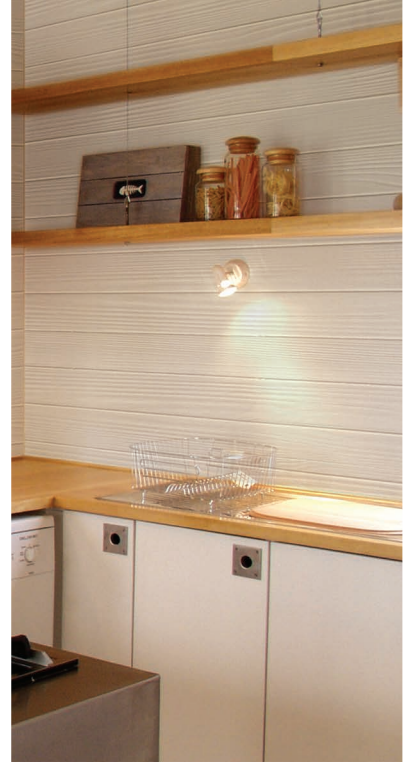


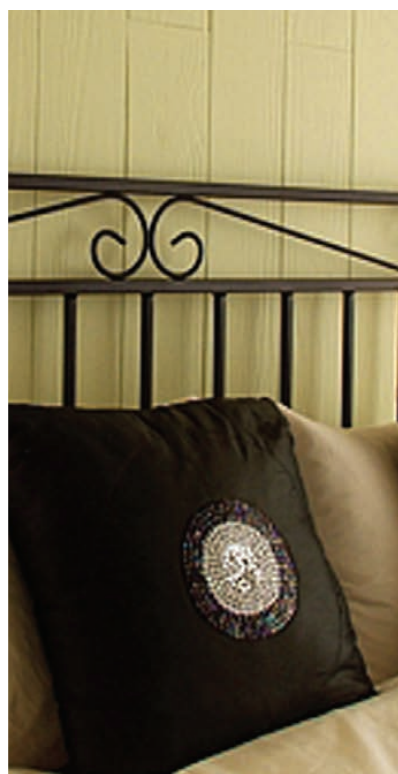
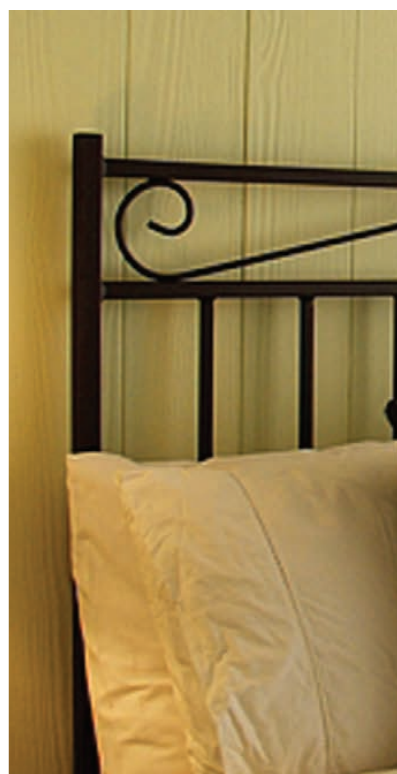
lasting strength  
with fibre-cement

**nutec**  
ROOFING AND CLADDING SOLUTIONS

Manufactured by  
**EVERITE**  
Established in 1941

## TONGUE & GROOVE





## CONTENTS

<b>About Everite and Nutec</b>	<b>2</b>
<b>Nutec Flat Sheets Features</b>	<b>4</b>
<b>Safety, Handling and Storage</b>	<b>5</b>
<b>General Design Criteria</b>	<b>6</b>
<b>Nutec Flat Sheet Product Range</b>	<b>8</b>
<b>Application Possibilities</b>	<b>9</b>
<b>General Installation Guidelines</b>	<b>10</b>
<b>Guidelines and Fixing Details</b>	<b>11</b>
<b>Tongue and Groove Installation</b>	<b>14</b>
<b>Fire Resistance Systems</b>	<b>18</b>
<b>Acoustical and Thermal Values</b>	<b>22</b>
<b>Mechanical and Physical Properties</b>	<b>24</b>
<b>Everite National Offices and Contact Details</b>	<b>30</b>

### Catalogue Information

The information contained in this catalogue serves as a general guide only and should not be accepted as the standard for all construction. EVERITE can assist in designs of a special nature, however, architects, engineers and specifiers must finally approve the acceptability in terms of the design and construction criteria, as well as other implications.

### About Everite and Nutec

#### ■ Everite Building Products

Everite Building Products, has been associated with the South African building industry since 1941. Producing a wide range of materials that satisfy the needs of the commercial, industrial and residential market sectors, Everite is renowned for its comprehensive range of Nutec Roofing and Cladding Solutions and includes fibre-cement roofing, cladding, ceilings and building columns amongst others.

Nutec fibre-cement high performance properties and added benefits include: the use of safe renewable fibres; considerable tensile strength with enhanced dynamic load bearing properties; excellent thermal properties; water and wind resistance; hail resistance; fire resistance and resistance to fungus, rodents and acid.

A programme of quality assurance in accordance with the requirements of the International Standards Organisation (ISO 9001:2008) is entrenched in Everite's process and management systems. Quality of all products is continuously monitored as specified by the South African National Standards and recognised international bodies.

Everite's 54 hectare manufacturing facility near Johannesburg is well located and has immediate access to all major road and rail links to national destinations and major ports. The company has branches located at major centres throughout South Africa. Nutec products are distributed through leading stockists countrywide and an established export market further endorses the international acceptance of the Nutec Roofing and Cladding Solutions range of products.

#### ■ Nutec

Nutec is the registered name for products manufactured without asbestos as a raw material. Nutec fibre cement products are manufactured using a mixture of cellulose fibre, cement, silica and water.

Through ongoing research and development, Everite Building Products are committed to provide product of world-class quality.

Accordingly, the Nutec product range is continuously reviewed not only in the interests of the end-user and superior product performance, but also with respect to its impact on the environment. Everite Building Products has over the years established a reputation for producing a variety of outstanding quality products which have been used in a wide range of external and internal applications.

### Environmental benefits of Nutec Fibre Cement

- Environmental costs incurred by using fibre cement are measurably less than for other building materials. (Low embodied energy per m<sup>2</sup>).
- Requires less energy in assembly and construction than all other wall materials except timber.
- Low energy consumption in transportation and installation.
- Environmental costs relating to ozone layer depletion, carcinogenic substances and solid waste emissions are almost negligible.
- Low environmental impact in relation to ozone layer depletion, carcinogenic substances, and solid waste emissions.
- No pesticides are involved in the manufacture or use of fibre cement.

### The benefits of Nutec Fibre Cement

- The use of safe fibres.
- Considerable tensile strength with enhanced dynamic load bearing properties.
- Cost competitive.
- Excellent thermal properties.
- Water tight and wind resistant.
- Hail resistant.
- Fire-resistant.
- Fungus and rodent resistant.
- Acid resistant.
- Complies with SABS ISO 9933.
- ISO 9001 : 2008 Quality Management System.

### The environmental benefits in the manufacturing process of Nutec Fibre Cement

- Recycling the water used in production many times.
- Recycling solid wastes.
- Using sustainable raw materials in production.

### Embodied Energy – Definition

Embodied energy is the energy consumed by all of the processes associated with the production of a building, from the mining and processing of natural resources to manufacturing, transport and product delivery. Embodied energy does not include the operation and disposal of the building material. This would be considered in a life cycle approach. Embodied energy is the 'upstream' or 'front-end' component of the lifecycle impact of a home. Fibre cement is one of the most energy efficient materials on the market and it has one of the lowest embodied energy contents per square metre of cover of any building product.

## NUTEC FLAT SHEETS FEATURES

### Nutec Flat Sheets

Nutec Flat Sheets are an economical, multi-purpose building board that can be used in diverse exterior and interior applications, ranging from cladding, eaves linings and fascias to ceilings, partitioning, panelling and suspended flooring.

Nutec High-Density and Medium Density flat sheets provide considerable scope for design flexibility and creative expression. Used as a flat vertical surface, Nutec Flat Sheets are produced in a smooth or textured finish. They are supplied in a neutral colour that can accept a wide variety of coatings and paints to suit the palette of any application.

The range includes Nutec Tongue & Groove that is available in a plain or realistic wood grain finish and is suitable for use in a variety of applications, both interior and exterior. Supplied in a natural colour and, as it is compatible with a variety of paints, the timber-like finish can be enhanced with wood stain varnishes or paint techniques.

#### ■ Features

- An economical all-purpose building board which is unaffected by moisture and therefore ideal for internal and external use in almost any application.
- Relatively light in weight and can be supported on light gauge metal frames or light timber structures. These factors facilitate easy handling and erection and are major benefits on projects where low mass construction is an important factor.
- Non combustible and provide perfect protection against flying sparks.
- Resistant to corrosion and are unaffected by ultraviolet light.
- Designed to have good thermal properties when compared with other building materials. The thermal properties of Nutec Flat Sheets compare very well with other building materials available on the market.  
For thermal conductivity values (K value), .
- Manufactured to the highest internal quality standards and compliance is ensured by strict quality assurance programmes in the production process as well as stringent testing in our laboratory. Nutec Flat Sheets are manufactured to the requirements of ISO 9001:2008.
- All Nutec Flat Sheets carry a SABS mark for compliance to the specification SANS 803.
- Nutec Flat Sheets are supplied in their natural colour, but are compatible with a large variety of in-situ applied coatings and paints. This will allow the designer an almost limitless combination of colours and textures for external and internal applications.

### Safety, Handling and Storage Instructions

#### Safety

Safety rules as per current legislation and work practices as described in General Installation Guidelines must be observed when working with the product.

Nutec Flat Sheets as manufactured are made without asbestos fibres, it is nevertheless recommended that when working with the product, tools that create excessive dust should not be used. Ordinary carpenters' tools can be used effectively.

#### Handling

Nutec Flat Sheets are cement-based and may be damaged under excessively high shock loads. Reasonable care should therefore be taken to ensure that the products are not dropped or subjected to rough handling.

#### Storage

Nutec Flat Sheets should not be exposed to the elements and under cover storage is recommended. A smooth level under cover area should therefore be made available where they can be stacked safely. Nutec Flat Sheets should be stacked clear off the ground on suitable timber supports at maximum 400 mm centres and the edges and corners protected against possible damage.

Where under cover storage is not available, the stacked product should be covered to avoid it becoming soaked with water. Soaked boards will be difficult to handle and should be allowed to dry out before use.

## GENERAL DESIGN CRITERIA

### General Design Criteria

#### Recommended Uses

The recommended uses of Nutec Flat Sheets under normal conditions are tabulated for easy reference in

#### Mechanical and Physical Properties

Details on the mechanical and physical properties of Nutec Flat Sheets are scheduled at the end of this brochure.

#### Painting, Finishes and Coatings

The sheets are best painted with a pure acrylic PVA paint. Where it is intended to use oil or alkyd paints it is essential to prime the sheet with an alkali-resistant sealer. In this instance both faces of the product should be sealed.

#### Exposed and Windy Conditions

The information presented in this catalogue is a guide only for normal wind-loading conditions.

**Please consult an Engineer or Architect for advice on specific fixing and framing recommendations for structures in normal-or high-wind areas.**

#### Substructure Guidelines

The design of structural supports requires professional expertise and should be executed by structural engineers.

**TABLE 1**

Guideline - Supporting Structure for Nutec Flat Sheets		
	External and Internal Vertical Cladding	
Description and Thickness of Board	Maximum spans between vertical supports	Maximum spans between horizontal supports
<b>Medium density</b> 9 mm 12 mm	600 mm 800 mm	600 mm 900 mm
<b>High density</b> 10 mm 15 mm	600 mm 800 mm	800 mm 1 200 mm

- For specific fixing and framing recommendations where the sheets are to be used for applications such as floors, shelving and permanent shuttering, please consult an engineer or architect for details.
- If used for flooring, and covered with ceramic tiles or other inflexible material, expansion joints must be provided. Please refer to an engineer for details.



## GENERAL DESIGN CRITERIA

### Ventilation

When using Nutec Flat Sheets to form a double skin wall in a prefabricated steel or timber framed structure, the cavity (if not fully filled) between the two skins should be ventilated. In these structures, especially in humid conditions, foil is often installed as a moisture barrier and as an insulator. Ventilating the cavity will permit the evaporation of any condensation which may collect.

### Site Service

Site service personnel are available on request to assist with recommended storage, handling and erection of the Company's products before and during installation.

## NUTEC TONGUE AND GROOVE PRODUCT RANGE

### Product Range

#### ■ Nutec Tongue & Groove Product Range, Dimensions and Properties

##### Nutec Textured Tongue & Groove Medium Density (MD) Boards

Product No.	Nominal thickness mm	Size mm	Average Mass per unit (kg)
650-567	6 MD	1 200 x 2 400	24
650-568	6 MD	1 200 x 3 000	30
650-569	6 MD	1 200 x 3 600	37
060-643	9 MD	1 200 x 2 400	35
060-644	9 MD	1 200 x 3 000	44
060-645	9 MD	1 200 x 3 600	52

##### Nutec Plain Tongue & Groove Medium Density (MD) Boards

650-566	6 MD	1 200 x 3 000	30
---------	------	---------------	----

##### Nutec Floor Boards High Density (HD) Boards

011-504	15HD	1 800 x 1 200	52
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Nutec Textured Tongue and Groove



Nutec Plain Tongue and Groove

## APPLICATION POSSIBILITIES

**TABLE 2**

Recommended Uses of Nutec Flat Sheets						
Product Description	Medium Density				High Density	
	9 mm Plain	12 mm Plain	6 mm Textured	9 mm Textured	10 mm Plain	15 mm Plain
Internal panelling	•	•	•	•		
Gable cladding	•	•		•	•	
Prefabricated housing	•	•		•	•	
Steel & Timber frame houses & steel frame interior / exterior walls	•	•		•	•	•
Partitioning	•			•	•	
Sandwich panels (Double skin light weight steel infill)	•					
Louvres		•			•	•
Balustrading					•	•
Steel beam and column lining (Aesthetic finish)	•	•			•	•
Permanent shuttering						•
Toilet and shower partitioning					•	•
Floors						•
External facades (stone chip finish)	•	•			•	
External facades (paint application)	•	•		•	•	
Suspended floors						•

### General Installation Guidelines

- To ensure a high standard of finish, it is essential that the supporting structure is accurately constructed. Warped, twisted or poor quality timber, or badly erected steelwork will reflect in the finished surface and can cause damage to the product.

The structure must be checked and adjusted as necessary to ensure that there is no bowing or distortion which could affect the true plane of the final application.

- For maximum spacings between supports for Nutec flat sheets, refer to the guidelines.

Sheets should not be fixed directly onto a masonry wall, but on timber or steel battens forming a framework to which the fascia boards or sheets can be fixed.

- Holes for fixing must be set out evenly and must be drilled and not punched.

An ordinary hand drill and steel drill bits specially sharpened to a 20° angle are recommended.

The drill bit must be 2 mm larger than the diameter of the fixing bolt or screw.

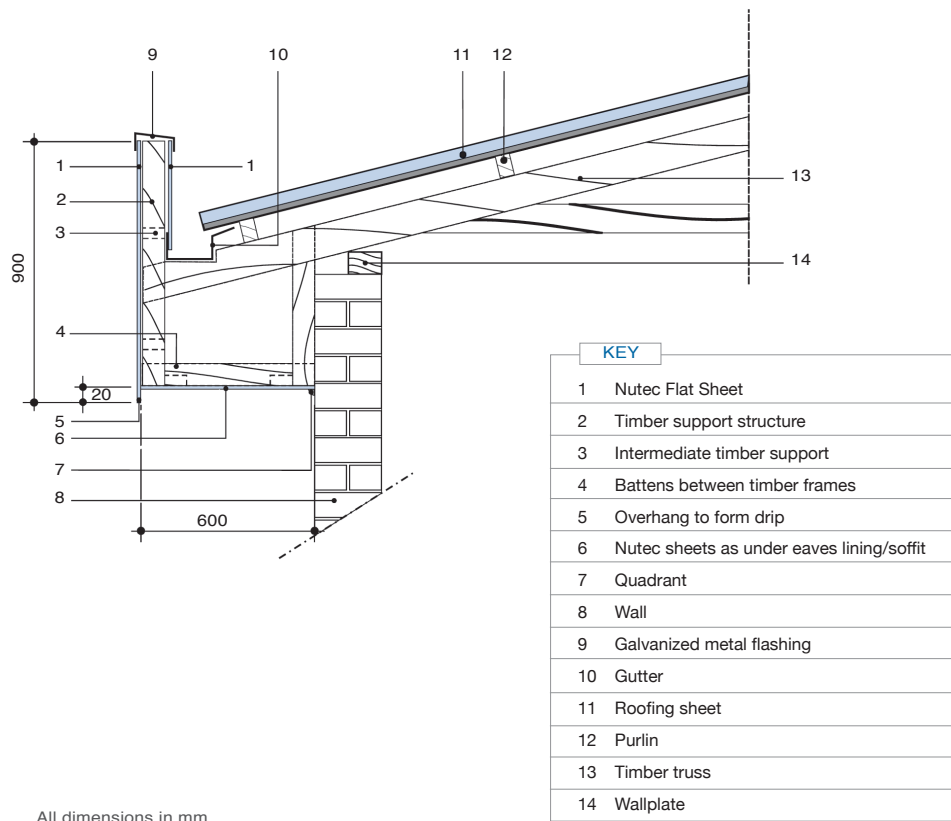
- When the sheets are fixed into a framed structure allowance must be made for thermal movements in the sheet and the supporting structure.

The allowance for movement will depend on the size of the sheet, but an average can be accepted as  $\pm 2$  mm per metre in both directions. For facade jointing, use recommended jointing details.

## Installation Guidelines and Fixing Details

### ■ Special Fascia Boards

**Fig 1 : Using Nutec Flat Sheets as a Special Fascia**

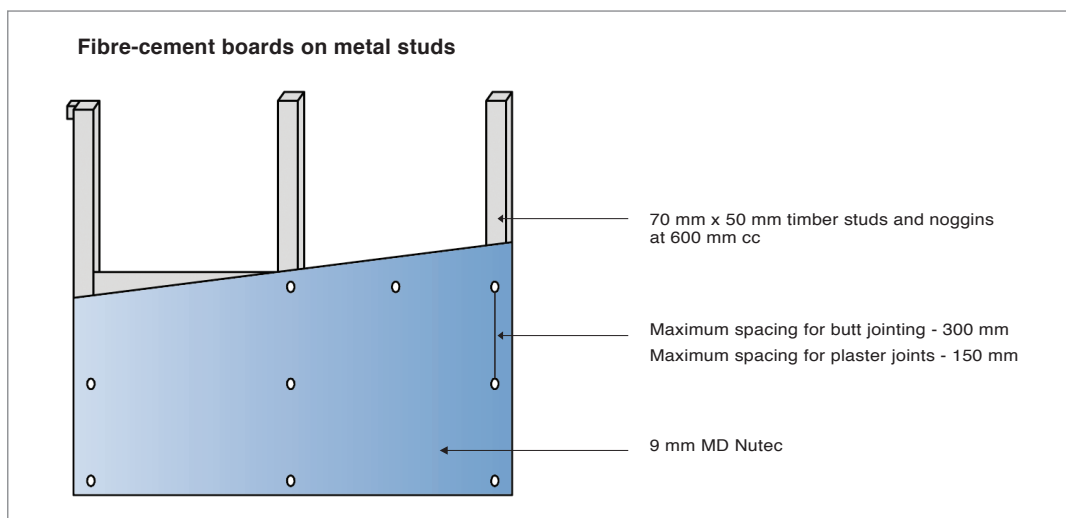
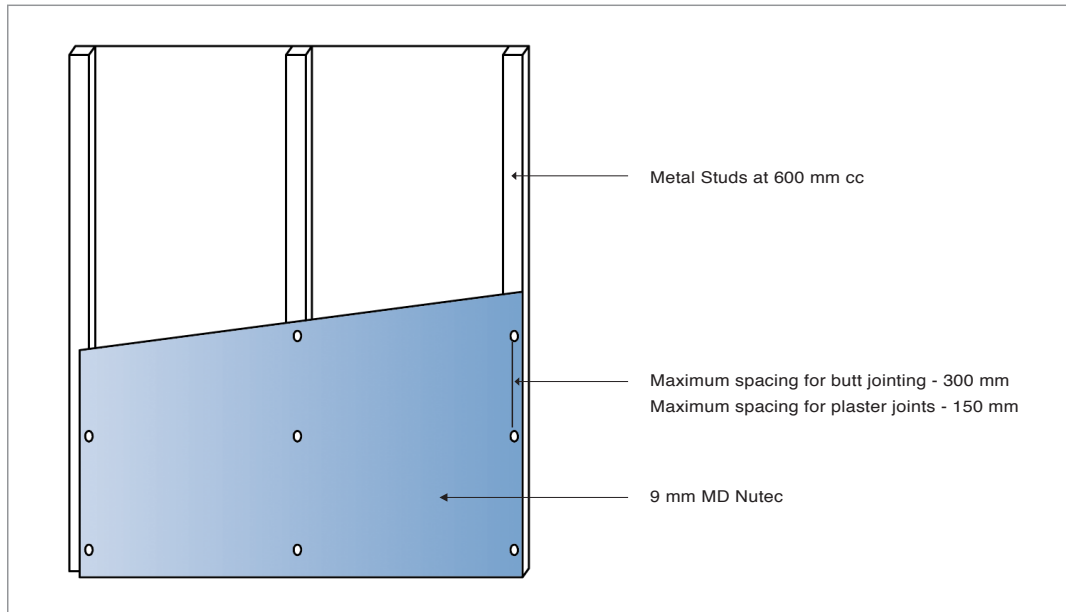


**NB:**

- In the above application 9 mm medium density sheets are used. In instances where ceramic tiles are fixed to a fascia, minimum thickness of sheets should be 10 mm high density or 12 mm medium density sheets.
- The flashing should be sloped away from the face of the fascia to avoid discolouration due to dust being washed down by rain over the finished surface.
- Guideline for spanning capabilities of NUTEC FLAT SHEETS, [Refer Table 1.](#)
- Fascias should not be fixed directly to a wall, use timber battens to provide a framework for the fascia.

## INSTALLATION GUIDELINES AND FIXING DETAILS

### ■ Typical Layout of Nutec Flat Sheet on Timber and Steel Framework

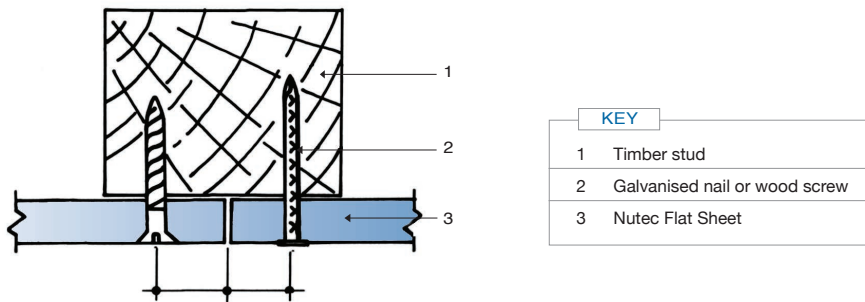


#### NB:

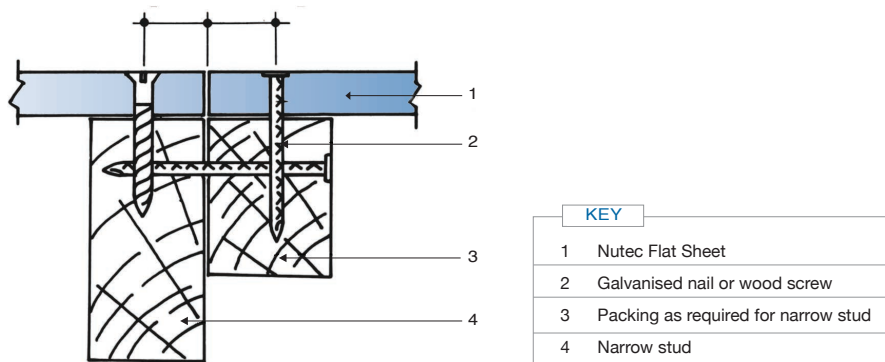
- Timber or steel framing may be used and should be constructed in accordance with local building regulations and acceptable building practice.
- Timber should be selected structural grade timber.
- Timber supports must be firmly secured to top and bottom plates and frames must not rely on the Nutec Flat Sheets for stability.
- Support spacings for external or internal walls should not exceed 600 mm centres.
- Framing members, should be arranged to support all sheet edges.
- Where the support faces behind sheet joints are less than 38 mm wide, pack out to provide additional landing for sheet fixing. [Refer Fig. 4.](#)
- For further information on timber framed structures, refer to SANS 10082.

## INSTALLATION GUIDELINES AND FIXING DETAILS

### Fixing of Nutec Flat Sheets to Support



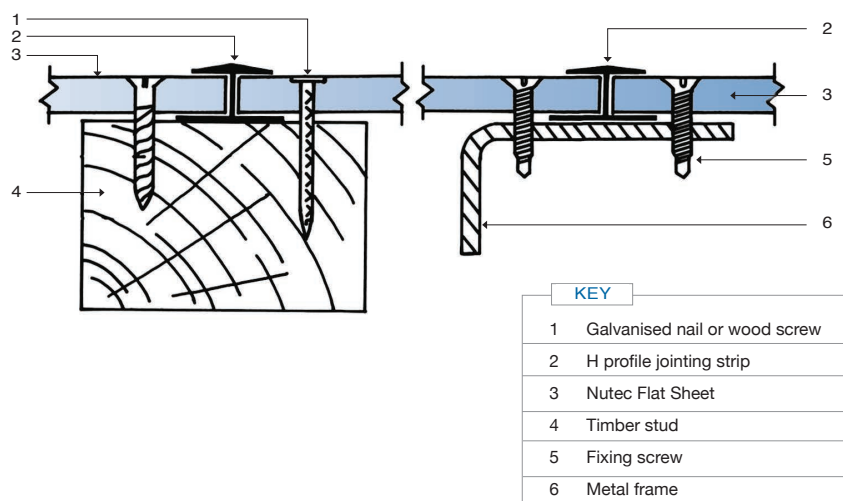
### Fixing of Nutec Flat Sheet to Narrow Support



## ■ Jointing

There are various methods that can be used for jointing.

### Showing the Use of an H-profile Strip



## TONGUE AND GROOVE INSTALLATION

### Nutec Tongue and Groove Boards

Nutec Tongue and Groove Textured and Plain boards are medium density. These sheets are supplied in the natural grey and can be varnished with wood stain to simulate timber. Textured sheets can also be painted in various techniques to achieve a pleasant aesthetic finish. These boards are ideal for ceilings, internal and external wall panelling, door panelling and garden sheds.

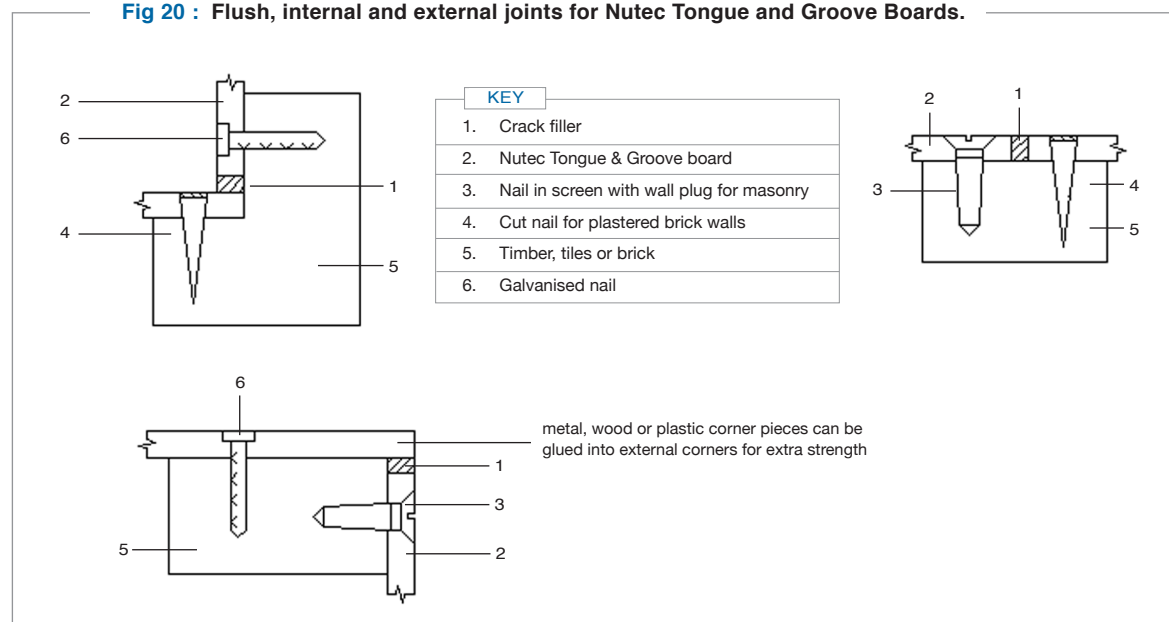
Tongue and Groove Plain boards provide a classic smooth Tongue and Groove finish.

#### ■ Fixing and Installation Details

Guideline - Supporting Structure for Nutec Tongue and Groove Boards (Interior Application)		
Maximim Span Between		
Description and Thickness of Board	Vertical supports	Horizontal supports
6 mm	570 mm	500 mm
9 mm	570 mm	800 mm

1. Cut the board to the correct size using a masonry cutting disk and place onto the wall in the desired position.
2. Drill 5 mm holes through the board at the fixing points and fasten the board to the wall using a 5 x 30 mm (minimum size) nail in screws with wall plugs. Cut nails can be used on plastered brick walls.
3. Make sure the screws are countersunk into the board when fastened.
4. Adjoining boards are butt joined together to simulate an extra 'groove' (5 mm apart).
5. Use crack filler to cover the screw heads and fill the butt joint leaving a smooth finish, (eg. Painter's mate).

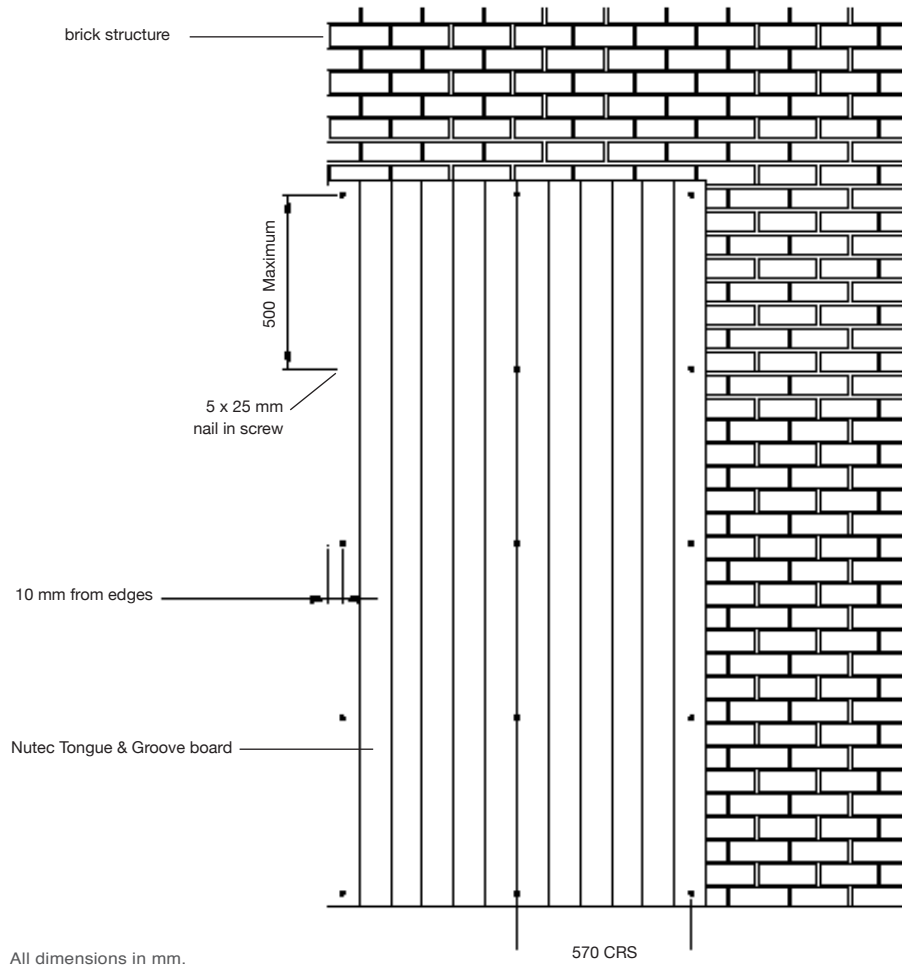
**Fig 20 : Flush, internal and external joints for Nutec Tongue and Groove Boards.**





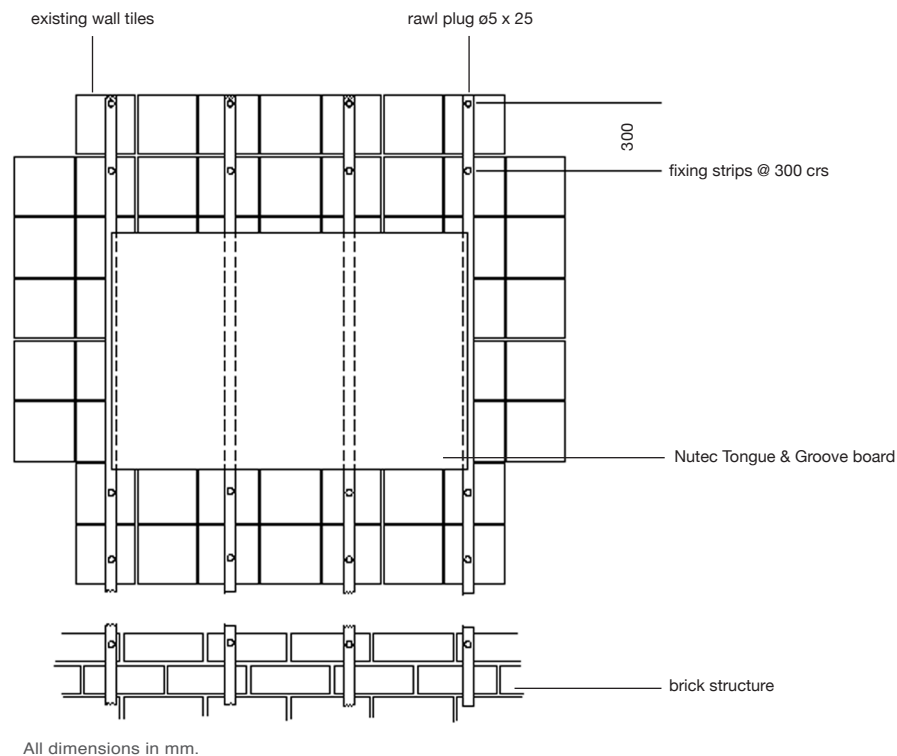
## TONGUE AND GROOVE INSTALLATION

**Fig 21 : Installing Nutec Tongue and Groove Board to even surfaces**



## TONGUE AND GROOVE INSTALLATION

**Fig 22 : Installing Nutec Tongue and Groove Board to uneven surfaces**



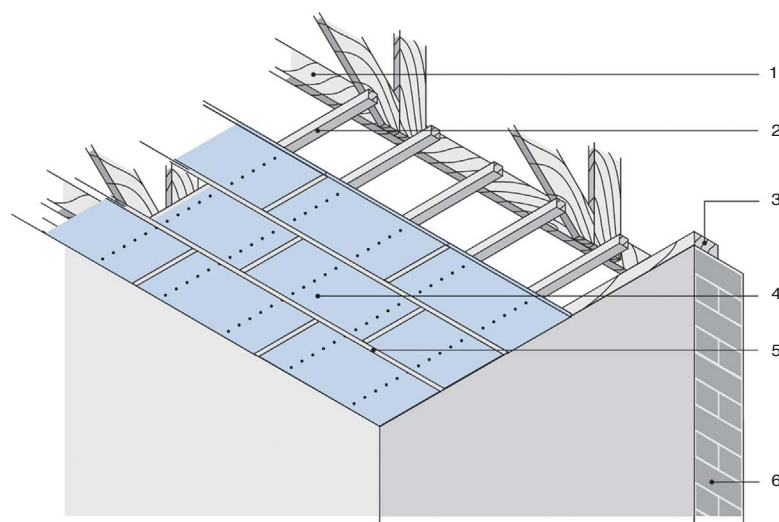
### Things to remember when installing Nutec Tongue and Groove Boards.

- Nutec Tongue and Groove Boards may be applied to timber frames, plastered and unplastered walls and tiled surfaces as shown in [figure 21](#).
- Standard dado rails can be easily attached onto the wall above or below Tongue and Groove boards except when fixing strips are used. In such cases a shelf should be used instead.
- Fixing to uneven walls may required the use of fixing strips ([figure 22](#)) to ensure that the board remains flat and does not follow an uneven contour.
- Fixing strips must be fastened to the wall with nail in screws at 300 mm intervals. The irregularity of the wall will determine the thickness of timber used but a minimum of 15 mm should be adhered to.
- Spacer must be used at relevant fixing points behind the strips to compensate for the irregularities in the wall. A builders line must be used to draw a level across the strips.
- Nutec Tongue and Groove boards are attached to the fixing strips at the same intervals as they would normally be attached using.
- For ceiling applications these boards should be fixed at 600 m centers as shown in [figure 23](#).
- When used in wet areas, the board must be sealed continuously around the perimeter of the reverse side of the board 5mm from the edge.
- To form a double skin wall in a prefabricated steel or timber framed structure, the cavity between the two skins should be ventilated. In these structures, especially in humid conditions, foil is often

## TONGUE AND GROOVE INSTALLATION

installed as a moisture barrier and as an insulator. Ventilating the cavity will permit the evaporation of any condensation which may collect on the insulating material. The sheets are best painted with a pure acrylic PVA paint. Where it is intended to use oil or alkyd paints it is essential to prime the sheet with an alkali-resistant sealer. In this instance both faces of the product should be sealed.

**Fig 23 : Installing Nutec Tongue and Groove Boards as a Ceiling**



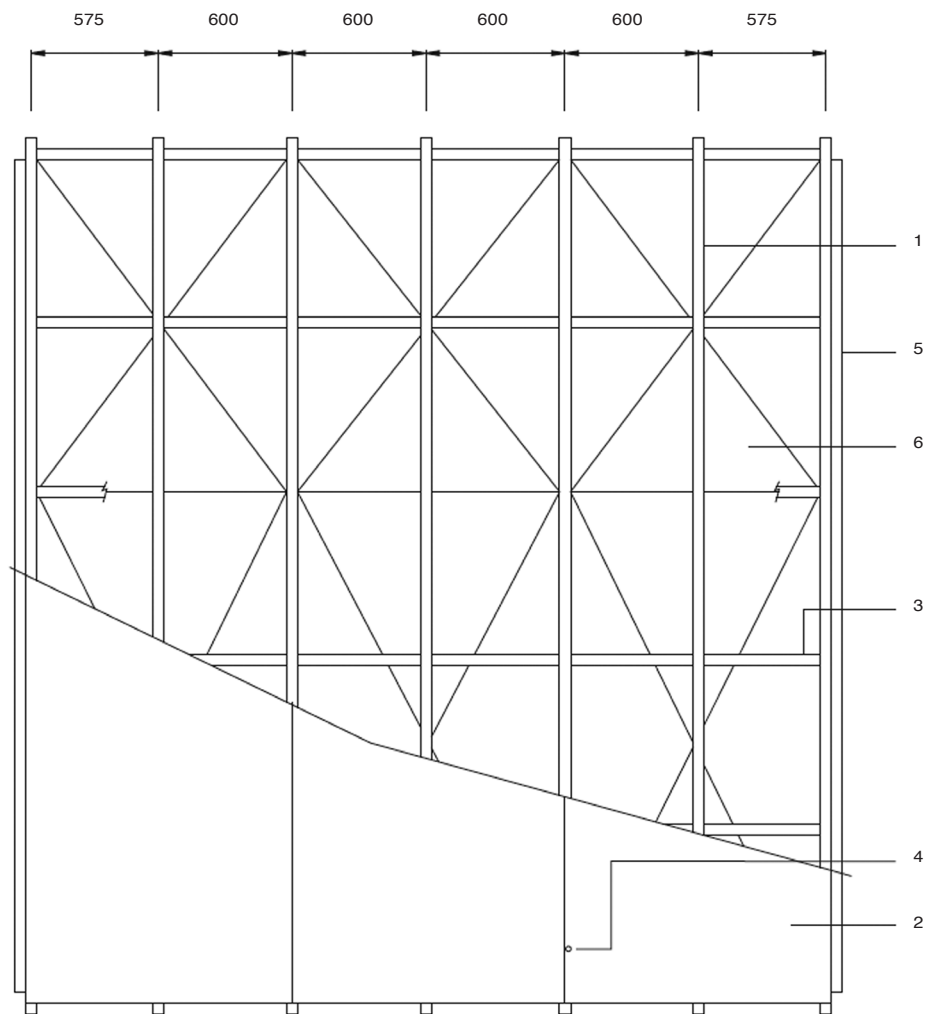
KEY
1. Tie beam
2. Bracing
3. Wallplate
4. Nutec Tongue & Groove
5. H-profile jointing strip
6. Wall

**NB:**

- Timber or steel framing may be used and should be constructed in accordance with local building regulations and acceptable building practice.
- Timber should be selected structural grade timber.
- Timber supports must be firmly secured to top and bottom plates and frames must not rely on the Nutec Flat Sheets for stability.
- Support spacings for external or internal walls should not exceed 600 mm centres.
- Framing members, should be arranged to support all sheet edges.
- Where the support faces behind sheet joints are less than 38 mm wide, pack out to provide additional landing for sheet fixing.
- For further information on timber framed structures refer to SABS 082 - the Code of Practice for Timber Buildings.

## ■ Floor / Ceiling Fire Resistant Systems

**Fig 24 : General Plan of Arrangement of Floor/Ceiling 60 Minute Fire Rated System - Loading 1500 kN/m<sup>2</sup>**



### KEY

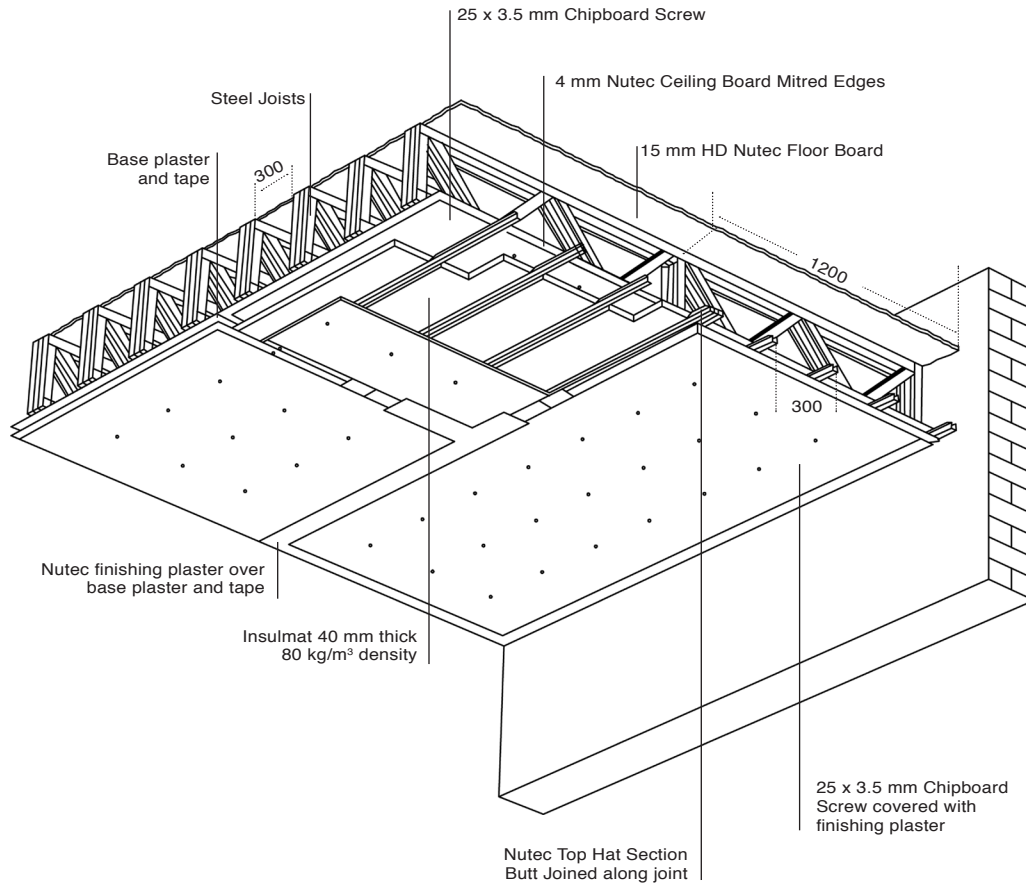
1. Softwood timber joists - 230 mm x 50 mm at 600 mm centre.
2. Floor Boards HD Nutec, 3600 mm x 1200 mm x 15 mm.
3. Softwood timber noggings at 600 mm centres by means of 100 mm nails.
4. 50 mm timber screws at 300 mm centres.
5. Mineral Fibre seal.
6. 6 mm Nutec Ceiling Board, 3600 mm x 1200 mm. Fixed with 50 mm timber screws at 300 mm centres to underside.

Insulation: 50 mm Insulmate, 80 kg/m<sup>3</sup>.

Joints sealed with Intumex MA.

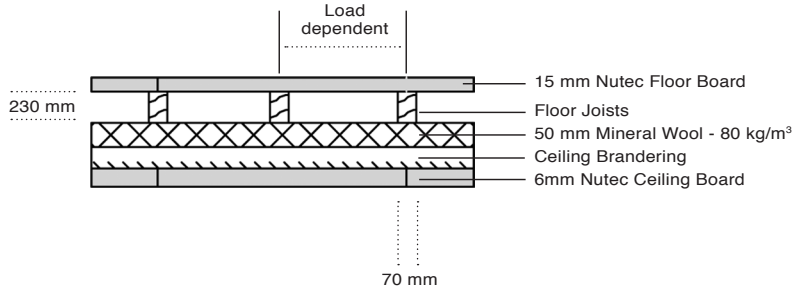
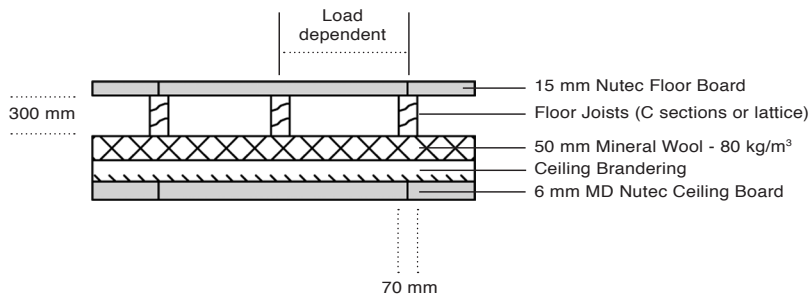
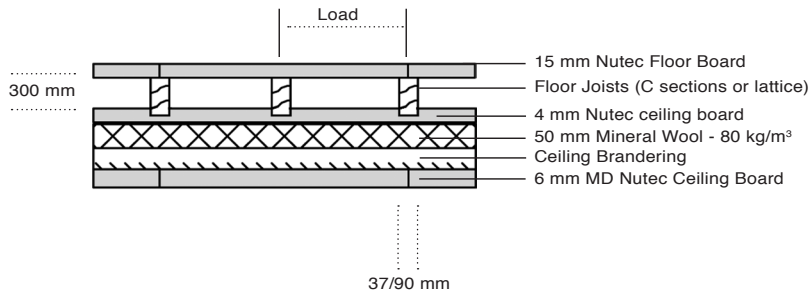
Screws and nail heads sealed with sodium silicate liquid.

**Fig 25 : Typical 2-hour fire rated floor system**



## FIRE RESISTANCE SYSTEMS

### Nutec Ceiling Boards in a suspended Floor System


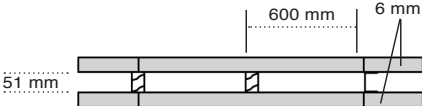
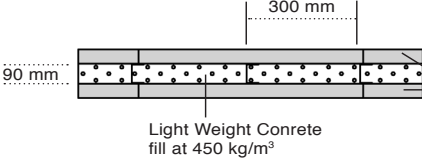
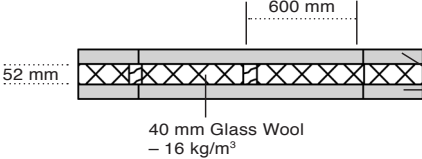
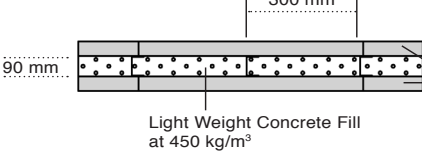
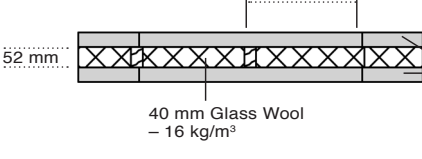
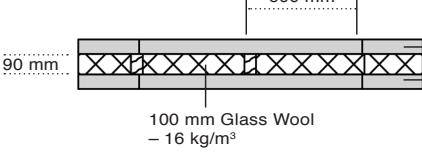
Fire Resistance	Timber Support Systems
60 minutes (structural)	 <p>230 mm</p> <p>Load dependent</p> <p>70 mm</p> <ul style="list-style-type: none"> <li>15 mm Nutec Floor Board</li> <li>Floor Joists</li> <li>50 mm Mineral Wool - 80 kg/m<sup>3</sup></li> <li>Ceiling Bracing</li> <li>6 mm Nutec Ceiling Board</li> </ul>
Fire Resistance	Metal Support Systems
30 minutes (structural)	 <p>300 mm</p> <p>Load dependent</p> <p>70 mm</p> <ul style="list-style-type: none"> <li>15 mm Nutec Floor Board</li> <li>Floor Joists (C sections or lattice)</li> <li>50 mm Mineral Wool - 80 kg/m<sup>3</sup></li> <li>Ceiling Bracing</li> <li>6 mm MD Nutec Ceiling Board</li> </ul>
60 minutes (structural)	 <p>300 mm</p> <p>Load</p> <p>37/90 mm</p> <ul style="list-style-type: none"> <li>15 mm Nutec Floor Board</li> <li>Floor Joists (C sections or lattice)</li> <li>4 mm Nutec ceiling board</li> <li>50 mm Mineral Wool - 80 kg/m<sup>3</sup></li> <li>Ceiling Bracing</li> <li>6 mm MD Nutec Ceiling Board</li> </ul>

## Nutec Board for Fire Rated Walling Systems

Fire Resistance	Timber Frame Systems	Metal Frame Systems
30 minutes (non-structural)		
30 minutes (non-structural)		
60 minutes (non-structural)		
90 minutes (non-structural)		
90 minutes (non-structural)		

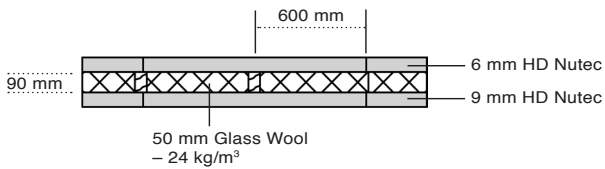
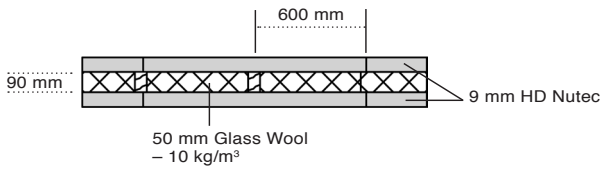
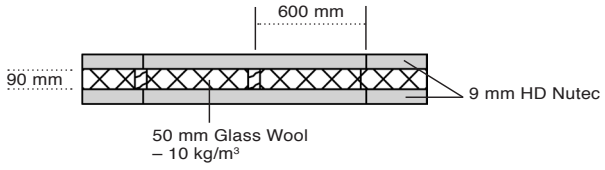
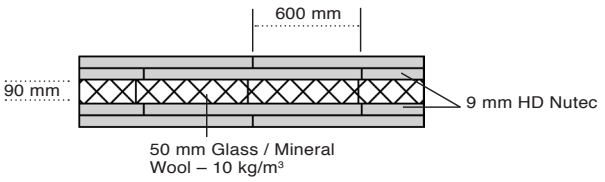
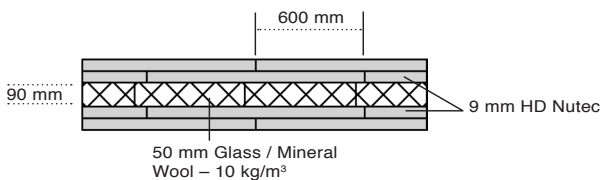
## ACOUSTICAL AND THERMAL VALUES

### ■ Acoustical Insulation Walling Systems

Acoustical Performance	System Details Timber or Steel	Thermal Resistance
26.0 dB	 4 mm Unpressed Fibre-Cement	0.02 m <sup>2</sup> K/W
35.7 dB	 51 mm, 600 mm, 6 mm MD Nutec	0.06 m <sup>2</sup> K/W
44.0 dB	 90 mm, 300 mm, 7.5 mm HD Nutec, Light Weight Concrete fill at 450 kg/m <sup>3</sup>	-
44.8 dB	 52 mm, 600 mm, 6 mm HD Nutec, 40 mm Glass Wool - 16 kg/m <sup>3</sup>	1.06 m <sup>2</sup> K/W
45.0 dB	 90 mm, 300 mm, 9 mm HD Nutec, Light Weight Concrete Fill at 450 kg/m <sup>3</sup>	-
46.5 dB	 52 mm, 600 mm, 6 mm HD Nutec, 40 mm Glass Wool - 16 kg/m <sup>3</sup>	1.05 m <sup>2</sup> K/W
48.0 dB	 90 mm, 600 mm, 6 mm HD Nutec, 9 mm HD Nutec, 100 mm Glass Wool - 16 kg/m <sup>3</sup>	2.56 m <sup>2</sup> K/W



## ACOUSTICAL AND THERMAL VALUES

Acoustical Performance	System Details Timber or Steel	Thermal Resistance
48.0 dB	 <p>600 mm</p> <p>90 mm</p> <p>50 mm Glass Wool – 24 kg/m<sup>3</sup></p> <p>6 mm HD Nutech</p> <p>9 mm HD Nutech</p>	2.76 m <sup>2</sup> K/W
48.0 dB	 <p>600 mm</p> <p>90 mm</p> <p>50 mm Glass Wool – 10 kg/m<sup>3</sup></p> <p>9 mm HD Nutech</p>	1.44 m <sup>2</sup> K/W
49.0 dB	 <p>600 mm</p> <p>90 mm</p> <p>50 mm Glass Wool – 10 kg/m<sup>3</sup></p> <p>9 mm HD Nutech</p>	2.56 m <sup>2</sup> K/W
55.0 dB	 <p>600 mm</p> <p>90 mm</p> <p>50 mm Glass / Mineral Wool – 10 kg/m<sup>3</sup></p> <p>9 mm HD Nutech</p>	1.44 m <sup>2</sup> K/W
56.0 dB	 <p>600 mm</p> <p>90 mm</p> <p>50 mm Glass / Mineral Wool – 10 kg/m<sup>3</sup></p> <p>9 mm HD Nutech</p>	1.44m <sup>2</sup> K/W

## MECHANICAL AND PHYSICAL PROPERTIES

### Mechanical and Physical Properties

#### ■ Plain and Textured Nutec Flat Sheets

Parameter	Unit	High Density	Semi-High Density	Medium Density	Textured Nutec	Test Method
<b>Specifications</b>						
<b>DIMENSIONS</b>						
<b>Thickness Tolerance:</b>						
9 mm	mm	-	± 0.3	± 0.8	± 0.8	SANS 803
10 mm	mm	± 0.8	-	-	-	SANS 803
12 mm	mm	-	± 0.8	-	-	SANS 803
15 mm	mm	± 1.0	-	-	-	
<b>Length Tolerance:</b>						
All lengths	mm	± 2	+0 or -5	+3 or -5	+3 or -5	SANS 803
<b>Width Tolerance:</b>						
All widths	mm	± 2	+0 or -2	+3 or -5	+3 or -5	SANS 803
<b>Squareness</b>						
All sizes	mm	Maximum 5	Maximum 2	Maximum 5	Maximum 5	SANS 803
<b>Edge Trueness</b>						
All sizes	mm	Maximum 1	Maximum 3	Maximum 5	Maximum 5	SANS 803
<b>Physical Properties</b>						
<b>Minimum MOR :</b>						
With Grain	MPa	9.00 <sup>(2)</sup>	8.44 <sup>(1)</sup>	7.40 <sup>(1)</sup>	7.40 <sup>(1)</sup>	SANS 803
<b>Minimum MOR :</b>						
Across Grain	MPa	13.00 <sup>(2)</sup>	12.10 <sup>(1)</sup>	10.60 <sup>(1)</sup>	10.60 <sup>(1)</sup>	SANS 803
<b>Target Density</b>	g/cm <sup>3</sup>	1.50	1.35	1.26	1.26	ISO 8336
<b>Maximum Hygral Linear Expansion</b>	mm/m	2.47	2.47	2.47	2.47	SANS 803

(1) Dried till constant weight (2) Saturated with water (3) Equilibrium conditions

## MECHANICAL AND PHYSICAL PROPERTIES

Parameter	Unit	High Density	Semi-High Density	Medium Density	Textured Nutec	Test Method
<b>Typical Values</b>						
<b>Thermal Conductivity</b>	W/m.K	0.30	-	0.19	0.19	ASTM C518
<b>Thermal Expansion Coefficient</b>						
20-70°C	°C-1	Negligible	-	Negligible	Negligible	SANS Doc. 722/W 1009
10-70°C	°C-1	4.21 x 10-6	-	9.31 x 10-6	9.31 x 10-6	ASTM C518
<b>Moisture Movement</b>						
With Grain	%	0.30	0.053	0.06	0.06	ASTM C1185
Across Grain	%	0.06	0.049	0.06	0.06	ASTM C1185
<b>Moisture Content</b>	%	6.92	2.53	6.25	6.25	ASTM C1185
<b>Water Absorption</b>	%	22.05	28.10	37.72	37.72	ASTM C1185
<b>Permeability</b>	-	No droplets	No droplets	No droplets	No droplets	SANS 685 ASTM C1185 BS 4624
<b>Water Vapour Transmission</b>	ng /Pa.s.m <sup>2</sup>	97.154	-	276.79	276.79	ASTM E96
<b>pH</b>		10 -12	10 -12	10 -12	10 -12	
<b>Mechanical Properties</b>						
<b>MOR :</b>						
With Grain	MPa	-	6.20 <sup>(2)</sup>	4.20 <sup>(2)</sup>	4.20 <sup>(2)</sup>	ASTM C1185
	MPa	14.40 <sup>(3)</sup>	11.20 <sup>(3)</sup>	7.50 <sup>(3)</sup>	7.50 <sup>(3)</sup>	ASTM C1185
	MPa	-	9.40 <sup>(3)</sup>	11.20 <sup>(3)</sup>	11.20 <sup>(3)</sup>	BS 4624
<b>MOR :</b>						
Across Grain	MPa	-	8.40 <sup>(2)</sup>	7.75 <sup>(2)</sup>	7.75 <sup>(2)</sup>	ASTM C1185
	MPa	24.05 <sup>(3)</sup>	18.50 <sup>(3)</sup>	12.10 <sup>(3)</sup>	12.10 <sup>(3)</sup>	ASTM C1185
	MPa	-	15.60 <sup>(3)</sup>	16.40 <sup>(3)</sup>	16.40 <sup>(3)</sup>	BS 4624

(1) Dried till constant weight (2) Saturated with water (3) Equilibrium conditions

## MECHANICAL AND PHYSICAL PROPERTIES

Parameter	Unit	High Density	Semi-High Density	Medium Density	Textured Nutec	Test Method
<b>Specifications</b>						
<b>Classification in Accordance to ASTM C1186</b>	-	II	I	I	I	
<b>Compressive Strength Parallel to Surface of Board</b>						ASTM C1186
With Grain	MPa	15.21	-	10.86 <sup>(2)</sup>	-	ASTM D1037
	MPa	24.62	-	15.57 <sup>(3)</sup>	-	ASTM D1037
Across Grain	MPa	20.61	-	11.54 <sup>(2)</sup>	-	ASTM D1037
	MPa	37.22 3 <sup>(3)</sup>	-	19.58 <sup>(3)</sup>	-	ASTM D1037
<b>Tensile Strength Parallel to Surface of Board</b>						
With Grain	MPa	3.47 <sup>(2)</sup>	-	2.11 <sup>(2)</sup>	-	ASTM D1037
	MPa	5.12 <sup>(3)</sup>	-	3.26 <sup>(3)</sup>	-	ASTM D1037
Across Grain	MPa	4.34 <sup>(2)</sup>	-	2.24 <sup>(2)</sup>	-	ASTM D1037
	MPa	5.95 <sup>(3)</sup>	-	2.88 <sup>(3)</sup>	-	ASTM D1037
<b>Tensile Strength Parallel to Surface of Board</b>						
	MPa	1.42 <sup>(2)</sup>	-	0.83 <sup>(2)</sup>	-	ASTM D1037
	MPa	2.18 <sup>(3)</sup>	-	1.02 <sup>(3)</sup>	-	ASTM D1037
<b>Young's Modulus (E.Mod)</b>						
With Grain	MPa	9898 <sup>(3)</sup>	-	5337 <sup>(3)</sup>	-	ASTM C120
	MPa	7747 <sup>(2)</sup>	-	3974 <sup>(2)</sup>	-	ASTM C120
Across Grain	MPa	11645 <sup>(3)</sup>	-	6474 <sup>(3)</sup>	-	ASTM C120
	MPa	7903 <sup>(2)</sup>	-	4681 <sup>(2)</sup>	-	ASTM C120
<b>Block Shear Strength</b>						
	MPa	3.30 <sup>(3)</sup>	-	1.60 <sup>(2)</sup>	-	ASTM D143
	MPa	3.17 <sup>(2)</sup>	-	1.32 <sup>(3)</sup>	-	ASTM D143

(1) Dried till constant weight (2) Saturated with water (3) Equilibrium conditions

## MECHANICAL AND PHYSICAL PROPERTIES

Parameter	Unit	High Density	Semi-High Density	Medium Density	Textured Nutec	Test Method
<b>Fire Properties</b>						
Surface Spread of Flame	Class	1	1	1	1	SANS 10177: Part 111, BS 476: Part 7
Spread of Flame Index	-	Nil	Nil	Nil	Nil	SANS 10177 Part III
Heat Contribution Index	-	Nil	Nil	Nil	Nil	SANS 10177 Part III
Smoke Emission Index	-	Nil	Nil	Nil	Nil	SANS 10177 Part III
Surface Fire Index	-	Nil	Nil	Nil	Nil	SANS 10177 Part III
<b>Surface Burning Characteristics</b>						
FSI (Flame spread index)	-	0	-	0	0	ASTM E84
SD (Smoke developed index)	-	5	-	3	3	ASTM E 84
Non-Combustibility		Non-combus.	Non-combus.	Non-combus.	Non-combus.	BS 476 Part 4, SANS 10177: Part V
Continuous Temperature	-	150°C	150°C	150°C	150°C	-

(1) Dried till constant weight (2) Saturated with water (3) Equilibrium conditions

## MECHANICAL AND PHYSICAL PROPERTIES

Parameter	Unit	High Density	Semi-High Density	Medium Density	Textured Nutec	Test Method
<b>Other Properties</b>						
<b>Frost Resistance</b> Cycles Completed	-	50	-	50	-	ASTM C1185
<b>Strength Ratio</b>	%	97.5	-	78.5	-	ASTM C1185
<b>Biological Resistance</b> Rodent Resistance Termite Resistance Resistance to Bacteria	Class	B1 No Damage -	- - -	B1 No Damage No Growth	- - -	SANS 5417 SANS 5471 BS 5980

(1) Dried till constant weight (2) Saturated with water (3) Equilibrium conditions

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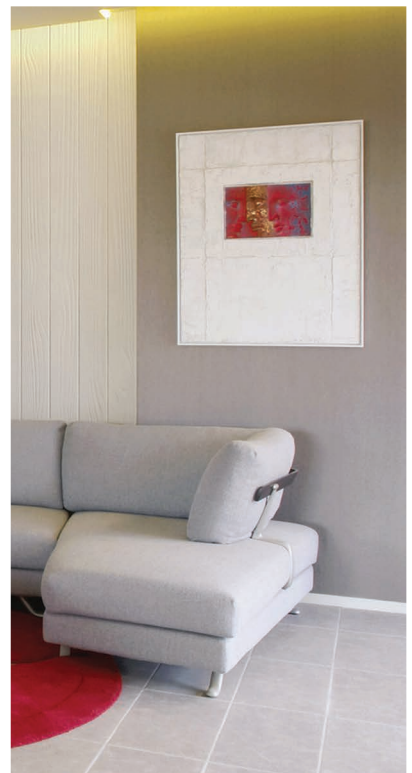
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