

BONDERITE 492XR PREPAINT TREATMENT

1. SCOPE

The **Bonderite 492XR** process is designed for the treatment of iron and steel and is particularly intended for use as a prepaint application. It may be applied by immersion or spray. Zinc coated steels may be processed in mixed production along with steel.

The treatment converts the metal surface to a zinc phosphate coating which inhibits corrosion and improves adhesion of subsequent paint application by:

1. Providing a clean, grease free surface.
2. Converting the surface from a metallic to an inorganic surface.
3. Providing a corrosion inhibiting surface.
4. Providing a non conducting bond between the base metal and paint film.

2. MATERIALS

Bonderite 492XR solution
Parco Cleaner
Parcolene 60
Soda Ash or Caustic Soda

3. TESTING REAGENTS

Testing Solution No. 11 (N/10 sodium hydroxide)
Indicator Solution No. 3 (Phenolphthalein)
Indicator Solution No. 2 (Bromocresol green)

These three reagents are supplied by Henkel Surface Technologies Division for the control of the working solution.

4. EQUIPMENT

Mild steel may be used for all tanks, however longer tank life will be obtained if 316ELC stainless steel is used for the Bonderite tank.

5. THE PROCESS

The complete process for the application of the **Bonderite 492XR** solution normally consists of the following steps:

- A. Cleaning with suitable **Parco Cleaner** or **P3-Neutral Cleaner**.
- B. Water rinsing.
- C. Bonderising using **Bonderite 492XR**.
- D. Water rinsing.
- E. **Parcolene 60**, or alternative final rinse.
- F. Dry off (if required)

(a) Cleaning

All metal to be processed should be free from grease, oil, rust, loose scale or other foreign matter.

Oil, grease and other foreign matter should be removed by alkali cleaning, solvent cleaning or vapour degreasing. Rust and scale is best removed by shot blasting or pickling.

(b) Water Rinsing

If the metal is alkali cleaned, and/or pickled, it must be thoroughly water rinsed, preferably first in cold and then in hot water, before being **Bonderised**. Carrying cleaner, or pickle, into the **Bonderite 492XR** solution will destroy its chemical balance and will result in excessive use of **Bonderite 492XR** solution. The rinses should be overflowed continuously to keep them clean.

Detailed instructions for the operation and control of water rinses are given on a separate Technical Service Data Sheet.

(c) Bonderite 492XR

(i) Control Points for Normal Operations

Free Acid	1.6 – 2.2 mls
Total Acid	19 – 22 mls
Temperature	55°C – 70°C

THE PROCESS (continued)**(ii) Make up**

To make up a 20 point solution, fill the tanks approximately 2/3 full with water, heat to 60 – 66°C and add 45 kg (31 litres) **Bonderite 492XR** solution for each 1,000 litres of solution required. Add water to the operating level, mix thoroughly and heat to the operating temperature of 55 – 70°C.

The optimum pointage, and temperature, for any specific type of production will be decided by the Henkel Technical Representative at the time of starting up the process.

(iii) Operation

The process treatment consists of immersing (or spraying) the properly cleaned articles in the **Bonderite 492XR** solution at 55–70°C for a sufficient time (2 – 5 minutes by immersion and 1 minute by spray) to convert the metal surface to a uniform coating.

(iv) Testing and Control

Pointage : Titrate a 10 ml sample of the working solution against Titrating Solution No. 11 (N/10 sodium hydroxide) using 5 – 10 drops of Indicator Solution No. 3 (phenolphthalein) as indicator. A colour change from colourless to pink determines the end point of the titration. A working solution prepared as above should require 20 ml of Titration Solution No. 11 and is known as a 20 point solution.

An addition of 2.24 kgs (1.6 litres) of **Bonderite 492XR** solution is required for each 1,000 litres to increase the strength 1 point. Frequent additions of small amounts of **Bonderite 492XR** solution give more uniform results than occasional additions of larger amounts, and it is best to add continuously at the proper rate.

Free Acid : Pipette a 10 ml sample of bath into a flask and add about 100 ml of water. Add 3 – 6 drops of **Indicator No. 2** (Bromocresol Green) and mix well. Solution should be yellow.

Titrate with **Titrating Solution No. 11** until the solution turns a clear bright green. Record the number of mls of **Titrating Solution No. 11** as the Free Acid. The Free Acid is used to calculate the acid ratio value.

THE PROCESS (continued)

Acid Ratio : Acid Ratio is defined as Total Acid divided by Free Acid and the ratio should be maintained in the range of 9 – 12. Under normal operating conditions the Acid Ratio will remain in this range. Should the acid ratio vary outside this range contact you Henkel Technical Representative.

(d) Water Rinsing

Following the **Bonderite 492XR** treatment, the work is rinsed with water (preferably hot) for approximately 30 seconds. The flow of water through the rinse should be regulated with the rate of production so that at no time will the main body of the rinse become excessively contaminated.

Detailed instructions for the operation and control of water rinses are given on a separate Technical Service Data Sheet.

(e) Final Rinsing**Parcolene 60**

After water rinsing, work subsequently to be painted is rinsed in ambient to hot **Parcolene 60** solution for maximum corrosion resistance.

Detailed instructions for the operation and control of **Parcolene 60** are given on a separate Technical Service Data Sheet.

(f) Dry Off

After **Parcolene** rinsing, the phosphated parts are dried in an indirectly gas fired oven. Metal temperature should not exceed 120°C. Tubes, and other heavy gauge metal sections, may dry off under their own heat.

6. CHARACTERISTICS

During the operation of the process, sludge is formed as a by-product of the reaction. This sludge settles to the bottom of the tank and should be removed either by continuous filtration or by periodically transferring the solution to an empty rinse tank and then removing the sludge from the **Bonderising** tank. When the desludged solution has been returned to the **Bonderising** tank, it should be made up to level with clean water and retested for strength.

For each point low in strength as a result of clean out or other mechanical loss, add 2.24 kgs (1.6 litres) of **Bonderite 492XR** solution for each 1,000 litres of working solution.

When the solution has been heated for some time, scale will form on the heating unit and must be removed at intervals so that adequate heat transfer will occur and proper processing temperature will be maintained. To remove the scale, arrange to dry the unit either by removing it from the solution or by pumping the solution from the tank. The scale may then be removed.

Notes: In some installations, improved results (more uniform coating and finer crystal structure) are obtained by using **Parcolene Z** in the water rinse ahead of the **Bonderite 492XR** treatment. In a 5 stage process the **Parcolene Z** is added to the rinse between the cleaner and the **Bonderite**. In 6 stage plants with 2 rinses after the cleaner, the **Parcolene Z** is added to the second rinse. The **Parcolene Z** rinse is operated at 1 kg **Parcolene Z** per 1000 litres of water and air agitation of the bath is recommended. Regular small additions of **Parcolene Z** should be made to match the overflow rate and the bath should be renewed about every 2 days.

DISCLAIMER

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