Guidance document on

Fires caused by unattended cooking and how to prevent them

euralarm
for a safer and more secure Europe

Enhancing Residential Fire Safety

Executive Summary

This guidance document provides a comprehensive analysis of stove guards as an effective tool to prevent fires in residential environments. A stove guard monitors the temperatures from above the stove and warns of potential danger, and automatically cuts off the power if it detects a potential fire hazard, hence preventing fires. In this document the technical functionalities, the role in mitigating fire risks, and the regulatory frameworks governing stove guards across the European Union are examined.

The document highlights the growing trend of mandatory adoption in EU member states and outlines the safety, economic, and societal benefits of widespread implementation.

In general, reports show that cookers cause around half of the house fires. The fires are usually caused by user errors and risky usage habit and could be limited with high quality cooker safety products. Cooker fires are also worrying because of toxic fumes formation and fire spreading rapidly.

Objective

The objective of this guidance document is to:

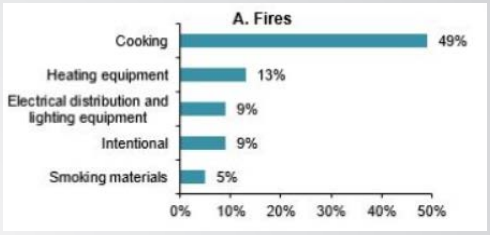
- Highlight the role of how stove guards can reduce residential fire risks in the kitchen
- Provide a roadmap for adopting and enforcing specific stove guard regulation
- Foster collaboration between stakeholders to promote fire-safe living environments
- Advocate for harmonized EU regulations and their expansion globally

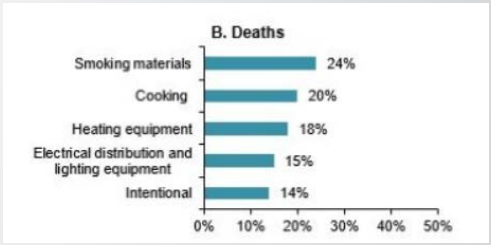
This guidance document aims to act as a guiding document for advancing fire safety measures and ensuring their widespread adoption for the benefit of society.

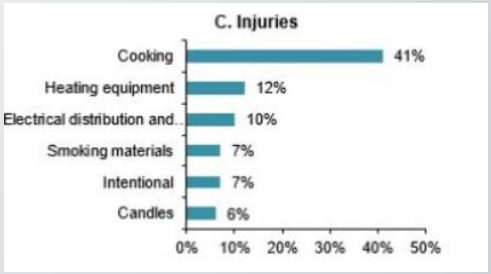
Introduction

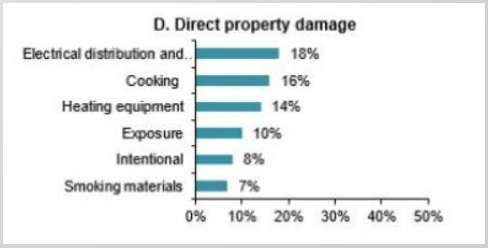
Fire risks in residential environments: Scope and impact

Many residential fires start in the kitchen and/or are related to cooking. In Europe the Zurich insurance company mentions cooking equipment as first in an overview of common causes of house fires[1]. In USA where the NFPA[2] has actively researched home structure fires, reports show cooking to be the leading cause of home fires and fire injuries, as well as the second highest cause of fire deaths and direct property damage.









[1] Zurich Municipal, Most common causes of house fires .... And some more unusual.

[2] NFPA Research, Fire Statistical Reports, Home Structure Fires, April 2023

How do stove fires start?

Unattended cooking: Leaving food cooking on the stove without supervision is the main cause of kitchen fires. Based on lifestyle, age, or disability it is easy to get distracted with so much going on at the same time. Sometimes people start doing something else while cooking and leave the kitchen and stove.
Children: Kids love to copy what parents do and to push any button visible. They are often capable of much more than the parents know or notice.
Pets: When leaving food on the kitchen counter or on the stove, cats or dogs might want to get to it. This could cause paws turning the stove on accidentally.
Overheated oils and grease: cooking oils and grease can reach their flashpoint and self-ignite, causing sudden and rapidly spreading intense fires.
Flammable items near heat sources: Items like dish towels, paper towels, or wooden utensils placed on the stove or too close to it can catch fire.
Faulty or misused appliances: Malfunctioning or improperly used cooking appliances, such as stoves, ovens, or deep fryers, can spark fires. Also outdated wiring to these appliances may represent a fire risk.
Cluttered cooking area: Overcrowded spaces around the stove increase the risk of items accidentally igniting.
Spilled food or oil: Spills can ignite if they contact the heat source or build up in the burners over time.

Loose clothing: Loose or dangling sleeves can accidentally brush against open flames or hot surfaces.
Alcohol near heat sources: Cooking with alcohol or keeping flammable liquids near a heat source can result in a flare-up or fire. Tiredness and alcohol are not a good combination.

Although a stove guard cannot prevent all incidents, it will help to reduce significantly the amount of home kitchen fires.

Technologies

In this paragraph some examples of preventive and alarm & suppression technologies are presented. These technologies are designed to stop fire incidents around stoves in the kitchen.

Preventive technologies

Stove Guards: This typically is a device that monitors the temperatures from above a stove/ cooktop, alerts the user of a potential danger and cuts the electric power off to the stove if a fire hazard exists. National regulations usually require EN 50615 standardised Stove Guards. EN 50615 defines particular requirements for devices for fire prevention and suppression for electric hobs (cooktops). The Stove Guard technologies are designed to enhance safety by providing automatic intervention or early warnings to reduce the likelihood of fire incidents.

Induction cooktops with safety features: Induction stoves that automatically shut off when cookware is removed or if the temperature exceeds safe limits.

Materials other than magnetic cookware, such as pizza boxes or plastic cooking utensils, will not lit up on an induction cooktop. However, the power of an induction cooktop compared to more traditional cast-iron or even ceramic cooktops, can come as a surprise to the user. The boost function on an induction cooktop heats the frying pan and oil in it much faster than other types of cooktops, and if left on too long can start a fire. There is to a certain extent also a false sense of security since only the surface is protected and there is the possibility to turn on a wrong plate.

Cooktop sensors: Sensors that are attached to the stovetop or burners to monitor temperature and prevent overheating by automatically reducing or cutting off power.

Timer based auto shut-off devices: Devices that turn off the stove after a pre-set time,, preventing fires caused by forgetting to turn off the appliance. These devices could give a false sense of security: wrong plates could be turned on with burning material left on them.

Alarm & suppression technologies

Smoke and heat sensors: Sensors integrated with alarms or stove control systems that detect smoke or excessive heat and alert the user or shut off the stove. They are recommended instead of smoke detectors in kitchens and are designed to respond to temperatures from 58 °C at the detector. Normal smoke detectors are not recommended to be used in the kitchen as they often get triggered already from normal cooking vapours. In principle, smoke and heat alarms are perfectly suited to alerting people present. However, they are not designed to prevent fires. If they are connected to devices that can control the appliance where the fire started, at least the ignition source can be switched off.

Automatic fire suppression systems: Systems installed above or near stoves that release extinguishing agents when a fire is detected, such as cooker hood fire suppression systems.

- Where larger kitchen facilities, such as those found in student accommodation and care homes, are in place automatic fire suppression systems are critical for reducing fire risks, especially where cooking activities may be left unattended
- Systems designed in accordance with EN 17446 specifically address fire suppression providing reliable protection in commercial premises.
- Additionally, EN 16282-7 sets out detailed requirements for fire suppression systems in commercial kitchen ventilation systems, ensuring effective detection and suppression of fires at their source.
- Together, these standards offer comprehensive guidance for selecting and implementing suitable fire suppression systems for safeguarding high-occupancy residential environments.

Smart stove monitors: IoT-enabled devices that connect to smartphones, providing real-time alerts and allow remote stove shutdown.

Fire-resistant mats and covers: Flame-retardant materials placed around the cooking area to contain and prevent fires from spreading.

Fire safety challenges in residential environments

Vulnerable populations: elderly, children, and disabled residents

The global demographic landscape is undergoing a profound transformation. By 2050, the number of people over 65 in OECD countries is projected to rise significantly, reflecting the broader aging trend worldwide. This aging population brings unique challenges, particularly in ensuring the safety and well-being of individuals who wish to maintain their independence by living in their own homes. The same counts for elderly people who are stimulated by their government to stay in their own homes as long as possible, because it is seen to be too expensive to offer supported and service housing to many.

One of the most pressing concerns is the sharp increase in dementia cases. In 2015, approximately 10.5 million people in Europe were living with dementia. By 2050, this figure is expected to climb to 18.7 million. People with dementia or memory disorders face elevated risks of accidents, including fire hazards, due to cognitive and physical impairments. These vulnerabilities underscore the urgent need for comprehensive safety measures tailored to their needs.

For older adults and those with limited physical capabilities, the home environment should be a sanctuary—not a source of risk. However, the reality is that many homes are ill-equipped to address the unique safety requirements of this population. From forgetting to turn off appliances to difficulties responding promptly and appropriately in emergencies, these risks can have devastating consequences if not proactively addressed.
Safety must be the number one priority. Solutions to mitigate these risks include connected home technologies that can detect hazards such as smoke, gas leaks, or unusual activity, alerting caregivers, or emergency services immediately – also known as Active Assisted Living Systems (AAL). These devices and systems including stove guards are increasing the fire safety of this group by preventing fires and assisting them dealing with given situations.

Student housing

In student accommodations, the risk of kitchen fires is often heightened due to the lifestyle of young residents, who may be inexperienced with cooking, prone to distractions, or juggling busy schedules that lead to inattentiveness.

In shared kitchens, common in student housing, the presence of multiple users increases the likelihood of accidents, such as leaving burners on unintentionally or misusing appliances.

Stove guards address these risks by actively monitoring cooking activity and automatically cutting off power to the stove if dangerous conditions, such as overheating or prolonged inactivity, are detected. They provide a consistent safety measure, reducing the reliance on individual vigilance and minimizing human error.

Additionally, stove guards align with the fire safety priorities of universities and housing providers, offering a proactive solution to comply with safety regulations and mitigate risks. Unattended cooking may also trigger false alarms forwarded to the fire officials in case a fire detection system is installed with direct alarm transmission to the fire brigade. This can cause extra charges to the landlord/property owner. Fires in student housing can result in costly property damage, disruptions, and even risks to life, making preventive technologies like stove guards essential. By integrating these devices, student housing can create a safer environment, protect valuable property, and foster a culture of responsibility among residents, ensuring peace of mind for both students and housing managers.

Unknown cooking habits of changing tenants

In rental properties, landlords often face challenges in ensuring that tenants consistently follow safe cooking practices, as behaviors and habits vary widely.

Stove guards address this uncertainty by actively monitoring the stove's usage and automatically cutting off power if conditions become unsafe, such as when cooking is left unattended, or overheating occurs.

For property owners, stove guards reduce the risk of fire-related property damage, which can be financially devastating and lead to costly repairs, prolonged vacancies, and increased insurance premiums. By preventing fires before they start, stove guards help maintain the structural integrity of the property and protect investments. Additionally, they demonstrate a commitment to tenant safety, which can enhance the property's reputation and attract responsible tenants.

The use of stove guards also supports compliance with fire safety regulations, a crucial responsibility for landlords and property owners. In many areas, failure to implement adequate fire prevention measures can result in legal penalties and liability in the event of an incident. By installing stove guards, property owners can meet or exceed safety requirements, reducing potential liabilities and fostering peace of mind.

Incorporating stove guards into rental properties not only safeguards assets but also strengthens the relationship between landlords and tenants by creating a safer, more secure living environment. This proactive approach to fire safety can lead to long-term benefits, including reduced turnover, fewer emergencies, and enhanced tenant satisfaction.

Stove Guard: technology and functionality

Overview of stove guard technology

A stove guard consists of a control unit which can switch off the power of the stove and a heat sensor.

Every day multiple kitchen fires require the fire departments to come extinguish them. Many more fires are put out by the occupants themselves. Even the smallest fires cause at least nuisance of smoke, not to mention the fatal ones destroying the lives of many.

A Stove Guard alerts of a hazard in the kitchen before toxic gases are produced and a fire starts. It predicts a potential cooking fire hazard before normal fire alarms do and sounds out a warning alarm, so the person cooking can act. A Stove Guard can use self-learning technology, allowing it to learn the necessary sensitivity based on the user's cooking habits. This ensures accurate hazard recognition and uninterrupted cooking. Stove guards are compatible with most electric cookers.

The easy and effective way to reduce house fires.
There are several hundred thousand stove guards installed to protect kitchens around the world. In those European countries where the stove guards are made mandatory, the European stove guard standard EN 50615 is applied to the devices. In general, a stove guard will have the following features (depending on brand and type):

- Acoustic alarm signal
- Low power consumption
- Made of fire-retardant plastic
- Communication enabled optimally with wireless connection between sensor and control unit
- Readily paired sensor and control unit
- Automatic fault diagnosis (dirt sensor, battery, removal from stove)
- Compliance with EN50615

Sensor Unit

Stove Guard's heat sensor is attached on top of a stove. Typically to cooker hood, wall behind the stove or on the ceiling above. The heat sensor measures temperatures on top of the cooktop, alerts the user of potentially dangerous temperatures or the speed of increasing temperature, and sends a signal to the Control Unit if it needs to cut the power to the stove off. The Sensor Unit is usually attached to the surface by adhesive tape or screws. It needs to be manufactured of flame retardent material. The unit is powered by a button battery or other types of batteries but can also be wired or powered via solar cells.

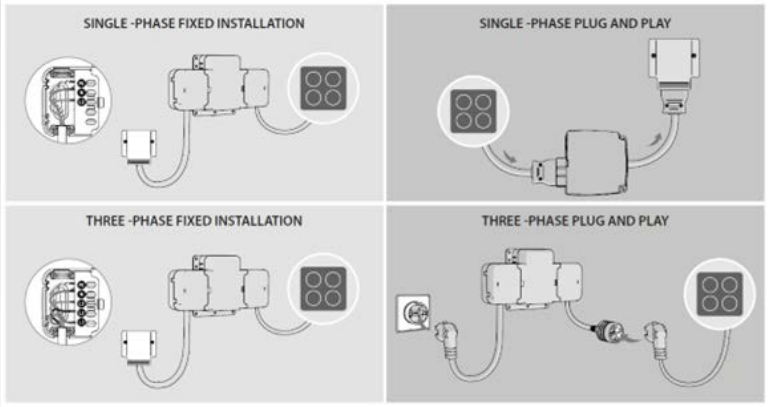
Control Unit

The control unit cuts off the electricity after the alarm has set off. The unit is installed out of sight and connected to the stove power. This device usually requires an electrician to install it. The Control Unit is available in different versions for different markets, depending on what the cooktop power connection is like (Perilex, 1-phase, 2-phase, etc.).

Installation

Stove guard installation is typically done by a professional electrician, who installs the control unit between the power outlet and the stove and mounts the sensor above the stove. There are different control units for each market, based on the stove power connection. Usually with traditional stoves that have one power connection for both the oven and the cooktop, 1 phase goes to oven and 2 to the cooktop. The oven phase is typically not connected to the stove guard.

Modern (induction) cooktops have their own power connection, and the oven is separate and has a common power plug to be plugged to a wall socket. There are also plug-and-play versions of the control units which, depending on the country standards, can be installed by anyone. The installer makes sure that installation parameters are according to the set-up in question.



How to Use

In general, a stove guard is easy to use. It is in constant operation and operates independently. The device only requires action when the power has been cut-off because of a fire hazard. The sensor measures the temperature from the stove and gives a pre-alarm in case of a potentially dangerous situation. If the warning is not acknowledged, the stove guard cuts off the power to the cooker. When the cooker has cooled down to a safe temperature, it is ready to be used again.

The device works silently in the background and can also be used easily by special user groups. Some of them adjust their sensitivity level based on the kitchen and user's cooking styles, so that nuisance alarms do not disturb the cooking. It acts before flames appear.

Regulatory landscape in EU

The European Union published its standard for stove guards (EN50615) in 2015. The EU standard introduces minimum requirements for all cooker safety products, aiming to decrease the amount of kitchen and house fires across Europe.

Traditional smoke alarms vs. modern stove guards

A smoke alarm was present in 66% – 84% of larger and more serious fires that started from a cooker[3]. However, traditional smoke alarms do not always effectively help in preventing serious fires, as they are not typically equipped with the functionality to shut off cookers in case of danger. Furthermore, smoke alarms are not recommended for kitchen use in general, as they can produce false alarms.

This is where modern, standard-complying stove guards step into the picture: by monitoring the cooker's temperature, they can identify dangerous situations, before a fire can start. The most advanced models even self-adjust to the user's cooking, resulting in improved alarm accuracy and extra safety. In general, more widespread use of standard-complying stove guards could contribute to a significant decrease in the number of kitchen fires everywhere.

The EN standard is ensuring the quality and safety of stove guards

The EN 50615 is giving specifications for cooker safety products in the EU. Safety devices that meet the standard's requirements prevent kitchen fires effectively. The standard brings clarity to the market and acts as an aid in purchase decisions for those wishing to improve fire safety in their homes. The standard is a welcome addition in many ways, the main reason of course being the number of kitchen fires being so high, despite the advancement of cooking technology.

Even modern induction cookers are not as safe as is usually presumed: they are so powerful, that oil or food left on a pan on the induction cooktop can ignite in turbo/boost mode within a minute.

The standard introduces minimum requirements for stove guards, grouping the stove guards into three distinctive categories:

- Category A – Extinguishing & simultaneous power cut-off
- Category B – Preventive power cut-off
- Category AB – Preventive power cut-off followed by extinguishing if flame occurs.

To meet the standard, a stove guard must be able to cut off the cooker's electricity supply before the temperature on the cooker reaches 330°C. Furthermore, for a minimum of 10 minutes after the cut-off, it may not self-ignite. To ensure optimal user experience, the electricity cut-off must not be triggered at a too low temperature either.

Stove guards must disconnect the appliance from the supply before ignition and give an audible warning of at least 65 dB for a maximum of 15 seconds, during which time the electricity supply must be cut off.

[3] USA statistics, TFRS Volume 13, Issue 12/Cooking Fires in Residential Buildings (2008-2010)

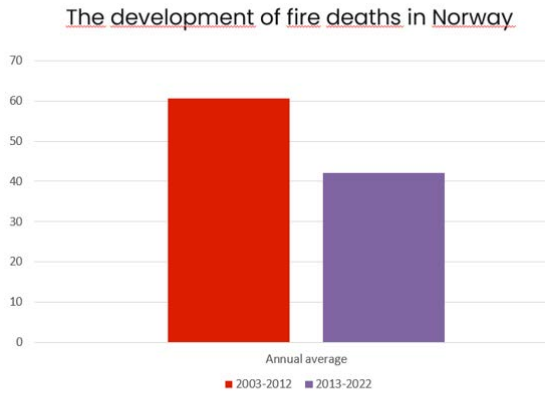
Case studies

Norway

Norway: first to introduce stove guards in national regulation

The current hotspot of stove guard research and development is in the Nordic Countries. In 2010, a couple of years before the EN50615 standard came into effect, Norway updated their electrical installation regulation to require all new home kitchens with electrical cooktops/stoves to have a stove guard installed. Norway has traditionally been a forerunner in fire safety, and the country's high percentage of wooden buildings with difficult access (often in mountainous areas) has had an additional effect on the regulation to being set.

The stove fires are still of concern to the Norwegians although many stove guards are in place. The current estimate of homes with stove guards varies between 30-50 % of all homes. Also the new holiday houses need to follow the same regulation.



Sources: Brannstatistikk.no
https://brannvernforeningen.no/aktuelt/nyheter/farre-omkomne-i-brann

Finland

Finland: Protecting the most vulnerable

In Finland, misuse of stoves and ovens is the single most common cause of electrical fires. 95 % of these cooking-related fires are the result of carelessness rather than technical faults, posing a significant risk to households. The most vulnerable individuals are those with reduced functional capacity, who may have challenges detecting a fire hazard and escaping from a fire.

As Finland's population ages, there is a growing emphasis on enabling people to live independently in their own homes for longer. This makes safety a critical priority, particularly in ensuring that living environments are adapted to meet the needs of individuals while reducing risks. Recognizing this, Finland has led the way in integrating stove guards into the electrical installation standards, ensuring both autonomy and protection for its citizens as well as improved fire safety.

The Finnish National Regulation for Electrical Low Voltage Installations (SFS 6000:2022) mandates that in senior and assisted living facilities, as well as homes for special-needs groups, the power supply of new electrical stoves and cooktops must be equipped with a stove guard that conforms to the EN 50615 standard. In addition, the stove guard is recommended by the SFS 6000 to all other types of homes as a good preventive measure against the common stove fires. This regulation demonstrates Finland's commitment to proactive safety measures, setting an example for other nations to follow in safeguarding vulnerable populations from the dangers of cooking-related fires.

Germany

In Germany, the Pflegekasse (long-term care insurance fund) plays a significant role in supporting fire safety measures for elderly and vulnerable individuals. As part of its commitment to fostering independent living and improving home safety, the Pflegekasse provides financial assistance for modifications and equipment that enhances the well-being of individuals with limited functional capacities, including the installation of stove guards in kitchens.

Recognizing the importance of fire safety for these people, the Pflegekasse often covers part or all of the costs for stove guard installations when they are deemed necessary for the individual's safety. This support is typically provided under the framework of benefits for home modifications (Wohnumfeldverbessernde Maßnahmen), which aim to adapt living spaces to the specific needs of the individual. Eligible applicants can receive funding, allowing families to ensure that their loved ones live in a safer, more secure environment.

By supporting the installation of stove guards, the Pflegekasse not only reduces the risk of kitchen fires but also helps elderly and vulnerable individuals maintain their independence and quality of life in their own homes. This proactive approach reflects Germany's dedication to integrating safety with personal autonomy for those in need.

Sweden

The housing adaptation grant (Bostadsanpassning[4]) is a municipal grant aimed at those who have a disability, eg. memory disorder. With the housing adaptation grant, it is possible to make the adaptations to one's home that are necessary for the home to function in their daily life. To have a Stove Guard installed is one of the common examples of housing adaptation. It is the applicants disability that determines which measures can be granted a grant.

The Swedish building regulation (Boverket Byggregler[5]) is recently updated in 2025. In order to ensure better fire safety to people who have difficulty to evacuate in case of fire, a new classification was made (verksamhet 3C). For homes for this new group as well as shared housing types (e.g. student accomodation), stove guards were made mandatory

[4] https://www.boverket.se/sv/babhandboken/bostadsanpassningsbidrag/villkor-for-bostadsanpassningsbidrag/anpassa-och-komplettera-fasta-funktioner/

[5] https://www.boverket.se/sv/PBL-kunskapsbanken/regler-om-byggande/brandskydd/uppkomst-brand/spisvakt/

Economic and social impact

The installation of stove guards has a notable economic and social impact, addressing both the financial and human costs associated with residential fires. Economically, stove guards reduce the significant expenses linked to fire damage, including property repairs, replacement of belongings, and insurance claims. By preventing fires before they escalate, these devices save homeowners and landlords from costly repairs and potential rent loss in rental properties. Insurance companies may also benefit, as the reduced risk of fire can lead to fewer claims and lower payouts, potentially resulting in lower premiums for property owners who install stove guards.

The installation of stove guards has a notable economic and social impact, addressing both the financial and human costs associated with residential fires. Economically, stove guards reduce the significant expenses linked to fire damage, including property repairs, replacement of belongings, and insurance claims. By preventing fires before they escalate, these devices save homeowners and landlords from costly repairs and potential rent loss in rental properties. Insurance companies may also benefit, as the reduced risk of fire can lead to fewer claims and lower payouts, potentially resulting in lower premiums for property owners who install stove guards.

From a societal perspective, stove guards contribute to public safety by reducing the risk of fire-related injuries or fatalities. Vulnerable groups, such as the elderly or individuals with disabilities, gain an added layer of security, enabling them to live independently for longer. This independence reduces the need for costly institutional care or assisted living arrangements, lessening the financial burden on families and social care systems. Additionally, stove guards play a role in protecting emergency services by reducing the frequency of kitchen fires, freeing up resources for other critical interventions and lowering the strain on fire departments.

On a community level, the installation of stove guards helps foster a culture of safety and responsibility. It reduces the emotional toll associated with fire incidents, including trauma and displacement, while preserving housing stability. The reassurance provided by stove guards can also improve the quality of life for families and tenants, knowing their living environment is equipped with effective fire prevention measures.

Overall, stove guards represent a practical and cost-effective investment that benefits individuals, communities, and society at large, combining economic savings with improved well-being and safety for all.

Conclusion

In conclusion, stove guards can represent a crucial advancement in residential fire safety, offering a reliable and proactive solution to prevent a vast majority of the most common causes of domestic fires: cooking-related incidents.
By automatically monitoring and managing stove use, these devices address both human error and behavioral risks, ensuring greater safety for households. Their importance is especially evident in protecting vulnerable populations, such as the elderly and individuals with reduced functional capacity, enabling them to live independently with enhanced security. Furthermore, stove guards reduce the financial and emotional costs associated with fire incidents, safeguarding property, and lives. As an integral component of modern fire prevention strategies, stove guards contribute significantly to creating safer living environments and fostering peace of mind for residents and property managers alike.

Euralarm

Gubelstrasse 22
CH-6301 Zug (Switzerland)

Swiss Commercial Registration No: CHE-222.522.503

E secretariat@euralarm.org
W www.euralarm.org

DISCLAIMER

This document was released by Euralarm's Taskgroup Domestic Life Safety and is intended solely for guidance of Euralarm members, and, where applicable, their members, on the state of affairs concerning its subject. Whilst every effort has been made to ensure its accuracy, readers should not rely upon its completeness or correctness, nor rely on it as legal interpretation. Euralarm will not be liable for the provision of any incorrect or incomplete information.

Note: The English version of this document is the approved Euralarm reference document.

euralarm
for a safer and more secure Europe