

TSM



CEMENT BOARD CONSTRUCTION GUIDE

MULTI-PURPOSE CONSTRUCTION BOARD
BAKER BOARD/ BASE BOARD/ BUILDING
PRODUCT/ BUILDING MATERIAL

SINCE 1989





ABOUT US

Zhejiang Terasun Air Duct Co.,Ltd., founded in 1989, is a large enterprise specializing in production of building products. Terasun is committed to researching and developing environmental-friendly and energy saving building materials.



ISO 9001
Quality System Approved

ISO 14001
Environmental Quality

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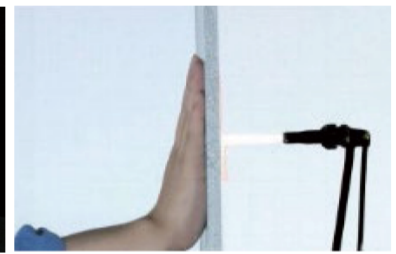
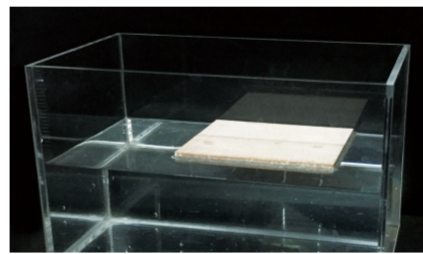
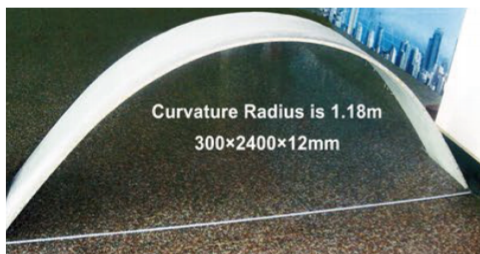
TSM PRODUCT

TSM Cement Board

Suitable for use in many interior and exterior applications, even in challenging conditions.

TSM Cement LIGHT

Weight 50% less than other cement board on the market.



TSM Key Benefits:

- **Mold/Fungus Resistant:** Does not support mold/fungus growth
- **Moisture Resistant:** Resistant to weather, freeze/thaw & standing water
- **Termite/Vermin Resistant:** Provides no food value to insects/vermin
- **Dimensionally Stable:** Exhibits excellent resistance to dimensional changes when exposed to variations in temperature & moisture
- **Environmentally Friendly:** no formaldehyde or asbestos
- **Workability:** Installs quickly, easy cutting and fastening
- **Durable:** Flexible and strong, creative design possibilities, bending radius of ≥ 1 m

Applications:

Product	Floors	Countertops	Walls	Ceilings	Exteriors	SIP panel
6mm TSM	✓	✓	✗	✓	✗	✓
8mm TSM	✓	✓	✗	✓	✗	✓
10mm TSM	✓	✓	✓	✓	✓	✓
12mm TSM	✓	✓	✓	✓	✓	✓
16mm TSM	✓	✓	✓	✓	✓	✓
18mm TSM	✓	✓	✓	✗	✓	✗
20mm TSM	✓	✓	✓	✗	✓	✗
12mm TSM LIGHT	✗	✗	✓	✓	✓	✓



TSM ADVANTAGES

The ideal substrate withstands prolonged exposure to moisture in both interior and exterior applications.

RESISTS MOISTURE BETTER

- Stays intact when exposed to water: will not rot, disintegrate or swell – built for the long run
- Achieves the industry’s lowest water, absorption rating – offering better installation
- Helps inhibit mold growth with the highest possible score on mold tests

STAYS STRONG AND LASTS LONG

- Resists impact and remains dimensionally stable – extending the life of your project
- Holds up to the toughest conditions

INSTALLS QUICKLY

- Lightweight and easy to cut – speeding up installation
- Reduces job site waste – easier, cleaner cut

WORKS FOR INTERIOR AND EXTERIOR PROJECTS

- One panel, many applications
- Great for all interior applications, as well as exterior decks and outdoor kitchens
- Durable substrate for direct-applied coating systems

OFFERS BEST-IN-CLASS WARRANTY

- 30-year limited warranty: Interior applications
- 15-year limited warranty: Exterior applications

TSM Defining Characteristics

Physical feature benefits	TSM cement boards	Other cement boards	Fiber cement boards
Low-weight glass-mesh cement board	✓	✗	✗
Reinforced edge	✓	✗	✗
Fasten near edge with no breakout	✓	✗	✗
Highest damage Resistance from handling	✓	✗	✗
Cleanest to score and snap	✓	✗	✗
Lowest water absorption	✓	✗	✗
Cut with utility knife VS. Power tools	✓	✓	✗
Standard fasteners countersink into board	✓	✓	✗
Can be used in both residential and commercial steam rooms and saunas	✓	✓	✗
Inorganic VS. Organic Core	✓	✓	✗
30-year Warranty for Interior Use	✓	✗	✗
15-year Warranty for Exterior Use	✓	✗	✗



Recent Projects



Solution for Any Application



TSM CEMENT BOARD

- Lightweight cement tile backerboard
- Water-durable, mold-resistant substrate for high-moisture areas
- Suitable for using in interior or exterior applications
- Will not rot, warp, delaminate or disintegrate
- Easy to cut and fasten
- Noncombustible



Interior Application:

Bathrooms:

Shower and tub enclosures
Garden/whirlpool tubs,
Steamrooms and saunas

Kitchens:

Countertops
Backsplashes

Special Places :

Swimming pool and whirlpool decks

Flooring:

Entryways and foyers
Kitchens and Bathrooms
Laundry rooms

Walls:

Bathrooms
Accent walls
Fireplaces

Exterior Application :

TSM can meet requirements of various kinds of exterior applications, including Cement Board Stucco Systems, Cement Board Masonry Veneer Wall systems, Exterior Insulation and Finish System.

Commercial exteriors
Residential exteriors
Outdoor kitchens
Decks

Cement Board Stucco Wall System



Combine the strength and durability of TSM cement board with the performance and aesthetics of reinforced base coats and textured finishes. Use in residential and low-rise commercial applications.

Cement Board Masonry Veneer Wall System



Combine the strength and durability of TSM cement board with the popular beauty of stone and thin brick veneers. Use in residential and low-rise commercial applications.

TECHNICAL DATA

Nominal Dimensions	1200x2400x12mm
Dimensions tolerance (EN 12467)	Level 1(+/-3mm)
Thickness tolerance (EN 12467)	Level 1(+/-0.6mm)
Bending Strength(EN 12467)	≥6.2MPa
Bending Radius	2m
Resistance to Fire (EN13501-1:2013)	A1(non-combustible)
Water Vapour Transmission	1975g/h m ²
Water Impermeability (EN 12467)	Category A
Freeze-thaw cycle (EN 12467)	Category A(100 cycles)
Heat-rain (EN 12467)	Category A(50 cycles)
Warm water(EN 12467)	Category A(56 days)
Soak Dry(EN 12467)	Category A(50 cycles)
Fungus Resistance	(No growth)
Bacteria Resistance	(No growth)
Sounding proofing	41dB
Nail holding power	20-60N
Non-formaldehyde	Yes
Non Asbestos	Yes
Non-Toxic	Yes

Size & Packaging / TSM cement board

Size:thickness,width and length	Qty/ 20GP
6mmx1200mmx2400mm	1112 PCS
8mmx1200mmx2400mm	832PCS
10mmx1200mmx2400mm	664PCS
12mmx1200mmx2400mm	556PCS
16mmx1200mmx2400mm	416PCS
18mmx1200mmx2400mm	372PCS
20mmx1200mmx2400mm	332PCS

INSTALLATION GUIDE - INTERIOR APPLICATIONS

An ideal substrate for interior applications, such as:

- Shower and tub enclosures
- Garden/whirlpool tubs
- Countertops
- Backsplashes
- Steamrooms and saunas
- Swimming pool and whirlpool decks and enclosures
- Floor underlayment
- Entryways
- Kitchens
- Bathrooms
- Foyers
- Laundry rooms

WALLS AND CEILINGS

Wall Framing: Edges of TSM parallel to framing should be continuously supported. Provide additional blocking when necessary to permit proper attachment. Do not install TSM directly over protrusions from stud plane, such as heavy brackets and fastener heads. Studs above a shower floor should either be notched or furred to accommodate the thickness of the waterproof membrane or pan. The surround opening for a tub or precast shower receptor should not be more than 1/4" (6.35mm) longer than unit to be installed.

Ceiling Framing: The deflection of the complete ceiling assembly due to dead load (including insulation, TSM, bonding material and facing material) should not exceed L/360. The dead load applied to the ceiling frame should not exceed 10 psf (0.0004788Mpa). Ceiling joist or furring channel should not exceed 16" o.c.(406.4mm) (Edges of TSM parallel to framing should be continuously supported.) Provide additional blocking when necessary to permit proper attachment.

TSM Cement Board: Apply TSM with ends and edges closely butted but not forced together. Stagger ends joints in successive courses. Drive fasteners into field of cement board first, working toward ends and edges. Space fasteners maximum 8"o.c. (203.2mm) for walls, 6"o.c. (152.4mm) for ceilings with perimeter fasteners at least 3/8" (9.5mm) and less than 5/8" (15.9mm) from ends and edges. Ensure TSM is tight to framing.

Joint Reinforcement: Trowel bonding material to completely fill the tapered recessed board joints and gaps between each panel. On non-tapered joints, apply a 6" (152.4mm) wide, approx. 1/16" (1.59mm) thick coat of bonding material over entire joint. For all joints, immediately embed 2" (50.8mm) alkali-resistant fiberglass mesh tape fully into applied bonding material and allow it to cure. For outside corners, 4" (101.6mm) wide mesh tape is recommended. Same bonding material should be applied to corners, control joints, trims and other accessories. Feather bonding material over fasteners to fully conceal.



SHOWER INSTALLATION

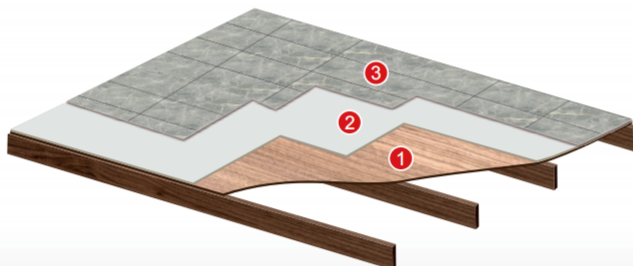
1. TSM cement board
2. Membrane
3. Mortar
4. Mesh tape
5. Tile

FLOORS AND COUNTERS

Subfloor or Base: For flooring applications with 16" o.c. (406.4mm) floor joists, 5/8" (15.9mm) tongue-and-groove exterior-grade plywood or 3/4" (19.05mm) tongue-and-groove exterior-grade OSB may be used. For 19.2" o.c. (487.7mm) and 24" o.c. (609.6mm) floor joists, 3/4" (19.05mm) tongue-and-groove exterior-grade plywood or OSB must be used. Tile size for floors with 24" o.c. (609.6mm) floor joists must be 12" x 12" (304.8x304.8mm) or larger. The joist and subfloor assembly must meet L/360 as well as the appropriate code tables for live and dead loads.

Underlayment: Using a 1/4" (6.35mm) square-notched trowel, apply a setting bed of polymer-modified mortar (or thin-set mortar) to the subfloor or counter base. Immediately laminate TSM to subfloor or base leaving a 1/8" (3.18mm) space between boards at all joints and corners. Leave a 1/4" (6.35mm) gap along walls. Stagger all joints so that they do not line up with underlying substrate joints. Fasten TSM every 8" o.c. (203.2mm) throughout board field and around all edges

while setting bed mortar is still workable. Around perimeter of each board, locate fasteners 2" (50.8mm) from corners and not less than 3/8" (9.53mm) from the edges. Fill all joints solid with bonding material. On non-tapered joints such as butt ends, apply a 6" (152.4mm) wide, 1/16" (1.59mm) thick coat over the entire joint. For all joints, immediately embed 2" (50.8mm) fiberglass mesh tape fully into applied bonding material; ensure that tape is centered over joint. Apply bonding material over fasteners to fully conceal. Remove all excess bonding material and allow to cure.



FLOOR UNDERLAYMENT

1. Subfloor
2. TSM cement board
3. Tile



COUNTERTOP INSTALLATION

1. Plywood
2. Mortar
3. TSM cement board
4. Tile

INSTALLATION GUIDE - EXTERIOR APPLICATIONS

An ideal substrate for exterior applications, such as:

- Tile applications
 - Stucco applications
 - Cement board stucco
 - Thin brick
- Adhered stone veneer
 - Thin porcelain tile
 - Ventilated rainscreen facade
- EIFS
 - Continuous Insulation
 - Outdoor kitchens/grills

WALLS AND CEILINGS

Wall Framing: Studs should be spaced a maximum of 16" o.c. (406.4mm) Edges/ends of TSM parallel to framing should be continuously supported. Provide additional blocking when necessary to permit proper TSM attachment. Do not install TSM directly over protrusions from stud plane such as heavy brackets or fastener heads.

Ceiling Framing: The deflection of the complete ceiling assembly due to dead load (including insulation, TSM, bonding material and facing material) should not exceed L/360. The dead load applied to the ceiling frame should not exceed 10 psf (0.0004788Mpa) . Ceiling joist or furring channel should not exceed 16" o.c. (406.4mm) (Edges of TSM parallel to framing should be continuously supported.) Provide additional blocking when necessary to permit proper attachment.

Water Barrier: While TSM is unaffected by moisture, a water/air resistive barrier (WRB) must be installed to protect the cavity. The type and specific placement or location of the water barrier will vary based on local building codes and/or manufacturers' warranties. Consult the WRB manufacturer's recommendations for specific installation guidelines.

TSM Cement Board: Apply TSM with ends and edges closely butted but not forced together. Stagger end joints in successive courses. Drive fasteners into field of cement board first, working toward ends and edges. Space fasteners maximum 8" o.c. (203.2mm) for walls, 6" o.c. (152.4mm) for ceilings with perimeter fasteners at least 3/8" (9.53mm) and less than 5/8" (15.9mm) from ends and edges.

Joint Reinforcement: Trowel bonding material to completely fill the tapered recessed board joints and gaps between each panel. On non-tapered joints, apply a 6" (152.4mm) wide, approximately 1/16" (1.59mm) thick coat of bonding material over entire joint. For all joints, immediately embed 4" (101.6mm) alkali-resistant fiberglass mesh tape fully into applied bonding material and allow to cure. Same bonding material should be applied to corners, control joints, trims or other accessories. Feather bonding material over fasteners to fully conceal.



DECKS

Subfloor: Plywood should be securely glued and fastened to floor joists spaced a maximum of 16" o.c. (406.4mm). Subfloor should be sloped at a minimum pitch of 1/4" (6.35mm) per foot. The floor surface should be true to plane within 1/8" (3.18mm) in 10' (254mm) .

Underlayment: Using a 1/4" (6.35mm) square-notched trowel, apply a setting bed of mortar to the subfloor. Immediately laminate TSM to subfloor, leaving a 1/8" (3.18mm) space between boards at all joints and corners. Leave a 1/4" (6.35mm) gap along walls. Stagger joints so they do not line up with underlying substrate joints. Fasten TSM every 8" o.c. (203.2mm) throughout board field and around all edges while setting bed mortar is still workable. Around perimeter of each board, locate fasteners 2" (50.8mm) from the corners and not less than 3/8" (9.53mm) from the edges. Fill all joints solid with bonding material. On non-tapered joints such as butt ends, apply a 6" (152.4mm) wide, 1/16" (1.59mm) thick coat over the entire joint. For all joints, embed alkali-resistant fiberglass mesh tape fully into applied bonding material; ensure that tape is centered over joint. Apply bonding material over fasteners to fully conceal. Remove all excess bonding material and allow it to cure.

Waterproof Membrane: Trowel apply waterproof membrane to the entire surface of the cement board, following membrane manufacturer's installation instructions in detail.



CONTINUOUS INSULATION

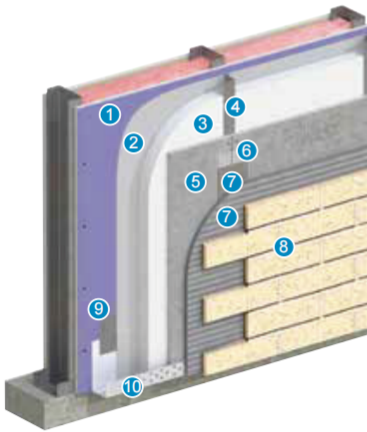
For use in residential and low-rise commercial applications, Continuous Insulation offers a complete, engineered solution for required structural performance. Including TSM as a component in this system reinforces the building and provides the ability to incorporate an effective water-management system.

BENEFITS INCLUDE

- Engineered system that allows a faster installation while providing superior quality control
- Helps mitigate the loss of heat/air conditioning by insulating the studs (reduces thermal bridging)
- Helps eliminate air and moisture leakage
- Appropriate for all climates, resists the growth of mold and mildew, and offers fire protection
- Provides added dimensional stability
- Helps prevent the water/air resistive barrier (WRB) from being compromised as assembly components shift
- Provides a 15-year exterior warranty – the industry’s best

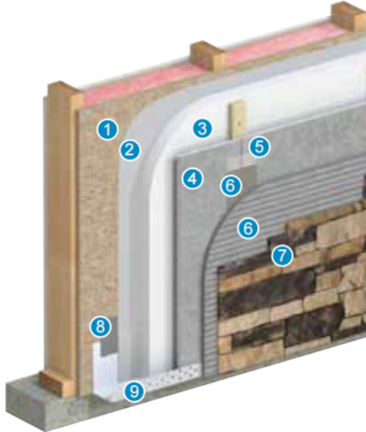
LIMITATIONS

- Sheathing selection and installation varies according to type of wall construction
- Code-approved water/air resistive barrier (WRB) must first be installed (type and placement will vary per local building codes and/or manufacturer’s specifications, installation guidelines and warranties)



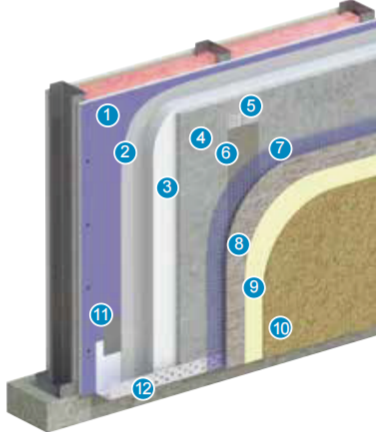
Continuous Insulation–Z Furring–Installation

1. Sheathing
2. Weather Resistant Barrier
3. Insulation
4. Z-Furring
5. TSM Cement Board
6. Mesh Tape
7. Mortar
8. Thin Brick Veneer
9. Flashing Tape
10. Weep Screed



Continuous Insulation–Batten Strip

1. Sheathing
2. Weather Resistant Barrier
3. Insulation
4. TSM Cement Board
5. Mesh Tape
6. Mortar
7. Thin Stone Veneer
8. Flashing Tape
9. Weep Screed



Continuous Insulation–Specialty Fastener

- | | |
|------------------------------|-------------------|
| 1. Sheathing | 7. Mesh |
| 2. Weather Resistant Barrier | 8. Base Coat |
| 3. Insulation | 9. Primer |
| 4. TSM Cement Board | 10. Finish Coat |
| 5. Mesh Tape | 11. Flashing Tape |
| 6. Base Coat | 12. Weep Screed |

CEMENT BOARD STUCCO WALL SYSTEMS (CBSS)

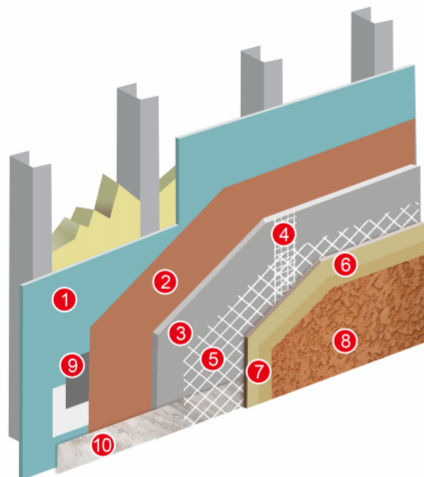
For use in residential and low-rise commercial applications, CBSS provides a drainage system to help preventing water from penetrating behind cladding in framed construction.

BENEFITS INCLUDE

- Appropriate for all climates and resists the growth of mold and mildew
- Extremely durable with increased resistance to impact and inclement weather
- Acrylic polymers provide more resistance to fading, cracking and peeling
- Engineered system that allows a faster installation while providing superior quality control (manufactured product that must comply with ASTM product specifications)
- Provides a 15-year exterior warranty – the industry’s best

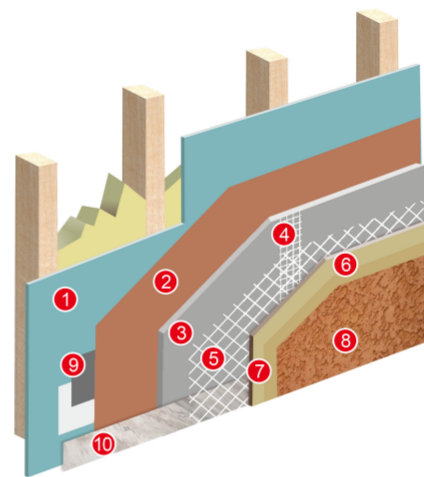
LIMITATIONS

- Follow finish material manufacturer's instructions for proper installation
- Treat joints in TSM with mesh tape and base coat
- Thin veneer construction can reveal planar irregularities in framing
- Minor cracking at joints may become visible in finished exterior surface
- Exterior finishes applied directly to TSM. Reinforcing mesh must be embedded in base coat (consult exterior finish manufacturer for additional installation requirements)
- Conventional cement plaster systems Self-fuming metal lath must be used over TSM and fastened to studs
- Code-approved water/air resistive barrier (WRB) must first be installed to protect the cavity (type and placement will vary per local building codes and/or manufacturer’s specifications, installation guidelines and warranties)



CEMENT BOARD STUCCO

- | | |
|------------------------------|------------------|
| 1. Sheathing | 6. Base Coat |
| 2. Weather Resistant Barrier | 7. Primer |
| 3. TMS Cement Board | 8. Finish Coat |
| 4. Mesh Tape | 9. Flashing Tape |
| 5. Base Coat | 10. Weep Screed |



WOOD STUD STUCCO

- | | |
|------------------------------|----------------|
| 1. Weather Resistant Barrier | 6. Base Coat |
| 2. TSM | 7. Finish Coat |
| 3. Mesh Tape | 8. Flashing |
| 4. Base Coat | 9. Weep Screed |
| 5. Reinforcing Mesh | |

CEMENT BOARD MASONRY VENEER WALL SYSTEM (CBMV)

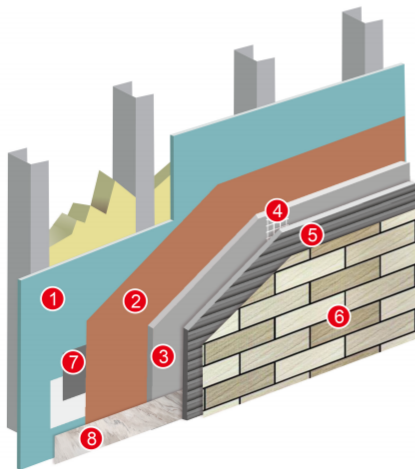
For use in residential and low-rise commercial applications, CBMV offers a complete, engineered solution for installation of adhered veneers. It provides the ability to incorporate an effective water-management system for a variety of building exteriors with manufactured or natural stone and thin brick veneers.

BENEFITS INCLUDE

- Engineered system that allows a faster installation while providing superior quality control Increased performance by utilizing modified adhesive mortars (designed for hanging materials) rather than type S&N mortars developed for stacking materials)
- Extremely durable with increased resistance to impact and inclement weather
- Easily allows for the inclusion of continuous installation into the assembly
- Appropriate for all climates, and resists the growth of mold and mildew
- Speed up your schedule – faster, easier and cleaner than traditional metal lath/scratch-coat method
- TSM is suitable for use in combustible and noncombustible construction

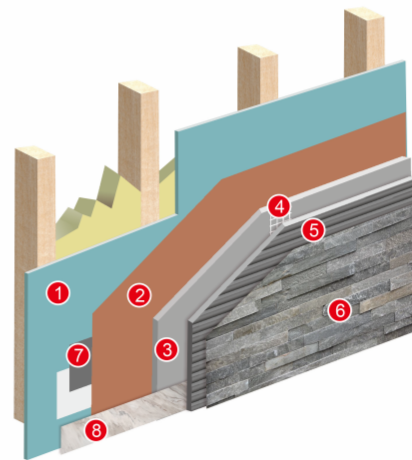
LIMITATIONS

- Sheathing selection and installation varies according to type of wall construction
- Code-approved water/air resistive barrier (WRB) must be installed to protect the cavity (type and placement will vary per local building codes and/or manufacturer’s specifications, installation guidelines and warranties)



Cement Board Masonry Veneer–Thin Brick

- | | |
|------------------------------|----------------------|
| 1. Sheathing | 5. Mortar |
| 2. Weather Resistant Barrier | 6. Thin Brick Veneer |
| 3. TMS Cement Board | 7. Flashing Tape |
| 4. Mesh Tape | 8. Weep Screed |



Cement Board Masonry Veneer – Stone

- | | |
|------------------------------|----------------------|
| 1. Sheathing | 5. Mortar |
| 2. Weather Resistant Barrier | 6. Thin Stone Veneer |
| 3. TMS Cement Board | 7. Flashing Tape |
| 4. Mesh Tape | 8. Weep Screed |

Fire-Rated 2-TSM cement board 12mm 2-hour Fire Rating

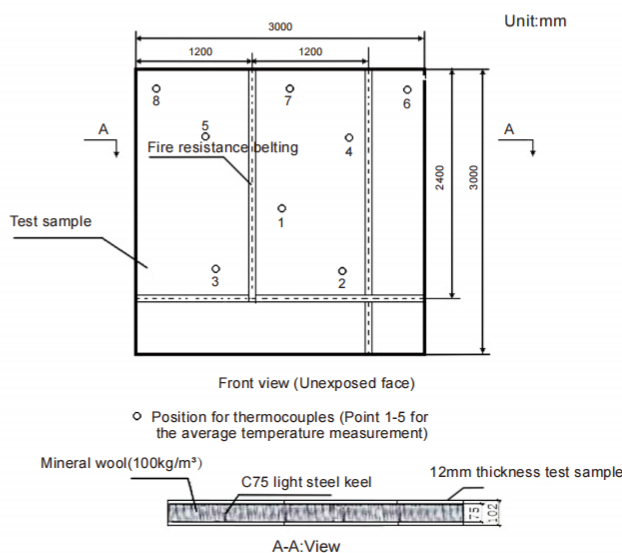
The product specification as follows:

Exposed face: two 2400* 1200*12mm panels + two 2400* 600*12mm panels + 600*600*12mm panels, with density about 900kg/m³.


Interlayer: C75 Lightgauge Steel Joists + mineral wool (about 100kg/m³).

Unexposed face: two 2400*1200* 12mm panels + two 2400*600* 12mm panels + 600*600*12mm panels, with density about 900kg/m³.

TSM was installed into a prepared masonry wall with the opening size 3010mm width by 3010 mm height .C75 Lightgauge Steel Joists were fixed to masonry wall by expansion bolts. The exposed and unexposed face testing panels were fixed to C75 Lightgauge Steel Joists by self-tapping screw (space about10mm).Gaps between sample panels as well as gaps around of the specimen and masonry wall were covered by fire resistance belting and glue (provided by client) . Installation was conducted by representative of Lab on 10 Feb 2015.The detail is show in figure 1.





	European Standard	North American Standard	Other standards
Standard	EN 12467 EN 13501 BS 476	ASTM E 84 CAN/ULC S135 ASTM E9-09 AC 386	CNS 14705 GB 8624 JC 688
Mark			/
Key content	Reaction to fire:A1	WH APPROVED (listed by Intertek)	Qualification
Testing Institution	   	 	  



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