Foil test
Testing of ultrasonic baths

A foil test\(^1\) is recommended for testing ultrasonic baths. It is to be conducted upon initial startup, and at regular intervals thereafter (e.g. every 3 months). The frequency of testing is the responsibility of the user.

The foil test is a simple procedure to demonstrate the intensity and distribution of cavitation in an ultrasonic bath. To do so, aluminium foil is stretched over a foil test frame. It is perforated or destroyed to a certain degree by cavitation, depending on the duration.

For purposes of reproducibility, it is \textbf{important that the test conditions remain constant}:

- Fill level in the oscillating tank (\(\frac{2}{3}\))
- Temperature of tank contents
- Degassing time, if needed (degassing 5 to 30 min. before the test, depending on the tank contents)
  - Time may need to be extended with acidic cleaning solutions.
- Frame positioning
- Foil properties (thickness, surface)
- Sonication time
- Concentration and type of ultrasound preparation

Foils can be archived in a suitable way (scanning, photos, etc.) This allows the foils to be compared at any time. The perforated areas of all foils should have approx. the same dimensions and distribution – the results are never identical.

A process validation, e.g. for the treatment of medical products, can only be achieved by conducting regular foil tests.

To execute the foil test, different foil test frames FT can be ordered from the manufacturer (for a fee). The foil test frames are suitable for a wide range of tank dimensions. Aluminium household foil is also required to conduct the test and is not included in the delivery.

Film: http://bandelin.com/folientest/.

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\(^1\) Investigations on test procedures for ultrasonic cleaners. IEC/TR 60886 (1987-03)

**Fluid for the foil test**

In order to obtain an adequately strong cavitation effect, the surface tension of the water used must also be reduced for the foil test with the help of surfactant preparations. We recommend the following ultrasound preparations:

- STAMMOPUR DR 8, STAMMOPUR R, TICKOMED 1,
- TICKOPUR R 33, TICKOPUR R 30, TICKOPUR TR 7

If none of these preparations is available, a neutral or mildly alkaline preparation that does not destroy aluminium may be used. The preparation must be approved by the manufacturer for use in ultrasonic baths.
Conducting the foil test
1. Fill 2/3 of the oscillating tank with water and a suitable ultrasound preparation in the dosage specified by the manufacturer.

2. Degas the liquid: < 10 l - 10 min and > 10 l - 30 min (see user instructions.)

3. Stretch aluminium foil (household foil with a thickness of 10 μm to 25 μm) over the wire frame (stainless steel).
   Depending on the tank size, it is possible that the frame protrudes from the tank.
   Covering the portion of the frame that is submerged will suffice.

4. With the ultrasound switched off, place the foil-wrapped wire frame diagonally inside the oscillating tank, adjust if necessary.

5. Switch on the ultrasound and sonicate the foil for at least one minute until visible perforations or holes are produced.
   With sturdier foils (thicker or coated ones), the sonication time can last up to 3 minutes.

6. Switch off the ultrasound, take the foil out and let it dry.

7. The foil must be perforated, otherwise contact the manufacturer.

8. Archive it together with testing date and the serial number of the ultrasonic bath.

9. After the test, the oscillating tank must be thoroughly rinsed out to remove any loose foil particles.

<table>
<thead>
<tr>
<th>Type</th>
<th>for interior tank dimensions in mm (L x W x H)</th>
<th>Order No.</th>
<th>for</th>
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<tbody>
<tr>
<td></td>
<td>from</td>
<td>to</td>
<td></td>
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<tr>
<td>FT 1</td>
<td>190 × 85 × 60</td>
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<td>TRISON (TE 3000)</td>
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