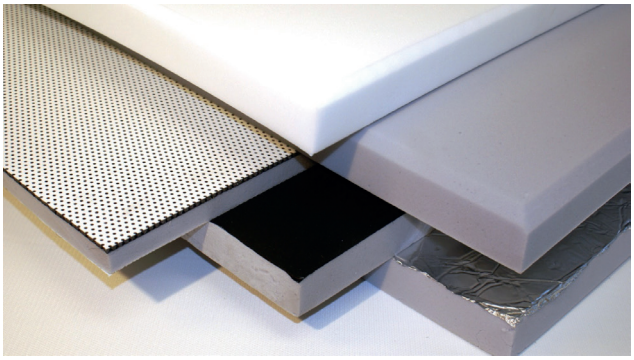
SOUND ABSORPTION

GENERAL INFORMATION:

Sound absorbing materials are used in various areas in order to reduce (absorb) air- borne noise within this area.

The below shown graph indicates the absorption co-efficient versus 1/3 octave frequency band in Hz.



Properties

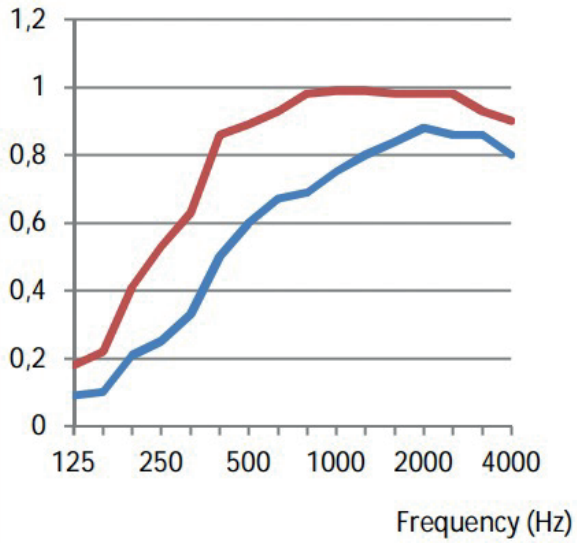
- Sound absorbing
- Heat resistance
- Chemical resistance
- Various finishing's

Fire behaviour

from C-s2,d0 (EN13501-1)

Absorption coefficient (α)

NEN-EN-ISO 354 : 2003



	Type	α_w	Class
	25 mm	0.55	D
	50 mm	0.80	B

Sound absorbing materials are very useful for high frequency noise and not so much for low frequency noise

Common used materials are:
- Open cell foam (no Armaflex)
- Rockwool or Glass wool
- Fire Master or equal

The above-mentioned materials must have an acoustic open finishing. No **closed aluminium foil** as this finishing reflects the noise instead of absorbing the noise.

ENGINE ROOM

Although the main target, related to noise and vibration control, is to "keep the noise inside the engine room as much as possible" we can use a sound absorbing material at the hull sides in combination with a sound isolator such as (SLP-MASS).

This sandwich construction with an acoustic open finishing can be installed behind a perforated plate (perforation 30%).

ACCOMMODATION AREAS

The ship structure (hull | bulkheads | deck) can be insulated using sound absorbing materials with an acoustic open finishing. This will reduce the noise levels inside the space between the structure and the liner (so called cavity or void).

This however for steel or aluminium Yachts means that the structure must be treated with a thermal anti condensation product (SLP-THERM X9) in order to avoid condensation problems.

HVAC

HVAC is an important sound source especially at anchor condition. The average noise level, in accommodation areas, emitted by fan coil and air flow noise is 50 – 55 dB(A) which we prefer to reduce to 30 – 35 dB(A).
To do this we need quiet fans (10 speed DC fans), sound absorbing tubes between FCU and air outlet box and low air flow at air inlet and out let grill (max. 3 m/sec at full speed).
Last but not least we have to install a labyrinth system at the FCU and air outlet box and cover both boxes with sound absorbing open cell foam with and acoustic open finishing. This in order to absorb air flow and fan noise. ARMAFLEX is not recommended as it is **a closed cell foam and does not absorb any noise.**