRETREATMENT INFORMATION

The following is a synopsis of the tank line wash system. There are three steps to the system.

Fleet line 205 Special (Oakite) (for hot rolled pickled and oiled metal).

The function of this chemical solution is to remove oil from hot rolled pickled and oiled sheet metal. The concentration is the chemical mixed 1:1 to 1:3 with water (target is a 50% solution). There are no adverse effects if the concentration is higher than recommended but a lower concentration may result in not all of the oil being removed from the metal.

The Fleet line solution is applied with a low pressure spray using a pressure washer, for about 2 - 5 minutes. It should not be allowed to dry because it is then more difficult to rinse off.

The solution is extremely alkaline, with a pH range of 12 - 13. Extreme caution must be exercised when handling this chemical, and all necessary personal protective equipment worn. Consult the MSDS sheet for more information.

Stage 1 - Cryscoat 347 C (Oakite)

The purpose of this stage is to produce an iron phosphate conversion coating on the steel surface. This conversion coat enhances paint adhesion and improves the corrosion resistance of the metal surface under the paint.

This solution actually brings about a process of 'controlled rusting'. Iron is removed from the surface, combines with the phosphate in the bath, and a new layer of crystallized iron phosphate is deposited on the steel surface. This reaction is virtually instantaneous. The resulting surface is ideal for both paint adhesion and corrosion resistance.

The acid cleaner, which is also a part of Cryscoat 347C, cleans inorganic soils from the tank surface. Inorganic soils include rust, smut, heat scale, abrasives, and shop dust. The cleaner performs its function directly before the phosphate reaction occurs.

The concentration, pH, and temperature of this bath are extremely important to control. If any one of these factors is out of parameters, your solution will fail to perform up to standards. The concentration target is 4.2%, with a range of 4.0 - 4.4%. If the concentration is slightly higher than 4.4, there will be no adverse effects to the coating. An extremely high concentration will leave a phosphate residue on the surface. This residue will affect paint adhesion. A very low concentration will fail to produce an adequate phosphate conversion coating, resulting in poor paint adhesion and flash rusting on the tank surface.

Temperature range is 49 - 55° C (120 - 130° F) with a target of 53° C. If the solution temperature is higher than 55° C, there may be a quicker evaporation rate, resulting in dry down on tank surface prior to rinsing. If the temperature is too low, the reactivity of the iron phosphate solution will be reduced, resulting in less coating and lower coating weights.

The pH target is 4.75 with a range of 4.50 to 5.00. If the pH is higher than is recommended, the phosphate solution is less aggressive and produces a lower coating mass on the steel surface. If the phosphate solution pH is low, it becomes very aggressive and will pickle the tank surface instead of building a phosphate conversion coating. You will also get some flash rusting.

Tank capacity is 3,682 litres, and is dumped, cleaned, and recharged every 4 - 6 months. Amount of 347 C required to charge a new tank is 155 litres. The nozzle pressure is about 30 PSI (about 50 for Spinners) and the dwell time is 180 seconds.

To aid in controlling the critical pH readings for this stage there are two chemical additives the wash operator can add directly to the tank. If the pH is too high, Adjust M will bring it back down into the proper range. This additive is added automatically when pH goes above 5.00. When pH falls below 4.50, Enprox 714 can be added manually to bring it back up.

Stage 2 - Fresh Water Rinse

The goal of this step is to remove the excess phosphate salts on the metal surface to prevent phosphate salt dry down on the tank. This would result in a white, spotty residue on the tank.

Temperature of the water is ambient. If the temperature is too low, a longer rinsing time (more than the usual 90 seconds) may be necessary to remove the excess phosphate salts. If water temperature is very high, there are no adverse effects. In fact, the higher temperature may remove the salts more completely. P.S.I. is about 40; 60 for the spinner nozzles.

If the rinse is too short, all of the phosphate salts may not be removed. This would cause a white, spotty residue on the tank.

Stage 3 - Ultra Seal (Oakite)

This three minutes long step serves as a sealer rinse to remove any phosphate or water salts from the tank surface. It also reacts with the phosphate conversion coat to provide better corrosion resistance.

The concentration target is 2.5%, with a range of 2.00 - 2.75%. If the concentration is higher than specified, a residue may be left on the tank which would affect proper paint adhesion. If the concentration is lower than recommended, the solution will not provide an adequate reaction with the phosphate coating to enhance paint adhesion or corrosion resistance.

Temperature target for Ultra Seal is 32° C with a range of 21 - 43°C (70 - 110° F). If the solution temperature is much lower, the desired reaction will not occur, evaporation will

be slower, and both paint adhesion and corrosion resistance will suffer. A very high temperature may evaporate one of the ingredients in Ultra Seal, making the solution less effective. Very high temperatures will also encourage algae-like growths (flock) in the solution.

Recommended pH range is from 8 - 10. If the pH is much higher than 10, paint adhesion may be affected by raising the tank surface pH above what is acceptable to the powder manufacturer. This could cause paint adhesion failures. If the pH is very low, the effect of Ultra Seal is greatly diminished.

Our tank capacity is 3,682 litres. It requires 92 litres to charge after being dumped and cleaned (every 4 - 6 months or maximum 450 TDS). The nozzle PSI is about 30 and about 50 P.S.I. for the spinner nozzles.

This was a very brief summary of the functions of the tank line pretreatment system. If you require additional information on any one or all of the steps, contact your Supervisor or Maintenance.