

Smart Fire Protection

Don't play with fire, extinguish it!



TECHNOLOGY SCOUTING

FIRE PREVENTION / DETECTION / PROTECTION DEVICES



Prevention



Prevention

Hilti fire protection system



Description

- ▶ Fire protection coatings
- ▶ Fire protection joint compounds
- ▶ Fire-retardant coating
- ▶ fire protection software

Development stage:

Retail (Product)

References

1. <https://www.hilti.de/brandschutzsysteme#nav/close/>

Prevention

Detection

Protection

Prevention

Gloria fire protection products



Description

- ▶ PORTABLE FIRE EXTINGUISHERS
- ▶ MOBILE FIRE EXTINGUISHERS
- ▶ LARGE FIRE EXTINGUISHERS / FIRE EXTINGUISHING CONTAINERS
- ▶ VEHICLE SYSTEMS
- ▶ FIRE WATER TECHNOLOGY / WALL HYDRANTS
- ▶ OBJECT PROTECTION EXTINGUISHING SYSTEMS
- ▶ SMOKE DETECTOR / CARBON DIOXIDE DETECTORS
- ▶ DORGARD
- ▶ PROTECTIVE CABINETS FOR FIRE EXTINGUISHERS
- ▶ DORGARD
- ▶ PROTECTIVE CABINETS FOR FIRE EXTINGUISHERS
- ▶ SIGNS

Development stage:

Retail (Product)

References

1. <http://www.gloria.de/Products/Pages/Products.aspx>

Prevention

Detection

Protection

Prevention

Wagner fire protection products



Description

- ▶ early fire detection
- ▶ Active fire prevention (oxygen reduction)
- ▶ fire fighting (Gas extinguisher)
- ▶ hazard management (Central control and coordination of security systems)

Development stage:

Retail (Product)

References

1. <https://www.wagnergroup.com/systeme.html>

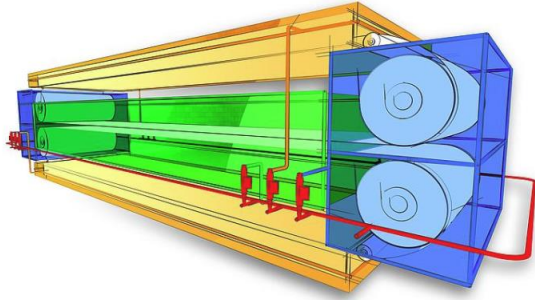
Prevention

Detection

Protection

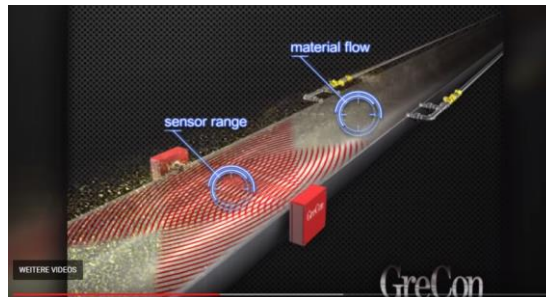
Prevention

Fagus GreCon fire protection products



Description

- ▶ Spark Extinguishing System BS 7
- ▶ Machine Fire Protection FLAMEWOLF
- ▶ Spark Detectors
- ▶ Heat Detectors
- ▶ Flame Detectors



Development stage:

Retail (Product)

References

1. <https://www.fagus-grecon.com/en/solutions/fire-protection/spark-extinguishing-system-bs-7/>
2. <https://www.fagus-grecon.com/en/solutions/fire-protection/industry-solutions/textile-industry/>

Prevention

Detection

Protection

Prevention

Dust binding



Description

- ▶ In extreme cases, too much dust can cause a dust explosion caused by static charging due to insufficient air humidity.
- ▶ The health of your employees or colleagues suffers enormously from a lack of dust binding.
- ▶ The micro-fine atomisation of the dust binding water binds the dust particles. Dust flight is reduced and bound to the ground, so that the dust particles become moist, but never the ground or machine parts. Due to the ingenious moisture measurement control procedure, over-humidification or failure of water particles is completely excluded. The generated water mist is positively charged, which acts as a magnet for the negatively charged dust particles. The dust binding ensures charge equalisation and neutralises the static charge. At the same time, the dust particles are saturated with moisture and precipitate and sink to the ground.

Development stage:

Retail (Product)

References

1. <http://www.befeuchtung.de/anwendungen/staubbindung/>

Prevention

Detection

Protection

Prevention

Air humidification for textiles, yarns and synthetic fibres



Description

- In the textile industry, air humidification is part of quality assurance for many applications. Yarns and fabrics react quickly to air that is too dry or too moist. Fibres become brittle, materials contract or expand in longitudinal or transverse direction. This **reduces the quality of semi-finished or finished products** and leads to additional costs in textile production.
- Another production-inhibiting factor with too low relative humidity is the problem of **electrostatic charges** in the textile industry. Fully synthetic fibres, such as nylon or nylon, in particular, become electrostatically charged in an excessively dry environment.



Hochdruck-Düsen-Systeme

Die energieeffizienteste Form der Luftbefeuchtung mit sehr feiner Vernebelung und fast geräuschlos. Ideal für alle Anwendungen in Industrie und Büro.

[Mehr über Hochdruck-Systeme](#)



Wasseraufbereitung

Macht aus jedem Wasser reines Wasser! Ohne Keime, Bakterien und frei von Salzen und Verunreinigungen. Sichert die Hygiene und Betriebssicherheit jeder Befeuchtung.

[Mehr über Wasseraufbereitung](#)



Druckluft-Düsen-Systeme

Bewährte Technologie für geringe Anforderungen an "Tröpfchengröße" und Betriebsgeräusche. Ideal für kleine bis mittelgroße Industrie-Anwendungen.

[Mehr über Druckluft-Systeme](#)



Digitale Steuerung

Bringt die optimale Luftfeuchte immer genau auf den Punkt - ob Einzelbüro oder Industriehalle! Steuert die gesamte Anlage komfortabel und bedienungsfreundlich.

[Mehr über Digitale Steuerung](#)



Mobile Luftbefeuchter

Geräte ohne automatische Wasserversorgung für Räume mit nur geringem Feuchtebedarf. Ideal für Komfortanwendungen, wie z.B. Museen, Galerien.

[Mehr über Mobile Luftbefeuchter](#)



Komplettsysteme

Komplette Hochdruck-Luftbefeuchtung mit Rundum-sorglos-Paket und unbegrenzter Garantieleistung. Ideal für kleinere Anwendungen (bis 2000 m³).

[Mehr zu den Komplettsystemen](#)

Development stage:

Retail (Product)

References

1. <https://www.condair-systems.de/anwendungen/industrie/textil>

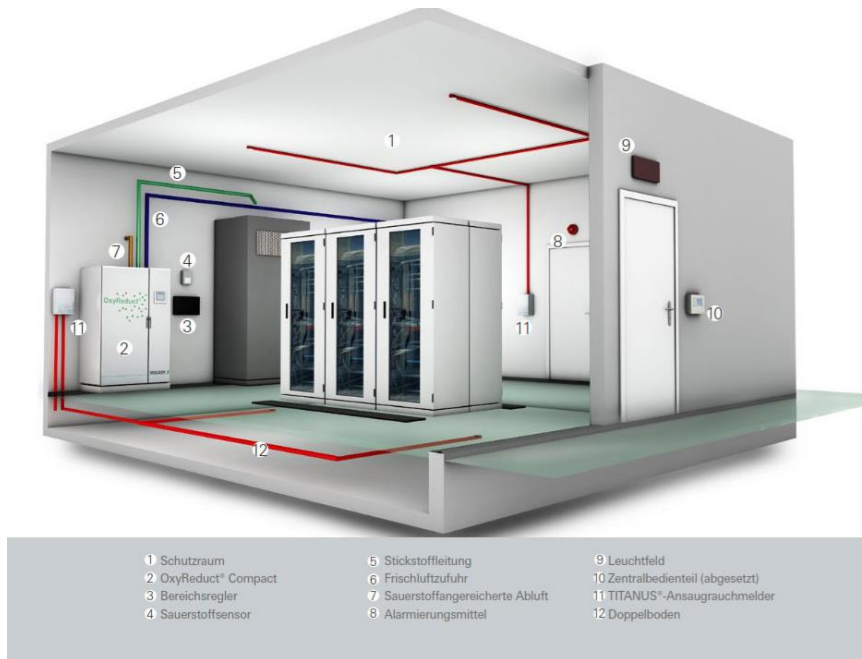
Prevention

Detection

Protection

Prevention

Fire prevention through oxygen reduction



- ▶ Since nitrogen is already present in the ambient air, the device can generate it directly from it. Nitrogen is non-toxic and spreads quickly and evenly throughout the room. To avoid a fire, the usual proportion of 78.09% by volume of nitrogen, for example, is increased to 85.98%, thus reducing the oxygen content.
- ▶ The oxygen reduction system is designed for each area of application in accordance with the protection objectives; it can be designed in such a way that the premises (in accordance with workplace guidelines) are also accessible to persons.

Description

- ▶ To ignite and maintain a fire, oxygen, which is normally sufficient in the ambient air, is necessary. If oxygen is specifically extracted from an interior fire cannot even develop there. Wagner offers a system for controlled oxygen reduction under the name Oxyreduct, which is already in use in rooms between two and 200,000 cubic metres. Nitrogen is introduced into the room in order to reduce its oxygen concentration to a certain degree and to maintain it there. Such a fire prevention device can be used in areas where even the first flue gases can cause great damage (e.g. in warehouses for food or textiles) or where the use of extinguishing agents can have devastating consequences, e.g. in IT and server rooms, archives or museums.

Development stage:

Retail (Product)

References

1. <https://www.baunetzwissen.de/brandschutz/tipps/news-produkte/brandvermeidung-durch-sauerstoffreduktion-4078147>

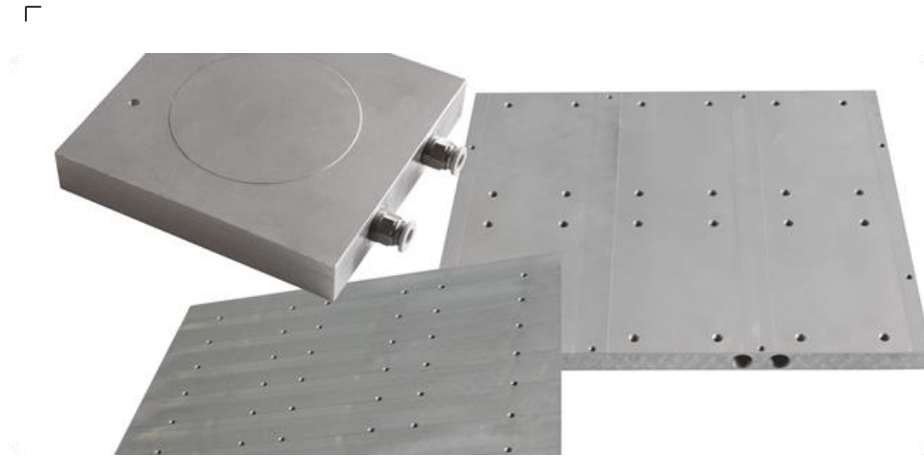
Prevention

Detection

Protection

Prevention

Cold-Plate textile machines



Description

- ▶ Cold plate cooling systems guide the waste heat via a [heat exchanger to the outside](#).
- ▶ This means that control cabinets do no longer have air slots (the air slot system fails often because of dust)

Development stage:

Retail (Product)

References

1. <http://www.all-electronics.de/ai/resources/4b47c1a6996.pdf>

Prevention

Detection

Protection

Prevention

Safety Check in a textile factory



Description

- ▶ Are people aware of the dangers posed by electricity?
- ▶ Not all yet. But it gets better. What's more, if we overfeed people with innovations, they won't change anything. It is important to proceed step by step and gradually introduce these security improvements. People should be able to perceive and implement it consciously.

Development stage:

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References

1. https://www.coop.ch/pb/site/common/get/documents/system/elements/nachhaltigkeit/themen/fairerhandel/inhaltsseiten/2204_1417CZ40_R0_OEKO.pdf

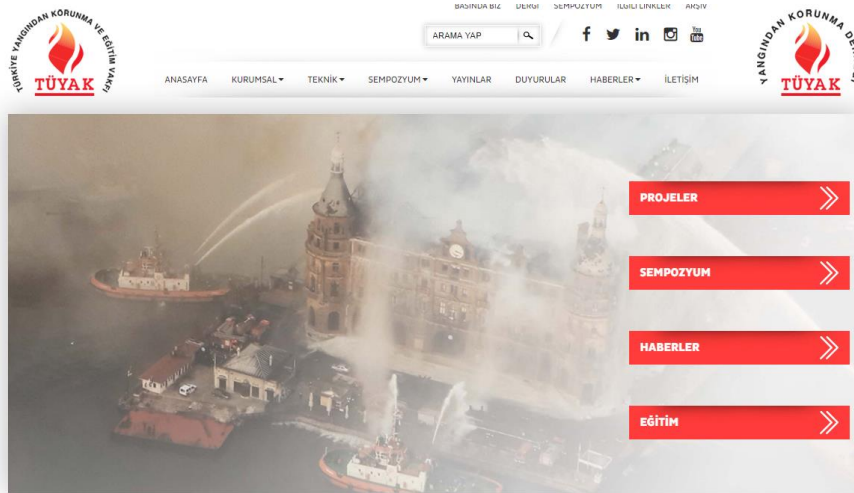
Prevention

Detection

Protection

Prevention

Awareness of fire protection in Turkey



Description

- ▶ Tüyak (Foundation for Fire Protection)
- ▶ Ensuring that science and technology research is carried out to ensure that society is trained in fire safety
- ▶ Preparation of technical publications to ensure that personnel of public and private institutions are trained in fire protection and fire extinguishing,
- ▶ Provide or help to improve the standards and devices of fire prevention systems by establishing relations with public institutions and scientific institutions.
- ▶ Establishment of laboratory, test station and similar facilities for fire prevention and fire protection,
- ▶ Reducing the loss of life and property caused by fire in the country by using the right information and resources
- ▶ Ensure that society is trained in fire safety.

Development stage: -

References

1. <http://www.tuyak.org.tr/index.html>
2. <http://tuyak2017.com/en/>

Prevention

Detection

Protection

Prevention

Ahead of the fire



HOW BUSINESSES CAN PREPARE FOR WILDFIRE

There are some basic actions businesses can implement to potentially limit the damage to their property ahead of a wildfire, explains Scott Steinmetz, Global Head of Allianz Risk Consulting MidCorp. Moving combustibles, such as patio furniture cushions, away from the property and clearing brush around the perimeter will help prevent embers that cause fire damage.

Here are five tips to help prepare for a wildfire:

1. Prepare a written wildfire response plan and educate your people: Hold a preparedness discussion to ensure everyone knows the important steps to take to prepare for a wildfire and the organization's communications plan in the event of a wildfire.
2. Maintain your property: Keep debris and combustible material from accumulating on roofs, gutters and around the structure.
3. Enclose the bottom of elevated decks and do not store combustible materials below the deck or under low roof/eave structures.
4. Cover attic and crawlspace vents with metal mesh screens to reduce entry points for wind-driven embers (*Minimum 1/16" mesh size per California Building Code Chapter 7A*).
5. Create defensible space up to 100 feet from the structures that serve as a layer of protection between the business and wildfire.

Description

- ▶ Wildfires in California in 2017
- ▶ Allianz as a big carrier: proactive in having some form of in-event response for commercial clients
- ▶ Value-added service provided much needed peace of mind for local winery owners/operators during the significant wildfire catastrophe

Development stage:

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References

Prevention

Detection

Protection

Prevention Pyro-Paint



Description

- ▶ Pyro-Painttm 634-AL is a two-part, 99% alumina filled, **ceramic coating system** used to bond, coat and seal refractory fiber boards and other shapes used in molten metal fluid handling components and structures in foundry applications to 3200 °F (1760 °C). The advanced material helps to **prevent wear and oxidation of refractory components and increases heat reflectivity to improve thermal efficiency and enable temperatures to ramp up more rapidly.**
- ▶ When a layer of intumescent coating Pyro Pro (ca. 1 mm thick) is exposed to heat of 300 C and above, it will swell up to 10-50 times to build a foam char barrier that insulates the underlying

Development stage:

Retail (Product)

References

1. <https://www.aremco.com/news-item/new-pyro-paint%E2%84%A2-634-al-high-temp-refractory-coating/>

Prevention

Detection

Protection

Prevention Aerogel



Description

- ▶ Aerogel is a synthetic porous ultralight material derived from a gel, in which the liquid component of the gel has been replaced with a gas. The result is a solid with extremely low density and low thermal conductivity. Nicknames include frozen smoke, solid smoke, solid air, solid cloud, blue smoke owing to its translucent nature and the way light scatters in the material. It feels like fragile expanded polystyrene to the touch. Aerogels can be made from a variety of chemical compounds.
- ▶ Aerogels are good thermal insulators because they almost nullify two of the three methods of heat transfer – conduction (they are mostly composed of insulating gas) and convection (the microstructure prevents net gas movement). They are good conductive insulators because they are composed almost entirely of gases, which are very poor heat conductors.

Development stage:

Retail (Product)

References

1. <https://en.wikipedia.org/wiki/Aerogel>

Prevention

Detection

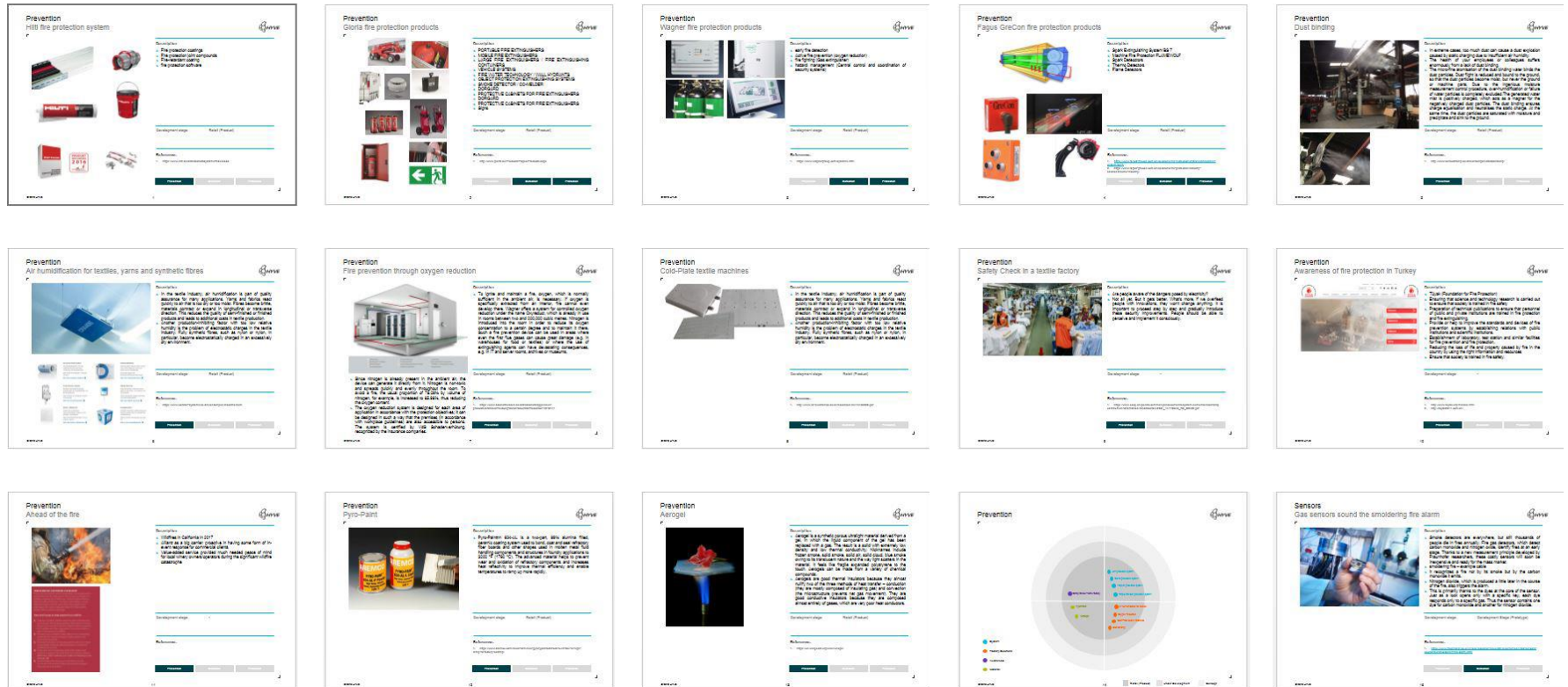
Protection

Prevention



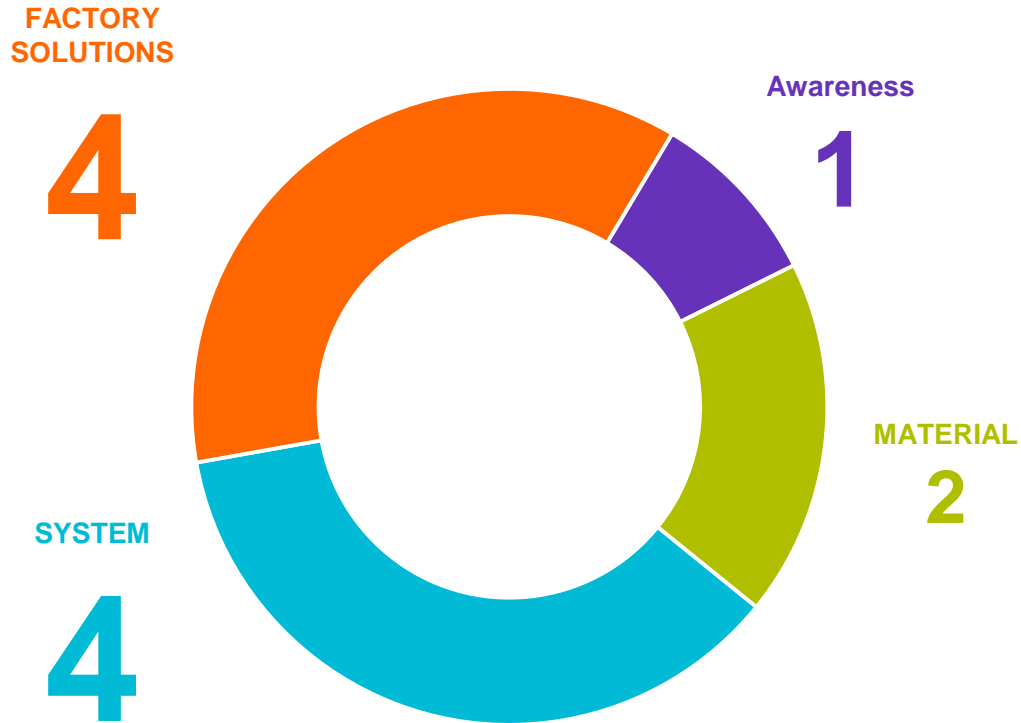
- System
- Factory Solutions
- Awareness
- Material

Prevention



Most findings in the field of prevention are currently **state of the art**. There are **no new developments**.

Prevention



In the field of prevention, **systems** are usually offered by **large companies**. These often consist of fire resistant materials, but also classic things such as **fire extinguishers**, **smoke detectors**, **fire alarm systems** or special areas such as extinguishing systems for objects.

Prevention



Are people aware of the dangers posed by electricity?

Not all yet. But it gets better. What's more, if we overfeed people with innovations, they won't change anything. It is important to proceed step by step and gradually introduce these security improvements. People should be able to perceive and implement it consciously.

References

1. https://www.coop.ch/pb/site/common/get/documents/system/elements/nachhaltigkeit/themen/fairerhandel/inhaltseiten/2204_1417CZ40_R0_OEKO.pdf

Besides a good equipment with fire prevention systems it is nevertheless **very important to train the employees** and to **create the awareness** for the correct handling in case of fire.



Detection



Sensors

Gas sensors sound the smoldering fire alarm



Description

- ▶ Smoke detectors are everywhere, but still thousands of people die in fires annually. Fire gas detectors, which detect **carbon monoxide and nitrogen oxide**, identify fires at an early stage. Thanks to a new measurement principle developed by Fraunhofer researchers, these costly sensors will soon be inexpensive and ready for the mass market.
- ▶ smoldering fire – example cable
- ▶ It recognizes a fire not by its smoke but by the carbon monoxide it emits.
- ▶ Nitrogen dioxide, which is produced a little later in the course of the fire, also triggers the alarm.
- ▶ This is primarily thanks to the dyes at the core of the sensor. Just as a **lock opens only with a specific key**, each dye responds only to a specific gas. Thus the sensor contains one dye for carbon monoxide and another for nitrogen dioxide.

Development stage:

Development Stage (Prototype)

References

1. <https://www.fraunhofer.de/en/press/research-news/2015/september/gas-sensors-sound-the-smoldering-fire-alarm.html>

Prevention

Detection

Protection

Sensors

Gas sensors sound the smoldering fire alarm



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Description

- ▶ Gas transmission and storage is an important part of the industry today, and gas leaks have been a malady of related industries. Traditional detection methods like pressure detection, concentration detection and manual inspection are unable to discover leaks sensitively and in real time. The development of modern science and technology creates conditions for the emergence of Flylisten. Flylisten integrates ultrasonic sensors with high sensitivity and low-power processors for real-time detection of the ultrasound emitted when gas leaks from pipelines. Once the ultrasound is captured, LoRa technologies are used to send sensor data to the CLAA network, which then analyses the received alarm information for accurate arrangement of rescue operations.

Development stage:

Development Stage (Prototype)

References

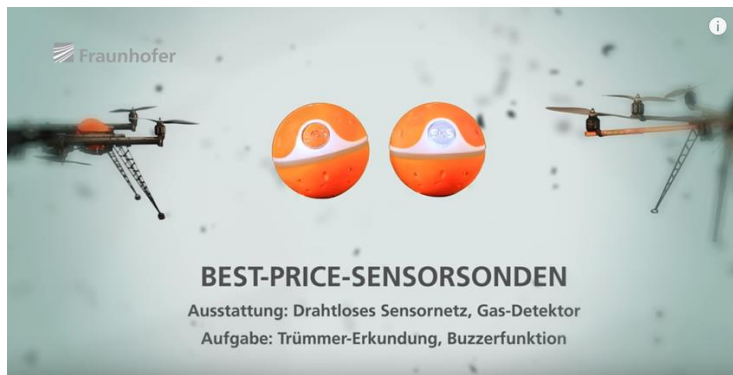
1. <http://www.red-dot.sg/en/flylisten/>

Prevention

Detection

Protection

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Description

- Five Fraunhofer institutes from different disciplines have teamed up for the [Beyond Tomorrow project SENEKA](#) – a sensor network with [mobile robots for disaster management](#).
- As part of SENEKA, the researchers also developed [autonomous sensor](#) probes that provide additional detail about the situation. In this way, Best Price sensor probes are dropped from aerial robots; from there, they find their own way into hard-to-reach spots in the rubble. They [have chemical sensors for detecting gas](#) and also feature an SOS button.

Development stage:

Development Stage (Prototype)

References

1. <https://www.fraunhofer.de/de/forschung/forschungsfelder/schutz-sicherheit/krisenmanagement/sensornetzwerk-seneka.html>

Prevention

Detection

Protection

Sensors

Infrared sensor technology



Description

- ▶ The infrared sensor technology in facilities can be diverted into three fields of application: intelligent air conditioning, thermal facility surveillance and occupant counting. Low resolved IR detectors – approx. 32x32 pixels – which can measure the spatially resolved temperature, are used for these applications. Different from cameras used for the visual spectrum, there is **no danger of infringing on privacy rights** with these images.
- ▶ Fire detection devices that are fitted with an IR sensor **can detect a potential fire at an earlier stage simply through the abnormally high temperature in a particular room**, whereas smoke detectors rely on smoke that builds up during the course of a fire. This time advantage can reduce the consequences of a fire considerably.

Development stage:

Retail (Product)



References

1. <https://www.bau.fraunhofer.de/en/fieldsofresearch/safety/infrared-sensor-technology.html>

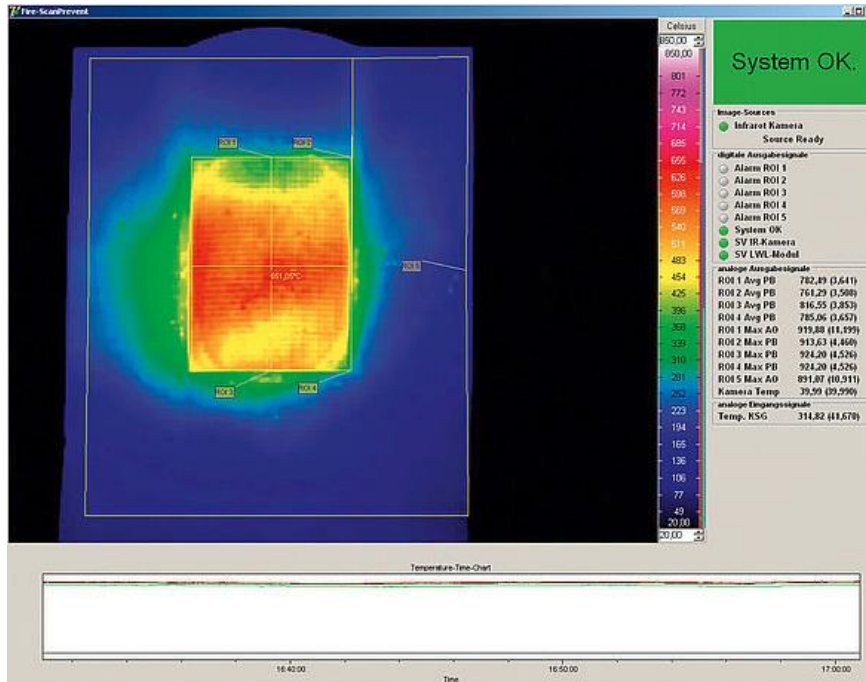
Prevention

Detection

Protection

Sensors

Thermographic System FIRE-SCAN for Early Fire Detection



Description

- ▶ Early fire detection system FIRE-SCAN enables capturing of critical temperature indoor and on open-air grounds at an early stage. An automatic calibration with threshold values results in prompt alerting up to automated fire fighting. However, should a fire break out, FIRE-SCAN provides an additional option for monitoring the area surrounded by fire even in case of smoke or formation of dust. Thus, fire fighting can be supported very effectively.

Development stage:

Retail (Product)

References

1. <https://www.tandfonline.com/doi/abs/10.1080/01431161.2017.1385109>

Prevention

Detection

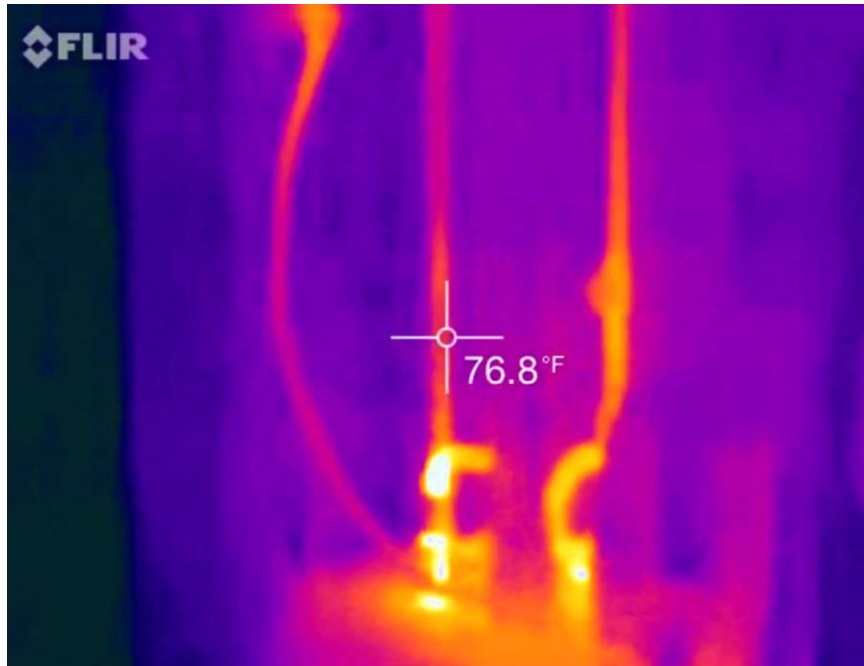
Protection

Sensors

low-cost near-infrared digital camera for fire detection



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Description

- ▶ Digital cameras modified to record near-infrared (NIR) are potential alternatives and are much more affordable (<\$500).

Development stage:

Retail (Product)

References

1. <https://www.bau.fraunhofer.de/en/fieldsofresearch/safety/infrared-sensor-technology.html>

Prevention

Detection

Protection

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Sensors

Seek Thermal



Description

- ▶ Made for iPhone® and Android™ top models, Seek Compact transforms your smartphone or tablet into a professional thermal imaging tool. By utilizing the power and convenience of your smartphone, our cameras make it easy to take thermal photos and video, share findings, and send for documentation. Simply connect and detect energy loss caused by air leaks, missing or damaged insulation, inefficient HVAC systems, electrical faults, and much more. On top of all this, Seek Compact cameras are engineered to run on low power from your smartphone and do not require batteries or charging.

Development stage:

Retail (Product)

References

1. <https://www.thermal.com/compact-series.html>
2. <https://www.wired.com/2014/10/seek-thermal-infrared-camera-iphone-android/>

Prevention

Detection

Protection

Sensors

Automatic forest fire detection system



Description

- ▶ Researchers from UPM are developing a method to detect forest fires by using a [new color index](#). The index is based on methods for vegetation classification and has been adapted to detect the [tonalities of flames and smoke](#).
- ▶ In the case of deforestation, researchers suggest various algorithms that allow them to detect the fire and smoke generated during a forest fire as well as their fundamental characteristics (area, wind direction...). The algorithms have high accuracy in real time, and they have low computational load that allows them to address the problem in real time and implement such algorithms in [autonomous systems](#) (drones) and perform continuous monitoring.

Development stage:

Under Development (Prototype)

References

1. <https://phys.org/news/2016-10-automatic-forest-surveillance-drones.html>

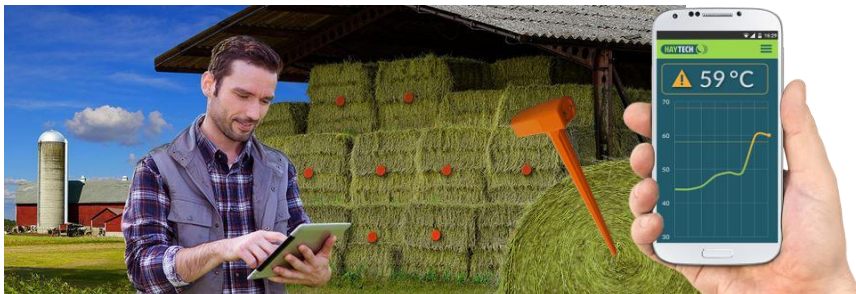
Prevention

Detection

Protection

Sensors

Finnish startup Haytech aims to prevent barn fires



Description

- ▶ An application for IoT technology comes from one of the most traditional sectors in the world – farming. Most people outside of the farming world have no idea that hay is a major fire hazard. When hay is baled, it is at a risk of spontaneously combusting, leading to tremendous damage and costs for farmers.
- ▶ Haytech's technology has passed through a testing period and the team has already managed to prevent a farm fire. At the moment Haytech is looking for funding – the most important element in order to be able to start the production. The company already has a production partner so all that's needed is to convince funds, private investors and angel investors to support the company.

Development stage:

Under Development (Prototype)

References

1. <http://www.goodnewsfinland.com/feature/finnish-startup-helps-farmers-to-prevent-fires-2/>

Prevention

Detection

Protection

Sensors

Moon by 1-Ring



Description

- ▶ The Moon is an innovative Smart Home Solution.
- ▶ Smart Home Hub with ZigBee, Z-Wave, BLE & IR Blaster
- ▶ Stabilized levitation with wireless charging
- ▶ 360° Day&Night Vision with sound direction detection technology
- ▶ Temperature, CO2, Humidity and Light Sensors

Development stage: Under development (Concept)

References

1. <https://www.indiegogo.com/projects/moon-by-1-ring-world-s-coolest-smart-home-system-security#/>

Prevention

Detection

Protection

Sensors

TempTag - Monitoring system for electrical systems

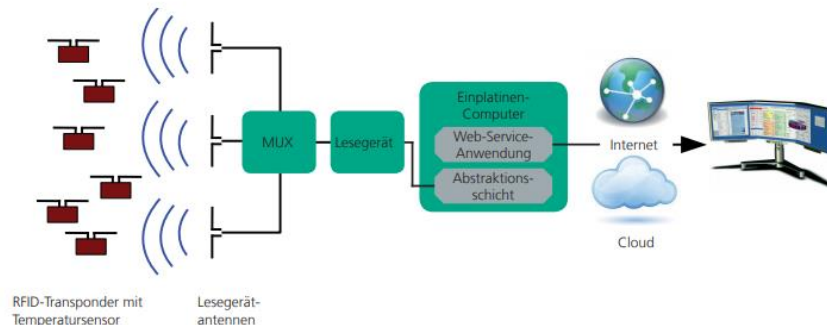


Description

- ▶ RFID transponders are equipped with temperature sensors and are connected to electrical contacts is positioned. These RFID transponders are **passive and do not require any local Energy supply**. They draw their **energy From electromagnetic of the reader**. For this reason Sensor transponder both inexpensive and maintenance-free.
- ▶ Increasing the reliability and safety of electrical systems
- ▶ Continuous monitoring of important electrical connections
- ▶ Remote selection via internet or cloud-based services
- ▶ Early prevention in the event of a temperature rise is made possible by an alarm function
- ▶ On-site maintenance is not necessary
- ▶ Simple retrofitting of existing systems

Development stage:

Retail (Product)



References

1. <https://www.ims.fraunhofer.de/content/dam/ims/de/documents/Downloads/20151210%20GF%203%20-%20C3%9Cberwachungssystem%20f%C3%BCr%20elektrische%20Anlagen.pdf>

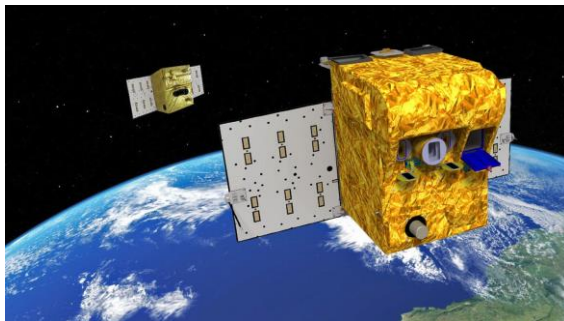
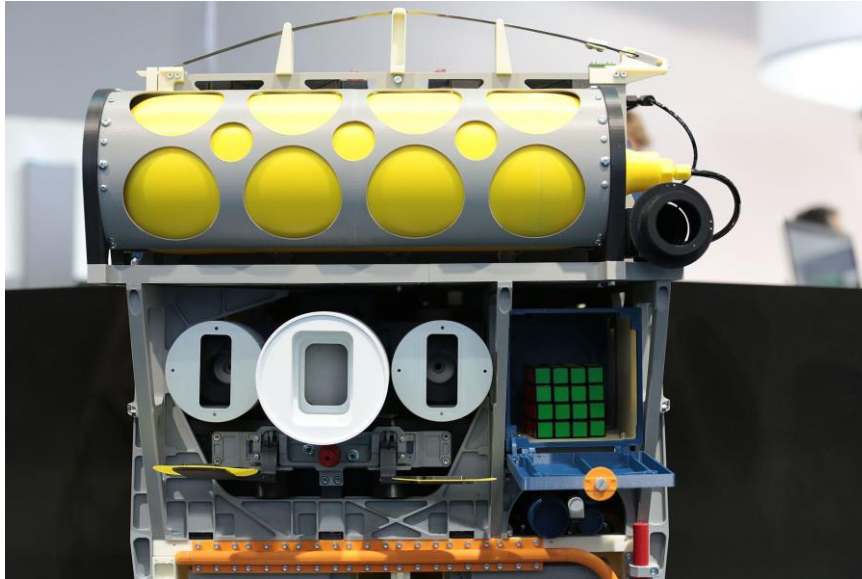
Prevention

Detection

Protection

Sensors

Automatic forest fire detection system



Description

- ▶ Infrared Camera System
- ▶ Satellite to detect forest fires

Development stage:

Retail (Product)

References

1. <https://de.wikipedia.org/wiki/BIROS>

Prevention

Detection

Protection

Sensors

Gas explosions: more safety for rescuers



Description

- ▶ A car involved in an accident caught fire near Bad Segeberg in 2014. When the firefighters started extinguishing the fire, the vehicle's gas tank exploded seriously injuring ten firefighters. If the helpers had been aware of the danger and the potential impact, they would have been able to keep the necessary safety distance.
- ▶ AM has developed a measuring system made up of several infrared cameras to determine heat radiation from such highly dynamic processes. The measurement system is mounted on an unmanned aerial vehicle (UAV), also called a drone, to determine gas concentrations and is currently being implemented and tested under realistic conditions. This will enable rescuers to detect gas leakage from a safe distance.

Development stage:

Under Development (Concept)

References

1. <https://www.bam.de/Content/DE/Bildergalerie/infrastruktur-gasexplosionen-mehr-sicherheit-fuer-retter.html>

Prevention

Detection

Protection



Description

- ▶ Current industrial applications of robots, especially drones are largely subjected to the expensive price and the limited functionality.
- ▶ Aside from the high pilot labor cost, human-operated robots (drones) have drawbacks such as:
- ▶ Incapability of long-distance control
- ▶ Incapability of nocturne flight
- ▶ Lack of obstacle avoidance
- ▶ Lack of precision during positioning
- ▶ We need A.I. for smarter Industrial Robots.

Development stage:

Under Development



References

1. <https://www.flyinstinct.com/>

Prevention

Detection

Protection

Other Solutions

Hover Camera designed for use indoors



Description

- ▶ A young Chinese startup specializing in drones came out of two years of hiding and secretive development today to unveil its **Hover Camera**. Unlike most drones, it's **designed for indoor use**, with its rotors tucked safely inside its carbon fiber mesh bodywork.



Development stage:

Under Development (Prototype)

References

1. <https://www.techinasia.com/carbon-fiber-hover-camera-indoor-drone-launch>

Prevention

Detection

Protection

Sensors

AirSafe



Description

- ▶ **Monitoring of dust concentration** in buildings, production halls, silo enclosures, boiler houses or at the workplace.
- ▶ **To avoid dust explosions**
- ▶ Dust concentrations at workplaces are continuously monitored.
- ▶ Possible dust leakage from system components is quickly detected.
- ▶ Dust concentrations that may endanger employees are detected reliably and at an early stage with the AirSafe.

Development stage:

Retail (Product)

References

1. <https://www.swr-engineering.com/de/messtechnik-produkte/staubexplosionen-messgeraet-staub.html>
<https://www.swr-engineering.com/de/messtechnik-produkte/staubexplosionen-messgeraet-staub.html>

Prevention

Detection

Protection

Sensors

Optical Dust Sensor



Description

- ▶ Sharp's GP2Y1010AU0F is an **optical air quality sensor**, designed to sense dust particles. An infrared emitting diode and a phototransistor are diagonally arranged into this device, to allow it to detect the reflected light of dust in air. It is especially effective in detecting very fine particles like cigarette smoke, and is commonly used in air purifier systems.

Development stage:

Retail (Product)

References

1. <https://www.sparkfun.com/products/9689>

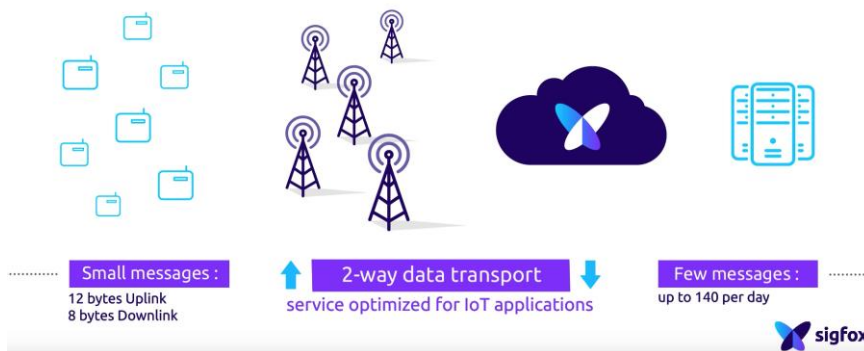
Prevention

Detection

Protection



Sigfox core service



Description

- ▶ Sigfox is a French company founded in 2009 that builds **wireless networks to connect low-power objects** such as electricity meters, smartwatches, which need to be continuously on and emitting small amounts of data.
- ▶ Sigfox employs a proprietary technology that enables communication using the Industrial, Scientific and Medical ISM radio band which uses 868MHz in Europe and 902MHz in the US. It utilizes a wide-reaching signal **that passes freely through solid objects, called "ultra narrowband"** and requires little energy, being termed "Low-power Wide-area network (LPWAN)". The network is based on one-hop star topology and requires a mobile operator to carry the generated traffic.[6] The signal can also be used to easily cover large areas and to reach underground objects.

Development stage:

Retail (Product)

References

1. <https://www.sigfox.com/en>
2. <https://en.wikipedia.org/wiki/Sigfox>

Prevention

Detection

Protection

IoT

Mioty - The Wireless IoT Technology



Description

- ▶ Wireless data transmission systems are being increasingly deployed in industrial and home automation applications. These robust systems are used to **transmit sensor data and control information across network infrastructures**. In the age of the Internet of Things (IoT), people and things will be intelligently connected to one another, leading to innovations in business and Industry 4.0.
- ▶ MIOTY, a **miniaturized IoT system** developed by Fraunhofer IIS, sets new standards in the field of wireless data transmission when it comes to cost efficiency, transmission range, transmission security and battery life.

Development stage:

Retail (Product)



References

1. <https://www.iis.fraunhofer.de/en/ff/lv/net/tech/drahtlose-kommunikation/telemetrie.html>

Prevention

Detection

Protection



Description

- ▶ Monixo is a complete solution for monitoring the operation of industrial assets and for anticipating failures on these in real time.
- ▶ Monixo provides a complete, efficient and reliable solution to effectively anticipate failures. Thanks to continuous data acquisition and analysis, Monixo beyond alerting teams in case of fault detection, ensures anticipating these. Monixo allows acting in time in order to avoid the cumbersome and costly failures, but never too early to avoid the expense and unnecessary downtimes.

Development stage:

Retail (Product)

References

1. <http://www.monixo.com/?lang=en>

Prevention

Detection

Protection

Fire Device

Smoke alarm for hearing disabled people



Description

- ▶ To protect hearing impaired people from smoke poisoning, smoke detectors should be equipped with a flash lamp and/or a vibration cushion. A mobile alarm for the deaf detects the alarm signal of an existing smoke detector in the room and converts it into a flash of light and a vibration alarm. The wireless device can be taken along when travelling and works in all rooms with a conventional smoke alarm, for example in hotel rooms. A flash lamp with a built-in receiver can be connected to a smoke alarm from the same manufacturer with an appropriate transmitter via radio link (retrospectively). Since the installation of interconnected radio warning devices in several rooms is recommended for hearing impaired persons anyway, this system makes sense for a new installation.

Development stage:

Retail (Product)

References

1. <https://www.baunetzwissen.de/brandschutz/tipps/news-produkte/rauchwarnmelder-fuer-hoergeschaedigte-3269059>

Prevention

Detection

Protection

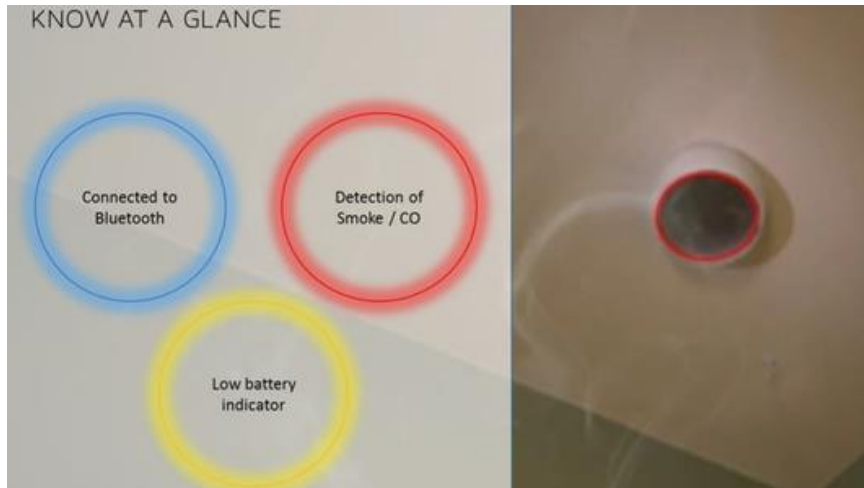
Fire Device

A smoke detector with Bluetooth audio built in



┌

Crowdfun
ding



Description

- ▶ Day to day value out of an electronic that is in every room in our house?
- ▶ Smoke Audio is a smoke and carbon monoxide detector for the home that incorporates Bluetooth audio capability. At first glance it truly is an idea that appears incredibly simple and yet it delivers so much that you really can see the benefit. With the capability to play music via Bluetooth streamed from a smart device and acting as an external speaker, Smoke Audio is a product that is both practical and functional. It makes the most of a device that already has a place in most homes, the smoke alarm/detector.

Development stage:

Under Development (Prototype)

References

1. <https://www.kickstarter.com/projects/192069777/smoke-audio-a-smoke-detector-with-bluetooth-audio?ref=discovery&term=smoke%20detector>

Prevention

Detection

Protection

└

Fire/Smoke Detectors

Nest Smart Smoke Detector



Description

- ▶ The **smoke alarm that thinks, speaks and alerts your phone**.
- ▶ Nest Protect has been redesigned from the inside out. It has a Split-Spectrum Sensor, **tests itself** automatically and lasts up to a decade. It's also the first home alarm you can hush from your phone without any extra hardware required. And it tells you what's wrong and can even alert your phone.

Development stage:

Retail (Product)

References

1. <https://nest.com/smoke-co-alarm/overview/>

Prevention

Detection

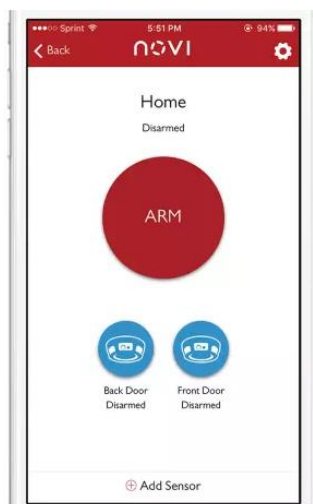
Protection

Fire/Smoke Detectors

Novi: 4-in-1 Smart Security System



Crowdfund
ding



Description

- ▶ All-in-One: **HD Camera, Motion Detector, Smoke Detector, and 90dB siren** built into one device.
- ▶ Take Action: Call police, dismiss alarms, sound siren, and take more pictures from the free Novi app.
- ▶ Battery Powered: No wires or power cord. Place sensors anywhere you want. Extra long battery life.
- ▶ Simple Install: Less than 5 minutes. That's it. Syncs with Novi App.
- ▶ How it works: When Novi detects motion or smoke it **takes 3 photos**. Novi immediately sends these photos to your smartphone.

Development stage:

Retail (Product)

References

1. <https://www.indiegogo.com/products/novi-4-in-1-smart-security-system>

Prevention

Detection

Protection

Fire/Smoke Detectors

Haven Fire Safety



Description

- ▶ Modern homes with modern furniture made from "modern" materials (cheap plastics and other synthetics from China) have created an epidemic of "blazing fast" burning homes. This is why our founder and the creator of the HAVEN, Matthew Perry, created this simple, but highly effective solution.
- ▶ Having a HAVEN installed is like having a **firefighter in your home protecting you 24/7**.
- ▶ Since the HAVEN is **heat-activated, not smoke-activated**, it won't trigger in low-risk instances of accidental smoke. Only when a real fire is present will the HAVEN discharge the MSDS safe, **non-toxic, dry chemistry** into the room.

Development stage:

Retail (Product)

References

1. <http://havenfiresafety.com/>

Prevention

Detection

Protection

Fire Device

Kidde RemoteLync Monitor



Description

- ▶ If you have a big home and don't want to spend the money replacing all of your smoke detectors with smart ones, a device that listens for smoke alarms, like the Kidde RemoteLync Monitor, would help you cover your home with smart smoke safety more efficiently. Plug the Kidde Monitor into a wall, and it'll listen for the specific frequency of smoke and CO detectors and send you an alert when it hears them.

Development stage:

Retail (Product)

References

1. <https://www.cnet.com/news/devices-to-help-your-smart-home-guard-against-fire/>

Prevention

Detection

Protection

Fire/Smoke Detectors

Lumkani Fire Detection



Crowdfun
ding



Description

- ▶ Prevent the spread of fires in urban slums with our **networked fire detector**
- ▶ On New Year's Day 2013, three massive fires ripped through South Africa's largest slum, Khayelitsha, displacing over 5 000 people. From the smoke and ashes, Lumkani was born.
- ▶ Lumkani is a tech start-up and social enterprise with one vision: to minimize the loss of life and property caused by fires in slums in South Africa and across the globe.
- ▶ We have engineered the world's first **networked heat-detector** designed specifically for a slum/informal settlement environment.

Development stage:

Under development (Concept)

References

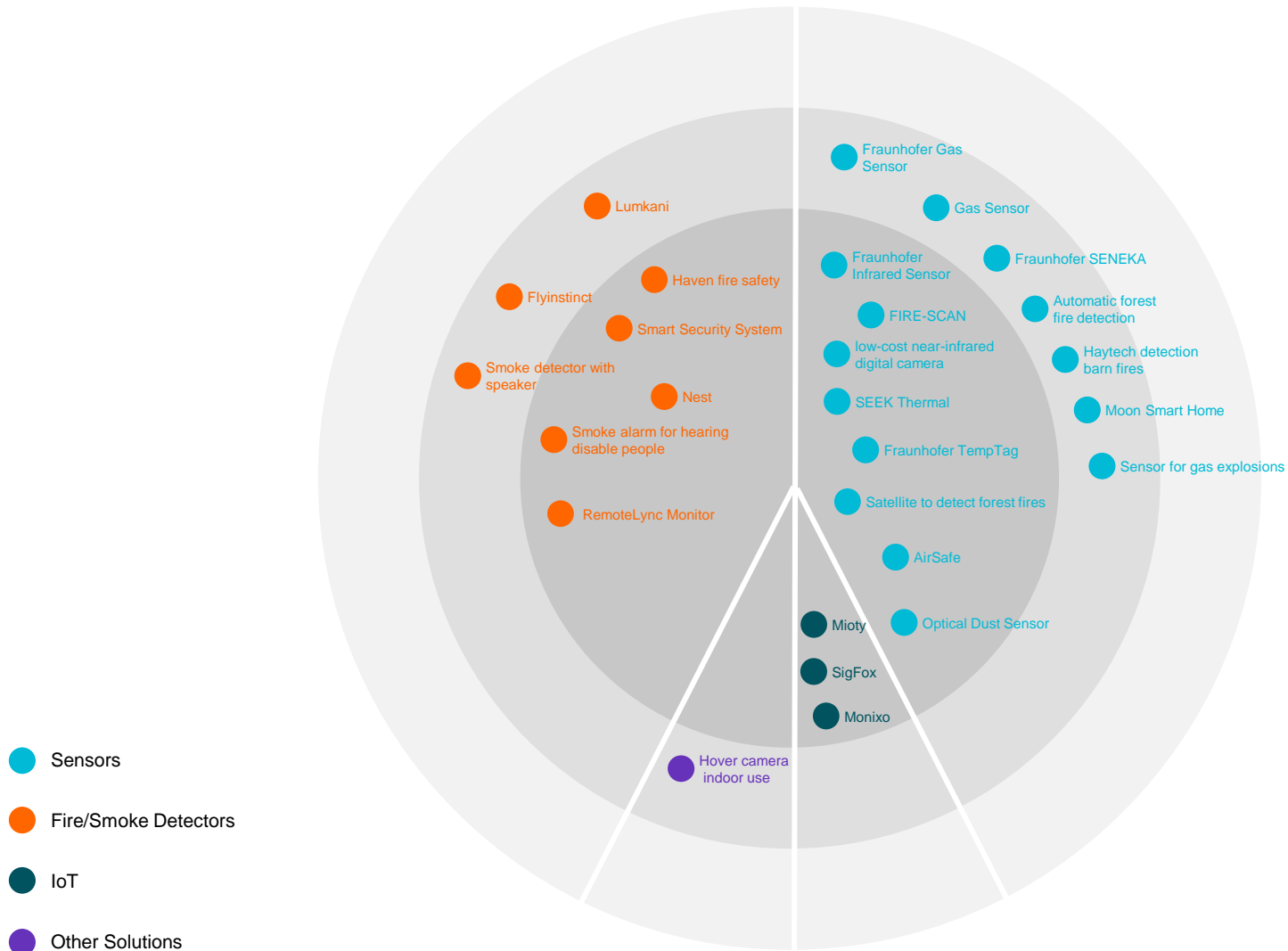
1. <https://www.indiegogo.com/projects/lumkani-fire-detection#/>

Prevention

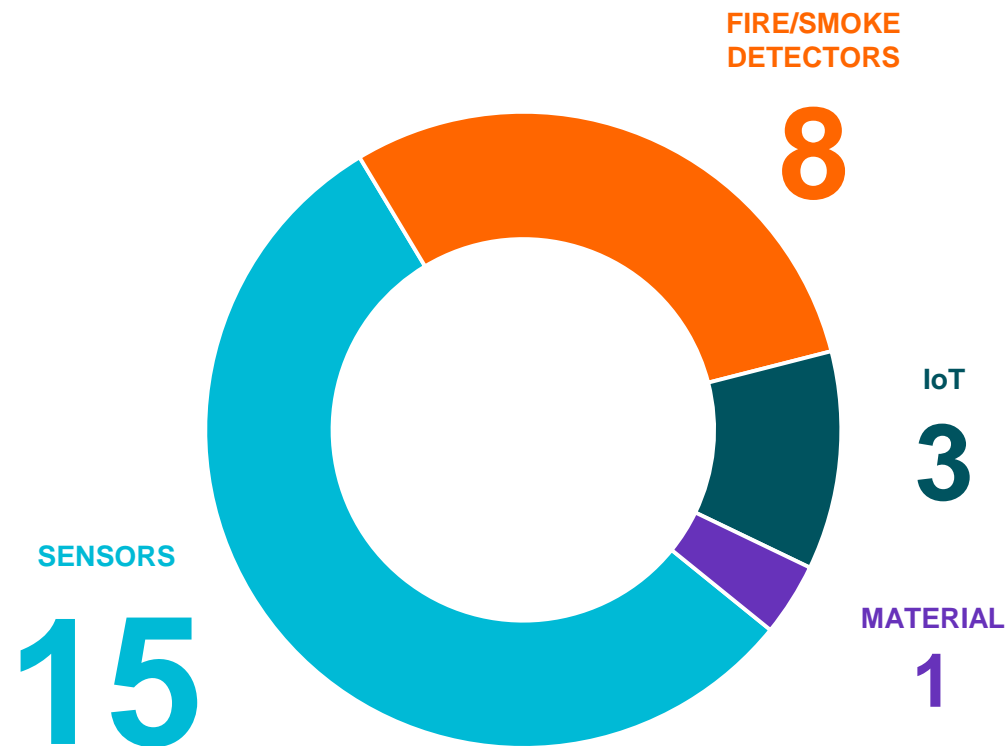
Detection

Protection

Detection



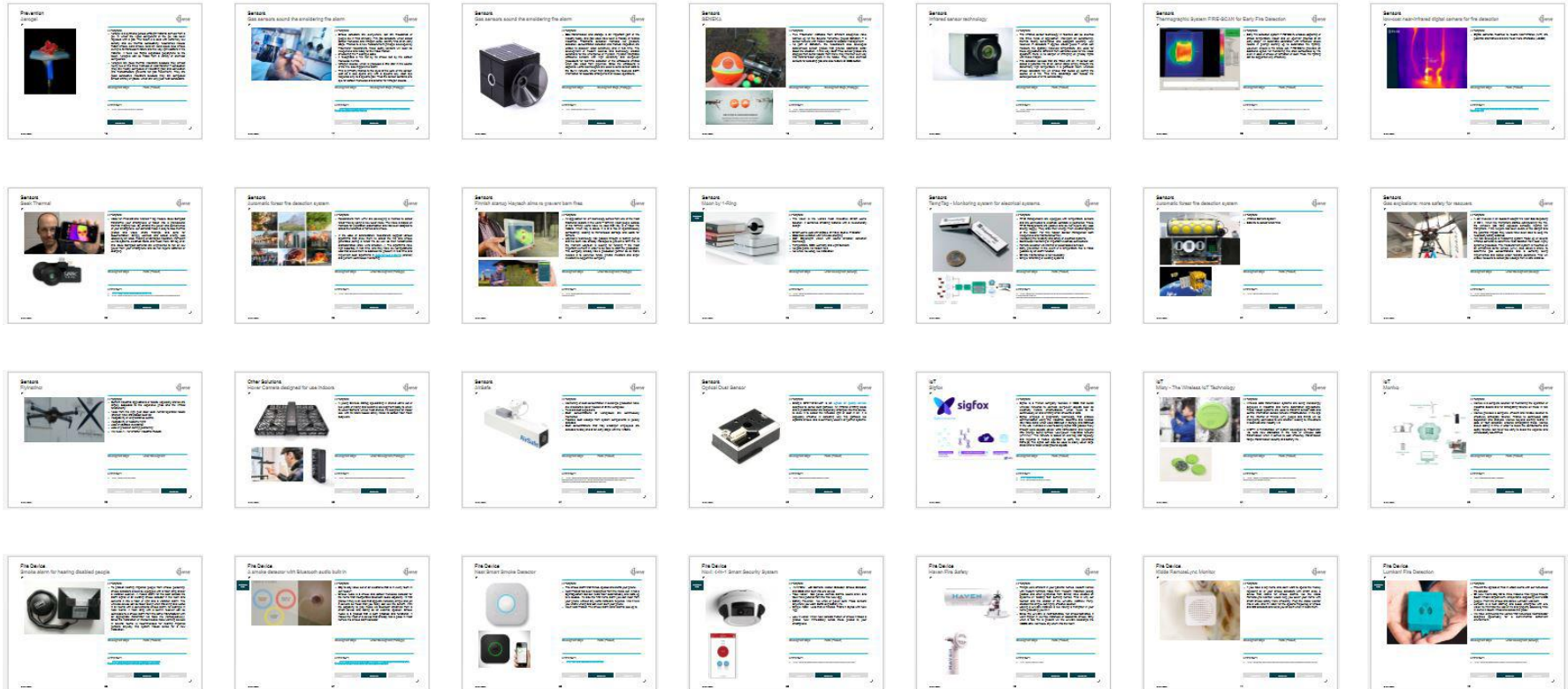
Detection



A lot is currently being developed in the field of sensor technology.

The aim is often to [detect a fire as early as possible](#).

Detection



Fire and smoke detectors are often networked with each other or with other devices to **create intelligent systems**. In this area, too, the aim is to **detect fires as early as possible**.

Mobile systems such as drones or robots are also developed or used for detection.



Protection



Extinguish Small Fires

Sound Wave Fire Extinguisher



Description

- ▶ Two engineering students at George Mason University harnessed sound to put out fires. Their chemical-free, water-free extinguisher uses **sound waves to separate burning fuel from oxygen**. Fire dies out without oxygen, so using the soundwave extinguisher on a small fire snuffs it out.
- ▶ Researchers previously patented this idea but this is the first sound wave extinguisher to work reliably. Not only does it work, but the final prototype is handheld (though, admittedly large) and only cost \$600 to build.

Development stage:

Development Stage

References

1. <http://www.strikefirstusa.com/2016/08/7-remarkable-new-fire-safety-technologies/>

Prevention

Detection

Protection

Extinguish Small Fires

Fire grenade



Description

- ▶ Another type of **carbon tetrachloride** extinguisher was the **fire grenade**. This consisted of a glass sphere filled with CTC, that was intended to be hurled at the base of a fire (early ones used salt-water, but CTC was more effective). Carbon tetrachloride was suitable for liquid and electrical fires and the extinguishers were fitted to motor vehicles. **Carbon tetrachloride extinguishers were withdrawn in the 1950s because of the chemical's toxicity** – exposure to high concentrations damages the nervous system and internal organs. Additionally, when used on a fire, the heat can convert CTC to phosgene gas,[7] formerly used as a chemical weapon.

Development stage:

Retail (Product)

References

1. <http://www.feuerwehr-weblog.org/2012/06/17/ausflug-auf-die-insel/>

Prevention

Detection

Protection

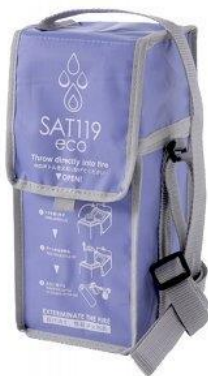
Extinguish Small Fires

SAT119 Eco Throwable Fire Extinguisher



Description

- ▶ A sort of **reverse Molotov cocktail**, is this the most user-friendly fire extinguisher available today? The patented and officially approved fire-dousing "grenade" might seem like an illogical idea (throw chemicals onto a burning flame?!) but its results are impressive, and almost immediate.
- ▶ The **container is made from special breakable plastic** that poses no risk to the thrower or other people. The agent inside will then extinguish the flames. It contains 500ml (16.9 fl oz) of **ammonium phosphate dibasic and ammonium bicarbonate**, and has **the extinguishing capacity ten times that of water**. However, despite being chemical, the **non-toxic agent** is not flammable or liable to explode, and can in theory even be used by the elderly or youngsters.



Development stage:

Retail (Product)

References

1. <http://www.japantrendshop.com/DE-sat119-eco-feuerl%C3%B6schergrenate-p-1832.html>

Prevention

Detection

Protection

Extinguish Small Fires

Extinguisher



Design
Concepts



Description

- ▶ We generally imagine fire extinguishers as large, bulky, single-use items kept behind safety glass. Though they're built for emergency situations, they're ironically not something you're able to keep very handy. This design by Philip Andersson, however, solves the portability problem with a compact unit that can be held in one hand. Durable, lightweight, & easy to pack, it's perfect for the car, camping, or keeping handy in the kitchen!

Development stage:

Under Development (Concept)

References

1. <https://www.yankodesign.com/2013/08/09/what-an-extinguisher-should-be/>

Prevention

Detection

Protection

Extinguish Small Fires

Fight Fire with safety



Design
Concepts



Description

- ▶ Personally, safety is much more important to me than any other instinct. Survival first, fittest later, if you get what I mean. Which is why the Safety iQ Saver Emergency Breath System is something I advocate every home have, even before owning a Fire Extinguisher. The Saver Emergency **Breath System** is a face-fitting device that purifies dense, smoky air, allowing you to safely reach a secure location, away from danger. More than just being a mask, the Saver is a complete set of air filters that can provide pure, **breathable air for 5 minutes**, while it takes only 5 seconds to put on. It comes with a nose-clip too, to prevent accidental nasal inhalation of smoke. Its small size means you can literally carry one around in a bag, being prepared for when you may, or someone else may need it in a time of emergency.

Development stage:

Under Development (Concept)

References

1. <https://www.yankodesign.com/2016/07/14/dont-let-your-camping-go-up-in-flames/>

Prevention

Detection

Protection

Extinguish Small Fires

Don't let your camping go up in flames



Design
Concepts



Description

- ▶ Similar to an integrated indoor fire sprinkler system, the Campinguard was designed to combat these disaster situations. It's a light, a fire alarm device and an automatic fire extinguishing system in one. If a fire occurs in a tent, the fire detection alarm will sound, the LED lights are turned on and an extinguishing liquid will be dispensed to extinguish the fire. Campers can simply hang it in their tent and rest assured that they and their belongings will be safe and sound!

Development stage: Under Development (Concept)

References

1. <https://www.yankodesign.com/2016/07/14/dont-let-your-camping-go-up-in-flames/>

Prevention

Detection

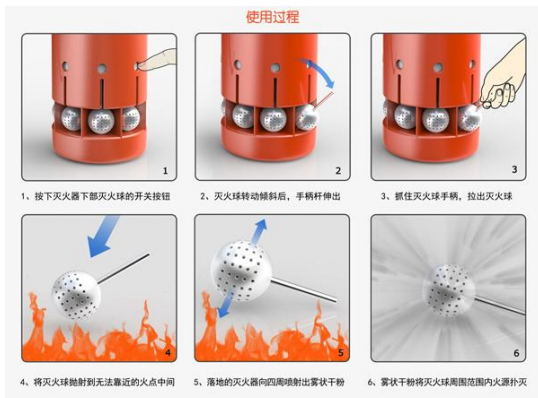
Protection

Extinguish Small Fires

Fire bombs



Design Concepts



Description

- ▶ It has several water bombs – or balls if you'd like to call them that, which can be used instantly for small fires. It's definitely a radical redesign that I'm seeing for the first time. Several tweaks to it and you can have a brand new take on how to put out fires!

Development stage:

Under Development (Concept)

References

1. <https://www.yankodesign.com/2014/01/23/fire-bombs/>

Prevention

Detection

Protection

Extinguish Small Fires

Agricultural sprinkler system



10L spraying system



gcele.en.alibaba.com



What'sApp/Wechat: +86 13189742502
www.4fpv.com

Description

- ▶ The spraying system capacity 10L, total weight: 2650G
- ▶ Supporting 4 nozzles, spray rod length 1500mm, single centrifugal spray distance 1M, distance crops 1-2 m height spray width of up to 3-5 meters
- ▶ With A control system (which occupies the receiver of a channel) supports remote spraying, 12V power supply
- ▶ This platform has the advantages of saving medicine, good atomization effect, fine particles, with the fastest speed average per minute can spray 0.6 acres of land, the fastest can per minute 1 acres of lands.

Development stage:

Retail (Product)

References

1. https://gcele.en.alibaba.com/product/60356340705-804284823/agricultural_spray_system_sprinkler_spraying_system_Sprayer_gimbal_for_agricultural_Drone_with_4_pcs_nozzles.html

Prevention

Detection

Protection

Extinguish Small Fires

Forest Fire Fighter Drone



Design Concepts



Description

► -

Development stage:

Under Development (Concept)

References

1. <https://i.pinimg.com/originals/f5/11/88/f51188511d1e7926568ed914df5d9835.jpg>

Prevention

Detection

Protection

Extinguish Small Fires

FIRE SAFETY WITH HOME SPRINKLER SYSTEM



Design
Concepts



Description

- This Sprinkler concept was designed for residential homes doing triple duty as a **smoke detector**, **emergency light source**, and **sprinkler**. Sometimes the nearest fire extinguisher just isn't near enough so this bad boy is extra insurance.

Development stage: Under Development (Concept)

References

- <http://www.yankodesign.com/2010/11/03/sprinkler-concept/>

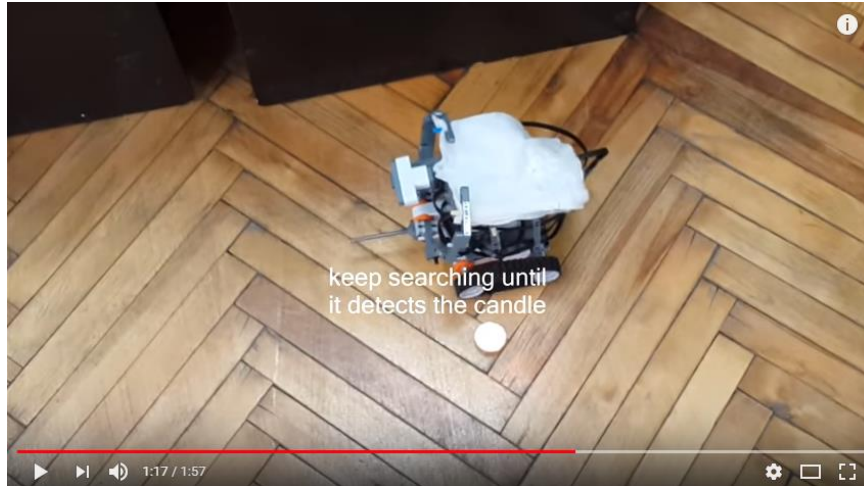
Prevention

Detection

Protection

Extinguish Small Fires

Lego Mindstorms NXT fire fighting robot project



Description

- ▶ Lego Mindstorms NXT firefighting robot project using behavior based architecture
- ▶ This is very basic project due to the lack of the sensors, here temp sensor and ultrasonic sensor are used

Development stage:

Under Development (Concept)

References

1. <https://www.youtube.com/watch?v=xcaAMolH0u4>

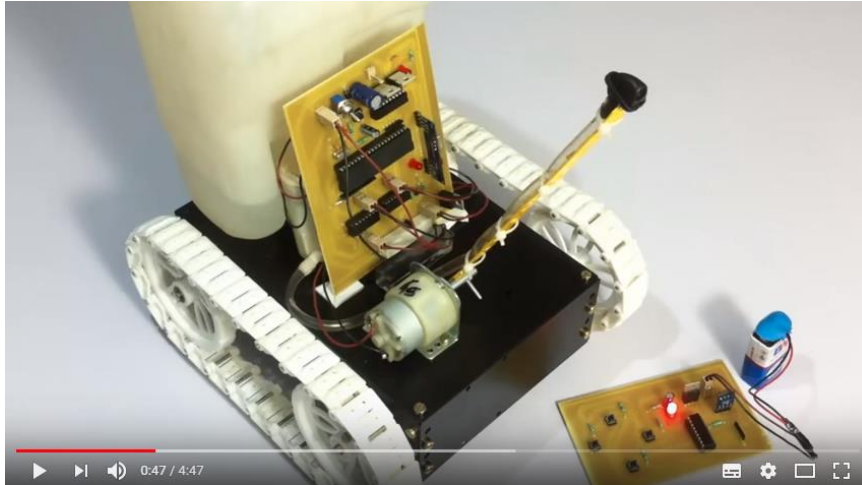
Prevention

Detection

Protection

Extinguish Small Fires

Fire Fighter Robot Project



Description

- ▶ This advanced project allows a user to control a fire fighter robot equipped with water tank and gun remotely wirelessly for extinguishing fires. For this purposes the system uses an Rf remote for remote operation along with rf receive based microcontroller circuit for operating the robotic vehicle and water pump. The rf based remote transfers users commands through rf signals which are received by the receiver circuit. The receiver circuit now decodes the data commands sent. It then forwards it to the microcontroller. Now the microcontroller processes these instructions and then instructions the vehicle motors to run the vehicle in desired directions. It also operates the water pump motor and pump direction motor to spray water based on users commands. This allows the user to operate the robot and put off the fire by standing at a safe distance. The robot operates within a 8 meter range of the remote.

Development stage:

Under Development (Prototype)

References

1. <https://www.youtube.com/watch?v=WDrJw5wEPSU>
2. <http://nevonprojects.com/fire-fighter-robot-project/>

Prevention

Detection

Protection

Extinguish Fire

Firefighting Robot



Description

- ▶ Thermite RS1-3 is the most CAPABLE, DURABLE AND RELIABLE 1,250 GPM firefighting robot on the market today. Manufactured by the leaders in robotic innovation Howe and Howe Tech, the Thermite provides safety and inside access to firefighters working on containing and defeating fires of any magnitude or origin. The Thermite gives firefighters and first responders instant eyes inside the fire and the ability to attack the fire from its core all the while creating effective stand-off to its users. With the power to tow full hoses and dispense up to 1,250gpm the Thermite is changing tactics on combating and conquering fires that up until now would not have been effectively controlled. Thermite is not intended to replace firefighters in any way. Instead, this remarkable firefighting robot is an advanced tool developed to assist first responders in safely and efficiently combating industrial and HAZMAT fires.

Development stage:

Retail (Product)

References

1. <http://www.roboticfirefighters.com/>

Prevention

Detection

Protection

Extinguish Fire

Water Mist Systems



ESFR-Sprinkler

E early / früh
S suppression / löschend
F fast / schnell
R response / auslösend

- K-Wert 200 und mehr
- Zeichnet sich durch hohe Löschleistung aus
- Für Lagerisiken mit hohen Lagerhöhen ohne Zwischenebenenschutz

BAUINGENIEURWESEN

TECHNISCHE UNIVERSITÄT KAISERSLAUTERN

Grundlagen der Feinsprühntechnik

	
Klassische Wasserverteilung	Wassernebel
▪ Tropfendurchmesser > 1 mm	▪ Tropfendurchmesser < 1 mm
▪ Oberfläche von 1 Liter Wasser: z.B. ~3 m ²	▪ Oberfläche von 1 Liter Wasser: z.B. ~60 m ²

FBI

40

Description

- ▶ Water mist fire safety technology improves on typical sprinkler systems, and is considered to be a major part of the future of firefighting. Water simply works, and it's the most common agent used to fight fires today.
- ▶ Instead of large droplets of water, water mist systems send out a fine mist that smothers a fire. Since the droplets are smaller, the mist systems create more of them. The larger surface area of droplets converts water to steam faster. The steam absorbs more heat from the flame, lowering the temperature of the fire, suffocating the fire faster than regular old water.
- ▶ Limited damage

Development stage: -

References

1. <http://www.strikefirstusa.com/2016/08/7-remarkable-new-fire-safety-technologies/>

Prevention

Detection

Protection

Extinguish Fire

Water/Nitrogen Sprinkler (Hybrid)



Description

- ▶ Vortex™ extinguishes small fires in large rooms in naturally ventilated environments. The average Vortex™ droplet size is less than 10 microns, using a minimal amount of water, released per emitter - as little as 3.8 litres per minute - virtually eliminates any wetting in a space. The Vortex™ fire suppression system provides the best capabilities of both water mist and inert gas systems. Ease of design, minimal wetting and advanced fire suppression capabilities all give the Vortex™ system the advantage over existing systems. The homogeneous mixture of water droplets and nitrogen gas is propelled with enough energy to overcome the drag effect that has limited the effectiveness of traditional water mist systems.

Development stage:

Retail (Product)

References

1. [http://www.fire-protection.com.au/product-menu/gaseous-suppression/hybrid-systems-\(water-n2\)/vortex](http://www.fire-protection.com.au/product-menu/gaseous-suppression/hybrid-systems-(water-n2)/vortex)

Prevention

Detection

Protection

Extinguish Fire

Dry systems



Description

- ▶ A dry system, as defined in NFPA 13, is a sprinkler system employing automatic sprinklers that are attached to a piping system containing air or nitrogen under pressure, the release of which (as from the opening of a sprinkler) permits water pressure to open a valve known as a dry pipe valve; the water then flows into the piping system and out the opened sprinklers. A dry system is going to be considered for areas where the temperature cannot be maintained above 40° F (4° C). It is important, however, to make sure the dry pipe valve assembly and equipment is installed within a heated environment. The dry pipe valve is a fairly simple concept, but, like the wet riser, offers a few options to consider when specifying the equipment.

Development stage:

Retail (Product)

References

1. <https://www.phcpropros.com/articles/1917-back-to-basics-wet-dry-sprinkler-system>

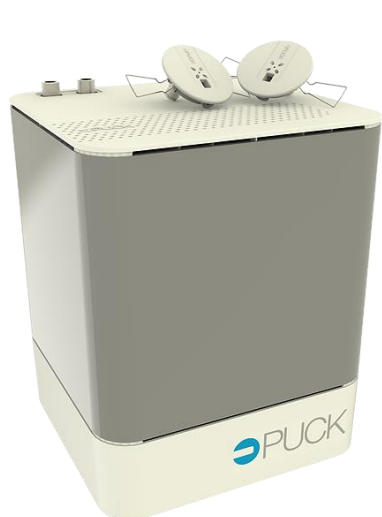
Prevention

Detection

Protection

Extinguish Fire

The next Generation Sprinkler System



Description

- ▶ PUCK is fire tested to BS:8458 residential watermist standard and BS:9252 sprinkler standard.
- ▶ The PUCK nozzles sit flush with the ceiling making them as discrete as possible.
- ▶ Using flexible small bore high pressure hose the PUCK system is easy to install.
- ▶ With the revolutionary technologies throughout PUCK, fire safety can be offered at a reasonable price for the first time.
- ▶ The PUCK pump unit automatically tests once per week to ensure the unit is functioning correctly.
- ▶ PUCK runs purely from the mains water supply, no large water storage tanks required.

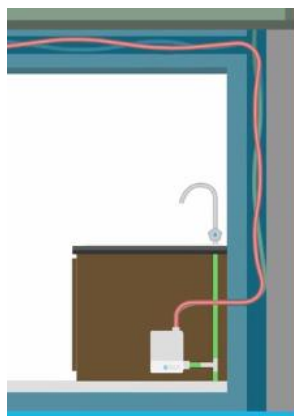
On average PUCK uses 80% less water



PUCK



Sprinklers



Development stage:

Under Development

References

1. <http://www.puckfire.com/>

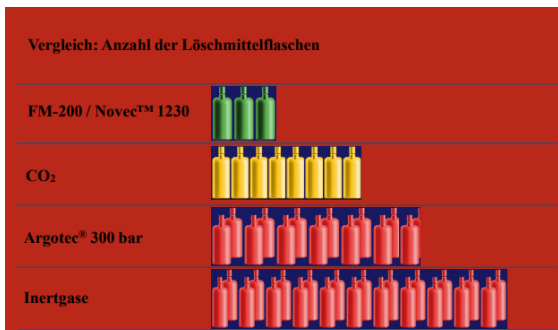
Prevention

Detection

Protection

Extinguish Fire

3M Novec 1230 Fire Protection Fluid



Description

- ▶ Extinguishes a fire in seconds, before it even starts and long before water-based systems discharge.
- ▶ Helps protect irreplaceable paper documents and electronics. Because Novec 1230 fluid is a waterless fire suppression solution, it leaves no residue and is electrically non-conductive.
- ▶ Provides the highest margin of safety for human occupancy of any clean agent solution.
- ▶ Is not subject to the Halon 1301 phaseout or HFC phasedown under any global regulatory body, including the Montreal Protocol.
- ▶ Comes with a global environmental warranty — the 3MTM Blue SkySM Warranty, designed to provide additional peace of mind.
- ▶ Is stored as a liquid and discharged as a gas.
- ▶ Is appropriate for Class A, B and C fire hazards.

Development stage:

Retail (Product)

References

1. <http://multimedia.3m.com/mws/media/644805O/extinguishing-mechanism-of-novec-1230-fire-protection-fluid.pdf>
2. http://solutions.3mdeutschland.de/wps/portal/3M/de_DE/Novec/Home/Product_Information/Products/?PC_Z7_RJH9U5230OLB014HB8HRT3OC0000000_nid=V96QT B3Q4Qbe97VBRX36CMgl

Prevention

Detection

Protection

Extinguish Fire

Electric fire extinguisher



Description

- ▶ Concept from the Harvard University
- ▶ Extinguish fire by electrical fields
- ▶ This invention could bring enormous advantages for firefighters. The so-called "wall system" generates an electric field with a strength of one million volts per meter. This field is generated by a 600 watt amplifier that is just as powerful as that of a high-end car radio. As part of the research on this project, the researchers brought the "electric fire extinguishers" close to a flame. This then went out immediately. The revolutionary discovery could also prevent damage caused by extinguishing water or other extinguishing agents such as foam and others. Fire brigades as well as other security institutions could use these devices.

Development stage:

Under Development (Prototype)

References

1. <https://www.trendsderzukunft.de/elektrischer-feuerloscher-loschen-ohne-wasser-und-schaum/>

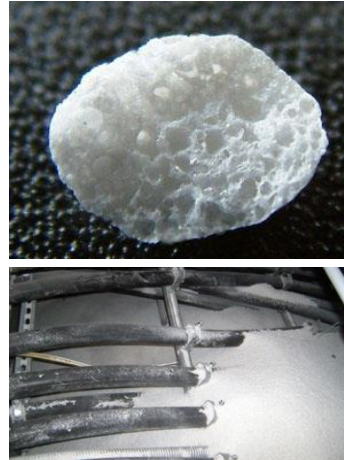
Prevention

Detection

Protection

Extinguish Fire

Pyrobubbles



Description

- ▶ Pyrobubbles are small white globules with an average grain size of 0.5 - 5 mm that can be used **as extinguishing agents as well as in preventive fire protection**. Unlike water, they do not cause fire-fighting water damage. The hollow glass granulate produced by Genius consists mainly of silicon dioxide and is assigned to building material class A1.
- ▶ The granulate is **applied to the fire by gravity manually, mechanically or with downpipes**. Due to its dense storage or pouring it **suffocates the flames**. At temperatures above 1,100°C it melts into a continuous layer above the fire load. Normally - at lower temperatures - it can be absorbed and mostly reused. It is suitable as an extinguishing agent for solid and liquid substances.

Development stage:

Retail (Product)



References

1. <https://www.genius-group.de/>
2. <https://www.baunetzwissen.de/brandschutz/tipps/news-produkte/granulat-als-loeschmittel-4694223>
3. http://www.deutschlandfunk.de/glaskugeln-als-feuerloescher.676.de.html?dram:article_id=231570

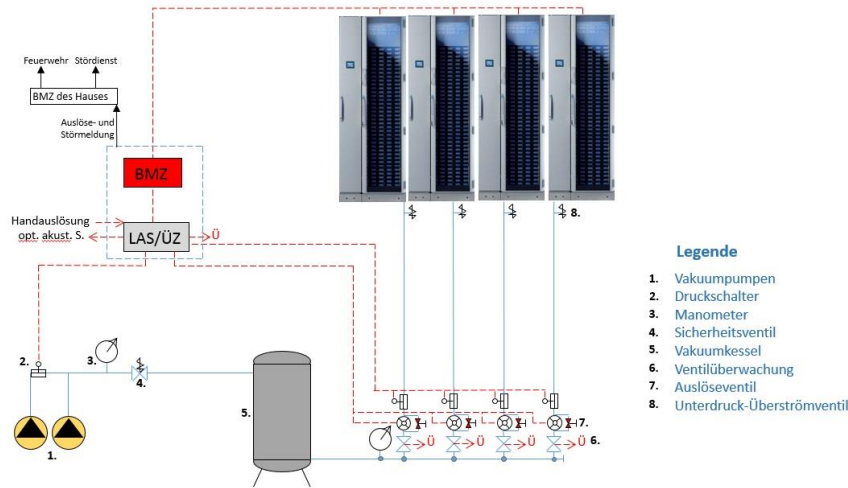
Prevention

Detection

Protection

Extinguish Fire

Vacuum extinguishing systems



Description

- ▶ A vacuum extinguishing system removes part of the air from a previously defined room volume, so that the oxygen content is no longer sufficient to maintain an exothermic oxidation reaction. In the absence of oxygen, heat is no longer produced and the fire extinguishes. Switch cabinets must be specially designed for connection to a vacuum extinguishing system in order to form and maintain a partial vacuum and to withstand the load of the air pressure differential. Existing ventilation openings must be provided with flaps which close in the event of a fire or vacuum and are pressed on in a self-sealing manner by the difference in air pressure. The deletion leaves no damage and minimizes loss of use and production as well as storage losses. If there are persons on the premises, warning times must be observed. The extinguishing system is particularly suitable for server rooms, operating theatres and clean rooms.

Development stage:

Retail (Product)

References

1. <https://www.baunetzwissen.de/brandschutz/fachwissen/loeschanlagen--mittel/sonderloeschanlagen-4128169>

Prevention

Detection

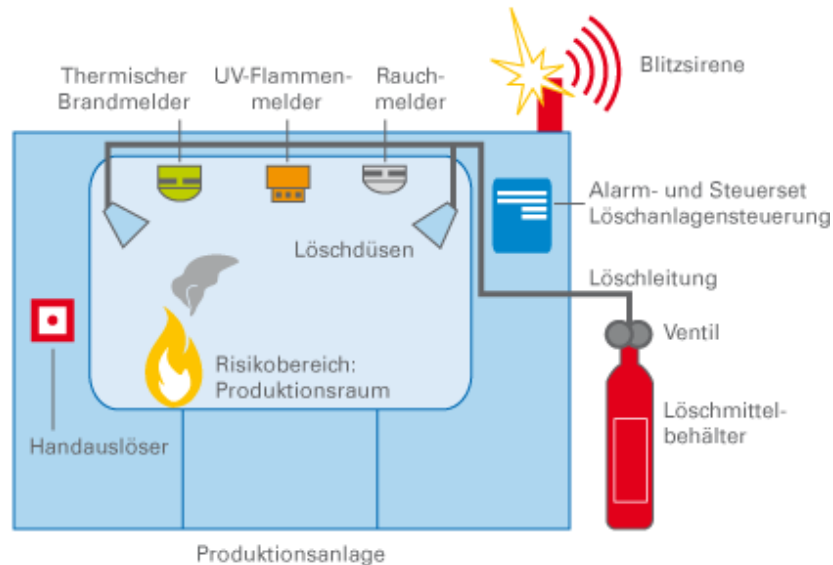
Protection

Extinguish Fire Punctual

Machine extinguishing system



Objektschutz-Löschanlagen



Description

- Friction processes, machining or drying processes often lead to sparks in industrial production. This **flying sparks can cause fires or even explosions**. Spark extinguishing systems are able to detect and extinguish or eliminate even the smallest sparks. Spark extinguishing systems generally operate without interruption - i.e. production continues without interruption despite the activity of the spark extinguishing system, provided the number of sparks and the extinguishing time do not exceed a certain threshold value. However, if the specified threshold value is exceeded, the machines are switched off. Fire detection is carried out by flame and infrared detectors that monitor every area of the machine tool. The extinguishing system can of course also be triggered via a manual call point.

Development stage:

Retail (Product)

References

1. <http://www.scel-systems.de/maschinenloeschanlagen.html>

Prevention

Detection

Protection

Extinguish Fire Punctual

Machine extinguishing system



GLORIA Objektschutz-Löschanlagen – Sicherheit rund um die Uhr

Die GLORIA Löschanlage eignet sich besonders für den Objektschutz, z. B. für Schaltschränke, Funkenerodiermaschinen, Bearbeitungszentren, Werkzeugmaschinen, Ölgelassen u.v.m.

Die Ausführung erfolgt in Anlehnung an die Richtlinien des VDE und VDI sowie der Norm DIN 14497 und ist somit als Feuerlöschanlage für den Einsatz z. B. an Elektroerodieranlagen im Sinne der VDI 3402 geeignet.

Je nach entsprechenden Erfordernissen können als Löschmittel Kohlendioxid (CO₂) oder Argon eingesetzt werden. Beide Löschmittel löschen rückstandslos. Die Dimensionierung der Löschanlagen erfolgt entsprechend dem zu schützenden Objekt, so dass zusätzlich zu den Kundenwünschen auch die Anforderungen der Berufsgenossenschaft berücksichtigt werden können.

Optisch-elektronischer Rauchmelder ODM
Der Rauchmelder erkennt frühzeitig den bei Schweißarbeiten entstehenden Rauch und gibt sofort eine Alarmmeldung zur Zentrale (Steuergerät).
Anwendung z. B. Schweißbränke, EDV-Anlagen

Steuergerät
Mit automatischer Anlagenüberwachung, Löscherauslösung, Zustandsanzeige und Notabschirmung

DIN Feuermelder
Zum manuellen Auslösen der Löschanlage von Hand

Löschschlange
Praktische Sonderausführung zum sicheren Abblasen von Flüssigkeitsbränden

Blitz-Sirene
Für die optische und akustische Alarmierung

Thermischer Brandmelder (a)
Wärme-Maximalmelder in Miniatur-Ausführung mit gezieltem Bereich.
Anwendung z. B. Erodiermaschinen, Härtebecken

Thermischer Brandmelder (b)
Hochreiner, gekapselter Präzisionsmelder Schutzart: IP 65
Anwendung z. B. Abzughäute, Bearbeitungszentren

UV-Flammenmelder
Für die schnelle Branderkennung eines Feuers in der Entstehungsphase
Anwendung z. B. Erodiermaschinen, Löschformen

Löschmittelbehälter
mit Schweißschutzhelm, Schlauchmutter und Anschlußdose

Description

- ▶ Two extinguishing agent container
- ▶ Automatic extinguish system
- ▶ Gas extinguisher

Development stage:

Retail (Product)

References

1. <http://www.gloria.de/Documents/086253-03.pdf>

Prevention

Detection

Protection

Extinguish Fire Punctual

Kitchen extinguishing systems



Description

- ▶ In large kitchens, such as those found in restaurants, hotels, canteens, hospitals, homes, etc., the food is prepared **using large quantities of hot fats and oils**. Typically these are tilting frying pans, grill plates, hobs with roasters and deep fryers. Large quantities of hot fats or oils entail a considerable risk of fire: spontaneous combustion with devastating consequences can occur even at 350° C.
- ▶ All systems use the same special extinguishing agent **Febramax-S**. The extinguishing agent Febramax-S is a hygienically harmless extinguishing agent and almost residue-free. It is **based on water with a special additive and extinguishes fat fires** 2 extinguishing effects: The extinguishing agent is finely distributed on the source of the fire and covers it with a film-forming layer. On the one hand this interrupts the oxygen supply and the fire goes out and on the other hand the source of the fire is cooled by the water.

Development stage:

Retail (Product)

References

1. <http://www.minimax.ch/de/kuechenloeschanlagen>

Prevention

Detection

Protection

Extinguish Fire Punctual

China powder Automatic Fire Extinguisher



Description

- ▶ 90ABC Dry Powder

Development stage:

Retail (Product)

References

1. https://www.alibaba.com/product-detail/China-powder-Automatic-Fire-Extinguisher-Ball_60681848994.html?spm=a2700.7724838.2017115.387.44656937xBp63N&s=p

Prevention

Detection

Protection

Extinguish Fire Punctual

Aerosol Fire Extinguisher Technology



Description

- ▶ An innovating, clean and economical extinguishing agent
- ▶ Aerosol is a cost effective alternative to halon.
- ▶ The extinguisher is suitable for fighting fires in closed environments, where the risk is caused by the availability
- ▶ Solid combustible material as woods, papers, cloths, composed materials, plastic material and other such things
- ▶ Liquid combustible material as oils, gasoline and other such products resulting from the refining of petroleum, organic solvents, resins, etc.
- ▶ The aerosol is not dangerous for the human beings
- ▶ It doesn't corrode or damage other materials
- ▶ Removable with common vacuum cleaner
- ▶ Wash away with fresh water

Development stage:

Retail (Product)

References

1. http://www.weiku.com/products/14633204/YG_Aerosol_Fire_Extinguisher_Technology.html



Prevention

Detection

Protection

Extinguish Fire Punctual

Smart sprinkler



Description

- ▶ Locates the source of the fire and uses water there in a limited way
- ▶ There is a **sensor on the ceiling** that scans the room for unusual heat developments.
- ▶ The alarm and activates the individual sprinklers. However, these are not on the ceiling, but on the walls of the room. From there they determine the **hottest spot in the room with the help of an infrared scanner**. This source of fire is then **bombarded with water until the temperature has dropped to such an extent** that it is no longer a hazard.
- ▶ No Tank necessary
- ▶ 5,6 Liter water per minute

Development stage:

Retail 2018 (Product)

References

1. <https://www.trendsderzukunft.de/weniger-wasserschaden-smarte-sprinkleranlage-bekaempft-das-feuer-effizienter/>

Prevention

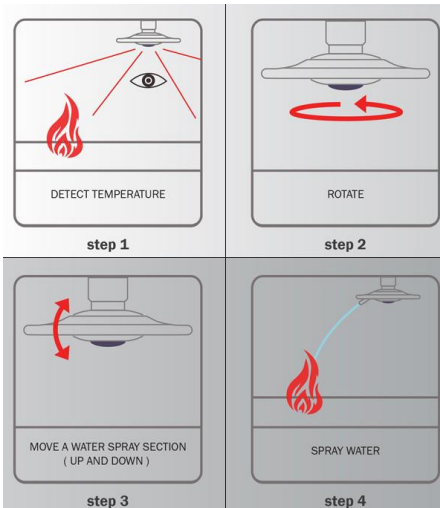
Detection

Protection

Extinguish Fire Punctual Smart sprinkler



Design
Concepts



Description

- ▶ A self-adjusting fire sprinkler system that is simpler, smarter, and safer than most existing models. The design features a heat-detection camera and capacity for movement. Movinkler is fitted with a heat-detecting camera.
- ▶ When the camera detects heat due to a fire, Movinkler starts rotating and its headpiece aims at the fire by moving up and down. It ejects water immediately to put out the fire.
- ▶ Once the fire is extinguished, it stops operating.
- ▶ The sprinkler system extinguishes fire in what would otherwise be dead spots; enables early fire suppression by operating promptly upon detection of a fire; and guarantees far less wastage of water as well as less severe secondary water damage.

Development stage:

Development Stage (Product)

References

1. <http://www.yankodesign.com/2013/11/26/movinkler-say-what/>

Prevention

Detection

Protection

Passive Protection

Smoke protection closures



Description

- ▶ In addition to the fire, dangerous smoke (fire = fire + smoke) is also produced during a fire. In the event of a fire, smoke protection doors (RS) hinder the passage of smoke through openings in walls with fire protection requirements for a certain period of time. **Smoke protection doors are not completely smoke-proof.** Depending on the type of smoke protection closure, certain amounts of air may pass from one side to the other per hour.
- ▶ The fire protection closure with the classification EI 90 (T 90) does not require any compensatory measures such as sprinklers.

Development stage:

Retail (Product)

References

1. <https://www.baunetzwissen.de/brandschutz/fachwissen/bauprodukte/rauchschutz-abschluesse-3139073>

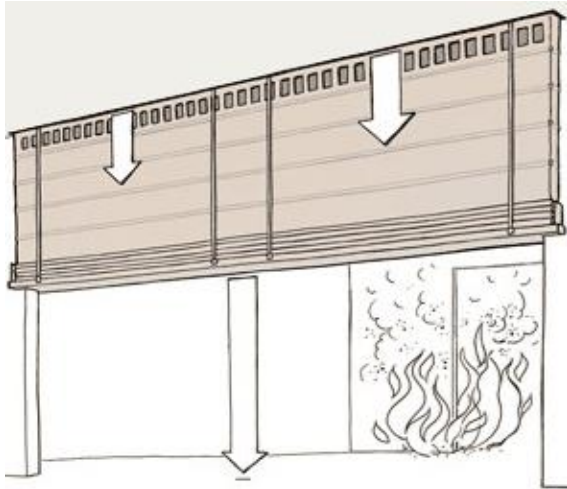
Prevention

Detection

Protection

Passive Protection

Textile fabric as fire protection closure



Description

- ▶ Openings in walls and ceilings which are subject to fire protection requirements must be fitted with **movable fire protection closures**. These can, for example, consist of radiation-inhibiting fabric. The textile fire protection closure can be integrated almost invisibly into suspended ceilings and closes a fire compartment without external energy in the event of an alarm. It is suitable for openings up to 12 metres wide and up to 5 metres high. Thus it offers a new and discreet solution for room closures with open living concepts.



Development stage:

Retail (Product)

References

1. <https://www.baunetzwissen.de/brandschutz/tipps/news-produkte/textiles-gewebe-als-feuerschutzabschluss-3118227>

Prevention

Detection

Protection

Passive Protection

Curtains made of flame-retardant polyester yarn



Description

- ▶ Drinking bottles made of the plastic polyethylene terephthalate (PET) are used as mass-produced disposable and reusable goods and quickly end up in the garbage. Designers have often been involved in the development of products or even buildings that use recycled material or recycle entire PET bottles. The Swiss textile manufacturer Christian Fischbacher has succeeded in producing a flame-retardant fabric from the recycled material with Benu Flow.
- ▶ The bottles are collected in Northern Italy, cleaned, pressed, shredded into flakes and then spun with a flame-retardant additive to polyester yarn. According to the manufacturer, the quality of the yarn is strictly controlled, its flame resistance is molecularly anchored in the fiber. The result is a light, softly flowing and translucent textile that is suitable as stage and decoration fabric as well as privacy and sun protection.

Development stage:

Retail (Product)

References

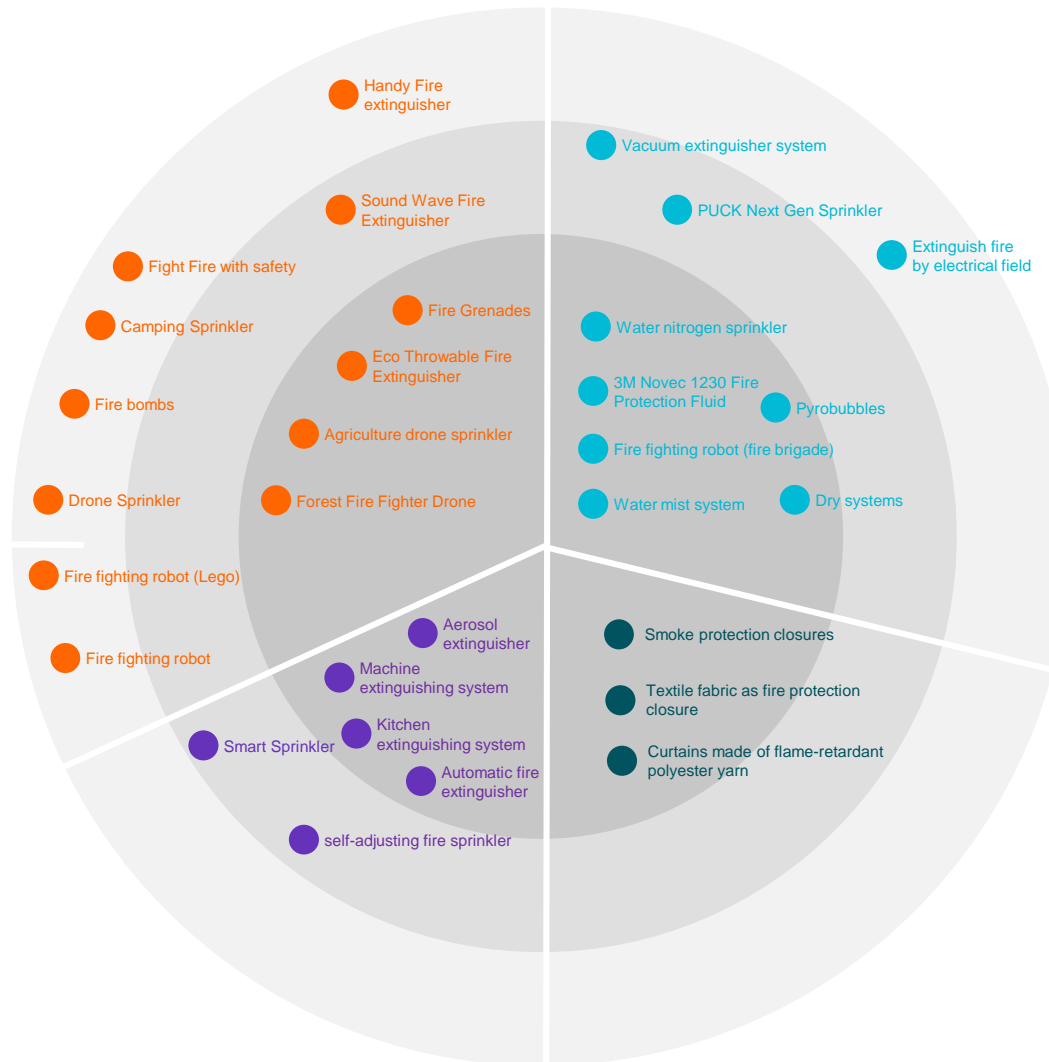
1. <https://www.baunetzwissen.de/brandschutz/tipps/news-produkte/vorhaenge-aus-flammhemmendem-polyestergarn-3980041>

Prevention

Detection

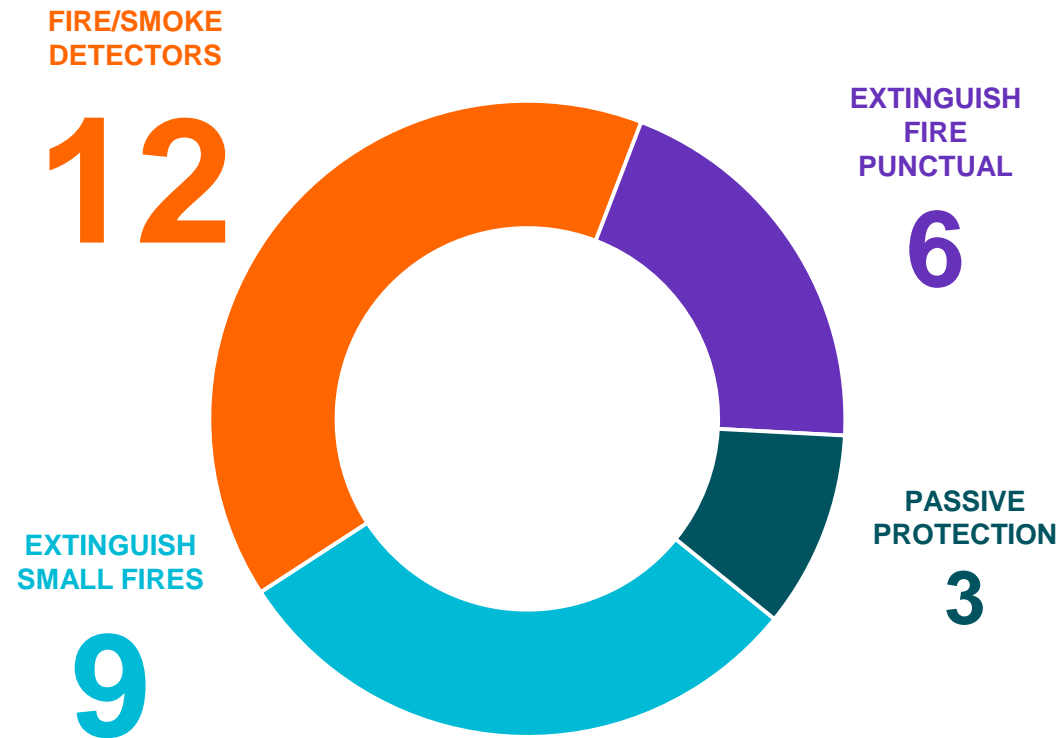
Protection

Protection



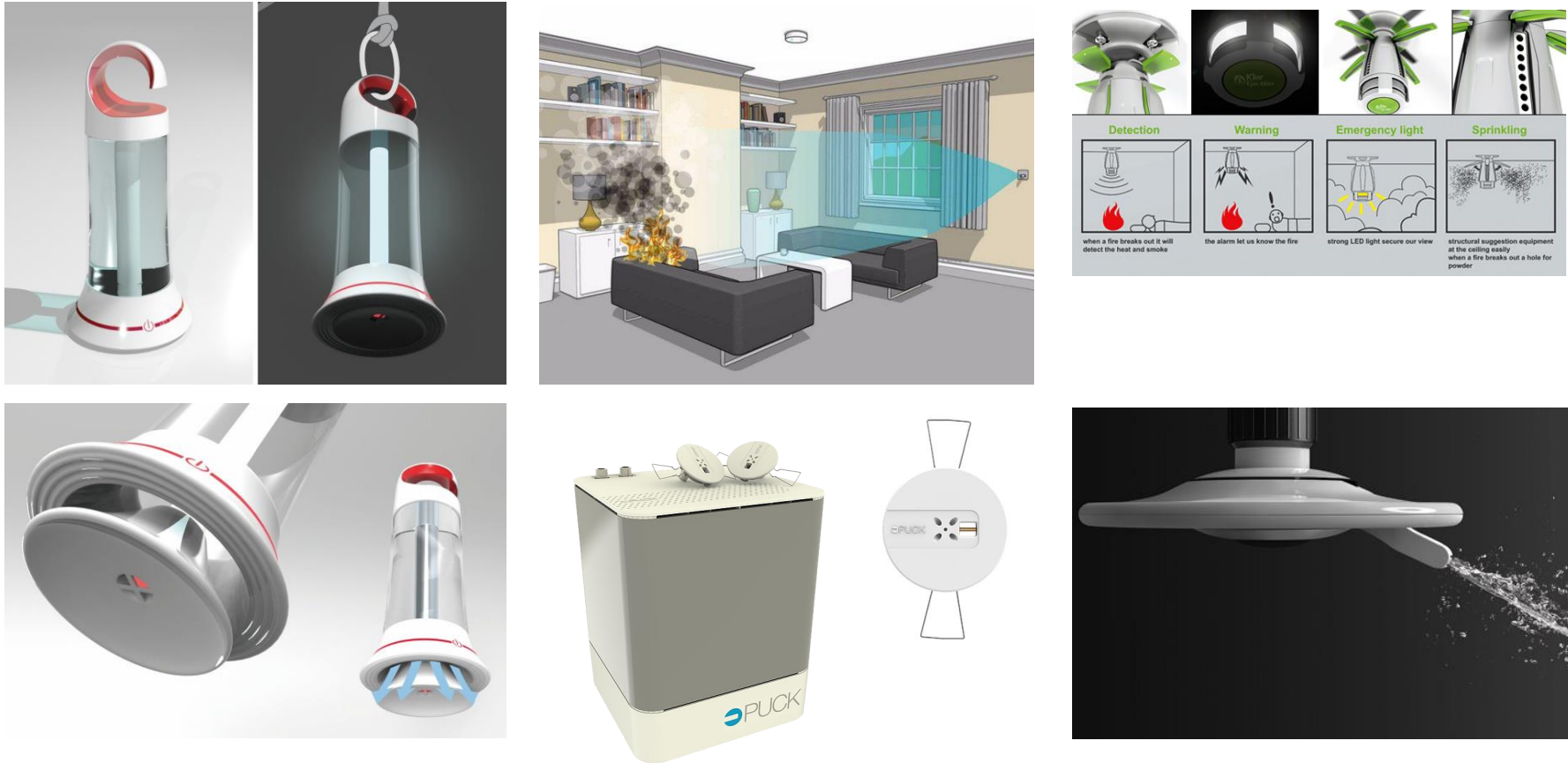
- Extinguish Small Fires
- Extinguish Fire
- Extinguish Fire Punctual
- Passive Protection

Protection



New technologies to extinguish fires are developed and used. There are new extinguishing agents, but also, for example, [electricity as an extinguishing agent](#) or [developments of chemical extinguishing agents](#).

Protection



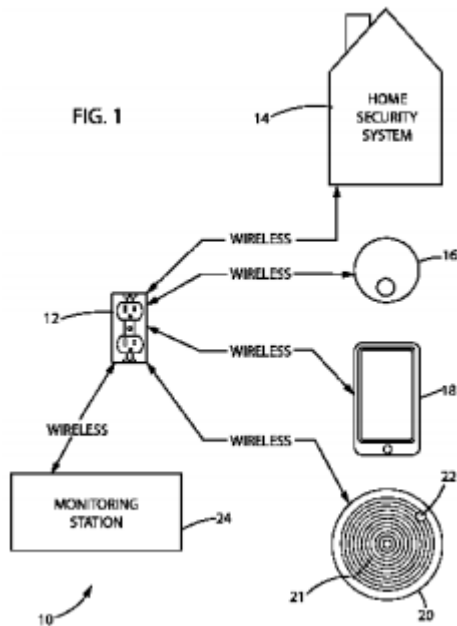
There are several new concepts developed on the sprinkler system. They act very punctually and detect the fire in order to extinguish it punctually and to minimize the use of water.

Often these systems are connected to the normal water network of the house.



Patents





Description

- An electrical outlet has an integrated environment detector such as a fire detector. The electrical outlet has an electrical outlet receptacle with one or more electrical sockets. The electrical outlet receptacle is adapted to be disposed in an electrical outlet box. Advantageously, carbon monoxide sensor along with at least one additional sensor such as heat, particle and smoke are disposed within or integral with the electrical receptacle. A wireless transmitter is operatively associated with the carbon monoxide sensor and the at least one additional sensor for identifying an environmental event such as a fire event.

Patent Number: WO002018035339A1

17.08.2017

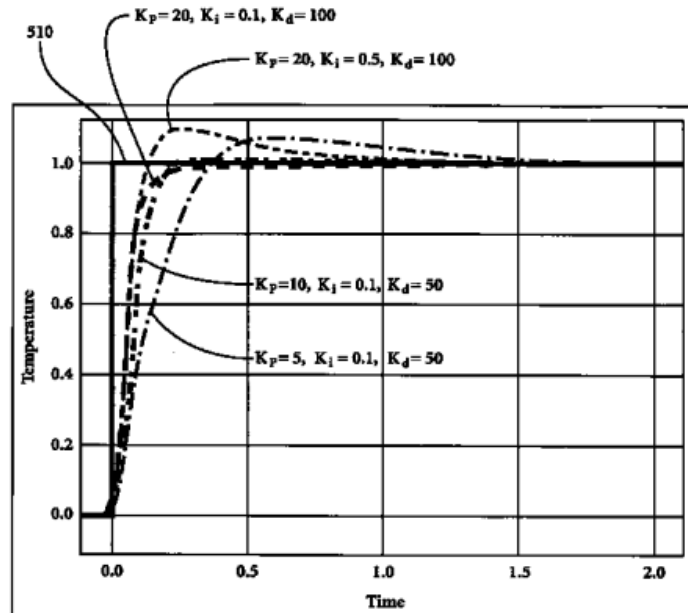
References

1. <https://depatisnet.dpma.de/DepatisNet/depatisnet?action=bibdat&docid=WO002018035339A1>

Prevention

Detection

Protection



Description

- ▶ A system and method for providing greatly improved linear heat detection using fiber optic distributed temperature systems (DTS). The invention makes use of correction algorithms based on proportional-integral-derivative notions that anticipate exterior temperature increases based on the rate of measured temperature changes.

Patent Number: CA000002778227C

05.12.2017

References

1. <https://depatisnet.dpma.de/DepatisNet/depatisnet?action=pdf&docid=CA000002778227C>

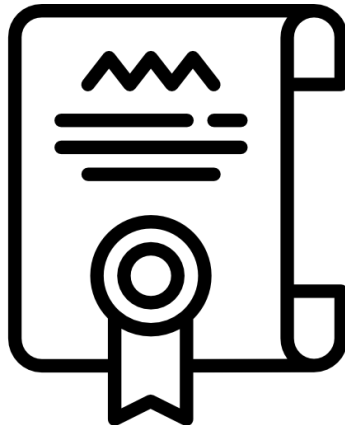
Prevention

Detection

Protection

Patents

Fire detection alarm



Description

- ▶ The utility model discloses a fire detection and tracking means of small -size unmanned helicopter, the device includes: treater, infrared camera, colored high definition digital camera, image acquisition card, yun tai, wherein, infrared camera is used for gathering infrared image, and colored high definition digital camera is used for gathering the color image, and the cloud platform is used for guaranteeing the real -time tracking to forest fire when helicopter flight gesture position change, the infrared image process image processing extraction temperature who obtains is shot through infrared camera to the treater, and circularity, area change are rateed and texture features discerns the conflagration and builds the streaming media server and come the real time transport color image.

Patent Number: CN000206696992U

01.12.2017

References

1. <https://depatisnet.dpma.de/DepatisNet/depatisnet?action=pdf&docid=CN000206696995U>

Prevention

Detection

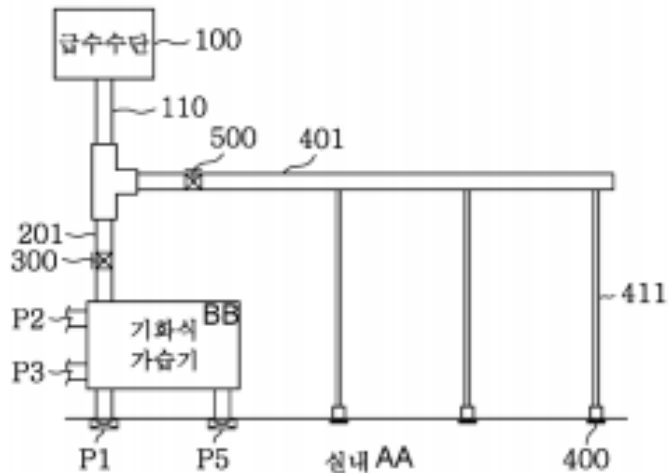
Protection

Patents

Management system for humidification and fire detection



┌



Description

- ▶ The present invention relates to a humidification and fire management system which normally performs indoor humidification by using water supplied through a water supply pipe as humidifying water, and which enables to extinguish fire by using water supplied through a water supply pipe as extinguishing water in case of fire.

Patent Number: KR102017126325A

17.11.2017

References

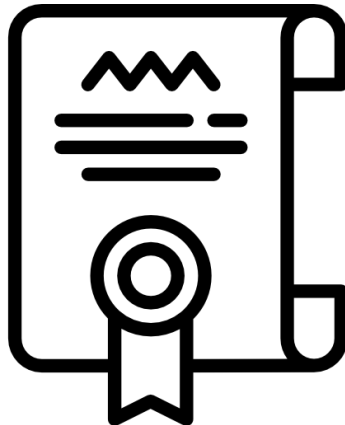
1. <https://depatisnet.dpma.de/DepatisNet/depatisnet?action=pdf&docid=KR102017126325A>

Prevention

Detection

Protection

└



Description

- ▶ The invention discloses an intelligent fire detection method. According to the basic information of a detection-needing building fire projection, the basic information is saved in a database, and a detection scheme, the required detection person quantity and required detection tools are generated; real-time video monitoring record and detection data record are carried out, and the recorded information is stored in the database; after detection is accomplished, a detection report is automatically generated according to received monitoring videos and the detection data.

Patent Number: CN000206696992U

01.12.2017

References

1. <https://depatisnet.dpma.de/DepatisNet/depatisnet?action=pdf&docid=CN000206696995U>

Prevention

Detection

Protection