

Very positive results in assessment of interventions using cutting extinguisher

The Swedish Fire and Rescue Service (Svensk Räddningstjänst), the Swedish Civil Contingencies Agency (MSB) and the Swedish Work Environment Authority, together with Cold Cut Systems, have conducted a project called "The Swedish Cutting Extinguisher Project". Over the course of two years, a large number of firefighting interventions, where the cutting extinguisher has been used, have been assessed and documented. The results during these two years have shown a very positive outcome. In the majority of the interventions conducted, it has been possible to prevent fires from spreading, conduct interventions more safely, reduce the quantity of contaminated extinguishing water and/or limit water damage.

Positive result

In 76% of the interventions where the cutting extinguisher has been used first, the equipment and the method have either been **directly responsible** for or have had a very large impact on preventing the spread of fire. This confirms that the cutting extinguisher is very efficient and especially when a decision has been made to use it first. If we include all the interventions where the cutting extinguisher has been used, i.e. also those that constitute final extinction and alarms for reinforcements, it has been experienced that the cutting extinguisher has either been directly responsible for or has had a very large impact on preventing the spread of fire in 67% of the interventions.

Background

A development project was started in spring 2011 of which the focus was the cutting extinguisher, the Cobra. The project was based on the need for developing technical and tactical methods during rescue operations. Follow-up work, assessments and the feedback of knowledge pertaining to the interventions conducted have taken place during the implementation of the project. The method development process also included opportunities to create a safer work environment, cool combustion gases and, consequently, create better conditions for any smoke diving. The project's interventions have been reported and assessed based on specific assessment criteria over the course of two years. The organisations that have taken part in the project are Räddningstjänsten Lomma-Staffanstorp, Räddningstjänsten Syd, Södertörn Fire Prevention Association, the Swedish Work Environment Authority, Cold Cut Systems and the Swedish Civil Contingencies Agency.

Over the past two years, a number of fires have occurred where the cutting extinguisher has been successfully used and experiences documented. In the majority of the interventions, it has been possible to prevent fires from spreading, conduct interventions more safely, reduce the quantity of contaminated extinguishing water and/or limit water damage.

Results when using first	
76%	Direct/very large impact on preventing the spread of fire
43%	Direct/very large impact on safer firefighting
62%	Direct/very large impact on limiting water damage
55%	Direct/very large impact on reducing environmental load

Table 1. Results when using first

Interventions

During the assessment period, the fire and rescue services have been called out a large number of times to fires in buildings where firefighting interventions have been conducted. Fires in buildings are the most common reason for interventions involving the cutting extinguisher. During the period, the fire and rescue services have had access to 10 cutting extinguishers where the preparedness to use the cutting extinguishers has been maintained for 215 man-months.

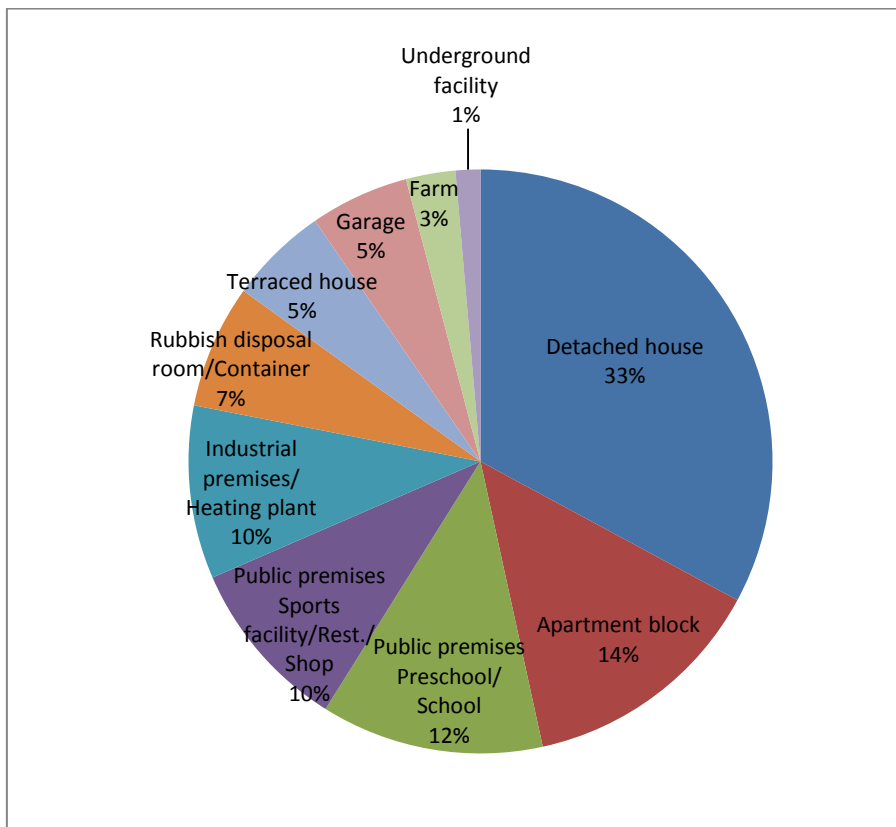


Diagram 1. Object type in assessed interventions for fires in buildings

The conditions for success are greater when choosing to use the cutting extinguisher first. A contributory factor is the cutting extinguisher's unique ability to cool combustion gases and, thereby, prevent a flashover of hot, but not yet ignited, combustion gases. On those occasions when a fire and rescue service experiences widespread damage, this is often the result of there being a powerful and uncontrolled flashover, more often than not when hot combustion gases ignite. On several occasions during the project, it has also been possible to keep within limit lines during interventions with successful results. During a few interventions, the cutting extinguisher has not had the intended effect, partly because the call out alarm was too late in order for the intervention to be efficient, and partly because the fire and rescue services tried to extinguish the fire when there had been a very powerful flashover, it had burnt through roofs or suchlike. When it comes to large fires, however, there have been very positive results when several cutting extinguishers have been used simultaneously.

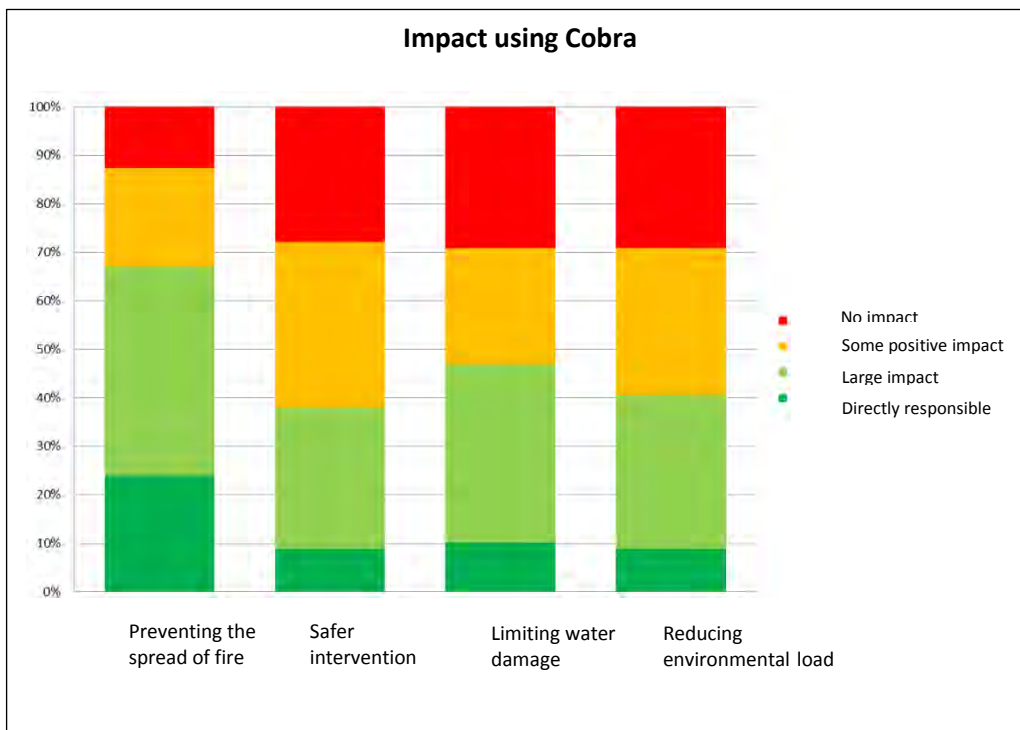


Diagram 2. Impact diagram for assessed interventions

Experiences and comments

- "The work environment aspects at the scene of a fire have been and still are hot discussion topics. Reports show that firefighters have a drastically increased risk of being affected by certain types of cancer. This is worrying and requires consideration as well as better solutions in the future. If we can find effective solutions for getting at fires without needing to "bathe" in concentrated combustion gases, then this will probably go some way to reduce the amount of cancer cases among firefighters. The reports that have been generated during the project period show that the fire and rescue services have succeeded with this many times." Lasse Nelson, Swedish Civil Contingencies Agency.

- The Swedish Civil Contingencies Agency and the Swedish Work Environment Authority state that safer interventions have been able to be conducted than if conventional equipment had been used. "The Swedish Work Environment Authority is very positive about the project overall and we particularly want to highlight the system being used to gather up experiences from the interventions using cutting extinguishers as a method for safer firefighting." Tommy Eriksson Wikén, Swedish Work Environment Authority.
- On arrival, flames were coming out of the windows and roof and the restaurant was on fire. Two cutting extinguishers were used to get at the fire in the restaurant's roof construction between laminated wood beams. The intervention using the cutting extinguishers prevented the fire from spreading and ensured better safety and less water damage. "From experience, I can certainly say that we would have had huge problems with extinguishing the fire using conventional methods such as internal extinguishing with smoke diving and external roof work." Quote from Räddningstjänsten Syd.
- "The cutting extinguisher was used during the intervention as well as in the final extinction work. The majority of the water that was used with the cutting extinguisher was vaporised and contributed to putting out the fire. Very small amounts needed to be taken care of during the efforts to collect residuals. No extinguishing water left the building. The cutting extinguisher was directly responsible for reducing the amount of contaminated extinguishing water." Quote from Räddningstjänsten Syd.
- Räddningstjänsten Syd can ascertain that huge costs due to damaged property have been saved by using the cutting extinguisher and the scanning camera effectively. The work environment has been improved in that it has been possible to plan and conduct the roof work during some interventions without the pressure of time.
- "Fire in an old wooden detached property in Nacka, measuring 300 m². Due to the villa property's design with low attics, varying ceiling heights, roof angles, dormers, cups and vaults, the cutting extinguisher was necessary for being able to extinguish the beams and confined spaces." Quote from Södertörn Fire Prevention Association
- Fire in a local train in Kävlinge, where the Cobra was used successfully in combination with a thermocamera. Risk of flashover dramatically reduced because of the cutting extinguisher. Quote from Räddningstjänsten Lomma-Staffanstorp.
- The personnel and I are convinced that responding to alarms with offensive units equipped with infrared cameras, fans and cutting extinguishers results in a positive intervention and prevents the spread of fire at an early stage." Roger Gustafsson, Fire Chief at Staffanstorp-Lomma.

- Fire in preschool. External extinguishing and cooling of the eaves prior to regular smoke diving. Due to the rapid deployment of offensive units, the fire's progress was halted before the entire force was assembled. Following the intervention with the cutting extinguisher, smoke divers were sent in to determine whether the fire had spread into the premises, which was not the case. No internal extinguishing was therefore required.
Räddningstjänsten Lomma-Staffanstorp
- "Experience has shown that the cutting extinguisher has saved large sums by preventing the spread of fires, and has also created a safer working environment for firefighters. Water damage is reduced, which also limits the amount of contaminated fire extinguishing water. Despite the limited number of interventions with the cutting extinguisher in which it has been used at full capacity, it has been used to tackle construction fires and it has almost always simplified the work and made it safer for firefighters." Södertörn Fire Prevention Association.

Results

To sum up, what can be ascertained from the project is that if correctly implemented in the fire and rescue services, the cutting extinguisher is a very important component of modern firefighting:

- quick, efficient interventions with regard to the time required for the intervention, as well as very high extinguishing efficiency
- safer interventions for personnel
- drastically reduced secondary damage
- drastically reduced environmental load caused by fire and firefighting interventions

The report, in its entirety, is available from Cold Cut Systems AB, among others.

www.coldcutsystems.com/contact-us/news/cutting-extinguisher-project

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