
THE
fire
BOOK
RAMCO
HILUX
The best-rated boards for Dry Walls & Ceilings

1

HILUX

RAMCO

Modern structures reflect more than just utility and usability. There is a growing need for buildings that combine culture, and lifestyle and splendor. But do conventional building materials meet such challenging demands? Simply lending itself to basic functionality just does not work any longer in interior design. What then should a modern building material offer apart from just mere look? Aesthetics combined with superior functionality, of course. Some of the features being

- **Extra strength**
- **Water resistance**
- **Chemical resistance**
- **Charming Aesthetics**
- **Value for money**
- **Fire resistance**
- **Termite resistance**
- **Acoustic performance**
- **Eco friendliness**
- **Dimensional stability**

For almost 50 years. Ramco Industries Ltd, a part of the USD 1 Billion Ramco Group, has been In the forefront of innovation answering perplexing challenges with definitive solutions. For the construction industry, Ramco offers an amazing and versatile solution – the future building material – Ramco Hilux Calcium Silicate Boards.

Hilux Calcium Silicate boards are fast replacing conventional building materials such as Gypsum boards, Plywood & Plaster of Paris across the international markets by virtue of their sheer versatility. Several landmark and iconic structures that have stood the test of time bear the Hilux stamp of excellence, signifying stronger, safer and aesthetically appealing buildings.

Ramco Hilux Calcium Silicate Board

Ramco Industries Ltd is one of the best performing, highly efficient producers of Fibre Cement Sheets in India and has pioneered and introduced the innovative Calcium Silicate Board, a versatile building material, using Japanese technology from the A&A Material Corporation, Japan.

Located at Keshwana (Rajasthan) and Arakonam (Tamil Nadu). Ramco Industries' two world class manufacturing plants have a combined capacity of approx. 75,000 metric tonnes per annum. Hilux boards are composed of a composite matrix of Portland cement and mineral additives reinforced with special grade cellulose fibres.

Hilux Calcium Silicate boards are fast replacing conventional building materials such as Gypsum boards, Plywood & Plaster of Paris across the international markets by virtue of their sheer versatility. Several landmark and iconic structures that have stood the test of time bear the Hilux stamp of excellence, signifying stronger, safer and aesthetically appealing buildings.

Ramco Hilux Calcium Silicate Board is manufactured from siliceous and calcareous materials reinforced with fibres. The boards are made in a laminar process and then autoclaved to give a stable crystalline structure.

The boards are light in weight, non-combusitible and water resistant. The stable crystalline structure and autoclaving makes the board very strong, durable and dimensionally stable. HILUX Calcium Silicate boards provide better Fire Protection, Sound and Thermal Insulation Properties.

CONTENTS

1.	Introduction		04
2.	Fire Testing		05
3.	Fire Certification		07
4.	Fire Rated Partitions	One Hour	08
5.	Fire Rated Partitions	Two Hours	10
6.	Fire Rated Partitions	One & Half Hours	12
7.	Fire Rated Partitions	Two Hours	14
7.	Fire Rated High Walls	Two Hours	18
8.	Fire Rated High Walls	Four Hours	20
9.	Functional Features		22

THE fire BOOK

Introduction

The Fire Book Design Guide provides a ready reference to the performance of an extensive range of fire systems.

Ramco has developed effective, practical and cost-effective fire systems for most applications. Fire and structural testing has been carried out for all our products. To complement this extensive testing program, Ramco has obtained certified assessments from appropriate authorities. These assessments are based on test results and expert opinion.

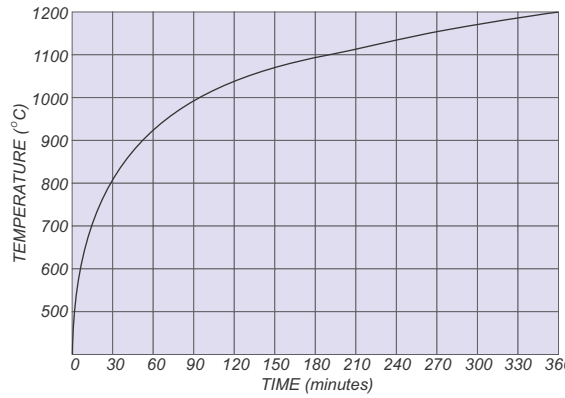
Hilux fire-rated systems have been tested or assessed to IS 3809-1979, BS:476 (Part 20 & 22)-1987 and IS 3614 (Part 2)-1992 at approved testing laboratories. Hilux has developed systems with Fire Resistance Levels upto 4 hours. The systems and performance specifications listed in this manual are guaranteed only for the construction specified. Ramco is continuously developing products, which may result in changes to product specifications, range and performance. The systems and products in this manual are current at the publication date.

5 FIRE TESTING

Fire resistance testing is conducted to the ISO 1182, BS 476 : Part 6:1989+A1:2009; Part 7:1997; Part 5:1979; Part 4:1970 'Fire Resistance Tests of Elements of Building Construction'.

This standard gives the test method and criteria of failure for the various elements of construction such as partition walls, floor/ceilings and roof/ceilings.

FIG A3: STANDARD TIME vs TEMPERATURE CURVE



How the Specimen is Assessed.

The test specimen is heated in the prescribed manner until the failure criteria has been reached, or is terminated by agreement between parties.

Assessment criteria are represented by three performance measurements known as 'Fire Resistance Levels' (FRL).

Structural Adequacy

Failure occurs when the specimen collapses under load.

Insulation

Failure occurs when the average temperature of the unexposed surface of the specimen increases by more than 140°C above the initial temperature, or the temperature at any point of the unexposed surface increases by more than 180°C above the initial temperature.

The test performance of the specimen is expressed as a 'Fire Resistance Level', which indicates the number of minutes for which the specimen fulfils the requirements of the three fire test criteria. These numbers are then rounded down to the nearest regulatory requirement.

Non-load bearing	Load bearing
-/30/30	30/30/30
-/60/60	60/60/60
-/90/90	90/90/90
-/120/120	120/120/120
-/180/180	180/180/180

- The dash indicates no requirement for 'Structural Adequacy', which applies to all non-load bearing systems.
- The first 120 indicates 'Integrity' for 120 minutes.
- The second 120 indicates 'Insulation' for 120 minutes.

For any specified FRL, a system having equal or higher respective criteria may be used. Some systems have multiple FRLs stated. FRLs expressed as x/y/z relate to non-load bearing walls; FRLs expressed as x/y/z relate to load bearing walls; or FRLs expressed as x/y/z* relate to walls with additional design limits.

How the Specimen is Assessed.

Ceiling systems may be required to achieve a 'Resistance to the Incipient Spread of Fire'. This requires the ceiling to provide adequate thermal insulation to prevent combustibles in a roof/ceiling or floor/ceiling cavity from igniting for the specified time. The Building Code of Australia requirement for some ceiling systems is to provide 'Resistance to the Incipient Spread of Fire (RISF), into the space above itself, for not less than 60 minutes'. Systems that meet this requirement are indicated in the system tables.

Fire hazard Properties

Fire hazard properties of wall and ceiling linings in some classes of building are specified by the BCA.

Smoke Proof Walls

Smoke proof walls are required in some Class 9a buildings, and they must be built from non-combustible materials where they do not require an FRL Steel framed wall systems clad with Hilux.

Fire rated smoke proof walls should be selected from the G.I. framed systems with an appropriate FRL.

Smoke proof walls required for Class 9c buildings may use G.I. framing with linings of 12mm Hilux.

Fire Testing

FIRE CERTIFICATION

Best of Fire Protection

FIRE PROTECTION

a)	**Non combustibility**	Non-combustible according to BS 476: part 4-1970
b)	**Surface spread of flame**	Class - 1 as per BS 476: Part -7-1971
c)	**Ignitibility**	'P' NOT EASILY IGNITABLE as per BS 476:Part 5-1968
d)	**Fire Propagation**	Fire propagation index I = 3.79 as per BS 476: Part 6 and 1.2 as per BS 476:Part 6-1989+A1:-2009
e)	**Fire Resistance**	Up to 240 minutes

List of Certifications available

Description	Testing Centre	Code	Result
Non- Combustibility	M/s PSB Corporation, Singapore	BS-476-Part-4 -1970	Non-Combustible
Fire propagation Index	M/s CBRI, Roorkee	BS-476-Part-6 -1981	I = 3.79 & 1.2
Surface Spread of Flame	M/s CBRI, Roorkee	BS-476-Part-7 -1971	Class-1
Ignitability	M/s CBRI, Roorkee	BS-476-Part-5 -1968	"P" Not easily ignitable

List of Certificates available

Fire resistance:			
1x12mm Hilux board + Fillet on each side of 48mm stud + 50x48 Kg/m³. Ceramic wool in the cavity.	M/s CBRI, Roorkee	BS- 476-Part-20/22	One Hour
2x10mm hilux boards on each side of 48mm stud + 50x48 Kg/m³. Ceramic wool in the cavity.	M/s CBRI, Roorkee	BS- 476-Part -20/22	One & Half Hour
2x12mm Hilux board on each side of 48mm stud +50 x 64 Kg/m³. Ceramic wool in the cavity.	M/s CBRI, Roorkee	BS- 476-Part -20/22	Two Hours
1x12mm Hilux board + Fillet on each side of 48 mm stud + 50x64 Kg/m³. Ceramic wool in the cavity.	M/s CBRI, Roorkee	BS- 476-Part -20/22	Two Hours
3x12mm Hilux Boards on each side 98mm stud + 100x64 Kg/m³. Ceramic wool in the cavity.	M/s CBRI, Roorkee	BS- 476-Part -20/22	4 Hours

Fire Resistance :

Hilux Calcium Silicate Boards have Class-1, surface spread of flame with ignitability as "P"- not easily ignitable, hence can provide good fire resistance in the range of 30 minutes to 240 minutes depending on the system design.

ONE HOUR

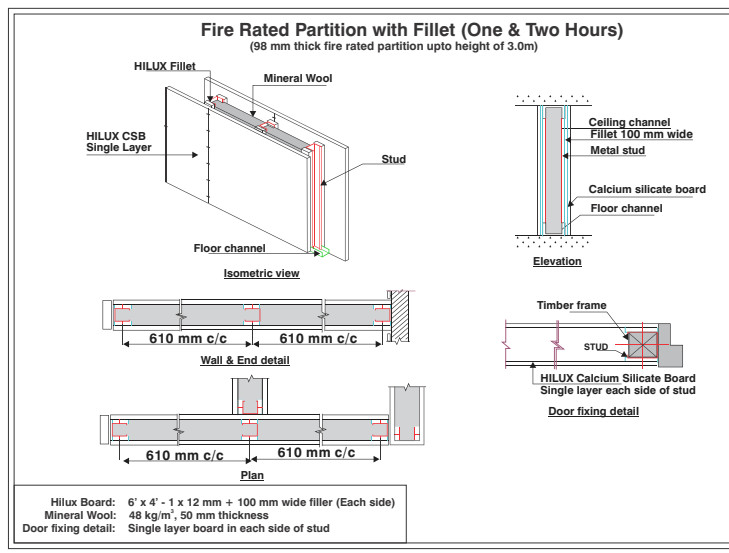
Main System

98 mm thick metal stud partition comprising of a 100 mm wide x 12 mm thick Hilux board fillets (strips) screw fixed with 25 mm long Hilux self-drilling and tapping screws at 200mm centres to both sides of a composite framework which includes a 48 mm branded stud of 0.55 mm thick and having two unequal flanges of 48 and 50 mm each placed at 610 mm center to center in 50 mm branded floor and ceiling channel with two equal flanges of 32 mm each fixed to floor and ceiling at 600 mm center, with the help of nylon sleeves and wood screws. 12 mm thick Hilux boards are then screw fixed by 35 mm long Hilux self-drilling and tapping screws having Phillips head with under head cutter, to the studs and channels on both sides of the frame work. The board's joints are to be staggered to avoid through passage.

PERFORMANCE

System Thickness	98mm
Fire Resistance	One Hour
Sound Insulation	41 dB
Maximum Height	20000mm

Installation



9

ONE HOUR

Insulation

50 mm thick (Density - 48 Kg/m³) Ceramic wool mat is to be placed in the cavity of the partition.

Jointing and Finishing

Finally edges of the facing boards are to be jointed and finished so as to have a seamless finish which includes filling and finishing with specially formulated Hilux jointing compound and self-adhesive Hilux fibre tape. Cement Primer (Oil / Water based) to be provided on entire surface before putty/ painting.

Note:

A Horizontal branded Intermediate channel of web 45mm and equal flanges of 15mm each of 0.9mm thickness is to be provided for every 3 feet level on both sides, if the partition height exceeds the board length to provide edge support to the board.

Details:

Sl. no	Item	Size	Description
1.	Hilux board	12mm thick	One board on each side of studs
2.	Hilux Board Fillets	100mm wide	On each side of all studs and channels
3.	Floor & Ceiling Channel	50 x 32 x 32 x 0.55mm	Top and Bottom perimeter of the partition
4.	Stud	48 x 50 x 48 x 0.55mm	Vertically at 610mm c/c
5.	Intermediate channel	45 x 15 x 15 x 0.9mm	At horizontal board joints
6.	Screws (Phillips Head)	25 and 35mm long, self-drilling with under head cutter	12mm from the edge and 40mm from the corner of the board at 200mm c/c
7.	Insulation	Ceramic wool – 50mm thick and 48 Kg/m³	Placed in the cavity

TWO HOURS

Main System

98 mm thick metal stud partition comprising of a 100 mm wide x 12 mm thick Hilux board fillets (strips) screw fixed with 25 mm long Hilux self-drilling and tapping screws at 200 mm centres to both sides of a composite framework which includes a 48 mm branded stud of 0.55 mm thick and having two unequal flanges of 48 and 50 mm each placed at 610 mm center to center in 50 mm branded floor and ceiling channel with two equal flanges of 32 mm each fixed to floor and ceiling at 600 mm center, with the help of nylon sleeves and wood screws. 12 mm thick Hilux boards are then screw fixed by 35 mm long Hilux self-drilling and tapping screws having Phillips head with under head cutter, to the studs and channels on both sides of the frame work. The board's joints are to be staggered to avoid through passage.

PERFORMANCE

System Thickness	98mm
Fire Resistance	Two Hour
Sound Insulation	43 dB
Maximum Height	20000mm

Installation

Insulation

50 mm thick (Density - 64 Kg /m^3) Ceramic wool mat is to be placed in the cavity of the partition.

11

TWO HOURS

Jointing and Finishing

Finally edges of the Boards are to be jointed and finished so as to have a Seamless finish which includes filling and finishing with specially formulated Hilux jointing compound and 48mm wide self-adhesive Hilux fibre tape. Cement Primer (Oil / Water based) to be provided on entire surface before putty/ painting.

Note:

A Horizontal branded Intermediate channel of web 45mm and equal flanges of 15mm each of 0.9mm thickness is to be provided for every 3 feet level on both sides, if the partition height exceeds the board length to provide edge support to the board.

Details:

Sl. no	Item	Size	Description
1.	Hilux board	12mm thick	One board on each side of studs
2.	Hilux Board Fillets	100mm wide	On each side of all studs and channels
3.	Floor & Ceiling Channel	50 x 32 x 32 x 0.55mm	Top and Bottom perimeter of the partition
4.	Stud	48 x 50 x 48 x 0.55mm	Vertically at 610mm c/c
5.	Intermediate channel	45 x 15 x 15 x 0.9mm	At horizontal board joints
6.	Screws (Phillips Head)	25 and 35mm long, self-drilling with under head cutter	12mm from the edge and 40mm from the corner of the board at 200mm c/c
7.	Insulation	Ceramic wool – 50mm thick and 64 Kg/m^3	Placed in the cavity

ONE & HALF HOURS

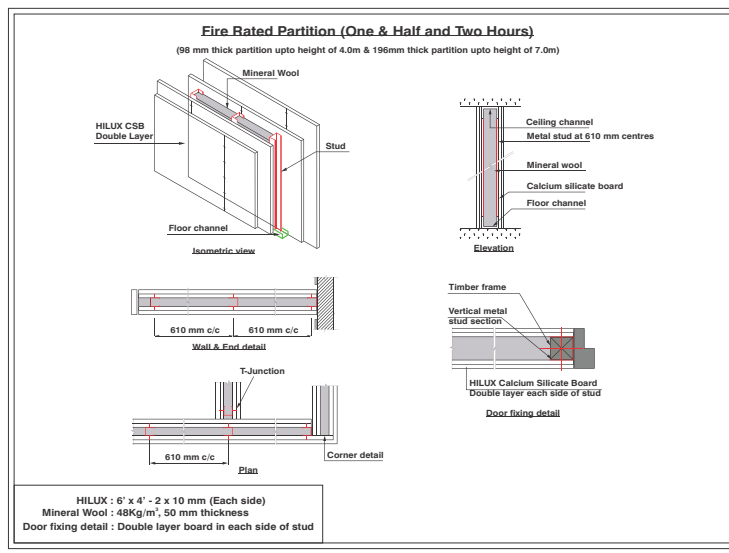
Main System

90 mm thick metal stud partition comprising of a composite framework which includes a 48 mm branded stud of 0.55 mm thick and having two unequal flanges of 48 and 50 mm each placed at 610 mm center to center in 50 mm branded floor and ceiling channel with two equal flanges of 32 mm each fixed to floor and ceiling at 600 mm center, with the help of nylon sleeves and wood screws. Two layers of 10 mm thick Hilux boards are then screw fixed to the studs and channels at 200 mm centers on both sides of the frame work, with 25 & 35 mm long Hilux self-drilling & tapping screws having Phillips head with under head cutter, for first and second layer boards respectively. The board's joints are to be staggered to avoid through passage.

PERFORMANCE

System Thickness	90mm
Fire Resistance	One & Half Hour
Sound Insulation	42 dB
Maximum Height	20000mm

Installation



13

ONE & HALF HOURS

Insulation

50 mm thick (Density - 48 Kg/m^3) Mineral wool mat is to be placed in the cavity of the partition.

Jointing and Finishing

Finally edges of the facing boards are to be jointed and finished so as to have a seamless finish which includes filling and finishing with specially formulated Hilux jointing compound and 48mm wide self-adhesive Hilux fibre tape. Cement Primer (Oil / Water based) to be provided on entire surface before putty/ painting.

Note:

A Horizontal branded Intermediate channel of web 45mm and equal flanges of 15mm each of 0.9mm thickness is to be provided for every 3 feet level on both sides, if the partition height exceeds the board length to provide edge support to the board.

Details:

Sl. no	Item	Size	Description
1.	Hilux board	12mm thick	Two boards on each side of studs
3.	Floor & Ceiling Channel	50 x 32 x 32 x 0.55mm	Top and Bottom perimeter of the partition
4.	Stud	48 x 50 x 48 x 0.55mm	Vertically at 610mm c/c
4.	Intermediate channel	45 x 15 x 15 x 0.9mm	At horizontal board joints
5.	Screws (Phillips Head)	25 and 35mm long, self-drilling with under head cutter	12mm from the edge and 40mm from the corner of the board at 200mm c/c
6.	Insulation	Ceramic wool – 50mm thick and 48 Kg/m^3	Placed in the cavity

TWO HOURS

Main System

98 mm thick metal stud partition comprising of a composite framework which includes a 48 mm branded stud of 0.55 mm thick and having two unequal flanges of 48 and 50 mm each placed at 610 mm center to center in 50 mm branded floor and ceiling channel with two equal flanges of 32 mm each fixed to floor and ceiling at 600 mm center, with the help of nylon sleeves and wood screws. Two layers of 12 mm thick Hilux boards are then screw fixed to the studs and channels at 200 mm centres on both sides of the frame work, with 25 & 35 mm long Hilux self-drilling & tapping screws having Phillips head with under head cutter, for first and second layer boards respectively. The board's joints are to be staggered to avoid through passage.

PERFORMANCE

System Thickness	98mm
Fire Resistance	Two Hour
Sound Insulation	43 dB
Maximum Height	20000mm

Installation

Insulation

50 mm thick (Density - 64 Kg/m^3) Ceramic wool mat is to be placed in the cavity of the partition.

15

TWO HOURS

Jointing and Finishing

Finally edges of the Boards are to be jointed and finished so as to have a flush look which includes filling and finishing with specially formulated Hilux jointing compound and 48 mm wide self-adhesive Hilux fibre tape. Cement Primer (Oil / Water based) to be provided on entire surface before putty/ painting.

Note:

A Horizontal branded Intermediate channel of web 45mm and equal flanges of 15mm each of 0.9mm thickness is to be provided for every 3 feet level on both sides, if the partition height exceeds the board length to provide edge support to the board.

Details:

Sl. no	Item	Size	Description
1.	Hilux board	2 x 12mm thick	Two boards on each side of studs
3.	Floor & Ceiling Channel	50 x 32 x 32 x 0.55mm	Top and Bottom perimeter of the partition
4.	Stud	48 x 50 x 48 x 0.55mm	Vertically at 610mm c/c
4.	Intermediate channel	45 x 15 x 15 x 0.9mm	At horizontal board joints
5.	Screws (Phillips Head)	25 and 35mm long, self-drilling with under head cutter	12mm from the edge and 40mm from the corner of the board at 200mm c/c
6.	Insulation	Ceramic wool – 50mm thick and 48 Kg/m^3	Placed in the cavity

TWO HOURS

Main System

98 mm thick metal stud partition comprising of a composite framework which includes a 146 mm branded stud of 0.55 mm thick and having two unequal flanges of 48 and 50 mm each placed at 610 mm center to center in 148 mm branded floor and ceiling channel with two equal flanges of 32 mm each fixed to floor and ceiling at 600 mm center, with the help of nylon sleeves and wood screws. Two layers of 12 mm thick Hilux boards are then screw fixed to the studs and channels at 200 mm centres on both sides of the frame work, with 25 & 35 mm long Hilux self-drilling & tapping screws having Phillips head with under head cutter, for first and second layer boards respectively. The board's joints are to be staggered to avoid through passage.

PERFORMANCE

System Thickness	98mm
Fire Resistance	Two Hour
Sound Insulation	43 dB
Maximum Height	20000mm

Installation

Insulation

50 mm thick (Density - 64 Kg/m^3) Ceramic wool mat is to be placed in the cavity of the partition.

17

TWO HOURS

Jointing and Finishing

Finally edges of the Boards are to be jointed and finished so as to have a flush look which includes filling and finishing with specially formulated Hilux jointing compound and 48mm wide self-adhesive Hilux fibre tape. Cement Primer (Oil / Water based) to be provided on entire surface before putty/ painting.

Note:

A Horizontal branded Intermediate channel of web 45mm and equal flanges of 15mm each of 0.9mm thickness is to be provided for every 3 feet level on both sides, if the partition height exceeds the board length to provide edge support to the board.

Details:

Sl. no	Item	Size	Description
1.	Hilux board	2 x 12mm thick	Two boards on each side of studs
3.	Floor & Ceiling Channel	148 x 32 x 32 x 0.55mm	Top and Bottom perimeter of the partition
4.	Stud	146 x 50 x 48 x 0.55mm	Vertically at 610mm c/c
4.	Intermediate channel	45 x 15 x 15 x 0.9mm	At horizontal board joints
5.	Screws (Phillips Head)	25 and 35mm long, self-drilling with under head cutter	12mm from the edge and 40mm from the corner of the board at 200mm c/c
6.	Insulation	Ceramic wool – 50mm thick and 64 Kg/m^3	Placed in the cavity

TWO HOURS

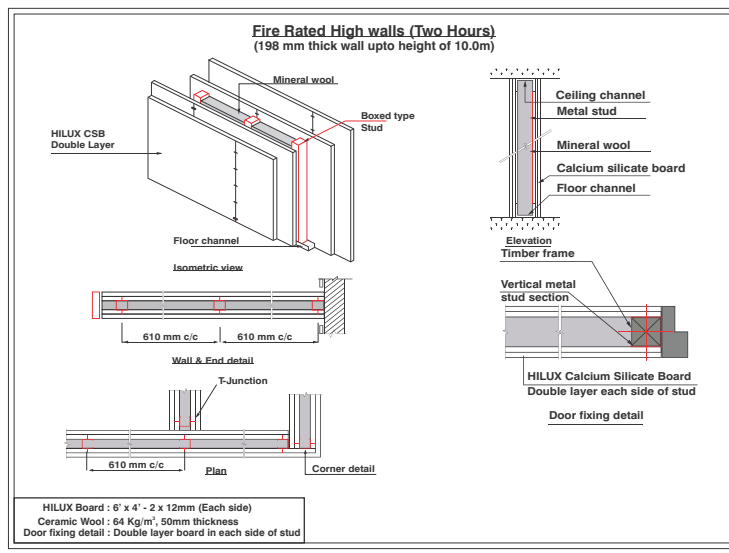
Main System

198 mm thick metal stud partition comprising of a composite framework which includes two branded studs of size 146 x 1.0 mm, and having two unequal flanges of 48 and 50 mm each, boxed together and placed at 610 mm center to center in 148 mm branded floor and ceiling channel with two equal flanges of 32 mm each fixed to floor and ceiling at 600 mm center, with the help of nylon sleeves and wood screws. Two layers of 12 mm thick Hilux boards are then screw fixed to the studs and channels at 200 mm centres on both sides of the frame work, with 25 & 35 mm long Hilux self-drilling & tapping screws having Phillips head with under head cutter, for first and second layer boards respectively. The board's joints are to be staggered to avoid through passage.

PERFORMANCE

System Thickness	198mm
Fire Resistance	Two Hour
Sound Insulation	54 dB
Maximum Height	10000mm

Installation



TWO HOURS

Insulation

50 mm thick (Density - 64Kg/m^3) Ceramic wool mat is to be placed in the cavity of the partition.

Jointing and Finishing

Finally edges of the Boards are to be jointed and finished so as to have a flush look which includes filling and finishing with specially formulated Hilux jointing compound and 48mm wide self-adhesive Hilux fibre tape. Cement Primer (Oil / Water based) to be provided on entire surface before putty/ painting.

Note:

A Horizontal branded Intermediate channel of web 45mm and equal flanges of 15mm each of 0.9mm thickness is to be provided for every 3 feet level on both sides, if the partition height exceeds the board length to provide edge support to the board.

Details:

Sl. no	Item	Size	Description
1.	Hilux board	2 x 12mm thick	Two boards on each side of studs
3.	Floor & Ceiling Channel	148 x 32 x 32 x 1mm	Top and Bottom perimeter of the partition
4.	Stud	146 x 50 x 48 x 1mm	Vertically at 610mm c/c
4.	Intermediate channel	45 x 15 x 15 x 0.9mm	At horizontal board joints
5.	Screws (Phillips Head)	25 and 35mm long, self-drilling with under head cutter	12mm from the edge and 40mm from the corner of the board at 200mm c/c
6.	Insulation	Ceramic wool – 50mm thick and 64 Kg/m^3	Placed in the cavity

FOUR HOURS

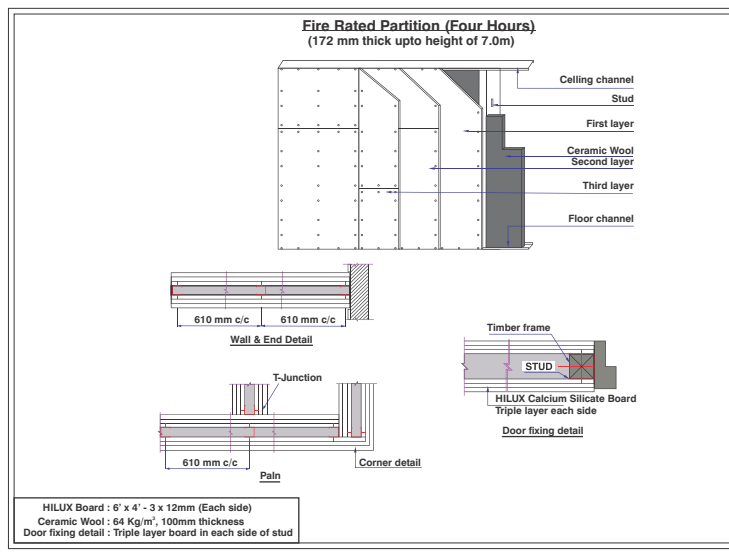
Main System

172 mm thick metal stud partition comprising of a composite framework which includes a 98 mm branded stud of 1.0 mm thick and having two unequal flanges of 48 and 50mm each placed at 610 mm center to center in 100 mm branded floor and ceiling channel with two equal flanges of 50 mm each fixed to floor and ceiling at 600 mm center, with the help of metal expansion fasteners. Three layers of 12 mm thick Hilux boards are then screw fixed to the studs and channels at 200 mm centres on both sides of the frame work, with 25,35 & 50 mm long Hilux self-drilling & tapping screws having Phillips head with under head cutter, for first, second and third layer boards respectively. The board's joints are to be staggered, horizontally as well as vertically, to avoid through passage.

PERFORMANCE

System Thickness	172mm
Fire Resistance	Four Hours
Sound Insulation	54 dB
Maximum Height	20000mm

Installation



FOUR HOURS

Insulation

100mm thick (Density -64Kg/m^3) Ceramic wool mat is to be placed in the cavity of the partition.

Jointing and Finishing

Finally edges of the Boards are to be jointed and finished so as to have a flush look which includes filling and finishing with specially formulated Hilux jointing compound and 48mm wide self-adhesive Hilux fibre tape. Cement Primer (Oil / Water based) to be provided on entire surface before putty/ painting.

Note:

A Horizontal branded Intermediate channel of web 45mm and equal flanges of 15mm each of 0.9mm thickness is to be provided for every 3 feet level on both sides, if the partition height exceeds the board length to provide edge support to the board.

Details:

Sl. no	Item	Size	Description
1.	Hilux board	3 x 12mm thick	Three boards on each side of studs
3.	Floor & Ceiling Channel	100 x 32 x 32 x 1mm	Top and Bottom perimeter of the partition
4.	Stud	98 x 50 x 48 x 1mm	Vertically at 610mm c/c
4.	Intermediate channel	45 x 15 x 15 x 0.9mm	At horizontal board joints
5.	Screws (Phillips Head)	25, 35mm and 50mm long, self-drilling with under head cutter	12mm from the edge and 40mm from the corner of the board at 200mm c/c
6.	Insulation	Ceramic wool – 100mm thick and 64 Kg/m^3	Placed in the cavity

Fire Resistance

The most important requirement in any building is fire safety. To this end, Hilux provides excellent protection from fire and out performs all other building material's results achieved in standard fire tests contained in various parts of British Standard- 476. Hilux Calcium Silicate Boards have Class-1 Surface Spread of Flame with Ignitability as "P"- not easily ignitable, hence can provide good fire resistance upto 240 minutes, depending on the construction design. The fire test methods used are:

Non-Combustibility

Building materials are classified as either non-combustible or combustible according to their behavior when tested to BS 476-Part - 4:1970. This test provides a measure of the propensity of materials to generate heat and flames under standardized heat exposure conditions. It represents the highest and most stringent standard for the fire performance of materials. Hilux Calcium Silicate Board has gone through this test and has been rated as Non-Combustible by CBRI, Roorkee.

Surface Spread of Flame

This test, as specified in BS-476-Part-7: 1971, is used to determine the tendency of materials to support the spread of flame across their surfaces. Materials are classified Class-1 to Class-4, in descending order of performance. These classifications are applied mainly to wall and ceilings. In this test too, Hilux passed with the highest rating of Class-1. Hilux boards have Class-1 Surface Spread of Flame with ignitability as "P", NOT EASILY IGNITABLE, and hence they can provide good fire resistance in the range of 30 minutes to 240 minutes, depending on the construction design. Fire resistance is determined by tests to BS-476- Part -20 & 22-1987, "Fire test on Building Materials and structures" in which a specimen is subjected to heating conditions based on a standard temperature/time curve. Hilux Board Partition Systems have been tested at CBRI, Roorkee and have passed 60, 90, 120 minutes fire ratings.

Fire Propagation

This test as per BS-476-Part-6: 1968 provides a means of measuring the rate of heat evolution of materials exposed to flames and radiant heat. Hilux passed this test with Fire Propagation Index (I) = 3.79 & 1.2.

contd..

Thermal Insulation

Thermal insulation involves maintaining the internal temperature within a building and not allowing it to be affected by the temperature of the external atmosphere. Buildings with centralized air-conditioning require their thermal insulators to protect its coolness within and not to allow it to go out. Good thermal insulated materials can block the passage of external heat from penetrating cooled areas. Alternatively, buildings, in colder climates which have a central heating system will lose heat to the external atmosphere. This can also be prevented by using good thermal insulated materials, with low Thermal Conductivity. Hilux Calcium Silicate boards are extensively used in keeping the cooling or heating costs down, in both hot and cold environments across the world, in new as well as existing buildings

Thermal Conductivity

Thermal Conductivity is the measure of a material's ability to transmit heat. It is expressed as heat flow in watts per square meter of surface area for a temperature gradient of one Kelvin(K) per meter thickness and is expressed as W/mK. Dense materials have a high thermal conductivity and are inefficient thermal insulates whereas lightweight materials have low conductivity and act as effective thermal insulates. The lower the (K) value of a material, the better is its insulating efficiency.

Thermal resistance

Thermal Resistance®: Thermal resistance is the measure of the resistance to the passage of heat offered by the thickness of a material and is expressed as m^2 K/W. The thermal resistance of material is obtained by dividing the thickness of material in meter by its thermal conductivity (K) value. (R=Thickness in meters / K value) Hilux boards have "K" value of 0.18 W/mK, hence can contribute to energy savings and can provide comfort to the occupants of the buildings in which they are used.

Thermal Transmittance (U)

Thermal transmittance of a building element is a property of its whole construction including air spaces and is the measure of its ability to transmit heat under steady state condition. It is calculated by taking reciprocal of the sum of all the individual thermal resistances. It is expressed as W/m^2K. The lower the (U) value of the element, the better is its thermal insulation. As mentioned earlier, the thermal insulation of Hilux boards is very good as it has good thermal resistance and also as a very low thermal transmittance, hence it retains the heat within the building. These inherent qualities of Hilux make it imminently suitable for a wide variety of applications falling under three broad solution heads:

Compatibility

The boards will not promote corrosion or saponification of paints or affect bituminous compound. Hilux boards are compatible with most common building materials.

Light Reflection

Undecorated boards provide 75% light reflectance.

Dimensional Stability

The boards are cured in a high pressure steam autoclave which causes an irreversible chemical change, thus providing high dimensional and chemical stability accompanied by low alkalinity.

RIL, Keshwana Plant, Kotputli

Ramco Industries

Ramco Hilux is brought to you by Ramco Industries Limited, a part of the US$ 1 billion Ramco Group with interests in cement, dry walls & ceiling products, cotton yarn, surgicals & software. Ramco Industries is one of the leading building materials manufacturers in South Asia and has been in the forefront of innovation, answering perplexing challenges with definitive solutions.

Ramco Hilux is manufactured at the ISO 9001 & ISO 14001 certified state-of-the-art plant in Keshwana, Rajasthan and distributed across India through its 300-strong dealer network.

ISO 9001 CERTIFIED | ISO 14001 CERTIFIED

Boards	Acoustic Tiles	Ceiling Tiles	Accessories
Chroma Walls	Tiny Hole Perforated	Semi Pin Hole	Finishing Jointing Compound, Fibre Mesh Tape
Wall Woods	Random Slit Perforated	Semi Pin Hole Pquare	
Visual Walls	Round Hole Perforated	Tiny Stars	Frame Work Accessories G.I. Channels, Connecting Clip, Soffit Cleat, Rawl Plug
Marble Walls	Square Hole Perforated	9 Squares	
	Tiny Slit Perforated		
	Round Hole		
	Straight Slit Perforated		Minor Accessories Self Drilling and Tapping Screws

RAMCO HILUX
CALCIUM SILICATE Dry Walls & Ceilings

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