

## VialTweeter at UIS250L - Intensive Sonication of Vials

Sonication is a very effective method for the mixing, homogenizing, [emulsifying](#), [dispersing](#), disintegration, and degassing of liquids by means of ultrasonic [cavitation](#). The VialTweeter applies this technology to vials, such as autosampler vials, storage vials and reagent vials without the need to open the cap or any water bath.

The VialTweeter replaces the indirect sonication in ultrasonic cleaning baths/tanks, in which the water surrounding the vials takes most of the energy - while the effective power in a 1.5ml vial is as low as 0.01 watt. For sonication processes, this is no power at all. (Our high power ultrasonic bath [UTR200](#) gives you approx. 0.5 watts per 1.5ml in a vial instead.)

The VialTweeter delivers up to 10 watts to each of the six vials in its high intensity part and up to 5 watts to the two vials placed in its low intensity part. These power levels allow for sophisticated sonication processes (see a list at the end of this page) in short time, similar to direct sonication by a homogenizer. The VialTweeter can sonicate a test tube, bottle or beaker of up to 500ml volume attached to its end, too. The power can be adjusted by means of the amplitude adjustment at the front panel of the generator. Once set, the amplitude will be maintained at the adjusted value and will be distributed evenly across the 6 high intensity vials and the 2 low intensity vials, respectively. This gives you reproducible sonication effects.

The VialTweeter is powered by the ultrasonic processor UIS250L (250 watts, 24kHz). This compact and reliable unit is easy to set-up and operate. As the ultrasonic generator is tuned to the frequency of the sonotrode automatically, there is no manual frequency tuning required. For a good transmission of the ultrasonic vibrations to the individual vials, the vials are pushed gently into the holes of the VialTweeter. Each hole of the VialTweeter is made to hold vials of the most common sizes, brands and designs, such as

- vials and test tubes of 0.5ml, 1.0ml, 1.5ml or 2.0ml volume, e.g. 12x32mm or 15x45mm
- vials made by [Eppendorf](#), [Sun-SRI](#), [Greenwood](#) or compatible
- vials with snap top, crimp top or screw thread finish
- vials with/without limited volume inserts
- vials with/without closures
- conical bottom vials, flat bottom vials, or V-bottom vials
- microsampling vials, headspace vials, and sample storage vials
- vials made of polypropylene (PP), polyethylene (PE), polymethylpentene (TPX), polystyrene or PTFE or any other plastic

At the end of the VialTweeter, a single vessel can be attached for sonication. You can use vessels, such as

- bottles, test tubes or beakers
- vessels of up to 500ml volume
- vessels of 10mm minimum diameter
- vessels made of glass, polypropylene, polystyrene or any other plastic

Since the VialTweeter vibrates through the vial/vessel wall, the vial can remain closed. Different from the direct sonication by means of an ultrasonic probe/sonotrode (e.g. LS24d5 for UIS250L) that is immersed into the liquid, this eliminates cross contamination of samples. It reduces the time required per vial/vessel. The VialTweeter can be cleaned and disinfected easily.

The VialTweeter is made of Titanium and is autoclavable while the transducer of the UIS250L is made of stainless steel (IP65, NEMA4). The generator is connected to the transducer by a 4m connection cable. The UIS250L with VialTweeter can be operated continuously. Pulse cycle operation can be selected at the front panel of the ultrasonic generator. An optionally available PC-interface with software can record the total ultrasonic power and the combined net input power at any Windows®-PC and allows for the remote control of all essential parameters, such as sonication time and amplitude.



Alternatively to the **VialTweeter**, the UIS250L can be equipped with one of the following sonotrodes for direct immersion into liquids:

- LS24d3 - 3mm tip diameter, length approx. 100mm
- LS24d5 - 5mm tip diameter, length approx. 100mm
- LS24d10 - 10mm tip diameter, length approx. 100mm

When equipped with one of above mentioned sonotrodes, the UIS250L can be used as a hand-held or stand-mounted homogenizer. The exchange between the **VialTweeter** and the sonotrodes takes approx. 5min.

The **VialTweeter** as well as the individual sonotrodes can be used in combination with the UIS250L for many applications a vial shaker does not make possible, such as:

- mixing and blending
- homogenization
- emulsifying
- dispersing and dissolving and making suspensions
- disintegration and cell disruption, e.g for protein extraction, or enzyme release
- deagglomeration and particle size reduction e.g. to obtain single-dispersed particles
- degassing, e.g. before analysis



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