

Heating up the bath liquid

In **SONOREX** ultrasonic baths with a built-in heater (type H) the bath liquid can be preheated independently of the ultrasound. This increases the cleaning effect and shortens the subsequent ultrasonic cleaning period, especially for removing fats, oils and polish residues. When preheating the bath liquid, it has to be stirred briefly at least every thirty minutes or the ultrasound has to be turned on for five minutes to prevent delayed boiling.

Delayed boiling

Delayed boiling means a sudden, possibly explosive expansion of a liquid volume heated beyond its boiling point. There is danger of scald!

This can occur at home, e.g. heating a liquid in the microwave, in the laboratory when heating test tubes or operating heated ultrasonic baths:

A certain amount of mostly dustless and gasfree liquid can be heated beyond its boiling point rather quickly (e.g. microwave), or slowly in a clean vessel (test tubes, stainless steel tank) without starting to boil. The smallest energetic excitation by a bump, lifting the tank lid, or ultrasonic cavitation will already do to set off the sudden ebullition under explosive expansion of the entire liquid volume!

The onset of liquid boiling at its boiling point requires the existence of certain "seeds" (e. g. dissolved dust or gas particles) that facilitate formation of smallest steam bubbles.

Normally, the formation of steam bubbles would be initiated by heating the liquid to its boiling point – caused by dissolved dust and gas particles and the surface roughness of the tanks used.

To generally prevent delayed boiling, the liquid has to be stirred several times at certain time intervals, or ultrasound has to be switched on simultaneously.

The user instructions of **SONOREX** ultrasonic baths stress that phenomenon.

With **SONOREX** equipment, the heater is thermostatically adjustable from 30 - 80 °C.

It switches off when the pre-selected temperature is reached. The ultrasonic bath RK 31 H has a heating, set at 65 °C.

In principle, the temperature of the bath liquid is inhomogeneous in the bath and can deviate at different measuring points for up to 10 °C. In addition, still falsifications of the temperature level come by switching hysteresis, set accuracy and parallax error at the temperature scale at the front label. If more exact values are demanded, then these are to be determined by measurements directly in the ultrasonic bath.

The high ultrasonic power of **SONOREX** ultrasonic baths heats up the bath liquid also without a heater. By means of the ultrasonic converters attached to the tank bottom, the wave energy is transferred into the liquid. Thereby a not insignificant part is converted into heating energy.

During ultrasonic operation, the bath temperature can increase strongly also without heating and reach the boiling point in extreme cases.

Putting the lid on will accelerate the heating up and avoid evaporation of the liquid as far as possible.

Approximate values for heating up period in minutes

type	Heating up period in min*			
	operation with ultrasound up to 60 °C	operation with heater up to 60 °C	operation with ultrasound and heater up to 60 °C	operation with ultrasound and heater up to 80 °C
DT/RK 31 H	70	40	30	-
DT/RK 52 H	70	30	25	40
DT/RK 100 H	90	45	35	60
DT/RK 100 SH	90	50	35	60
DL/DT/RK 102 H	60	50	30	50
DT/RK 103 H	70	40	30	50
DL/DT/RK 156 BH	100	30	30	50
RK 170 H	300	70	55	90
DL/DT/RK 255 H	80	40	35	55
DL/DT/RK 510 H	145	60	40	75
DL/DT/RK 512 H	150	75	55	95
DT/RK 514 H	150	45	40	70
DL/DT/RK 514 BH	200	75	60	100
DL/DT/RK 1028 H	225	55	47	75
DT/RK 1028 CH	350	90	80	110
DT/RK 1050 CH	350	125	100	150
RL 70 UH	245	140	100	150
RM 16 UH	150	60	45	75
RM 40 UH	210	100	75	110
RM 75 UH	210	105	85	130
RM/TM 110/112 UH	385	60	55	120
RM/TM 180/182 UH	280	60	55	110
RM/TM 210/212 UH	365	95	80	145

* Conditions:

2/3 – filling with water; starting at approx. 20 °C (room temperature); with lid

Subject to technical alterations.

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Certification
EN ISO 9001:2008 • EN ISO 13485:2012

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