

# e-core®

## GENERAL INFORMATION



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### Who is E-Core®?

e+ Building Products was originally established with the sole purpose of sourcing and supplying high quality fire proofing products and materials to companies with established customers and markets. e+ Building Products had seen the opportunity to relieve companies of the role of manufacturing allowing them to focus on the development of fire protection solutions and systems for end users.

As a result of our activity in the passive fire protection market, we were successful in acquiring the E-Core® business from Trafalgar Building Products in May of 2009. It is e+'s goal to further develop, and improve, the E-Core® product and expand its penetration into Australian and overseas markets. It is a very effective product that has withstood the test of time well and has proven its durability. We believe that it is the best product available for fire doors in the market today.

It is important for customers, specifiers and architects to know that there is only one E-Core® product and that is what is supplied by e+. E-Core® is sold under licence to door manufacturers who are obligated to meet the manufacturing requirements of the product as tested and approved. There have been similar imitation products sold however these do not have the breadth of test approvals that E-Core® enjoys. A list of current E-Core® manufacturers is available at [www.e-core.com.au](http://www.e-core.com.au).

If you have particular requirements or simply require additional about E-Core® please contact one of our licensees or e+ as per the details below.

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### Passive Fire Protection

Passive measures of fire protection or passive fire protection systems are those which are part of the built system and are available and effective at all times. Compartmentation, in the form of fire separation barriers, is one major aspect of passive fire protection.

Fire separation barriers such as fire walls prevent the spread of fire from one compartment to another within a building. All elements of building construction such as fire walls must have proven performance under fire test conditions. A prototype system is fire tested to Australian Standard (AS 1530.4) to give some confidence that in a building an identical system will, in the advent of a real fire, prevent its spread.

Any opening in a fire wall such as that for a door must also be able to prevent the spread of fire and therefore, must also be subjected to the same fire test standard (AS 1530.4). In addition to this fire test standard, relevant Australian design standards exist to ensure that the functionality of products is adequate.

### Fire Rated Doorsets

The Building Code of Australia (BCA) requires that all fire doorsets are identical to prototypes that have been fire tested to AS 1530.4. They must also comply with the fire door design standard AS 1905.1. Any variations to the tested prototypes must also comply with the rules in AS 1530.4 and AS 1905.1.

It is important to keep in mind that a fire door alone is not a fire rated element but part of a fire rated system, namely, a fire rated doorset. A fire rated doorset consists of a fire door leaf, associated door hardware (hinges, closer, lock, eye viewer, air grille, etc.), a door frame and the fixing to the surrounding fire wall. The fire rated doorset should not compromise the fire rating of the fire wall, so the compatibility of the doorset with the wall is an essential consideration when certifying the integrity of the entire system. The compatibility of a fire rated doorset and fire wall is determined by testing a prototype to the standard fire test AS 1530.4.

From the results of a standard fire test a Fire Resistance Level or fire rating can be determined.

### Fire Resistance Levels (FRL)

Fire Resistance Levels (FRL's) are not assigned to individual materials but to a complete system as an indication of its ability to contain a fire. The FRL achieved by a doorset in a test is expressed in minutes for which the system fulfils each of three criteria. These are, in order: Structural Adequacy, Integrity and Insulation (written as a/b/c).

As a fire rated doorset is not considered a load bearing element the first criteria is represented by a dash (or NA, not applicable), for example 2 hour rated doorset is expressed as:

- -/120/30
- or NA/120/30

Under the BCA, all fire doorsets require an insulation level of only 30 minutes irrespective of the fire rating of the wall. Over panels and sidelights adjacent to fire doors are, however, currently considered as part of the wall and require the full insulation rating as the wall.

Fire and design requirements can limit the maximum sizes of door leaves and may restrict certain systems in some applications. Refer to the data sheets in this manual for a summary of approved E-Core® fire door systems.

### E-Core® Fire Doors

Up to the early 1980's, fire doors were manufactured from asbestos boards, fibre-cement boards or mineral fibre cores. Those products were understood to be problematic due to long-term health concerns, excessive weight and complex construction and assembly methods.

The E-Core® product was developed in response to these issues. It is a versatile vermiculite based homogenous core that reduces manufacturing complexity and cost and has no known OH&S issues. It is manufactured into flush panel fire rated doors.

The product has proven incredibly durable and has stood the test of time extremely well. More than 1 million E-Core® fire doorsets have been manufactured and installed since the product's introduction. In this time the product has been continually finetuned and enhanced to remain current and viable and to meet and exceed the requirements of the ever changing standards.

There are other products available however the E-Core® product has the benefit of being subjected to hundreds of fire tests (and assessments) and the continual ongoing development of the product for over 20 years.

Although initially developed for the Australia/New Zealand market, E-Core® fire rated doorsets have been successfully fire tested in other countries including Singapore, U.K., Malaysia, USA, and Canada. There are hundreds of approvals for both steel and timber sheeted door leaves in both steel and timber door frames built into all types of fire rated walls.



E-Core® fire doors have been carefully designed and tested to provide the following features and benefits;

- E-Core® fire doors contain no asbestos, ceramic or mineral fibres.
- E-Core® fire doors provide a homogenous (one piece) internal construction (the actual E-Core® core) so there is no risk of internal delamination of layered boards or loose infill packing materials.
- E-Core® fire doors are strong and durable and have been in use for over 20 years.
- E-Core® is mould proof.
- E-Core® fire doors possess significant acoustic properties.
- After 20 years of continuous improvement, E-Core® has one of the most significant libraries of fire testing approvals available.

### What is Vermiculite?

Vermiculite has been used in various industries for over 80 years. It is used in the construction, agricultural, horticultural, and industrial markets. Vermiculite is the mineralogical name given to naturally occurring ore which resembles mica in appearance. It is found in various parts of the world. Locations of the predominant commercial mines are in Australia, South America, China, the Americas, and the USA.

Vermiculite mines are surface operations where ore is separated from other minerals, and then screened or classified into several basic particle sizes. When subjected to heat vermiculite has the unusual property of exfoliating or expanding into worm-like pieces. Think of exfoliation like popping corn. This characteristic of exfoliation, the basis for commercial use of the mineral, is the result of the mechanical separation of the layers by the rapid conversion of contained water to steam.

The increase in bulk volume of commercial grades is 8 to 12 times, but individual flakes may exfoliate as many as 30 times. There is a colour change during expansion that is dependent upon the composition of the vermiculite and furnace temperature.

Vermiculite is a superior insulating material whose characteristics are brought about by its unique ability to exfoliate. It is mould and bacteria resistant. It is extremely versatile and has been used in a wide range of applications including animal feed, anti-caking material, bulking agent, fertilizer, pesticide, seed encapsulant, soil conditioner, acoustic finishes, air setting binder, board, fire protection (internal/external), floor and roof screeds (lightweight insulating concrete), gypsum plaster, loft insulation, sound deadening compounds, blocking mixes, hydroponics, micro-propagation, potting mixes, rooting cuttings, seed germination, seedling wedgemix, sowing composts, twin scaling bulbs, absorbent packing, brake pads and brake shoes, castables, dispersions, drilling muds, filtration, fireproof safes, fixation of hazardous material, furnaces, insulation blocks and shapes, insulation (high and low temperature), molten metal insulation, moulded products, nuclear waste disposal, paints, perfume absorbent and sealants.



### Why Choose an E-Core® Fire Door?

Although being able to withstand a fire is a critical feature of any fire door, there are many other criteria that are applicable to doors, regardless of whether they are fire doors or not.

#### ***Endurance testing***

E-Core® fire doors have been subjected to cyclic tests and have been unaffected after 100,000 cycles. E-Core® fire doors are designed for heavy traffic applications. The E-Core® design of door having been installed for over 20 years, have stood the test of time. There are tens of thousands of E-Core® doors being opened and closed as you read this, testimony of the quality of durability of the product.

#### ***Acoustic testing***

E-Core® fire doors have excellent acoustic properties as proven from the acoustic tests that have been performed. This can assist Architects and Designers in achieving various acoustic attenuation properties in their buildings.

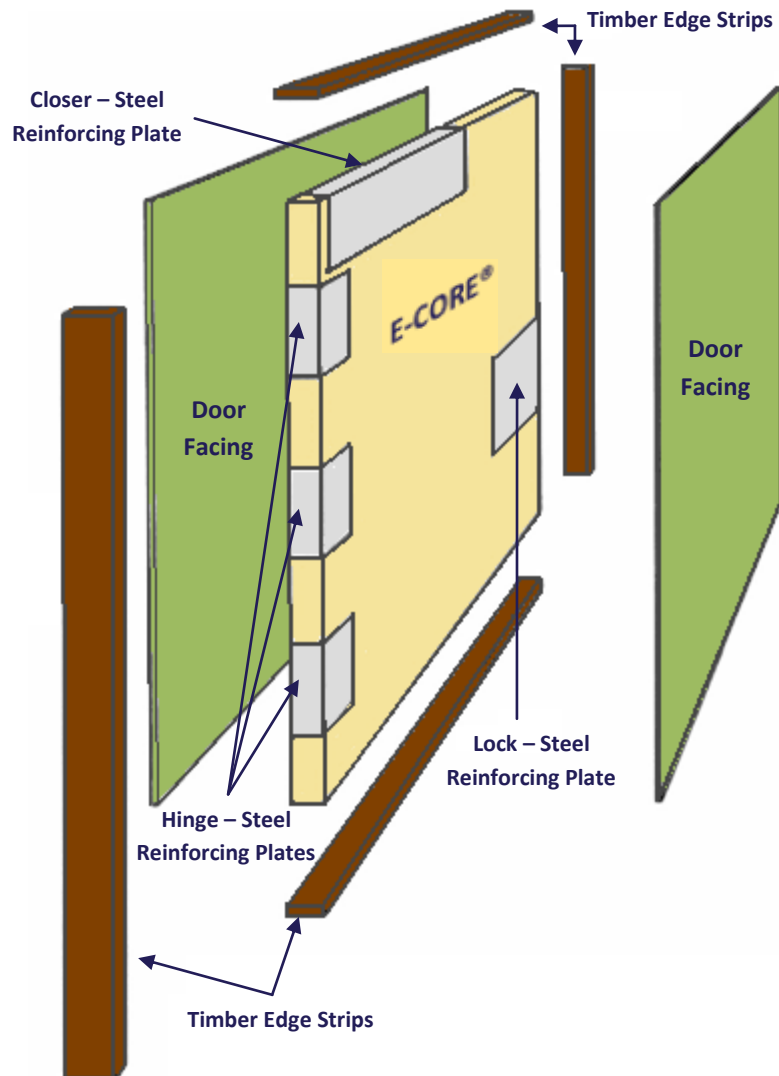
For example, E-Core® fire doors have been installed in cinemas, theatres, hotels and law courts ensure safety from fire and act as acoustic barriers as required.

#### ***Aesthetics***

As the finished E-Core® product is a flush panel door, E-Core® fire doors blend seamlessly with other doors in the overall building design. Approved finishes include exotic timber veneers, decorative mouldings and trims, vision panels, moulded panel door design, heritage style doors, steel and plastic laminate faced doors. This reduces the need to compromise the aesthetics of a building because of the requirement for fire separation.

If your requirement is outside of the existing approvals, E-Core® can discuss with you the best way to meet your demands. This may include a full-scale fire test, a pilot fire test or an assessment based on existing test data. In all instances, approvals are issued by NATA approved and recognised authorities.

### *Exploded Schematic of a Typical E-Core® Fire Door Leaf*



### Fire Rated Doorset Specification

- Fire rated doorsets** Will be tested in accordance with AS 1530.4, [applicable year] and comply with AS/NZS 1905.1, [applicable year]. Extracts from test reports will be provided by the supplier on request each type of the scheduled fire rated doorsets as evidence of compliance. The door leaf core will be of a solid, non-laminated homogenous construction containing no asbestos or other mineral fibres. Vermiculite based E-Core® monolithic refractory core is recommended. The door leaf will have steel reinforcing plates for all hardware locations including hinges, locks, closing devices, meeting stiles, leaf sequencers and supplementary lock systems.
- Fire door frames** Steel door frames will be fabricated from zincanneal mild steel or stainless steel and display the proven fire resistance level on a tag as described in AS/NZS 1905.1, [applicable year]. Steel heavy duty hinges are to be used on all fire door frames. All screw fixed hinges will be fully recessed into the frame. All welded hinges will be slotted in behind the frame and projection welded to the back of the frame. All hinge and hardware preparations will have mortar box protection in place. All fire door frames will be fixed to an approved fire rated wall in accordance with AS/NZS 1905.1, [applicable year].
- Fire door hardware** All items of hardware will be fire tested in accordance with AS 1905.1 [applicable year] and will meet the necessary requirements for fitment to the door leaf.
- Fire door certification** Each fire door leaf will display a metal tag as described in AS 1905.1 [applicable year].
- All relevant forms and certificates must be completed after each door leaf has been tagged by the contractor responsible for the supply and installation of the system(s).