

Foil test

Functional test for an ultrasonic bath

A foil test should be carried out before the first use and at regular intervals, e.g., every 3 months. This serves to ensure that the ultrasound has a consistent effect. You are responsible for how often this test is performed.

The foil test is a simple method for displaying the intensity and distribution of the cavitation in an ultrasonic bath. It is performed by inserting aluminium foil stretched over a foil test frame; for suitable foil test frames (FT) and foils (FL), see the table on page 4. Depending on the duration of sonication, the foil will be perforated or destroyed to a certain extent by cavitation.

In order to be able to compare results, it is **important that the conditions of the foil test are always the same:**

- The oscillating tank is filled up to the filling level mark
- Temperature of the sonication liquid
- The power setting on the ultrasonic bath is 100%
- Duration of degassing
- Positioning of the foil test frame
- Foil type (brand, thickness)
- Sonication duration
- Type and concentration of the ultrasound agent

Liquid for the foil test

In order to obtain sufficiently strong cavitation, the boundary 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 agents:

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

If none of these agents is available, a neutral or mildly alkaline agent that is not destructive to aluminium should be used. The agent must be approved by the manufacturer for use in the ultrasonic bath.

Test result and documentation

While always maintaining the same test conditions, the test result must be assessed based on the perforated area of the foils. The perforated areas of the foils should always have approximately the same extent and distribution – they are never congruent. Through regular foil tests, it is possible to perform a constant process check, e.g., for reprocessing medical devices. An alternative is to measure the cavitation noise according to IEC TS 63001:2019.

You can download a documentation template here for documenting the test results:

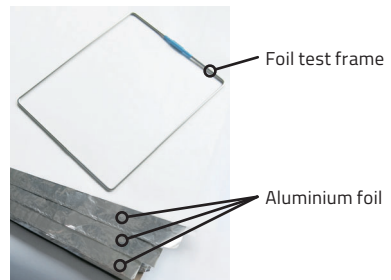
<https://bandelin.com/folientest/>

You will also find an application video there.

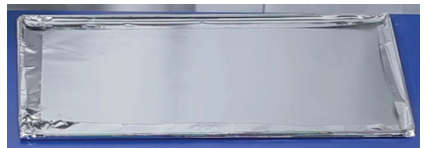
What's more, the foils can be archived in a suitable manner (scan, photo, etc.). This makes it possible to compare the foils at any time.



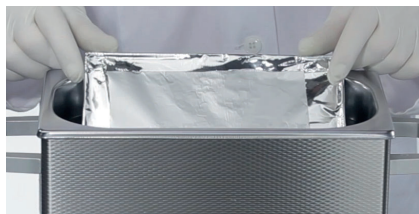
Performing the foil test



1. Fill the oscillating tank with water and a suitable ultrasound agent in the dosage specified by the manufacturer up to the filling level mark.
2. Degas the sonication liquid.
3. Clamp the aluminium foil onto the foil test frame. We recommend using our foil blanks. As a substitute, you can also use commercially available aluminium foil (thickness of 10 µm to 25 µm). Depending on the size of the tank, the foil test frame may protrude. It is sufficient to cover the part of the foil test frame that is covered by the sonication liquid.



4. Place the covered foil test frame on a diagonal in the middle of the oscillating tank. If necessary, fix it in place.



5. Switch on the ultrasound. Sonicate the foil for at least 1 minute until visible perforation or pitting occurs. For more stable foils (thicker or coated), the duration of sonication may be up to 3 minutes. Make a note of the duration of your test.
6. Switch off the ultrasound. Take out the foil test frame. Remove the aluminium foil from the foil test frame and allow it to dry.
7. The foil must be perforated. If it is not, it is recommended that the device be checked by the service department of BANDELIN electronic GmbH & Co. KG.
8. Archive the foil with the test date and serial number of the ultrasonic bath, the previously selected conditions, and the duration. The documentation template for the foil test can additionally be filled in and archived.
9. Rinse out the oscillating tank thoroughly to remove any dissolved foil particles.

Suitable foil test frames and foils can be ordered from BANDELIN electronic GmbH & Co. KG.

The foil test frames and foils are designed for a wide range of tank dimensions; see the following table:

Foil test frames (PU = 1 piece)			Film (PU = 50 pieces)	
Type	Code no.	for	Type	Code no.
FT 1	3190	DT 31/H, DT 52/H, RK 31/H, RK 52/H		
FT 4	3074	DL 102 H, DL 255 H, DT 100 / H, DT 102 H /H-RC, DT 103, DT 106, DT 255 /H /H-RC, RK 100 /H, RK 102 H, RK 103, RK 106, RK 255 /H SC 255.2 ST 102 H, ST 103 H, ST 255 H	FL 4	71004
FT 6	3222	DL 156 BH, DT 156 /BH, ST 156 BH		
FT 14	3084	BactoSonic 14.2 DL 510 H, DL 512 H, DL 514 BH, DT 510 /H /H-RC, DT 512 H, DT 514 H /BH / BH-RC, DT 510 F, RK 510 /H, RK 512 H, RK 514 /H /BH, RM 16.2 U /UH /ST ST 510 H, ST 514 H /BH ZE 514/...DT,	FL 14	71014
FT 36	3673	DT 1028 F, ZE 1031/1032/ ...DT		
FT 37	3674	DT 1058 M, DT 1048 H, ZE 1058/1059/ ...DT		
FT 38	3672	MC 1001/E		
FT 40	3094	DL 1028 H, DT 1028 /H /CH, RK 170 H, RK 1028 /H /C / CH, RK 1040, RM 40.2 U /UH /ST ST 170 H, ST 1028 H / CH	FL 40	71040
FT 42	3224	TRISON (TE 3000 / TE 4000)		
FT 45	3204	DT 1050 CH, RK 1050/CH, RM 75.2 U/UH/ST ST 1050 CH	FL 45	71045