

Smooth Strand TDS

NATURAL WALLS AND CEILINGS

www.anutone.com/strand.htm



HISTORY OF WOODWOOL BOARDS

Woodwool boards were accidentally discovered when in the making of loghouses on snow-covered slopes in northern Europe the wood shaving were proving to be a nuisance. Somebody thought of dumping the wood shaving in a wooden box which had some cement residue. Thus was formed the first woodwool board!

Wood wool boards made with wood fibres, gypsum and water were first patented in Germany in 1880. Later they were patented with magnesite cement at the Vienna Patent Office in Austria in 1908 by Robert Scherer. Thus magnesite bonded woodwool boards, equivalent to Strand by Anutone, have been around for 100 years.

Earlier magnesium oxychloride cement was discovered by Sorrel and hence also known as Sorrel cement. This air-curing, sound-absorbing, fire-retardant cement was preferred over gypsum because of its functional performance and durability.

In the 1920s grey cement was also successfully used to make woodwool boards. Initially the boards were used more for thermal insulation than acoustics. Soon it became a revolutionary building product so versatile and economical that rapidly spread to all parts of the globe.

Woodwool boards being timeless continue to be a popular building material worldwide despite many newer

materials attempting to substitute it. The unique combination of raw materials and the low-energy manufacturing process have propelled the product forward in the current green building movement. Architects appreciate the natural finish and the design options for modern interiors.


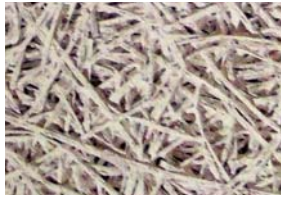


Anutone has been one of the pioneers of woodwool boards bringing the product to South Asia in 1966 with Austrian technology. Earlier known as Natural SoundSmooth or NSS, it then was shortened to Smooth and today as Anutone enters new markets and has an array of wall and ceiling products it has become necessary to rechristen this popular product as 'Strand'.

Application

Wood wool boards find widespread usage as a false ceiling and wall panelling materials in interiors of cinema theatres, concert halls, multipurpose auditoria, community centres, indoor stadia, studios, conference rooms, industries, educational institutions, worship places, swimming pools for sound absorption.








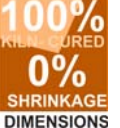




They are also extensively used in roof and wall structures for thermal insulation in all types of buildings. The usage of wood wool boards is more popular in the developed countries of Europe and North America.

STRAND VARIANTS

| Brand | Strand Plus | Strand | Strand SS | Strandec |
|--------------------|---|---|--|---|
| |  |  |  |  |
| Fibre | Superfine | Fine | Medium | Wide |
| Matrix | Duolay | Duolay | | |
| Cement | Magnesite | Magnesite | Magnesite | Grey |
| Application | Interiors | Interiors | Interiors | Exteriors |
| Function | Acoustics | Acoustics | Acoustics | Thermal |
| Install | Premium | Performance | Budget | Structural |
| Compliant | Euro | Euro | BIS | Euro |
| Density | 400 | 400, 600, 800 | 400 | 500 |
| Thickness | 25, 38, 50 | 10, 15, 20, 25, 38, 50 | 15, 20, 25 | 25, 38, 50 |
| Dimensions | 600x1200/2400 | 600x1200/2400 | 600x1200 | 600x1200/2400 |

Strand's 20 fabulous features

Strand Plus, Strand and Strandec conform to Euro norms - EN 13168 2001

| | | | |
|--|--|--|---|
|  <p>10K PPM PINE OIL</p> | <p>PINWOOD OIL CONTENT Pure seasoned pinewood of optimum moisture Very high pine oil content of 10,000 ppm For strength, durability, anti-termite properties Own fibre making to IS 1707 standards Not outsourced - controlled quality</p> |  <p>SIX SUPER STRONG TESTS</p> | <p>STRENGTH Tensile - EN 1607; Compressive - EN 826; Bending - EN 12089; Load, Impact, Dynamic Stiffness For lifelong sag resistance and worry-free fastener-fixing</p> |
|  <p>0.6 mm SUPER FINE</p> | <p>WOODWOOL - VERSATILE FIBRE RANGE 0.6 to 3.0mm from superfine to wide fibres More fibres per unit volume For superior acoustics and strength Unique sieving & moisture control process for intelligent fibre management</p> |  <p>FIRE 5 TESTS REACTION</p> | <p>REACTION TO FIRE Flaming - ISO 1182 Ignitability - BS 476 Part 5 Fire propagation - BS 476 Part 6 Surface spread - BS 476 Part 7 Smoke density - ASTM E662</p> |
|  <p>900 DEGREES 85 GRADE BINDER</p> | <p>CEMENT - 85 GRADE 85 grade purity magnesite Calcined to 900° C in oil-fired kilns From designated magnesite mines For consistent whiteness, strength & durability</p> |  <p>CLIMATE RH 95 CONTROL</p> | <p>WEATHERING RH95 resistance; Weathering effects tested in own Climate Chambers No change in dimensions or strength on sustained weathering Weathering cycle as per IS 9307</p> |
|  <p>200 POWDER</p> | <p>CEMENT - 200 MESH 200 mesh fine powder to IS 657 standards For uniform blending and individual fibre coating Own pulverising - not outsourced Controlled quality - no contamination</p> |  <p>100Hz-5KHz 1/3 OCTAVE ACOUSTICS</p> | <p>ACOUSTICS Test data in 1/3 octave bands from 100Hz to 5kHz Various mountings as per real-world sites Widest frequency range & response for new-age loudspeaker systems Project-specific testing by in-house engineers</p> |
|  <p>PURE SALT 5 FILTRATION</p> | <p>SALT FILTRATION Unique presoak, soak & drain process Decantation & netting procedures Soaking & draining to electronic timer control For high purity salt solution per IS 2730 standards - no contamination</p> |  <p>PRODUCT 10 YEARS WARRANTY</p> | <p>LIFETIME WARRANTY Strand panels installed to specifications is warranted against manufacturing defects for product life cycle of 10 years! <i>(conditions apply)</i></p> |
|  <p>NO ADVERSE 3.5% SALT CONTENT EFFECTS</p> | <p>SALT CONTENT ≤3.5% content as per EN 13168 2001 Ensures no adverse effects on building structures during product lifetime</p> |  <p>QUALITY 100% INSPECTION ISO 9001 CONTROL</p> | <p>QUALITY 100% panels inspected individually Labelled for identification & traceability TPM & TQM process-based manufacturing from an ISO 9001 2008 certified company for error-free, worry-free top-notch quality</p> |
|  <p>DUAL LAYER</p> | <p>DUOLAY MATRIX Research-engineered unique technology Strand Plus and Strand ≥20mm thick Wide fibre base for strength and economy Fine fibre surface for aesthetics & acoustics</p> |  <p>ISO 14001:2004 CERTIFIED</p> | <p>ENVIRONMENT SENSITIVITY Environmental-friendly initiatives from an ISO 14001 2004 certified company Company - green processes & practices Product Low VoC, Recycled content, Recyclable</p> |
|  <p>STABLE 100% KILN-CURED 0% SHRINKAGE DIMENSIONS</p> | <p>DEMOULDED PANELS - KILN-CURED 100% kiln-cured in continuous dryer to optimum moisture content; fully cured prior to trimming Zero-shrinkage on panel installation Dimensional stability - no gaps, no warping</p> |  <p>TOTAL SOUNDLAB</p> | <p>SOUNDLAB In-house Reverberation Chamber with own Bruel & Kjaer instruments; all as per ISO 354 For comprehensive acoustic calibration Unique ability to bridge the gap between panel & acoustic technologies</p> |
|  <p>MACHINE-CUT & PLANED ACCURACY</p> | <p>MACHINE-CUT & PLANED Machine cut & planed for consistent accuracy to +0,-1mm tolerances for L x W x T Best tolerance classes to EN 822 - 825 standards For perfect alignment during installation</p> |  <p>DESIGN TECH TEAM SUPPORT</p> | <p>TECHNICAL DESIGN Free product-based acoustical design with CAD support for installation* - ultimate acoustical performance guaranteed to current international standards *Conditions apply</p> |
|  <p>STABLE 15% MOISTURE CONTENT DENSITY</p> | <p>DENSITY Stable and consistent @ 15% moisture content Optimal panel equilibrium at unstable sites More moisture content means less fibre-cement. Less means brittle panel Conforms to ± 10% per EN 1602 standards</p> |  <p>GLOBAL TRACK RECORD</p> | <p>TRACK RECORD Landmark projects across sectors, segments, regions, countries Creative company - stays ahead with state-of-the-art technologies in entire value-chain International outlook - imports & exports</p> |

EURO NORMS

Acoustical panels installed at world-class venues with the state-of-the-art audio video equipment must conform to global standards. The latest standard for wood wool boards is **EN 13168-2001**. Here is how Strand panels conform to Euro norms for most parameters in the best class.

| Parameter | Standard | Class | Tolerances |
|------------|----------|-----------|---|
| Length | EN 822 | Class Lt3 | ± 1mm for lengths < 1250mm ± 2mm for lengths > 1250mm |
| Width | | Class W2 | ± 1mm |
| Thickness | EN 823 | Class D2 | ± 1mm for thickness < 100mm |
| Squareness | EN 824 | Class Q3 | ≤ 2mm |
| Flatness | EN 825 | | ≤ 3mm for suspended ceiling ≤ 6mm for faced products |
| Density | EN 1602 | | ± 10 per cent |
| Moisture | AS* | | ~ 15 per cent |
| Shrinkage | AS* | | ~ 0.1% |
| Weathering | AS* | | < 1mm change in dimensions, < 5 per cent change in density, no delamination |

To achieve such superior tolerances, innovative methodology, checks and balances, continuous monitoring are employed throughout the manufacturing cycle.

Acoustical Ratings

- Sound Absorption - Sound absorption coefficient as per ISO 354 equivalent to ASTM C423
- Sound Insulation - As per ISO 140-III 1995 and rating as per ISO 717-I

Please see pages 6 to 9.

Fire Ratings

Non-combustibility as per ISO 1182 - At 750 °C

- Sustained Flaming - 55 seconds
- Mass loss - 53 per cent

Ignitability Classification as per BS 476 Parts 5 – 'P' Not Easily Ignitable

Fire Propagation Index as per BS 476 Part 6 – 5.17

Surface Spread of Flame Classification as per BS 476 Part 7 – Class 1

Specific Optical Density of Smoke as per ASTM E662

- Non-Flaming Exposure - 11.82 D_m (Corr)
- Flaming Exposure - 26.28 D_m (Corr)

EAP conforms to Fire Class

as per ASTM E1264 – Class A

- Flame Spread Rating – 25
- Smoke Developed Rating - 50

as per Euro WI 127065 - Class A

Thermal Resistance

For > 10mm thickness upto 600 kg/m³ density - 0.09W/(m-K) as per EN 8302

Water Vapour Diffusion Resistance

μ 5 as per EN 12086

Tensile Strength Perpendicular to Faces

Class T3 - 90 kPa as per EN 1607

Compressive Stress / Strength

Class C6 - 2350 kPa as per EN 826

Bending strength

Minimum class B1 (all values > in kPa for nominal thickness in mm) as per EN 12089

| | | | | | | |
|------|------|-----|-----|-----|-----|-----|
| 15 | 25 | 35 | 50 | 75 | 100 | mm |
| 1700 | 1000 | 700 | 500 | 400 | 300 | kPa |

Dynamic stiffness

> 8000 MN/m³ as per EN 29052-1

Load resistance

For HD and VHD series of nominal thickness > 50mm capable of supporting 2.2 kN

Impact resistance

For HD and VHD series of nominal thickness > 50mm

Capable of withstanding 45 kg mass dropped from 1200 mm height and afterwards of a static load 1.32 kN.

Deformation under point load

Maximum 2mm under short-term point load of 1 kN

Salt Content

Class CI 1 - 3.5% as per Annex C2 EN 13168

Product Classification as per ASTM E1264 – Standard Classification for Acoustical Ceiling Products

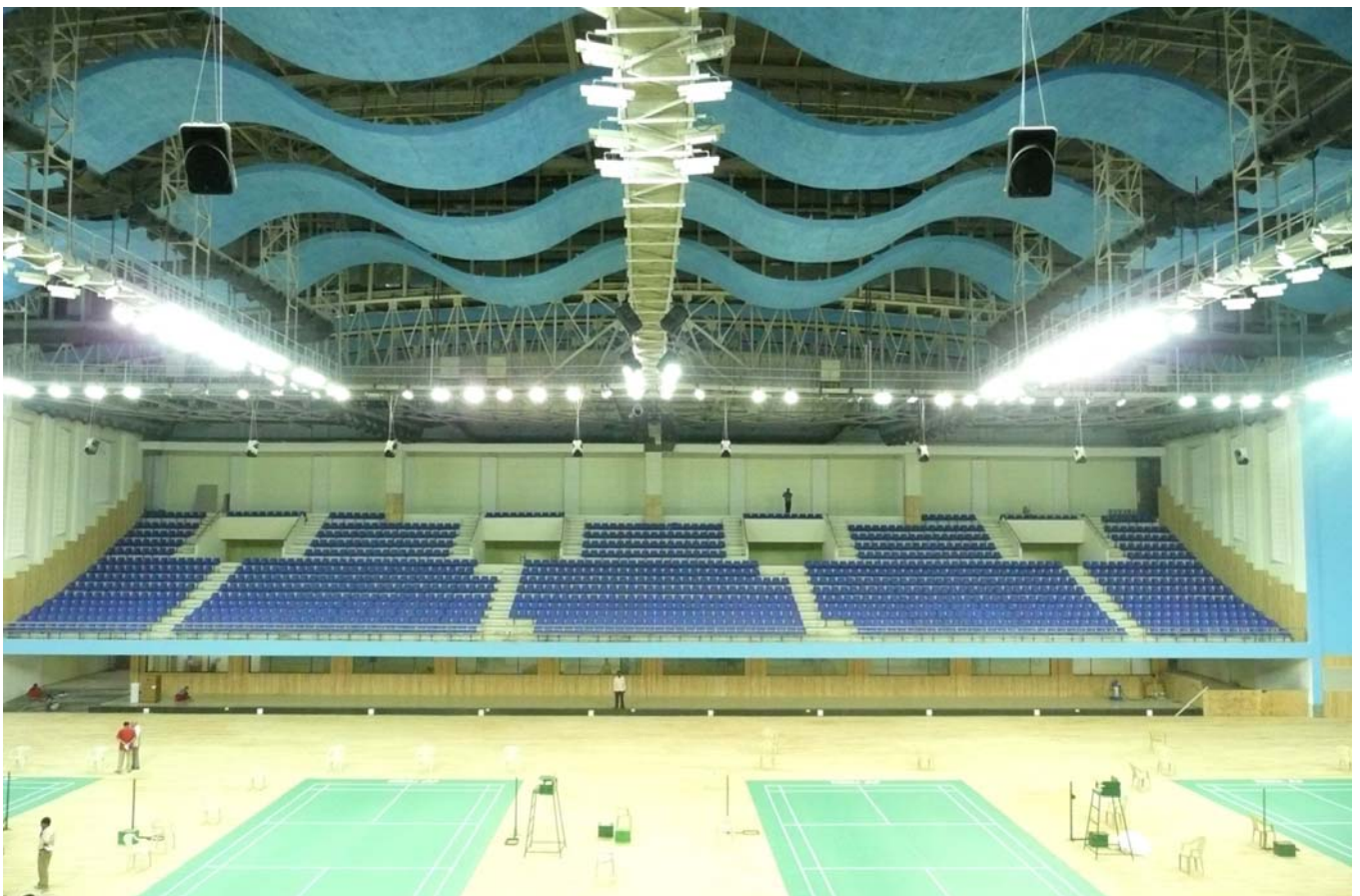
Class XIV – Wood Wool bonded with inorganic binders

- Form 1 – No backing
- Form 2 – Backed with SMF

Ceiling pattern – L – random swirl

Technical excellence of Strand panels is validated by comprehensive testing at national accredited laboratories for key properties like sound absorption, sound isolation and fire resistance.

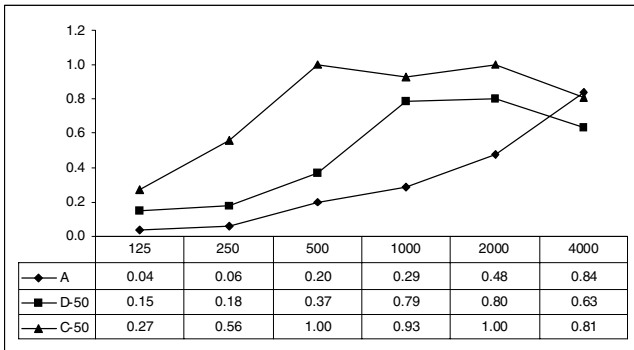
*Anutone standards



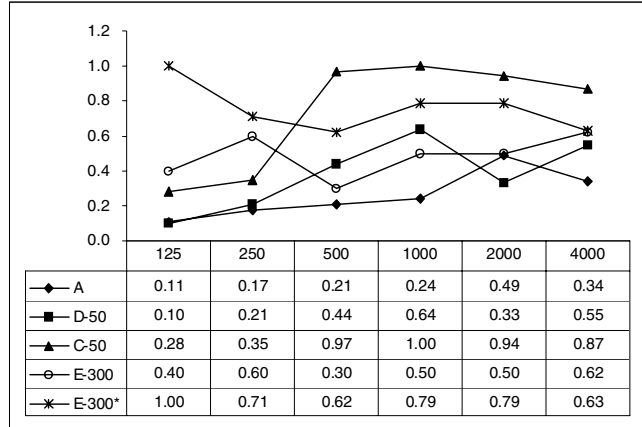
ACOUSTICAL PERFORMANCE

MEASUREMENT OF SOUND ABSORPTION COEFFICIENT BY REVERBERATION ROOM METHOD AS PER IS:8225-1987 EQUIVALENT TO ISO:354-1985 AND ASTM:C423-99

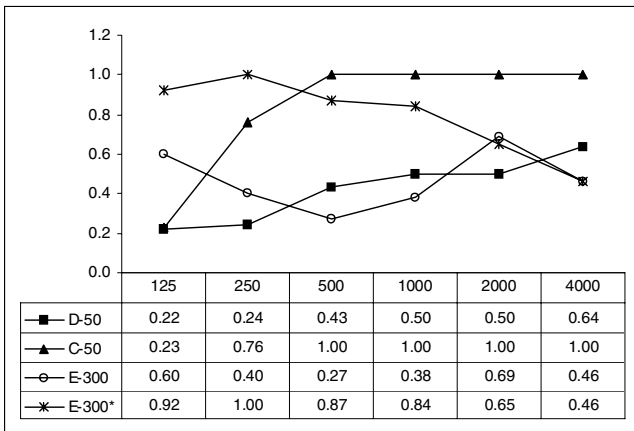
Strand - 15 mm thick



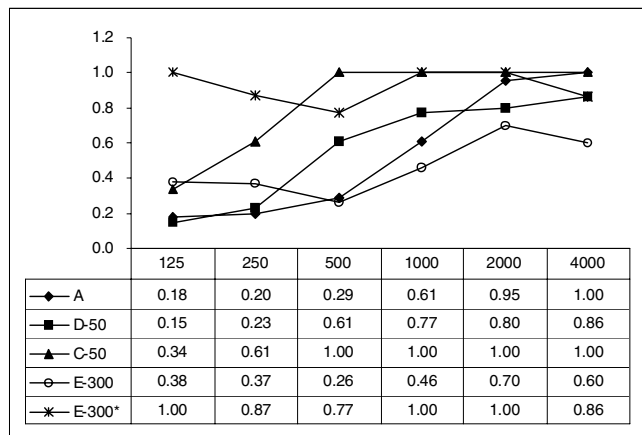
Strand - 25 mm thick



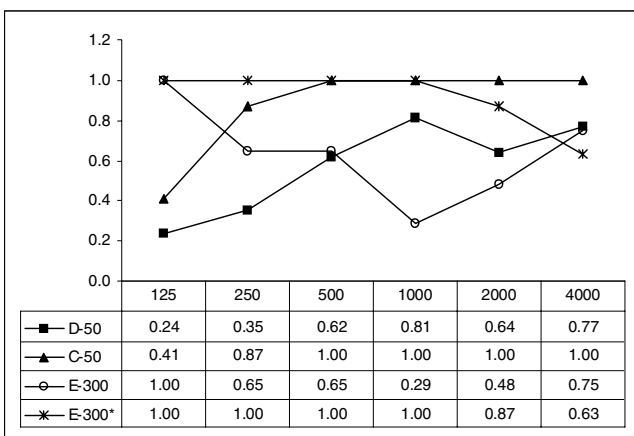
Strand Trax - 20mm thick



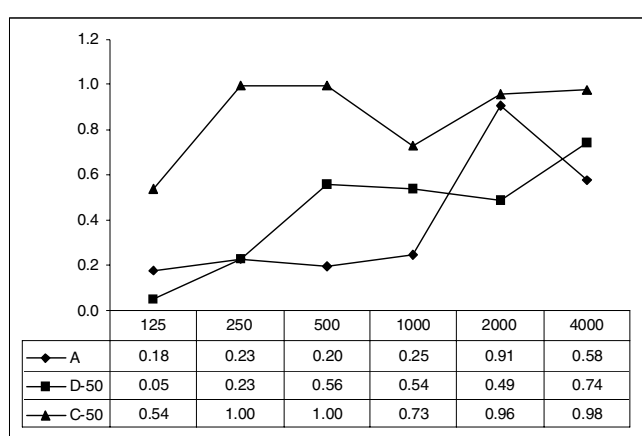
Strand - 50 mm thick



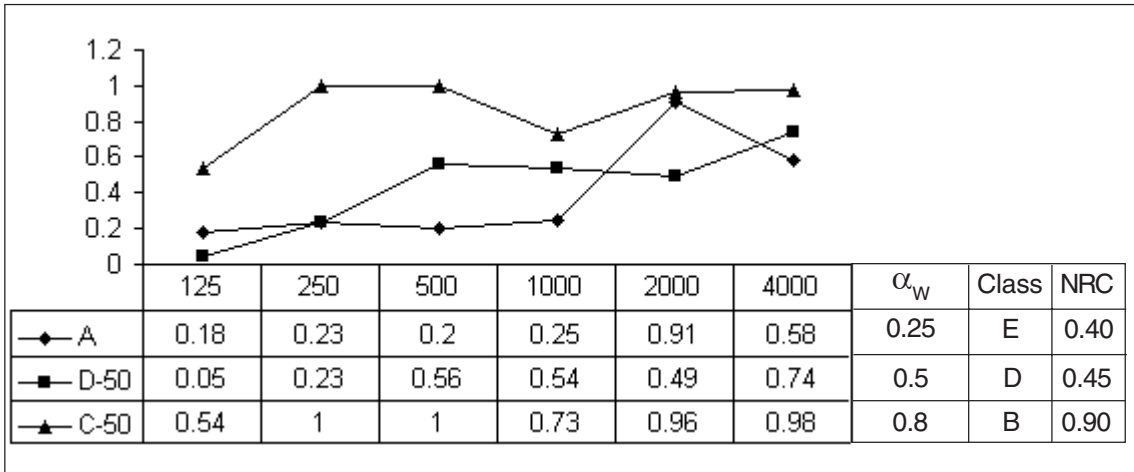
Strand - 40mm thick



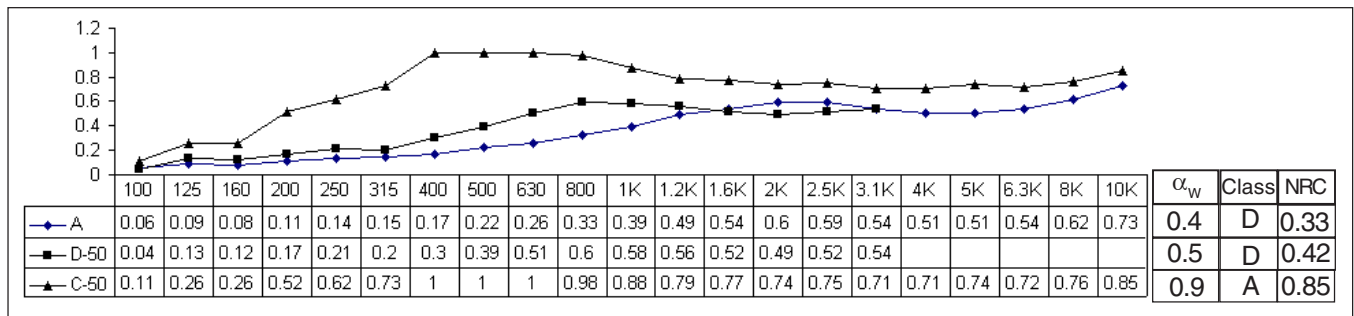
Strand HD6 - 25mm thick



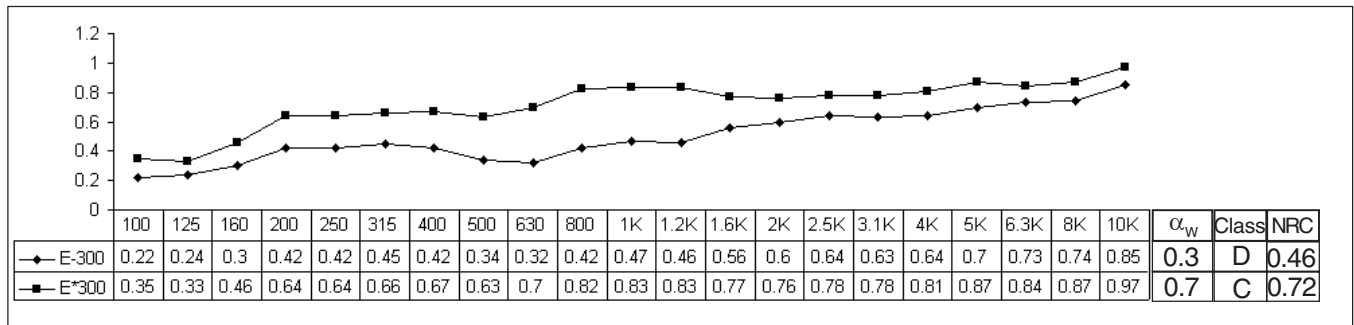
Strand HD6 - 25mm thick



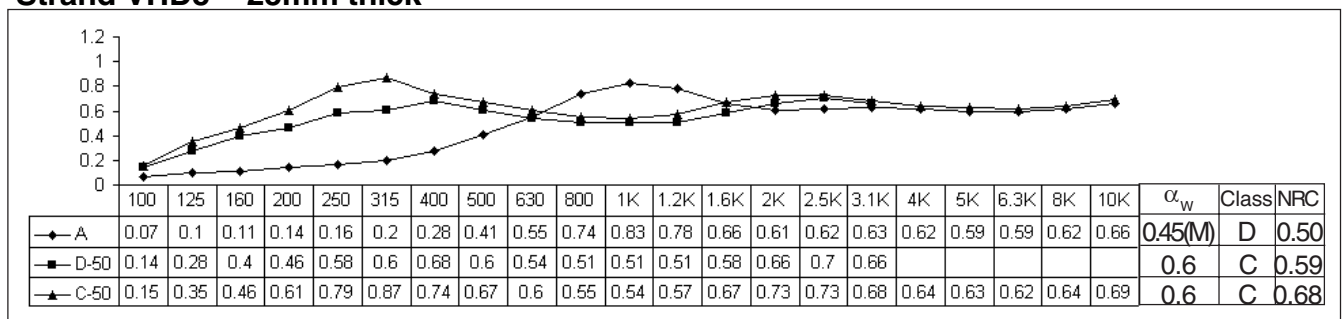
Strand LD3 - 25mm thick



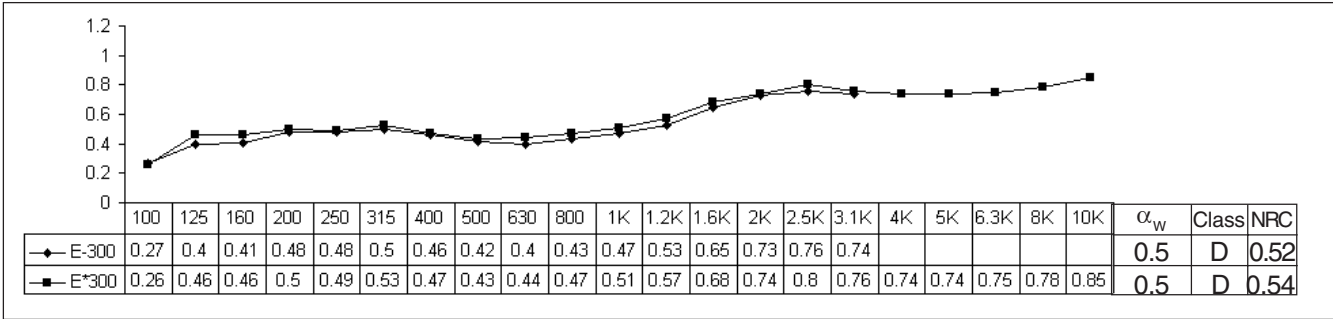
Strand LD3 - 25mm thick



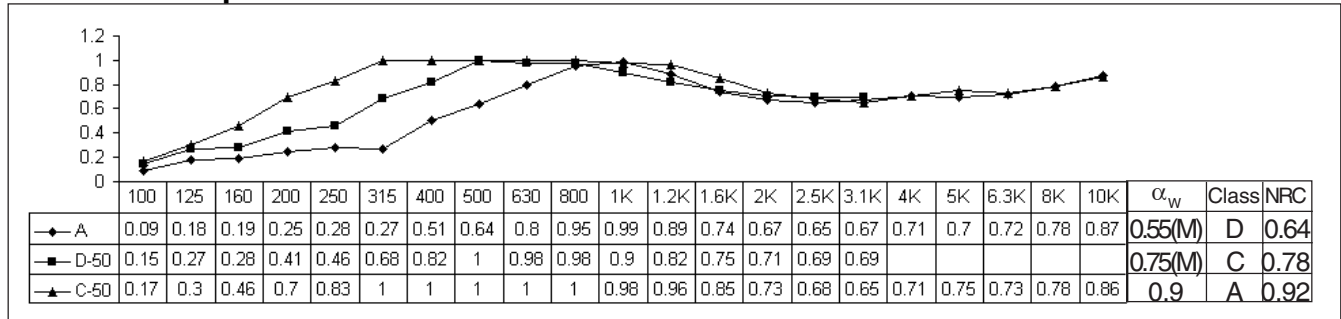
Strand VHD8 - 25mm thick



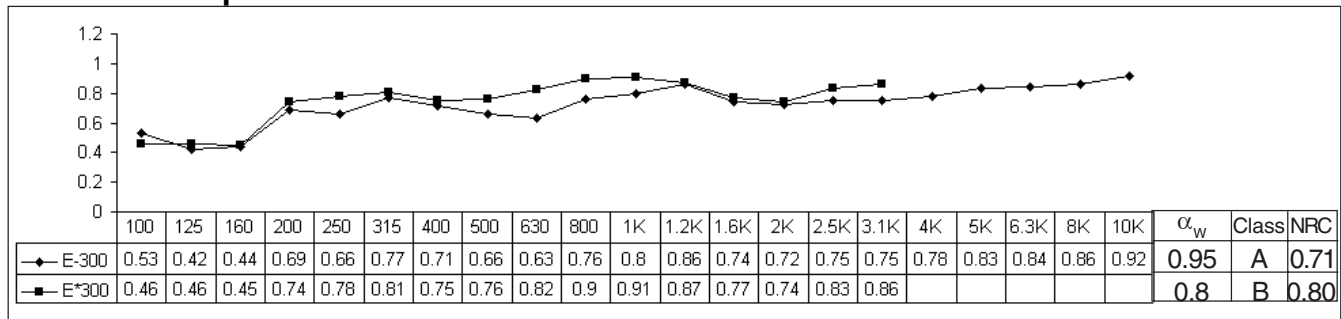
Strand VHD8 - 25mm thick



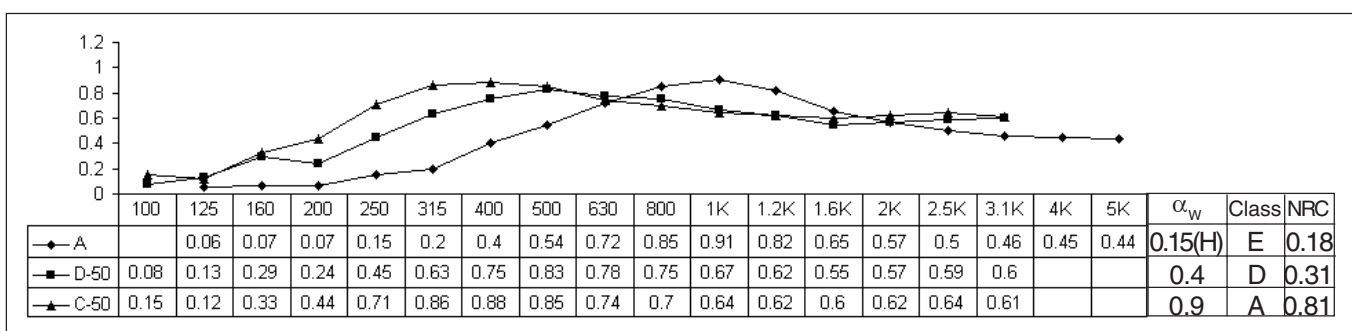
Strandec Composite MW - 50mm thick



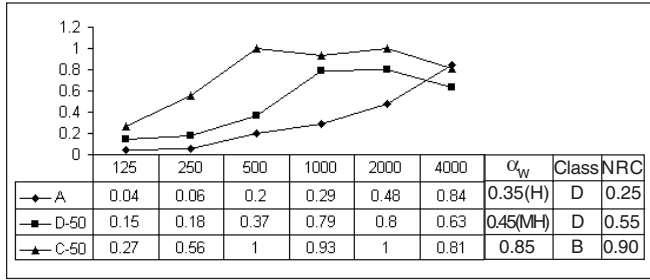
Strandec Composite MW - 50mm thick



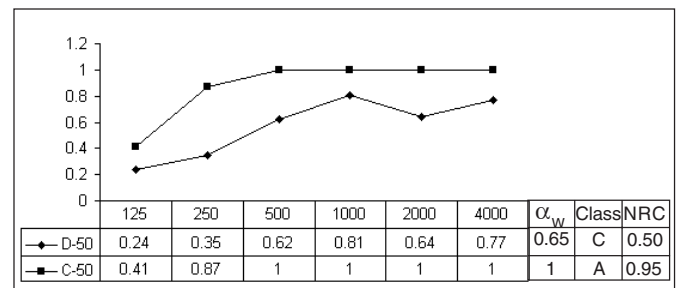
Strand - 10mm thick



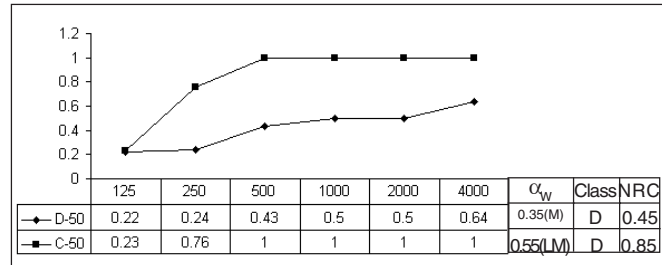
Strand - 15mm thick



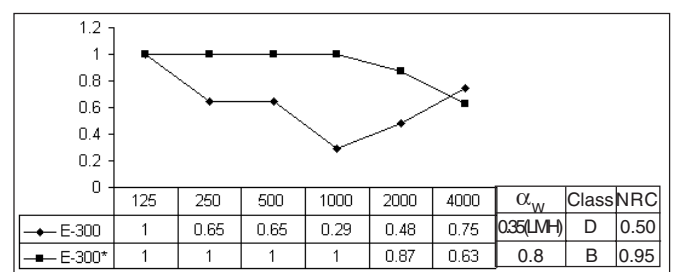
Strand - 40mm thick



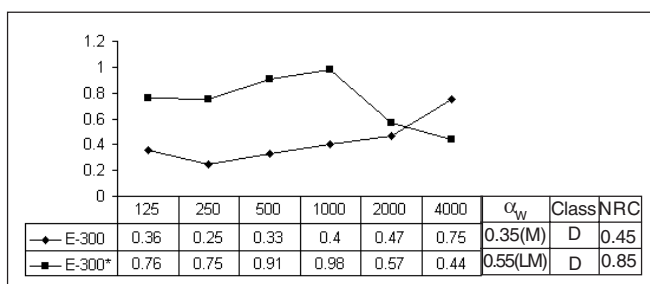
Strand Trax - 20mm thick



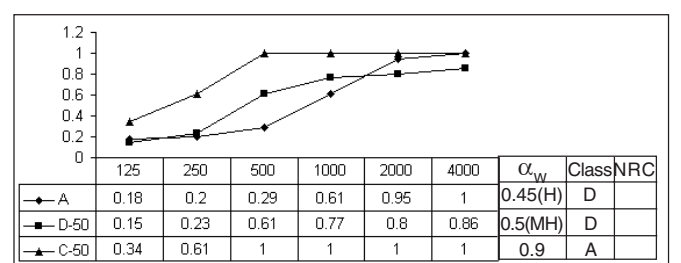
Strand - 40mm thick



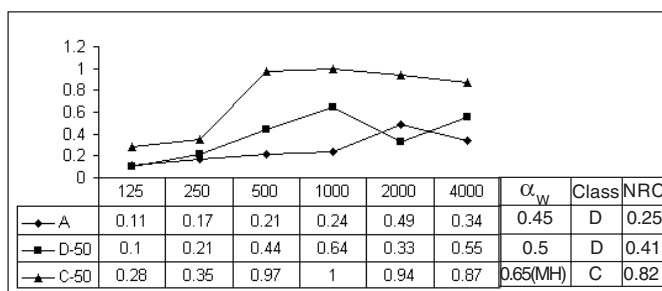
Strand Trax - 20mm thick



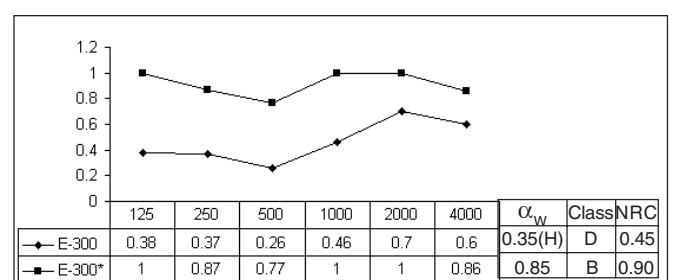
Strand - 50mm thick



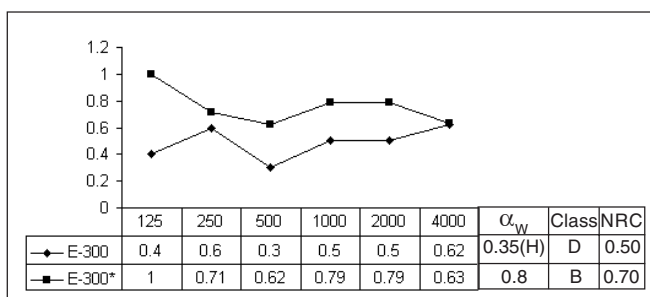
Strand - 25mm thick



Strand - 50mm thick



Strand - 25mm thick



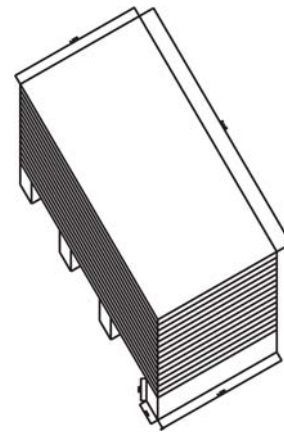
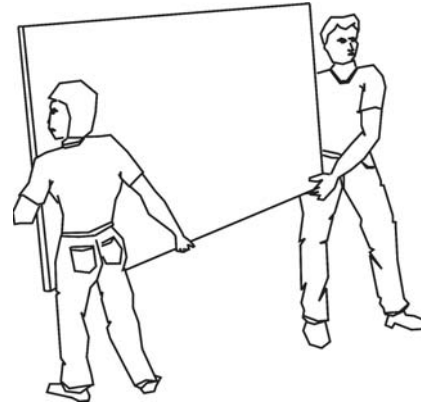
Mounting details are as per ASTM:795-93

- a) A - Rigid backing (without air-gap)
- b) D-50 - With 50 mm air-gap by means of 50 x 50 mm section wooden framework of grid 2'x2'
- c) C-50 - With 24 kg/m³ density / 50 mm thick fibreglass wool friction fitted in wooden framework
- d) E-300 - With 300 mm air gap (as suspended as a false ceiling)
- e) E-300* - With 300 mm air gap and an overlay of 24d/50 mm fibreglass wool

INSTALLATION GUIDE

HANDLING AND STORAGE

- Strand panels are fragile and rough handling may chip the edges and corners.
- Bigger size panels are to be handled properly, carried vertically on the longer edges as shown in figure, otherwise they may crack at the centre.
- Panels should be stored flat, in a dry and clean place. Do not place the panels in contact with floors and walls. They should not be in continuous contact with water and must be stored as shown in the figure, allowing air circulation all around.
- Panel, packed in cartons, should be covered with plastic sheets.
- Long term storage under uncontrolled environmental conditions should be avoided.



INSTALLATION

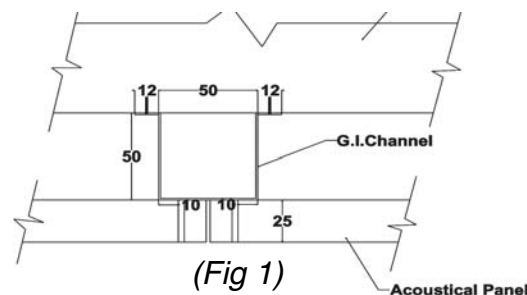
Strand panels can be installed by various methods in wooden or metal framework. The metal framework may be concealed or exposed. Screw application is possible and should be spaced 24" cc or less.

Grid systems should be true, straight and level. The suspension and grid system should be designed to take the panel weight without sagging.

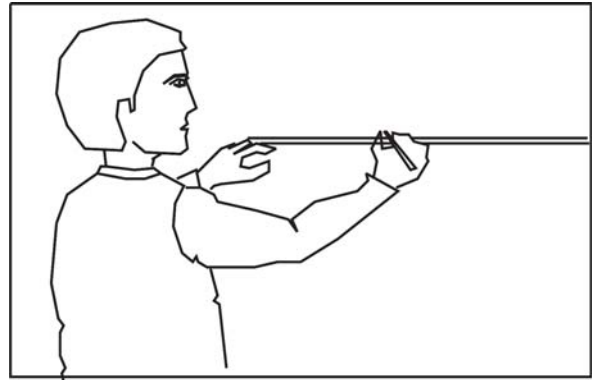
Orientation of panels, relative to light source, should be carefully considered for desired visual effect. Strong sidelighting with slight angle of incidence to ceiling surface, greatly exaggerates the designs. Shadows falling on the panels should be eliminated or softened.

WALL PANELLING INSTALLATION

Step 1 - Mark the location of the framework channels on the wall at maximum 600mm spans depending on the size of the acoustical panel. Level the channels to correct position, grout the channel to the wall using self tapping screws. (Fig 1)

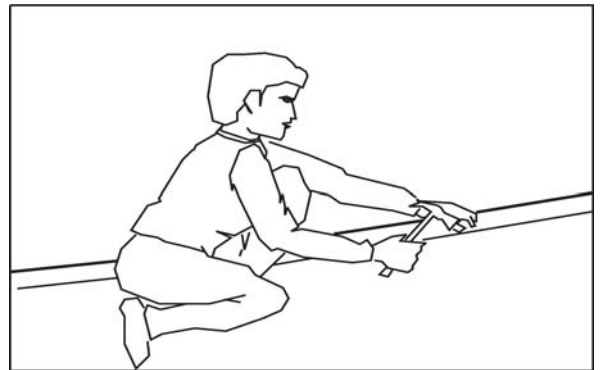


Step 2 - Mark the location of each panel to determine the number of panels required, minimizing wastage. (Fig 2)



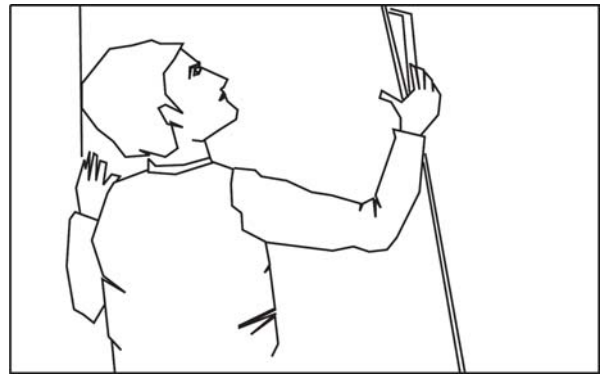
(Fig 2)

Step 3 - Fix the nails at the base for panel support. The height of the nails depends on the height of the floor skirting desired. (Fig 3)

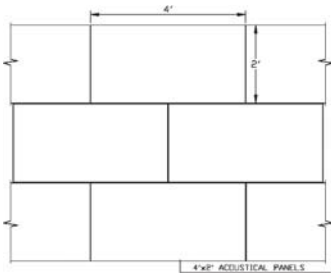


(Fig 3)

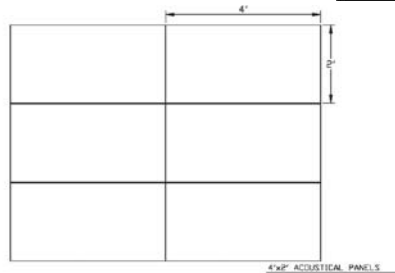
Step 4 - Position the first panel on the channel using plumb level and fix it on the framework channel by using self tapping screws. (Fig 4)



(Fig 4)



(Fig 5)



Step 5 - Place the next panel against the first until they fully butted and edges uniform for a regular pattern. Continue the same procedure along the length of the wall. For staggered pattern butt the short edge of the succeeding panels to the centre of the long edge of the previous panel. (Fig 5)