

BZ-217 trivalent chromium black zinc passivator for zinc plating

Features

Black passivator without hexavalent chromium, suitable for rack plating and barrel plating.

Used together with a sealer, it can produce a dense black passivation layer on the acid zinc chloride coating.

When used with a sealant, the anti-white rust time of 5% salt spray test is ≥ 72 hours.

Excellent anti-impurity performance. The bath has a long service life. Easy to operate and maintain.

In barrel plating or automatic wire passivation, the scratches caused by collision or friction will be automatically repaired.

Operating conditions

| Passivation operating conditions | Optimal value | range |
|---|--|--|
| BZ-217 Trivalent Chromium Black Zinc Water | 200ml/L | 180-220ml/L |
| PH | 1.6 | 1.6-2.0 |
| Time | 30 seconds | 20-60 seconds |
| Temperature | 25°C | 20-30°C |
| Closed operating conditions | | |
| Sealing agent 76 | rack plating: 100ml/liter Barrel plating: 150ml/liter | Rack plating: 50-150ml/liter Barrel plating: 50-250ml/liter |
| Sealant 77 | 5ml/l | 0-10ml/l |
| PH | 4.0 | 3.8-5.5 |
| Time | 10 seconds | 5-20 seconds |
| Temperature | 40°C | 30-50°C |
| Stir | Stir gently | |

Equipment

Plating tank: stainless steel with heat-resistant plastic coating.

Stirring: During rack plating, it is recommended to use partial stirring or bath stirring to ensure uniform passivation effect.

It is recommended to use PVC or polypropylene coils.

Solution Make-up

Pour the required amount of water into the plating tank, and add BZ-217 trivalent chromium black zinc water.

Let stand for 15 minutes and continue to stir until the additives react.

Adjust the pH to 1.8-2.2 with 10% sodium hydroxide. If you need to lower the pH, use 50% nitric acid.

Process flow

Galvanizing → washing → washing → activation → washing → black passivation (BZ-217 trivalent chromium black zinc water) → washing → washing → sealing (sealing agent 76) → drying (60-120°C)

Solution Control & Maintenance

By regularly supplementing BZ-217 trivalent chromium black zinc water, the best state of the work passivation solution can be maintained.

Reduce the PH and adjust with dilute nitric acid. Increase the pH and adjust with dilute sodium hydroxide solution.

Before establishing a schedule for regular supplementation of additives, the addition amount needs to be controlled by solution analysis.

The replenishment amount can also be formulated according to the surface area of the work piece and used as a reference. For every 100 square decimeters (10 square feet) of passivation, approximately 20-25 ml of BZ-217 trivalent chromium black zinc water needs to be supplemented. The specific addition amount also depends on the loss.

Analysis control

1. Take 2 ml of BZ-217 trivalent chromium black zinc plating solution and pour it into a 250 ml conical flask.
2. Add 50 ml of pure water.
3. Adjust the PH to about 10 (the color turns green, use 10-15 ml of 10% sodium hydroxide)
4. Add 1.0-1.5 ml of hydrogen peroxide
5. Boil the solution for 30-45 minutes until its volume remains 1/3. Allow the excess hydrogen peroxide to

evaporate completely.

6. After the solution has cooled, add 100 ml of pure water.

7. Add about 15 ml of concentrated hydrochloric acid, the color of the solution changes from yellow to orange. After the solution becomes hot, it needs to be cooled again.

8. Add 4-5 ml of 10% potassium iodide (dark red) and starch solution.

9. Titrate with 0.1N sodium thiosulfate solution until the solution turns dark and disappears.

Calculation: Concentration of BZ-217 trivalent chromium black zinc water (ml/l)

$$= \frac{\text{Reading} * \text{constant of sodium thiosulfate} * 50}{0.1}$$

Wastewater treatment

BZ-217 trivalent chromium black zinc water passivation solution contains trivalent chromium compounds.

Adjust the pH to 9.0 with lime to remove the precipitated heavy metals. The solution can only be discharged after clarification.

Precautions

BZ-217 trivalent chromium black zinc water and its operating liquid are acidic substances, and operation needs to be careful. Nitric acid can cause severe burns to the skin and eyes. Wear protective clothing, goggles and face shields during operation. In case of accidental contact, rinse immediately with plenty of water.

Troubleshooting

| Symptom | Cause | Solution |
|---|---|--|
| The passivation film is gray and the blackness is | 1. The galvanized layer is too thin. | 1. Increase the thickness of the galvanized layer (above 6μ) |
| | 2. BZ-217 trivalent chromium black zinc water concentration is too high | 2. Analyze and adjust the BZ-217 trivalent chromium black zinc water concentration |
| | 3. The PH value of the passivation | 3. Adjust the PH value of the |

| | | |
|---|---|---|
| not enough. | liquid is too high or too low | passivation liquid |
| | 4. The temperature of the passivation solution is too low | 4. Increase the temperature of the passivation solution |
| | 5. Passivation time is too short | 5. Prolong passivation time appropriately |
| | 6. Too much zinc and iron impurities in the passivation solution (< 10000ppm) | 6. Replace part of passivation liquid |
| | 7. The impregnation time of the sealing treatment is too long | 7. Shorten the impregnation time of the sealing treatment |
| The surface of the black film is iridescent | 1. The pH of BZ-217 trivalent chromium black zinc water is too low. | 1. Adjust the pH of BZ-217 trivalent chromium black zinc water. |
| | 2. The operating concentration of the sealing solution is too low | 2. Increase the operating concentration of the sealing solution |
| | 3. The operating temperature of the sealing liquid is too low | 3. Increase the operating temperature of the sealing liquid |
| | 4. Uneven stirring of the passivation solution | 4. Strengthen the stirring of the passivation solution |
| The brightness of the film is poor 10. The brightness of the | 1. The concentration of BZ-217 trivalent chromium black zinc water is too high. | 1. The concentration of BZ-217 trivalent chromium black zinc water is analyzed and adjusted |
| | 2. The PH of the passivation solution is too low | 2. Adjust the PH value of the passivation solution |
| | 3. The stirring of the passivation solution is too intense | 3. Adjust the stirring intensity of the passivation solution |
| | 4. The passivation time is too long | 4. Adjust the passivation time |

| | | |
|--|---|--|
| galvanized layer itself is poor.10. Improve the brightness of the galvanized layer | 5. The temperature of the passivation liquid is too high | 5. Increase the temperature of the passivation liquid |
| | 6. The operating concentration of the sealing solution is too low | 6. Increase the operating concentration of the sealing solution |
| | 7. The operating temperature of the sealing liquid is too low | 7. Increase the operating temperature of the sealing liquid |
| | 8. The PH of the sealing liquid is too low | 8. Adjust the pH of the sealing liquid |
| | 9. The drying temperature is too high | 9. Reduce the drying temperature |
| | 10. The brightness of the galvanized layer itself is poor. | 10. Improve the brightness of the galvanized layer |
| The black of the passivation film is uneven, and the edge part does not form a film. | 1. Too much organic matter in the plating solution. | 1. Treatment with activated carbon in the plating solution |
| | 2. The electroplating current is too large | 2. Adjust the electroplating current |
| | 3. The galvanized layer is too thin | 3. Increase the thickness of the galvanized layer |
| | 4. BZ-217 trivalent chromium black zinc water concentration is too high | 4. Analyze and adjust the BZ-217 trivalent chromium black zinc water concentration |
| | 5. PH of passivation solution is too low (passivation dipping time is too long) | 5. Properly increase the PH of passivation solution |
| | 6. When the barrel-plated parts are passivated, the flip is too intense. | 6. Adjust the flip frequency |
| The color of the | 1. The PH of the passivation solution is too high. | 1. Adjust the PH of the passivation solution |

| | | |
|--|--|--|
| passivation film is slow, or the black film on the edge part is normal and the middle part is not black. | 2. Low passivation liquid temperature | 2. Increase passivation liquid temperature |
| | 3. No stirring or insufficient stirring strength | 3. Increase air stirring or strengthen stirring strength |
| | 4. Passivation time is too short | 4. Prolong the passivation immersion time appropriately |
| passivation film has poor corrosion resistance | 1. BZ-217 trivalent chromium black zinc water concentration is too low | 1. Analyze and adjust BZ-217 trivalent chromium black zinc water concentration |
| | 2. The temperature of passivation solution is too low | 2. Increase the temperature of passivation solution |
| | 3. The PH of the passivation liquid is too low or too high | 3. Adjust the PH of the passivation liquid |
| | 4. The treatment time of passivation solution is too short | 4. Prolong the treatment time of passivation solution appropriately |
| | 5. The influence of zinc and iron ions in the passivation solution (zinc < 10000ppm) (iron<200ppm) | 5. Replace part of the passivation solution |
| | 6. The operating concentration of the sealing solution is too low | 6. Increase the operating concentration of the sealing solution |
| | 7. The operating temperature of the sealing liquid is too low | 7. Increase the operating temperature of the sealing liquid |
| | 8. The PH of the sealing liquid is too low | 8. Adjust the pH of the sealing liquid |
| | 9. The influence of iron impurities in the sealant(<200ppm) | 9. Replace part of the sealing liquid |

| | | |
|--|---|-------------------------------------|
| | 10. The drying temperature after sealing is too low | 10. Increase the drying temperature |
|--|---|-------------------------------------|