

# PROACTIVE FIRE TRENDS

The Journal of ProActive Fire Technologies  
for Asia Pacific Building Industry Professionals

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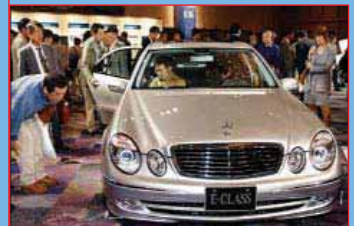
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## A super highway for safety or danger?

Examples of various ductwork for mock-up room of Promat International (Asia Pacific) Ltd., regional headquarters in Kuala Lumpur, Malaysia. ● PROMATECT®-H post cladding of existing sheet metal duct; ● PROMATECT®-H E&M services enclosure; ● PROMATECT®-H self-supporting duct; ● PROMATECT®-L500 self-supporting duct; ● PROMATECT®-S self-supporting duct. This illustration is an impression of artist only.

Promat International world-wide over the last four decades, have built up a vast amount of knowledge and experience on the subject of the fire performance of ductwork systems. These systems can include ductwork for ventilation, smoke extraction, kitchen extraction, pressurisation or a combination of functions. During this period, Promat have been involved with the installation of over 15,000 km of fire resisting and smoke extraction ductwork systems in new and refurbished commercial, public and private buildings. The extraordinary thing is that as much as 90% of this ducting has been installed to provide the three principle criteria of fire protection i.e. stability, integrity and insulation which contrasts noticeably with the majority of installations in the Asia Pacific region which are only required to provide stability and integrity.

The vexing question is, who is right – Europe and elsewhere with their strict requirements for insulation, or Asia which appears to believe that in most instances this third element is unnecessary? Has a full and informed consideration of the problem been given or has cost been the overriding factor?

Ductwork in simple terms is a super highway that can travel through all areas and compartments of the building, its function being to allow the flow of air for hopefully the full term of the life cycle of the building. Unfortunately, in the event of a fire in any compartment the action of the duct can become a superhighway for fire and smoke. Often the action of the duct is dual purpose and that super highway is then required to extract the smoke from the fire area to provide a period of time sufficient to allow

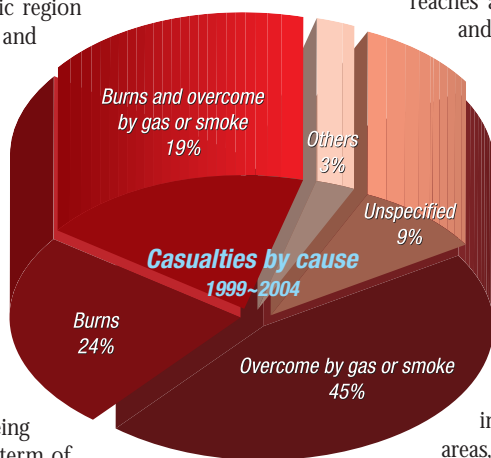
occupants to escape and the fire services to enter the building, for as we all know, it is almost certainly the smoke and the heat that kills rather than the actual fire. Thus the ducting creates that vital margin of safety.

It is the extraction of the smoke which can, if not handled correctly, become the very provider of transmitting the fire from one compartment to another! Under certain conditions flashover may well occur and, given sufficient duration of the fire, the heat generation within the duct can itself heat up the next compartment through which it is passing until the temperature near the duct reaches a level sufficient to ignite nearby combustibles and thus spread the fire from the duct to the compartment.

It is this element of fire safety which is addressed by the addition of the third discipline of insulation i.e. that the temperature within the duct must not be allowed to transgress the walls of the duct and so create the danger of excessive radiation from heat build up outside of the duct.

The insulation criterion will also provide a very important fire safety element to individuals escaping through smoke darkened areas, or indeed the fire services who have to enter a fire raked building, both of whom are capable of coming into contact with the ductwork. Without the insulation criterion the ducts would have a surface heat level that is more than capable of causing severe burns to hands, arms and face.

Continued on page 4 and 5.



A Complete Guide to  
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## STRONG LINKS MAKE AN EVEN STRONGER CHAIN

We live in challenging times, in a world where apparently random events can have lasting, often devastating effect. To cope, we cling to tried and tested routines and habits, in the frequently misplaced belief that these fragile security blankets are permanently adequate. Worse, we often overlook the obvious, rarely asking if there are other, more effective solutions for the problems that challenge us worldwide. But it seems to me that we have means at our individual and collective disposal to effectively deal with AND correct most common problems.

The basic building block is of course The Extended Family or The Team concept. In both, the whole is considerably greater than the sum of its parts. It is unwise not to expect the unexpected and when it happens, someone else in the family/team can pick up the ball and continue forward. True, this involves an inevitable degree of self-interest but concern for the group is also based on the extended idea of individual welfare. This is true of Promat... in its strategic business mission, the company's concern for the built environment and how we also look after our people.

One of the many good factors about working for an industry leader such as Promat is that our products and systems are not only extensively researched but developed and designed to actually make our world a safer place in which to live. We see these advantages up close and personal on a daily basis. But soon, when the World Cup kicks off in Germany – Promat's birthplace, by the way – most viewers on Planet Earth will receive subtle reminders of Promat's many benefits. Not surprising in a country with one of the world's most stringent building codes, German organisers have gone to extraordinary lengths to ensure that tournament stadiums meet exacting safety standards. The security of players and spectators in the Schalke Stadium, for example, is enhanced by extraction ducts clad by Promat protection.

Speaking about the world's most popular game, a complimentary full colour poster – our very own Promat World Cup Tournament Schedule – is included here in this issue of PFT. This attractive insert will guide our colleagues, friends and business partners through the intricacies and excitement sure to accompany this June's highly anticipated festival of football.

We kick off PFT number 17 with a page 1 feature of A Layman's Guide to Smoke Extraction in Buildings. This important information has been compiled from various sources by our Regional Technical Manager. It continues on the centre page spread. While page 2 looks at how Singapore's PSB Corporation keeps a close watch on fire products, we have another contribution to our ever-expanding repertoire of essential knowledge with a look at the AS1851 White Paper in the Industry Review feature on page 3. It's based on the clear ground rules and processes involved in the long-awaited and just released revised standards governing testing and preventive maintenance for the continued reliability of fire prevention systems in use in Australia. Page 3 details Promat's involvement at the One Raffles Quay building, a remarkable new addition to Singapore's ever-changing skyline.

Page 6 carries Industry Review and Network Reports which look at Promat Steel Protection employed at Welingkar (India's top management school) in Mumbai, PROMAVIC® fire stop panels at a 400kV Paya Lebar substation in Singapore and the extensive use of PROMATECT®-H at the new Prince Court Medical Centre, Kuala Lumpur.

After our Multilingual Business Feature on page 7, we round out this PFT on page 8 with Promat fire protection and our colleagues' innovative solutions to various problems at the underground Kim Chuan Depot of Singapore's MRT Circle Line.

At the end of the day, we can be justifiably pleased with Promat's considerable achievements. However, we must never forget that every chain is only as strong as its weakest link. If every link in the Promat chain is prepared to multi-task and to be innovative, our strength and our continued success is virtually unlimited. I am very proud to say that the Promat chain of fire science technologies is proven to be strong. Thanks to this and our united team spirit, Promat can look to the future with considerable confidence.

**Erik D. van Diffelen**  
Managing Director  
Promat Asia Pacific Organisations  
May 2006



### ● Singapore's PSB Corp maintains a watching overview

## Close watch on fire products streamlines approvals, helps maintain high standards

In Singapore, the Fire Safety Act specifies the requirements for active and passive fire-protection products based on codes and standards. It requires products to be certified under the Product Listing Scheme administered by PSB Corporation (PSB Corp).

Any material intended for fire safety works listed under PSB Corp's Product Listing Scheme (PLS), and use in compliance with the requirements stipulated in the Fire Code, would be deemed acceptable to the Fire Safety and Shelter Department (FSSD) of the Singapore Civil Defence Force. No separate approval is needed.

PSB Corp helps manufacturers gain access to both local and global markets by meeting recognised standards and conformity requirements on quality and safety. This is because PSB Corp is part of a worldwide network of accreditation bodies. As a leader in third-party product specification and inspection, PSB Corp offers state-of-the-art testing facilities and multidisciplinary capabilities to stay ahead of industry needs.

### Introducing the PSB Corp Product Listing Scheme (PLS)

PSB Corp's Product Listing Scheme (PLS) is a product certification scheme which took effect on 1 April 1998. It was designed for use by purchasers, manufacturers and regulatory authorities such as FSSD to assess product conformity to safety, reliability and performance specifications. PLS is administered by PSB Corp's Product Certification & Inspection (CIN).

In fact there are a number of possible users of PLS. These include regulatory authorities who play a critical role in ensuring that regulated products sold and used in Singapore conform to safety and health requirements; buyers who are concerned that the quality of products purchased meet required standards; manufacturers and suppliers who want to prove that their products are able to and continue to comply with safety and performance standards; specifiers like architects, and engineers who are concerned about approving products which meet standards of safety and quality for their building projects; consumers who are discerning in their choice of products and who insist on products which are certified by PSB Corp.

The scheme is well established as a third-party, independent product certification scheme, no doubt testifying to its worthy safety objectives and its ease of use.

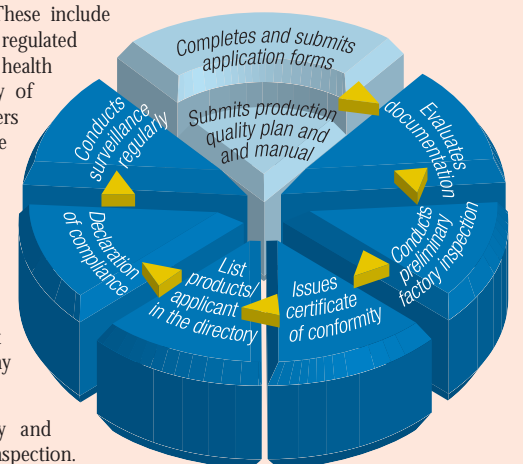
Under this scheme, products are assessed for safety and performance by type testing, surveillance testing and inspection. These tests are conducted to national, international standards and/or relevant regulatory requirements. There are three classes of product listing class 1A, 1B and class 2.

For example, the type of fire protection systems offered by Promat is certified under PLS Class 1A. This in turn involves type testing and quality assurance plan audit.

Although the PLS is voluntary in nature, regulatory authorities may use them as a means to regulate products under their jurisdiction. It is compulsory for those regulated by FSSD.

There are however other benefits of joining the PLS. For example, through the publication of the listed products in the PLS directory, in hardcopy form and via the Internet, products are exposed to a considerably wider audience. PSB Corp also regularly promotes and publicises the PLS.

In fact, with the Certificate of Conformity (COC) and PSB Corp Test Mark 'Tick' mark clearly visible on products, the PLS becomes a useful marketing tool for manufacturers and suppliers to gain better acceptance of their products locally and internationally.



The diagram demonstrates the requirements for products certified under PLS Class 1A.

### How PSB Corp monitors certification of fire rated systems

There are three ways customers can find out if our products are PLS certified:

#### Certificate of Conformity (COC)

All application for PSB Corp's PLS must be accompanied with a valid full type test report to the required standard(s) either by PSB Corp laboratory or PSB Corp recognised laboratories. Besides test evidence, PSB Corp also checks on the company Quality Assurance Plan covering the production process flowchart; suppliers qualification; incoming raw material check and quality plan to ensure installed system on site compliant to standards. Upon successful compliance, a Certificate of Conformity (COC) will be issued. This certificate is subjected to renewal every three years. Follow-up surveillance is an essential part of the certification.

#### Product Listing Scheme website and hardcopy directory

Products certified under PSB Corp's PLS will be listed on the PLS website ([http://www.psbtest.com/prodcert\\_prodlst.cfm](http://www.psbtest.com/prodcert_prodlst.cfm)), as well as updated on the annual hardcopy print of the PLS directory of listed products.

#### Declaration of Compliance (DOC)

Finally, our systems are backed with a Declaration of Compliance (DOC), which is our declaration of our system compliance installed at each site. Information such as the COC reference no., area of coverage and location is detailed in the declaration form.

The DOC works as follows:

Promat completes a DOC (in triplicate) obtained from PSB Corp. The completed DOC is then submitted to PSB Corp. An on-site surveillance audit will be carried out by PSB Corp on a random basis. Upon successful audit completion, a copy of the triplicate form is submitted to the Project Qualified Person (QP) for the issuance of FSSD Temporary Fire Permit, while Promat and PSB Corp retain the remaining copies for record purposes.

### Renewal requirements

PSB Corp regularly monitors its PLS certified products to meet the required standards for safety and performance.

PSB Corp also recently completed an annual renewal exercise where all fire rated systems (with test reports more than 10 years old) were revalidated with new type tests. It is this vigorous drive for quality ensures that only products which consistently meet requirements, remain certified in PSB Corp's PLS Scheme.

For more information on Promat's latest list of PLS certified products, please follow on this link to the website: [http://www.psbtest.com/prodcert\\_prodlst.cfm](http://www.psbtest.com/prodcert_prodlst.cfm)

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## PROACTIVE FIRE TRENDS

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

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● **Introducing the new revised National Building Code in Australia**

# Standards Australia releases fire protection maintenance standards AS1851: 2005

Fire protection systems and equipment are required to be ready to operate at all times, or a substantial threat to occupants and property may exist. However they may only be required to operate infrequently over the life of a building and therefore their reliability in a building is critical.

Regular maintenance of fire protection systems and equipment for continuing operational efficiency is an important part of every building owner's responsibility

Standards Australia has just released the long awaited revision of AS1851: 2005 "Maintenance of fire protection system and equipment". Important changes in AS1851: 2005 include:

- Clear ground rules and procedures for testing and preventive maintenance to ensure system operation.
- More rigorous recording and reporting to ensure that maintenance documentation is kept current.
- Standardised test frequencies – requiring monthly sprinkler and pump testing.
- New building fire systems interface tests for annual compliance.
- New annual survey.
- Reduced water consumption for system testing. PFT



Published by permission. A detailed AS1851: 2005 White Paper by Fire Protection Association Australia can be found on [www.fpa.com.au](http://www.fpa.com.au).



NETWORK REPORT

● **Promat proactive solutions to quality concerns**

## Promat features at One Raffles Quay, "The Logical Move" for business

In global business, demands for quality will continue to play an increasingly significant role in the corporate level decision-making process. This unrelenting economic principle is never more obvious than in the dynamics of Singapore's perpetually changing skyline. In its ambition to be a regional powerhouse for business and perhaps eventually even a so-called "global city", a high level of sophisticated infrastructure is the rule rather than the exception.

Policy and urban planners in the bustling island city state realised long ago that quality buildings incorporating the latest building techniques, materials and technologies provide a distinct competitive advantage. One Raffles Quay, a new two-tower complex in the heart of the CBD, is a very good example.

### Quality site management, finest workmanship

The developers promote One Raffles Quay as "The Logical Move" for businesses seeking prestige office accommodation. It has quickly attracted quality anchor tenants.

The first impression at the One Raffles Quay building site is one of orderly site management and the next is an unusual concern for detail and remarkable workmanship. The high level of quality installation at One Raffles Quay is immediately obvious, even to the untrained eye. But this is not a coincidence. The main contractors are well known for upholding very strict site installation quality procedures.

Three Promat systems are installed at One Raffles Quay: Two hours fire resistant PROMATECT®-S enclosures to high tension cables, two hours fire resistant PROMATECT®-H cladding to HVAC ducts and two hours fire resistant VICUCLAD® enclosure to wet and dry riser pipes.

### High impact resistance PROMATECT®-S enclosure for high tension cables

A 700m run of high tension cables ply the basement, first, second,



third and eleventh storey of the One Raffles Quay complex. These high tension cables are critical to a fail-safe power supply in the complex, even during emergencies. The cables must not collapse or be susceptible to dislodgement.

It is therefore essential for the enclosure to have high impact resistance and two hours fire resistance.

PROMATECT®-S was selected as it fulfilled all the requirements perfectly. The panels were cut onsite to ensure a precision fit to the cable ladders.

### PROMATECT®-H cladding to HVAC ducts

As with many projects, Promat ducts were the right choice for One Raffles Quay because PROMATECT®-H cladding complies with impact resistant requirements of BS 5234, provides two hours fire resistance performance as certified by Singapore's approving authority, and Promat is known to administer an efficient and effective installation audit service, carried out by trained Promat personnel.

Some 5,800m<sup>2</sup> of Promat fire rated duct are installed at One Raffles Quay.

### VICUCLAD® enclosure to wet and dry riser pipes

Singapore fire regulations require riser pipes conveying water supply to the sprinkler system to be fire rated. The relevant standard requires a maximum temperature limit of 75°C measured within the water pipe under ISO fire curve.

That temperature – way below the boiling point of 100°C – usually guarantees that water supply to the sprinkler system is not impaired in any. Including the One Raffles Quay project, VICUCLAD® has been installed in more than 1500 Singapore projects since 1984. PFT



A high quality finished PROMATECT®-S services enclosure.



HVAC ducts after cladding with PROMATECT®-H.



A VICUCLAD® pipe.

● **A guide to smoke extraction in buildings**

# A super highway for

Smoke detectors, containment areas, passive fire protection and automatic fire sprinklers – taken in concert, this quartet of construction features is responsible for an improving record of life and property protection in commercial buildings that have been constructed throughout the world over the past several decades. Unfortunately, some participants in Building Code development and enforcement processes attribute this safety record to sprinklers alone – an invalid and dangerous assumption.

Sprinklers alone – without limitations on compartment size, without tested and inspected passive fire protection, and without smoke detection – cannot deliver equivalent results. It is crucial that Building Codes reflect a clear understanding of the systems nature of effective fire protection if we are to avoid sanctioning the construction of buildings that are code – compliant but unsuitable for life safety and property protection.

*Figure (right)* Effective fire protection requires a systems approach with four primary elements in place, installed in accordance with established standards, and monitored for continuing effectiveness. Sprinklers alone cannot effectively protect life and property.



According to "America Burning Revisited", published by NFPA, the United States, along with Canada still has the worst fire death rate for all the industrialised countries for which we have comparable data. The U.S. fire deaths per million in population are almost twice the average fire death rates for other industrialised countries.

Smoke kills approximately 75 percent of the fire victims across the world. These deaths occur in areas remote from the room of fire origin and are due to the toxic effects of the smoke as it migrates throughout a building. Smoke contaminates escape routes, including stairs, hallways and elevators, trapping occupants, inhibiting safe egress.

## Why must we contain smoke, toxic gases and fire?

- ¾ of all fire deaths are caused by smoke inhalation. Source: Hall, Jr. John R. NFPA Fire Analysis & Research, Quincy, MA. "Burns, Toxic Gases, and other Hazards".
- Approximately 57% of people killed in fires are not in the room of the fire's origin. Source: NFPA Fire Protection Handbook, 18th Ed. Table 1-1P. Page 1-15.
- Visibility – 47% of survivors caught in a fire could not see more than 12 feet (3.6 metres). Source: NFPA Fire Protection Handbook, 18th Ed. Table 8-1P. Page 8-17.
- Smoke travels 40-70 metres per minute under fire conditions. Source: Estimate based upon ceiling jet velocity calculations for typical ceiling heights and heat release rates.

Any ductwork is required to maintain fire resisting compartmentation. A general requirement used to exist worldwide to ensure that a building is provided with a level of structural fire

protection and compartmentation such that the building is capable of surviving a full burn out even if a sprinkler systems is installed. Nowadays modern fire engineered designs tends to allow a trade off between active and passive systems The older concept allows for the possibility of the sprinklers either failing to operate effectively due to poor maintenance, equipment failure or the inability to control an unexpectedly growing fire.

The rapidity and extent of the transmission of smoke through the ventilation system to remote parts of a building are of primary importance to life safety, particularly as the smoke is likely to contain toxic and/or noxious products of combustion. The areas contaminated will be determined by the comparative pressure conditions in parts of the building served by the system; these will result from:

1. expansion effects due to the fire;
2. buoyancy effects due primarily to the fire (particularly in vertical ductwork);
3. wind effects on the building;
4. stack effects; i.e., caused by the differences between the indoor and outdoor temperatures.

There is potential for cool smoke and gases to spread thorough the system so long as the air handling plant continues to function and before fire dampers operate to isolate the fire area. Fire dampers, which are designed primarily to stop flames and hot gases passing from one area to another through the ductwork, are usually controlled by thermally actuated devices. Unless also actuated by smoke detectors, fire dampers will not close until the thermally actuated devices reach their operating temperature, and during this intervening period cool smoke may be drawn, or may diffuse, into the system and be circulated to other areas as yet unaffected by fire. Careful control of the extract plant during this period can assist the removal of such smoke.

There are a number of methods of controlling the movement of smoke in buildings, and several reasons for wanting to do so. The need for smoke control in any building is usually decided in context of the means of escape, compartmentation and active suppression systems in the particular circumstances of that building. In general terms, smoke extraction should be considered and may be found particularly useful in the following circumstances.

- a) Smoke extraction for life safety: Smoke extraction for life safety purposes is of benefit in buildings where means of escape to the open air cannot be achieved within a short period of time and in which the means of escape could be severely contaminated with smoke and become impassable. Examples include shopping malls, atrium buildings, and high-rise buildings with phased evacuation (i.e. when a proportion of the occupants are expected to stay in the building throughout the duration of a fire).
- b) Smoke extraction for fire-fighter access: Buildings where either
  - i) fire brigade access is difficult, e.g. basements, high-rise buildings, or
  - ii) rapid attack on a fire is desirable to reduce fire spread and property damage, e.g. high value warehouses, will benefit from the provision of an appropriate smoke extraction system.
- c) Smoke extraction to clear smoke after a fire (smoke purging): Buildings where smoke clearance by natural means may be difficult (e.g. basements, windowless buildings, and high-rise buildings without operable windows) may be require a mechanical smoke purging system.

*Continued on the right.*



*(Left, top, below and far left) PROMATECT® -H fire rated ductwork systems throughout the Changi Water Reclamation Plant.*



*(Above) Specialist installer training conducted by Promat Singapore for installing the ducts in Changi Water Reclamation Plant.*

*(Left and below) PROMATECT® -H post cladding smoke extraction ductwork for the refugee floors in Nina Tower, Hong Kong.*

# safety or danger?

*PROMATECT® -L500 post cladding steel ducts in Jurong Deep Sewerage, Singapore.*



*(Right and top right) PROMATECT® -L500 two hours fire rated self-supporting ducts in Telstra Exchange of City North, Sydney, Australia.*



*(Far right) PROMATECT® -L500 post cladding steel ducts for the staircase entrance in United Square, Singapore.*




*(Bottom) PROMATECT® -H post cladding smoke extraction ductwork in Langham Place, Hong Kong.*



*(Above) Steel ventilation ducts in Shanghai Formula One Racing Circuit, China.*

## Conclusion

So to go back to the original question posed; who is right? Well we believe our European colleagues are. By adding that third discipline of insulation to that of stability and integrity, if a fire does occur, then those responsible for the specification of the system can be fully and totally satisfied that they have taken every precaution possible to provide the maximum level of safety for the occupants of that building, and to ensure the safety of the emergency services that have the responsibility for safety and rescue of individuals.

To find an answer, it is hoped that the guides produced by companies and organisations such as Promat will go some way towards promoting a better understanding of this complicated subject and thus ensuring that the buildings we occupy are safer for all and that properly designed systems will be installed to make certain that ductwork can be used and will become **a super highway for safety**, and not for the movement of fire and smoke! 



*(Top right, below and here) PROMATECT® -H two hours fire rated post cladding steel ducts in Queensway Fire Station, Singapore.*



*(Above and right) PROMATECT® -H smoke extraction ductwork in One Raffles Quay, Singapore.*



● **Building expansion at management school looks to Promat**

# PROMATECT® 250 cladding protects structural steel

Mumbai, previously known by many as Bombay, has long enjoyed status as a centre of trade for the subcontinent and westwards to the countries of the Middle East. Today, pulsating with raw energy, this huge and densely populated metropolis is without doubt India's financial powerhouse and dominant city for business and industry.

In the short space of recent years, dazzling new shopping arcades, exciting sport activities, nightclubs and discotheques, theatre and music, gourmet restaurants and interesting sightseeing destinations have been added to Mumbai's already rich palette of life. If it happens anywhere in India it will almost definitely be seen first amongst the business addresses of Mumbai.

In fact, many observers note that it is entrepreneurial Mumbai who is leading India away from the shadows of economic stagnation and into the spotlight of international business. As a result, most accurately predict that this huge subcontinental economic force will soon take its rightful place on the stage of international commerce.

It could also be said that global business is not just looking to India for competitively priced goods and services, but also for business leadership.

## Welingkar Institute of Management studies



The Welingkar Institute of Management Development & Research ranks among the top Business Schools in South Asia. It provides a comprehensive syllabus of quality management studies to national and international students.

As business activities have increased across India's spectrum of recent years, so have similar demands been placed on its tertiary educational facilities. As a result, Welingkar confidently predicted that a major plan to increase its enrolment base of the students would be needed by 2006.

Plans were drawn up and it became known that the expansion programme project had to be completed within a record 16 month timeline. Other factors that had to be considered for the building extension plan included space constraints, lack of load-bearing capacity of existing columns, safety exits and high human traffic areas, plus a understandable desire to safely maximise the useable floor area.

Weighing these options and more, the designers eventually recommended the use of structural steel as the fundamental structural method for creating additional levels for the existing four storey structure.

## Promat protection for structural steel

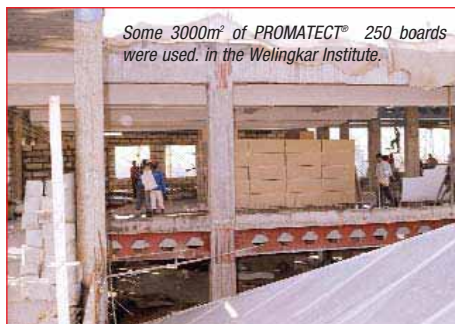
Consultants to the Welingkar Institutes building extension eventually targeted Promat recommendations for protecting structural steel with PROMATECT® 250 cladding system being the system of ultimate choice.

The following Promat advantages were cited as influential in the decision-making process:

- Inert material, no harmful emissions in either normal or fire conditions;
- Good durability, usually more than 30 years;
- Excellent resistance to humidity;
- Easy quality control working and installation process;
- Dry work, no cross trade pollution;
- Excellent aesthetic qualities, good appearance, ease of decoration;
- Little or no maintenance required.



The asbestos-free PROMATECT® 250 boards are also easy to work with and install.



Some 3000m<sup>2</sup> of PROMATECT® 250 boards were used in the Welingkar Institute.

In the final analysis, some 3000m<sup>2</sup> of 20mm and 25mm PROMATECT® 250, offering two hours steel protection for the castellated sections used in the Welingkar Institute buildings extension were employed as steel beam cladding. **PFT**

For a copy of PROMATECT® 250 PROMAXON® Technology structural fire protection, please contact us via the Enquiry Form on page 7.

## NETWORK REPORTS

● **Proven performance a key factor**

# PROMAVIC® panels fire stop two substations in Singapore



Each PROMAVIC® panel bears a serialised number to facilitate traceability.

The humble electrical substation is the rugged workhorse of most power distribution grids. Dedicated to reliability, their basic function is to step up and step down electricity to higher and lower voltages several times on its way from the power generation plant to the consumer.

There are essentially two types – transmission substations with voltage ratings from 170kV to 800kV and distribution substations which step down the voltage from 170kV to the medium voltage levels required by customers.

## PROMAVIC® panels in unique design meet substations' operational requirements

Two key Singapore 400kV substations – one at Labrador Park and another at Paya Lebar in the east of the densely populated island city state – are now protected with PROMAVIC® fire barrier panels.

With cable penetration an unavoidable fact of life throughout every substation, large openings are made in compartment walls and floors to facilitate cable works. These openings breach the integrity of the substation's compartment and have to be fire stopped to ensure that a fire outbreak is confined within its source.

However, in view of near constant cabling work, a permanent fire stop system is usually considered a burden to efficient daily operations. The unique construction of cable ramps and large span openings also requires installed fire stopping to be able to take a level of traffic loading (see picture at top of page).

Configured in modules to suit site-specific openings and supported on a light gauge framework capable of taking human traffic load, the PROMAVIC® panels installed in the two Singapore substations are 100% retrievable from the openings. They are also re-useable after new cables are installed.

A total of 2759 PROMAVIC® panels – all with serialised numbers to facilitate traceability – were installed at the Paya Lebar location. **PFT**

PROMAVIC® panels are fabricated from a composite of VICUCLAD® sandwiched on both faces with PROMINA® 60.

● **Promat fire protection employed at key locations in new hospital**

# PROMATECT® -H installed in key locations at KL's new Prince Court Medical Centre

Malaysia's entry into and subsequent move up the value-added chain of the international health care industries is generally seen as a wise move for the country's expanding economy. As planners look to this vital industry for long term benefits as well as sensible investment opportunities, hospitals, medical services and specialist clinics continue to multiply. Many involve foreign participation, particularly at planning level. All have a keen sense of long-term security.



Typical is the prestige, new five star international Prince Court Medical Centre in Kuala Lumpur, serving the nation's business and administrative capitals.

Said to provide 'world class' private health care services for Malaysian residents and patients from adjacent South East Asian countries, the original design of this very modern building included acoustics, environmental sustainable design, computational fluid dynamics, thermal modelling, automatic handling system and fire safety engineering.

## Promat products protect auditorium and ductwork

Some 5000m<sup>2</sup> of PROMATECT®-H was used to enhance safety at the Prince Court Medical Centre.

More than 4000m<sup>2</sup> were installed for two hours fire rated ductwork in a vertical duct running from ground level to the seventh floor roof top. PROMATECT®-H met the required fire resistant performance and impact specifications.

Due to the ease and speed of installation, PROMATECT®-H was also installed in the hospital's auditorium for a two hours fire rated ceiling and partition wall to separate the auditorium as a single compartment.

Elsewhere, the specifiers used PROMASTOP® Cement to seal opening for cables penetrating floor compartments. About 200 bags of PROMASTOP® Cement were finally used. **PFT**

● 梅赛德斯-奔驰 (Mercedes Benz) 座落在北京的新工厂

# 德国名牌轿车制造厂信赖保全防火系统

梅赛德斯-奔驰从20世纪30年代起就已经进入中国。戴姆勒-克莱斯勒 (Daimler Chrysler) 通过子公司梅赛德斯-奔驰中国有限公司将轿车产品推向中国。2004年初, 戴姆勒-克莱斯勒与长期合作伙伴北京汽车工业控股有限公司计划在北京建立新工厂, 生产梅赛德斯-奔驰E级和C级轿车。



北京奔驰-戴·克公司新厂区座落在北京经济技术开发区, 占地总面积为198万平方米。奔驰新工厂的厂房占地面积为62,777平方米, 包括车身车间、车辆总装区、部件装配区、工程技术区和行政管理区, 新增年生产能力为25,000辆梅赛德斯-奔驰E级和C级轿车。新工厂建成后将是一座拥有世界汽车制造业先进技术和最优秀品牌的汽车制造厂, 工厂将严格遵循梅赛德斯-奔驰生产体系运作, 从而确保每辆汽车都达到全球统一的高质量标准。与此同时, 克莱斯勒公司的最新产品也将陆续在新厂区安排生产。

正如奔驰汽车的品质一样, 保全被动防火系统在专业客户的眼中同样是值得高度信赖。在北京奔驰-戴·克公司新厂建设中, 保全防火墙系统被大量地应用于车身车间与总装车间及装配区的防火隔断中, 以及动力区的重要功能房间隔断。其中有部分墙体长度达到168m, 高度达到14m, 由于保全防火板 PROMATECT® 具有卓越的防火性能, 轻质高强, 而且保全公司运用了专业的大体量墙体结构计算技术, 这些技术难题迎刃而解。在本工程中, 最终应用保全防火板 PROMATECT® 的防火隔墙面积达到7200m<sup>2</sup>。并且有 PROMASEAL® Fire Collar 阻火圈用于塑胶管道穿越防火墙的密封处理。PFT



请按照以下的咨询表 (Enquiry Form) 联络我们以获取一本“保全防火板材的建筑预防式防火系统技术手册”。

● 重庆国际会议展览中心应用保全防火板 PROMINA®

## 中国西南首要建筑的预防式防火设备

重庆国际会议展览中心 (Chongqing International Convention & Exhibition Center) 坐落于重庆市南岸区南桥头, 地处南岸区商业中心, 是重庆市十大社会文化基础设施之一, 也是中国西南地区配套设备最为齐全的综合会议展览场地。重庆国际会议展览中心距重庆江北国际机场30公里, 约30分钟高速公路车程, 距重庆火车站3公里, 同时濒临长江客货运码头, 这一得天独厚的地理位置给参展客商带来了及大的交通便利。

重庆国际会议展览中心占地面积23公顷, 总建筑面积约237,500平方米。同时建有面积达30,000平方米绿化广场和可容纳2,750辆车的停车场。附近配套的酒店、艺术馆和购物中心等更是咫尺之遥。

该会展中心展厅共分3层, 其中每层展区面积均超过15,000平方米, 最大净空高度超过16米, 所有展区共可提供2,400个标准展位。该工程已于2005年9月顺利竣工并投入使用。

一般来讲, 越重要的项目, 其消防安全性能就越会引起人们的关注, 重庆国际会议展览中心更是如此。如何对分布在展厅楼板下侧的电缆进行防火保护并方便定时检修是一直摆在专业设计人员面前的棘手问题。最终, 品质优越的保全电缆防火保护系统使这一难题得到了圆满的解决。由保全防火板 PROMINA® 构筑的电缆沟槽具有出色的防火性能, 不但可以防止下侧火灾对槽沟内电缆的影响, 而且可以将由于电缆自身引起的火灾限制在槽沟内部。同时, 由于防火系统结构内部增加了承重支撑结构, 这样操作人员可以放心的从楼板上侧进入到电缆沟槽内开展布线、维护等工作。在该项目中, 共有超过10,000平方米的保全防火板 PROMINA® 被应用。PFT

请按照以下的咨询表 (Enquiry Form) 联络我们以获取一本“保全防火板材的建筑预防式防火系统技术手册”。

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\_\_\_\_\_ (number)\* copy/copies of the FIFA World Cup Germany 2006 wall chart

Others (please specify) \_\_\_\_\_

On value scale of 1~5, I would rate this issue a \_\_\_\_\_ for my reference. (1 = Excellent; 2 = Very good; 3 = Useful; 4 = Okay; 5 = Not useful.)

Please include/update me in your mailing list.

\*Subject to approval.

**FAX NOW**  
Your nearest Promat office can be selected from behind this form.

This Enquiry Form refers to ProActive Fire Trends Newsletter Volume 9, Number 1 - First Half, 2006

● World class transportation system sets safety standards

# Sophisticated MRT depot turns to proven Promat solutions

The 1987 launch of Singapore's Mass Rapid Transit System (MRT) is considered by some to be one of several important pivotal moments in the country's strategic development. Here, for the first time in Southeast Asia, a clean, fast, coolly efficient, easy-to-use mass people mover on a grand and thoroughly modern scale. The Little Red Dot On The Map never looked back. Nor did the MRT.

With the Northeast Line (NEL) added in 2003 to the system's inaugural North-South East-West main line configuration, work is now well advanced on the 29 station, fully automated and underground Circle Line (CCL). Scheduled for operations in 2010, the 33km long CCL will assure commuters considerably enhanced connectivity and greater convenience.

Included in Stage 2 of four construction stages is the S\$297 million Kim Chuan Depot, a large underground complex responsible for stabling of trains, maintenance and CCL operational control. Some 2.1 million cubic metres of soil was excavated for the depot on Upper Paya Lebar Road. It covers an area of 100,000m<sup>2</sup>, reaches depths of 24m and includes a four storeys 66Kv power intake substation.

To achieve a higher level of quality and a shorter construction period than possible with conventional cast in-situ construction, the Kim Chuan Depot used pre-fabricated construction.

Within the complex, myriads of train tracks converge at the platform level. To connect the massive network of service platforms and various plant and equipment rooms, a precast concrete link-bridge system joins these important areas.

## Four hours fire rated link and fire exit passageways

The link-bridge also allows occupants access to exit staircases and an effective means of escape in the event of emergency. Elevated 6.5 metres above the track platform level, this exit passage needs to be a fire safe zone of at least four hours fire resistance. Measuring between 1.3m to 3m wide and 2.8m high over a total length of 2.5km, the enclosing fire resistant walls represent a rather unique list of requirements.

- Four hours fire rated and possess all the necessary local approving authority's listing requirements;
- the overall thickness of the 4 hour fire rated wall must be thin enough not to reduce the effective width of the passageway;
- the constructed weight must not exceed 100kg/sqm so as not to further load burden the pre-fabricated construction;
- impact resistance because exit passageways required to resist crowd pressure and impact;

- rapid construction from preliminaries to actual installation;
- access is only available on the linkway side.

The latter was seen as the most challenging of all because the use of scaffolding to gain access to the other side of the wall for 6.5 metres above the ground level and for the entire 2.5km of the bridge was quickly assessed as counter-productive, particularly in terms of cost and time.

In the final analysis, four hours fire rated PROMATECT®-H partitions met all the technical demands because PROMATECT®-H is listed with the PSB Corporation, the compulsory requirement for all fire rated elements in Singapore buildings (please see PSB story on page 2) is a mere 136mm thick, weighs only 53kg/m<sup>2</sup>, significantly reduces by 60% construction time over conventional masonry construction methods and pass severe duty class in accordance with BS5234 and BS5588.

The 2.5km of four hours fire rated PROMATECT®-H partition required 10,400 sheets of 9mm x 1220mm x 2440mm PROMATECT®-H boards and 400 man-hours of installation time. The installation was so successful in meeting all requirements – including quality solutions to accessibility from one side only – that the Promat Most Innovative Solution System Award in this important project justifiably went to Promat's business partner, Welmate Pte. Ltd.

## Two hours fire rated vertical protected shaft

The Singapore Fire Code requires air ventilation shafts serving several compartments to be fire rated throughout. PROMATECT® was also used at the Kim Chuan Depot project within a two hours fire rated air handling shaft.

The fire rated duct division was constructed within the narrow confines of a 2.55m x 3.25m wide masonry shaft. In addition to fire resistance, the construction component must be lightweight enough to facilitate maneuvering within a tight space. 50mm thick PROMATECT®-L500 boards in self-supporting ducts effectively met the challenge.

## PROMAVIC® fire barrier panels

In the Kim Chuan Depot's four storeys 66kv power in-take substation, PROMAVIC® fire barrier panels provide fire stopping to cable penetration on walls and floors.

PROMAVIC® panels are modular and serve as a trafficable, retrieval, re-useable fire barrier panel suited perfectly to service the constant cabling. A total of 221 panels were installed. **PFT**

PROMAVIC® panels are fabricated from a composite of VICUCLAD® sandwiched on both faces with PROMINA® 60.



Four hours PROMATECT®-H partitions flanked on both sides of the wall; (inset) before completion of final layer boards.



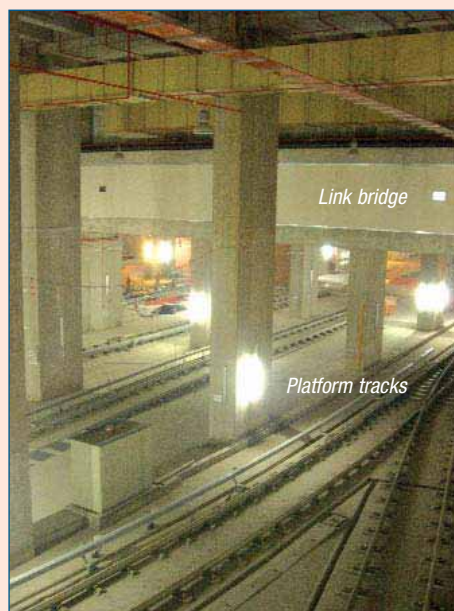
Cable entries at ramp covered with PROMAVIC® panels.



Cable entries penetrate the PROMAVIC® panels.



PROMAVIC® panels cover over cable ramp.



A view at Kim Chuan Depot's platform, the new depot for Upper Paya Lebar Road of Singapore's MRT map.

## Promat Asia Pacific Organisations

**Promat**



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