

3. Maintenance

Solution is lost through drag-out and water is lost through evaporation. The solution should be maintained at constant volume and boiling point by the addition of PX-3 salts and water. Maintenance additions can be made at any time providing there is no work being processed. The correct ratio between salts and water is critical and maintenance must not be neglected.

Addition of PX-3 Salts

This is required when the boiling point is low. Salts should be added very slowly, with stirring, to prevent boil over until the boiling temperature rises to the operating level. If the volume of the tank is low due to drag-out losses, estimate the volume loss and add 500 g/l of PX-3 Salts. Finally, correct boiling point with water if required. If the volume is high and the Boiling point is low, it is better to allow water to evaporate to restore the boiling point and lower the volume.

Addition of Water

Water is required when the boiling point is high and the volume is low. Water should always be added very cautiously to a PX-3 bath by running it slowly down a corner of the tank. Because of the high temperature some sputtering may occur and a splash guard or shield may be placed to cover the corner. (If the operator is inexperienced, it is preferable to cool the bath to 100°C before diluting it and then raising the temperature again). The addition of water should continue until the boiling temperature is correct. If the volume is too high before the correct boiling point is reached, due to over addition of salts, some solution must be taken out of the tank. Do not add water below the level of the solution - an explosion could result.

4. Operating Sequence

Articles should be carried in iron or steel baskets or racks, hung on iron hoods or wired with soft iron wire. Do not use stainless steel or Monel for fixtures. Do not treat aluminium, cadmium, copper, tin, zinc or other reactive metals.

- (a) If possible a pre-cleaning with a light sand or shotblast before going through the operations below will be helpful, although not mandatory.
- (b) Clean articles in a hot alkaline cleaner such as Activax SF24102.
- (c) Rinse in clean, cold water.
- (d) Acid etch (i) for 18-8 and 300 series stainless steel. 10 to 20% by volume sulphuric acid at 93°C for 30 seconds to 1 minute.



- (ii) For chromium type stainless steels, 400 series stainless steels, cast and malleable irons. 50% by volume hydrochloric acid at room temperature for 30 seconds to one minute.

(If the type of stainless steel is not known, it will often be possible to decide whether to etch in sulphuric or hydrochloric acid by testing the magnetic properties of the metal. Magnetic stainless steels should usually be etched in hydrochloric acid, while non-magnetic stainless steels are etched in sulphuric acid).

- (e) Rinse immediately in cold, running water and transfer with minimum waiting to the blackening solution.
- (f) PX-3 Blackening Solution. Do not allow work to remain in any longer than necessary. Solutions must be boiling before work is immersed.
- (g) Rinse thoroughly in clean, cold water. Also, be sure to rinse any remaining salts from fixtures and baskets.
- (h) Immerse in a dewatering oil, heavy oil or wax, depending on the final use of the articles and the corrosion resistance required e.g. MacDermid plc Rust Preventative DW Blacking SF24603.

5. Equipment

Tanks, fixtures, pipes, heaters and extraction hoods should be constructed from mild steel only. All joints and seams should be welded. Stainless steel or Monel, will interfere with proper blackening.

It is recommended that efficient fume extraction is fitted. Heating may be by gas burners under the tank or by steel steam coils or steel clad electric immersion heaters.

Temperature control is critical and a direct reading dial type thermometer is an advantage. A volume level indicator is also recommended to avoid guesswork in maintenance.

6. Safety In Handling And Use

Refer to relevant Material Safety Data Sheets.



7. Effluent

It is recommended that waste water treatment is carried out to conform to the specific requirements of the local authority. Advice on how to meet these requirements, once known, can be obtained from MacDermid plc.

Disclaimer

Any information given here relating to Health & Safety should be regarded as general advice and is not to be regarded as comprehensive or definitive.

Every user should also be in possession of Safety Data Sheets for each individual product/chemical used. These are available for all products sold by MacDermid plc.

The Safety Data Sheet contains the definitive advice.

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