

## Sentinel® streamer: best-in-class signal to noise performance for improved imaging

*Leader in seismic equipment, Sercel has developed a unique technological solution providing the best quality data resulting in the best seismic data image.*

The Sentinel® streamer's superb signal to noise performance is primarily due its high immunity to vibration noise. There are two primary sources of noise that affect conventional streamer performance; these are flow noise and vibration. Flow noise is caused by the turbulent boundary layer flow across the streamer. It is a very small contributor to the noise field and is only significant when the overall streamer noise is very low and occurs in very calm seas. The vibration noise is caused by vibrations that are transmitted into the streamer and converted to pressure waves. These vibrations can come from many sources including the ship, the towing arrangement, tail buoy, external devices, and the motion of the sea. The vibration noise increases very rapidly as sea conditions increase. Fluid or gel filled streamers dissipate the vibration energy through bulge waves within the cable. These waves produce pressure fluctuations which are seen as signals by the hydrophones.

To avoid the coupling of the vibrations in the cable into the hydrophones the Sentinel® streamer uses multiple techniques to isolate the hydrophone from the cable. The individual hydrophone elements are isolated from the hydrophone carrier and the carrier is also isolated from the cable. These methods of decoupling the hydrophone from the cable are very effective at preventing the cable-borne vibrations from being transmitted into the hydrophone and corrupting the seismic signals.

A comparison of vibration immunity between the Sentinel® and gel filled streamers is shown in the figure below. The acceleration input into the cable and the acoustic output due to the acceleration is computed in the transfer function. The Sentinel® has 20dB better isolation from vibration noise in the seismic band which provides improved signal to noise. The Sentinel®'s superior vibration immunity is the principal reason it provides high signal to noise performance in all sea states. This performance allows improved imaging with enlarged bandwidth and more specifically low frequency signal to noise ratio allowing clearer imaging of deep reservoirs.

