

# WHAT ARE THE BENEFITS OF NOISE INSULATING ?

Marine diesels create very high noise levels – often well over 100 decibels. Engines are always located close to the boat user, generally in engine spaces made from GRP, timber, or steel. Engine noise is then amplified by bouncing around between the hard bulkheads and the steel of the actual engines. Noise contributes seriously to fatigue and seasickness, as well as spoiling life on board.

Noise insulation changes all this. It adds a soft facing to hard bulkheads to absorb noise and stop it bouncing around and growing. It adds weight to the bulkhead to reduce noise transmission. It features a clever multi-layer construction to make a thin material more effective than simple insulations many times thicker.

If you cocoon the engine with noise insulation you can reduce airborne noise by 85% and transform the comfort for all on board. Remember structure borne noise and exhaust noise are separate subjects, and Halyard can help with both.

## WHAT MAKES A GOOD QUALITY NOISE CONTROL PRODUCT?

Marine diesels are more of a problem than vehicle engines, because a marine engine shares the hull with you. The insulation you use, therefore, has to be much more effective. The key to HMI Noise Insulation lies in its multi-layer construction. Vehicle insulation is usually a fibre padding which absorbs some noise. HMI insulation has three layers in addition to a protective facing – each with important functions:

### ■ The absorption layer.

A thick layer of fire zero rated foam which soaks up noise and stops it bouncing around the engine space.

### ■ The transmission layer.

A high density barrier provides the highest possible mass and gives the best noise reduction. The HMI damping layer weighs 5kgs per square metre – more than the lead sheet used in older materials.

### ■ The isolation layer.

This thin layer of foam has a crucial function: It acts like the gap in double glazing and stops the noise which hits the transmission layer being carried through to the bulkhead – just like the gap in double glazing.

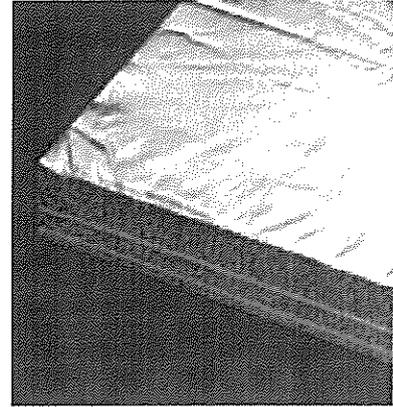
The multi-layer construction used in HMI materials offers the best possible acoustic result in a thicknesses which can be accommodated in the tightest engine space, beating simpler materials many times as thick.

# WHAT THICKNESS SHOULD I USE?

There are three standard thicknesses for each HMI material

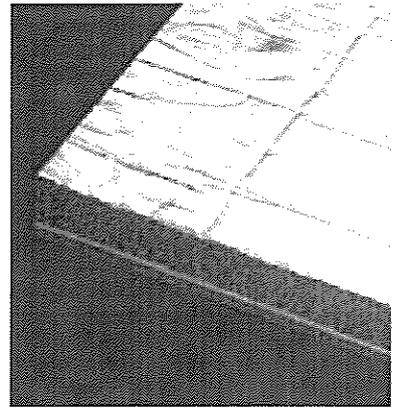
## **45mm (1.75").**

This unique double damper material was invented by Halyard and is designed to give the best possible result for the minimum thickness and weight. It is used where big turbo-charged engines are involved, or for vessels where noise is a particular problem – for instance yachts where the engine is boxed into the saloon.



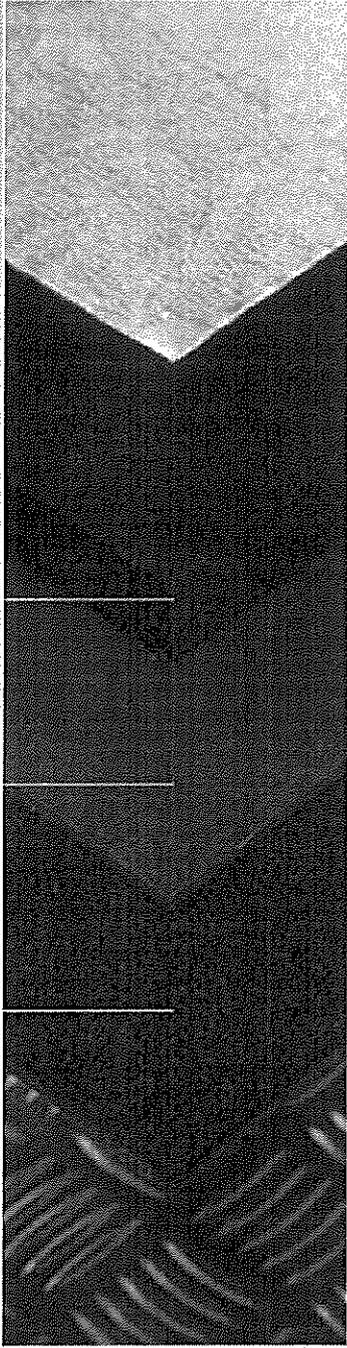
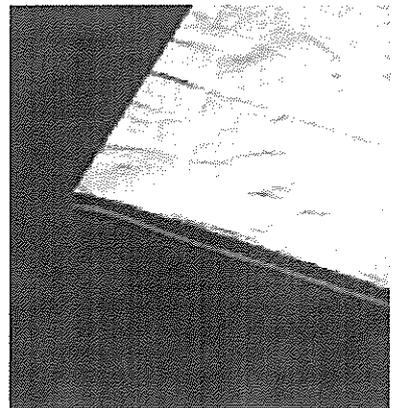
## **32mm (1.25").**

The standard thickness used throughout the industry. Today's fire zero rated foams have increased the weight and made this material even more effective. 32mm is the choice for any installation where the builder wants an excellent result at a sensible cost. Remember, you can always double layer it in critical areas.



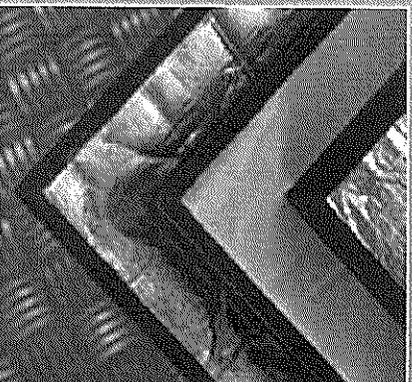
## **12mm (0.5").**

The budget material when thickness or cost are crucial. Although it is only 12mm or half an inch thick, this material is highly effective and will reduce noise by 50% if used properly. You can also double layer it in places.



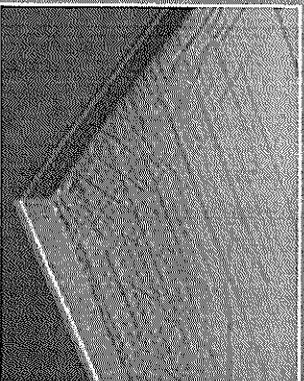
# NEW FACINGS FOR A NEW CENTURY

HMI facings are chosen with different purposes in mind



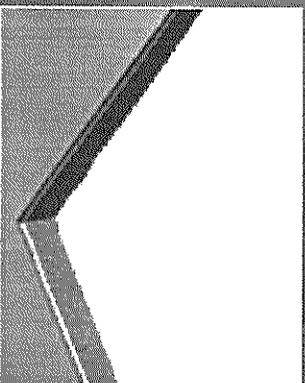
## **Maritex.**

An immensely tough fibreglass cloth with a sealed metallised skin so it cannot absorb oil. It won't tear or fray. It looks heavy duty, and it is fire zero rated. Maritex is simply the best facing in the HMI range. Maritex is fire zero rated to BS 476 parts 6 and 7.



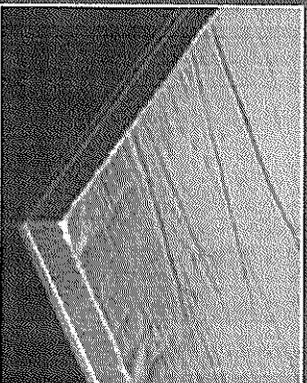
## **Sealglass.**

A tough off-white glass cloth, sealed against oil. The cloth is extremely tough and will not tear. The sealant will burn off in a fire. The material meets the ISO 9094 fire requirements of the EU Recreational Craft Directive.



## **Reinforced silver polyester.**

This facing meets the requirements of the Recreational Craft Directive. It provides a seal to keep oil out. You can pierce it, but it has a re-inforcing layer behind it. It will burn, but once laminated in place it meets the ISO 9094 fire requirements of the EU Recreational Craft Directive. In a fire the facing will burn, but not the foam behind it.



## **SELF ADHESIVE?**

We've never made a self adhesive material, as we couldn't find a self adhesive which would take the weight involved and stay put in the extremes of temperature and damp found in a marine engine space.

Modern adhesives have changed all this, and Halvard will during 2000 launch selected materials with self adhesive backings.

The savings in labour and the avoidance of problems with fumes will be enormous.

Full details will be given in HMI price lists accompanying our literature.

## **WILL HMI MATERIALS BURN?**

The foam will not. Some of the facings will. The noise absorbing foams used in all HMI materials meet BS476 parts 6 and 7, which means you cannot set fire to them with a gas blowtorch. The materials far exceed the EU standard required in the new Recreational Craft Directive, and Test Certificates are held proving this.

All HMI materials meet the ISO 9094 fire standard required by the EU Recreational Craft Directive. Materials with Maritex facings are generally accepted by Lloyds Register of Shipping, and for some purposes by the MCA. Checks should always be made with the individual surveyor.

**HMI**

## HOW DO I FIT IT?

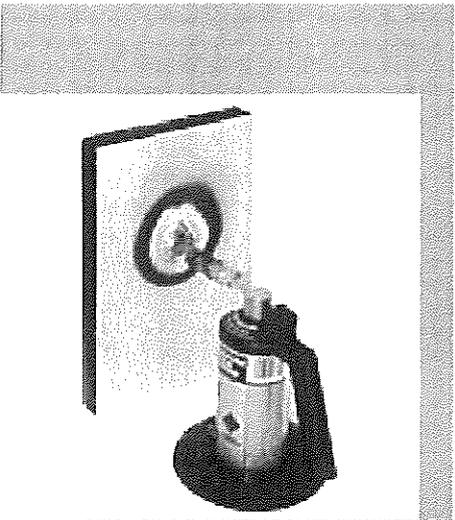
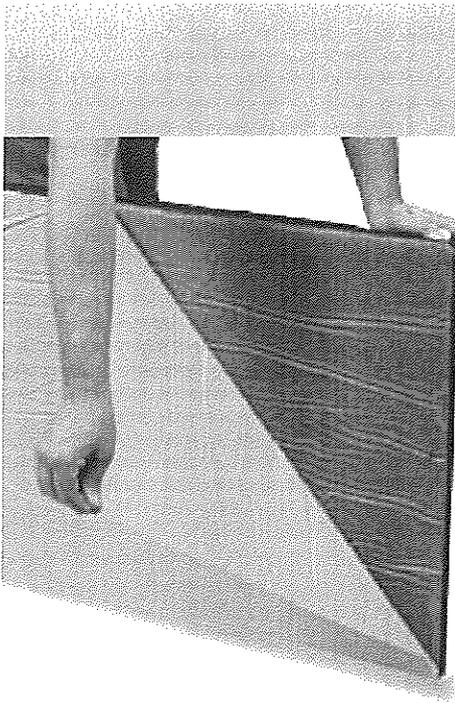
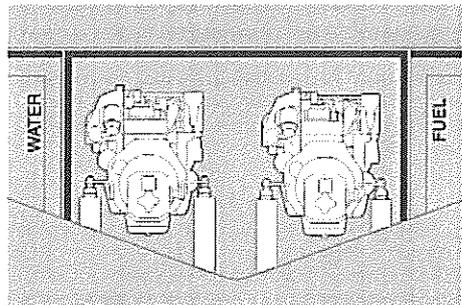
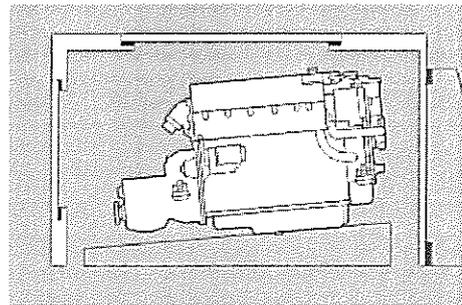
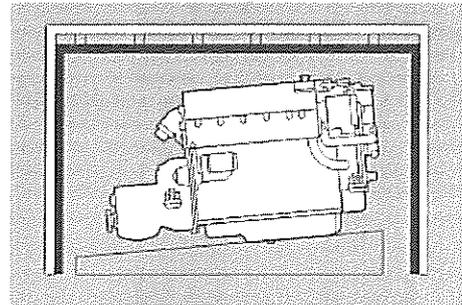
HMI Noise Insulation comes with detailed fitting instructions, but the golden rules are:

Insulation should be used on as much of the total surface of the engine room as possible. Cut around pumps, filters and electrical items, but don't leave large areas of hard surface for noise to bounce off.

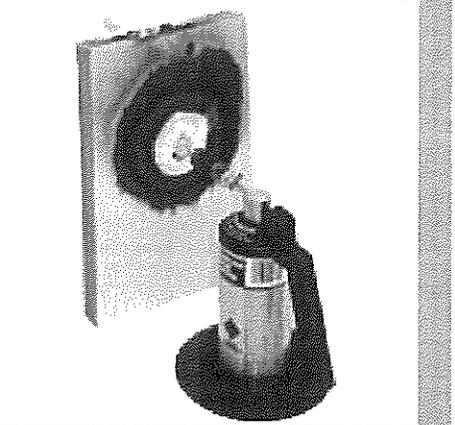
Hatches and steps must fit neatly and should have a noise tight cushion such as our hatch tape.

Bulkheads around the engine should go right down to the hull. Don't leave openings where noise can leak forward – for instance under a cabin floor. Remember that fuel and water tanks absorb and amplify noise. If you can't put a bulkhead in front of them, at least insulate the actual tank.

Use any good contact adhesive such as Dunlop Thix-o-Fix or Evostik. The jelly glues are easier to use than the liquid ones. Glues should be used on dry, clean, grease free surfaces. Occasional screws right through the material, perhaps with large washers under the heads, will supplement the glue bond. In really hot climates you may need special high temperature glues. Remember the engine room temperature will be far higher than the outside temperature. We do not sell glues, because most freight companies will not transport them.



*New HMI materials after 20 minutes*



*Old materials after 20 seconds*

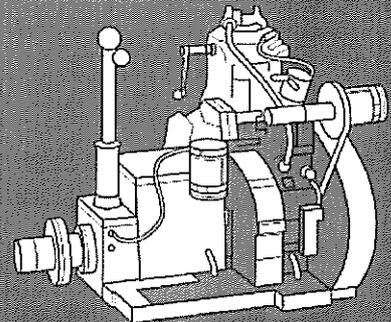
# USING HMI INSULATION

## HOW DID WE TEST IT?

We built a 20mm (3/4") ply engine casing, and tested how much noise came through the bulkheads at all the different frequencies. Then we applied each material in turn to the engine casing, and tested it again. The difference between the two curves shows how much noise was reduced when the material was fitted. The tests were carried out on each thickness. Results vary slightly depending on which facing is used.

## Older engines or steel hulls?

Beware of air-cooled engines. Noise insulation can only be used with care, as it must not impede the flow of cooling air. Beware of solid mounted engines. Most of the noise will be structure borne with a solid mounted engine. The same applies with a steel hull. The Aquadrive anti-vibration system can reduce noise by 75% with such installations.



## 12mm (1/2") Materials

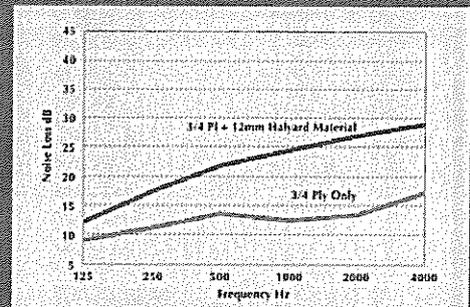
All are supplied with 4 sheets 1000 x 600mm (39" x 24") per box.

S3002 Maritex faced material.

S3004 Sealglass faced material.

S3003 Re-inforced silver polyester faced material

These material offers around 12dB reduction at 1000Hz and above, but its efficiency reduces with the heavier noises of lower frequencies. The overall reduction will give excellent results with smaller, lighter engines.



## 32mm (1.25") Materials.

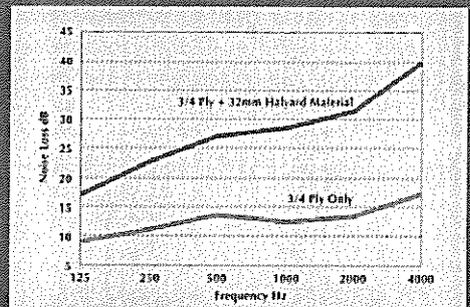
All are supplied with 4 sheets 1000mm x 600mm (39" x 24") per box

S3017 Maritex faced material

S3015 Sealglass faced material

S3016 Re-inforced silver polyester face material

The 32mm materials offer a startling 15dB reduction at 1000Hz. Noise doubles every three decibels, so this is nearly three times as good as the 12mm. It also holds a good performance at lower frequencies, making it excellent with larger engines.



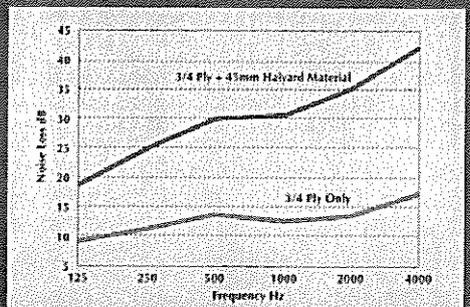
## 45mm (1.75") Materials

All are supplied with 2 sheets 1000mm x 600mm (39" x 24") per box

S3039 Maritex faced material.

S3037 Sealglass faced material

S3038 Re-inforced silver polyester faced material.



## I'M CONFUSED. HELP ME TO CHOOSE!

### Certainly. Here are three straightforward recommendations:

**Budget.** S3004 12mm material with Sealglass face. This material meets current EU requirements for pleasure craft. It works well. It doesn't weigh very much, and it is at the lower end of the cost scale.

**Quality.** S3017 32mm Maritex material. Really startling noise results with a tough, fireproof facing at a mid-range price.

**Excellence.** S3039 45mm Maritex material. The best results possible from any off-the-shelf material.

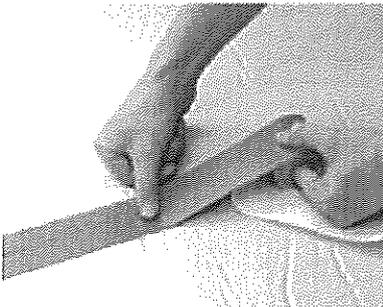
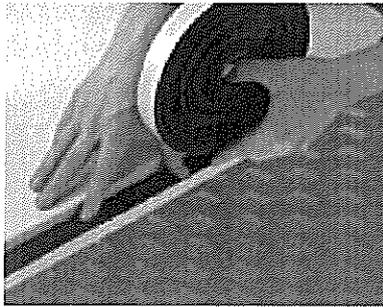
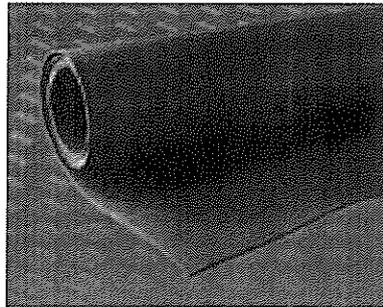
### Notes

Halyard is the only company to have tested materials in situations designed to replicate marine engine spaces, and to offer guaranteed results on this basis. The copyright of these test results remains our property and may not be reproduced without our written permission. Results are given in dB at each frequency. Averaged decibels dB(a) have not been used, as these disguise performance at difficult frequencies.

### Classification Societies and Approvals

Rules set by Lloyds, DNV and the MCA vary from time to time and from one use to another. Users should contact their surveyor or us for precise guidance, particularly where MCA rules are involved.

### Damper layer



## ACCESSORIES

This heavy damper layer is the same as the one used in the middle of each material. It can be used beneath carpets and as a centre core to double thickness bulkheads – or on the bulkhead before the noise insulation is applied.

### Hatch tape

Results can be spoilt by a poorly fitting hatch, or a panel which rests straight on a timber frame. As with a car door, a sealing strip should be applied as a cushion, and HMI Hatch Tape is designed for this purpose. Made from self-adhesive neoprene foam for maximum oil resistance, and available 19mm (3/4") or 25mm (1") widths.

### Joining tapes

Joining tapes are available for use with each face. Tapes can be difficult in damp machinery spaces with high temperature variations. Full details in price list.