

Promat Technology Trends

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“ INNOVATE

Our mission is to protect precious human life and valuable property in the built environment. It is a noble idea and certainly one that we can take a great deal of pride in making available to a wide audience.

In doing so we acquire and project a hard earned reputation as a leader of the modern fire science technologies industry.

The core corporate values of Promat are built on a rock solid foundation of scientific and ongoing Research & Development, peerless Technical Excellence and good business practices that predicate and endorse genuine sustainability.

These traditions go back many decades and nowadays integrate many new solutions.

For example, the evolving digital IT revolution has a profound impact on the way we live and, naturally, do business.

At Promat we wholeheartedly embrace and adapt these changes with the creation of new products and systems while upgrading and improving others. Promat brands and systems are synonymous with the very best of international quality.

» Continued on next page



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Effective Fire Doors Are Vital To Every Building's Safety

We use them frequently on a daily basis, in all types of locations and functions, so it is perhaps not surprising that we simply take most of them for granted...at, it should be noted, considerable risk!

However, their security and safety functions — and, indeed, fabrication and proper on-site installation, followed by a routine, essential maintenance programme — are vital to the normal functionality of almost every building...as well as many ocean-going and even some interplanetary vessels.

Indeed, they are critically important components to the fundamental principles of compartmentation and the fire resistance of virtually every structure they are built into.

They open and close, manually and sometimes automatically. They swing, pivot, rotate, rise and fall. They control climate and vision, and the movement and flow of human and vehicular traffic.

They are used, and all too frequently abused, but they are also expected to operate in a wide range of climatic, frequently adverse conditions. They have to resist fire, and control smoke and toxic gases, as well as the occasional hostile attack from the forces of sporadic blasts or unwanted extremism.

In the final analysis, they have to be exceptionally tough and durable, able to function robustly through years — let's say the next decade or so — of unrelenting wear and tear...and still look pristine, purpose built and aesthetically pleasing!

In many ways, it is quite understandable that we overlook the significance of these utilitarian and usually rather small but big on performance wonders of design, engineering and fire science technology.

Doors — and specifically, genuine fire doors — have many key roles to play, especially if the idea of seamless fire resistance in the overall skin of any structure is to be effectively sustained. Given the expectations, many of which were completely unheard of just ten years ago, much more is nowadays expected by building owners, users and regulatory authorities.

Fire Doors And Doors Of Perception?

The widely held perception is that they must deliver the basic, minimum promise of their tested, published claims of their performance characteristics. Most fire doors simply function as doors for most of their serviceable lives. But in the event of a real fire scenario they are expected to perform above and beyond the call of claimed fire science duty.

Fortunately most do but there are many, sometimes conflicting factors that have to be rationalised in sustaining sensible life and property saving plans.

Architects, engineers and developers are usually the first professionals in the long and complex equation of building every structure to deal effectively with expected usage. They have to integrate many concepts into an overall system that offers optimum protection and security...no easy task given the technical complexity of most modern constructions.

It is the architect, in close collaboration with the owner/developer, who usually determines the requirements of the building and its numerous users. The architect decides where and in what form fire and other doors are required.

The architect then assembles the specialised information from other experts into the complete fire doors' final design, and arranges their manufacture by another proven, trusted specialist in an allied fenestration industry.

» Please turn over

» Continued from front page

The Right Fire Door For The Right Location And The Right Fire Resistance

The planning of a building involves the efficient arrangement of complicated circulation routes and allocation rooms and spaces with all their specialist functions and essential servicing needs in mind.

In doing so, it is also necessary to locate openings and/or doors in sites that provide sensible and efficient access from space to space. Single or double doors, for example, must take into account suitably sized clear openings to permit the passage of varying pedestrian and vehicular traffic.

Fire doors must be hung or pivoted to open and close to suit the requirements of the occupants. They will frequently be required to be self-closing and many will also be fitted with locks.

Fire doors must equal or exceed the fire resistance performance of surrounding fire resistant building components such as door frames, partitions, walls, ceilings, door accessories and ironmongery.

The expected fire performance of a fire door is normally outlined in local compartmentation for fire containment code regulations and other legislation. This and the means of escape in case of fire usually determine the period of fire resistance fire doors.

Additional guidance, usually in the form of widely recognised international standards and related empirical fire test performance data, should always be factored into the decision making process, particularly during early planning.

The core idea of fire doors, as with all other penetrations of fire rated compartments and all other fire protection principles, is to sustain the fire rated performance of the compartment, the surrounding materials and the door structure itself.

Given that fire doors are in fact highly specialised constructions functioning within other specialised constructions, many other factors need to be taken into consideration.

Other Important Aspects To Consider For Effective Fire Doors

These include visibility, smoke resisting door sets, seals, thresholds, ironmongery and site installation (please see opposite page).

- **Vision panels**

In many locations, fire doors require vision panels so that traffic collisions can be avoided or in the unlikely event of fire, flame and smoke can be seen. One or two vision panels may be appropriate. In the case of a single panel of glazing, the bottom of the panel must be no higher than 1,000mm above floor level to permit visibility by smaller wheelchair users.



A fire door with vision panel



Emergency door within a compartmentation



Fire exit at the side entrance of a residence building



Clear, exemplary signs for fire exit



Fire exit/door at roof top



Fire exit for industrial factory



An airport's emergency fire exit



Fire exit/back door for a kitchen



Emergency exit in a department store



Typical exit/fire escape design for brickwall apartments



Glazed fire exit within an office



Fire exit/door for a food canteen

- **Smoke resisting door sets**

Many building regulations now recognise and legislate against the problem of smoke at ambient temperatures before it activates intumescent seals. As a result some fire doors are required to be designated as smoke resisting.

Closed doors and minimum sized gaps are an essential first line of defence, but once smoke is in sufficient volumes and at pressure, only special smoke-sealed doors will reduce the passage of smoke to the levels deemed acceptable.

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INNOVATE » continued from the front page

This exciting edition of Promat Technology Trends is testament to our company's unique approach to providing the best fire protection with modern technology. At the centre of this PTT is an article about the recent development of Promat's new App for iPad users. It is designed to provide accurate, comprehensive information about the complicated, potentially profitable business of protecting structural steelwork. It is fast and reliable. In a parallel development, we are very pleased to see that one of Promat Australia's most popular training manuals is now also available in iBooks format.

I am proud to say that this brilliant new App — called "Quote Steel", by the way — and the iBooks version of the Promat Fire Stopping Training Manual were developed by the professionals of the Promat Technical and Communications Departments.

On a more traditional note, this edition also looks at a vital building feature all too often simply overlooked...fire doors. Building owners and developers spend a great deal of time and money ensuring that their buildings meet or exceed the demands of regulatory codes. Sadly, this is then frequently put at risk by inferior quality doors, non fire resistant door accessories, shoddy installation and poor workmanship. Our fire door article addresses many of these shortcomings.

On other pages we read about high performance insulation on offshore natural gas platforms and Promat sturdy and aesthetically reassuring fire protection for strategically and economically important vehicular tunnels. We round out this issue with a brief and very reassuring overview of fire test results reaffirming Promat system suitability in the protection of modern naval vessels.

This issue of PTT is certainly a very interesting read, and I encourage one and all to use it to help make better business AND business better.

Samson Ho
Managing Director
Promat Asia Pacific companies

The Fire Protection Philosophy For Ironmongery In Fire Doors

Ironmongery fitted to and in most cases essential to a door's routine purpose has critical impact on the functionality and fire performance of every fire door.

Designs for fire doors normally include a full range of ironmongery and these include hinges and pivots, floor springs with shoes or straps, top centres, pivots and other accessories, overhead closers, and mortise cylinder locks, mortise latches and flush bolts.

When assessing proprietary door set designs it is necessary to ascertain that appropriate evidence is available to show that these door sets and all ironmongery and accessories have passed the tests when fitted with a full complement of ironmongery.

Ready access to available and recognised test certification for the full range of ironmongery is an intrinsic part of every assessment process.

Ironmongery for fire doors normally refers to:

● Hanging

Single swing door sets are generally fitted with overhead closers, hinges will be used to hang the doors. When single swing doors are mounted on floor springs, offset pivots will be employed. Double swing doors will normally be mounted on floor springs with pivots.

● Operating

Single swing doors are normally fitted with face fixed overhead closers. Operating arms must not include materials with a melting point of less than 800°C. If extremely heavy use is expected, floor springs may be preferred.



Double swing doors should be mounted on floor springs with pivots, adjustable top centres, and either shoes or straps. Shoes should not have a heel. Bottom straps should be longer than the cover plate of the floor spring as radiation from highly polished cover plates has been shown to burn away the underside of door leaves. Floor spring boxes should permit adjustment.

● Securing

Locks, latches and bolts are needed on many fire doors. When they are mortised in, part of the door material is cut away. Considerable care must therefore be exercised in their selection and fitting. Mortises to receive ironmongery should be the minimum size which will accept the item, as gaps around ironmongery can reduce the fire resistance of the door.



Flush bolts mortised into the edge of the bolted leaf of double doors provide a high level of security from both sides. These have been tested successfully in many fire tests which have also shown that some mortised flush bolts of aluminium can melt and cause burn through. Brass and stainless steel equivalents should therefore be employed. However, note should also be taken that use of flush bolts can severely reduce the fire performance of timber doors, and therefore use of such ironmongery must be shown by fire test to offer the required performance.

Combined lock and latch sets have also caused failure in fire tests due to their mass. Separate mortise locks and latches are recommended.

Striking plates for locks, latches and bolts must be selected from the smallest available, preferably

not more than 75mm long. Test results indicate that failure invariably results when long striking plates are used. Striking plates which include intumescent material can be used to minimise this risk.

● Fire door furniture

Face fixed handles and plates seldom present any fire resistance problems. Bolt through items need validation to show that they do not impair fire resistance when fitted to the particular door construction. Such items have been successfully fire tested.



● Intumescent seals

Gaps between edges of door leaves and faces of the frames must be sealed to pass fire resistance tests. The gap beneath the door is not normally required to be sealed, but must be kept as small as practicable.



● Vision panels

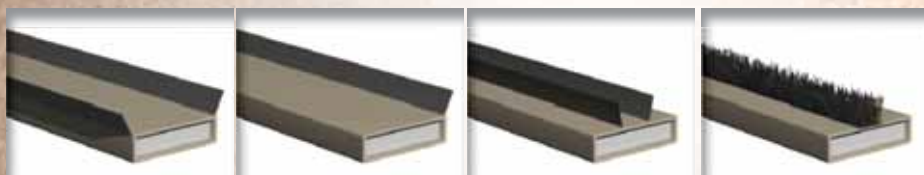
The glazing system has to remain in place for the full test period, retain the glass and seal the edge of the opening, both to prevent gases/flames from within the furnace escaping, and to seal the cut edge, since combustible gases are released due to the action of pyrolysis within the door itself. The types of glass for these applications are borosilicate or ceramic, since these can withstand higher temperatures than soda-lime glass. It should be noted however, that large panes typically used in screens begin to slump under their own weight as the glass softens towards the end of a fire test.

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The problem of ill considered, badly designed and poorly fitting seals can still be seen in many buildings. If fitted seals jam tightly against the faces of door and frame, it is likely the doors cannot open and close properly. Reliable observations show that in large numbers of fire doors with fitted smoke seals, doors do not close fully, allowing more smoke through than without seals.

Many of these doors when fitted with smoke seals also require considerably greater opening force than many weaker building occupants of buildings occupants have at their command. This is especially relevant in a stressful fire event, particularly if stronger closers are fitted to overcome the extra resistance caused by seals.

The simplest solution is to fit combined smoke/intumescent seals. Alternatively, smoke seals may be provided as separate items and fitted into slots in the door edges and frames. Both methods must be proven by tests.



Variation of smoke/intumescent seals

● Gap seals

Seals in fire doors normally only accept a limited variation in the widths of gaps. Extreme care must therefore be taken to fit the appropriate size and type of seal. Seals must be continuous to pass any ironmongery.

● Thresholds

Thresholds are not normally required to be sealed. However, doors to protected escape staircases are typical of some situations that require seals at thresholds. Promat solutions have been tested and shown to give satisfactory results but it is essential that these seals do not drag on the floor and restrict the opening and closing of the doors. Merely reducing the gap to minimum is frequently not a wise solution.



● Air tightness

Air tightness is necessary for all other gaps in or around smoke control doorsets to be sealed, thus avoiding invalidation of the smoke resistance performance of the door set. Provisions for air tightness include gaps between frame and partition, around glazing ironmongery and through the partition itself.



Fire Door Site Installation

Abundant scientific data and empirical evidence indicates that properly manufactured and professionally installed fire doors will make huge contributions to saving human life and expensive property in any fire in the built environment.

However, in yet another twist of the old "every chain is only as strong as its weakest link" saga, improper installation of fire doors and substandard workmanship are often the culprits that undermine proven fire resistant systems and the best fire protection intentions.

Improper or inadequate training is often to blame, as is the lack of rigorous and systematic quality assurance checks of on-site installation methodology. Self-explanatory Promat installation information and Promat training modules are available upon request.

It is essential that fire and smoke door sets are installed exactly as specified according to the door manufacturer's specifications. This includes gaps between door leaves and frames, and between meeting stiles.

It is also recommended that the gaps between leaves and frames should be increased to ease site problems, and allow satisfactory fitting of several types of smoke seals. If smoke and fumes are expected, the gaps between frame and partition opening must be effectively sealed.

Observations of many fire tests, and of fire doors installed in buildings, some where fires have occurred, show that slightly larger gaps of, say, 3 to 5mm have little effect on the overall fire resistance of the door set, although this may adversely affect the fire doors' resistance to the passage of smoke.

Promat intumescent seals used to close the gaps on almost all fire doors can quickly activate and effectively seal the gaps.

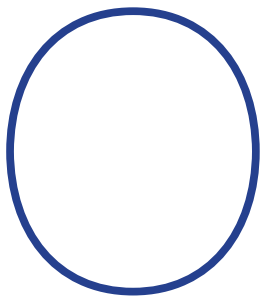
A routine inspection and maintenance programme, not surprisingly, is essential to keep smoke doors in their best "as designed" condition and expected performance levels.

Once again, a fire door — complete with accessories and door ironmongery — should provide the same if not better fire resistant levels as the surrounding building components. This includes the door frame, seals, partitions, walls and ceilings.

For more information on fire doors, please contact your nearest Promat office or visit <http://www.promadoor.com/> today. □



New Promat Business Communications Establish Benchmarks In Digital Age



Our world is increasingly globalised and the need for complex, timely and accurate information is essential for business success.

This is particularly relevant to highly competitive niche markets like professional fire science technologies, and the building and construction industry in general. Here, time is money and being able to deliver goods and services to onerous time lines frequently makes the difference between success and failure.

Just as Promat is constantly developing and delivering new and improved fire protection products and systems — through an ongoing, century-old Research & Development tradition — the company also uses its reputation for Technical Excellence to create new business tools to meet the demands of the digital age.

Typical of these smart, user friendly tools are the Promat's new Application Programme (or App) for steel section factors and bill of quantity calculations for the fire protection of structural steelwork, and the new iBooks edition of Promat's *Fire Stopping Training Manual*.

The App is called *Quote Steel* and both new tools work with the increasingly popular iPad and other Apple computing and portable computing devices. When complete, the App will be demonstrated and distributed by local Promat technical representatives. Upon request, a stand-alone version of *Quote Steel* can then be installed in the user's iPad. The new iBooks training manual is provided as an integral part of Promat's Fire Stopping Training courses.

Both business tools are slated for launch by early third quarter 2012 with editions for Android devices and additional tools to follow.

“Quote Steel” App For Structural Steelwork Protection And Other Calculations

In just a couple of years since their launch, powerful new computers, tablets and other handheld devices continue to have a huge impact on the digital landscape.

Their portability and connectivity change the way people and commercial enterprises work and, increasingly, how we deal with complex IT requirements.

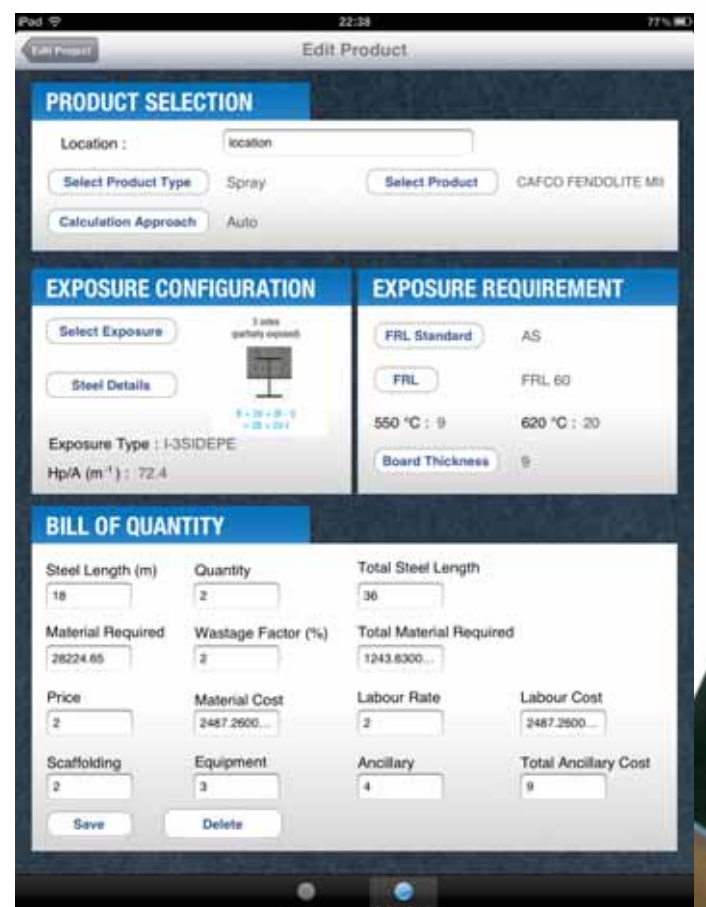
Even the business of sustained brand building and essential corporate communications feels their remarkable impact.

Indeed, these new and powerful devices — complemented by the parallel development of smart, purpose-written software — present new opportunities for speed and professionalism, particularly in industries where timelines are equated in valuable dollars and common sense.

With *Quote Steel*, users simply enter appropriate project data and the new App automatically calculates requirements in accordance with the required criteria of fire protection performance. The iPad screen shot (right) illustrates typical calculation charts.

The new App calculates the cost of fire protection, by paint, a sprayed or board encasement system, by structural element, by compartment and by total cost, as well as other complex calculations for different project requirements.

All users have to do now is key in their specifications, and the App delivers...all in a matter of minutes!



» Continued on opposite page

Building awareness for the new App for structural steelwork protection and other calculations, a trial version of *Quote Steel* is accessible at <http://www.promat-ap.com/> under the "Structural Steel" link via the "Calculation" section within the "PIC Member Login" menu. See illustration below. This section is exclusively for Promat Information Centre (PIC) members. The screen shot at right shows a typical calculation process PIC users will work with under the "Structural Steel" link.



Quintessentially Promat, Fire Stopping Training Manual Now In New Interactive iBooks Format

Promat Australia's Fire Stopping Training Manual was a popular success from its first launch in 2004 as a hardcopy printed edition. The 56 page full colour manual was revised, fine tuned, reprinted and re-issued as a second edition in 2011.

The revised edition enjoyed similar success and is generally considered the bible of Promat's Fire Stopping Training programmes in Australia.

Responding to popular demand, and to widely recognised and expanded training requirements, Promat has reconfigured and reformatted this unique training manual in iBooks format specifically for the needs of iPad users.

Scheduled to gradually replace its printed predecessors, this new iBooks edition is expected to be a key component in Promat Australia's nationwide fire stopping training programme and similar exercises in other areas of Asia Pacific operations.

The aim is to make the learning curve, and sustaining professional high quality installation of Promat's fire stopping systems in all penetration seal applications, as easy and as practical as possible.

The iBooks edition is also laid out in three main, easy-to-learn chapters. These contain virtually everything a programme participant or trainee needs to know about installation of some of Promat's fire stopping systems.

Chapter One information includes theoretical and scientific aspects of passive fire protection, legislative and regulatory code requirements, commonly recognised test standards and test results.

Chapter Two looks in depth at fire collars while Chapter Three concludes with an overview of applications in fire resistant penetration seals.

Each chapter concludes with a questionnaire assessing the sequential, progressive learning level of each trainee.

Like the earlier printed version, the new iBooks edition is a visual treat, lavishly illustrated with a full range of high quality and detailed technical drawings.

The big difference with digital and printed versions, however, lies in the former's numerous interactive links and never-before-seen widgets.

Electronic readers now simply click, pinch, drag and/or swing on their iPad touchscreens and access interactive illustrations, graphics or video footage... immediately entering a new world of high impact audiovisual information that reinforces, expands, enhances and accelerates the entire learning process!

These screen shots (right) demonstrate different three dimensional views of PromaSnap® users can get by turning 360 degree on their iPad touchscreens.

Stay tuned and closely in touch with the Promat International Asia Pacific website for further information and the release of this much anticipated business tool.



Your Feedback Will Help Determine Communication And Marketing Support Needs

Promat produces a considerable volume of timely technical, marketing support and brand building information. It is all based on a tradition of technical excellence which in turn is driven by many decades of tried, tested, proven and available fire test data.

On the other hand, the company has developed its own best sustainable business systems and seeks to ensure that customers, clients and business partners also subscribe to *green and sustainable* business practices.

It is therefore essential to accurately determine user preference, and how they use a wide range of up-to-date Promat information available in traditional printed format, on-line, in PDF (portable document format) files or, soon, in digital Apps or dedicated eBooks for fans of the tablet platform.

Promat and the editors of PTT newsletter invite all readers, Promat product users and applicators to complete the on-line questionnaire at <http://www.promat-ap.com/form/survey/communications/preference.htm> to help us help you with your information requirements. □



Subterranean solutions echo skyscrapers reaching for the stars as city planners try to balance the problems of congestion. As the built environment becomes increasingly complex, so too does the potential for fire risk.

Promat's reputation as a specialist in the fire protection of tunnels and other underground structures, reinforced by its leadership of the global fire sciences industry, provide the company with a unique ability to provide effective fire protection and security solutions for all tunnels.

Below is a brief outline of three typical but very different tunnel projects which employ professional fire protections systems integrated by Promat.

Brisbane Airport Link Tunnel Spray Protected

Australia's largest infrastructure project, the Brisbane Airport Link is a 6.7km toll road, mainly underground, connecting Clem7 tunnel, Inner City Bypass and the local road network at Bowen Hills to the northern arterials of Gympie, Stafford and Sandgate roads and the East West Arterial leading to Brisbane Airport.

The 15km network of tunnels and ramps is the first major motorway linking the Brisbane city centre to the northern suburbs and airport. The basic statistics certainly reflect the dynamism of the concept.

FAIS

Builder/Client
Thiess John Holland

Project Consultant
Promat Australia Pty Ltd

Applicator
McAfee Plastering & Spraying Pty Ltd

Main Product
Cafco FENDOLITE® MII
vermiculite and portland
cement based
wet mix spray

When finally on stream, the Airport Link, Northern Busway (Windsor to Kedron) and Airport Roundabout projects together will cost more than €2.91 billion. Some €2.34 billion of that budget is committed to the Airport Link's twin 5.1km tunnels.

More than 12,000 jobs were created along the way and in excess of 23 million man hours invested in this massive infrastructure project. Some 463km of cable have been laid along with 807,000m³ of concrete, 117,000 tonnes of reinforced steel and 250,000 tonnes of asphalt.

To secure the passive fire protection of an estimated total of 120,000m² of the tunnel's critical structural areas, approximately 100,000 bags of Cafco FENDOLITE® MII were supplied to the project.



Promat is proud to be involved in the Brisbane Airport Link Tunnel project...from concept, design and specification to providing product, expertise and advice to the client and a multitude of engineers. This includes on-site adhesion testing and QA/QC procedures during installation of Cafco FENDOLITE® MII to ensure the spray system was applied correctly for the fire protection requirements of the specific tunnel.

International Tunnels Demand High Safety Quotient

FAIS

Civil Contracts
Daelim Industrial Co Ltd,
Hock Lian Seng Infrastructure Ltd,
Penta-Ocean Construction Co Ltd,
Samsung C&T Corp, Ssangyong
Engineering & Construction Co Ltd

Product
PROMATECT®-H
matrix engineered
mineral boards

PROMATECT®-H Board Linings At Marina Coastal Expressway

The 5km long Marina Coastal Expressway (MCE) is the tenth major expressway in the densely populated city-state republic. It is a key element in an island-wide road network that supports the long term strategic growth of Singapore.

The MCE is an underground tunnel linking Kallang Paya-Lebar Expressway and East Coast Parkway with the Ayer Rajah Expressway. MCE also provides access to the Marina South and Straits View areas.

When complete, the MCE will allow road users to circumvent the congested central business district.

The Land Transport Authority of Singapore awarded civil works in five packages — Contracts 482, 483, 485, 486 and 487 — all of which involve tunnel sections of close to one kilometre each.

The tunnel structure for Contract 487 is complete. PROMATECT®-H boards are employed throughout the expressway tunnel's concrete soffit. This particular scope of works commenced in the third quarter of 2011 and smooth installation was reported.

The construction of the MCE is an integral part of the government's commitment to improve Singapore's land transport network over the next ten to fifteen years. It is slated for completion by end 2013.

Successful Durability Tests For PROMATECT®-H Boards Installed In Kallang-Paya Lebar Expressway Tunnel

Singapore's Kallang-Paya Lebar Expressway (KPE) opened to traffic on 20 September 2008. It features the longest vehicular traffic tunnel in Southeast Asia. Durability of fixtures, safety features and tunnel lining systems are key considerations in the decision making process, particularly in an infrastructure project of KPE's scale.

As part of a process that addresses the question of durability, especially where products and systems are exposed to the ravages of hydrocarbon by-products such as in the highly acidic environment of road tunnels, Promat recently took samples of PROMATECT®-H boards and subjected these to a range of rigorous scientific tests. Their aim? To determine if product/system performance is the same now as when the boards were first installed in the KPE in 2004.

The test samples were removed from the roof area and, together with spare stock boards, were compared against original performance test data and new board material. The tests included inspection under microscope to check for carbonation, checks on physical and mechanical properties such as flexural, tensile and shear strength, as well as in-depth analysis using X-Ray diffraction and X-Ray Fluorescence. The latter determines the level of compositional change over the interim exposure period.

Images at right, in 44.5 times of magnification, show the board samples in different tests.

The results clearly demonstrate that the PROMATECT®-H boards samples taken from Singapore's KPE tunnel show no change in the properties of the products that would result in a reduced durability performance today or in the future. □



Marriage Of Promat Expertise And Microtherm Innovation Delivers Effective HPI Solutions To Offshore Gas Platform

Following the success of their project trial for insulating the Holimesy® furnace segment of PT Chemco Harapan Nusantara in Indonesia, the Promat-Nippon Microtherm team recently combined their expertise in the oil and gas sector and applied tailored solutions for the tough offshore conditions at the Erawan Riser Platform.

the offshore platform's overall turbine stack exhaust insulation. Finally, microporous insulation materials — MICROTHERM® Slatted Panels (of 235kg/m³ density) — were segmented to wrap easily around those circular ducts in the more critical zones of the site.

The touch temperature requirement was calculated as a bulk average temperature, with the 2500mm outer diameter vertical ducts providing the most difficult heat rejection conditions.

From the results, it is evident that a maximum lagging thickness of 100mm is required to meet the 49°C specified touch temperature at the most onerous conditions of a warm day in relatively still air. □

The team generated over 30 thermal calculation/costing scenarios — involving problem analysis, heat flow calculations, applications proposal and site training — prior to receiving final approvals. Work commenced in mid 2011.

Key drivers of the project were limited space and safe touch

temperature requirements for on-site worker safety, and high insulation performance for three huge exhaust stack modules requiring up to 5km of insulation.

Lightweight and prefabricated Promat ALSIFLEX®-1260 ceramic fibre mats were extensively installed for



Promat ALSIFLEX®-1260 ceramic fibre mats were installed at an on-shore yard prior to shipping to the Erawan Riser Platform.

Everything about offshore oil platforms — be they exploration or production rigs — reflects the high risk investment and rewards associated with the elusive search for and downstream use of black gold, natural gas and other natural resources that fuel the global economy's need for energy.

Time is big money here and these industrial scale marvels of heavy engineering not only have to withstand the constant abrasive forces of Mother Nature but punishing 24/7 work schedules. They also have to accommodate turnaround crews of management personnel, specialist technicians and other workers in relative comfort.

Most offshore oil platforms are in fact a number of small interconnected factories within a larger industrial complex. All have to be self-sustaining.

Despite their large scale, space for man and machines on these towable purpose-built behemoths is extremely limited. Safety and security protocols are understandably important concerns in the constant and ongoing operation of a typical platform.

The Erawan Riser Platform in the Gulf of Thailand is no exception to the forces that drive most oil and gas platforms worldwide.

PTT Public Company Limited, previously known as PTT (Petroleum Authority of Thailand), is a Thai state-owned Stock Exchange of Thailand-listed oil and gas company. The company currently owns and operates extensive submarine gas pipelines in the Gulf of Thailand, and a network of Liquid Petroleum Gas (LPG) terminals throughout the country.

PTT company is involved in electricity generation, petrochemical products, oil and gas exploration and production, and gasoline distribution and retailing operations.

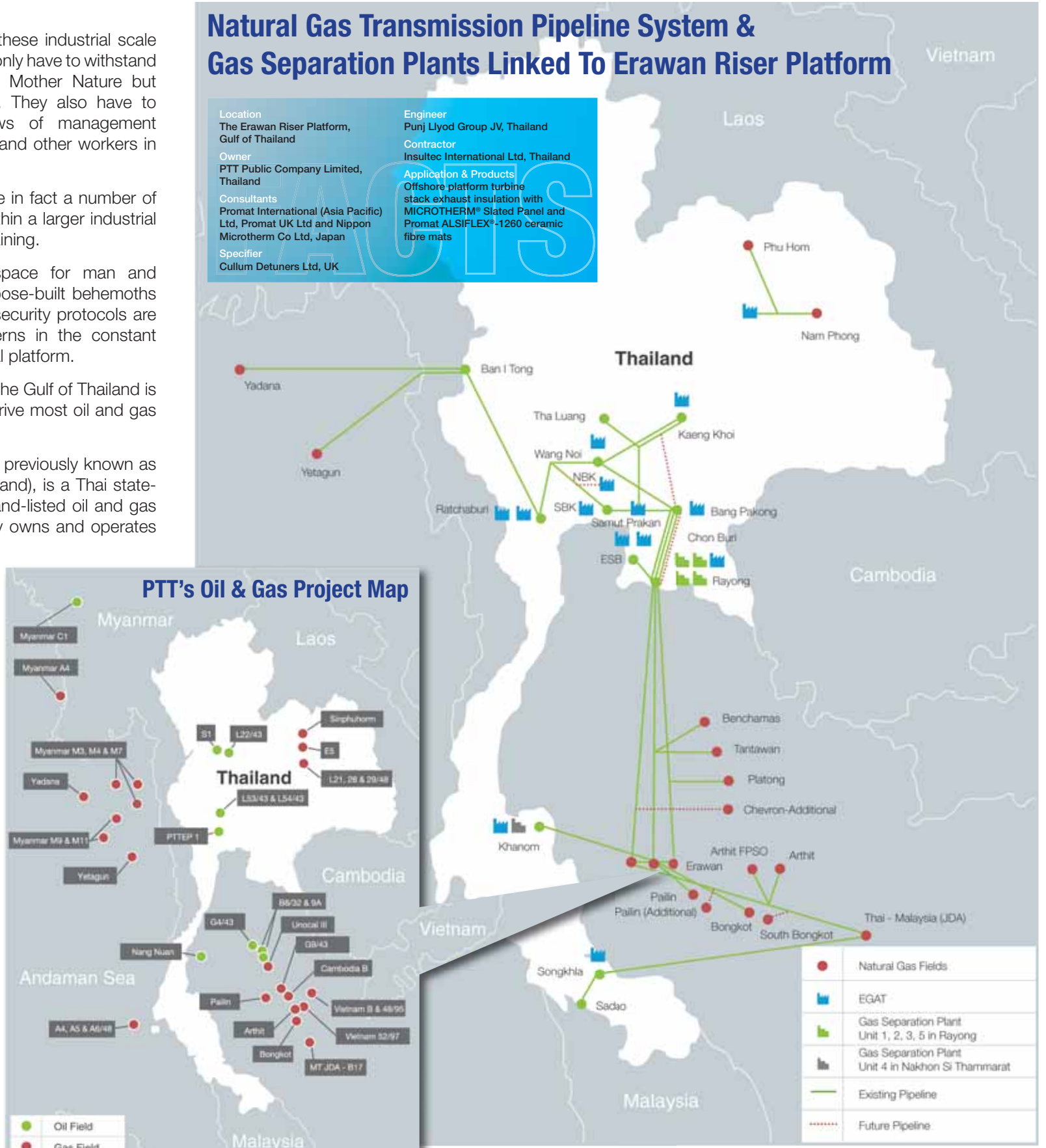
PTT's Erawan Riser Platform is an integral part of the company's offshore operations.

Top picture, PTT's Erawan Riser Platform in Gulf of Thailand. Maps at right indicate PTT project sites and the company's Natural Gas Transmission Pipeline System and Gas Separation Plants linking the Erawan Riser Platform to the overall national network. All illustrations courtesy of PTT Public Company Ltd, www.pttplc.com.

PTT Public Company Ltd invests in joint venture gas transmission development businesses with a few international partners, such as PTT Natural Gas Distribution Co., Ltd, Trans Thai-Malaysia Co., Ltd and Trans Thai-Malaysia (Malaysia) Sdn. Bhd.

Natural Gas Transmission Pipeline System & Gas Separation Plants Linked To Erawan Riser Platform

Location The Erawan Riser Platform, Gulf of Thailand	Engineer Punj Lyod Group JV, Thailand
Owner PTT Public Company Limited, Thailand	Contractor Insultec International Ltd, Thailand
Consultants Promat International (Asia Pacific) Ltd, Promat UK Ltd and Nippon Microtherm Co Ltd, Japan	Application & Products Offshore platform turbine stack exhaust insulation with MICROTHERM® Slatted Panel and Promat ALSIFLEX®-1260 ceramic fibre mats
Specifier Cullum Detuners Ltd, UK	



●	Natural Gas Fields
■	EGAT
■	Gas Separation Plant Unit 1, 2, 3, 5 in Rayong
■	Gas Separation Plant Unit 4 in Nakhon Si Thammarat
—	Existing Pipeline
- - - -	Future Pipeline



Specimen before test



Specimen after test



Captain Sawal Bin Alif TLDM, Technical Advisor of Omahams Corporation accessed the 2500mm x 4100mm specimen construction before test.

Promat Proves Its Value For High Seas Naval Applications

From its headquarters in Lumut, Perak, the Royal Malaysian Navy is expanding its fleet to meet the maritime, naval and humanitarian challenges of the future.

High on its masthead of priorities is sustaining the nation's security, and the safety of some of the world's most strategically important waterways.

The economic importance of the historic Straits of Malacca, for example, can never be overlooked or underestimated.

Every year, about a quarter of the world's shipped trade volume passes through these narrow and crowded waterways. In 2006, an estimated 15 million barrels per day, most from the Middle East and bound for China and Japan, were transported through the Straits. As the demand for energy increases substantially in both these major markets, shipping traffic trends are likely to increase.

Reassuringly, Malaysia is a partner in tripartite agreements with the navies of the Republics of Indonesia and Singapore to protect shipping in the Straits of Malacca.

To the north, the deep waters of the South China Sea fronting Malaysia's coastlines also need plenty of attention and resources.

The Royal Malaysia Navy therefore has a highly developed sense of national pride and an understandable interest in keeping its fleet operating at peak efficiency.

One of its recent initiatives is to optimise the fire security of its seagoing vessels. And in doing so it measures itself against international standards, a language that Promat understands very well indeed.

Part of Promat's long established traditions as an industry leader is a programme of constant and scientific Research & Development, and the willingness to prove the performance of Promat products and systems.

Promat does this typically by undertaking fire tests for clients to demonstrate clearly and scientifically that a system proposed and designed for a specific project will indeed provide the requisite fire performance.

Application & Product Marine bulkhead system with 19.1mm thick PROMARINE®-640 boards	Attendants Omahams Corporation Sdn Bhd, Malaysian Maritime Enforcement Agency, Royal Malaysian Navy Ministry of Defence etc.
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Above: Group picture of the test attendants with Promat's representative at the laboratory.

For some years now, Promat has a working relationship with the Royal Malaysian Navy to provide fire and smoke protection systems for their ships. This relationship includes existing vessels slated for routine refurbishment and the design and fitting out of new craft entering regular commissioned service.

A typical and recent demonstration of this unique philosophy proved that the proposed Promat systems clearly meet the professional demands and expectations of the Royal Malaysian Navy.

A full scale bulkhead system 2500mm high x 4100mm wide, together with all joints between panels was constructed for an independent and accredited fire test. The test sample consisted of PROMARINE®-640 bulkhead system and the test aimed to achieve a performance of B15 in accordance with the requirements of IMO Resolution A.754 (18).

Bulkheads in a seagoing vessel create architectural rigidity and divide space into functional areas. Bulkheads are also the foundation of watertight and, if treated with the appropriate fire resistant materials, fireproof areas, achieving real levels of genuine compartmentation.

The independent test was witnessed by senior officers and leading officials of the Royal Malaysian Navy, together with staff members of Promat's exclusive Malaysian distributor, Omahams Corporation.

The fire test delivered very successful result, achieving the required performance with a large safety factor over and above the B15 requirements.

Indeed, the test once again satisfied the naval client that Promat only provides fire protection products and systems which consistently deliver their stated performance characteristics and benefits. And that certainly leads to high levels reassurance and peace of mind that the officers, men and vessels of the Royal Malaysian Navy appreciate as they keep their nation's flag proudly flying high on the region's wide oceans. □

DISCLAIMER

The Promat Asia Pacific Network spans the region with innovative proactive fire protection products, systems and solutions: Australia, China, Hong Kong, India, Malaysia and Singapore, with distributors in Brunei, Indonesia, Japan, New Zealand, Philippines, South Korea, Taiwan, Thailand and Vietnam.

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