Quick Guide:

DNA Shearing with S2/E210 Focused-ultrasonicator

This Quick Guide provides DNA Shearing protocols when using microTUBE or miniTUBE and a Covaris S2 or E210 Focused-ultrasonicator.

130 µl sample volume- from 150 to 1,500 bp

microTUBE AFA Fiber Snap-Cap
microTUBE AFA Fiber Crimp-Cap
8 microTUBE Strip
96 microTUBE Plate

Target BP (Peak)	150	200	300	400	500	800	1,000	1,500
Intensity	**5**	**5**	**4**	**4**	**3**	**3**	**3**	**4**
Duty Cycle	**10%**	**10%**	**10%**	**10%**	**5%**	**5%**	**5%**	**2%**
Cycles per Burst	**200**	**200**	**200**	**200**	**200**	**200**	**200**	**200**
Treatment Time (s)	**430**	**180**	**80**	**55**	**80**	**50**	**40**	**15**
Temperature (°C)	7	7	7	7	7	7	7	7
Water Level – S2	12	12	12	12	12	12	12	12
Water Level – E210	6	6	6	6	6	6	6	6
Sample volume (µl)	130	130	130	130	130	130	130	130
E210 - Intensifier (PN 500141)	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**

50 µl sample volume - from 150 to 1,500 bp

microTUBE AFA Fiber Snap-Cap
microTUBE AFA Fiber Crimp-Cap
8 microTUBE Strip
96 microTUBE Plate

Target BP (Peak)	150	200	300	400	500	1,000	1,500
Intensity	**5**	**5**	**5**	**5**	**5**	**5**	**5**
Duty Cycle	**10%**	**10%**	**10%**	**5%**	**5%**	**2%**	**1%**
Cycles per Burst	**200**	**200**	**200**	**200**	**200**	**200**	**200**
Treatment Time (s)	**280**	**120**	**50**	**55**	**35**	**45**	**20**
Temperature (°C)	7	7	7	7	7	7	7
Water Level – S2	12	12	12	12	12	12	12
Water Level – E210	6	6	6	6	6	6	6
Sample volume (µl)	50	50	50	50	50	50	50
E210 - Intensifier (PN 500141)	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**

200 µl sample - 2,000; 3,000 and 5,000 bp

miniTUBE Clear, Blue or Red

Target BP (Peak)	**2,000**	**3,000**	**5,000**
miniTUBE	Clear	Blue	Red
Intensity	**0.1**	**0.1**	**1**
Duty Cycle	**20%**	**20%**	**20%**
Cycles per Burst	**1,000**	**1,000**	**1,000**
Treatment Time (s)	**900**	**600**	**600**
Temperature (°C)	7	20	20
Water Level – S2	15	15	15
Water Level – E210	11	11	11
Sample Volume (µl)	200	200	200
E210 - Intensifier (PN 500141)	**No**	**No**	**No**

Please note that miniTUBE requires removal of the Intensifier (PN 500141) from the E210 focused-ultrasonicator. Please see Appendix A for instructions.

To fragment DNA to size larger than 5 kb, Covaris offers the g-TUBE: a single-use device that shears genomic DNA into selected fragments sizes ranging from 6 kb to 20 kb. The only equipment needed is a compatible bench-top centrifuge.

Values mentioned in this Quick Guide are nominal values. The tolerances are as follow:

- Temperature +/-2°C
- Sample volume +/- 5µl
- Water Level +/- 1

Sample preparation guidelines

- **DNA input:** from 100 ng to 5 µg purified DNA
- **Buffer:** Tris EDTA, pH 8.0
- **DNA quality:** Genomic DNA (> 10 kb). For lower quality DNA, Covaris recommends setting up a time dose response experiment for determining appropriate treatment times.

Recommended settings are subject to change without notice.
See following link http://www.covarisinc.com/wp-content/uploads/pn_010158.pdf for updates to this document.

Supplies

Product Name Part Number	microTUBE AFA Fiber Snap-Cap 520045	microTUBE AFA Fiber Crimp-Cap 520052	miniTUBE Clear 520064	miniTUBE Blue 520065	miniTUBE Red 520066
Compatible volume	50 µl; 130 µl	50 µl; 130 µl	200 µl	200 µl	200 µl
S2	S-Series Holder microTUBE PN 500114		S-Series Holder miniTUBE PN 500206		
E210	Rack 24 Place microTUBE Snap-Cap PN 500111	Rack 96 Place microTUBE Crimp-Cap PN 500282	Rack 24 Place miniTUBE PN 500205		

Product Name Part Number	8 microTUBE Strip 520053	96 microTUBE Plate 520078
Compatible volume	50 µl; 130 µl	50 µl; 130 µl
E210	Rack 12 Place 8 microTUBE Strip PN 500191	No Rack needed

Preparation stations	microTUBE Prep Station Snap & Screw Cap	500330
	miniTUBE loading and unloading station	500207
	8 microTUBE Strip Prep Station	500327
Intensifier	IE-DNA (required for E210)	500141
Centrifuge adapter	Fit microTUBEs in bench top micro centrifuges	520059
g-TUBE	g-TUBEs (10) and prep station	520079

Appendix A : Removing or Installing the Intensifier (Covaris PN 500141) from an E System

The 500141 Intensifier is a small inverted stainless steel cone centered over the E Series transducer by four stainless wires. The wires are held by in a black plastic ring pressed into the transducer well.

If an AFA protocol requires "no intensifier", please *remove the Intensifier*, using the following steps:

1. Empty the water bath. Start the E System and start the SonoLAB software.
2. Wait for the homing sequence to complete (the transducer will be lowered with the rack holder at it home position, allowing easy access to the Intensifier).
3. Grasp opposite sides of plastic ring and gently pull the entire assembly out of the transducer well. Do not pull on the steel cone or the wires. The ring is a friction fit in the well – no hardware is used to hold it in place.

The 500141 Intensifier (left) shown installed in the E System transducer well and (right) removed.
Note the "UP" marking at the center of the Intensifier.

If a protocol requires the Intensifier to be present, simply reverse this process:

1. Align the black plastic ring with the perimeter of the transducer well. Note that the flat side of the center cone (marked UP) should be facing up (away from the transducer).
2. Gently press each section of the ring into the well until the ring is seated uniformly in contact with the transducer, with approximately 2 mm of the ring evenly exposed above the transducer assembly. Do not press on the cone or wires. The rotation of the ring relative to the transducer assembly is not important.
3. Refill the tank. Degas and chill the water before proceeding.

Technical Assistance

- By telephone (+1 781 932 3959) during the hours of 9:00am to 5:00pm, Monday through Friday, United States Eastern Standard Time (EST) or Greenwich Mean Time (GMT) minus 05:00 hours
- By e-mail at techsupport@covarisinc.com