PROACTIVE FIRE TRENDS

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

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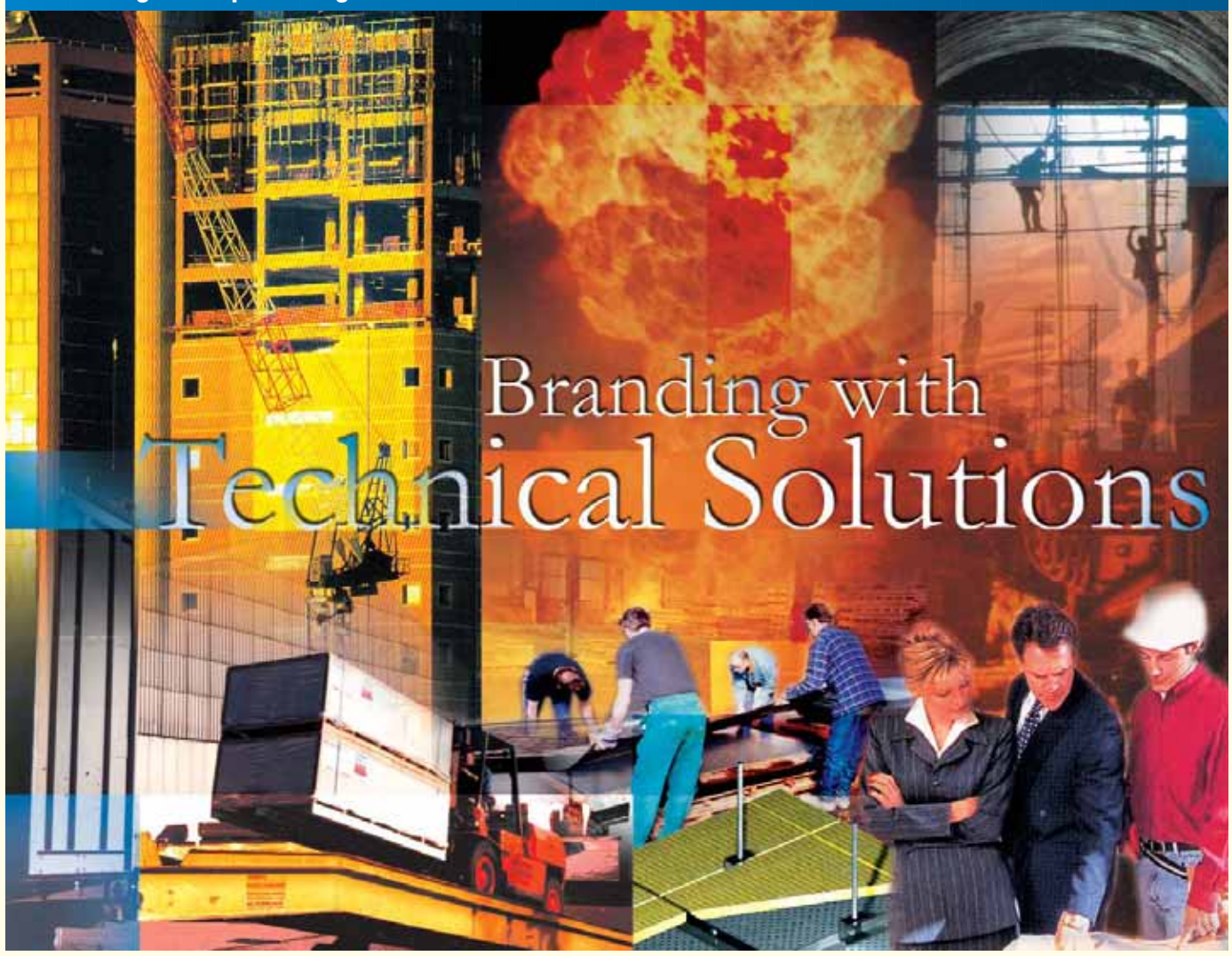
● Creating A Competive Edge



We hear a lot these days about Brand Building. Particularly about the process now referred to simply as Branding. To Be or Not To Be can now easily be given a new interpretation, the cool shorthand slang of the times – 2BE – To Brand is Essential.

A quick glance at any business sector reveals a sobering truism. Competition is heating up at a faster rate – no doubt driven by information technology and the speed with which new information is delivered – than even before. And it will no doubt get even faster in the near future.

Branding is therefore not a flavour of the month fad but an issue of critical significance facing all businesses. It is especially important for the fire protection industry generally and for Promat in particular.

Define Branding?

Branding can be loosely described as creating a product (or name, service or business reputation) and enhancing it through a deliberate and careful planned strategy that aims to add value to, and build consumer confidence in, that product or service.

It doesn't matter which business it is applied to, the general principles of branding remain remarkably similar. Occasionally, the methodology and the mechanics of the process might differ slightly from product to product, industry to industry.

For example, branding a universally popular soft drink will not always be the same as branding for a *ProActive Fire Protection* product. This is largely due as much to the different nature of the products as to the unique markets they address themselves to and work within.

Critical Factors Contributing To Branding Strategies

The success or failure of any product or service depends on many factors. Quality. Price. Functionality. Availability. Reliability.

However, two factors stand out, above all else – reputation and confidence.

Although time lines can be compressed or stretched, a good reputation in any business takes time and much effort to acquire. Nor does confidence in that reputation happen over night. It is not an instant process, despite what a lot of quick-fix entrepreneurs would have us believe.

Typical marketing strategies carry across six to 12 months. It is normal for branding strategies to stretch over five to 10 years, sometimes considerably longer.

The converse also holds equally true. Hard won reputation and confidence are both fragile commodities, even at the best of times and can disappear in the blink of an eye it takes to make a bad decision.

Consumer Confidence Equals A Promise

Consumer confidence cuts across right across all considerations because it is an accumulation and an aggregate of all positive factors. And more.

It is confidence in a product or service – or the lack of it – which will make or break years of brilliant but unrelenting hard work. It is no different selling competitively priced hamburgers through a global fast food chain than marketing a premium priced fire collar designed to ultimately save property and life.

The stakes are high in both cases.

As we know, most market economies are in the final analysis driven by psychological factors, most of which are also anchored in consumer confidence. Effective brand building or branding can therefore play a huge role in reinforcing consumer confidence. It also is a key component in the critical matter of image.

Effective branding therefore becomes synonymous with extending a promise. It also can and usually does encourage preference and loyalty. But at the end of the day, there is no doubt about it. A brand is built gradually, systematically, step by careful step over an extended period of time.

Investing time, effort and resources if properly coordinated usually improves a brand's assets.

continued on page 2

FEATURES

Point of View

As we become more scientific in the ways we do business, there is an unfortunate tendency to overlook many a human dimension. True, we need clever MBAs with their scientific methodologies. But we also need vision and large measures of entrepreneurial initiative, which continually recognise the humanity of our mission, human safety. Call it creativity if you like - in my opinion everyone is creative, to some extent, even within the usual context of business. Whether it is identifying a new market niche or closing a deal, individual creativity is a vital component, indeed the very lifeblood of any enterprise. It recognises no limitations, the sky is literally the limit and it can even express itself in the most humble of ways, from the mundane to the brilliant.

Getting to the top, as we all know, is tough. But once at the top, staying there is even tougher. This is where the art of doing business, identifying and responding to human needs and in so doing creating new opportunities, is just as if not more important than a hard science-only approach. It could be convincingly argued at this critical point in time that, in order to stay ahead of competition, we have little choice but to be artful or creative in our approach to business.

To underline my point, in this PFT, our ninth so far, we are pleased to provide a glimpse of several key related issues.

First is a matter of some strategic importance, for us as individuals and as a progressive, forward-looking company. It is essential to continue building our brand with as many tools as possible. Providing value added Technical Solutions, for example, is just one obvious and smart way towards this objective. The page 1 theme of this PFT provides some thought provoking Technical Solution ideas based on extensive information soon to be centralised in the pages of our forthcoming Promat Solutions Catalogue (a new edition of the Promat Asia Pacific Technical Handbook), due to be launched in the next few months.

In an ongoing series of industry reviews which look at intellectual aspects of fire protection, two guest contributors from New Zealand question the fire resistance ratings of evacuation times. Food for thought as expectations of fire protection increase.

As befits a company which habitually leads the industry from the front with continuing research and development of new products, this PFT also takes a look at our remarkable and improved flexible, open cell PROMASEAL® IBS™ foam strip. Designed specifically for fire stopping joints and gaps, PROMASEAL® IBS™ minimises many of the problems usually associated with other sealants. In view of its of good sales in Australia, there's every reason to believe that similar successes can be achieved in other markets.

Perfect examples of the company's devotion to Technical Solutions as a value added strategy, Promat's advice on upgrading concrete walls and floors on Page 5 outlines various factors which determine correct specifications for fire performance of concrete walls and floors. Extending the same concept further with sensible pragmatic ideas, a review of how a low budget practical technique pioneered by Promat Hong Kong upgrades concrete and gives new life to old buildings rounds out that page. Obviously we can learn a lot from each other if we keep the channels of communication open and active.

Elsewhere in this PFT, two articles of mutual and relevant interest. From Singapore there's proof positive of "artful" technical solutions at work in "space" engineering of fire protection in the baggage handling system at Singapore's Changi International Airport. And from north of the causeway comes news of one of Malaysia's leading insurance companies making extensive use of fire protection systems in their new headquarters building in KL. No coincidence that Promat is one of many shared commonalities. Our usual and helpful multilingual business friend appears on Page 6.

If there's a paradox between science and art in business I believe it is one we can use to our collective advantage and individual benefit. The only real paradox to me is if we don't recognise that science has to be balanced with creativity in the short and long term safety interests of our customers and the business interests of our company.

As we continue our efforts together to keep Promat in a leadership position, it will be absolutely vital to think outside the box, to be just a little more creative than usual, as we apply Technical Solutions to the business problems which undoubtedly await us in the months ahead.

Don't forget, look around at many examples – at the end of the day, being artful or creative is definitely very good for business!

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April 2002

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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, Philippines and Singapore, with distributors in Brunei, Indonesia, Japan, New Zealand, South Korea, Taiwan and Thailand.

Proactive Fire Trends is published by Promat (Malaysia) Sdn. Bhd. (PMSB) and Promat Building System Pte. Ltd. (PBS) for professional organisations and/or individuals interested in the fire sciences industry in the Asia Pacific region.

Branding In The Fire Protection Business

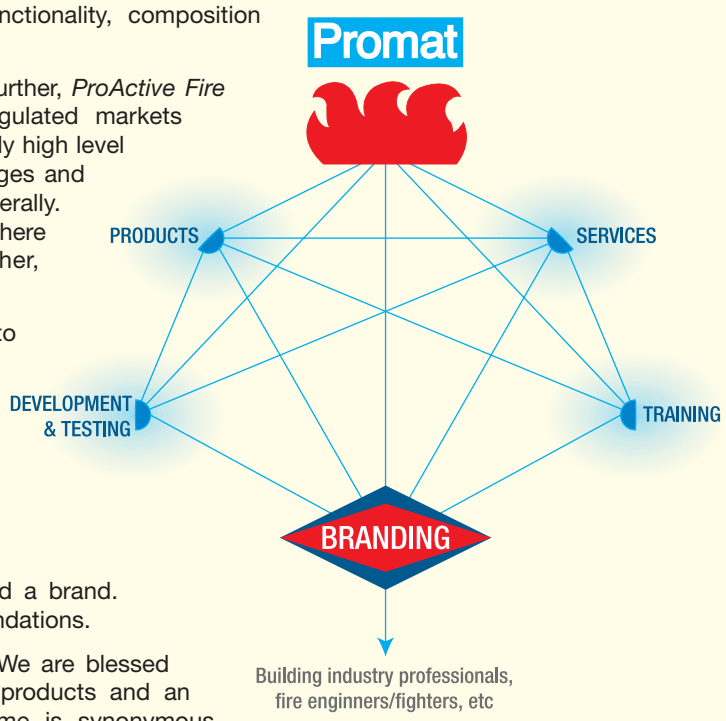
The fire protection business is no exception to these general rules of thumb.

However, its highly specialised nature makes it more competitive than most. The ultimate stakes might be considered higher, depending on your point of view, simply because they involved the safety of the built environment and human life.

The relatively narrow range of *ProActive* fire products available on the market today also means that there is an unavoidable high level of commonality. In purpose, functionality, composition and behaviour.

To complicate matters even further, *ProActive Fire Protection* works well in regulated markets where there exists a reasonably high level of awareness for the advantages and benefits of fire protection generally. In many developing markets where the need is even higher, awareness is sadly low.

But as branding is extended to all markets and all levels of marketing activity, awareness too is changing fast.



Branding The Promat Way

There are many ways to build a brand. It helps to build on strong foundations.

At Promat we are fortunate. We are blessed with superior fire protection products and an excellent reputation. Our name is synonymous with quality and leadership, worldwide. The Promat image represents all that is good in the world of *ProActive* protection.

This has been achieved over many years by building steadily and conservatively on rock solid foundations. Promat products and services a single promise – effective fire protection – a promise which has been delivered time and time again.

System Selling A ProActive Fire Protection System

It is the fire protected version of the same old story – a chain is as strong as its weakest link. When the same thought is expressed in different words – the whole is greater than the sum of individual parts – it becomes immediately apparent that effective fire safety depends on a web of interlocked software and hardware.

Simply having a product or range of products with outstanding individual USPs (Unique Selling Points/Propositions) is no longer sufficient for survive in this competitive world.

Promat products and services work well individually. They work better together if they're designed into and are part of the overall structure.

Installed as a raft of integrated fire protection system they work even better. A structure with a total fire protection system designed and built in from the very beginning is sure to enjoy optimum levels of environmental safety.

The glue that holds selling a system together is software. At Promat this is comprised of the accumulated expertise and knowledge Promat has built up over 40 odd years of experience in the fire protection business. No wonder that Promat is well known as The Knowledge Centre for its abundant test reports and technical solutions.

Technical Solutions Assist & Extend Branding Process

As an industry standard, providing technical solutions usually refers to assisting an architect or engineer's problem solving with an adequately professional technical drawing perhaps reinforced by a little wise counsel.

At Promat we taken this idea and amplify across all levels of human and built environment fire safety. From micro and macro matters to issues that integrate fire safety with the larger surrounding environment.

Technical solutions can of course be individual one-off solutions for specific problems, on the one hand. On the other, technical solutions can and should integrate all relevant fire safety measures in a seamless system of interrelated, interdependent protective measures effecting each and every aspect of a structure's operations.

In this way, each and every link of the chain is strengthened. The idea is simple enough and it is not new.

But the process can be incredibly complex as it not only takes into account architectural, structural, engineering and environmental issues but considerable political and socio-economic matters as well.

On both a global and local basis, Promat is the type of company which can act locally with applications of local expertise while thinking globally on all matters related to applied modern fire science technology.

Through an international network of offices and affiliated companies on virtually every continent, Promat has access to a level of modern relevant information, applied knowledge, sophisticated technology and expertise few others can match.

In this way, Promat adds additional and meaningful dimensions to Technical Solutions.

Integrating and enhancing system selling with unrivalled technical solutions is designed to add new dimensions to Promat branding while building confidence as the company pushes into new areas of profitable business.

Professional technical solutions – an integral component of 2BE – definitely form a unique and competitive edge for Promat. PFT

● Latest Revision of NZBC Acceptable Solution Reduced FRR Required for Fire Safety Building Elements

How Realistic Are Those Fire Resistance Ratings For Evacuation Times?

Original article reprinted from BUILD (Issue May/June 2001) with permission from
BRANZ
Building Research Association of New Zealand (www.branz.org.nz)

The latest revision of the New Zealand Building Code (NZBC) Acceptable Solution for Fire Safety has resulted in reductions in the passive fire ratings required for life safety. Sprinklers have been introduced in some cases, but in most instances passive protection has been reduced without a corresponding increase in active fire suppression systems. Those fire resistance ratings for fire cells are now among the lowest in the world, at no more than 30 minutes for both sprinklered and un-sprinklered buildings. Concerning such short times of fire resistance, standard furnace tests poorly represent temperatures in many real building fires. As a matter of fact, fire-rated elements in real fires can fail significantly earlier than the predicted result.

This article compares recent furnace tests with real building fires. We suggest that reliance on fire safety designs in accordance with the latest revision may result in minimum evacuation times as low as half the required rating, thus insufficient for fire fighters to respond and carry out search and rescue.

Passive/ProActive Fire Protection Reduced

NZBC Acceptable Solution C/AS1 specifies 2 types of fire resistance rating (FRR):

Structural Endurance (S-rating)

Aim to prevent collapse and fire spread damaging other property (not life), and applies when a building is located sufficiently close to a property boundary. A time equivalence (t_e) calculation relates expected compartment temperatures to a standard furnace test. For example. consider a compartment with fuel and ventilation conditions resulting in more severe temperatures than simulated by the standard furnace test. The t_e calculation ensures that the required S-rating is increased to represent an equivalent (longer) time of exposure to the furnace test. In the new Acceptable Solution, S-ratings have been increased by about 30% to account for the thermal characteristics of common gypsum plasterboard-lined fire-cells.

Fire-cell Endurance (F-rating)

Protect the health and life safety of occupants (some of whom may have time while evacuation proceeds) and fire fighters engaged in rescue operations. F-ratings have been reduced to 30 minutes for most buildings. No time equivalence calculation has been applied. In cases where the building fire is more severe than the standard furnace test, the minimum evacuation time can be much less than the F-rating implies.

Why Are NZ's Fire Ratings So Low?

Comparing New Zealand requirements for fire-cell separation with other nations, European countries commonly require ratings 2-3 times higher whereas Australian ratings are 2-4 times as high. New Zealand is the only country to have separate F- and S-ratings.

Overseas prescriptive building code requirements are generally more conservative yet safe. Specific designs are relied upon to introduce further economies. Such designs are carried out by qualified fire engineers who consider aspects such as occupant type and numbers, fuel load, fire scenarios, sprinkler response and proximity to the fire service. In New Zealand, however, major consideration for reducing the prescribed requirements is found in Section 6 of the Building Act, which requires the Building Industry Authority to "pay due regard to the national cost and benefits of any control".

Has emphasis been placed on simply reducing the cost side of the equation, without a coherent cost-benefit justification? Against a total commercial market activity of approximately $2.5 billion, the direct cost saving of reduced F-ratings is estimated at less than 0.1%.

What about the increased societal cost resulting from a substantial fire loss? A trend already observed in Europe indicates that such cost savings are likely to be eroded by increased insurance premiums.

Furnace Test Out Of Date

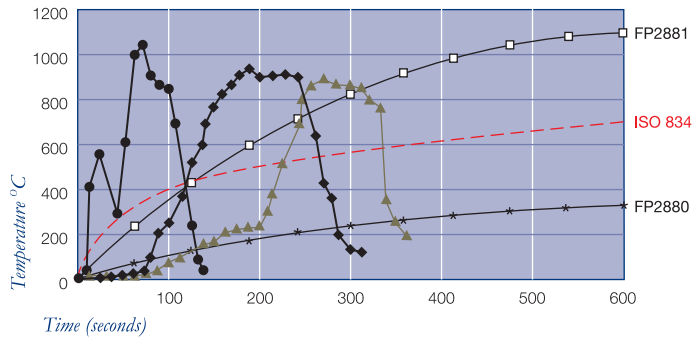
In New Zealand, most fire resistance tests are carried out in accordance with Australian Standard 1530 Part 4: 1997. Using a furnace which follows the ISO 834 time-temperature curve, this dates back to the 1930s and is based on wood-crib fires in furnace-like compartments.

New Zealand buildings and contents have significantly changed over the 70 years. Buildings are better insulated, and wood-based content has been largely replaced by synthetic furnishings and furniture padded with foam plastics. These materials are even more flammable and fire fighters often call them "solid petrol".

Although published test results provide good comparisons between different assemblies, they do not give a good estimate of the time to failure in a real fire. Research on actual fires had showed that most building fires are much hotter than ISO 834 temperatures, particularly in the early stages of a flash-over fire.

Real Fire Temperatures Much Higher

The chart below shows the ISO 834 temperatures compared with the first 10 minutes of three actual compartment fires recorded during a New Zealand Fire Service training exercise in Masterton in December 2000. Three 2.4m cubicles with a single open door were respectively furnished as bedroom, office and lounge (see pictures right and below right).



Above: The ISO 834 temperature curve compared with temperatures recorded in 3 actual fires. The highest and lowest furnace temperatures are also shown here.

As the chart shows, the fires had a rapid temperature rise. They were extinguished by fire fighters shortly after they reached peak temperature (which explains the fast temperature fall). All 3 fires were significantly hotter than the early stages of the ISO 834 curve. The two other smooth curved lines (**FP2880★** and **FP2881□**) represent furnace extremes. FP2881 represents temperatures close to the upper limit of the BRANZ pilot test furnace. FP2880 represents the lower limit of the furnace.

During the early stages of fire, the ISO 834 temperatures are well below those in the **bedroom◆**, **office●** and **lounge▲**. Even the maximum furnace conditions do not match the compartment temperatures. This shows that the standard furnace test does not accurately predict failure times for short duration fires and it is unsafe to rely on ISO test results when specifying short duration evacuation times.

New Research Raises Doubts

A recent research project (Jones, 2001) compared the performance of gypsum plasterboard systems exposed to different fires. Tests were carried out to ISO conditions, and against high and low furnace extremes. The main conclusions of the study are that:

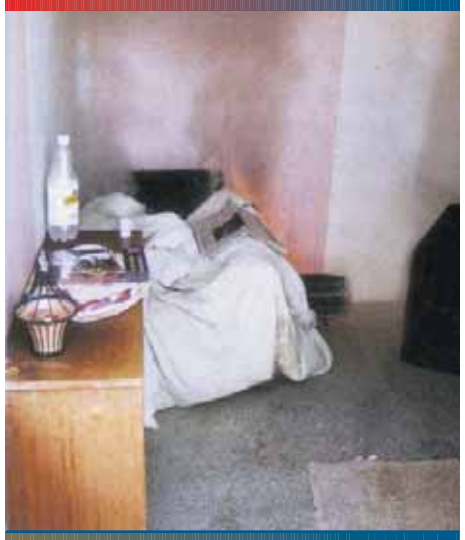
- the fire resisting performance of gypsum plasterboard assemblies is highly dependent on fire severity;
- rapid fire growth is difficult or impossible to simulate with current furnace test facilities – severe furnace tests approximate only a moderate compartment fire;
- currently available computer models give poor predictions of temperatures in assemblies exposed to severe fires.

The tests showed that a wall construction with a published 60-minute FRR failed in less than 30 minutes when exposed to the maximum achievable furnace conditions. The tests also measured char rates of timber studs. Similarly, these were found to vary significantly depending on fire severity.

These measurements cast doubt on the accuracy of fire engineering designs for exposed structural timber, where the nominal char rate of 0.65mm/minute (Buchanan, 1994) has been determined from standard furnace tests.

Similarly, fire-rated penetrations and fire-rated closures (such as doors, windows, glazing and access hatches) have all been tested to standard ISO 834 furnace conditions. There is good reason to suspect a significant performance difference when these systems are exposed to real building fires.

by **Hans Gerlich**/*Technical Manager*, Winstone Wallsboards Ltd.
and **Andy Buchanan**/*Head of Civil Engineering*, University of Canterbury



Fire starting in the compartment furnished as a lounge (above). Flash-over occurring less than 3 minutes after the fire started (below), when the heat is so intense that everything in the room ignites and the fire explodes out of the room opeings.

Pictures courtesy of BRANZ.

Are Sprinklers Reliable?

Sprinklers are a very effective means of protecting life and property. However, are we putting all our eggs in one basket?

New Zealand fire engineers often quote 99.5% sprinkler reliability based on a study by Marryat (1998). A publication by Budnick (2001) compares several studies with reliability values ranging from 81.3% to 99.5%. Marryat is the most optimistic and reflects sprinkler performance in occupancies where inspection, testing and maintenance "exceeding customary requirements".

But the concern is that sprinklers may not always be operational. For instances, when maintenance or building alteration work is in progress, the risk of fire is increased and the sprinkler system may be temporarily out of action. Earthquakes can also damage water supplies of individual buildings or, more seriously, rupture mains supply pipes and affect a number of buildings simultaneously.

It is certianly difficult to design for fires after earthquakes, but is it wise to ignore the possibility in an earthquake-prone country like New Zealand? Robertson and Mehaffey (2000) recommend that "performance-based codes should avoid undue reliance on sprinkler systems which depend on seismically vulnerable water supply".

PROMAT'S ADVICE TO DESIGNERS

If designers rely on published fire resistance ratings to give occupants time to safely evacuate, then their designs may be unsafe. The time available for escape may be much less than the published rating. While discussion regarding safe minimum levels for F-ratings is continuing. the authors recommend that designers select published systems with a rating higher than the F-ratings required by the NZBC Approved Documents.

It would be safely conservative to use twice the F-rating or to refer to the S-rating for guidance.

We are witnessing major changes in the approach to life safety and property protection in our industry. The use of fire engineering techniques is inevitable and a welcome breath of fresh air. But who is to be the policeman? Surely not the Fire Engineers themselves?

The pendulum has already swung too far in some countries, so let us hope that the regulators in countries such as Singapore can learn from the mistakes of others and let us pray that we do not have to wait for a disaster before current trends are tempered.

PFT

● Introducing PROMASEAL® IBS™ Foam Strip

Stopping Fire Passage Through Gaps & Joints

PROMASEAL® IBS™ is a flexible, open cell foam strip designed to provide fire protection to joints and gaps. The application of this foam strip minimises the problems usually associated with sealants such as substitution, varying depths and difficult access.

In Australia, PROMASEAL® IBS™ foam strip is supplied as part of the new Lightweight (aerated concrete) Fire and Acoustic Wall Systems which have been developed to satisfy the increasing demand for noise abatement in residential and commercial applications.

These wall systems are primarily used for partitions, corridor and shaft walls in high rise apartments, multi-residential developments, hotels and commercial structures.

In order to maintain the relevant fire resistance levels of the systems, PROMASEAL® IBS™ foam strip must be installed in the deflection head. The IBS™ foam strip is positioned at the head of the panel (or blockwork system) and compressed as the panels are fixed in place. The installation may vary between manufacturers' systems and should be checked prior to installation.

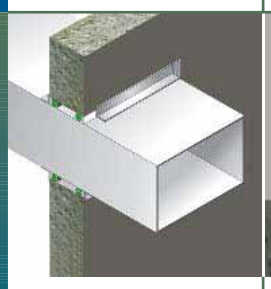
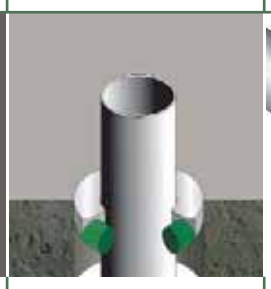
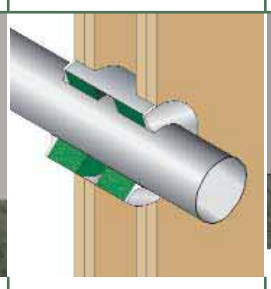
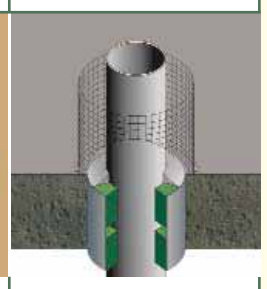
Tested To 4 Hours Fire Rating

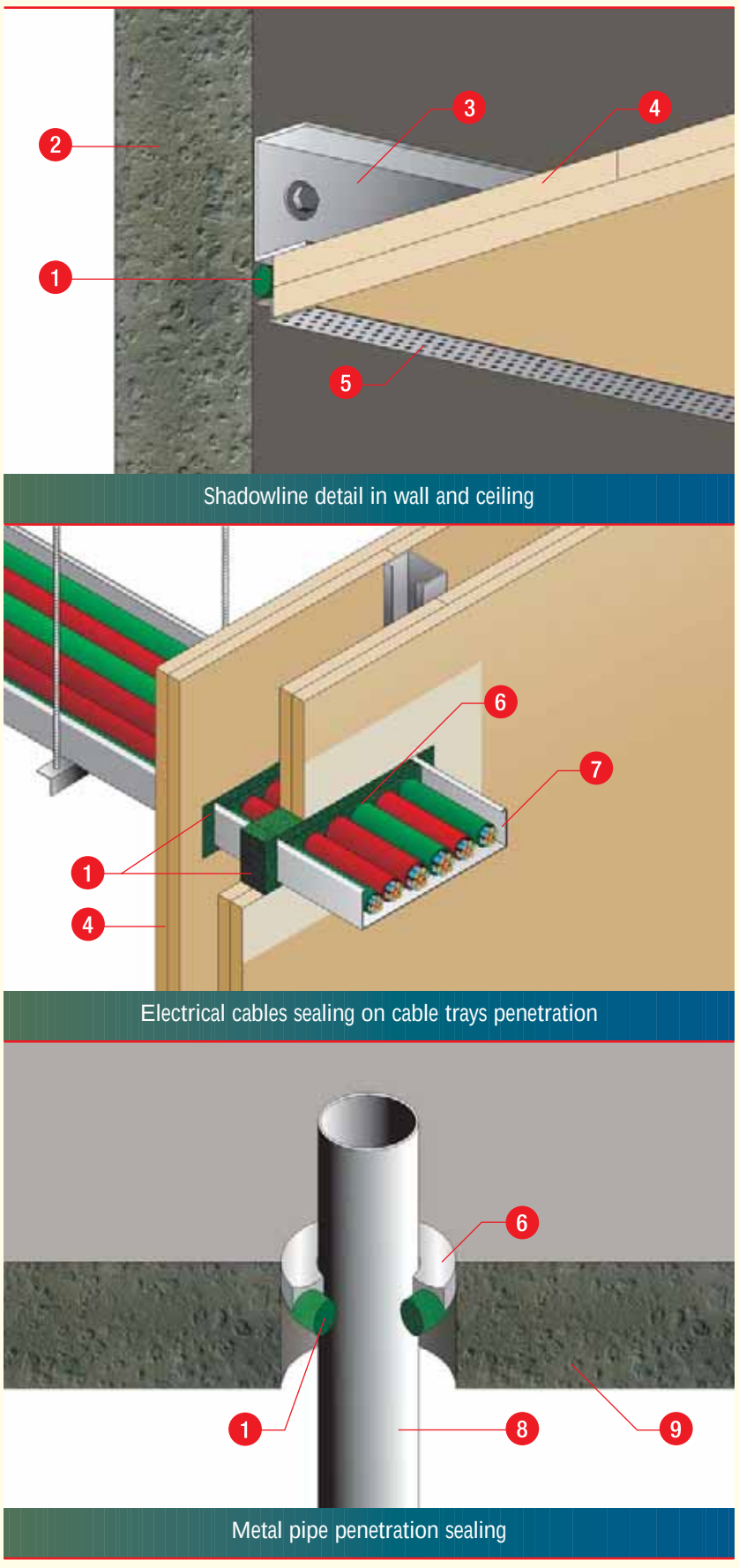
Easy to handle PROMASEAL® IBS™ is installed simply by compressing and inserting it into the appropriate joint or gap. For joints up to 18mm, insert the foam strip into the centre of wall or floor, or 10mm back from the fire side. The additional use of sealant is optional if installed in this way. For joints over 18mm, please consult your nearest Promat office for complete information.

Where joints and gaps are uneven, the maximum gap width is to be taken and matched to the foam strip size. If through-gaps still occur because of uneven surfaces, seal these gaps with a bead of acrylic sealant.

PROMASEAL® IBS™ foam strip is tested to 4 hours fire rating in accordance with the criteria of AS 1530: Part 4 and AS 4072: Part 1. The Fire Resistance Level (FRL) will vary with applications depending on the barrier and the type and size of service in use.

Recent Projects in Sydney, Australia

Project Name & Location	World Square *George Street*	Walsh Bay Re-Development *Hickson Road*	The Cove Apartments *The Rocks*	Saint Vincent's Hospital *Darlinghurst*
				
Details	84-storey apartment tower consists of 800 residential units.	230 luxury apartments included in Sydney Harbourside Wharfs project.	43-storey CBD tower consists of 213 luxury apartments.	New 12-storey block (the Xavier Building) in hospital complex.
Where PROMASEAL® IBS™ Works				
	Control joints to Hebel Fire/Acoustic Wall Systems. Penetration Seals to copper services and air-conditioning ducts.	Penetration seals for metal pipes and air-conditioning ducts.	Penetration seals for metal pipes and air-conditioning ducts.	Specialist metal pipe penetrations; copper, steel, stainless steel



Shadowline detail in wall and ceiling

Electrical cables sealing on cable trays penetration

Metal pipe penetration sealing

Annotation guide of pictures above:

1. PROMASEAL® IBS™ foam strip or backing rod, various thicknesses
2. Masonry wall or partition
3. Steel track
4. Calcium silicate or gypsum boards
5. Flush edge sheet, similar to Rondo P50
6. Acrylic sealant
7. Cables or cable tray
8. Metal pipes
9. Concrete floor

Further information of PROMASEAL® IBS™ foam strip is available on request, please refer to the Business Reply Coupon on page 7. PFT

SCIENCE & RESEARCH

● Concrete Advice on Fire Protection

Upgrading Concrete Walls & Floors Requires Awareness of Design Factors

The fire resistance of a reinforced concrete structure depends to a large extent upon two important factors: (1) the overall thickness of the section which, in turn, determines the acceptable limits of heat transfer through the member; and (2) the average concrete cover to the reinforcement, which also helps to keep the temperature of the reinforcement below critical values.

The tendency of concrete to spall or break-up in a fire can lead to loss of the insulating cover to the steel and reduction in the overall thickness of the structural member.

To reduce these effects, supplementary reinforcement is therefore necessary in some structures.

The overall thickness and cover of the section is determined by the properties of the aggregate used. For example, lightweight aggregate formed from expanded pulverised fuel ash has low thermal conductivity and expansion and is, to some degree at least, more resistant to spalling. Thickness and cover reduction can then be made without lowering fire resistance.

Fire Testing Methods

Concrete floors are normally tested and assessed in accordance with BS 476: Part 21, and are required to satisfy three failure criteria – loadbearing capacity, integrity and insulation – when exposed to fire from below.

Floors protected with a suspended ceiling are tested or assessed to BS 476: Part 23.

The systems detailed in these sections satisfy the above requirements. However, some concrete structures, tunnels for example, can be exposed to more onerous heating conditions.

Design Considerations

When determining specifications to ensure required fire performance of a concrete floor, some other factors should be taken into consideration:

1. **Concrete Density**
   Not only effects concrete's strength but also insulation properties and susceptibility to spalling when exposed to fire.
2. **Concrete Moisture Content**
   Depending on the concrete type, concrete will spall severely when exposed to fire if the moisture content of the concrete is greater than 2-3%.
3. **Concrete Thickness & Cover To Reinforcing Bars**
   Overall slab thickness contributes to the strength and insulation of the structure but concrete cover to the lowest reinforcing bars also plays a critical role. The concrete slab may therefore need upgrading if inadequate cover is first assessed.
4. **Supporting Steelwork**
   Structural steel supporting the concrete slab must be adequately protected against fire.
5. **Other Important Factors**
   Reference in the timber floor section made to suspended ceilings, light fittings, service penetrations, cavity barriers and loading is equally applicable to concrete floors.

Complete information on upgrading concrete walls and floors including the type of fire exposure, is available from your nearest Promat office. Please refer to the Business Reply Coupon on page 7. PFT

NETWORK REPORTS

● Concrete Upgrading of Old Buildings Using PROMATECT®-H

Innovation In Concrete Upgrading

PROMATECT®-H, the most sought after calcium silicate board for fire protection.

In a city better known for its never-say-die, pragmatic lust for future prosperity than its characteristic unsympathetic lack of nostalgia for much of the material past, old buildings in Hong Kong are sometimes balanced precariously between a useful yesterday and an uncertain tomorrow.

But, if attitudes don't always change significantly, economic times most certainly do. The bustling business dynamo of the South China coast has not remained unaffected by the cool winds of the business downturn sweeping through the region in recent times.

These days, some building owners now give serious second thought to redeveloping buildings, creating in turn an opportunity for clever cost-effective and profitable Promat technical solutions.

As in other densely populated fast forward business centres where space is always at a premium, there are still quite a few old buildings in Hong Kong with concrete walls and floors designed with a low fire rating.

When the use of the building changes, demolition is not always a preferred solution. In others, replacing load-bearing walls can be expensive, time consuming and environmentally undesirable.

Promat Hong Kong in conjunction with contributing business partners has developed a simple but highly effective concrete upgrading system that solves most of the problems.

PROMATECT®-H boards are fixed directly to the existing concrete walls and floors with anchors bolts, effectively upgrading their fire rating to meet the requirements of modern building standards.

Depending on requirements and the thickness of the original concrete wall or floor, the performance of the wall or floor can be increased from, say, the original 1 hour to a maximum of 4 hours fire rating, simply by attaching a cladding or over-lining of performance tested PROMATECT®-H boards.

A perfect example of the new technique put to good use is the recent renovation of the old factory building in the territory's Taipo district. Redesigned to house an optical fibre production plant, the PROMATECT®-H concrete upgrading system was employed to increase the fire rating of almost all the building's existing concrete walls from 2 hours to 4 hours. Similarly, the building's old concrete floors were upgraded from 1 to 2 hours fire rating.

Some 10,000m² of PROMATECT®-H were installed with characteristic ease. The PROMATECT®-H upgrading system also allowed for upgraded walls and floors to maintain the lowest possible thickness, an important consideration in over-crowded Hong Kong where efficient "space" engineering is always of paramount importance.

Net result? Promat provides new lease of useful life for an old building. Authorities satisfied. Tenant safe. Landlord pleased. PFT

● Fire Safe "Space" Engineering at Its Best

Baggage Check-In System At Changi Airport Gets Fire Rated Protection

It is not surprising when Singapore's Changi International Airport frequently receives top vote in frequent traveller polls as one of the world's best airports. It certainly is one of the world's busiest, handling in excess of some 5 to 6 million travellers a year – but somehow Changi manages to retain a very human scale and easy-to-use dimension to it.

Equally unsurprising, Changi Airport's support systems are proven, well tested, reliable and absolutely vital to overall efficiency. The baggage handling system, for example, copes quietly, unpraised and mostly unseen, with constant and demanding work loads within the restrictions of time and purpose-built functional building design.

These were just some of the parameters that had to be factored in to the logistics decision to recently upgrade baggage entry compartments in Terminal 2.

Applying The Concept Of Compartmentation

The concept and practice of compartmentation – the division of space in a building into smaller fire-safe cells – is a vital component of *ProActive Fire Protection*.

The form of the compartment should complement the function and the design of the building space it works within. This is particularly true of any airport where space, security and safety are always at a premium. To contain potential fire spread from baggage handling to check-in, the shape of the fire rated compartment in Changi Terminal 2 baggage entry compartment therefore follows the shape and curvature of the baggage conveying configuration.

Veteran contractor Shanghai Chongkee, partnered by Promat Building System Pte Ltd, employed versatile, flexible PROMATECT® boards in the new baggage entry compartment structure.

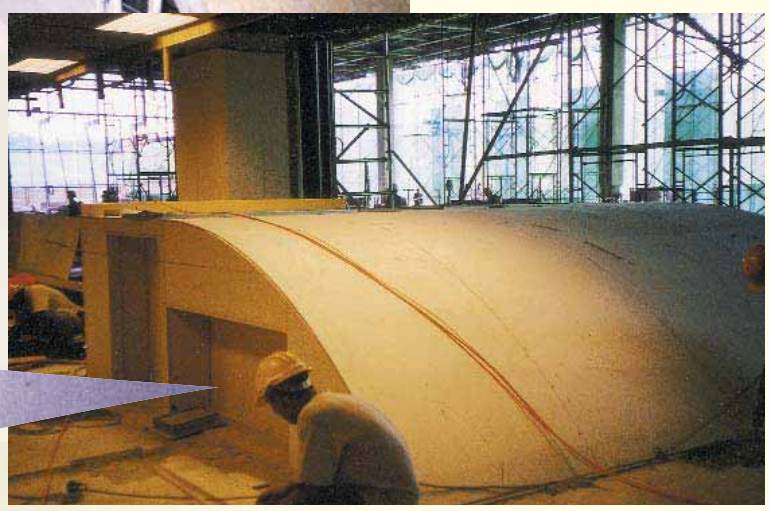
PROMATECT® boards were specified because they provide the required fire rating and can be curved to a radius as small as 4 metres.

In fact, all PROMATECT® installations in Singapore are subject to stringent quality inspection processes which ensure that fire rated boards conform to tested prototypes. Building inspectors simply look for the Promat seal of quality when providing clearance for construction, confident in the knowledge that Promat meets specifications.

The upgrade to Changi Airport's Terminal 2 baggage system was no exception, a triumph of form and function over the restrictions of pragmatic realities and modern "space" engineering. PFT

Skeletal frame construction of the baggage entry compartment.

Building up the construction: First layer of PROMATECT®-H board beneath, followed by rockwool and cover strips.



Right: Final layer of PROMATECT®-H boards is laid.

Left: Inside the baggage compartment.

Pictures courtesy of Shanghai Chongkee.

Pictures courtesy of Pair World Sdn. Bhd.

● Purpose Built PROMASEAL® Bulkhead, Coating & Mortar Systems

Insurance Group Confident in ProActive Fire Protection

The gracefully curved lines of the modern steel and glass facade of the new, soon-to-be-opened Menara Great Eastern Life Assurance has quickly established a dominant visual presence along the business district of Jalan Ampang in Kuala Lumpur. Located within one of the city's commercial areas, not far from the tallest twin towers in the world, the modest but nevertheless quietly imposing high rise building is a solid and striking testimonial to the Great Eastern Group's historical and leading role in Malaysia's insurance industry.

It is neither coincidental nor even surprising that a company primarily concerned with cautious and wise investment in future financial security now has a high level of *ProActive Fire Protection* built into its new Malaysian headquarters. Designed to house administrative and executive operations – along with a balanced mix of other tenants – Menara Great Eastern employs PROMASEAL® Bulkhead Sealer System and PROMASEAL® Mortar throughout its structure.

Located primarily at openings through compartment walls and floors, PROMASEAL® products work in concert to provide international standard integrity, particularly at gaps created by mechanical, electrical and service penetrations (see pictures at left).

If not sealed correctly, such gaps encourage the spread of flame, smoke & toxic gases from one compartment to another, rapidly spreading danger throughout the entire building.

Designed and built strictly in accordance with the criteria of international building safety and construction standards, priorities at Menara Great Eastern were simple and straightforward – *ProActive* fire systems had to be easy to work with and install and, once installed, could be left largely alone.

As there are no moving parts to breakdown or malfunction, PROMASEAL® Bulkhead Sealer System and PROMASEAL® Mortar require little or no maintenance, apart from an occasional visual check.

Like all Promat customers, Menara Great Eastern had a wide choice of innovative fire protection products and systems to meet the challenge of almost every situation. PFT

MULTILINGUAL FEATURE 多國語言刊載

保全 PROMATECT®-H 防火板
再次作爲首要耐火功能的國際貢獻

新加坡樟宜國際機場
行李處理系統的防火保護

新加坡的樟宜國際機場在世界旅遊業被公認爲全球最佳空港．日前它的年旅客流量大約達到 6,600 萬人次．在如此之大的運輸流量下，由於受到原有建築設計中形式和功能的限制，它的行李處理系統爲達到快速高效承受了巨大的壓力．

最近機場當局做出決定，要改進第二航站樓行李登記處理系統，而新的建築結構形式給改造工作提出了非常高的要求．此次改造的難題在於改造後的結構不但在輪廓和外形上要與原行李處理系統的結構外形和完善程度相一致，同時還必須兼顧到防火分區的功能

新加坡保全 Promat Building System Pte Ltd 作爲當地著名承包商上海忠記 Shanghai Chongkee 的合作夥伴，在此改造專案的防火隔牆系統中使用了靈活多變、用途廣泛的 PROMATECT®-H 防火板．

除了能提供指定的耐火強度要求，PROMATECT®-H 防火板還可以彎曲出小到 4 公尺的半徑，成功地解決了以上難題，並達到了規定的耐火時限．

在新加坡，所有的 PROMATECT®-H 產品安裝都要經過近乎苛刻的檢查程式．以保證系統安裝與測試報告之陳述完全一致．當被檢施工完成開始清理時，檢查人員甚至要進場檢查保全防火膠的質量．其樟宜機場第二航站樓行李系統的專案同樣也不例外． PFT

香港舊建築物
混凝土構件耐火強度的提高

在香港，有很多的舊時建築物面臨著翻新重建．此類建築的混凝土樓板和牆體的耐火極限非常低，根本無法滿足現行防火規範的要求

完全拆除現有的混凝土牆體和樓板去重建新樓，尤其是當承重構件也需要拆除時，資金投入巨大，而且即使是僅僅更新非承重混凝土隔牆，也是既不經濟，同時現場管理也非常困難．

保全已經創造了一種提高混凝土構件耐火極限的新系統來解決上述的問題．它通過將 PROMATECT®-H 防火板用膨脹螺栓直接固定在現有的混凝土上，得到了具有更高耐火強度的牆體和樓板，根據設計要求和原有牆（樓板）的厚度，在用 PROMATECT®-H 防火板保護後，牆體和樓板的耐火極限可以從最初的 1 小時上升到 4 小時

在香港大埔的一棟舊二廠需要重新設計成爲光纖工廠．他們採用了保全的 PROMATECT®-H 防火板混凝土更新技術，從而使幾乎所有的混凝土牆體耐火極限由 2 小時提高到 4 小時，舊的混凝土樓板的耐火極限也由 1 小時提高到 2 小時．這一工程總共使用了超過 10,200m² 的 PROMATECT®-H 防火板．除了安裝簡單的優勢外，PROMATECT®-H 防火板更新系統在使得耐火極限提高的同時只佔用最小的空間，這一點在寸土寸金的香港是極爲重要的． PFT

中國防火測試報告號
CNACL No.2001-2282 & No.2001-2284

- 所需的配件與材料只具備於單一包裝
- 可按所需實際長度進行任意切割
- 成型膨脹防火條
- 通過多種材質塑膠管道的防火測試
- 更低廉的存貨成本
- 3 小時的牆體 / 樓板耐火極限

有關詳細資料請參考 www.firecollar.com

FAX NOW

BUSINESS REPLY COUPON

Please complete your personal data and fax to your nearest Promat office, as listed on page 8.

Please send me information on:

Tick here

- ☐ **PROMASEAL® IBS™ Foam Strip**
- ☐ **PROMATECT®-H Calcium Silicate Board**
- ☐ **PROMASTOP® UniCollar®**
- ☐ **Laymen's Guide to Fire-Resistant Ductwork**
- ☐ **Others**

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My Name: _____

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State _____ Postcode/Zip _____

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Laymen's Guide To Fire-Resistant Ductwork - WHY, WHERE & HOW

• PART 2

HOW Fire-Resistant Ductwork Systems In Buildings

Ductwork is required to maintain fire-resisting compartmentation. A general requirement exists 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 sprinkler systems are installed. This 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.

1. Ductwork system fire risks

1.1 Extraction systems – fire may be drawn into the system or may develop within it as follows:

(a) Flames and hot gases from the room or diffused into the system dependent on relative pressure conditions.

(b) Hot sparks diffusing or drawn into the ductwork may ignite combustible insulation, filters, deposits etc. within the system or hot gases may undergo spontaneous ignition when mixing with air from, for example, a branch of the ductwork system.

(c) Heat conducted through the wall of the ductwork (during repair, for example) may ignite combustible insulation, filters, deposits etc.

1.2 Supply systems – a supply system may cause or spread fire as follows:

(a) Fan room fires may cause sparks or flame to travel through the system igniting combustible insulation, deposits etc.

(b) Fires within the room or space in which the ductwork is sited may cause ignition by conduction, through the ductwork wall, of combustible insulation, filters, deposits etc.

(c) Fire may enter the system against the flow, given high overpressure within the fire room or space.

1.3 Ductwork without forced flow

In ductwork without forced flow, the circulation fan is cut off, or where fire dampers at compartments walls or floors have isolated the compartment.

1.4 Fire spread within the ductwork system

The movement of flames and fire gases is similar to that of hot smoke as described in **1.1** above. Where natural convection, buoyancy or expansion effects are sufficient to overcome the air velocity whilst the fan is still working, fire can spread over any combustible material within the ductwork against the air flow, assisted in this case by radiated heat and fully oxygenated air; where combustible lightweight insulating material is used as a lining to a duct wall, this can result in rapid fire spread.

Picture courtesy of Promat GMBH.

2. Break-in of fire into the ductwork system

2.1 The potential for this situation occurring where ductwork (be it supply or extraction) passes through a room or space which is affected by fire is limited if there are no openings (eg. grilles) into the ductwork, providing that the integrity of the ductwork remains unimpaired, and combustible insulation, filters or deposits etc. are not present within the ductwork. Failure of integrity of the ductwork at any point can cause fire within the ductwork system.

2.2 The risk of fire breaking into the ductwork may be summarised as follows:

(a) Ignition of materials within the ductwork by conduction.

(b) Failure of integrity of the ductwork, for example by failure of joints or flexible connections due to thermal expansion or failure of the support system.

3. Fire spread by ductwork into adjoining areas

There is potential for fire spread into adjoining areas when the un-insulated ductwork containing fire or hot gases passes through a room or space unaffected by fire but within which there are combustible materials adjacent to the ductwork. PFT

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