

Fire safety engineering

Safeguarding buildings and occupants through engineering excellence



Protecting people and property by applying scientific and engineering principles to fire safety in buildings.



Fire safety in transport

Fire safety in transport systems can pose its own set of unique and challenging problems for designers, builders and managers. BRE's expertise in safety research, consultancy and testing on transport systems and transport infrastructure can help to understand the risks.

The Building Research Establishment (BRE) is at the forefront of driving fire safety engineering as a core discipline in the field of fire safety.

Through research and the development of guidance and associated codes & standards, BRE has helped pioneer the acceptance of fire safety engineering both nationally and internationally.

How can BRE help you?

The evolution of modern building design brings new challenges to fire safety. Buildings are frequently designed to be lighter, environmentally friendly and open in design to promote natural light and improve ventilation. These design principles can often be perceived to be in conflict with the standard fire safety guidance.

Fire safety engineering can involve applying bespoke solutions to a building based on the principles of fire dynamics, smoke movement and human behaviour so as to facilitate design solutions which match the priorities of the design team. These may include maximising a building's functionality and aesthetics, reducing costs and project risks, while helping to safeguard the building and its occupants.

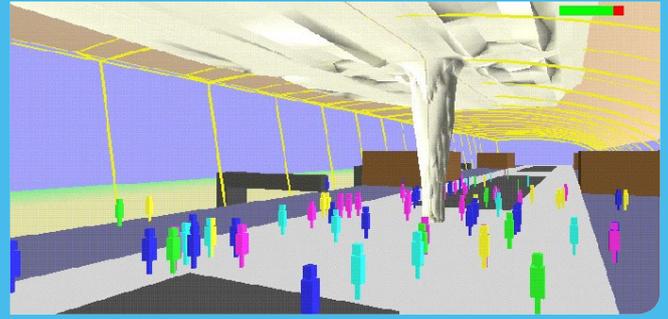
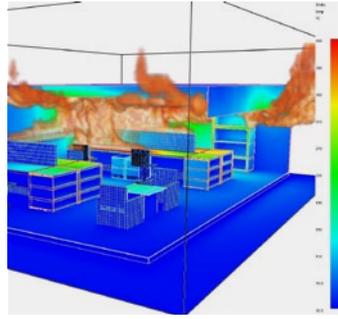
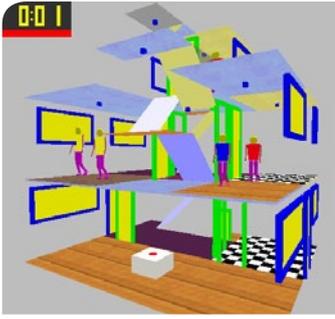
Fire safety engineering can bring significant advantages to the design process for all building types. Common examples include:

- Airports
- Industrial facilities
- Residential blocks
- Shops and shopping centres
- Stations
- Healthcare buildings
- Museums and art galleries
- Schools
- Stadia
- Tunnels and transportation buildings

To maximise the benefits that our fire safety design team can provide to a project, it is important to consider the fire safety implications at the earliest opportunity (i.e. RIBA Stage 2 or before).

The BRE Group has extensive world class facilities including:

- Resistance and reaction to fire test rigs
- Modelling facilities including physical scale and numerical
- The Burn Hall with environmental protection.



Comprehensive range of services

BRE's fire safety engineering team is well known within the UK. Our extensive experience coupled with access to some of the most advanced experimental fire safety facilities allows us to provide unique solutions to fulfil clients' needs and project aspirations.

Our comprehensive range of services includes:

- Compliance checking against guidance and regulations
- Fire detection and alarm systems
- Fire behaviour modelling, Computational Fluid Dynamics (CFD)
- Fire investigation
- Fire risk (and hazard) assessments
- Fire safety management
- Material performance
- Means of escape analysis
- Peer review
- People movement and egress modelling
- Smoke and heat exhaust ventilation system design and modelling
- Structural fire precautions
- Suppression systems

Successful fire safety design requires an understanding of the interactions between a number of different aspects and methods of analysis. BRE is fully equipped to advise you of interactions such as:

- Fire detection and alarm
- Fire suppression and control
- Passive fire protection measures
- Heat transfer within building components
- Human behaviour and egress
- Smoke spread and control
- Toxicity and tenability
- Fire development and dynamics
- Probabilistic risk analysis and Monte-Carlo simulations
- Fire fighter response



Human behaviour in fire and emergency evacuation design

BRE has proven, internationally-recognised expertise in the field of human behaviour in fire and emergency evacuation design. It has been at the forefront of the application of research in the development of regulatory tools and systems.

Advanced simulation methods

BRE pioneered the original development and application of Computational Fluid Dynamics (CFD) for predicting the spread of smoke and heat from fires. A number of computer modelling tools used in simulation have also been developed by BRE.

Building Information Management (BIM)

Both BIM and COBie (Construction Operations Building Information Exchange) are becoming more prevalent within design teams and supply chains enabling more collaborative, efficient ways of working.

Fire safety engineering at BRE embraces both these technologies through various innovative means to ensure that we can support the needs of design teams and provide continued commitment within supply chains.

BRE's fire safety group has undertaken considerable research and development into the application of similar technologies for providing intelligent real time feedback of fire scenarios within buildings.

The use of these technologies for communicating and controlling information relating to the fire strategy for the building together with fire safety management and fire risk assessment are ensuring that the services BRE provide are future proof.

About BRE

BRE Group

BRE is an international, multi-disciplinary, building science organisation with a mission to improve buildings and infrastructure through research and knowledge generation, and their application. BRE employs over 600 people in the UK, China, India, the Middle East and the USA who are committed to building a better world together.

Our products, services, standards and qualifications are applied in over 80 countries enabling our customers to make a positive difference to the built environment. We are owned by a charity called the BRE Trust, which delivers one of the largest programmes of built environment education and research for the public good.

BRE Global

BRE Global Limited (incorporating LPCB & BREEAM) is an independent third party approvals body offering certification of fire, security and sustainability products and services to an international market. BRE Global's product testing and approvals are carried out by recognised experts in our world renowned testing laboratories. BRE Global Limited is custodian of a number of world leading brands including:

- LPCB for the approval of fire and security products and services, listed in the Red Books.
- BREEAM the world's leading environmental assessment method for buildings, sets the standard for best practice in sustainable design and has become the de-facto measure of a building's environmental performance.



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BRE Trust

The BRE Trust uses profits made by BRE Group to fund new research and education programmes that will help it meet its goal of 'building a better world together'.

The BRE Trust is a registered charity in England & Wales:
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