

How pulsating light can save lives in the event of smoke and fire



LIGHTSAVER
the light that saves lives

In June 2015 Tom de Jong wrote his bachelor-thesis: ‘Different types of evacuation route signing techniques evaluated on the basis of their usability and efficiency in case of fire’ – this study was supported by Professor of Artificial Intelligence Jan Treur of the University of Amsterdam (Vrije Universiteit Amsterdam). This thesis is written in Dutch, referring to Dutch law, which is in compliance with European legislation. De Jong has studied international papers and research regarding this subject and has evaluated techniques as to their usability and (cost-) efficiency for new construction and existing dwellings.

Main conclusion

Current required evacuation route signs are often overlooked and are not easily perceptible during smoke formation.

.....

*Smoke and fire claim
lots of lives.
The shorter the route,
the better the chances
of survival.*

.....

Static, active and dynamic

Scientific research offers various methods and techniques in order to improve the escape process. A number of techniques will be discussed in this research, and there will be a distinction made among static, active, and dynamic evacuation route signage. The various techniques will be evaluated based on relevancy and efficiency. The conclusion is that active systems, those systems which are activated when an emergency is diagnosed, will double the visibility of the escape route signage, while at the same time, they are extremely suitable in the current construction inventory due to the limited financial investment needed, as well as the simplicity in installing those systems.

A dynamic system is more costly and installation more intensive because it utilizes a larger number of sensors and activators.

However, a dynamic system offers the safest escape route, because the avenue of escape is adapted on the basis of the observed fire and/or smoke formation.

Deadly smoke

Smoke is by far the most likely cause of death during a fire. It very rarely happens that people are actually killed by the flames. Smoke has a number of properties, some of which are lethal:

- Depending on the flammable materials at the location, it consists of poisonous substances that may result in suffocation if inhaled.
- During a fire, the air is usually extremely hot so when it is inhaled it can scorch the windpipe and lungs, possibly causing asphyxiation.
- Depending on the density of soot particles, smoke can be opaque causing people to become disoriented in an instant. Studies have shown that people's evacuation speed can be reduced to zero if visibility falls below 50 cm.
- Smoke can spread through a building extremely rapidly so the time available to exit the building safely is limited. The safe evacuation time depends on the location of the fire in the building in relation to the location of the occupant.
- As smoke is warm, it first rises to the ceiling of the room (or of the stairwell). The upper part of a space fills up first. The standard mandatory emergency exit signs can usually be found above doors, which means these are the first to be obscured. The temperature and visibility at floor level remain tolerable for the longest time. Pulsating light at floor level therefore dramatically improves orientation and reduces evacuation time. With smoke, every second counts so every appliance that can reduce evacuation time can be a life-saver.

- The danger fire presents to health has increased enormously over the past 50 years. Whereas in the Sixties, wools - which do not burn easily - were mainly used for upholstery, the application of various kinds of plastics in the present-day interior means that fires not only develop faster but also that the smoke is more toxic.

Fire in numbers

- Every year in the Netherlands, there are around 14,500 fires in buildings.
- In 2013, this type of fire killed 92 people and seriously injured a further 720.
- Only 492 people were saved from these fires.
- Every year in Belgium, there are around 12,500 fires in buildings.
- In 2013, this type of fire killed 120 people and seriously injured a further 900.
- In Belgium, the number of people saved is not registered.

.....
*During emergencies,
pulsating light can save
a lot of lives.*
.....

Pulsating lights

In America, flashing lights, in addition to audible signals, are an obligatory component of a fire alarm system as they reinforce the effect of the alarm on the occupant. Furthermore, the flashing light will alert deaf or hard-of-hearing people to an emergency. Around 3.5% of the population in the Netherlands uses a device to enhance hearing, so during an emergency, a pulsating light will be of great value to this group in particular.

Colour of the lighting strands

During an emergency the strands emit a blue colour.

The reasons for this are:

- 1.** Colour blindness: around 8.25% of the male population and 0.5% of the female population suffer colour blindness to a greater or lesser degree. This amounts to approximately 4.5% of the total population. The colour green is commonly associated with safety. Approximately 80% of colour blind people have difficulty distinguishing colours in the red/green ranges, seeing green as a shade between green and grey. Blue is perceived as blue by about 98% of colour blind people.
- 2.** Blue is usually associated with a warning signal, for instance the flashing lights on emergency service vehicles or the floor path systems on the floors of aircraft.
- 3.** The perception of blue requires less energy from the receptors in our eyes than other colours, making it most noticeable in stressful situations.

Vulnerable groups

During emergencies or disasters, non-self-reliant people depend on other people's help and are therefore the most vulnerable. This group is made up of young children, the elderly, the disabled and the sick. For instance, children can sleep right through the piercing sound of a smoke alarm and have to be awoken by their parents or guardians. However, anyone under the influence of alcohol, drugs or medicines may also be incapable of fleeing their home safely. Even the self-reliance of perfectly healthy people may be affected if they are rudely awakened by the sound of the smoke alarm. Nowadays, more and more seniors continue to live independently at home, so a great deal of attention is paid to their safety. However, as the hearing of this vulnerable group of people is often impaired,



it can take longer for them to be woken up by a smoke alarm. Elderly people are sometimes forgetful, which can lead to hazardous situations involving candles or pans left on the stove. Furthermore, the elderly need more time to get themselves together when they are awoken and they are more easily dis-oriented in an emergency.

.....
People who are deaf or hard of hearing will have a greater chance of escaping safely.

LightSaver® Life-saving light

LightSaver provides the solution to the above issues. The patented LightSaver system provides visual escape route marking triggered by the audible signal from a smoke detector. Even when there is smoke, escape routes and doors are made visibly recognisable, which reduces the time needed to escape. By providing a flashing light and light signals close to the floor, LightSaver goes significantly beyond the ISO 7010 standard for escape route signage.

LightSaver® doubles the chance of a safe escape during a fire

Research has shown that LightSaver doubles the visibility of escape routes (2014 study: Professor Edwin Galea, founder of Fire Safety Engineering Group (FSEG) at the University of Greenwich). He concluded that illuminated marking close to the floor considerably improves visibility in the event of smoke formation and reduce escape times.

For parents of young children

Marking the escape route and doors of children’s bedrooms with LightSaver’s flashing light system wins valuable seconds when escaping danger. In an emergency, everyone, whether young or old, can make out the perimeter of a door and instinctively follow this escape route. The chance of escaping more quickly and successfully is substantially increased.

Social recognition

LightSaver products have been available in the USA for several years. A number of renowned organisations have since rallied behind the LightSaver's effectiveness. The fact that in America, LightSaver is allowed to display the logos of these bodies on its website is proof that they have a great deal of confidence in the LightSaver's life-saving capabilities.



The National Fire Protection Associatio



The United States Fire Administration



Federal Emergency Management Agency



The National Association of State Fire Marshals



The Department of Homeland Security

What is striking is that in 2015, the Department of Homeland Security granted the 'Dept. of Homeland Security/SAFETY Act - Qualified Anti-Terrorism Technology (QATT)' designation to LightSaver. This designation is only bestowed upon technologies that increase the chances of survival among citizens during an emergency or terrorist attack and puts LightSaver in a significantly privileged position. For customers, this means legal as well as economic and insurance-related benefits.

Contact EU

General matters:

Bob de Jong

Mail - bob@lightsavereurope.com

Tel. - +31 (0) 85 303 52 44

Mob.- +31 (6) 24 22 56 35

Commercial matters:

Michel de Bree

Mail - info@lightsavereurope.com

Tel. - +31 (0) 85 303 52 44

www.lightsavereurope.com

