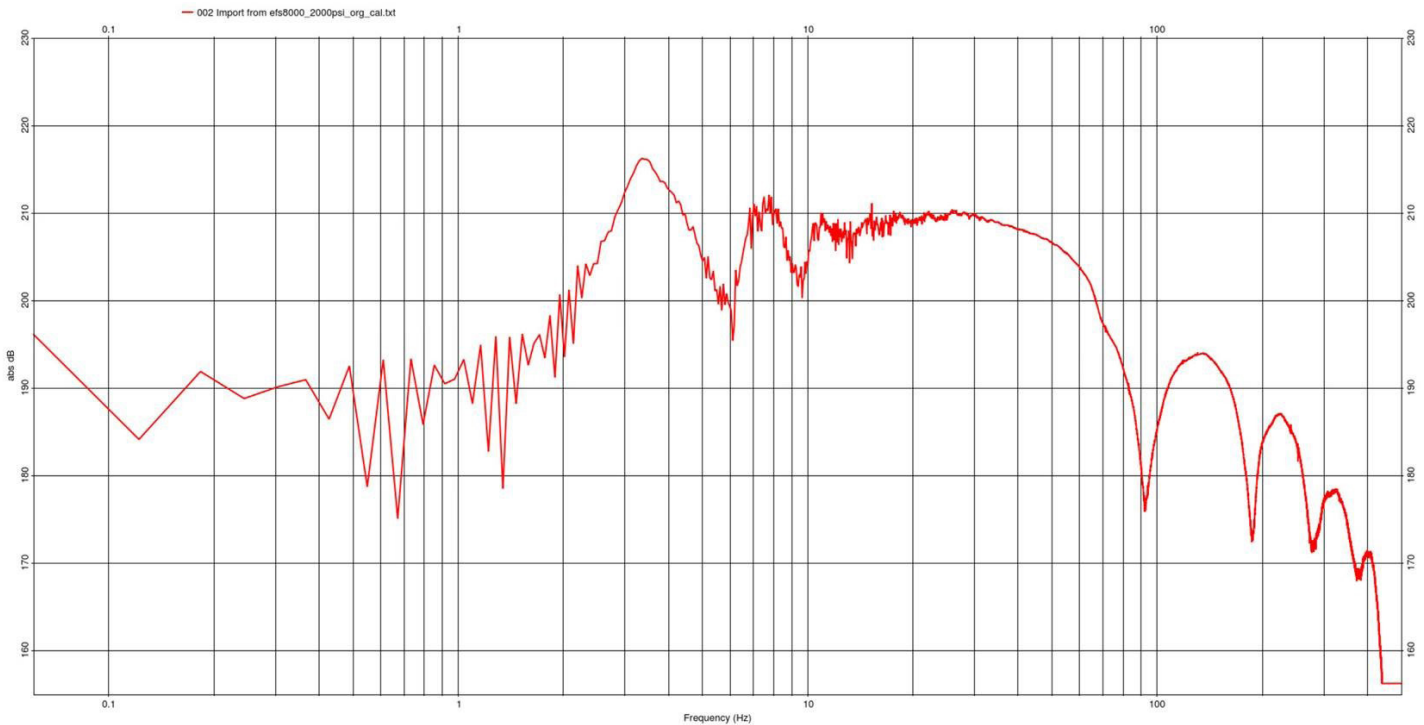




Gemini™ Extended Frequency Source

ION's Gemini™ extended frequency source technology is a compact, broadband, seismic source technology that may be utilized on seismic surveys to generate the low frequencies required to image complex geologies. The Gemini™ source is an 8,000 in³ air gun-based technology that is compatible with conventional vessel compressors, umbilical winches and cables, and deck deployment and recovery systems. The design utilizes modified field proven technologies including: industry standard seismic air gun elements, high-pressure rated manifolds, hoses and fittings, and industry standard flexible flotation.

The Gemini™ source provides improved signal to noise ratios at low frequencies while maintaining broad-spectrum performance at frequencies within the seismic window (Figure 1). In addition, it reduces impacts to marine life due to its limited emission of high frequency energy.



Technical Specifications	
Spectral Density Level:	
Low Frequency Bandwidth (2-7Hz)	>190 dB re 1 μPa^2 / Hz
Seismic Frequency Bandwidth (7-70Hz)	>195 dB re 1 μPa^2 / Hz
High Frequency Bandwidth (>200Hz)	<175 dB re 1 μPa^2 / Hz
Fundamental frequency:	<4Hz
Operating Pressure	2,000 psi / 138 bar



Technical Specifications, Cont.	
Volume per Shot	8,000 cubic inches / 131 liters
Reliability	Field Proven Air Gun Technology Fully redundant in-water equipment
Number of Sub-arrays per Array	A single shot is created by a single sub-array
Multiple Source in Water Steering	Compatible with conventional source steering door- based diverter technologies Compatible with ION's SailWing™ proprietary foil- based diverter technology
Controller and Power Supply	Source controller agnostic
Positioning and Navigation	Flexible Floats: Slots for RGPS pods for every gun position for highly accurate positioning and repeatability
Floatation	Field proven flexible floatation; also compatible with rigid floatation systems
Shipping and Installation	Modular design: delivered in a 40' container for expedient logistics, rigging and de-rigging
Vessel Overboarding Requirements	Deployed from conventional over boarding slipways or conventional rigid floatation systems
Spares	Delivered with full set of spares controlled by Asset Integrity and Business Management System
Compressor Requirements	Refill rates in line with current industry practice and capacity installed in seismic OBN source or streamer vessels