# - SOUND-PROOFING -

**Modern ocean-going trawlers are virtually all powered by Diesel engines, which are very reliable and efficient, but also quite noisy.**

**Controlling engine noise is an important part of a safe and comfortable passage. Excessive engine noise is not only annoying, but it can impair communication between crew members, cause headaches, and hinder sleep.**

**Inadequate rest can lead to fatigue and poor decision making at sea. Long-term exposure to excessive noise can damage hearing.**

### ◊How doe sound travel?

Engine noise travels by two primary means. Each requires specific steps to control and contain the noise: airborne noise transmitted directly off the engine casing. And structure-borne noise, induced by vibration from the engine through the hull and bulkheads. As the name implies,

-**airborne noise** travels through the air, and is transmitted most readily through holes or other openings that allow air to pass through. Controlling airborne noise is primarily a function of sealing up any paths that would allow the noise to be conducted into the living spaces in the trawler.

-**Structure-borne noise**, on the other hand, is best isolated at the source by isolating the engine vibration from the hull and other mechanical structures.

Notice that vibration noise can actually become airborne noise when it vibrates a bulkhead or other structure, and the noise of that vibration is then transmitted through the air. Sound insulation is a primary weapon in the battle against noise. It is designed to defeat noise in three ways:

**-by creating a barrier to block noise from escaping the engine room**

**-by absorbing noise from within the engine room**

**-by dampening vibration in the walls and ceiling of the engine room.**

### ◊Selene Engine Room Noise Insulation

The engine rooms of all Selene Trawlers are equipped with a system of *Soundown* insulation designed to achieve all three of the above goals. The sound insulation consists of three layers: the innermost layer, which is visible from within the engine room, is perforated aluminum. It's primary purpose is to protect the inner layers from dirt and damage. It is painted white and provides a clean, bright surface in the engine room. The middle layer is 3 inches of foam insulation. This layer absorbs and dissipates engine noise in the trapped air pockets within the insulation. Finally, the outer layer is a sheet of high-density IMT20 tuff-mass lead barrier. It reflects any noise energy that passes through the foam insulation back into the insulation and engine room.

The cabin bulkhead or floor is installed outside this outer insulation layer, and provides additional sound isolation and vibration damping. The floor, for example, typically consists of 1-3/4" of balsa sandwiched between layers of plywood decking.

### ◊Results

The *Soundown* insulation barrier substantially reduces both airborne and vibration noise. The salon, staterooms, and pilothouse on the Selene Trawlers are all quiet enough to allow normal conversation even under way. This noise control allows crew to sleep, communicate and work more effectively, resulting in a safer and more enjoyable passage.

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