

Ultrasonic Activity Detection Foil Ablation Test

The activity of an ultrasonic cleaner may be investigated by the erosion pattern which is created on aluminium foil exposed in the ultrasonic cleaner for a short period. The activity will not be uniform throughout the ultrasonic cleaner.

Tests carried out during commissioning are intended to establish the variation in activity at different positions within the ultrasonic cleaner and the time required to obtain a characteristic erosion pattern.

Tests should be carried out quarterly to ensure the ultrasonic activity remains unchanged.

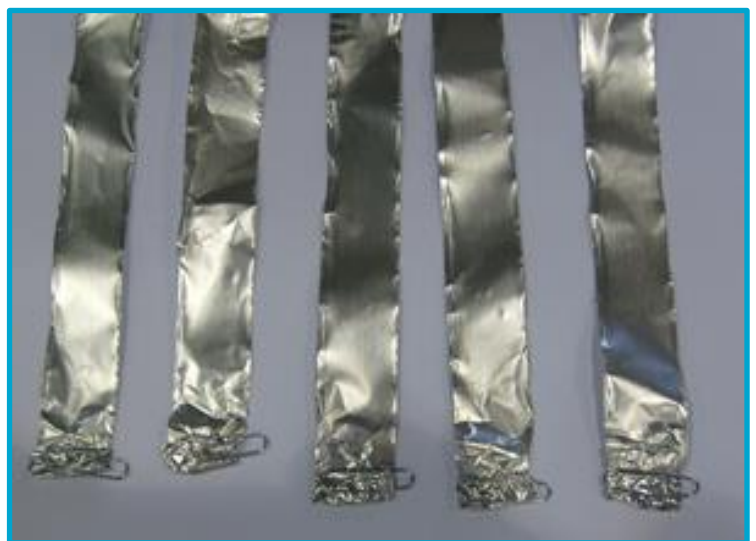
Equipment and materials

The following equipment and materials are required:

- Aluminium foil of nominal thickness 0.015 mm to 0.025 mm (A 20mm wide, 240m reel can be ordered from Ultrawave: Part number C7015701, aluminium foil).
- Waterproof adhesive tape (autoclave indicator tape is ideal).
- A stopwatch, graduated in 0.2seconds or better, and with an accuracy over a period of 15minutes of ± 0.5 seconds or better.
- A rule or tape measure graduated in mm.

Method

- Measure the depth of the bath from the level of the lid to the bottom of the bath. Let the depth be D mm.
- Cut nine strips of aluminium foil 15mm to 20mm wide and $\{D + 120\}$ mm in length.
- Roll 120mm of prepared foil strip into a cylindrical shape and secure with a paper-clip. Repeat for all nine strips.

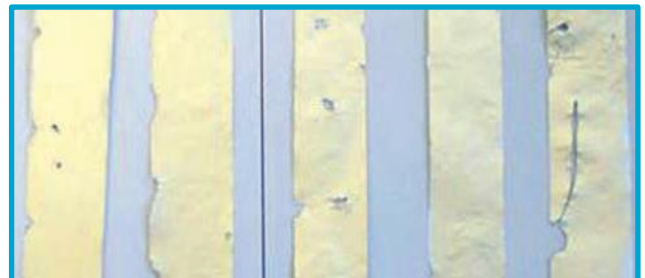


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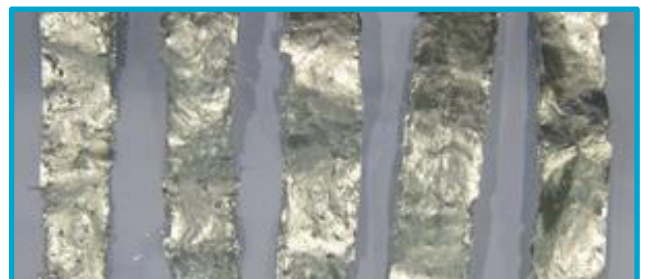
- Ensure that the water in the ultrasonic cleaner is at the required level, and that the required amount of appropriate detergent has been added, and the solution in the ultrasonic cleaner is at the specified operating temperature.
- Start the ultrasonic cycle and carry out the degas procedure to eliminate dissolved gases from the solution in the bath.
- Using strips of autoclave indicator tape across the top of the bath suspend nine strips of the prepared foil in the ultrasonic cleaner in a 3 x 3 grid.
- The rolled end of each foil strip acts as a sinker weight to maintain the foil in an approximately vertical position. The sinker weight should be not more than 10mm above, but not touching, the bottom of the bath.
- Run an ultrasonic cycle for a minimum of 30seconds.
- Remove the strips from the bath, blot dry and examine.
- Drain the bath and clean to remove debris of eroded aluminium foil.



Foil strips in position



Inadequate or uneven erosion patterns



Positive or satisfactory erosion patterns

Results

The zones of maximum erosion should be at similar positions on all nine foil strips, and each should be eroded to a similar extent (by visual inspection).

On re-testing the extent of erosion and the erosion pattern should have remained consistent with those originally determined during commissioning.

Note: The strips may be filed conveniently by sticking them to an A4 sheet of plain paper using a transparent adhesive tape. Laminating will provide a permanent record.

The erosion pattern will depend on the thickness of the foil, the hardness of the foil, and the temperature of the solution in the ultrasonic cleaner.