sprinkler OUTLOOK

Issue 3/2023

Hotel guests deserve to sleep safely...

EUROPEAN FIRE SPRINKLER NETWORK

Profit

BY PIPING LOGISTICS

PIPING COMPONENTS FOR FIRE SPRINKLER & HVAC INSTALLATIONS, WITH EUROPEAN QUALITY STANDARDS.

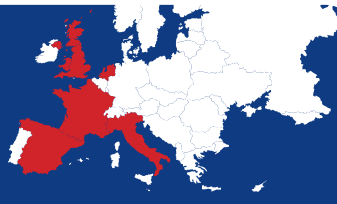
OWN R&D DEPARTMENT

CE Certified CNPP CSTB VdS EAC UL FM APPROVED Becetel CNBOP-PIB

Piping Logistics bv | T: +32 (0)53 64 51 00 | info@pipinglogistics.eu | www.pipinglogistics.eu

OUTLOOK

issue 3/2023



REGIONAL REPORTS

Welcome to the third edition of Sprinkler Outlook!

In this issue we focus on hotels, an application where sprinklers make a crucial difference in fire safety. Armin Wolski of Marriott explains why Marriott strongly encourages the fitting of sprinklers in its branded hotels, while I review the current situation and history of regulatory requirements for sprinklers in European hotels. We are also focusing on water mist. Maarit Tuomisaari of Marioff explains how to apply the EN 14972 series of standards to a building, while Graeme Leonard of Victaulic discusses the application of a combined water mist and gas system. Quality assurance of water mist systems is essential, as for all fire protection systems. Kamil Swietnicki presents the VdS approach.

Environmental considerations strongly influence the design of fire safety in buildings, as well as the products and systems used. Werner Hoyer and colleagues show how a building design using sprinklers can have a lower carbon footprint than one without. The phasing out of PFAS (perfluoroalkyl and polyfluoroalkyl substances) for environmental and health reasons means that fire-fighting foam concentrates can no longer include fluorine. Gerard Visser and Thiery Moinet of Johnson Controls discuss how to design foam systems using non-fluorinated concentrate.

Corrosion can cause leaks and seriously affect the performance of a sprinkler system. Paul Jackson and Andrew Simpson of Eddyfi Technologies introduce a new, non-intrusive tool to identify pipe corrosion, while The FPA gives insights on plunge testing of sprinklers from the field.

The Netherlands has a thriving sprinkler market yet no regulatory requirements to fit sprinklers. John van Lierop explains how equivalent solutions created the Dutch market. He also provides an update on recent progress in The Netherlands. The core mission of the EFSN is to develop the widespread use of sprinklers across Europe. We do this through national campaigns and are making great progress. Further country updates come from Youcef Ouammou for France, Gaetano Coppola for Italy, Alfredo Álvarez for Spain and Ali Perry for the UK.

I hope you enjoy this edition of Sprinkler Outlook!

Alan Brinson

editor
Alan Brinson
brinson@eurosprinkler.org

sales & production
Wendy Otway
wendyotway@gmail.com

design
Paul Buckley
paul@riasca.co

published by

EUROPEAN FIRE SPRINKLER NETWORK

European Fire
Sprinkler Network
70 Upper Richmond Road
London SW15 2RP
United Kingdom

+44 208877 2600

info@eurosprinkler.org

eurosprinkler.org

More European hotels should have sprinklers

State of the art hotel fire protection includes sprinklers but too many European hotels are without them, writes Alan Brinson

Why talk about this now?

Emerging from Covid Europe has rediscovered that it is still the world's number one tourist destination. Its major cities are packed once again with visitors but many are staying in hotels with lower fire safety standards than in their home countries. Europe is risking its reputation and it is time to say that when it comes to hotel fire safety, we can and should do better. Sprinklers should become a core fire safety measure for European hotels.

When we travel we can select a hotel based on many criteria but the level of fire safety is not one of them. While we can assume that hotels meet local fire safety regulations what does that mean in practice? Few countries have fire safety regulations specific to hotels and those that do exist are old, often reflecting thinking from more than 50 years ago. Yet hotel guests can be more vulnerable to fire than occupants of other apparently similar buildings, such as offices and apartment buildings. Firstly they are unfamiliar with the building, so may not know where to find alternative escape routes; secondly unlike in an office they may be asleep, so respond more slowly to an alarm; and thirdly they cannot assume other guests will help them to evacuate. In an office periodic fire drills clarify who needs assistance to evacuate and plans can be made. In an apartment building this may not be formalised but neighbours will know who needs help.

Not so in a hotel. Moreover, as our populations age and obesity becomes more common, the proportion of occupants who may need assistance to evacuate from a fire is increasing. The Grenfell Tower Inquiry revealed that a quarter of the residents needed assistance to evacuate. This may also apply to hotels, particularly if they host a party of elderly guests or other group with disabilities. If the fire safety design makes allowances for them at all, it expects them to stay in refuges until assistance arrives, yet there is typically only one refuge space for a wheelchair user per storey, on the escape stair landing.

Hotel fires are not only a danger for guests who are asleep. Larger hotels host events at which hundreds of people may be present. Some of the worst hotel fire disasters have involved groups of guests who were awake and trapped in the building.

High-rise fires are especially dangerous. Firefighters say that above about 20m they cannot fight a fire externally. To fight a fire inside a building they first establish a bridgehead, typically two storeys below the fire, with spare breathing apparatus cylinders and a backup crew. This takes time, during which the fire grows and people above it can be trapped. This means that in hotels higher than the height threshold for external firefighting there is a step increase in risk. Many codes recognise this and impose sprinklers in high-rise hotels to prevent fire and smoke spread, reducing the risk to an acceptable level.

Benefits of sprinklers

Sprinkler Outlook readers will be well aware of the benefits of sprinklers but it is worth emphasising how they are particularly relevant to hotels.

Sprinklers operate early, while the fire is still small. They control the fire, preventing its growth and spread, or extinguish it. Where sprinklers do not extinguish the fire they cool the hot smoke and fire gases, causing them to contract and reducing room overpressure. It is pressure that causes smoke to spread, forcing its way through the gaps around closed doors and through inadequately sealed compartment penetrations for plumbing, wiring and ventilation. Not only do sprinklers reduce the amount of smoke produced, they also reduce its tendency to spread. This has been demonstrated with fire tests in Belgium[1] and The Netherlands[2]. As it is smoke that kills most fire victims, this ability of sprinklers to limit smoke propagation is a major contribution to life safety outside the room where the fire starts. Guests unable to self-evacuate can safely wait for assistance in their rooms or in refuges.

Recently in France 11 guests with disabilities died in a fire in a three-storey hostel[3]. None of those who died was sleeping on the ground floor. Although it has been reported that the building was unlicensed and did not comply with regulations, French authorities increasingly accept sprinklers as a compensatory measure and we know that such loss of life has never occurred in a sprinklered hotel.

By limiting fire size and smoke evolution, sprinklers also improve the chances of those unable to leave the room of fire origin. Testing 20 years ago in the UK[4], supported by many anecdotal examples, show that in most cases those who remain in the room with the fire can survive when sprinklers are fitted.

Sprinklers are an important part of fire safety redundancy, a safety net making up for errors in other measures, including façades. Even where hotels have experienced major façade fires, such as the Address Downtown Hotel in Dubai[5], sprinklers have prevented fire deaths. To be clear, we are not suggesting that sub-standard facades are acceptable if sprinklers are fitted.

NFPA is the only source of data on the effectiveness of sprinklers in hotels. NFPA found that wet pipe sprinklers eliminated hotel fire deaths.[6]

Another benefit of sprinklers is the reduction in fire damage, which NFPA found to average 70% for direct property damage in hotels and insurers say is over 80% for all buildings once other losses such as business interruption are included. For a major hotel brand, a serious fire would be the worst possible publicity. For a single hotel, a major fire could lead to bankruptcy.

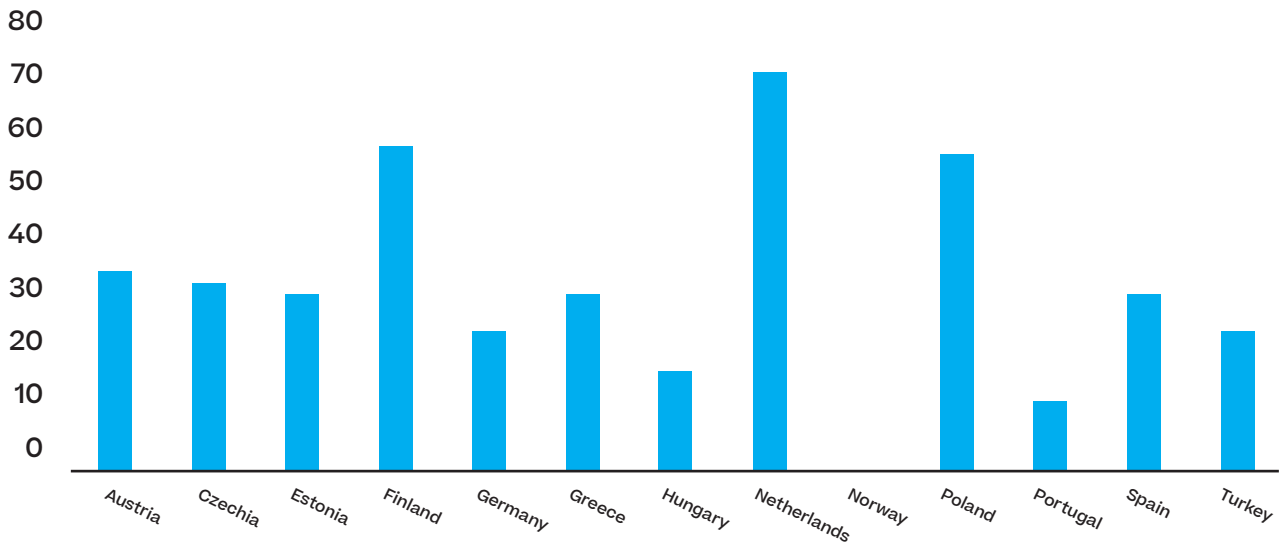


Figure 1. Sprinkler threshold heights for hotels in Europe

Legislation

Most European countries require sprinklers in high-rise hotels and it is noticeable that there are very few major high-rise hotel fires in Europe. High-rise hotels also tend to be large and are often upmarket, so their fire safety measures extend beyond the minimum imposed by regulations. It is still unfortunate that in some countries those regulations do not require sprinklers in high-rise hotels, while in others the sprinkler threshold height is too high, well beyond the approximately 20m height limit at which firefighters can externally attack the fire, with implications as discussed above. Figure 1 shows a selection of sprinkler threshold heights for hotels in European countries. Norway is the only country to require sprinklers in all new hotels, while Italy does not have a threshold height. Surprisingly, nor does the UK, although it does have a height threshold for apartments (0-11 m depending on jurisdiction) and offices (30 m).

Sadly, Europe does still experience major hotel fires. Generally, they occur in cheaper hotels. Expense is the main reason that more European hotels are not sprinklered. That said, the cost per night over the lifetime of a sprinkler system is less than €0.50. Nevertheless, we have responded to this concern with the introduction in 2019 of EN 16925, the European Residential Sprinkler Design, Installation and Maintenance standard[7]. Using this standard, smaller European hotels of up to four storeys or 18m in height can fit sprinklers at considerably lower cost than in the past, while complying with a national standard. Hotels are periodically refurbished and that would be an ideal time to fit sprinklers.

I have often been asked why I do not go to Brussels and get European legislation passed to force or at least encourage hotels to fit sprinklers. Some years ago I tried and learned that fire safety is a national legislative competency, meaning that Member States (national governments) within the EU are responsible for their fire safety regulations. European legislation would only be possible if they agree to it. About 50% of hotel nights in the EU are taken by guests from a foreign country, so there is some justification for a common European approach and I found support among some MEPs and officials. However, when the European Commission put the question to Member States, only a minority were in favour. This division of powers is mirrored in the US where it is the States rather than the Federal Government which have jurisdiction over fire safety. Nevertheless the Federal Government is responsible for the safety of its own employees and in passing the Hotel and Motel Fire Safety Act[8], obtained authority to specify which hotels it would approve for their travel. To get on the list, hotels generally must be fitted with sprinklers. Many hotels then voluntarily fitted sprinklers to retain business. Unlike the US Federal Government, European bodies do not employ millions of people so such a law would have little impact here. Europe did produce a Recommendation on hotel fire safety in 1986[9] but it confined itself to passive fire protection and was ignored by some Member States.

European sprinklered hotels

There are more sprinklered hotels in Europe than many of us realise. As those who have attended EFSN conferences know, we only hold them in sprinklered venues. I urge you to do the same, using the soft power we hold, by staying and holding events in sprinklered hotels. To make them easier to find the EFSN maintains a list on eurosprinkler.org of over 700 sprinklered European hotels. This list needs an update. If you are aware of any hotels that have been fitted with sprinklers over the past five years please send the hotel details to me at brinson@eurosprinkler.org

1 Brandveiligheid in ouderenvoorzieningen, Exova Warrington Fire Gent & Universiteit Gent, Belgium 2016
2 Rookverspreiding in woongebouwen, J. Ebus et al, Instituut Fysieke Veiligheid, Arnhem, Netherlands, 2021
3 La Forge, Witzenheim, France, 9 August 2023
4 Effectiveness of sprinklers in residential premises, C. Williams et al, BRE, UK, 2004
5 Address Downtown Hotel, Dubai, UAE, 31 December 2015
6 U.S. Experience with Sprinklers, M. Ahrens, National Fire Protection Association, USA, 2017
7 EN 16925 Fixed firefighting systems – Automatic residential sprinkler systems – Design, installation and maintenance, CEN, Brussels, Belgium, December 2018
8 Hotel and Motel Fire Safety Act of 1990, Public Law 101-391, 101st Congress, Washington, DC, USA
9 86/666/EEC: Council Recommendation of 22 December 1986 on fire safety in existing hotels, Official Journal of the European Communities, Brussels, Belgium

SPP PUMPS

SPP project: The Leadenhall and The Gherkin - London

SPP project: Petronas Twin Towers - Kuala Lumpur

SPP project: Marina Bay Sands - Singapore

SPP project: The Shard - London

SPP project: Flame Towers - Baku

SPP Pumps is the world's leading specialist manufacturer of quality fire protection pump packages.

Our unrivalled experience in design and manufacture together with advanced testing, accreditation and lifetime global support for all fire pumps and fire pump equipment ensures the utmost in fire pump reliability.

SPP Pumps Fire Pumps are designed specifically for the very particular needs of fire protection and are approved by major fire protection bodies around the world. As the first company to achieve fire pump approval and listing by the Loss Prevention Certification Board (LPCB), SPP Pumps have more approved and fire pump listed equipment than any other manufacturer.

NFPA®

c UL us LISTED

FM APPROVED

FPAL empowered by Achilles Registered

LPCB UKAS MANAGEMENT SYSTEMS 0007

Certificate No. 111
ISO 9001: 2015

bsi. UKAS MANAGEMENT SYSTEMS 0003

ISO 9001:2015 FS 704693
ISO 14001 EMS 704692
ISO 45001:2018 OHS 704691

To download or view SPP Pumps certification please see our website spppumps.com

PROTECTING LIFE. IMPROVING LIVES.

www.spppumps.com

spp PUMPS

The Marriott position on sprinklers and water mist

Safety is a top priority for Marriott International and the company encourages the installation of automatic fire sprinkler or mist suppression systems, writes Armin Wolski of Marriott International

Marriott International (MI) is the largest hospitality company in the world. As of August 2023, MI includes approximately 8,600 properties world-wide, with more than 850 properties in Europe. Safety is a top priority for Marriott. For every new and for every existing hotel undergoing conversion to one of Marriott brands, MI has fire safety professionals review and assess each new design or property for conformance to its fire safety standards. This often results in additional features or upgrades for a proposed or existing hotel to meet the standards and join the Marriott system.

As part of its fire safety standards, MI encourages the installation of automatic fire sprinkler or mist suppression systems. Even in jurisdictions where the local codes and standards might not require such systems, Marriott recommends their installation as a recognized best practice. MI understands that such systems not only can save lives, but can also protect the property, reduce business interruption, assist fire fighters, and potentially reduce the owner's insurance costs. As such, automatic fire suppression systems not only make sense from a safety perspective, they often make sense from a business perspective.

When a hotel embraces this philosophy and installs an automatic fire suppression system, either voluntarily or as required by local code, the Marriott standards include special allowances that offers the property several benefits. The allowances provide flexibility with certain specific requirements, a benefit that can save money, increase efficiency, and result in increased long-term profitability.

For example, one allowance addresses the MI standard for exit separation. When two exits are required from a story or a space, the standard requires that the exits be placed a certain distance apart known as ½ the maximum diagonal of the room, the greatest distance between remote corners of the room or the story. This separation is important as it offers occupants increased safety in exiting. If one of the two required exits were to be blocked by fire or smoke, having a second exit adequately remote from the first exit, helps reduce the chance that both won't be blocked by fire or smoke. In turn this gives occupants an opportunity to still exit safely. However, when a building is equipped with an automatic fire suppression system throughout, the minimum required exit separation can be reduced from ½ the maximum diagonal to 1/3rd the maximum diagonal.

This is because automatic fire suppression systems are recognized as capable of keeping fires small, restricting both smoke production and spread, and reducing the likelihood of multiple exits blocked by smoke and fire.

The provision of a complete fire sprinkler system can also offer operational benefits. Normally, the MI standards require that, in the event of smoke detector activation, the entire building's occupant notification system needs to be activated. This is necessary because smoke from an uncontrolled fire might spread between floors and it is therefore necessary to alert occupants not only on the floor of original fire alarm, but also on other floors. In a building equipped with automatic fire suppression systems, one can expect that fire and smoke spread will be limited to one floor; therefore, in buildings protected throughout by automatic fire sprinklers, the standards allow for fire alarm occupant notification only on the floor of fire alarm. This allowance provides for better operational functionality because in the event of a smouldering fire, which might cause a smoke detector to alarm, or in the case of an unintentional alarm, only the floor of alarm is notified, sparing the need to notify and possibly evacuate the entire building unnecessarily.

Another benefit automatic fire suppression systems offer in MI European properties is flexibility for existing hotels wishing to convert to a Marriott brand. In existing hotel properties undergoing a conversion, MI's fire life safety professionals review the building holistically and when the building is provided with an automatic fire suppression system throughout, there are increased options for addressing existing conditions. This holistic approach is only permissible as long as the building also meets the fire safety requirements of the local codes and standards, an overriding principle required by the Marriott standards. In this way, Marriott encourages the installation of automatic fire suppression systems. In turn, existing building owners wishing to engage Marriott can save money and enjoy enhanced operations which can offset the cost associated with the sprinkler system installation and its maintenance.

Another benefit sprinkler systems provide is often overlooked: they are a sustainability feature. Sprinkler systems protect structures from fire and smoke damage and therefore act to reduce the amount of materials needed to rebuild after a fire. And in comparison to the water amount needed by fire fighters to control building fires with their hoses, the amount used by automatic fire suppression systems to control fires is comparatively small. This is because such systems act with far more precision. In most fires, it can be expected that no more than 2-3 sprinklers will be activated, only in the area of the fire, resulting in far less water usage than in manual firefighting. Also, with less water needed to control a fire, less water run-off, potentially contaminated by combustion products, is expected. This is better for the environment. MI expects that as awareness about the improved safety and sustainability of sprinkler systems grows, more government and non-governmental organizations will look to prioritize patronizing hotels with sprinkler systems.

As Marriott branded hotels expand in Europe, MI looks forward to sharing its global experience with automatic fire suppression systems with its industry and business partners. Marriott believes in the protection provided to hotels by properly designed and installed automatic fire sprinklers and would support efforts in helping promulgate automatic fire sprinkler protection in all hotels, not just Marriott branded hotels.

More sprinklers for climate change mitigation?

Taking a conscious look at climate change mitigation and environmental protection is now an unavoidable part of contemporary construction projects. If sustainability is to become reality – and not just a buzzword – then the necessary course must already be set at the start of planning in order to reduce CO_2 emissions during construction and operation, reduce resource consumption and make buildings recyclable.

While fire protection does not actively shape the construction process, the selection of fire protection measures has a direct impact on the building as an overall system – and thus also on its life cycle assessment. Here Werner Hoyer and colleagues from Brandschutz and ATP sustain offer the following reflections which question the role of fire protection with respect to sustainable planning and construction, and compare passive and active fire protection measures directly as part of a comparative study.

Comparative study: passive vs. active fire protection

In order to compare the impacts of passive and active fire protection measures on the climate and environment, the Vienna-based engineering office Hoyer Brandschutz created two different fire protection concepts for an office building in Austria with a total floor area of over 10,000 square metres:

- **Fire protection concept version 1**: Measures focusing on passive fire protection and small-scale fire compartmentation
- **Fire protection concept version 2**: Measures focusing on active fire protection (sprinkler system) and larger-scale fire compartmentation

Finally, ATP sustain, a research and special planning company for sustainable buildings with offices in Germany and Austria, calculated the impacts on energy consumption, red and grey emissions, and investment costs for both concepts.

Red emissions (operating energy consumption)

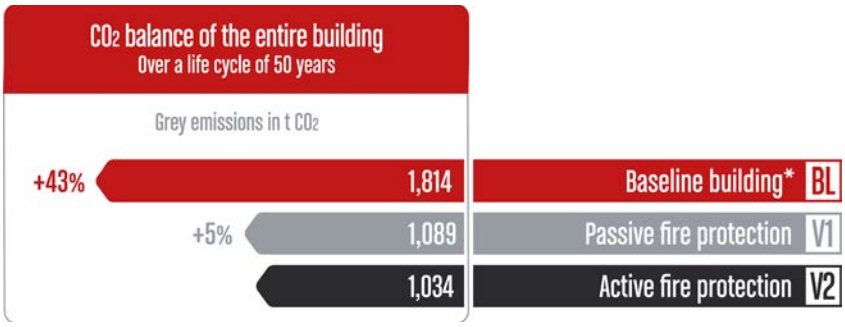
As fire compartments (and thus fire dampers) are omitted in fire protection concept version 2, ventilators can operate at lower external pressure difference, resulting in lower energy requirements. In order to evaluate this effect, the "worst" section – i.e., the one with the largest pressure loss – was inspected for both available ventilation systems. This section determines the pressure ratio in the entire system. With this in mind, two systems modelled in Revit were imported into the SOLAR-COMPUTER software in order to carry out the complex pipe network calculation.

Result: In version 1, three fire compartments were traversed in system I and four in system II. As the plant room also remains as an independent fire compartment in version 2, it is possible to omit all fire dampers except one in both systems. In fire protection concept version 2, this results in annual electricity savings of around 700 kilowatt hours in system I and 1,700 kilowatt hours in system II (based on 2,700 full load hours per year). In system II, this corresponds to just over 7% of the electricity consumption for the ventilation system. As a result, both systems together save around 190 kilograms of CO_2 per year in the Austrian electricity mix.

Grey emissions (embodied carbon) and life cycle assessment

Fire protection concept version 1 poses further demands in terms of partition walls, facades and doors due to the fire compartments, which has a direct impact on the life cycle assessment of the building. Gypsum board, mineral wool or firestops are examples of materials and products that are used regularly in passive fire protection yet offer no recycling possibilities and have high levels of grey energy. While partition walls in fire compartments have double planking with gypsum board and internal mineral wool insulation, we selected interior walls made of

	PRESSURE LOSS Pa		ELECTRICITY CONSUMPTION kWh/a		CO_2 EMISSIONS kg/a	
	System I	System II	System I	System II	System I	System II
V1 Passive fire protection	341	345	25,300	25,400	1,961	1,968
V2 Active fire protection	310	273	24,602	23,719	1,903	1,835
Difference	-31	-72	-698	-1,681	-58	-133
Difference in %	-9%	-21%	-3%	-7%	-3%	-7%



* Baseline building: A "business as usual" new building according to the assessment of the World Business Council for Sustainable Development (WBCSD) with 1,000 kg CO_2/m^2 in the construction phase

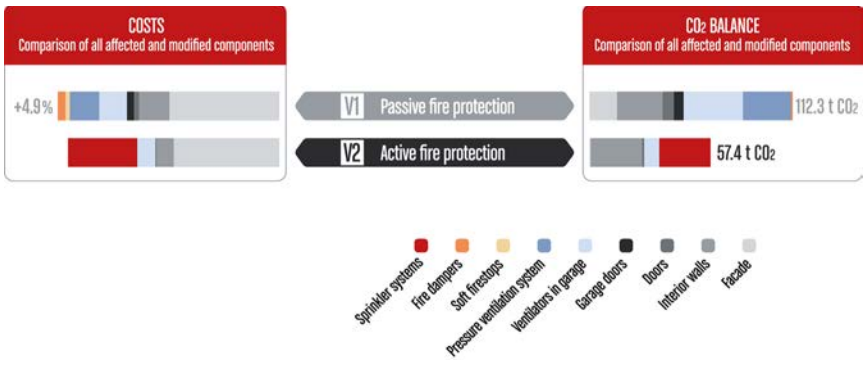
clay boards with wooden profiles and wood-fibre insulating boards in version 2. In the facade we used cellulose fibres for insulation instead of mineral wool. These insulating materials absorb CO_2 in their production and can be recycled after demolition of the building due to their low pollution load, whereas mineral wool and gypsum board currently must be disposed of as landfill. The sprinkler system itself is made of metal and thus has an increased CO_2 balance. However, as this is a single-origin system, the material can be reused very easily.

Result: All components were calculated over the entire life cycle of 50 years using One Click LCA software, whereby the potential for recycling (life cycle phase D) was also taken into consideration. In fire protection concept version 2, a total of 45,400 kilograms of CO_2 in grey emissions are saved through the selection of building materials and 9,500 kilograms of CO_2 in red emissions are saved by the ventilation system. In comparison, a new Volkswagen Golf 7 would have to drive around 460,000 kilometres to emit this volume of CO_2 – in other words, to the moon or eleven times around the equator. In our comparison, this means that around 5% of the life cycle emissions of the entire building are saved. This is particularly impressive when you consider that sustainable construction methods were already adhered to when planning the building, and that version 1 already has a life cycle assessment that is 40% better than the baseline building of 1.000 kg CO_2/m^2, as defined by the World Business Council for Sustainable Development (WBCSD). Thanks to the significantly improved life cycle assessment in version 2, compliance with EU taxonomy is also established earlier, meaning the long-term economic risks of "not being green" are reduced and the financial feasibility of the construction project is increased.

Costs

The additional and reduced costs when using a sprinkler system vary greatly depending on the system. However, while only the direct additional costs for active fire protection are often mentioned, the reduced construction costs must not be neglected. In our example, we have compared the costs of all affected components: on one hand, additional costs result from the sprinkler piping, plus the tanks, retention and processing of the extinguishing water. On the other hand, costs are reduced through lower requirements and the elimination of fire walls, facades and doors, the omission of soft firestops, fire dampers or pressure ventilation systems in the stairwells, and by reducing the ventilation rate of fire smoke dilution in the garage from 12 to just 3 changes per hour. The lower costs of the fire alarm control panel and fire controls due to fewer data points were also taken into consideration.

Result: Following a cost assessment of all affected and modified components, savings of around 4.9% were achieved in version 2. This corresponds to reduced costs in the low six figures (in euros).



Conclusions

The present investigation has shown that, while keeping a uniform level of safety in terms of fire protection, CO_2 emissions can be significantly reduced by focusing on active fire protection measures. A further reduction in emissions during operation is also conceivable as optimisations to active systems are possible, whereas the grey emissions associated with passive measures are released into the atmosphere at the point of production, transport and building construction. Which system is used is ultimately the decision of the building owner. However, alternatives to classic passive fire protection should be examined as these could result in further financial, safety-related, layout or architectural advantages.

Fundamentally, it can be said that the examination of various possible solutions – in this case, relating to fire protection – requires uniform, structured balancing methods. The life cycle assessment used in the present example contains grey and red emissions, and should demonstrate that only an overall balancing framework applied across the full life cycle of a property and under transparent conditions actually shows which measure has which ecological impact.

The topic of resource conservation is not considered in the assessment as the corresponding change has still not been taken into account in the balancing of the life cycle assessment. Looking forward, installed resources are specified that can be passed on for pollutant-free reuse or recycling in order to achieve an improved life cycle assessment. Considering European goals for climate change mitigation, in the future the consideration of variables should then also always be made from a carbon footprint perspective.

How equivalent solutions created the Dutch sprinkler market

John van Lierop, Country Manager, EFSN

The Dutch sprinkler market has developed strongly in recent years. This is not because our laws and regulations require sprinklers, but because the benefits of sprinklers are increasingly recognised and appreciated. The adoption of sprinklers has a history and future development. In this article I will give an overview of how sprinklers are valued and specifically how the sprinkler market will develop further with equivalent solutions. Maybe you can also use it in your country or for your situation.

The Dutch trade association VSI was set up in 1997 to represent the interests of sprinkler contractors. Its membership was extended to include manufacturers and it works to stimulate the use of sprinklers. Since 2012 the Country Manager has been working on the development of the Dutch sprinkler market.

Responsibility for fire safety

Before going in detail about the acceptance of sprinklers, I should first clarify something about our building code. The owner and/or user is responsible for the fire safety of the building. They must comply with laws and regulations and have to deal with insurers as claimants for the residual risk.

It is important to know that the Dutch laws and regulations are limited to escape safety and to ensure an adjacent building will not be affected by your fire. So, if you want to take more measures, such as limiting damage and measures to ensure business continuity, this is a voluntary choice. If everyone can escape to the outside in case of fire, the building is good according to the laws and regulations.

In the Netherlands, as in many European countries, building regulations are based on prescriptive passive measures. Fire compartments may be a maximum of 1000-2500 m^2 and can simply burn out, as long as the fire remains within the fire compartment. Since 2021 requirements for smoke compartments have been introduced in addition to those for fire compartments, with the details in the Dutch Standard NEN 6075. This seems to be unique to The Netherlands and is the subject of much discussion because many consultants do not know how to interpret the standard. Incidentally, in industry there are some requirements for active fire-fighting measures, not specifically sprinklers, for example in storage buildings for hazardous substances.

Cause of fire safety problems

So, as written, the owner/user is responsible for the fire safety of the building. They must comply with the laws and regulations and deal with insurers as the claimant for the residual risk. The big problem is that many users or property owners are not aware they are responsible and do not know the level of laws and regulations. What makes it even more complicated is that developers of new buildings are often not interested or do not want to invest in measures that provide higher fire safety than the laws and regulations. Often the users or future

owners are not yet known, and the insurer has no influence yet. And that is a pity because choosing certain investments such as sprinklers can save money if a different fire safety concept is chosen at an early stage. So, there is an opportunity for the sprinkler industry, in conjunction with other stakeholders, to do something about this and make everyone aware of it.

Equivalent solutions in the Netherlands

In the Netherlands, the main fire safety requirements are in 'Bouwbesluit 2012', which will be replaced by the 'Besluit Bouwwerken Leefomgeving' (BBL) in 2024. The first impression is that things are broadly similar, but for the sprinkler industry there are issues that have an impact. All new buildings and existing buildings must comply with the performance requirements of the building code. Other, lower requirements apply to existing buildings. When applying for a permit, the owner/user must prove to the local government that his new building meets the legal requirements, such as for fire safety. For utility buildings and flats in particular, the local authority works together with the fire service, which supports the local authority with advice and/or assessment of the building application. The Dutch Regulations include a so-called equivalence article, which provides the option to achieve the performance requirements in a different way. In practice, the owner hires a consultant who assists with the permit application and with demonstrating that the proposal meets the requirements.

To include sprinklers as an equivalent solution it is important not only that consultants have the knowledge, but the fire service, as adviser to the local government, must also understand the concept. In practice, this is not always easy, because the knowledge is not sufficiently available, sometimes also among the consultants! And as an employee of a local authority, would you say yes to a concept that you do not understand? Or is there sufficient confidence in the consultant? After all, how do you know whether the fire safety concept is correct, how far will you go when they want your signature? As a consultant, do you also include the end customer and insurer in the consultation?

Acceptance of sprinklers

There are several ways to reach widespread acceptance of sprinkler solutions. This is independent of individual projects, but new insights can also form the basis for a more widely accepted solution. In this article, I distinguish five groups.

A direct obligation from legislation and regulations

This is of course the strongest instrument for applying sprinklers, but it is more the exception than the rule. A regulatory requirement to fit sprinklers or an alternative measure to reduce the risks of the storage of hazardous substances is an example, while the new requirement to fit in car parks beneath sleeping risks is another.

There is reluctance from the government to require sprinklers, probably encouraged by other stakeholders and possibly also due to a lack of knowledge. But sometimes the government has no other choice when it comes to measures that ensure escape safety and the protection of neighbouring property. For example, it has been known for years that, partly due to the closure of homes for the elderly and of care homes for those with light needs, the question is not whether the fire safety level in general housing is too low – yes, it is – but how a solution is to be found. Since last year door closers have been mandatory on the front doors of apartments but we must wait for active extinguishing systems.

Inclusion of sprinklers in standards referenced to meet the performance requirements

A second group of strong instruments is the inclusion of sprinklers in standards referenced in regulations to interpret performance requirements. There are currently no examples of this, but they will come with the reference to the standards for large fire compartments and high-rise buildings in the new BBL that takes effect on 1 January 2024. In practice these standards are now frequently used for the equivalent solution to allow building owners to get their building permit. In fact, for this group, they are now the normal solution!

Equivalent solutions employing sprinklers in standards

A third group of instruments are standards in which sprinklers are used as an equivalent solution. These include two different standards for large fire compartments and a standard where by preventing damage to cabling sprinklers are an equivalent solution

for the regulatory requirement to 'maintain the function of the transmission path of fire alarm and evacuation systems in case of a fire'. A standard also allows longer escape routes with sprinklers and they are incentivised in an upcoming standard for car parks.

Guidelines
A fourth group of instruments are equivalent solutions using guidelines. The owner and his consultant can use guidelines which enjoy widespread stakeholder support. Our guidelines were drafted by working groups of representatives of stakeholders, including the authorities. An example is the guideline on buildings higher than the scope of the Bouwbesluit or BBL, i.e. higher than 70 m, where sprinkler systems are now the norm.

Equivalent solutions using publications
Finally, there are publications with simpler guidance, of course substantiated by research, which can be used for supporting the building application. These publications are aimed at a target group and if taken up the importance and support for them increases. Examples include studies on life safety with sprinklers, the equivalent solution for allowing lower structural fire safety of a building, compensatory measurements for object protection and facades, and the equivalent solution for fire resistance (internal and external fire spread) and to detect fire and send a signal to fire alarm and evacuation systems.

Everyone is free to apply for a building permit with an equivalent solution. In the Netherlands, the ATGB committee has been set up, where it is possible to submit conflicts/differences about the application of an equivalent solution for a project. The committee makes non-binding recommendations, which are usually adopted. These recommendations also contribute to new insights and accepted equivalences. An example is an ATGB-advice on where sprinklers can be used for multiple equivalences. That advice has led to broader uniform support for the applicability of sprinklers in a total fire safety concept. An example is designs with longer escape routes and larger fire compartments.

Development
It is especially important to know what is going on in the world of fire safety. What are the problems and developments. And in which markets? What is the government's policy and what can the role of the sector association be in contributing to a more fire-safe Netherlands? Active maintenance of the fire safety network is of great importance, but active participation in committees, working groups and standards committees is also essential. In recent years we have been monitoring the market segments and determining whether specific markets or applications for sprinklers can be a good value-added solution. At the same time, this must also be of interest to the sprinkler industry and there must be trade-offs that make sprinklers affordable.

Projects for new sprinkler applications
Usually projects start with an idea, an identification of a sprinkler application. These ideas arise from consultation in the network, seminars, regular consultation with stakeholders and our members. Usually, the start is a publication or white paper to talk to representatives in that potential market. What are the real fire safety issues, are there any problems at all and are sprinklers a better alternative? And if that is the case, it often becomes clear whether we are going to start an investigation to arrive at a report that provides sufficient clarity for the added value of sprinklers. An example is sprinklers for life safety, where there were many misunderstandings about the added value, in fact there were many misunderstandings about the effects of sprinklers. Then a consulting firm is asked to conduct a survey, which may be the basis for using consultants in their applications.

Sharing and developing knowledge
After an investigation has been completed, the next important phase of the work begins, which is to ensure that relevant parties are aware of the report and encourage advisers to use it, and that the competent authority also accepts the use of sprinklers. We organize knowledge seminars and conferences to make that happen. We are then on the first step towards application of the equivalent solution for a project. Subsequently, we stimulate wider application on the way to future guidelines, perhaps parts of a standard text and/or designation from building and regulations. The acceptance of sprinklers is all about attitude and behaviour, shaped by a lack of knowledge. People tend to display a less than positive attitude and behaviour when they have insufficient knowledge of a subject. Especially when there are all kinds of misconceptions and nonsense around, like all heads open at the same time and sprinklers are activated by smoke. Nonsense. But the behaviour of people can therefore be explained.

Sustainability
Another more indirect market stimulation is to link fire safety to sustainability. A building that cannot burn down is very sustainable. The resources or building materials remain available for use in subsequent buildings. Last year in London I called for sustainability labels such as BREEAM to put more effort into fire safety.

Future
The sprinkler industry believes that sprinklers and water mist will play an increasingly important role as a basic fire safety measure in the future. Sprinklers for the protection of vulnerable people should be the next obligation in the Dutch building regulations. It is not without reason that we follow and are actively involved in projects resulting from the energy transition. Buildings with a wooden supporting structure present a high fire safety risk and really need sprinklers, also to make the aesthetics interesting with visible wood. All those Lithium-Ion batteries are a major source of concern. And why in The Netherlands are we only equipping buildings above 70 meters with sprinklers? 13 meters seems to be a wiser idea. Smarter sprinklers and the quick development of remote service and remote inspection will help to make sprinklers more accepted by building owners and users for these and other applications.

Fire sprinklers save lives.
This article offers an overview of the way in which sprinklers are used in the Netherlands. There are still many applications where sprinklers make a big difference when it comes to preventing fire casualties, limiting damage, providing sustainability and protecting business continuity. The trade associations EFSN and the VSI spread that message because we believe in the great social importance of contributing to a more fire-safe Netherlands. Suggestions are warmly welcome.

For an overview of the current situation in the Netherlands, please visit: https://tinyurl.com/435tjs3p

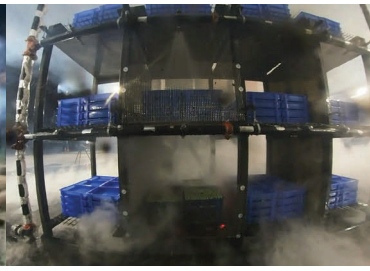
IT CANNOT BE DONE

Protection of Lithium-ion cell formation areas

Li-ion test setup

Thermal runaway

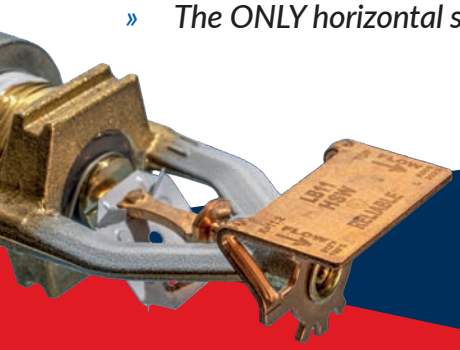
Suppression



Extinguishment

Introducing the LB11 sidewall storage sprinkler for the protection of Lithium-ion manufacturing and storage.

- *UL Specific Application Listing for Class I-IV and Group A Plastic Commodities*
- *Additional full-scale fire testing with rack storage of 100% state of charge lithium-ion batteries*
- *K11.2 (160) HSW storage sprinkler with robust 212° F (100° C) thermal element*
- *The ONLY horizontal sidewall sprinkler Listed for protection of in-rack storage*



Reliable®

For full fire test video and technical bulletins visit
reliablesprinkler.com/lb11

Flexible fire protection in a digital future

One of the fastest growing markets for fire protection systems is the data centre industry, where ease of installation, consistency of design, reliability and flexibility are all highly prized, says Graeme Leonard, EMEA Division Manager – Fire Protection at Victaulic.

The data centre industry is growing at an exponential rate, tripling every decade. In 2020 the global market was worth $187 billion, and by 2030 it is expected to be worth $517 billion. Today there are more than 8,000 data centres worldwide, averaging a floorspace of 100,000 m^2. It's a colossal business that continues to grow aggressively year-on-year – a multi-billion-dollar industry where the stakes are high.

Data centres are critical for the global economy and, understandably, fire protection is a vital part of their design. At Victaulic, it's also an important segment of our work: our systems are now protecting over 1,300 exabytes of data. If you're asking yourself what an 'exabyte' is, then you're probably not alone – the term has only existed for a couple of years (again, another reflection of the rapid growth in the data market). For the record, one exabyte is equivalent to one billion gigabytes (GB) or 500 trillion sheets of printed paper!

Unique requirements

Fires in data centres are rare, yet the consequences are huge. Damage that causes a loss of functionality can have significant negative impacts on businesses and communities across a wide area. Because of this, delivering fire protection to data centres demands a unique set of design requirements as the facilities are packed with technology; with densely populated rows and racks of temperature-controlled equipment alternating between hot and cold aisles alongside complex cooling systems that maintain temperatures.

Designing a fire protection system for a data centre should meet a number of protection imperatives. Not only should it provide effective defence, but limit collateral water damage when activated, to protect the high-value capital equipment inside. This is also why leaks from the system and pipework, caused by accidents or system wear, also have to be minimised.

In addition to first-class protection, data centre owners are looking for standardisation. Owners are often global technology giants who operate across multiple markets and look for consistency everywhere. They are also looking for adaptability so that the architecture within a data centre can change as demand grows. And, finally, customers want to know they're getting value for money, and that means the lowest possible total cost of ownership (TCO).

Best practice, best design

When beginning a data centre's fire protection design there are multiple best practice solutions to consider. Firstly, ensuring there is a preaction system in place. From Victaulic, this will typically be a double interlock set-up, with cross-zoned detection, with an option for auto convert to back up power in case the central power supply is unavailable. Dry pendent drops are another sensible inclusion, not least to ensure the system

instantly complies with recognised sprinkler installation standards for fire protection systems.

In edge data centres there can also be the option to use a hybrid fire suppression system such as the Victaulic Vortex system. This will deliver the right level of protection to the mission-critical infrastructure inside the facility. The [FM-approved] hybrid nitrogen and water solution used in Victaulic Vortex rapidly extinguishes fires without using toxic chemicals and ensuring minimal disruption to ongoing operations – an ideal solution for data centres.

Flexibility is key

As mentioned earlier, flexibility is another key consideration, yet simultaneously something that is harder to deliver. Data centres are typically designed for a lifespan of 30 years, but usage levels are usually planned only for five-year periods. This makes it difficult to design a complete lifespan system at the outset, because we know air flow containment and racks will change over time, only we can't be sure how they will change. Given this, how do you design a system that can keep up with the change?

One solution from Victaulic is the VicFlexTM Style VS1 UL Listed and FM Approved Flexible Dry Pendent sprinkler. This design enables easier relocation of the outlet as building configurations change. As with many other Victaulic products, careful attention has been paid to ease of installation on site. The system offers lengths of 38", 50" or 58", each able to accommodate four 90˚ bends for maximum versatility.

Traditionally, fire protection systems use dry pendant drops to protect these risks. The hard pipe drops require bespoke lengths based on precise measurements to perfectly fit the dimensions of a space. Multiple trips to a job site are then required for measurements, design, and installation. In the data centre industry, this presents many challenges. The architecture of a data centre changes regularly – servers are added and additional rooms built.

Our VS1 solution offers the complete flexibility that is needed within a data centre, paired with the dry sprinkler system that guarantees additional accuracy.

The unique braided pipe in VicFlex Style VS1 is up to 10 times faster to install than alternative threaded black pipe systems. The product arrives on site ready to install and the need for hard wired piping systems is eliminated. Aims of keeping water as far away from the servers are met and the flexible nature of the solution ensures that as the architecture of the room changes, data centre fire protection can be easily maintained. And with its choice of standard lengths there's no messy cutting required on site.

Exciting future

Having standardised and easy-to-install systems is a real advantage for data centres and helps owners establish the consistency they seek in their global operations. And with 'plug and play' solutions there's not only design consistency but also reliability in installation to make it easier to accommodate preferred designs at multiple locations. A further advantage of the Victaulic solutions is that installation specialists need less time on site, which data centre owners appreciate as they like to maintain commercial privacy at their sites for obvious reasons.

Victaulic has worked on data centres across the globe, so we know everyone gets the same level of service, installation and effectiveness, no matter where they are.

As I mentioned at the start, flexibility is key with data centres and in the future it will become even more so. The industry continues to grow rapidly and advances such as edge data centres and localised IoT (internet of things) networks, as well as the increased popularity of AI solutions, will only require greater flexibility. In tomorrow's world, our data will be one of our most precious commodities and it's exciting to think that Victaulic solutions have a critical role to play in protecting it.

Navigating challenges & standards in fire safety...

Ansul NFF-331 3x3 as the optimal non-fluorinated foam solution in sprinkler systems

by Gerard Visser and Thiery Monet of Johnson Controls International

Introduction

The current transition towards non-fluorinated foam concentrates in sprinkler systems is driven by the environmental and health concerns associated with traditional fluorinated foams. Although non-fluorinated foam offers numerous advantages, including reduced environmental impact and improved safety, there are potential challenges related to firefighting performance and the compatibility with existing standards and listings in the fire protection industry.

EN13565, EN1568, UL162, NFPA 11,13,15 and 16 are amongst the standards which are due for revision to accommodate for the use of non-fluorinated foam concentrates in systems. Although the development of non-fluorinated foam concentrates is accelerating there are several critical differences to fluorinated foam concentrates.

Not only are the challenges with the standards a concern, the compatibility with existing systems also causes issues. It is not a simple swap of foam concentrates. For the transition to non-fluorinated foam multiple aspects of the system as a whole must be taken into consideration.

Understanding Non-Fluorinated Foam

Non-fluorinated foam concentrates, often referred to as fluorine-free foams (F3) or as we would like to call them Non-Fluorinated Foams (NFF), are gaining recognition for their ability to suppress fires without the use of per- and polyfluoroalkyl substances (PFAS). These environmentally friendly alternatives have demonstrated their firefighting capabilities and safety, making them attractive options for fire protection.

However, the issue with many NFF products on the market today is that they have different mechanical requirements to assure their performance.

Where AFFF and AR-AFFF could rely on their film forming for firefighting, NFFs rely on a foam blanket to extinguish a fire. This leads to a major issue which is the need for higher expansion to create this foam blanket.

To achieve this more air needs to be captured by the foam solution. When used in sprinklers there is no natural aspiration which makes sprinklers basically unsuitable for

use with non-fluorinated foam concentrates unless the manufacturer takes this challenge seriously and designs their product with a different philosophy.

Another issue is the compatibility with proportioning systems. Because NFFs need to mimic fluorinated products as much as possible they are fully loaded with chemicals causing them to be very viscous. This higher viscosity will make the foam concentrate more difficult to mix into the water stream at the correct ratio. Another consequence is that it also harder for the foam concentrate to actually dissolve in the water instead of mixing homogenously.

Finally, the core competence of any firefighting foam concentrate must be its performance on fire. Application densities need to be in similar ranges to the fluorinated alternatives. It is obvious that any deviation in application densities will immediately lead to a re-design of the system.

Ignoring one or more of the above points will cause serious problems. The system will be transitioned to non-fluorinated foam but will not function. Every aspect of the change-over to NFF must be taken care of.

In the development of our range of non-fluorinated products JCI had one goal: come up with a viable non-fluorinated alternative for the AFFF and AR-AFFF products. A product that can be used in existing systems with minimal modifications, with similar firefighting performance and ensure the end-user of a fully functioning system.

Challenges and Considerations

1. Performance standards:
- Many existing fire protection standards and listings have been developed with the assumption that Aqueous Film-Forming Foams (AFFF) will be used.
- Non-fluorinated foam concentrates must meet equivalent performance standards to ensure their efficacy in fire suppression.
- Many NFFs require a higher application density than their fluorinated predecessors. That means systems need to be upgraded to accommodate for these higher densities, increased flows and water and foam storage.
- Increased flows will require enlarged water supply and larger pipe diameters

2. Regulatory compliance:
- Adhering to local and international regulations can be challenging when switching to non-fluorinated foam.
- Both the European Chemical Agency ECHA as well as the EPA in the US are working on banning PFHxA and PFAS in the very near future

3. Compatibility with existing systems:
- Retrofitting existing sprinkler systems, designed with AFFF in mind, to work optimally with non-fluorinated foam concentrates can be complex and costly.

4. Testing and certification:
- Non-fluorinated foam concentrates must undergo rigorous testing and certification processes to ensure their effectiveness and safety.
- Standards and listings need to be adapted for non-fluorinated foam concentrates in order to be relevant.

5. Education and training:
- Firefighters and building occupants must be educated about the differences between AFFF and non-fluorinated foam, including proper usage and disposal.
- Designers, authorities, insurers and end-users need to be aware about the issues of the transition to non-fluorinated foam. Ignoring these issues will lead to unsafe situations because systems will not perform at all or significantly less well.

The Ansul NFF-331 3x3 Solution

Ansul NFF-331 3x3 is emerging as a preferred non-fluorinated foam concentrate solution for a variety of reasons:

1. Proven performance:
- Ansul NFF-331 3x3 has demonstrated its firefighting capabilities in rigorous testing, ensuring it meets or exceeds industry standards for fire suppression.
- Ansul NFF-331 3x3 is designed for easy integration with existing sprinkler systems, minimizing retrofitting costs and simplifying the transition.
- Being a leading manufacturer of sprinklers, foam discharge devices and foam concentrates, supported by R&D, JCI is best positioned to understand backward compatibility with existing systems and applications.

2. Environmentally friendly:
- Ansul NFF-331 3x3 is free from PFAS, making it environmentally safe and non-persistent in ecosystems.
- Ansul NFFF-331 3x3 is GreenScreen Silver Certified

3. Education and support:
- Ansul offers comprehensive training and support for firefighters and building managers, facilitating a smooth transition to Ansul NFF-331 3x3.
- The in-house knowledge of foam systems and sprinklers makes Ansul the reliable partner you need in the transition to a non-fluorinated foam concentrate.

4. Cost-effective:
- Due to its unique specifications Ansul NFF-331 3x3 requires minimal modifications to existing installations making it an economically viable choice.

Conclusion

The transition from traditional fluorinated foam concentrates to non-fluorinated alternatives in sprinkler systems represents a significant step towards reducing environmental and health risks associated with firefighting.

While challenges related to existing standards and listings persist, Ansul NFF-331 3x3 is emerging as a leading solution that addresses these issues.

With its proven performance, environmental safety, regulatory compliance efforts, compatibility with existing systems, robust support and training programs, and cost-effectiveness, Ansul NFF-331 3x3 offers a comprehensive and compelling solution for those seeking a non-fluorinated foam concentrate that ensures both safety and sustainability in fire protection.

Commercial Sprinklers

Domestic & Residential Sprinklers

Dry & Wet Risers

Security Systems

Health & Safety

Gas Systems

Fire Safety

Fire Alarms

All courses hold national accreditation or benefit from CPD hours.

Organised in person across the UK and Ireland & On-line to cover international markets.

www.firesystemsacademy.co.uk

Safeguarding industries...

Pioneering inspection technologies for industrial sprinkler systems

by Paul Jackson, Director of LRUT and MFL Centre of Excellence, and Andrew Simpson, Technical Sales and Applications Engineer, Eddyfi Technologies

The reliability of industrial sprinkler systems is a paramount concern, as these systems stand as the first line of defense against devastating fires. Yet, beneath the surface of their apparent functionality lies a silent and persistent menace: corrosion. Generalised corrosion and microbiologically influenced corrosion (MIC) silently eat away at sprinkler pipes, rendering them vulnerable to catastrophic failure. Shockingly, over 70% of dry sprinkler systems require pipe replacement within just 12 years of installation, despite their intended lifespan of 30 to 50 years.

While some preventative measures like nitrogen-filled systems, galvanized steel, and biocides have been employed to deter corrosion growth, they fall short in preventing the insidious onset of corrosion itself.

The inspection challenge: inadequacies of current methods

The issue becomes even more concerning when we consider the limitations of current inspection protocols. According to BS EN 12485, periodic inspection of pipework and supports is mandatory. However, this inspection primarily relies on visible assessments, leaving inaccessible sections of pipework unchecked and potentially compromised. Even when visible, these inspections may miss subtle signs of corrosion, putting the entire system at risk. A weekly check for water line pressure is required but offers limited insights, mainly identifying pinhole leaks rather than addressing incipient corrosion within the sprinkler pipework.

Recognising the urgency of this situation, there is an evident market need for a practical and rapid solution to evaluate the corrosion status of particularly inaccessible and non-visible segments of sprinkler pipework, all before catastrophic through-wall defects materialize.

Enter two non-destructive testing (NDT) methods developed by Eddyfi Technologies, poised to revolutionise the inspection of such pipework.

Guided wave testing: precision meets efficiency

The first method harnesses guided wave ultrasonic testing with the innovative Sonyks instrument, enabling a comprehensive inspection of each pipe section without the need for constant probe movement. Unlike conventional ultrasonic testing, which operates in the MHz frequency range and primarily focuses on remaining wall thickness checks, guided wave testing (GWT) harnesses low-frequency ultrasound in the range of 20-150kHz. This distinctive frequency range allows GWT to cast ultrasound waves away from the tool and propagate them axially along the pipe.

When these broadcasted ultrasound waves encounter variations in cross-section, the resulting change in acoustic impedance triggers echoes that return to the tool for precise detection. By utilising reference points like welds or pipe ends for calibration and comparing signal amplitudes to these markers, GWT can not only detect corrosion but also gauge its severity.

Traditionally, guided wave testing has primarily been employed for long-range ultrasonic testing (LRUT) in the energy industry. However, the real breakthrough lies in the application of guided waves for medium-range ultrasonic testing (MRUT) within the context of sprinkler systems. MRUT employs higher frequencies, exceeding 100kHz, resulting in shorter pulse lengths for the transmitted ultrasound. This leads to improved resolution, enhanced sensitivity, superior detectability, and precise defect positioning.

In essence, guided wave testing emerges as a transformative force in ensuring the reliability and safety of sprinkler systems, offering a potent blend of precision and efficiency previously unattainable with conventional inspection techniques.

Eddyfi Technologies' Sonyks: a game changer

In the realm of industrial technology, certain breakthroughs hold the promise of redefining the way we approach critical tasks. Among these, Eddyfi Technologies' Sonyks guided wave system has quietly emerged as a standout player, ushering in a new era in medium-range ultrasonic testing, particularly for the inspection of sprinkler systems.

Figure 1: The Sonyks Magneto-Tool for 4-inch diameter pipes at a 128kHz test frequency. This tool, characterised by its lightweight and low-profile design, can be swiftly installed using a standard torque wrench, simplifying the inspection process dramatically.

Central to this innovation are the magnetostrictive collars, unassuming in appearance but formidable in function. These collars incorporate a magnetic strip and an electromagnetic acoustic transducer (EMAT) coil, housed securely within a simple clamp. What makes them remarkable is their ability to induce ultrasound into pipes through a torque-driven mechanical coupling, all without fuss or complexity.

Eddyfi Technologies' Sonyks system is not merely a technological advancement; it represents a shift in how we approach MRUT. By streamlining the detection of corrosion, it offers a pragmatic solution that contributes to enhanced safety and reliability in industrial fire suppression systems.

Innovations in inspection

A calibration pipe provided by an Eddyfi Technologies client for NDT inspection equipment pretesting featured the following specifications:
Diameter: 4.5 inches (114 millimeters)
Wall thickness: Schedule 80, measuring 0.337 inches (8.56 millimeters)
Length: 6 feet (1.83 meters)

Eight 1/16-inch (1.5 millimeters) diameter drilled holes, positioned at 45° angles with 3-inch (76 millimeters) spacing along the pipe.

A section of the pipe exhibited gradual thickness reduction, with a maximum thinning of 1/16 inch (1.5 millimeters) occurring over a 3-inch (76 millimeters) length.

For a visual representation of the calibration pipe, please refer to Figure 2, which includes both a schematic and a photograph for reference.

A close-up of the defects that were included in the pipe shows the diameter of the holes and the thinned area in Figure 3.

The MRUT 4-inch Magneto-tool, integrated with Sonyks software, played a pivotal role in conducting this inspection. Due to the relatively short length of the sample, the tool was strategically positioned at the

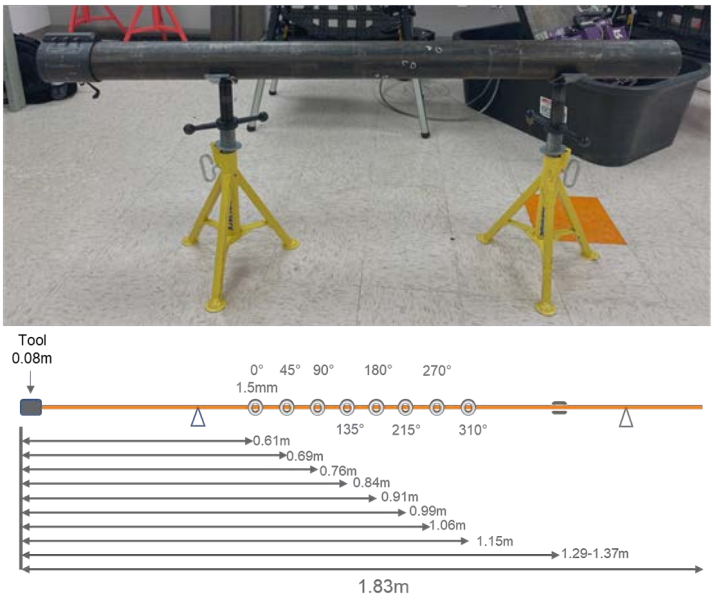


Figure 2: Diagram and schematic of the 4.5-inch (114mm) test pipe.

Figure 3: Close-up photographs of the drilled holes and the thinned areas requiring detection.

far end of the pipe. This positioning ensured that the pipe end would fall within the data's "dead zone," simplifying the interpretation process. In typical field scenarios with longer pipes, the tool would be situated closer to the midsection for inspection.

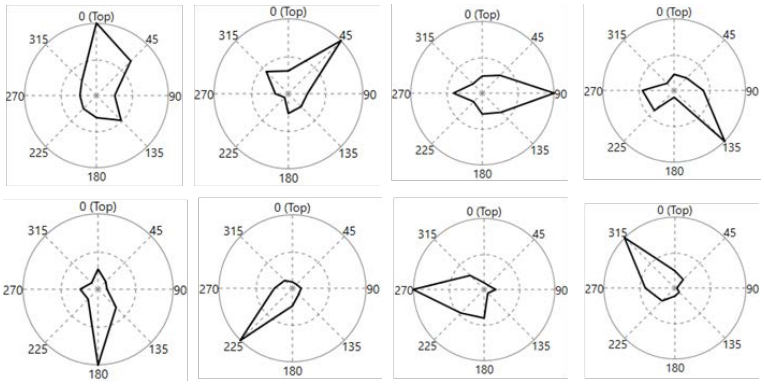


Figure 5: This figure displays the results of focusing efforts, showcasing the rotation of the defects along the entire circumference, ranging from 0° to 315°.

Upon interpretation, an exceptionally favorable signal-to-noise ratio was observed in this sample. Consequently, all defects within the sample were successfully detected. The resulting C-Scan image revealed six distinct coloured spots, corresponding to the locations of the eight defects present. Although the pulse length of the data collection fell just short of individually resolving all eight defects, a clear pattern emerged. These six spots consistently rotated around the pipe in alignment with the positions of the defects in the pipe. Furthermore, pipe thinning was detected between 5 feet and 5 feet, 3 inches (1.29-1.37 meters) from the pipe end. This thinning formed a circumferential band in the C-Scan. The data can be observed in Figure 4.

To gain further insights and enhance defect resolution, secondary focusing techniques were employed. By adjusting the focal length and focal distance of the data, each defect could be individually inspected and the rotation of all eight defects around the pipe, covering angles from 0° to 315°, was mapped. These focus plots are visualised in Figure 5.

Magnetic flux leakage for corrosion detection

The Eddyfi Technologies Pipescan HD solution has been meticulously engineered to optimise speed, reliability, and confidence in the detection of corrosion and pitting in ferrous pipes and surfaces. This innovative solution not only enhances the productivity of inspection teams but also

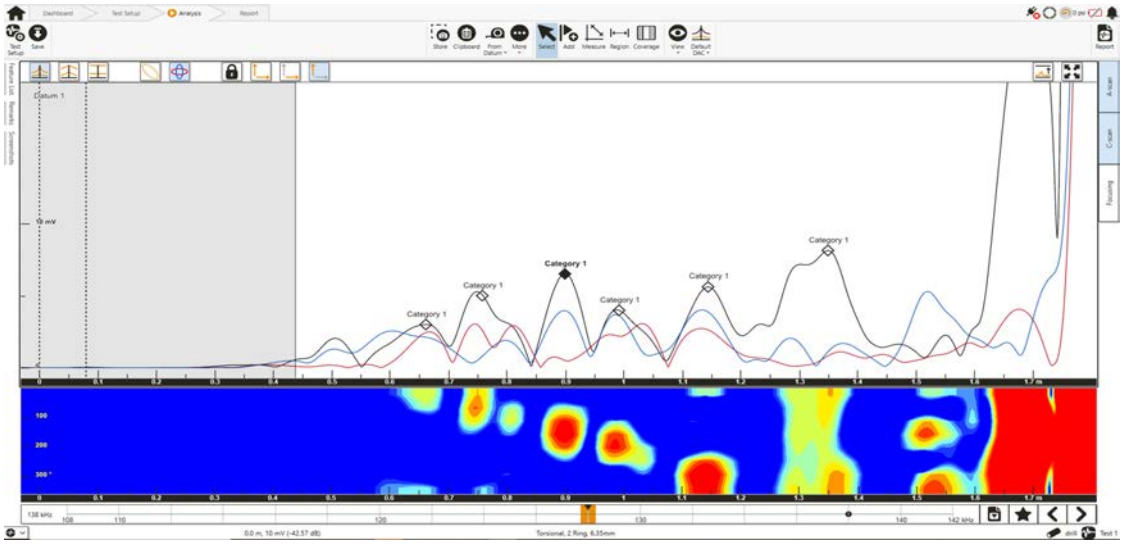


Figure 4: This figure presents an A-Scan and a colour map of the data, highlighting the defects within the pipe. The coloured spots on the map directly correspond to the defects, and their rotation closely matches the rotation of the actual defects on the pipe.

Figure 6: Pipescan HD deployment inspecting pipe for corrosion.

streamlines workflows by enabling on-the-spot reporting and furnishing asset owners with verifiable recorded data.

The Pipescan HD stands as the industry's highest-resolution magnetic flux leakage (MFL) scanner. With a remarkable probability of detection (PoD), it proves to be an effective and dependable solution for corrosion and pitting detection.

Deploying the Pipescan HD (as illustrated in Figure 6) is remarkably simple, thanks to its unique single curvature adjustment tool. This tool ensures swift inspection setup without the need for couplant or intricate gate settings. The process entails connecting the Pipescan HD to the data acquisition instrument, entering inspection details, and the system is ready for operation.

Moreover, all scanned data is automatically recorded, and reports can be generated on-site, providing asset owners with immediate insight into the condition of their assets and thereby enhancing productivity and efficiency.

MFL serves as a rapid, reliable, and robust corrosion screening technique. It operates by detecting the volume of missing magnetic material within the component under inspection. MFL necessitates minimal surface preparation and eliminates the need for couplant. Users require only minimal training, and with scanning speeds reaching up to one meter (3.2 feet) per second, MFL stands out as the ideal solution for fast, cost-effective corrosion detection.

In the same inspection challenge, the goal for MFL was to detect

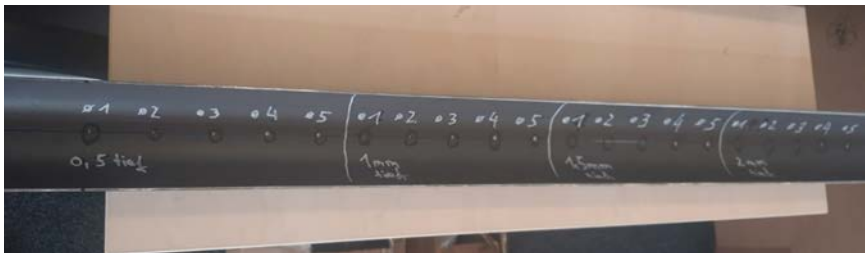


Figure 7: Sprinkler pipe section with simulated corrosion defects of various depths and diameters.

Figure 8: Software clearly displaying different corrosion defects within the pipe sample.

various defects within a section of a sprinkler pipe that had been halved to provide an indication of sensitivity. The half-pipe featured defects of different diameters and depths, including 0.5mm depth and diameters ranging from 1mm to 5mm, followed by a section with 1mm depth and diameters of 1mm to 5mm. You can view the sample in Figure 7.

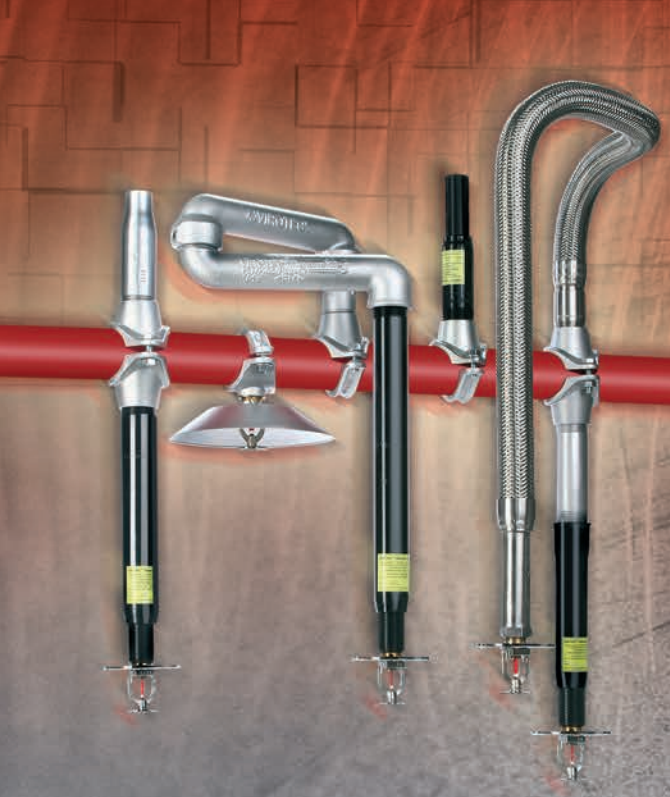
Inspecting the half pipe was a straightforward one-pass process, taking approximately 15 minutes from setup to scan to report generation. Most defects were conspicuously visible, as demonstrated in Figure 8 of the software.

Conclusion: elevating sprinkler system inspection

Eddyfi Technologies presents cutting-edge inspection technologies tailored for sprinkler systems, combining corrosion sensitivity with user-friendly efficiency. The Sonyks guided wave testing system excels in inspecting extended lengths of sprinkler pipe from a single location without requiring tool movement, while demonstrating remarkable sensitivity to small corrosion anomalies, even as small as 1mm (about 0.04 in) through-wall holes. In contrast, the Pipescan HD equipment necessitates traversal across the inspection area but offers enhanced sensitivity, detecting wall losses of less than 1mm (about 0.04 in).

Both NDT equipment solutions prove to be viable options for efficiently inspecting extensive sprinkler pipework when uncertainty exists regarding potential corrosion locations and where to commence the inspection.

For more detailed information, please contact Eddyfi Technologies; info@eddyfi.com; www.eddyfitechnologies.com



SALZGITTER MANNESMANN STAHLHANDEL

A Member of the Salzgitter Group

SYSTEM VIROTEC®

shop.virotec.de

RANGE OF PRODUCTS:

FLEXHOSE AND FIXTURE – THE NEW GENERATION!

The VX-Flexhose/-Fixture product line contains more than 100 new product types. So we can always provide you with the perfect solution, tailor-made for your sprinkler project.

All System VIROTEC® products are VdS and FM approved.

SPRINKLER TEE AND SHIELDING CAP

TELESCOPE PIPE AND FLEXARM®

GROOVED COUPLING AND FITTING

MAINTENANCE UNIT VWE

Schlieffenstr. 2 / 30419 Hanover, Germany / **T** +49 511 6700-0 / **F** +49 511 6700-151
E system.virotec@szmh-group.com

Raising awareness & making progress

Two recent important seminars have raised awareness of the potential benefits of sprinklers, write Youcef Ouammou and Alan Brinson

FNSPF Seminar

In April the French Firefighters' Association organised a seminar on cultural heritage protection, held at the Chateau of Chantilly north of Paris. 550 delegates attended, including politicians, officials, senior fire officers, consultants, insurers and providers of fire protection systems. They heard the results of research conducted by Project Notre Dame, funded by Renault following the disastrous cathedral fire to develop guidance to protect French cultural heritage from fire.

Philippe Moineau, a former fire chief, led the project, which conducted desktop research and fire tests of suppression systems. He presented the new guide and ran the seminar, at which French and international experts presented their research and experience. Many said that while occupants may be able to escape a cultural heritage building that was on fire, which is a legal requirement, firefighters often could not prevent huge damage. Analysis of 500 French cultural heritage fires found that in a third of cases the entire building is lost. Several speakers said that fire suppression systems are the answer and we heard that Notre Dame will be protected with high pressure mist, as will Beauvais Cathedral. Youcef Ouammou and Alan Brinson were among the speakers.

EFSN Seminar

In September over 60 delegates participated in person, with more than 40 online, in a seminar organised by Youcef Ouammou on behalf of the EFSN. A wide range of stakeholders, including insurers, installers, manufacturers, public authorities, laboratories, brokers, architects and developers were present. Held at AXA offices in Nanterre, we heard the latest developments in a number of important themes affecting fire safety in France.

Lieutenant-colonel Fabien Moigne and Lieutenant-colonel Stéphane Durand of the Paris Fire Brigade opened the day with a presentation of their experience of fires in wooden buildings and their recommendations for code changes. There is political will to use more wood, as a material that removes atmospheric carbon, since buildings contribute a quarter of French carbon emissions, with steel and concrete alone representing 8%. Today they see projects solely in wood, partially in wood or as an additional storey in wood above an existing building in traditional materials. Both speakers presented some recent fires in French wooden buildings, noting that not only during construction but also once the building was complete the fire led to the destruction of the entire building. This was despite massive deployment of fire brigade resources. The French building regulation dates from 1980 and is now under review. While they could not share any details they did point out that it assumes traditional, non-combustible construction materials. This has led to the construction of designs that are inherently vulnerable to fire, as events have shown. In the absence of a revision of the regulation various organisations, including the Paris Fire Brigade, have published codes of practice. Their code calls for sprinklers or passive protection in wooden buildings higher than 8m and both in buildings higher than 28 m. One issue about which there is insufficient knowledge is the behaviour of wooden structures as they cool, with some collapsing many hours after the fire has been extinguished, since wood continues to weaken even at relatively low temperatures. One can use passive fire protection to prevent heating of the wood but there are concerns that it degrades over time.

Marc Espieux of RiskCare, a consulting firm, continued the theme of wooden construction. 20% of new buildings already use wood, at least partially, and this is set to

increase. Much of this construction will use cross-laminated timber (CLT). Yet from 250 °C wood begins to pyrolyze and the glue in some types of CLT begins to delaminate, leading to fire and smoke spread, including to the facade. Therefore it is essential to keep the wood below this temperature. One could achieve that using passive fire protection but nobody wants to cover the wood in layers of gypsum, which not only adds direct cost but by adding weight increases structural costs. Sprinklers by contrast allow the wood to be exposed while keeping the temperature below 250 °C. The fire stays in the room of origin and away from the facade. Sprinkler systems can also be tested each year to check they are operational. Of course space needs to be found for the pump and tank, while the costs need to be compared with those for using gypsum. Fire tests conducted by Efectis, a laboratory, for WO2, a large developer of wooden buildings, proved that sprinklers and both high and low pressure water mist can prevent the temperature of the wood from exceeding 250 °C. With active fire suppression installed, insurers are more prepared to provide cover for wooden buildings. Aboretum, a WO2 project with 125,000 m² of wooden buildings east of Paris, will be protected entirely with sprinklers in accordance with EN 12845, while another complex north of Paris will be protected with high pressure water mist.

Cultural heritage buildings were often built using a large amount of wood, while compartmentation does not meet modern standards, making these buildings uniquely vulnerable to fire. Moreover, saving the occupants is not enough, the building and its contents must also be saved. Philippe Moineau presented the French cultural heritage protection guide.

Next Karim Karzazi of AXA, who is also convenor of CEN Technical Committee 191 Working Group 5, gave an overview of his WG5's progress with the revision of EN 12845, the drafting of the EN 17451 sprinkler pump standard and of sprinkler component standards. He explained the future structure, with EN 12845-1 as an umbrella standard, part 2 with complementary design guidance for ESFR and CMSA systems and part 3 for guidance on earthquake bracing.

Catherine Gibert of the French sprinkler manufacturer Rolland was the final speaker and gave a brief presentation of a new French sprinkler concept. An innovative design allows this sprinkler to be connected to pipe without the need for welding and using far less time than current technology. The sprinkler can also be connected to pipes that are internally coated to reduce friction and corrosion. Reducing friction reduces pressure losses, potentially allowing smaller pipe diameters to be employed. The product has been submitted to CNPP and others for approval.

Other news from France

We are hearing of more residential sprinkler activity in France, with systems often installed as a compensatory measure where a building is not compliant, whether in its internal layout or passive fire protection. Sometimes it is a change of building use that has identified the need for sprinklers. Youcef is receiving more requests for information, both from consultants as well as from developers and authorities.

Waste recycling centre fires occur frequently and often lead to major damage to the centre, as well as the release of huge volumes of toxic smoke. Sprinklers have proven effective in limiting the effects of these fires. France now has a standard, NF X08-070, for the protection of waste recycling centres. Youcef participated in working group GT X65 that drafted this French standard, with sprinklers being a core measure. Youcef contributed to an article on the new standard by EFSN and AXA XL that was published in Face au Risque. To support the new standard, French insurers drafted guidance on how to design sprinkler systems for the protection of waste recycling centres, adding it to their APSAD R1 sprinkler system design, installation and maintenance rules.

Fire regulations are local so we must be local

Working with EFSN Italian members and other partners, we have launched the Italian Fire Sprinkler Network, write Gaetano Coppola and Alan Brinson

Across Europe fire safety is regulated at a national or even sub-national level. We know that it takes a local organisation, run by local people, to have the greatest chance of increasing national regulatory recognition of sprinklers. Only someone in the country can attend important meetings at short notice and provide the swift technical support in the national language to become seen as a valuable contributor and be invited in the first place. Over the past 20 years we have set up national organisations in many European countries and all have made a difference. Yet we held back in Italy, where for many years the way forward for sprinklers seemed uncertain. In recent years sentiment has changed. Major players in the Italian sprinkler and wider fire protection industry now believe that change is possible and that we should try. Covid disrupted our plans but we were undeterred. We are now delighted to report the launch of the Italian Fire Sprinkler Network, an association open to all those who support the increased use of water-based fire protection systems in Italy.

In July Gianluigi Mussinelli of Sebino, Luciano Nigro of Jensen Hughes and Alan Brinson of EFSN signed the memorandum of association near Milan in the presence of a notary. Other administrative tasks have since been completed, allowing us to launch the Italian Fire Sprinkler Network in September to the Italian fire sector at Safety Expo in Bergamo. We had a very positive response and in October we held a meeting of 60 stakeholders in person and online to agree initial priorities, first steps and membership fees.

As with our campaigns in other countries, the IFSN will tailor its priorities and strategies to the local situation. Italy requires sprinklers in relatively few buildings. Table 1 shows a couple of examples where Italian requirements are less strict than in other countries.

In Italy, as in other countries, we will not only seek to develop the use of sprinklers, at the same time we wish to see them correctly installed and maintained. There are major differences between the level of regulatory supervision of sprinkler markets in different countries, and evidence that where control is weaker, quality suffers and so does the reliability of installed systems. This can become a vicious circle, where players who follow standards are undercut by unfair competition from those who do not. That goes against safety. We wish to see quality and fair competition so we will work with stakeholders to tighten quality assurance schemes in Italy.

While the IFSN is only a few months old we are very encouraged by the initial reaction to this initiative. If you would like to know more, please contact brinson@eurosprinkler.org or gaetano.coppola@jensenhughes.com

Threshold area for sprinklers in shopping centres	2,000 – 3,000 m²	Austria, Belgium, Czechia, Denmark, Estonia, Finland, France, Germany, Greece, Lithuania, Luxembourg, Netherlands, Norway, Serbia, Slovakia, Spain, Switzerland, Turkey, UK
	3,000 – 8,000 m²	Hungary, Ireland
	10,000 m²	Italy
Threshold height for sprinklers in buildings	0-32 m	Austria, Czechia, Estonia, Germany, Greece, Hungary, Ireland, Lithuania, Norway, Romania, Serbia, Slovenia, Spain (hotels), Turkey, UK
	32-80 m	Finland, Luxembourg, Netherlands, Poland, Spain
	No limit	Italy

Table 1: Examples of sprinklers in Italian regulations

WE MAKE SEISMIC SIMPLE

Seismic bracing for fire sprinklers

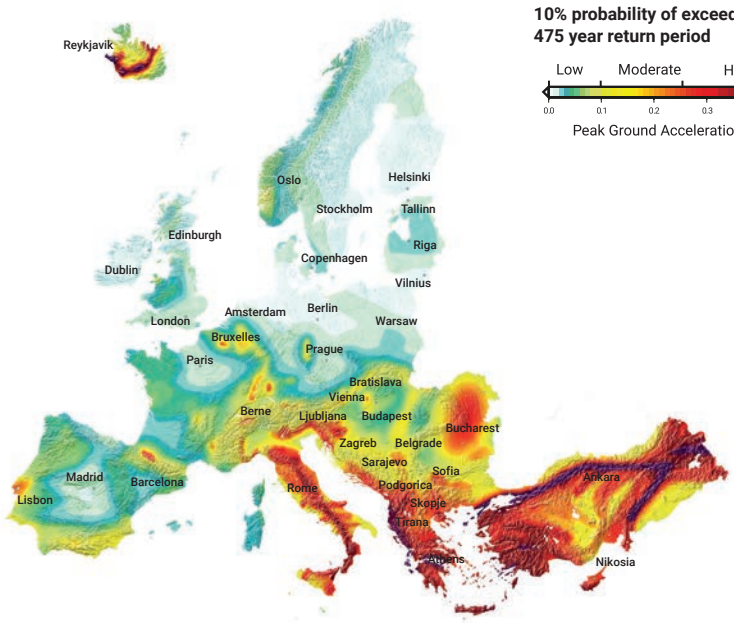
nVent CADDY

BRACING YOUR FIRE SPRINKLERS HAS NEVER BEEN EASIER!

With our FREE Bracing Calculator you can:

- **Design** a turn-key, fully engineered, complete bracing system that meets your needs
- **Identify appropriate products** from our complete offering
- Learn installation techniques and tips to **meet the evolving codes and standards** (FM DS 2-8M, CEN/TS 17551, NFPA13)

UL FM APPROVED



Scan the QR Code for the Seismic Calculator

NVENT CADDY SOLUTIONS

SAFE

FAST

EASY

nVent.com/CADDY

Codes, collaboration & campaigns

Alfredo Alvarez, EFSN representative in Spain

Just after our first regional article appeared in Sprinkler Outlook last September, the EFSN was engaged to participate in important national and international events, such as the last APICI congress in Madrid, where we introduced our second position paper, this one on sprinkler protection for social care residences. We showed the need to extend the sprinkler requirements in the Spanish building code to these uses, as happened in Scotland in 2004 following the fatal fire in the Rosepark care home. I gave a welcome address, covering Spanish legislation and the main EFSN campaigns, at the IWMA Conference in Madrid last autumn. This event offered greater visibility and the opportunity to meet others interested in the fundamentals and principals of automatic extinguishing with water.

At the end of 2022 the EFSN gave a presentation to fire brigades from different Spanish regions gathered for an event at the Mapfre insurance company tower in Barcelona, a 157m high fully sprinklered building. Each fire brigade covered their own City Ordinances, showing some discrepancies in terms of height and levels of protection from one to the other. We had the opportunity to show that the height threshold for sprinklers in the Spanish Building Code and Ordinances is well above the average across Europe. Madrid fire brigade presented their Ordinance, which dates from the 1990s, has long been recognised to be obsolete and is therefore not used so as to avoid conflicts with the 80 m height threshold in the Building Code.

National Building Code and Regional Fire Ordinances

Very little progress has been made recently with the proposed update of the Madrid Fire Ordinance, nor with a revision of the National Building Code. Both revisions could lead to an increased use of sprinklers to protect users and buildings. The EFSN has participated in several conversations with officials seeking advice on general active fire protection issues for high-rise residential buildings for a tentative plan to revise the Building Code. This seemed to have been put on hold due to the recent general elections but the next meeting is now scheduled. Meanwhile through conversations with Madrid Fire Officers we learned they envisage a tentative review of the 1990s Ordinance, including changes to encourage the installation of sprinklers in favour of some building construction relaxation measures over a certain height. We trust a new revision of the Madrid Fire Ordinance will soon be published to better protect future building developments in the capital as well as to at least match

the levels of protection in other main cities such as in Barcelona, Zaragoza or A Coruña where a block of flats over 50 m height will be protected with sprinklers, while in Madrid the threshold is 80 m.

Industrial Code

The new Spanish Industrial Code is expected to be published before the end of the year and some of our comments on the draft were accepted. Dialogue with government officials that showed an interest in our comments led to some positive changes around the use of sprinklers to better protect warehouses and industry; the most significant being the recognition that if two parts of a building contain very different fire load densities the decision on whether sprinklers are required for the whole building would be determined by the higher density and not by an average fire load for the building. For manufacturing, positive changes were made to the table of fire loads for certain industries that will increase their risk category and consequent protection requirements. Also our general advice on the lack of protection for empty warehouses of unlimited size was given and well received, ensuring hydrants will be closer to the building. Unfortunately, other comments were not considered and some risks seem to have been overlooked. We will therefore continue advising and asking for clarifications when needed to better understand weaknesses and contribute to improve the level of protection of Spanish industry. As an example, I recently spoke at a seminar organised by AERME, the Association of companies that install and maintain fire protection equipment and systems, where regulators were present.

RIPCI

The Spanish Royal Decree for fire protection products not only specifies to which standards products must comply but also which standards are to be used for the design, installation and maintenance of systems, and the periodicity of maintenance. It is understood to be under review, the current edition dating from 2017. Some standards referenced are European, others are national standards.

In recent years a number of new European standards have been published while others have been updated. Some Spanish standards have also been modified but are not yet on the RIPCI list. In addition the Ministry has clarified that on a case by case basis it may accept other published European or Spanish standards not yet on the RIPCI list.

Fire Deaths

Figures from the latest Fundación Mapfre and APTB Annual Victims Report, covering 2021, sadly show an increase to numbers back to the level of 2000. 204 people died in building fires, 152 of whom were at home. 2022 figures will be presented soon. While we are unsure if there will be another increase, we have seen a sudden rise in victims from fires in social care buildings, mainly homes for the elderly, where the most vulnerable live. Recently some fires in restaurants that started in kitchens or by serving flaming food have raised alarms in Madrid. We can also see more and more fires in car parks under blocks of flats.

In industry there is also an increase in fires in waste processing, food processing and energy generation plants, while regular fires result in the loss of thousands of square metres of warehouses.

Campaigns

All our campaigns are directed towards the better protection of those more vulnerable when a fire in a building occurs. Building height and uses related to social care should be watched closely. Numerous articles from the EFSN and some of our stakeholders have been published in the past 12 months encouraging the government to make changes and apply current European standards, in particular EN 16925:2022 and its Spanish National Annex to protect these kinds of buildings. Thousands of buildings have been retrofitted with residential sprinkler systems in other countries, why not in Spain?

New risks brought by new technologies, for example electric vehicles in underground car parks have been another matter of discussion, with the government admitting the risk and difficulty to extinguish an electric vehicle fire, especially when it is underground. The EFSN position paper was presented in Spanish as evidence of the risk and how sprinklers could mitigate it.

Our next campaign will be focused on the capabilities of those involved with the design, installation, commissioning, maintenance and inspection of water-based automatic extinguishing systems. The national standard, UNE 19005-02:2021 covers the procedures and periodicity of maintenance for fixed automatic water extinguishing systems. Recently UNE 23580-6 has been published, detailing the procedures and frequency of inspections to ensure that sprinkler systems are operational. These standards are still pending to be added to the RIPCI list but show a clear intention to improve standards to maintain systems in good order. Furthermore, for some years now Tecnifuego (the Spanish fire protection association) has assisted the Education Ministry in preparing the subjects to set an official qualification to train individuals in all aspects of active fire protection with 600 hours of lecturing and practice. Pending availability of an associated course, this qualification will ensure a good level of technical competence for personnel involved with these systems. This will be the first recognised qualification issued by the Ministry as part of a suite of new professional qualifications that will be available in future.

Extended Support

Fire Brigade knowledge of sprinkler systems is essential to secure support and collaboration. This is why we are cooperating with the APTB (Fire Brigade Technicians Professional Association) to launch our free courses amongst different Fire Brigades. These courses will be available for the first time to all Fire Brigades in Spain, starting in Madrid where there are two facilities ready with classrooms and the different systems installed for hands-on training. Training facilities in Barcelona and Burgos are preparing to extend the offer of training to other regions. More locations will be sourced in future upon demand.

To support our campaigns and give more visibility to the operation and benefits of fixed automatic water-based systems, we have entered in a collaboration with Fundación Mapfre to assist with the recording of some videos at their mobile demonstration unit to show how a sprinkler works under a real fire scenario in a room. This is expected to commence with the production of videos during the Fire Brigade National Congress in Avila where the EFSN will participate at the end of October. The next opportunity to show the mobile unit will be at SICUR 2024 next February in Madrid.

Developing & disseminating knowledge

John van Lierop,
Country Manager, EFSN

The new Dutch building code will bring some good news for the sprinkler industry. Today, with small exceptions, it does not include any requirements or direct incentives to fit sprinklers. The entire regulatory sprinkler market is based on equivalence, where sprinklers are installed as part of an alternative solution to that in the code. This approach has been highly successful and the Netherlands uses more sprinklers per capita than most other European countries. The article 'How equivalent solutions created the Dutch sprinkler market' gives an overview of how sprinklers are accepted, such as their use to permit larger fire compartment sizes in warehouses.

Our aim is to see the routine acceptance of more alternative solutions that incorporate sprinklers. To achieve this, we generate evidence that the sprinkler solution is as good or better than the code solution, then work with stakeholders to produce consensus guidance that can be used across the country.

Large fire compartments

The two standards for large fire compartments, NEN 6060 and NEN 6079 (risk-based), will be given a more important position in the new building regulations. The two standards will be referenced directly, giving them a higher status than the equivalence they hold now. Both standards are under revision. The update of the risk based NEN 6079 was restarted in 2023 after a three-year delay. At the government's request, an investigation was made to see how the impact of fire on the environment could be implemented. Addressing this issue is good news for the sprinkler industry.

The revision of the NEN 6060 is also necessary because it is very sprinkler-unfriendly. Requiring 240 minutes fire resistance for compartments larger than 20,000 m^2 despite the presence of a sprinkler system is economically unattractive for clients and actually inexplicable compared to other measures. There is a list of about 25 improvement proposals, which we assume will make the standard more attractive.

Smoke compartments

The Netherlands has additional requirements for smoke compartments since 2021, which can add significant cost. This was a reason for the sprinkler industry to investigate the benefits of a sprinkler system. Sprinklers can be a core part of any smoke control strategy in a building. Consultants investigated whether the smoke produced between the start of the fire and the activation of the first sprinkler could be vented using the building ventilation system, so that various measures such as controlled fire dampers could be omitted. It turns out that a sprinkler system is an equivalent solution to fulfil some aspects of the standard for performance requirements of smoke control referenced in building regulations. Sprinklers prevent fire spread, limiting the production of smoke and heat, and cool hot gases so that they contract, pressures drop and smoke spreads less readily. At Fire Sprinkler International 2023 in Amsterdam, Royal HaskoningDHV presented the first results. Their report will be published this year.

Management and image of sprinkler installations

We want to increase the satisfaction of owners/users of sprinkler systems through the development of materials such as education films. When sprinklers are in the news they are often portrayed negatively with an emphasis on water damage, not on the positive news that the fire is extinguished. Often, the sprinkler system is found to be poorly managed. This project aims to encourage the view that sprinklers make a welcome difference in a fire rather than being an imposed burden. To know better what the needs are, we will investigate what the target group thinks about the subject of sprinklers and fire safety. In doing so, we will also find out what people

think about digitisation and what questions exist in this respect. The first part of the project is underway and we aim to deliver material in early 2024.

Fire service guidance

The fire service academy (NIPV) is working on the procedure for the fire service in buildings equipped with sprinklers. That handbook will enable firefighters, in all phases of a fire, to carry out their work more safely and effectively. There is a growing need for it, partly due to the increasing size of distribution halls and automatic warehouses. The VSI is developing complementary materials to support the NIPV project.

Attracting talent

The sprinkler market in the Netherlands is growing substantially and installers are struggling to attract enough employees. The VSI started the project to 'mobilise technical talent'. The purpose of the project is to make the sprinkler industry visible as an interesting employer. Through campaigns, we will influence and encourage our potential target groups to apply to our members. The social media campaign will start at the end of 2023.

Handbook fire protection installations

In 2012, the fire service published the current edition of its Handbook on fire protection installations. We contributed to that update. A lot has changed since 2012. With our contribution, we expect a new edition of the handbook to be published in late 2023.

Car parks

For the first time the building code will introduce a requirement to fit sprinklers in car parks, specifically below buildings where people sleep. While car park fires have not caused significant loss of life, they have caused huge disruption, prevented people from returning home for months and other economic damage. There is concern that a car park fire could cause major loss of life, particularly if the car park were below a building where people sleep. Meanwhile in April a draft standard on 'fire protection of car parks' was published for public comment. The standard contains different solutions and off course sprinklers and watermist are well presented, compared to other solutions. The standard committee worked for five years on the draft, also considering the protection of electrical cars. More than 500 comments were received. What is striking is that the market is asking for clarification on fire protection systems, sprinklers and water mist; apparently it is not clear enough that it only concerns the application of automatic sprinkler and water mist systems. Also, it seems there is a need to clarify how it relates to the mandatory sprinklers in the new building code. Meanwhile Dutch consultants are asking the Dutch sprinkler association (VSI) to produce a more risk-related design for small car parks, aiming to make mains water supply more often feasible. The VSI has already written a draft guideline for comment and we hope that a final version can be published soon.

Wooden buildings

The Dutch government needs standards for buildings of wooden construction. A standards committee working group conducted a literature survey in 2022 as a first step towards a standard. The government has ordered the development of the standard this year, which will take two years. We encourage the use of sprinklers as a core measure.

High-rise buildings

Dutch building regulations apply to buildings up to 70m high and do not require sprinklers. For buildings higher than that a consensus guidance document exists which does call tor sprinklers. Yet 70m is a very high threshold for sprinklers, much higher than in other European countries where it is typically 30m or less; it is also not based on any obvious scientific or physical criteria. The government has approved a proposal of the standard committee working group to conduct a literature review as the basis for a risk-based standard for buildings between 20 and 70m, but its funding will not begin until 2024. Meanwhile, we have issued a white paper and will bring together the various stakeholders in a round table discussion to encourage that more informed choice.

Residential buildings

A broad stakeholder group produced guidance on how to value the presence of sprinklers in residential buildings. It is available on brandveiligwonen.org. It is not a code document but suggests what flexibilities in other measures may be acceptable if sprinklers are installed. Important stakeholders such as consultants and fire officers now need to become more familiar with it. For that, we organized a meeting and demonstration. Meetings at the fire service and a webinar are planned to stimulate this use of sprinklers.

Reductions in constructive fire resistance

A few years ago some independent research supported the development of guidance on how the structural fire resistance of steel may be reduced when sprinklers are fitted. Further research now under way is hoped to extend this concept. The project is paused waiting for the update of the large fire compartment standards.

Quality assurance

Sprinkler systems will only be used more widely if they are reliable. The reliability of sprinklers in the Netherlands is enormously high, thanks in part to the quality control tools we use. We are convinced the reliability of sprinkler systems strongly and unsurprisingly suggests that enhanced quality assurance regimes lead to greater reliability, potentially exceeding 99%. In the Netherlands the government set up and partly funds a stakeholder body, Het CCV, that approves certification schemes for safety measures, including sprinkler systems. These schemes and related documents are periodically reviewed. Besides third-party inspection, we can also provide independent product certification of sprinkler installations. In recent years, we have worked on improving the qualifications of employees working in the sprinkler industry. The sprinkler schemes are currently being reviewed. After the review the schemes will refer to the new qualifications made by the sprinkler industry. It will also be possible to certify water mist installations.

Summary

There are still a large number of applications where sprinklers could make a big difference when it comes to preventing fire casualties, limiting damage, improving sustainability and protecting business continuity. With our initiatives, we develop and disseminate knowledge on the applications of sprinklers.

Thanks to cooperation with various stakeholders in fire safety and active contributions to standard developments, we trust that buildings can better meet market requirements, making them more valuable, all at a lower cost.

The current position & developments

Ali Perry, CEO, the British Automatic Fire Sprinkler Association

I am extremely proud and privileged to have been appointed as the CEO of the British Automatic Fire Sprinkler Association (BAFSA). Prior to taking on this new role, I served for 29 years in the fire service in Scotland - in my final four years as the Head of Prevention and Protection responsible for Fire Prevention, Fire Investigation, Fire Engineering and Community Safety. While in this role I was involved in some key pieces of work including overseeing the services' response to the Grenfell Tower fire and the Cameron House fire investigation. I hope I can bring some of the experience I gained to my new role; it has certainly been a steep learning curve and I am very grateful for the warm welcome I received and would like to thank all those I met for their patience and assistance.

I am delighted to be able to continue my passion for improving safety through BAFSA and take on the role of Chief Executive with Keith McGillivary, my predecessor having left the association in a strong position. Over the past few years BAFSA, the wider sprinkler and fire safety community have made significant progress in promoting the increased requirement for sprinklers in the built environment.

In this article as BAFSA approaches its 50th anniversary in 2024 I will reflect on recent developments in the UK and also highlight some key priorities for the next few years, including the importance of competence within the industry and developing strong partnerships within the sector.

Recent Developments

I am pleased to report that the requirements for sprinklers in the built environment have progressed with some recent notable developments.

Wales

It is not surprising that there have been no significant changes in Wales since the substantial developments in January 2016. After the approval by the Welsh Assembly of the Domestic Fire Safety (Wales) Measure 2011 in October 2013, legislative changes made suitable fire suppression in new build and change of use applications forming the following building types a requirement:

- new houses and flats
- Care Homes
- rooms for residential purposes (other than in a hotel, hospital, prison, or short stay leisure hostel)
- registered group homes and sheltered housing

It is apparent that despite all the initial protestations from some interested parties, seven years later there have been no major obstacles to implementing the new regulations. This begs the question why such requirements have not been replicated across the UK, which it could be argued creates a disparity in how safe people are from fire in their homes.

Northern Ireland

In Northern Ireland, a "Consultation on Fire safety changes to the local Building Regulations" was opened on 3rd of July this year. The consultation focuses on amendments proposed to uplift fire safety protection by requiring additional measures in a range of buildings, primarily focused on residential buildings and in particular domestic multi-residential buildings. A new regulation, 37B will require the provision of suitable automatic fire suppression systems (e.g. sprinklers) within certain types of higher risk residential buildings;

- buildings containing one or more flats over 11 metres.
- Care Homes/Nursing Homes/Childrens Homes and Family Resident Centres.
- purpose built student accommodation with a height over 11 metres.

The recommendations have been supported by evidence from research carried out by the Building Research Establishment (BRE) and the Chief Fire Officers Association (CFOA) that demonstrates the clear benefits

to be gained from sprinkler installations in these types of premises, against the relatively low costs involved.

Scotland

In Scotland recent changes to the "Building Standards Technical Handbook 2020: Domestic" meant that all new-build social homes, flats, and shared multi-occupied residential buildings must be fitted with automatic fire suppression systems from March 2021.

The Cameron House Fire on 18th December 2017 cost the lives of Simon Midgley and his partner Richard Dyson. A Fatal Accident Inquiry was held into the tragic incident.

Also following the Fatal Accident Inquiry into the tragic fire at the Cameron House Hotel the determination of Sheriff McCartney, released on 11th January 2023, includes consideration of the impact a fire sprinkler system might have had on the fire, stating: "It was submitted that the Court is entitled to conclude that there is a real or likely possibility that had the sprinklers been installed and worked to inhibit the extent and spread of the fire and smoke, the deceased would, like other guests, have been able safely to escape the building."

Sheriff McCartney went on to recommend that: "The Scottish Government should constitute an expert working group to more fully explore the special risks which existing hotels and similar premises may pose through the presence of hidden cavities or voids, varying standards of workmanship, age, and the variance from current standards and to consider revising the guidance provided by the Scottish Government and others". He also stated that: "Given the potential added fire protection provided by an active fire suppression system, if such installation was said to be impossible or impractical in specific premises, it may be that such premises are simply not suitable as hotel accommodation."

The Scottish government has established a Building and Fire Safety: Cameron House Hotel Short Life Working Group (SLWG) to consider the "wider aspects" of the recommendation for converting historic buildings and revising relevant guidance for existing hotels. This work is being overseen by the Building and Fire Safety Ministerial Working Group.

The minutes of the SLWG from June 2023 are available online and state that a draft report (paper 05-03) of the SLWG was presented and discussed by members and the following points were recorded: "The need for automatic fire suppression systems in all conversions of historic buildings to hotels regardless of size, use, type and level of risk. Scottish Government (SG) officials noted that there is an expert panel being set up to consider this in detail prior to introducing regulations. It was noted that research will inform the expert panel's considerations. An attendee noted that there is a focus on conversions, alterations to extensions may bring in further discussion".

BAFSA has met with Scottish Government Building Standards regarding the work of the group and potential next step work and stands ready to provide any necessary expert advice.

England

In England, on January 10th 2023, the Department for Levelling Up, Housing and Communities published a "Consultation on Sprinklers in Care Homes, Removal of National Classes, and Staircases in Residential Buildings". The consultation, which closed on 17th March 2023, includes a recommendation for sprinklers in new care homes regardless of building height. It is widely expected that the outcome of the consultation will support this recommendation.

In addition, a consultation into a revision of Building Bulletin 100: fire safety design for schools ran from

27th May 2021 to 18th August 2021. The results of the consultation have still not been released and one can only speculate as to the reasons for this. However a BB100 draft for consultation has been released which recommends that automatic fire suppression systems should be installed in all:

- new school buildings that have a storey with a finished floor level over 11m above ground level
- new special schools
- new boarding accommodation

This is at odds with the position in Scotland and Wales where the importance of sprinklers in schools has long been recognised and is a requirement in all new build schools. It is a very disappointing and questionable position which differs significantly from the previous iteration of BB100 that had delivered a new and progressive policy on sprinklers. The value of suppression systems was recognised as a positive measure against the risk of fire and arson which stated that all new schools should have fire sprinklers installed except in a few low-risk schools. It also acknowledged that in order to reduce the effects of arson, installation of a suppression system (e.g., sprinklers) is likely to be very effective.

BASFA and other interested parties are responding to the current BB100 draft for consultation outlining our disappointment in the document and seeking to ensure the final version represents a more considered and reasonable position regarding the requirement for sprinklers in schools in England.

Competence in the construction industry

The tragic Grenfell Tower fire in 2017 raised difficult questions about construction management and safety in large, multi-occupancy buildings in the UK. Following the resultant independent review of the fire by Dame Judith Hackitt, the Ministry of Housing, Communities & Local Government committed to establishing of a new regulatory body to implement the lessons learned. As a result, the Building Safety Act 2022 Part 2 created the Building Safety Regulator (BSR) and named the Health and Safety Executive in this role.

As part of its remit the BSR established an Interim Industry Competence Committee in June 2022 and in August 2023 established and appointed members and a Chair to the new Industry Competence Committee (ICC). I am pleased to have been appointed as a member of this committee alongside 16 other members including the Chair, Jon Vanstone. Appointment to the committee is as an individual and not as a representative of any organisation. The first meeting of the committee took place on 13th September 2023.

The committees' functions include:

- Monitoring industry competence,
- Advising the BSR and industry,
- Helping industry to improve competence,
- And producing guidance to the public about assessing the competence of people in the built environment industry

Competence in the sprinkler industry

Competence in the sprinkler industry is hugely important to BAFSA. We engage with relevant standards committees to ensure the standards set for the industry are appropriate. The association has developed and provides training courses to ensure the industry meets these standards and has a well-trained, qualified workforce. As an association we require that all installer members have independent third-party certification.

This year BAFSA is working with the Awarding Body for the Built Environment (ABBE) to develop qualifications and assessments which are valid and reliable and are responsive to customer needs. The association has boosted its fire sprinkler training offering with a new online training centre that allows those working in industry opportunities to improve their skills in fire sprinkler inspection, design and installation to select the appropriate course, book and pay and take their course via its website.

In another significant development BAFSA is working closely with the third-party certification schemes. As an example of this, we are engaging with the LPCB as it reviews its 1048 scheme (covering the design, installation, and commissioning of industrial and commercial fire sprinkler systems) to ensure our courses align with their revised scheme. We are also working with LPCB to include exams as part of these courses that will be approved by the LPCB and replace the current LPCB exams. This will simplify the process for the industry as it will remove the uncertainty about the timings of exams and the associated challenges of planning and booking courses in line with these timescales.

BAFSA's next 5-year plan is currently being developed and although not yet published will have skills and development as a key focus.

So much progress has been made to date and as BAFSA prepares to celebrate its 50th anniversary in 2024 the focus is very much on how BAFSA can build on its success and continue to educate and advocate for sprinklers, serve its members and the sprinkler industry and improve the safety of the built environment.

50 bafsa
British Automatic Fire Sprinkler Association

CLARKE®

DIESEL FIRE PUMP DRIVERS

THE GLOBAL SUPPLIER

World's largest range of UL-FM & LPCB Approved Diesel Fire Pump Drivers.

UL-FM Fire Pump requirements covered from 31kW to 764kW and operating speeds from 1470 RPM to 3000 RPM.

LPCB Fire Pump requirements covered from 5kW to 205kW and operating speeds from 1760 RPM to 2960 RPM.

All engines are supplied with a minimum two year manufacturer's warranty.

Clarke have over 100,000 Diesel Fire Pump Drivers installed globally.

Driving Fire Protection Since 1964

www.clarkefire.com

Compliance with the EN 14972 water mist standard...

How to apply it in practice today

Background

The publication of the European standards for water mist fire protection systems is intended to unify the reference framework for how water mist systems will be applied in the European countries belonging to the European Committee for Standardisation, CEN. There are two series of water mist standards with the following principal structure:

EN 14972 Fixed firefighting systems. Water mist systems.
- Part 1 is the standard for Design, installation, inspection, and maintenance
- Parts 2 and onward are performance standards that contain fire test protocols for different occupancies and applications

EN 17450 Fixed firefighting systems
- Water mist components.
- All Parts are component standards that contain dedicated component test protocols.

The core standard is EN 14972-1, i.e., the Design and Installation part of the series, but it is not an independent all-inclusive standard: it is linked to application-specific performance standards (fire test protocols) and component standards (component test protocols).

Currently, there is a missing link between the fire test protocols and real installations, but there is work in process for an Amendment with a set of dedicated Annexes that will define the limits of applicability for each of the test protocols of EN 14972 Parts 2 to 17.

While most Parts of EN 14972 and one of EN 17450 have been published, several have not yet completed the CEN process. It will also be a never-ending story with respect to fire test protocols, as new applications may be added to increase the coverage of water mist protection in different areas for building protection and industrial applications.

This article describes best practice for claiming compliance with EN 14972 in the current situation where the standard series are incomplete. Red flags are also raised on potentially false or misleading claims presented about compliance.

Status of the EN 14972 and EN 17450 series

Table 1 shows the status of the EN 14972 and EN 17450 series to the extent that applications and component categories have been specified so far. Most of the current fire test protocols in EN 14972 series are directly based on existing test protocols from VdS, FM Approvals and BS, as indicated in the table, and existing component test protocols primarily by VdS and BS have been and are being used as the basis for the EN 17450 series.

Compliance with EN 14972 – principle

Full compliance with EN 14972 can be claimed when all the following conditions are met:

(i) The system is designed, installed, inspected, and maintained according to EN 14972-1.
(ii) The system design has been verified in full-scale fire tests according to EN 14972-X, i.e., the Part relevant to the application.
(iii) The system components have passed the tests of EN 17450-X, i.e., the relevant component Parts, or "other appropriate standard" where EN 17450 is still incomplete.
(iv) A system specific Design, Installation, Operation, and Maintenance (DIOM) manual exists with all the required information, together with a well-defined scope of application.

None of the water mist standards are harmonized and, therefore, it is not possible to CE mark water mist systems or system components under the CPR (Construction Products Regulation). The alternative way to prove compliance with the CPR and CE mark a product is to follow a European Technical Assessment through a Technical Assessment Body (TAB).

There are still gaps and ambiguities in the process: Although the core design standard EN 14972-1 has been published, not all the currently listed fire test protocols have been published, and only a single component test protocol exists as a published standard so far. Also, for the time being, the scope of application of the test protocols is missing altogether, and there is no established Technical Assessment procedure for water mist systems.

How to demonstrate compliance in practice today?

The factors that contribute to the success of any fire-fighting systems are the same. The EFSN has summarised these factors for sprinkler systems, but they are equally valid for water mist systems:

Publication			Status
EN 14972 / GENERAL DESIGN & INSTALLATION			
EN 14972-1 (2020)	Design, installation, inspection, and maintenance		Published (*
EN 14972 / FIRE TEST PROTOCOLS			
	Test protocol for …	Base protocol	
N/A (Part 2)	… shopping areas	VdS	Preliminary Stage
EN 14972-3 (2021)	… office, school classrooms and hotel	VdS	Published
prEN 14972-4	… non-storage occupancies	FM Approvals	Passed Enquiry
prEN 14972-5	… car garages	VdS	Passed Enquiry
EN 14972-6 (2023)	… false floors and false ceilings	VdS	Published
EN 14972-7 (2023)	… commercial low hazard occupancies	BS	Published
EN 14972-8 (2020)	… machinery in enclosures exceeding 260 m^3	FM Approvals	Published
EN 14972-9 (2020)	… machinery in enclosures not exceeding 260 m^3	FM Approvals	Published
EN 14972-10 (2022)	… atrium protection with sidewall nozzles	N/A	Published
EN 14972-11 (2023)	… cable tunnels	VdS	Published
prEN 14972-12	… commercial deep fat cooking fryers	UL/ISO	Passed Enquiry
N/A (Part 13)	… wet benches and other similar processing equipment	FM Approvals	Preliminary Stage
EN 14972-14 (2021)	… combustion turbines in enclosures exceeding 260 m^3	FM Approvals	Published
EN 14972-15 (2021)	… combustion turbines in enclosures not exceeding 260 m^3	FM Approvals	Published
EN 14972-16 (2019)	… industrial oil cookers	FM Approvals	Published
prEN 14972-17	… residential occupancies	BS	Passed Enquiry
EN 17450 / COMPONENT TEST PROTOCOLS			
	Requirements and test methods for…	Base protocol	
EN 17450-1 (2021)	… strainer and wire mesh filter	VdS & BS	Published
prEN 17450-2	… nozzles		Passed Enquiry
N/A (Part 3)	… check valves		Preliminary Stage
N/A (Part 4)	… control deluge valves and actuators		Preliminary Stage
N/A (Part 5)	… pressure switches		Preliminary Stage

Table 1. Status of the EN 14972 and EN 17450 series. (Work for an Amendment on-going.*

1. the existence of appropriate design standards / DIOM manuals
2. the use of appropriate components
3. their application by qualified, trained personnel
4. installation by competent, adequately supervised staff
5. inspection of the new system by a competent person
6. regular system maintenance by trained staff
7. periodic inspections of the system by a competent person

The first two requirements relate primarily to the technical requirements of the system as given in the relevant standards and guidelines, whereas the five other requirements relate to quality assurance of real installations.

Technical requirements

For sprinklers, there is a prescriptive design standard applying to all sprinkler systems, and harmonized component standards allowing for products with CE marking. In most cases the sprinklers are also type approved by VdS, LPCB, UL, and/or FM Approvals. The process for assessing compliance with the technical requirements is a well-established process.

For water mist systems the primary difference and challenge relate to the fact that the systems are manufacturer specific with dedicated design guidelines and components for each system. With sprinkler systems the prescriptive design guidelines do not need any assessment, whereas the DIOM manuals for water mist systems do. Very fundamental issues affect the reliability and credibility of the DIOM manual:

1) Is the test lab that conducted the fire tests competent enough for full-scale fire testing with water mist systems?
   Challenge: It is a very specific area of fire testing, and even the common requirement for “accredited labs” is no guarantee of the quality of all testing.

2) Is the organisation that has issued a "certificate" or "acceptance" for compliance with EN 14972 competent enough to evaluate (i) the fire tests, (ii) the component tests and (iii) the scope & contents of the DIOM manual?
Challenge: Assessing a full system is not a straightforward process as there are still a range of open issues within the EN framework for compliance evaluation.

Fundamental issues related to the components, are:
1) Have any component tests been conducted?
2) What tests have been conducted?
Challenge: most EN 17450 component test protocols are not yet available.

Currently VdS is the only authority in Europe with a well-established process for testing and evaluating water mist systems, including (i) witnessed fire testing, (ii) in-house component testing, (iii) DIOM manual assessment, and consequent (iv) type approvals for full systems. VdS guidelines, EN 14972 & EN 17450 are also largely aligned and therefore a VdS type approval indicates close compliance with EN 14972, and any deviations there may be are likely to be insignificant.

BRE/LPCB in the UK does have a limited scope for water mist approvals, but currently the scope is not linked to EN standards but to BS and LPS water mist standards.

In the USA, FM Approvals has a well-established process leading to type approvals. Many FM Approvals and EN 14972 fire test protocols are aligned but component test protocols differ. Therefore, systems with FM type approvals for applications covered by EN 14972 comply with the relevant Part in EN 14972. For components, EN 14972-1 currently refers to EN 17450 or "other appropriate standard", and where FM 5560 is considered an appropriate standard, also FM type approval indicates close compliance with EN 14972.

UL has a limited process with respect to components: UL Listing covers the system design and nozzles only. UL fire test protocols are different to those of EN 14972, although the basis for many of them is the same. For the nozzles, UL component tests may be considered to qualify as appropriate, as intended by EN 14972. This applies to nozzle tests according to IMO.Res.A.800 as well.

Apart from formal type approvals by VdS and FM Approvals, there are various certifications about EN 14972 compliance, the credibility of which is to be assessed by potential AHJs, consultants, and clients.

Table 2 summarises the assessment of technical requirements for sprinklers and water mist systems.

Quality assurance of real installations

Provided that the DIOM manual and the components applied in the water mist system can be considered to provide at least the same performance level against fires as that by the sprinkler design standard and components in the respective occupancy/application, then the design basis is equally acceptable for sprinklers and water mist. The next task is to assure that an actual installation is as it should be, and that it is operational for its entire expected lifetime.

For sprinkler systems practices differ in European countries. In most countries there are quality assurance schemes in place to comply with building regulations and in all countries systems installed for insurance reasons are inspected, often by the insurer. Many countries have also national installer accreditation schemes.

For water mist systems the practices – in countries where they exist – differ even more and can be quite vague. Only VdS and FM Approvals have comprehensive

		Standard or guidelines		Design basis	Compliance assessment to the standard requirements
Europe	Sprinkler	Design & Installation	EN 12845 CEA 4001	Prescriptive requirements Same design criteria for all sprinkler systems	The requirements are given in the prescriptive standard --> straightforward assessment
		Components	EN 12259		CE marking / Type approvals by VdS & LPCB Type approvals by UL & FM Approvals according to their own standards
	Water mist	Design & Installation	EN 14972 - 1 VdS 3188	Performance based requirements System specific DIOM manual	VdS guidelines and EN 14972 & EN 17450 are largely aligned. VdS type approval indicates a close compliance with EN 14972 for the specific application.
		Fire test protocols	EN 14972 - 2 ... VdS 3883		
		Components	EN 17450 - 1 ... VdS 3100		
USA		Design & Installation	NFPA 750 FM Global DS 4-2		FM 5560 and EN 14972 fire test protocols are fully aligned, and the FM component test protocols may be considered to fall under the definition "other appropriate standards" by EN 14972. FM type approval indicates a close compliance with EN 14972 for the specific application.
		Fire and component test protocols	FM 5560		
			UL 2167		The credibility and contents of certifications by other organizations about EN 14972 compliance is to be assessed by AHJs, consultants, and clients.

Table 2. Assessment of technical requirements.

quality assurance schemes for full water mist systems, including regular audits of the manufacturing sites for quality control.

Some European countries have national schemes often based on VdS and/or FM schemes, and many insurance companies have published their own guidelines and best practices. A process of defining a dedicated national scheme for water mist systems is on-going at least in the UK and in the Netherlands.

In general, the work has only just started for developing acknowledged and appropriate quality assurance schemes for water mist systems, but – as always – trained and competent people are the key in all assessments, installations, inspections, and maintenance actions. With water mist systems they must be trained in the specific manufacturer's systems and today manufacturers have their own training programmes for system design, installation, service, and commissioning, and consequent certifications for designers and installers.

Red flag: potentially misleading compliance claims

In the current situation with incomplete standards and evolving practices, one should be cautious with compliance claims. For example, it may well be that the system design has been defined and verified in fire tests complying with EN 14972 Parts 2 – 17, but full compliance with EN 14972 cannot be claimed based on plain fire testing.

As another example, many misunderstandings relate to Annex A of EN 14972-1. It is an informative annex providing guidelines for developing new test protocols for the EN 14972 series, but it is useful also in defining representative project-specific fire tests. Annex A does not give any "acceptance criteria" for a test protocol nor to a system tested based on the test protocol. A water mist system cannot be "according to Annex A" even if it has been tested against a protocol defined following the guidelines of Annex A. There is no quality control or standard practices for tests "according to Annex A", and the tests would not qualify as equivalent to Parts 2 – 17 in any compliance assessment.

Summary

European water mist system standardization has been progressing quite effectively in recent years. The design standard together with a set of fire test protocols have already been published, but work remains to be done, especially with component test protocols. Also, new fire test protocols will be included in the future for a more comprehensive coverage of different areas in building protection and industrial applications.

Close compliance with the technical requirements of EN 14972 is already built into the VdS and FM type approvals for water mist systems in applications covered by EN 14972. A more detailed compliance assessment by competent third-party assessment bodies is needed for systems without formal VdS or FM type approvals. For the quality assurance of real installations, the practices differ in European countries from non-existent to national schemes often based on VdS and/or FM schemes, and many insurance companies have published their own guidelines.

For full compliance assessment, the principles are the same as with sprinkler systems but today in practice interested parties like AHJs, consultants, and clients should go deeper in assessing the credibility and contents of the submitted documentation when dealing with water mist systems.

Water mist...

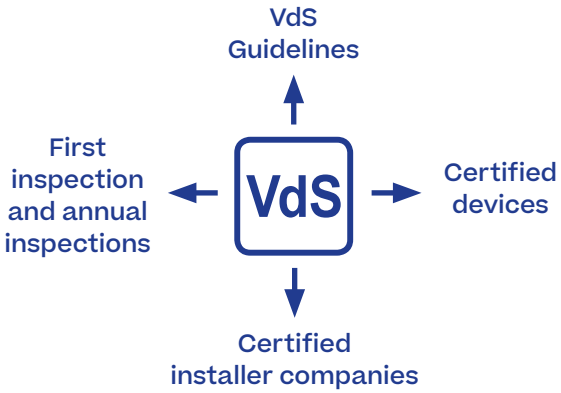
an alternative to conventional systems?

Water mist systems have been on the market for over 30 years and there are several guidelines for their application, yet water mist is still treated as a new technology. Should you be afraid of water mist? Can we use it as an alternative to conventional systems such as sprinklers? Kamil Swietnicki of VdS offers some guidance.

VdS has been dealing with certification and acceptance of this type of system for many years. The experience gained can be helpful not only for designers, contractors and manufacturers but also for customers who would like to invest in good and effective fire protection. But how can you tell if an installation is effective? Can safety be measured? Who can possibly do this?

VdS – who are we?

Set up in 1908, VdS Schadenverhütung GmbH is a 100% subsidiary of the German Insurance Association (GDV). With seven offices in Germany and four abroad (Poland, Czech Republic, Netherlands and China), VdS today has over 400 experts who conduct risk assessments, site inspections, and certifications of products, companies and professionals. We also offer training programmes and a comprehensive suite of publications. We believe in an integral concept of protection to achieve reliability and efficiency of fire protection systems!



Why are site inspections so important?

It might seem that a well-designed fire extinguishing system is a good system. But is it? During our daily work we find that even the best-designed system can have some errors. VdS differentiates between different notices of deficiency in its reports. Some of the examples we see are below.

Design deficiencies

- This is the moment when the most inaccuracies are made. Our customers can save a lot of money by identifying mistakes at this stage.

Deficiencies found during on-site inspections

- Sprinklers mounted before installation at the ceiling
- Incorrectly made pipe connections

Building deficiencies

- Sprinkler in ceiling insulation
- Non-executed / damaged installation passages through fire walls
- Incorrectly made electric trace-heating

Technical deficiencies

- Sprinklers painted on site, pump reductions on site
- Incorrect execution of pipe fasteners
- Improper slopes of pipelines in dry sections
- Missing inspections on old installations after 12½ or 25 years

Organizational errors
- Storage areas exceeded
- Storage of flammable materials right next to the building
- Inappropriate storage conditions

Differences between low and high pressure water mist systems and wet pipe and dry pipe systems

The information below shows the most relevant differences.

Pressure losses

	Low pressure	High pressure
Typical nozzle pressure	1 to 10 bar	50 to 80 bar
Typical pressure at the pump	3 to 10 bar	100 to 140 bar
Possible acceptable pressure loss	2 to 10 bar	20 to 80 bar

High-pressure technology requires different components
- Pumps - piston pumps are generally used instead of centrifugal pumps

Low pressure pump systems	High pressure pump systems
Pumps comply with VdS CEA 4001 or VdS 2109	The pump, pump modules or pump set comply with VdS 3188
As a rule, one pump and possibly a pressure tank are used	Pump modules are most used to achieve flow rates
Impellor pumps are used	Piston pumps are used Piston pumps need a safety valve and relief valve
Pump characteristic curve must be selected for the installation	Piston pumps always have the same capacity

- Valves - ball valves and solenoid valves are generally used instead of control and alarm valves
- Pipelines - stainless steel pipes are generally used instead of steel pipes

Cylinder systems (high pressure)
- Cylinder systems have separate cylinders for gas (usually nitrogen or compressed air) and water
- Typical gas/water mixture ratio is 1:3
- The duration is limited and is at least double the extinguishing time determined by fire tests
- Use with or without a pressure control valve

Low and High pressure systems according to standards:
- EN 14972:

Low pressure	Medium pressure	High pressure
Up to 12.5 bar	12.5 bar to 35 bar	over 35 bar

- NFPA 750 and FM 5560

Low pressure	Medium pressure	High pressure
Up to 12.1 bar	12.1 bar to 34.5 bar	over 34.5 bar

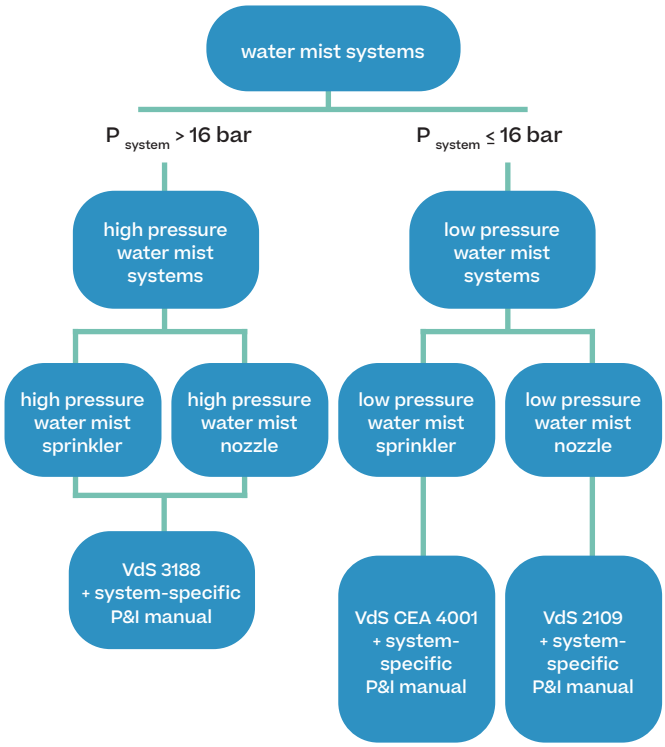
- VdS 3188

Low pressure	High pressure
Up to 16 bar	over 16 bar

What installation types can be found in water mist systems?

- Automatic water mist systems
  Systems with a thermal release element (e.g. glass bulb) in the water mist nozzle. Complete system providing water mist protection and comprising one or more systems, pipework to the systems and the water supply.
- Water mist extinguishing systems
  Systems in which open water mist nozzles are used, which may be divided into different extinguishing zones and are triggered in zones

How to choose a proper guideline for water mist systems according to VdS?



Schematic overview of the application of regulations for water mist systems

Design basics for water mist extinguishing systems

What standards and guidelines are present on the market?

- VdS 3188:2019-10(02): Water Mist Sprinkler Systems and Water Mist Extinguishing Systems (High Pressure Systems) - Planning and Installation
  - VdS 3188 contains the requirements of EN 14972
    Main part:
    - Basic requirements
    - Dimensioning and requirements for hydraulic calculations
    - Water supply and electric energy supply
    - Requirements for pressure systems
    - Arrangement of nozzles
    - Alarming and monitoring devices
    - Maintenance of operational readiness

    Annex K:
    - Requirements and guidelines for selected fields of application
    - Fields of application
    - Limits of application
    - Further annex:
    - Requirements for design, installation, operation and maintenance (DIOM) manual + technical sheets
    - Adding foaming agent
    - Dimensioning the network

- VdS 3883 1-8: Fire Test Protocols for different applications

- EN14972-1:2021: Fixed firefighting systems - Water mist systems - Part 1: Design, installation, inspection and maintenance
  Includes protection of areas such as:
  - Residential areas, rooms in hospitals, etc.
  - Underground garages
  - Office areas
  - Defined commercial and storage areas

  Must be used with the system certificate and its manufacturer's DIOM manual

- FM 5560: Approval Standard for Water Mist Systems
  - It is not a guideline for "design and installation"
  - A set of requirements for components and systems
  - Very detailed environmental requirements
  - Detailed fire test protocols (many are VdS approved)
  - Guideline FM 4-2 January 2022 "Water Mist Systems" provides basic information on planning and installation

- NFPA 750:2023: Standard on Water Mist Fire Protection Systems.
  - No details for installation dimensioning
  - Typically, a reference to the "manufacturer's listing" or AHJ. There are no binding statements or specifics, which can result in a very wide range of interpretations
  - Must be used with system certificate and its manufacturer's DIOM manual

- Other
  - IMO (np. IMO MSC 1165, IMO A. 800)
  - APSAD D2 CNPP
  - British Standard: DD 8489: 2016

What do you need to pay attention to when applying other design principles?

- Mixing of standards should be categorically excluded due to the frequent contradiction of requirements.
- The requirements of a given standard must be fully met.
- Selected standard together with the system certificate and its manufacturer's manual should be used.

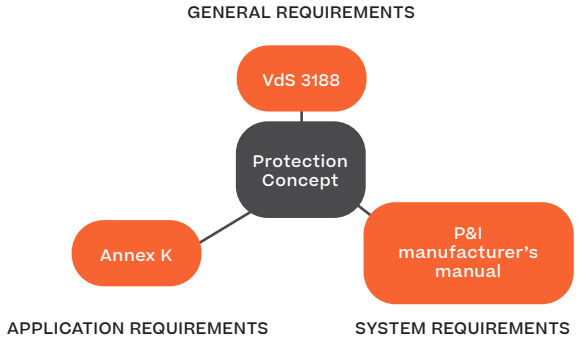
Necessary documents for design?

VdS 3188 - Basic requirements for the system, application and basic parameters

+

Nozzle parameters, system assembly details, etc. (DIOM = Design, Installation, Operation and Maintenance Manual

Examples of protection concepts



What are the general requirements according to VdS 3188?

- Hydraulics

Area of operation (VdS 3188 point 6.1.1) – for automatic water mist systems:

- Depends on the type of application (table below)

Designation	Corresponds to fire hazard class[1]	Wet pipe or pre-action system	Dry pipe system
		Area of operation [m²][1]	
Office areas	LH	84	inadmissible
	OH1	72	90
Recreation areas	LH	84	inadmissible
	OH1	72	90
Office and recreation areas with water mist side wall sprinklers	LH	144	inadmissible
	OH1	120	inadmissible
False ceilings in above mentioned areas	LH	84	inadmissible
	OH1	72	90
Parking garages	OH2	144	180
Selected sales, technical and storage areas	OH3	216	inadmissible

1) If further requirements (e.g. high-rise building or convention room) result in a classification in another fire hazard class, which results in a larger area of operation, and if the fire risk corresponds to the field of application defined for the respective water mist system, the larger area of operation shall always be taken as the basis.

Table 6-1: Fields of application and areas of operation for water mist sprinkler systems

Field of application	Restriction (examples)	Other limitations which can be found
Office: · single and open offices · restaurants and kitchens · public areas in buildings with low fire load · escape routes or other corridors · museums	· Storage of plastics only possible to a small extent (consultation with VdS necessary). · Kitchen areas (e.g. in restaurants) may only be protected with a water mist sprinkler system for office areas if it has been proven that no water can reach areas where hot grease is to be expected and no oil or grease is sprayed by the automatic water mist nozzles.	Area limitation ≤ 50m², (fire separated 30 min) for · Storage rooms (storage of flammable liquids, gases, plastics, etc. not allowed) · Libraries, file rooms, archives · Technical areas · Area of operation of 144 m2 · Technical rooms with low fire risk · High-rise buildings and areas classified as recreation areas (OH4) · Extra requirements in Annex D or E · Areas such as cinemas, theatres, concert halls, exhibitions, fairs, etc. not allowed
Recreation areas · hotel rooms · rooms in hospitals, care homes, homes for the elderly · apartments · recreation areas	· Other installations, e.g. air conditioning, must be switched off automatically	
Office and recreation areas with automatic water mist side wall nozzles · offices · public areas with low fire load · hotel rooms · rooms in hospitals, nursing homes, homes for the elderly · apartments · recreation areas	· Fast response nozzles shall be used · Automatic water mist side wall nozzles may be used in rooms up to 120 m² (fire separated 30 min)	· Storage rooms - not allowed
False ceilings and false floors	· False ceilings and false floors from 0.3 m to 0.8 m	· There shall be no fire load above the nozzles · Conveyor systems not allowed in these areas (e.g. pneumatic conveyor system) · Calculations of the fire load of cable routes according to Annex S, VdS 3188 · Space of the false floors shall be made as a fire-retardant area with a fire resistance of 30 minutes
Parking garages	· Non-automatic fully enclosed car parks and underground garages · Only parking areas and driveways for passenger cars with a permissible total weight of 3.5 tonnes may be protected	· Ventilation and its effects should be considered · Dry network only if included in DIOM · Storage in these areas, e.g. tyres is not allowed
Selected sales, storage and technical areas · sales areas · storage areas adjacent to sales areas · archives · libraries · technical areas	· The individual areas together may have a maximum area of 500 m² (fire separated 30 min)	· The storage of flammable liquids or gases is not permitted · The storage or sale of furniture or materials with expanded plastics is not permitted

(Annex K.1)

Field of application	Restriction (examples)	Other limitations which can be found
Cable ducts	• The maximum length of one area should not exceed 60 m • From 100 m² of the fire compartment, the water mist extinguishing system shall be designed for at least 100 m² or for three adjacent zones with the greatest water demand, whichever is greater	• The longitudinal air velocity shall not exceed 1 m/s • The size of a cable ducts is strictly defined
Machine room • Generators, emergency aggregates • Hydraulic aggregates (including associated equipment such as oil pumps, oil tanks, generators, gearboxes, drive shafts and hydraulic aggregates) • Pumping devices • Test stands • Gas or steam turbines	Combustible liquids: • Metal containers up to 210 l • Total storage quantity ≤ 450 l • Flash point ≥ -4°C • Rack or similar storage is not allowed • Storage of gases (including liquids) is not allowed	• Specified permissible openings in the room • Fuel (flash point ≤ -4°C) acceptable but limited for test run purposes only • A triggering of the water mist extinguishing system shall automatically stop the test • Duration = "Rundown time" + DIOM extinguishing time
Paint booths • paint booths • dryers • preparation or flash-off area • shifting area	• In the protected area, the quantity of flammable liquids shall not exceed 100 l, the maximum tank size is 50 l. Flash point > 21°C	• Only water mist extinguishing systems may be used in paint booths • Protect paint robots with a separate extinguishing system, such as a gas extinguishing system - CO_2
Storage and processing areas for flammable liquids • paint and lacquer storage room • paint mixing room	Combustible liquids: • Flash point ≥ -4°C	• Storage: Metal IBCs with a capacity of max. 1000 l on metal pallets • Rack storage (construction limitations) or directly on the floor • For storage quantities > 2,000 l in a room, a manually controlled proportioning of film-forming foam concentrates shall be provided
Kitchen protection equipment • deep fat fryers • tiltable frying pans • frying, griddle and grill plates • woks • associated exhaust hoods with grease separators • woks • associated exhaust hoods with grease separators	• The maximum filling capacity of a deep fat fryer shall not exceed 50 litres of grease or oil with area of 800 x 600 mm	• Ventilation and its effects should be considered • Dry network only if included in DIOM • Storage in these areas, e.g. tyres is not allowed

(Annex K.2)

Effective area (VdS 3188 point 6.1.2) – for water mist extinguishing systems:

- Room protection: the entire cubic capacity
- Dividing a room into several effective areas is not allowed
- All areas of operation within a radius of 7 m, if not separated according to point 4.4 VdS 3188

- Water duration

Automatic water mist systems:

- Areas LH - 30 min
- Areas OH - 60 min

Water mist extinguishing systems:

- Minimum 30 min
- Different durations are described in the DIOM manual

What examples of the applications or application requirements can be found in VdS 3188?

- Field of applications of water mist systems (Annex K.1)
- Field of applications of water mist extinguishing systems (Annex K.2)

Are you sure that's all?

The information provided is only an introduction to the world of water mist systems. For most customers, this is still a new and unrecognised fire protection system, and therefore there are great concerns about its effectiveness.

Water mist systems have been tested in many ways for many years. It is worth noting that these tests are performed under full scale conditions. The tests conducted by VdS compare the efficiency of these systems with sprinkler systems (in most cases) as a reference. You might wonder why we compare them to sprinkler systems. Well, we know the fire protection performance of sprinkler systems very well, hence they are the basis for comparisons.

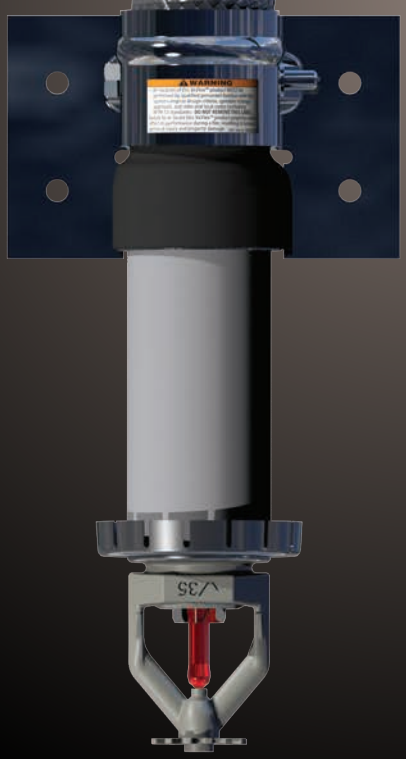
Are water mist systems effective? Of course, provided the water mist system is designed and manufactured in accordance with applicable standards. Are they complicated? That depends, but in fact they have limits and are not suitable for all areas. Should you be afraid of them? Absolutely not, if used properly. Ask the experts of VdS for support.

Vic Flex™

SPRINKLER FITTING SYSTEMS

VICFLEX™ DRY SPRINKLER STYLE VS1

THE ONLY THING CERTAIN
IN A DATA CENTER IS CHANGE.



WE CAN BE FLEXIBLE.

No more issues with sprinkler head alignment.
Change your layout and the VicFlex™ Dry Sprinkler moves with you.

No more water over your racks.
Don't take the risk, this sprinkler is flexible and dry.

No more rigid pipe.
If a ceiling sags or moves over time, the VicFlex Dry Sprinkler stays in place and the sprinkler's performance won't be compromised.

When flexible technology meets dry sprinkler technology the result is simpler, safer sprinkler systems from Victaulic.

www.victaulic.com

Victaulic®

Taking the plunge

The UK's Fire Protection Association (FPA) Sprinkler Team discusses how the Response Time Index plunge test can be used to check the efficiency of both sprinkler and water mist systems

Sprinkler systems have long been valued for their fire control properties and life saving features. The vital role they play in ensuring life safety in commercial, domestic, and industrial premises cannot be understated.

As the technology for newer suppression systems continues to evolve, testing methods have also adapted to suit them. One such option, currently under-utilised in the UK, is the plunge test method. The Response Time Index (RTI) plunge test wind tunnel currently housed at the FPA's fire testing and experimental unit is used to conduct response time index testing. This is an integral part of the testing that all new sprinklers and water mist heads should go through whilst being designed, and it is essential if a sprinkler head is to be third-party approved. It also serves as one of the tests that old sprinkler heads are subjected to every 25 years.

A response time index test is used to determine how quickly a sprinkler will operate when exposed to heat, and different sized bulbs have different requirements. The response time, or thermal response, of a sprinkler is measured by plunging (this is where the plunge test gets its name) a sprinkler head into a metal tunnel, where hot air is slowly cycled, and tracking how long it takes for the head to operate.

In terms of thermal response, sprinkler heads currently come under three categories:

- quick/fast response
- special response
- standard response

Quick or fast response heads are sprinklers with a glass bulb of up to 3mm in diameter and an RTI of 50 metres/second or less. Special response heads are sprinklers with a glass bulb of between 3 and 5mm in diameter and an RTI of between 50 and 80 metres/second. Most fusible link sprinkler heads are also classed as special response. Standard response heads tend to be older makes, have a glass bulb larger than 5mm and an RTI of between 100 and 350 meters/second. The LPC Sprinkler Rules (published on behalf of UK insurers by the FPA) now state that unless a room is smaller than 500m^2 with a height of less than 5m, quick/fast response sprinkler heads should be used.

This requirement for quick response sprinklers may have an impact on legacy systems using special or standard response heads, as insurance companies may no longer cover them or require larger premiums before providing cover. Therefore, it is important for legacy sprinkler systems to be subjected to plunge testing in order to confirm whether or not they have the correct response time. New sprinklers are now predominantly made as quick response sprinklers due to the LPC Sprinkler Rules, and water mist heads are only ever made with quick response bulbs as they are more reliant on early activation.

Quick/fast response sprinklers

Response time index testing using the plunge test wind tunnel was integral in the development of quick/fast response sprinkler heads, and is one of the reasons why we have ESFR (early suppression fast response) heads today. Before the development of the plunge test wind tunnel, it was almost impossible to reliably create a sprinkler that would activate within the correct parameters. The response time index itself was created using the plunge test wind tunnel and allows all sprinklers, regardless of age, size, and temperature to be tested to the same standard with reliable results.

Before the development of the plunge test wind tunnel, the only way to determine the thermal response of a sprinkler head was via the 'air-oven method'. However, this was difficult to standardise as each testing house conducted its test slightly differently, and consistent and accurate results were near impossible to achieve. In conjunction with FM (Factory Mutual), the company Archer Industries in Somersby, NSW, Australia developed the first RTI plunge test wind tunnel. Archer's design is now considered the standard for all plunge test wind tunnels, and the one found in the FPA laboratory is Archer's latest designed and manufactured model.

The response time index of a sprinkler or water mist head is calculated using the following parameters:

a. Operating temperature of the head
b. Velocity of the air in the tunnel
c. Air temperature in the tunnel
d. Conductivity factor of the sprinkler
e. Time taken for the sprinkler to activate

As water mist heads are designed with 3mm quick response bulbs, they are tested to the same standard

as quick/fast response sprinkler heads and the testing is conducted in much the same way. To conduct an RTI test using the FPA plunge test wind tunnel, the head is mounted onto a custom metal plate and left to condition within the testing room for 30 minutes. The plunge test wind tunnel is then calibrated using a micromanometer to ensure that the speed within the tunnel falls within the boundaries for the bulb size and activation temperature of the head to be tested. The metal plate with the head attached is slid into a specially designed rig above the wind tunnel and an air hose emitting 5 psi of air pressure is connected to the back. The rig is lowered quickly into the tunnel which automatically starts a timer on the plunge test control panel, as soon as the head activates, causing the air pressure behind the head to drop, the timer stops. This is then repeated for each head in a testing regime and the time noted so that it can be used in the RTI equation.

Thermal response testing is one of the six tests undertaken at the FPA for a 25-year sprinkler head test and is used to determine whether or not a sprinkler still activates within the correct response time bracket. It is used in conjunction with the other tests and is not an alternative as it is testing a specific component of the sprinkler head not covered by the other tests. For example, the function test is used to check that a sprinkler head still operates correctly, with the operational mechanism releasing fully from the sprinkler body. The operational temperature test is used to check that a sprinkler head still operates at the correct temperature.

The key components tested during a plunge test are the operational mechanism of the sprinkler/water mist head, be this a glass bulb or a fusible link, although thus far, there are no fusible link water mist heads. There is no functional difference between how a sprinkler head and a water mist head are tested within the wind tunnel.

The plunge test is unique in that it uses slow moving hot air to activate sprinklers. Function testing relies on the application of fire to a sprinkler to activate it, and temperature tests rely on water or oil in a heated bath. The plunge test rig at the FPA is highly accurate as it uses pressure differentials to capture activation time to the nearest millisecond. Future applications of the plunge test wind tunnel beyond the response time index test could include rate of rise testing which is another test for new sprinkler and water mist heads.

Find out more about the FPA's sprinkler head testing here: thefpa.co.uk/sprinkler-services/sprinkler-head-testing

After purchasing the plunge test wind tunnel, the FPA sent two technicians over to Australia to be trained in the proper and accurate use of the machine, including safe operation and maintenance. The technicians were also trained on the calibration checks needed before testing can commence, to ensure each test is performed within standard parameters and provides the most accurate results.

The FPA is currently the only testing laboratory in the UK to house an Archer RTI plunge test wind tunnel and only a handful of these wind tunnels exist in the world.

New waterflow switches

We are proud to announce that we have expanded our product range with two types of waterflow switches, U-bolt & threaded. They're designed for the detection of a water flow in fire sprinkler piping systems. Both types are CE certified, UL listed and FM approved. In addition they're both suitable for use in fire protection and HVAC systems. Order them now in our webshop!

Profit waterflow switch with u-bolt - WFS

Profit waterflow switches, type WFS, are used for the detection of a water flow in fire sprinkler piping systems. They're available from 2 to 8 inch. The installation is similar to a mechanical sprinkler tee with U-bolt clamp.

The main features are:

- Only suitable for wet systems on pipes sched 10 to sched 40.
- All parts have a corrosion resistant finish.
- Contains two synchronised switches (SPDT contacts model).
- Working pressure:
  - UL/FM: 450 PSI
  - CE: 16 bar

Profit threaded waterflow switch - WFST

The Profit waterflow switches, type WFST, are used for the detection of a water flow in fire sprinkler piping systems. They're suitable for 1", 1¼", 1½" and 2". The installation is with a threaded male connector into a classic threaded malleable mechanical tee.

The main features are:

- Only suitable for wet systems on classic threaded tees.
- All parts have a corrosion resistant finish.
- Contains two synchronised switches (SPDT contacts model).
- Working pressure:
  - UL/FM: 450 PSI
  - CE: 16 bar

New union sight glass orifice

We are proud to announce that we have extended our product range with an union sight glass orifice. This union restriction orifice, type KGU, with sight glass is a conveniently usable threaded union pipe fitting and is mostly applied in a sprinkler piping test-line on alarm post or at end-of line. The maximum working pressure is 21 bar (300 PSI). In addition it's both suitable for use in fire protection and HVAC systems. Available from 11,2 to 25mm. Order it now in our webshop!

The main features are:

- Sight glass for sprinkler pipe testing purposes.
- Easy use 1" male/female union fitting with rubber gasket sealing.
- Incorporated restriction orifice.
- Maximum working temperature: 30°C.

- Generally used for cold water applications.

IWMA elects new Scientific Council chair

During their annual meeting, the members of the International Water Mist Association (IWMA) have elected a new chair. His name: Max Lakkonen, the Managing Director of IFAB – the Institute for Applied Fire Safety Research based in Berlin, Germany. He has been involved with IWMA since 2005 and he has been serving as IWMA's representative in the NFPA 750 technical committee since 2009.

The IWMA Scientific Council is a group of well experienced fire protection scientists and engineers from testing laboratories, authorities having jurisdiction (AHJs), research institutes and universities around the world. It provides advisory input to IWMA on technical and scientific matters, evaluates the IWMA conference abstracts, applications for the IWMA Young Talent Award and offers guidance to the water mist industry. It also participates in research programmes and provides technical and scientific guidance to the fire protection industry, especially when related to water mist systems or best practices.

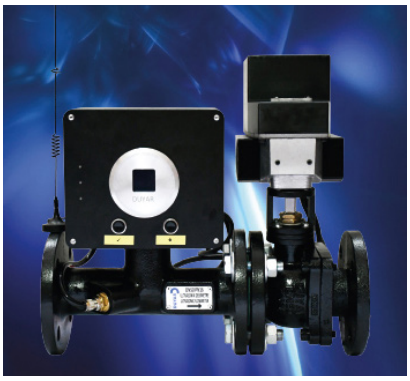
Max Lakkonen says: ""I am honoured to continue the excellent work of Bert Yu (FM Global), the former Chair of the Scientific Council. As the newly appointed Chair, my objective is to leverage my experience to enhance the water mist industry. Together, as a Scientific Council, we are committed to serving the fire protection industry in all matters related to water mist systems."

A digitalisation journey

While certifying many of the products in Duyar's portfolio for the international arenas, the company has developed unique and efficiency-enhancing products including the Duyar Smart Valve System.

The prototype work of the Smart Valve System, combining sensors and smart systems culminating in intelligent systems which can now be referred to as autonomous systems. Today, these systems are known for their ability to hold and interpret large data in the data pool. There is a lot of valuable work that we need to do for each of the detection, control, communication and data phases that we go through here. There has also been significant progress in elements of the installation process.

Smart Valve ensures that consumption is kept at an optimal level, energy efficiency is increased and operating costs are reduced. Considering these requirements, the Smart Valve system defines a plant as a network that comprises diverse elements functioning cohesively to achieve specific objectives. Its aim to achieve optimal plant and resource management by exercising precise control and detection capabilities



over each gate within the plant network. The inclusion of scenarios for valve position, flow, pressure, and energy makes the Smart Valve system highly beneficial for users as it enables effective monitoring, control, and analysis of plants. Its compatibility with IoT and Modbus connection types makes it easy to integrate with any system. The result of Duyar Valve's high value-added, eco-friendly, and autonomous product development efforts, will emerge as the most dependable solutions partner during the digital transformation of our customers' facilities.

A new online training centre

The British Automatic Fire Sprinkler Association has launched a comprehensive, online training centre.

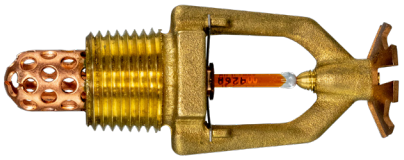
All courses are delivered on behalf of BAFSA by appropriate qualified/and or experienced course tutors working within ABBE accredited training providers. BAFSA works closely with its preferred training providers to ensure that course content is fit for purpose and supported by industry.

Courses currently available:

- L2 Certificate in Fire Sprinkler Installation
- BAFSA Intermediate Design (Commercial) 2 day course
- BAFSA FHC Design (Commercial) 4 day course
- BAFSA Basic Design (Commercial) 5 day course
- BAFSA Inspection & Commissioning (Commercial) 3 day course

Visit www.bafsa.org.uk/booking for further details.

Ultra low flow nozzle



Johnson Controls (JCI) has launched the new AquaMist® AM35 Ultra Low Flow (ULF) nozzle, completing the AquaMist ULF low-pressure water mist fire suppression portfolio to offer customers full-building water mist protection.

"Water mist fire suppression systems continue to grow in popularity because they effectively suppress fires using less water, which results in reduced water damage so buildings can return to operation sooner," said Dirk Laibach, senior global product manager, Water Mist at Johnson Controls. "

During testing, the AM35 nozzle cooled a room's ceiling area more effectively than traditional fire sprinklers using fewer AM35 nozzles, further reducing the total water usage and damage. In certain applications, because of the very fine droplet sizes, AquaMist ULF nozzles discharge up to 80% less water per minute than standard sprinklers or deluge nozzles.

The AquaMist ULF low-pressure system provides the same suppression benefits as a high-pressure water mist system using far less energy, which helps reduce its carbon footprint during operation. Less energy use allows the AquaMist ULF system to utilise more cost-effective water pumps and backup power generators. For greater cost savings, the AquaMist ULF low-pressure water mist system can be extended or retrofitted on many existing building sprinkler systems without the need for additional pumps or water supplies.

The system's reduced water demands combined with lower pressures means less space is required for the overall system, making retrofits easier. AquaMist ULF systems provide a high level of reliability by using well-established Tyco low-pressure system components and the GRINNELL G-Press stainless steel piping system with its 10-year warranty.

The new AM35 nozzle is VdS approved to protect ordinary hazard (OH3) areas of unlimited size like libraries, archives, laboratories, stores, storage areas and technical rooms and plant areas. With the addition of the AM35 nozzle, building owners, real estate companies, specifiers and managers can now use the complete AquaMist ULF low-pressure water mist fire suppression system to help protect their entire mixed-use buildings, offices, hotels, museums, libraries, care homes, hospitals and high-rises with significant water savings.

EUROPEAN FIRE SPRINKLER NETWORK

FIRE SPRINKLER INTERNATIONAL DUBLIN 2024

Wednesday 24th &
Thursday 25th April 2024

For two days our delegates will have an unmatched opportunity to experience over 40 presentations delivered by global fire protection specialists and sprinkler industry experts in the magnificent surrounding of Croke Park Stadium.

FOR REGISTRATION & UP-TO-DATE INFORMATION

www.firesprinklerinternational.com

GOLD SPONSOR

Patterson Pump Ireland Limited

PLATINUM SPONSOR

Victaulic

GOLD SPONSOR

VIKING