

# Technology for Life



**Dräger**

# Fire Escape Hoods

## Use in High Rise Residential Blocks



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April 15<sup>th</sup>, 2024 - 8<sup>th</sup> International Tall Building Fire Safety Conference, Indianapolis, US







# Agenda

**Item 01**  
Fire Statistics & Fires in  
High-Rise Buildings



**Item 02**  
What is a Fire Escape  
Hood & What to look for in  
an Escape Hood



**Item 03**  
Escape Hoods in  
Regulated Use Today

**Item 04**  
Questions & Open  
Discussion

01

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# Fire Statistics & Fires in High-Rise Buildings

Between 1993 and 2019, there was a total of  
**3.1 million reported fires** around the world with  
**19.2 thousand recorded fire deaths.**

- CTIF World Fire Statistics 2021

# Fire Statistics

354,400

2019 National Estimates of residential fires in the USA<sup>1</sup>

- *US Fire Administration Residential Building Fire Trends (2010-2019)*

14,500

(2009 – 2013) Average number of structure fires in high-rise buildings. Causing an average of 40 civilian death and 520 civilian fire injuries<sup>2</sup>.

- *NFPA U.S. High-Rise Building Fires Fact Sheet.*

145,208

Number of fires Fire Services attended in England (year ending Sept 21)<sup>3</sup>

- *Gov.uk*

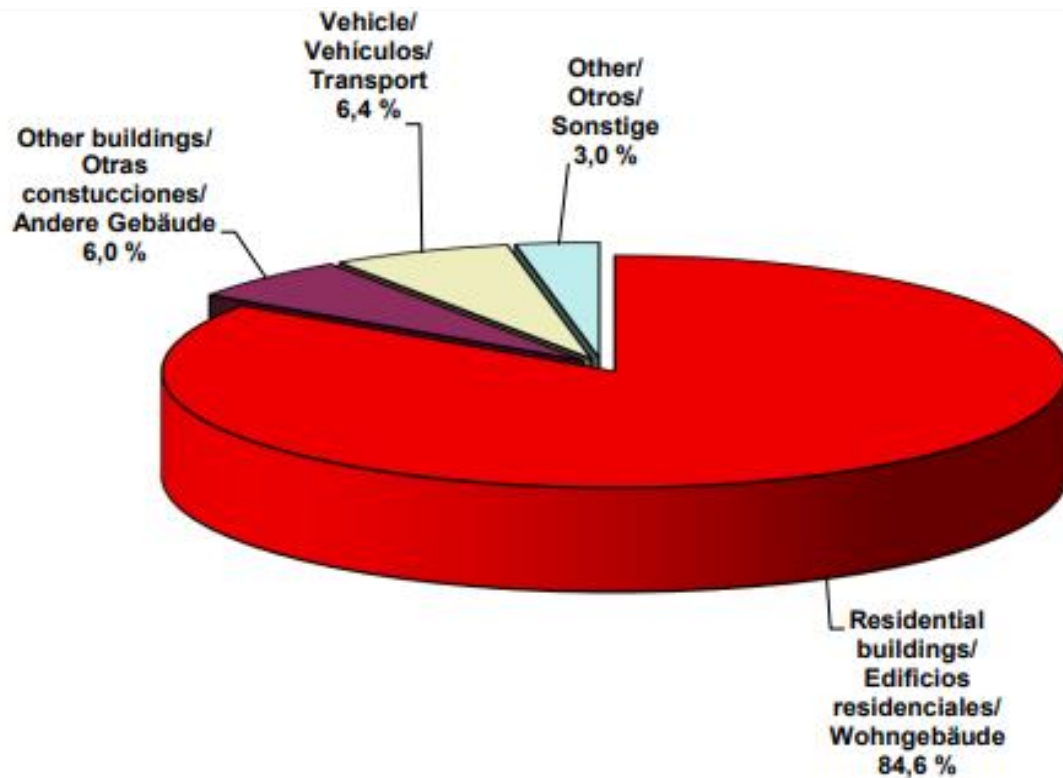
772

of these fires in the UK were in high-rise buildings (10+ story)<sup>3</sup>.

- *Gov.uk*



# Where Fire Deaths Occur



**84,6% of all  
fire related deaths  
occur in  
residential buildings\***

Fig. 1.7: Distribution of fire deaths by types in the counties (2021)  
Fig. 1.7: Distribución de fallecidos según tipo de incendio en países (2021)  
Bild 1.7: Verteilung der Brändtoten nach Objekten der Brandentstehung in den Staaten (2021)

\* CTIF (International Association of Fire and Rescue Services) Report detailing World Fire Statistics from 2023 [CTIF\\_Report27\\_ESG](#)



# What Makes Fire Deadly

**Beyond the flames, it's the smoke that poses a serious threat. Smoke inhalation is one of the most prevalent causes of death in building fires\*. The majority of fire victims inhaled carbon monoxide, smoke and other gases.**

## **Contributing Factors:**

- Thick smoke disorientates
- Fire reduces the oxygen levels
- CO is deadly in small amounts, replaces oxygen in the bloodstream, and is “silent”
- Burning of synthetic substances additionally releases toxic gases



# Major Fires in Tall Buildings



**1945**  
**Empire State**  
**11 casualties**



**1974**  
**Joelema**  
**227 casualties**



**9/11/2001**  
**Twin Towers**  
**2,606 casualties**



**6/14/2017**  
**Grenfell Tower**  
**72 casualties**



**2019**  
**Prešov, Slovakia**  
**8 casualties**



**2020**  
**Czech Republic**  
**11 casualties**



**2021**  
**Milan, Italy**  
**0 casualties**



**Jan 2022**  
**New York**  
**19 casualties**

**April 2023**  
**Beijing Hospital**  
**29 casualties**



**Jan 2024**  
**Germany Hospital**  
**5 casualties**



# Recent Fires in Tall Buildings



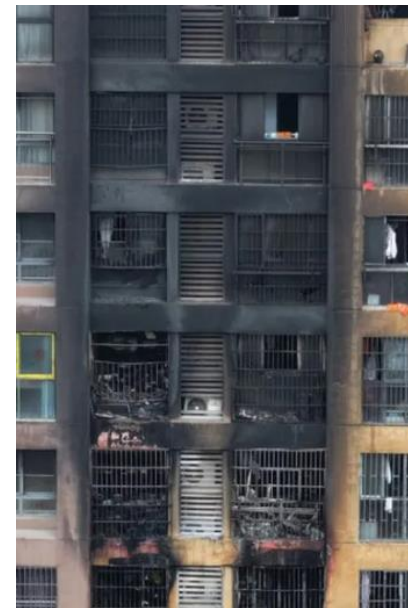
**Mar. 14, 2024**  
**Edinburgh, Scotland**  
**100 evacuated**



**Mar. 14, 2024**  
**Tver, Russia**  
**0 casualties**



**Feb. 23, 2024**  
**Valencia, Spain**  
**10 casualties**



**Feb. 23, 2024**  
**Nanjing, China**  
**15 casualties**

**Top Fire Safety Issues in high-rise buildings\*:**

**1.) Construction of the Building**

**2.) Evacuation of People**

\* According to a study from 2018 titled Fire safety issues in the design and construction of high-rise buildings.





02

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# What is an Escape Hood & What to look for in an Escape Hood

# What is a Fire Escape Hood?

Fire Escape (Smoke) Hood



Device covering head and face.

Visor for view during escape.

Filter protects the wearer from carbon monoxide and fire related gases.

## Definition:

A smoke hood is a hood wherein a bag seals around the head of the wearer while a filter held in the mouth connects to the outside atmosphere and is used to breathe. Smoke hoods are intended to protect victims of fire from the effects of smoke inhalation\*.

\* Source: Wikipedia



# What to Look for in an Escape Hood

01

Ease of Use

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02

Type of Filter for Hazards

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03

Approvals / Certification

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04

Protection for Unused Filters / Hoods

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05

Service Lifetime – Cost of Ownership

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06

Carrying / Storage / Packaging Options

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# Fire Escape Hood Standards & Regulations

## EN 403:2004

- This European standard is valid for hooded filtering escape devices for the individual escape from particles, carbon monoxide and other fire-related gases. No NIOSH or NFPA standards for Fire Escape Hoods.
- The standard defines the minimal requirements for an escape unit (e.g. min. 15 minutes of escape time), the scope of its purpose (e.g. definition as single use only) and describes the required tests and markings.
- This standard is not valid for escape devices, which can be used in case of oxygen deficiency

### Tested gas capacity:

Test gas	Test gas concentration (ppm)	Breakthrough concentration (ppm)
Propenol (Acrolein)	100	<b>0.5</b>
Hydrogen Chloride (HCl)	1,000	<b>5</b>
Hydrocyanic Acid	400	<b>10</b>
Carbon Monoxide	2,500	<b>200</b>
"	5,000	
"	7,500	
"	10,000	

**NO standard =  
NO guaranteed  
protection**

# Examples of Rescue with Fire Escape Hoods



Elderly woman rescued from 4 story burning building.  
May 2016. Duisburg, Germany



Man rescued from building. May 2017. Hamburg, Germany



Woman rescued from smoke-filled house.  
May 2014. Olching, Germany



Man rescued from building via truck ladder.  
Hamburg, Germany



Man and woman rescued from building.  
Germany



Child brought to safety.  
Germany



Woman rescued from building with fire escape hood.  
Germany



# Escape Hoods in Use – Recent Testimonials

BirminghamLive NEWS - IN YOUR AREA BLACK COUNTRY VILLA MORE -

News Midlands News West Midlands Fire Service

## Two rescued from house fire in Lea Hall

Fire crews were called to a semi-detached home in Lea Hall Road

By Andy Richardson  
14:18, 18 JAN 2022

Enter your postcode for local news and info



Firefighters used an escape hood to help save a man from a house fire in Lea Hall (Image: WMFS)

“A West Midlands Fire Service spokesman said: ‘A man’s been rescued using one of our fire escape hoods this lunchtime (18 Jan). The call came in at 12.20pm.’”

LFB LONDON FIRE BRIGADE ABOUT US SAFETY COMMUNITY INCIDENTS NEWS CAREERS SCHOOLS

Last updated: 08/03/2022, 10:11 AM

## Fire at block of flats and offices - Whitechapel

07/03/2022 | 15:53 | Tower Hamlets | House or flat fire

Twenty fire engines and around 125 firefighters were called to a fire at a block of flats and offices on Whitechapel High Street.

A three-roomed flat on the 17th floor of the building was destroyed and part of another three-roomed flat on the 18th floor was also damaged by the blaze. Half of an external 19th floor balcony was also damaged by fire.

Station Commander Chris Jenner, who was at the scene, said:

“This was a dynamic and visible fire with our 999 Control Officers taking more than 50 calls in the early stages. A woman was trapped by the nature of the fire on the 17th floor. She was given fire survival advice by control officers until firefighters located her. Fire crews used a fire escape hood to help lead the woman to safety via the internal staircase.

“Around 70 people evacuated the building with others remaining in their unaffected flats.

“We mobilised a 64 metre turntable ladder to the scene. This is the tallest firefighting ladder in Europe and allowed us to get water onto the fire from outside the building.

“The professionalism, hard work and quick actions of control officers and firefighters limited the damage to the block and prevented serious injuries.”

Fire escape hoods provide members of the public with up to 15 minutes protection from four of the main fire gases (carbon monoxide, hydrogen cyanide, hydrogen chloride and acrolein) and can be worn by conscious or unconscious

“A woman was trapped by the nature of the fire on the 17th floor. She was given fire survival advice by control officers until firefighters located her. Fire crews used a fire escape hood to help lead the woman to safety via the internal staircase.”

The Star News you can trust since 1887

## South Yorkshire fire service invests in 'escape hoods' to protect against toxic fumes and smoke

South Yorkshire fire chiefs have invested in new 'fire escape hoods' to protect people from toxic fumes and smoke.

By Claire Lewis  
Thursday, 31st June 2022, 10:05 am



The hoods provide members of the public with up to 15 minutes of protection from four of the main fire gases, including carbon monoxide, and can be worn by conscious or unconscious people.

“These hoods will also provide firefighters with vital extra time to consider their priorities and plan the safest exit route, as opposed to simply getting people out as quickly as possible.”

NEW MILTON ADVERTISER & LYMINGTON TIMES

Home News Sport New Forest Christchurch People Lifestyle Advertise Job


## New fire escape hoods piloted after Grenfell Tower tragedy

By Chris March - chris.march@advertiserandtimes.co.uk  
Published: 01:01, 19 April 2021

NEW life-saving kit to protect casualties against toxic smoke is being used for the first time by firefighters in Christchurch.

Brought in following recommendations from the Phase 1 report of the Grenfell Tower public inquiry, the fire escape hoods provide at least 15 minutes of protection from toxic fire-related gases, vapours and particles.

Dorset & Wiltshire Fire and Rescue Service procured the hoods from last September, training began in February and the first supplies were delivered to fire stations across the county last month. All of the service's fire engines are set to carry the hoods by the end of April.



A fire escape hood in use during a training exercise (46003966)

“Fifteen minutes of protection against toxic smoke can make the difference between life and death. We would always prefer an escape route away from smoke, but that isn't always possible.”

# Examples of Victim Rescue Without Hoods



Firefighter Bryan Kelly carried an 8-year old girl from fire, Brooklyn Fire, 2014



Bronx Fire, January 2022

03

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# Escape Hoods in Regulated Use Today



# Escape Hoods in Use Oil & Gas / Chemical Industry



## Key Application(s):



1.) Operational use:  
→ Chemical/Fire escape

2.) Offshore accommodation:  
→ Fire escape

3.) Administrative buildings:  
→ Fire escape

# Escape Hoods in Use Fire Services

## Key Application:



## Extinguishing vehicles in Germany require:

DIN 14530-5 (LF10) / DIN 14530-26 (HLF 10)

- two escape hoods acc. EN 403

DIN 14530-11 (LF20) / DIN 14530-27 (HLF20)

- four escape hoods acc. EN 403

## 1.) Victim / Self Rescue:

→ Fire escape

Similar requirements in the Netherlands, Austria, Switzerland and Malta.

In 2018 London Fire Brigade implemented use of Fire Escape Hoods, all other brigades in UK followed suit.

The provision of smoke hoods was one of the key recommendations within the Grenfell Tower Inquiry Phase 1 Report.



# Escape Hoods in Use Hospitals & Care Homes

## Key Application:



Statistically every 14 days a fire in a hospital occurs and every 7 days in a care home.

\* KEVOX / Brandschutz im Krankenhaus



Austrian Fire Fighters Association	Austrian Fire Prevention Policy	TRVB N 133
TECHNICAL GUIDELINES FOR PREVENTIVE FIRE PROTECTION		

Austrian law (TRVB N 133) requires that every hospital & care home keep at least **40 fire escape hoods** on hand for immediate use by fire brigades.

TRVB N 133 05

## 1.) Patient / Personnel Rescue:

→ Fire escape

Wall placement/nurses' stations/stocked



# Escape Hoods in Use Administrative / Public Sector



## Key Application:



### 1.) Administrative buildings

→ Fire escape

Wall-mounted or desk placement

Individual projects, no general regulation.  
In the financial sector for companies working in high rise buildings e.g. New York, individual companies implemented the use of escape hoods in the buildings.  
Trend toward heightening awareness.

# Additional Escape Hood Applications



**Hotels\***



**Hospitals\*\***



**Administration/Office Buildings**



**Residential High-Rise Flats**



**Government Buildings**



**Airport Traffic Control Towers / Power Stations**



**Tunneling**



**Railways / Public Transport**

\* Use of Escape Hoods in Hotels is regulated in China

\*\* Use of Escape Hoods in Hospitals & Care Homes is regulated in Austria

Dräger PARAT Escape Hoods



**PARAT® Escape Hoods -  
When every second counts**



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# Questions & Discussion

# Time for questions

# Thank you

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