QUIETSTONE
Innovative Acoustics

Quietstone FR30

Fire safety / sound absorption panels

Durable sound absorbers with high fire safety.

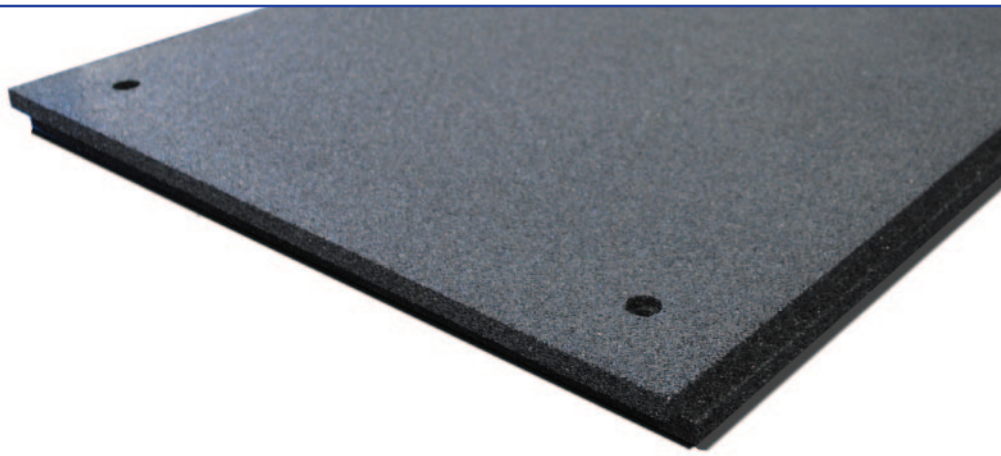
The new Quietstone FR30 panels are a world's first product combining high sound absorption, durability and heat resistance. These panels can be used in external settings and are particularly suited to controlling transport noise, even passing the stringent requirements of European tunnel lining safety. The testing for which required high impact resistance, moisture and frost resistance and a fire test which exposed the panels to 1150°C for 2 hours. Add to this high sound absorption, up to α_s, 1.12 at 100Hz and the advantages are clear.

Panels are typically mounted on a steel framework which leaves a space for all services in a tunnel and improves acoustic performance. Panels are pigmented in a range from an off-white through to black for aestheticly pleasing designs.

Key features:

- High sound absorption even at low frequencies
- High fire resistance - replaces fire safety panels
- High impact strength
- Frost and moisture resistance
- Long lifespan
- Available in a range of colours
- Passes current European tunnel lining standards
- Purpose designed mounting system available

Technical properties



Physical properties

Width	600mm
Length	1000mm
Thickness	30mm
includes interlocking lips for added strength and heat insulation	
Weight	37.5kg/m²,
Weight	1,250kg/m³
Flexural strength	1.6 MPa
Compressive strength	3 MPa

Fire resistance

Tested by Efectis Nederland BV for tunnel fire safety. The test involves exposure of a full wall construction to 1150°C for 2 hours and panels must not disintegrate or exceed .... °C in the rear cavity

Impact resistance

EN 1794-1 'Road traffic noise reducing devices - non acoustic performance - impact of stone': "Elements appear to show no visual damage."

Freeze / thaw resistance

EN 1338 - Class 0

Colours (Colours may vary from those depicted)

1	2	3	4	5	6	7	8

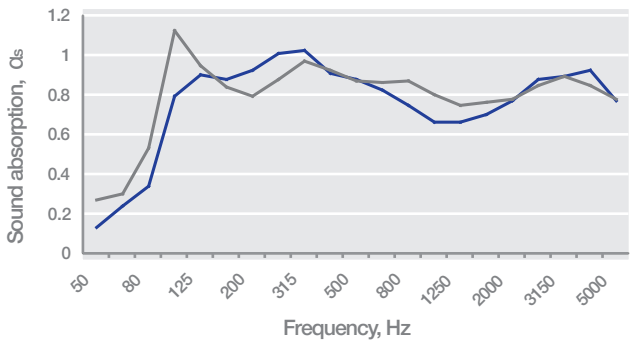
Acoustic performance

Tested in accordance with BS EN ISO 354: 2003 at TNO, Holland with typical tunnel lining construction.

Mounting parameters:

Test 1 - 190mm total buildup; 30mm panel, 90mm air gap, 70mm Rockwool.

Test 2 - 190mm total buildup; 30mm panel, 30mm Rockwool, 60mm air gap, 70mm Rockwool.



	125Hz	250Hz	500Hz	1kHz	2kHz	4kHz	EN-ISO11654 α_w	EN1793-1 DL_α	RMR2006 $DL_{\alpha,rail}$
Test 1	0,85	1,00	0,85	0,70	0,80	0,85	0,80(L); class B	7dB(A); cat A2	7dB(A)
Test 2	0,95	0,90	0,90	0,80	0,80	0,85	0,85(L); class B	8dB(A); cat A3	8dB(A)

Project:

A4 Burgerveen Tunnel, Holland

Material:

Quietstone FR30

A world's first solution, offering fire protection and sound absorption

Client: BAM Rubedel in conjunction with Van Campen Aluminium
Material supplied: 30,000m2 for the walls and 17,000m2 for the ceiling between May 2011 and 2013

47,000m² of Quietstone FR30 are now being installed on the walls and ceiling of the new A4 Burgerveen tunnel on the main road between Amsterdam and Rotterdam. The panels will be in a gradient from white through to black in 10 shades. The treatment provides high broadband absorption to control noise break out through the slotted roof which could affect local residents. Also, the high heat resistance provides protection for the tunnel services behind the panels, alleviating the need for extra fire protection panels.

FR30L

For the ceiling, a panel has been designed which is 22.5Kg/m2 rather than 37.5Kg/m2 to reduce fixing costs. This also has the same high performance as the wall tiles.

The tunnel

This is one of two sides of the new tunnel. Each has four lanes. Our system has been designed in partnership with Van Campen Aluminium, who make the framing, for the end client; BAM Rubedel.

A simple frame is fixed to the wall including C - sections at 1000mm centres.

Mineral fibre is inserted in the cavity to increase sound absorption and heat insulation before the panels are fixed.

Installation

- Steel frame work
- Cavity for services
- Mineral fibre in cavity
- Panels Fixed mechanically
- Holes 'plugged' with the same material
- Several different size panels used to accommodate services
- Details have been designed to fit around all services in a typical tunnel including extra panel sizes

Made in The United Kingdom

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