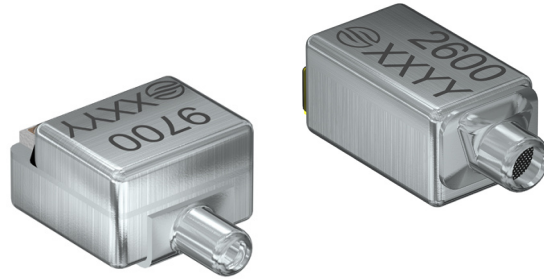


Application Note



Handling of Transducers

Transducers although robust, have limits to excessive handling or chemicals that they are exposed to. This application note explains influences of improper handling for microphones and receivers.

Some examples of critical handling may be dropping parts, forceful dismantling of hearing aid, excessive heat while soldering, using harmful cleaning solvents and ESD. These

may cause dents, loss of sensitivity and output, distortion, external leaks, damaged screens and solder pads and short circuit.

All this can be prevented if the correct tools, heat sinks, ESD protection are used and handling instructions are followed.

Application Note

Handling a Transducer

Receivers

Handling	Consequences	Recommendations	Comments
Forceful squeezing	This will cause dents on the side of a transducer, which may cause distortion and external leaks.	Using tweezers is recommended with a reasonable amount of pick up force.	Sonion receiver cases are carefully annealed for greater strength but care still needs to be taken.
Dropping	This may internal damage to a receiver and dents causing distortion or external leaks.	Do not drop. Evaluate production areas where dropping may occur more frequently	Sonion receivers have been greatly improved for shock damage of up to 20,000 g but care still needs to be taken.
Buffing	Materials from a buffing compound may get inside a transducer Forceful buffing may damage the transducer if the force of the machine throws it accidentally	Please cover up all transducer spouts to prevent anything getting inside Great care needs to be taken.	Sonion receivers have been greatly improved for shock damage of up to 20,000 g but care still needs to be taken.
Removing residue from screens	Screens are fragile. Dented screens or plugged up screens will cause decreased output.	Use care when removing residue from screens.	
Removal of residual adhesives	A possible internal damage to the receiver if the chemical gets inside	For recommended list please see page 6	If a chemical is not on the list please contact a Sonion representative before using it.
ESD	No damage on a receiver		No damage on a receiver
Soldering	Excessive heat will cause damage to the pads of the receivers.	Please see the soldering sections of this document.	

Application Note

Microphones

Handling	Consequences	Recommendations	Comments
Forceful squeezing	This will cause dents on the side of a transducer, which may cause distortion and external leaks.	Using tweezers is recommended with a reasonable amount of pick up force.	
Buffing	Materials from a buffing compound may get inside a transducer altering the sensitivity. Forceful buffing may damage the transducer if the force of the machine throws it accidentally.	Please cover up all transducer spouts to prevent anything getting inside. Great care needs to be taken.	Although sometimes screens in the spouts block particles from getting inside, the inlets must be covered up throughout the manufacturing process.
Removing residue from screens	Screens are fragile. Dented screens or plugged up screens may cause changes in frequency response.	Use care when removing residue from screens.	
Removal of residual adhesives	A loss of sensitivity will occur if a microphone is exposed to a harsh chemical or its vapor.	For recommended list please see page 6	Sonion microphones can handle up to class 3 ESD protection level. But some care still needs to be taken.
ESD	Internal damage.	Use ESD protection such as wrist straps and ESD matting at all work stations	Sonion microphones have up to 6 kV ESD protection but some care still needs to be taken.
Soldering	Excessive heat will cause damage to the pads of the microphone.	Please see the soldering sections of this document.	

Application Note

Soldering Instructions

Required Tools	Recommendations	Additional Comments	Recommended Brands
Soldering iron	Lower Power (25-60 Watts) with temperature control ESD safe	Series 100 Microphones: 340 - 350°C (644 - 662°F)	Weller EC2002, Weller WTCP-S, Weller WSD80, Metcal SP-PW1-20
		Series 6000, and 9000 Microphones: 350 - 400°C (662 - 752°F)	
		Series 8000 Microphones: 350 - 370°C (662 - 698°F)	
		All Receiver and Telecoil Models: 350 - 380°C (662 - 716°F)	
Soldering iron tip	Smallest tip possible	Series 30 and 100 Microphones: 0.2 - 0.8 mm (0.008 - 0.031 inch)	Weller LT1S, Metcall
		Series 6000, 8000 and 9000 Microphones: 0.2 - 0.6 mm (0.008 - 0.024 inch)	
		All Receiver and Telecoil Models 0.2 - 0.6 mm (0.008 - 0.024 inch)	
Solder	Lead Free Sn/Ag/Cu with no-clean flux	SAC305 with 1 - 2.2% flux (Sn 97.5%/Ag 3.0%/Cu 0.5%) diameter 0.25 - 0.5 mm	Kester: SAC305-275 flux Multicore: SAC305-crystal400 flux
Flux	Lead Free compatible, no-clean flux	Only add flux when needed. Flux can be added to the solderpad (using a flux pen or a syringe with tacky flux) or to the connection wire	Kester: 952-D6 Flux Pen TSF6592 Tacky Flux 186-5 Liquid Flux
Soldering time solderpads	1 s	Max: 2 s, dwell time: 10 s between solder operations	
Soldering time connection wires (>10mm)	3 s	Time can be increased when connection wires are held with tweezers	

Temperatures mentioned are settings on the soldering iron Weller WSD 80 with LT S1 tip. Tip-temperature is usually 10-20°C lower. Transducers were placed in a heat sink (see page 5 and the 8000 Microphone - Product Handling and Soldering Recommendations application note on the Sonion web site)

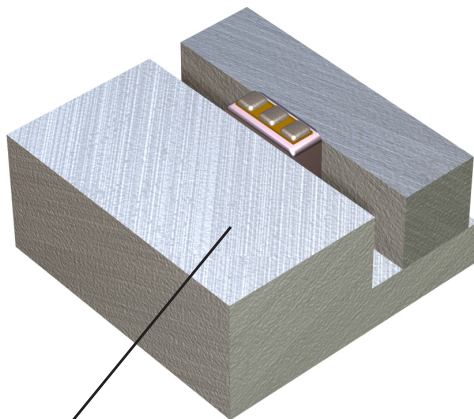
Application Note

Step-by-Step Instructions

1. Place the transducer in a heat sink, terminal pads up. See Figures below for more details. Sonion highly recommends using heat sinks to dissipate the heat from the transducers (see pictures). When placing a transducer in a heat sink fixture it is important not to press the sides with a lot of force this may cause damage.

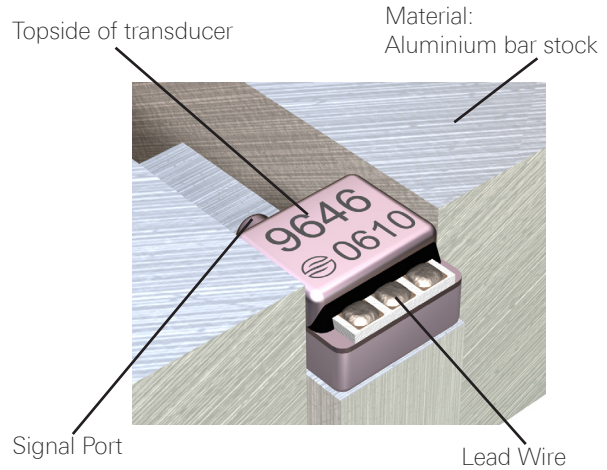
Warning: When soldering on the transducer the spout (of a receiver or microphone) must not be blocked. This is to prevent pressure increase due to expanding air.

Heat Sink series 30 and 100



Material:
Aluminium bar stock

Heat Sink series 6000 and 9000



2. Dip the pretinned part of the lead wire in liquid rosin flux. Avoid excessive flux residue.
3. Lay tinned tip of connection wire on terminal pad.
4. Clean soldering iron tip on wet cellulose sponge.
5. Apply soldering iron tip to the lead and terminal pad simultaneously.
6. Keep soldering iron tip in contact with lead and terminal pad until solder flows making a good connection.
Total time soldering iron tip is in contact with the lead and terminal should not exceed one second, and the temperature of the microphone should not exceed 80°C (176°F).
Remove solder iron tip and hold lead wire in place until solder solidifies.
7. Inspect connection to see that:
 - Solder has flowed smoothly over lead and terminal pad.
 - Solder has not bridged between adjacent terminal pads or between the terminal pad and the case.

Application Note

Chemical

	Adhesive	Solvent	Other	Safe	Critical, preferred not to use	Avoid saturated vapour levels	Do not use
Super Glue Cyanoacrylate (eg. Cyanolit, Loctite 416)				Safe		Avoid saturated vapour levels	
Silicone Mastic Based on acetic acid curing (eg Loctite 18198, GE RTV118)					Critical, preferred not to use	Avoid saturated vapour levels	
Silicone Mastic Acetic acid free, alcohol based				Safe			
Conformal Coating Polyurethane oligomer mixture (eg. Dymax 986)			Other	Safe		Avoid saturated vapour levels	
Moulding Compound Based on urethane acrylate (eg. Loctite 21365)			Other	Safe			
Accelerator/Activator for Super Glue (eg. Loctite 7452)			Other				Do not use
Methylen Chlorid		Solvent					Do not use
2 - Propanol (Isopropanol)		Solvent			Critical, preferred not to use	Avoid saturated vapour levels	
Acetone		Solvent					Do not use
Dry-Cleaning naphtha		Solvent					Do not use
Methylated Spirit		Solvent					Do not use
Aquasous Rosin Cleaner (eg. Alpha 2110)		Solvent		Safe		Avoid saturated vapour levels	
2 Component Polyurethane (eg. Conap EN-20)	Adhesive			Safe			
2 component epoxy resin (eg. Scotchcast resin 3)	Adhesive			Safe			
Clear Universal Adhesive based on polyvinyl acetate (eg. Bisoncol)	Adhesive						Do not use
Monomer (shell material)			Other		Critical, preferred not to use	Avoid saturated vapour levels	