RISK MANAGEMENT
LEADERSHIP & ANALYSIS

Improving the effectiveness of combining sprinklers with rooflights and heat and smoke vents

There is no point in spending tens or hundreds of thousands on a sprinkler system that will not adequately protect the building. Here, Anton Koch, Senior Engineer at Allied World, explains how to optimise the effectiveness of combining sprinkler systems with rooflights and/or heat and smoke vents to prevent fires from getting out of control.

When designing and constructing a large assembly building such as a shopping mall, the argument for having an automatic sprinkler system in place is crystal clear. Statistics show conclusively that fire sprinklers are effective in controlling or preventing the impact of fires.

However, by their very nature, large assembly buildings such as hypermarkets and shopping malls, but also large storage warehouses, present a number of fire safety challenges. Life safety has been – and will always be – the number one priority for any fire prevention strategy, but ensuring that your business is well protected from all risks and eventualities will also result in reducing the potential damage to the building as well as its assets.

Fire sprinklers combined with rooflights and heat and smoke vents

Heat and smoke vents are designed to direct the smoke out of the building quickly, while rooflights are usually installed for bringing daylight into a building, as well as having a mechanism in place to open in the case of a fire.

However, if a fire does start in a large building, it is vital to delay the activation of the heat and smoke vents and the roof light openings until the sprinklers have been activated. The timing of this is essential in order to both adequately prevent any loss of life, but also to avoid a large asset loss.

Here is the reason why: imagine a fireplace in your home, which has the elements needed to create a hot, lasting fire – heat, fuel and oxygen. The oxygen comes from a vent in the chimney. Much like a fireplace in your home, opening rooflights or activating the heat and smoke vents too quickly in a warehouse or a shopping mall may speed up fire growth significantly and result in a spectacular Hollywood movie-style fire. Having the vents and rooflights open at the right time after the activation of the sprinklers is vital for life safety, but if rooflights are made from plastic, they may melt prior to the first sprinkler opening and this will lead to adverse effects on fire control and maybe uncontrollable fire spread.

The importance of effective sprinkler control could mean the difference between a business surviving or experiencing a very high loss. Having no effective fire control could mean a loss 10 or even 100 times larger, which most businesses cannot overcome.

Helping Risk Managers Find The Balance

It is possible for Risk Managers to find the right balance when combining rooflights and heat and smoke vents with fire sprinklers that will keep life safety as the number one priority, while at the same time putting processes in place to try to reduce the losses involved in a fire event.

To support you, here are some of the top items to consider when looking to reduce damage to a building and its contents without compromising sprinkler effectiveness.

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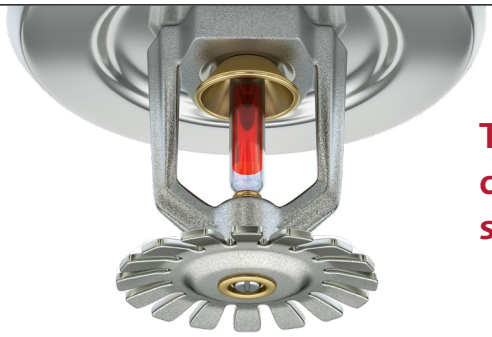

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Items To Consider When Combining Sprinklers with Vents and Skylights

Sprinklers in combination with heat and smoke vents

Always ensure:

- The vents are closed under normal operating conditions.
- For the vents, make sure metal or temperature-resistant material are used (aiming for at least 200 degrees Celsius or higher) to ensure the material doesn't melt.

In the unfortunate event of a fire, have a plan to do one of the following options:

Option 1: Only allow manual opening of the vents (by fire brigade).

Option 2: Ensure automatic vents open only after sprinklers activate – a rule of thumb could be to always use fusible links for vents opening that have at least 30 degrees Celsius higher ratings than the ratings of the sprinkler glass bulbs (fusible links).

Sprinklers in combination with plastic rooflights

Always ensure:

- Plastic rooflights remain in place long enough for sprinklers to activate – for conventional situations, the recommended timeframe would be five minutes.
- The melting point of the plastic material (mostly applied are polycarbonate types) is at least 60 degrees Celsius higher than the rating of the fire sprinkler bulb (fusible link).

The solution:

- Additional design criteria might be required by engineers for high bay and automated warehouses and for occupancies with extreme or special fire loading (for instance flammable liquids, oils, fats, aerosols, paints, high alcohol content goods).
- For conventional fire sprinkler design, use plastics with a melting point of more than 200 degrees Celsius.
- Early Suppression Fast Response (ESFR) sprinklers and also Control Mode Specific Application (CMSA) sprinkler systems use plastics with a melting point of more than 100 degrees Celsius.

There is always a solution

The technical nuances of balancing fire prevention strategies with asset protection and life safety can seem overwhelming, but any problems can always be solved with good Risk Management.

Risk Management is fundamental to fire safety. At Allied World, we understand that preventing the loss of life will always come first. However, we are also committed to ensure minimum impact on assets. Therefore, we look at the challenges and solutions when faced with this dilemma to find the best options to minimise the risk.

By putting risk perspectives at the heart of discussions when mapping, engineering and designing major infrastructure projects, businesses can ensure that both people inside their premises as the buildings/installations themselves, are protected from every conceivable fire scenario.

ABOUT THE AUTHOR

J. Anton Koch is a Senior Risk Engineer with Allied World and is currently based in Singapore. Previously, Anton worked with two large global insurance carriers where he established their Semiconductor Specialty Business Groups. Anton has over 25 years of experience within the Insurance Industry, embedding Risk Management Systems for Fortune 500 Clientele. His silicon platform client list includes telecommunications manufacturers, LCD screen manufacturers and other leading electronics firms. Anton has lived and worked in Europe, Asia and the USA.

For more information about Allied World's Risk Management services or our insurance and reinsurance solutions, please visit www.alliedworldinsurance.com

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