Interiors

by **INEXA**

Craftsmen to the world's finest ships

TNF

High Noise Reduction

The QUIET around TNF accomodation systems is a reason for installing them.

Many ship and rig owners specify TNF low noise products to improve their work and leisure environments, which will also be comfortably ahead of the authorities' noise level regulations.

There are three vital parameters, which determine the noise reduction you can achieve:

- **Ship layout.**
- **Application of low noise sources.**
- **Design of low noise cabins.**

High noise reduction is where the Inexa TNF products excel. When correctly installed, they provide maximum quiet and comfort by reducing unwanted structural and airborne noises. The product range and construction developed for TNF low noise cabins fall into four main categories.

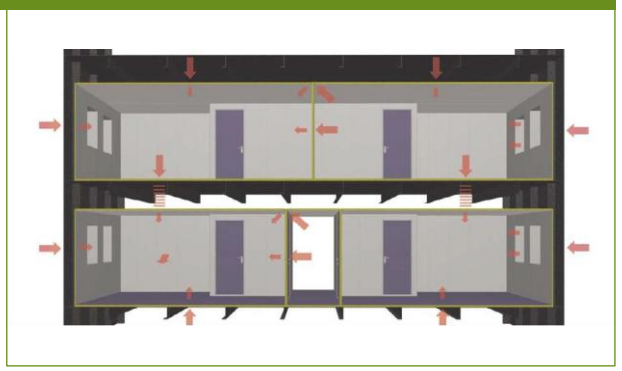
The TNF formula for low noise cabins includes:

- **Bulkhead systems with high noise reduction.**
- **Ceiling systems, self-supporting and fully insulated.**
- **Floating floor construction.**
- **Window box of insulated, telescopic construction.**

Appearance is another good reason

The TNF accommodation system finishes have been as carefully developed and tested for durability and appearance as they have for their insulating and fire-proofing properties.

TNF ship interiors designed to provide complete low noise accommodations on ships and offshore platforms.



The average figures (field values) achieved with TNF standard high noise reduction products and constructions are:

- **40-42 dB noise reduction between cabins.**
- **10 dBA reduction of structural noise.**

These values cause a considerable improvement on conventional cabin standards.

For higher noise reduction values, special TNF products and designs will be used.

Most modern ships and offshore platforms are constructed to low background noise specifications.

Low background noise increases the need for an accommodation installation with high noise reduction values. In a TNF ship interior with low noise cabins, a noise level of 80 dB in one cabin will be reduced to 35-40 dB in adjacent cabins.

The diagram illustrates the difference in noise transmission using interior

TNF low noise cabins prevent a normal conversation from being overheard in adjacent cabins.

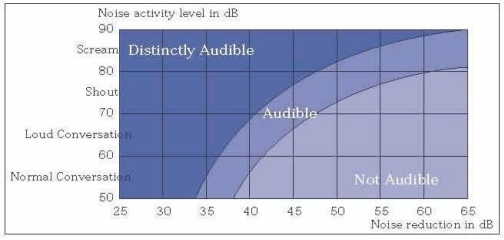
The difference between 30 dB and 40 dB noise reduction is significant.

Audibility

The audibility of different noise activity levels at given sound insulation values with low background noise.

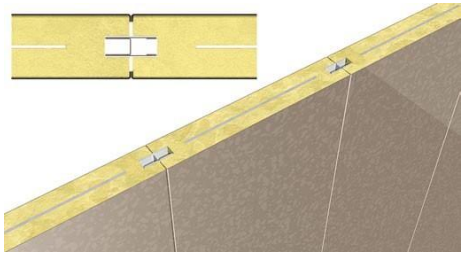
Don't let noise get to you!

Higher background noise values will cause the audibility curves to move to the left.

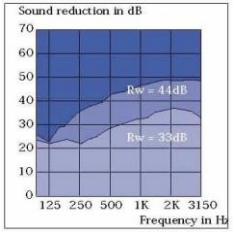


High noise reduction bulkhead system

The high noise reduction bulkhead panel TNF 2SM has a good noise reduction value – only 50 mm thick, yet giving a lab value of Rw=44 dB. This B15 class TNF 2SM panel has exactly the same dimensions and appearance as a standard panel, but provides real privacy due to its superior insulating properties.

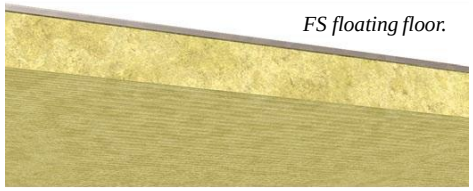


Type 2SM wall panel construction.



Floating floor units

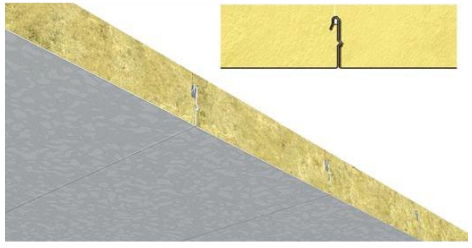
The TNF FS floating floor units have a steel surface and an underlay of specially developed insulation material. The floating floor unit provides extremely effective noise reduction and structural noise damping, which contributes to the overall quiet of any environment.



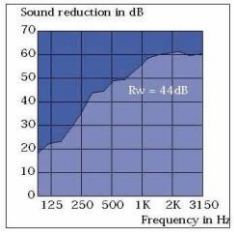
FS floating floor.

Fully insulated self-supporting ceiling system

With a free span up to 3000 mm, the TNF B class ceilings are the lids on the TNF quiet cabins. The TNF ceilings have a noise reduction of Rw=44 dB (lab value). In combination with TNF 2SM bulkhead panels, a field value of 40-42 dB noise reductions can easily be achieved between cabins and between cabins and corridor. Used in conjunction with a steel deck, the vertical noise reduction will be Rw=60 dB (lab value).

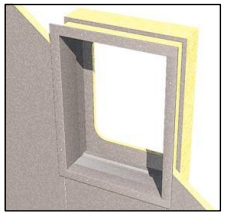


TNF C55 ceiling construction.



Window boxes

A two part telescopic construction, the window outer part is fastened to the hull and the inner part to the TNF bulkhead panels. This prevents the transfer of structural noise and vibration to the cabin. Thermal insulation of the window box has to take place during installation.



Window Box construction.

Correct installation of TNF products is important
- they are tailor made for quiet assurance in the future!

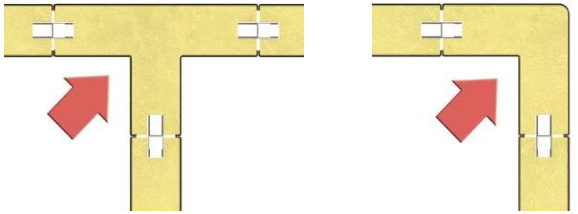
Reduction of airborne sound

The inherently high noise reduction values of the prefabricated TNF panel system are maintained after installation, as interior designs are tailored to ensure the best results in any type of project. The product and installation details shown are examples from TNF technical literature.

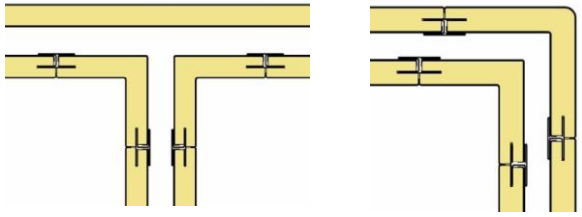
Corner and T-joints

Prefabrication minimizes noise penetration at the joints and noise transmission through the steel surface of the panels.

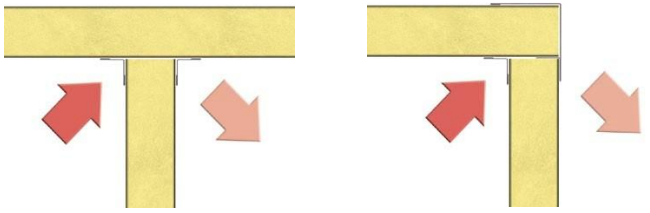
QUIET
Panel construction.



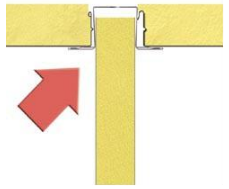
QUIET
Panel construction.



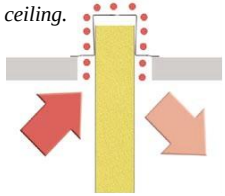
STANDARD joints.



QUIET ceiling.
Ceiling construction - resting the ceiling panels on the profile flange, close to the wall panel, reduces sound transmission between cabins.

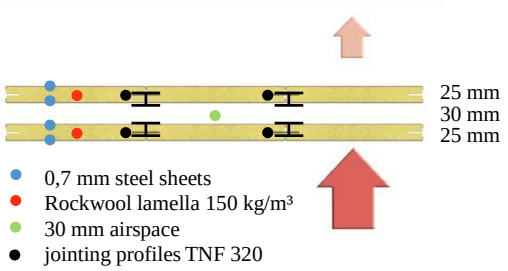


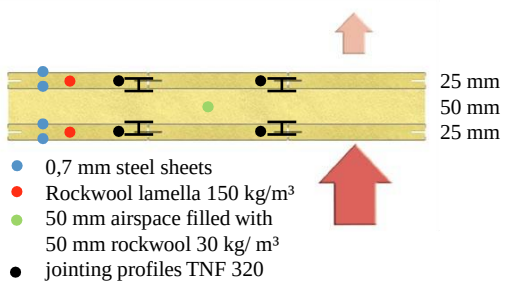
STANDARD ceiling.



Double wall constructions

dB neg. Deviation at	Hz	
R_w=43 dB	Sum of neg. Deviation 31 dB	M_a= -9 dB
8 dB neg. Deviation at	**Hz**	
Lab l_a=43 dB	Sum of neg. Deviation 31 dB	- R= 41 dB
dB neg. Deviation at	**Hz**	
R_w=54 dB	Sum of neg. Deviation 28 dB	M_a= 2 dB
8 dB neg. Deviation at	**Hz**	
Lab l_a=54 dB	Sum of neg. Deviation 28 dB	- R= 50 dB





We will optimize the design of the double wall to the weight restrictions and sound reduction requirements. The optimization will include, among others, the following parameters; steel thickness, rockwool density, perforation of insides, distance between the walls and rockwool between the walls.

VLD Velocity Level Difference

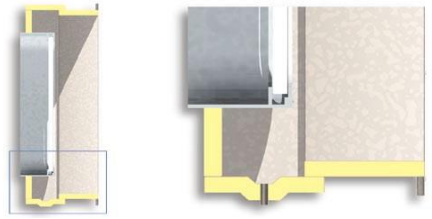
Reduction of structural sound

No hangers provide high Velocity Level Difference (VLD). Transfer of noise from ship side or steel bulkhead to the wall panels can be minimized by resting the top channels on the panels.

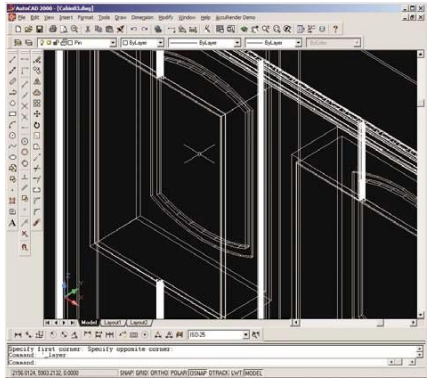
Self supporting ceiling provides high VLD.

Floating floor provides high VLD.

Telescopic window box provides high VLD.



Our technical services department can assist architects and engineers by creating design proposals of their actual projects, using a 3D CAD system. The drawings serve as a basis for the contractor to ensure correct installation.



TNF is the complete high quality accommodation system for all marine interiors. The TNF system includes wall and ceiling panels, doors, floors, wetunits and prefabricated cabins. TNF has been leading the development in marine interiors since 1973. The world famous TNF quality is demonstrated in the environment, which can be designed to provide the ideal conditions for all functions.

TNF

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www.inexa-tnf.com

info@inexa-tnf.com