Promat

Compartmentation

4 hours fire rated external wall system

Technical Brochure

Singapore version

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Introduction – partitions & external walls

Depending upon its situation and function within a building, a wall may be expected to fulfil different requirements in the event of fire. Fire resisting walls used for partitioning buildings and enclosing compartments will be required to provide a barrier to the passage of fire from one side or the other. It must therefore be able to satisfy each of the relevant criteria; integrity, insulation and if the wall is loadbearing – loadbearing capacity; from either sides for the fire resistance period required.

Compartmentation – separation of different fire risk
Fire resistant partitions serves as compartmentation to separate different fire risks.

Fire safe exit passage ways
In an event of a fire, the route to exit must be absolutely fire safe, not only must it be totally compartmented without risk of fire spread, the limit on thermal heat transfer of the wall is crucial to ensure a tenable environment for occupants within the route to escape to safety.

Fire resistant party walls
One has no control on the fire risk pose by our neighbours who share the same wall that separates different ownership. Fire resistant party walls ensure that fire in one unit does not spread to the neighbouring unit.

Loadbearing walls occasionally form part of the structural frame of a building and sometimes may not be required to perform of fire separation function. In this event the construction would be judge only by the criteria of loadbearing capacity. Such a wall, while it may have to withstand the effect of fire from both sides at once, is difficult to test in existing designs of furnaces which apply heat to only one side. Constructions which are satisfactory when tested from each side separately are not necessarily adequate when heated from both sides at the same time.

Adopting methods of computing fire resistance require careful consideration: the nature and thickness of facings; stud size and spacing, type, thickness / density and method of fixing cavity insulation; and loading conditions; are all important. Possible areas of weakness in walls are joints and junctions, method and type of fixings, charring of combustible framework and the expansion of metal studs.

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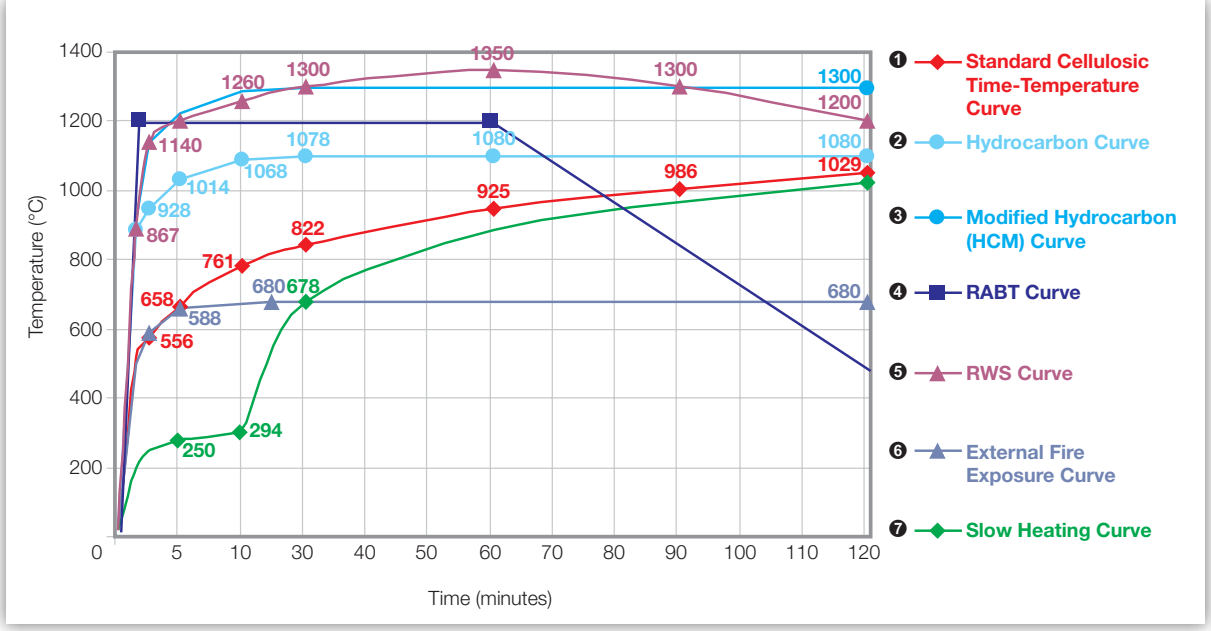
Fire testing methods: Fire curves

The fire performance of any systems will vary depending on the heating conditions it is exposed to. Different national and international fire curves have been developed to simulate fires of different types of fire and fuel load. Figure below is a collection a several internationally recognised fire curves.

For the nature of fire in building, the most commonly adopted fire curve is the Standard ISO Cellulosic Curve.



Fire test standards tests define fire performance in terms of

A material's REACTION to Fire
Such tests define the specimen's property in terms of its level of non-combustible behaviour, its surface spread of flame, is smoke behaviours.

A full construction's RESISTANCE to fire
Unlike the property of a singular material specimen, fire resistance is a measure of the performance of a complete system construction when exposed to the standard heating conditions of either one of the international time temperature fire curves. The criteria of assessment are:

Load bearing capacity – The ability of a loadbearing specimen construction to support the test load without exceeding specific criteria with respect to its rate and extent of deformation.

Integrity – The ability of a fire separating element to contain a fire in terms of no collapse, no development of fissures, cracks of holes and no sustaining flames on the unexposed face of the specimen.

Insulation – The ability of a fire separating element to restrict thermal heat transfer to the unexposed face to below specific limits; ie 140OC mean rise in temperature, 180OC maximum rise in temperature on the unexposed face.

FIRE TESTS STANDARDS TO DETERMINE PERFORMANCE OF PARTITIONS & WALLS
The relevant testing standards for non-loadbearing partitions are, if according to British Standard; BS 476: Part 22: 1987 Methods for Determination of the Fire Resistance of Non-Loadbearing Elements of Construction OR if European Standards are adopted, EN 1364 Part 1. Walls. Fire Resistance Tests for determining the fire resistance of non-loadbearing walls. EN 1364: Part 1 is used in conjunction with EN 1363-1. It is applicable to internal non-loadbearing walls with and without glazing, non-loadbearing walls consisting almost wholly of glazing (ie glazed non-loadbearing walls) and other non-loadbearing internal and external non-loadbearing walls with and without glazing.

Always consult the User Guide for instructions on working with Promat products.

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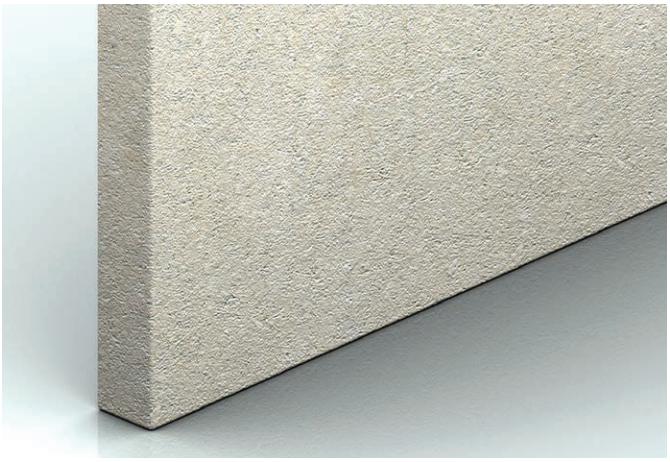
SUPABOARD®

Fire protective construction board



Product description

SUPABOARD® is a non combustible matrix engineered mineral board reinforced with selected fibres and fillers. It does not contain formaldehyde.

SUPABOARD® is beige in colour. The front face is smooth and is suitable for any forms of architectural/finishing treatment; the reverse face is sanded. The board can be left undecorated or easily finished with paints, wallpapers or tiles.

SUPABOARD® is resistant to effects of moisture and will not physically deteriorate in a damp or humid environment. Whilst its performance characteristics are not degraded by moisture or aging, SUPABOARD® is not designed for application in areas subject to continual damp or high temperatures.

Material properties	
General description	Calcium Silicate board made with Mineral Matrix Engineering technology
Surface condition & appearance	Beige colour Front face: smooth Back face: sanded
Nominal dry density (average)	Nominal 1000kg/m³
Moisture Content	Approx 8.0% (may change depending on ambient Relative Humidity)
Alkalinity	pH 9
Thickness tolerance	-0.5mm, +1mm (standard thickness of boards)
Dimension tolerance	±5mm (standard board dimensions)

Advantages

- → Resistant to the effects of moisture
- → Not physically deteriorate when used in damp or humid conditions
- → Performance characteristics are not degraded by age or moisture

Fire Resistant Applications

- → Partitions & External Walls
- → Ductwork
- → M&E Services Enclosures
- → Cavity & Smoke Barriers

Static Values (deflection f ≤ l/250, safety factor n ≥ 3)			
Modulus of Elasticity E	**Flexural Strength** F	**Tensile strength** T	**Compressive strength** ⊥
Longitudinal: 4599/mm² Transverse: 3817N/mm²	Longitudinal: 7.52N/mm² Transverse: 5.15N/mm²	Longitudinal: 5.99N/mm² Transverse: 5.17N/mm²	7.76 N/mm²

Reaction to Fire & Thermal Properties		
Combustibility	**Surface burning**	**Thermal conductivity**
A1 Classification: EN 13501-1 Non-combustible: BS 476: Part 4 AS 1530: Part 1	Class 1: BS 476: Part 7 Class 0: AS 1530: Part 3	0.136W/m°K

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Standard thickness	Standard dimension	Number of boards per pallet	Surface area per pallet	Weight of boards per m²	Weight per pallet
9mm	2440mm x 1220mm	61	181m²	Approx. 9kg	Approx. 1,760kg
12mm	2440mm x 1220mm	46	137m²	Approx. 12kg	Approx. 1,775kg
15mm	2440mm x 1220mm	36	107.m²	Approx. 15kg	Approx. 1,733kg

All physical and mechanical values are averages based on standard production and tested according to internal procedures. The typical values are given for guidance. The figures can change dependent on the test methods used. If a particular value is of prime importance for a specification, please consult Promat Technical Department.

Manufacturing Certification

SUPABOARD® is manufactured under a quality management system certified in accordance with ISO 9001:2015. The manufacturing site is also certified to meet the environmental standards of ISO 14001: 2015 and the occupational health & safety requirements of ISO 45001:2018.

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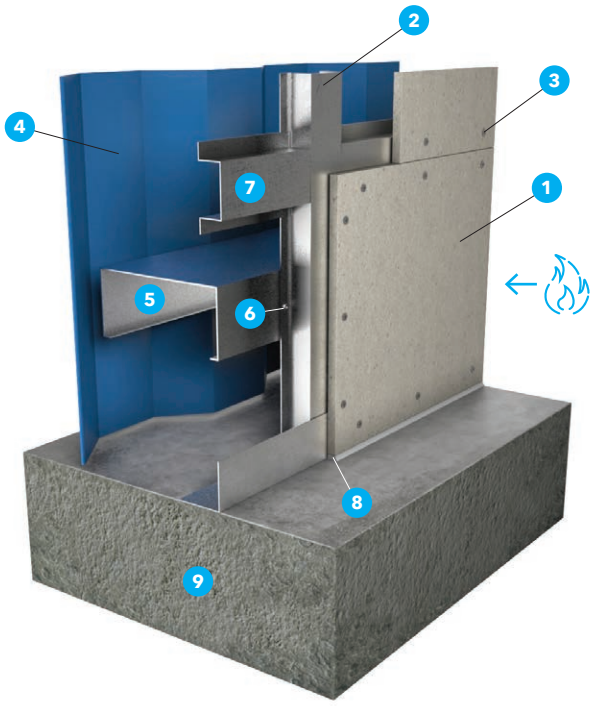
SUPABOARD® – 4-hour fire rated external wall

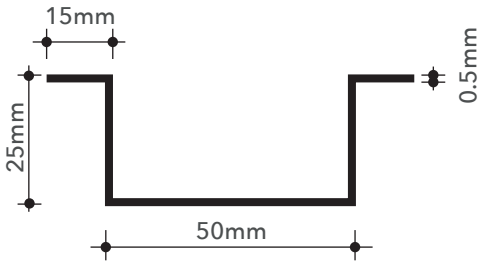
Resisting fire from board side / Non loadbearing



Fire Resistance	**FRL**	-/240/15	Model number: SUB.30.24.I15
	Standard	BS 476: Part 22: 1987	
Acoustic	**STC** **R_w**	56 56dB *Margin of error is generally within ±3*	
	Standard	STC: ASTM E90 ASTM E413 R_w: ISO 10140: Part 2 ISO 717: Part 1	
Construction	**Maximum length**	Unlimited	
	Thickness	Nominal 199mm	

1. One layer of 9mm thick SUPABOARD® board fixed to steel top-hat sections.
2. Steel top-hat sections, 15mm x 25mm x 50mm x 0.5mm thick at 610mm centres.
3. M4 x 25mm long self-tapping screws at 300mm centres.
4. Steel cladding (by others).
5. Steel sheeting rails min. 165mm deep at maximum 1500mm centres (by others).
6. Steel rivets, 4mm diameter to fix vertical steel top-hat sections to steel sheeting rails, one on each flange.
7. Steel top-hat sections, 15mm x 25mm x 50mm x 0.5mm thick at horizontal board joints.
8. Caulk all perimeter gaps between the boards and masonry structure with PROMASEAL®-A Sealant to achieve the required fire resistance and/or acoustic performance when necessary.
9. Masonry floor or wall.

Top hat detail



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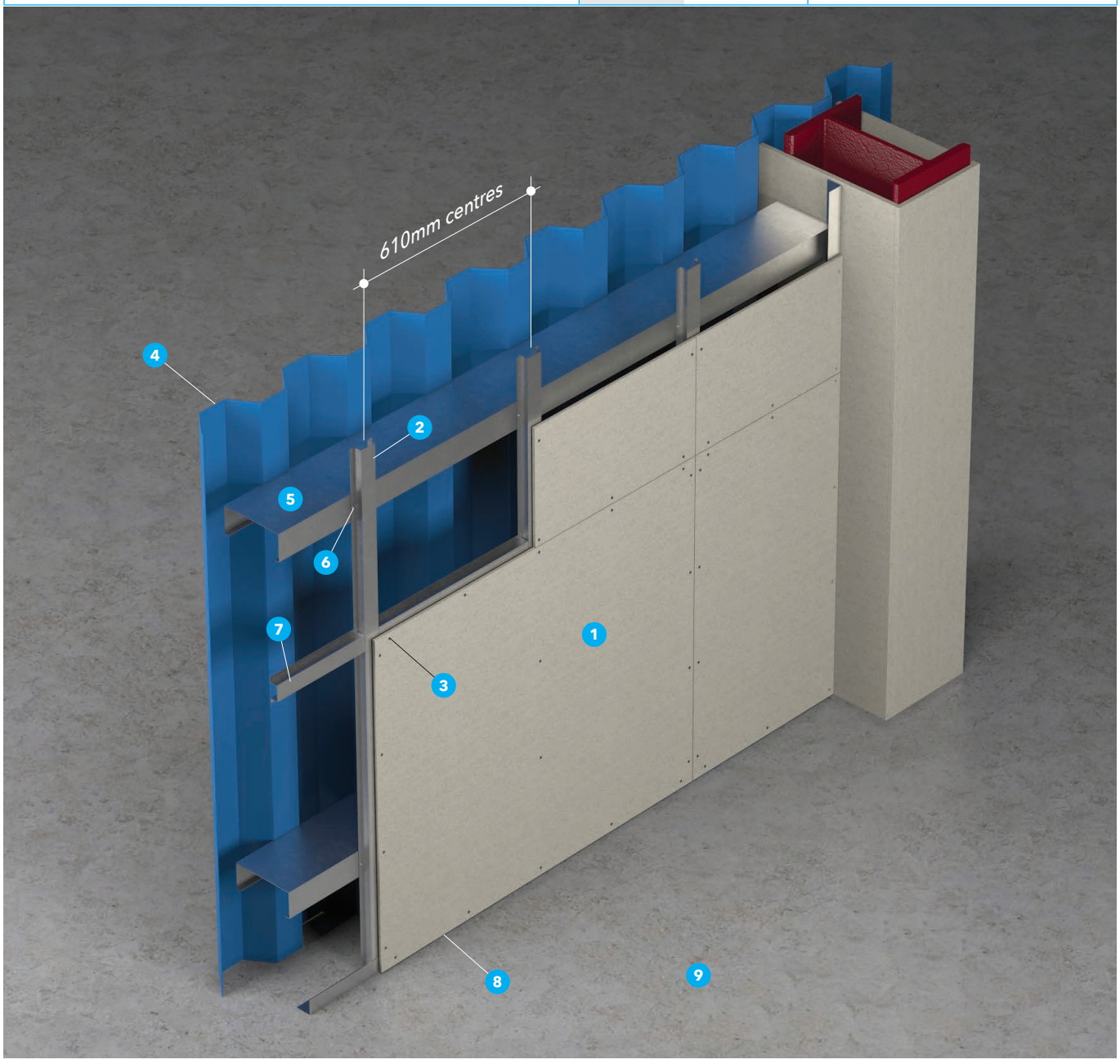
SUPABOARD® – 4-hour fire rated external wall

Vertical sheeting Non loadbearing partition	**FRL**	-/240/15	Model number: SUB.30.24.I15



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Promat

Australia

Promat Australia Pty Ltd

South Australia office
1 Scotland Road
SA 5031 Mile End South
1800 Promat (776 628)
+61 8 8352 1014
PAPL.mail@etexgroup.com

New South Wales office
Unit 1, 175 Briens Road
Northmead, NSW 2152
1800 Promat (776 628)
+61 2 9630 0258
PAPL.mail@etexgroup.com

Victoria office
Unit 1, 355 Grieve Parade
Altona North, VIC 3025
1800 Promat (776 628)
1800 334 598
PAPL.mail@etexgroup.com

Queensland office
80 Stradbroke St
Heathwood QLD 4110
1800 011 376
1800 334 598
PAPL.mail@etexgroup.com

China

Promat Shanghai Ltd
No.2, Tai Hua Street
Yonghe Economic District
Guangzhou City
Guangdong Province 511356
+86 20 8136 1167
promat.cn@etexgroup.com

Hong Kong

Promat International (Asia Pacific) Ltd
Room 1010, C.C. Wu Building
302-308 Hennessy Road
Wanchai
+852 2836 3692
promat.hk@etexgroup.com

Malaysia

Etex Malaysia Sdn Bhd
(Formerly known as Promat (Malaysia) Sdn. Bhd.)
Unit 19-02-01, Level 2, Wisma Tune
19 Lorong Dungun, Damansara Heights
50490 Kuala Lumpur
+60 3 2095 8555
promat.my@etexgroup.com

Singapore

Promat Building System Pte Ltd
10 Science Park Road, #03-02 The Alpha
Singapore Science Park II
117684 Singapore
+65 6776 7635
promat.sg@etexgroup.com

www.promat.com

- The technical data provided in this publication is based on mean values prevalent at time of publication and is thus subject to fluctuation. It should not be regarded as a guarantee to system performance.
- All data contained herein conforms to and frequently surpasses generally accepted fire protection standards recognised by most professional fire science practitioners and regulatory authorities worldwide. The same general principle is equally applicable to all Promat products and systems. Promat has access to a considerable body of test authentication data and this can be provided on a complimentary basis upon request. It should be noted however that this publication replaces all previous editions in its entirety.
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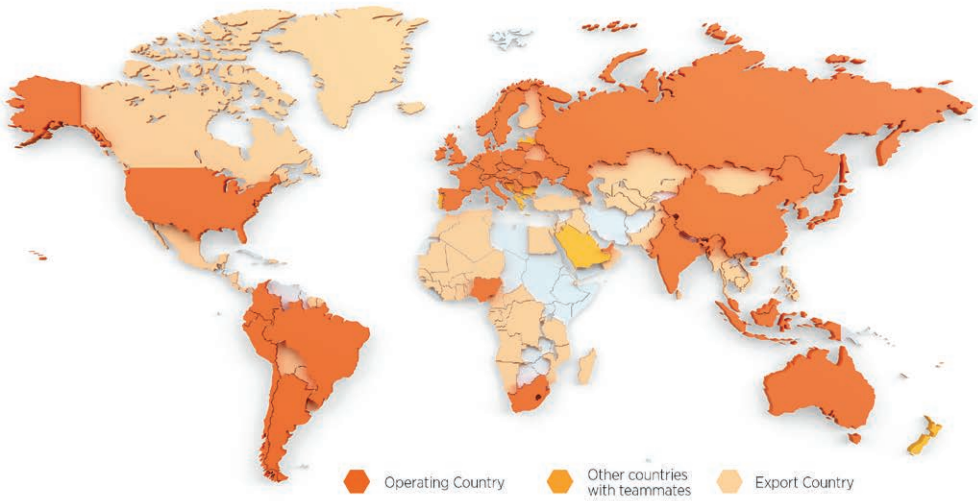

About Etex

Etex is a global building material manufacturer and pioneer in lightweight construction. Etex wants to inspire people around the world to build living spaces that are ever more safe, sustainable, smart and beautiful.

Founded in 1905, headquartered in Zaventem, Belgium, Etex is a family-owned company with more than 13,500 employees globally. It operates more than 140 sites in 45 countries and recorded a revenue of EUR 3.0 billion and a REBITDA of EUR 570 million in 2021. Etex fosters a collaborative and caring culture, a pioneering spirit and a passion to always do better for its customers.

Etex has five R&D centres supporting five global divisions:

- Building Performance: dry construction solutions including plasterboards and fibre cement boards, plasters and formulated products, passive fire protection and associated products.
- Exteriors: a range of aesthetic fibre cement materials for use in agriculture, architectural and residential exteriors.
- Industry: fire protection and high-performance insulation products for the construction and OEM (Original Equipment Manufacturer) industries.
- Insulation: glass mineral wool and extruded polystyrene (XPS) for thermal and acoustic insulation.
- New Ways: high-tech offsite modular solutions based on wood and steel framing.

Etex's global portfolio includes leading commercial brands such as Promat, Kalsi, Siniat, Equitone, Eternit, Cedral, Durlock, Gyplac, Pladur, Superboard and URSA.

Etex is Inspiring Ways of Living, for more information, please visit our website: www.etexgroup.com