

bre

BRE FIRE CONFERENCE 2015

11th June 2015



Part of the BRE Trust



Characterisation of the fire issues associated with mobility scooters

BRE Fire Conference 2015
11th June 2015

Martin Shipp
Fire Safety Team, BRE Global



Part of the BRE Trust

The problem

- Ensuring fire safety for the residents of care homes and sheltered accommodation for the elderly is one of the biggest challenges facing the fire safety community in the coming decades.
- The need to maintain fire safety provisions in such buildings often conflicts with the every-day life of the occupants.

The problem

- Mobility scooters present a potential obstruction to escape.
- There is now a clear and increasing body of evidence to show that mobility scooters present a fire risk in themselves, often while charging, which can result in the production of quantities of smoke and heat.
- Need to quantify the size of fires.

DVLA categories of scooters and wheelchairs

- Class 1 - Manual Wheelchairs, i.e. self-propelled or attendant propelled, not electrically propelled. These are not required to be registered with DVLA.
- Class 2 - Powered Wheelchairs and scooters – intended for footway use only with a maximum speed of 4mph and an unladen weight not exceeding 113.4kgs. These are not required to be registered with DVLA.
- Class 3 – Powered Wheelchairs and Scooters with a maximum speed of 8mph generally intended for use on roads/highways. They must be fitted with a device capable of limiting the maximum speed to 4mph for use when travelling on footways. The unladen weight must not exceed 150kgs. These are required to be registered with DVLA.

The market

- There is a lack of comprehensive, reliable commercial data on the size of the mobility scooter market and that published data focuses on sales value rather than units sold.
- “Best estimates” put the number of units sold per year at approximately 80,000 and total number of UK users at approximately 300-350,000.
- There is an expectation of high levels of annual sales growth in the sector (5-10%) and a widening range of retail options - specialist and mainstream shops, charity trading arms, second-hand sales, catalogue and online retailers.

The problem

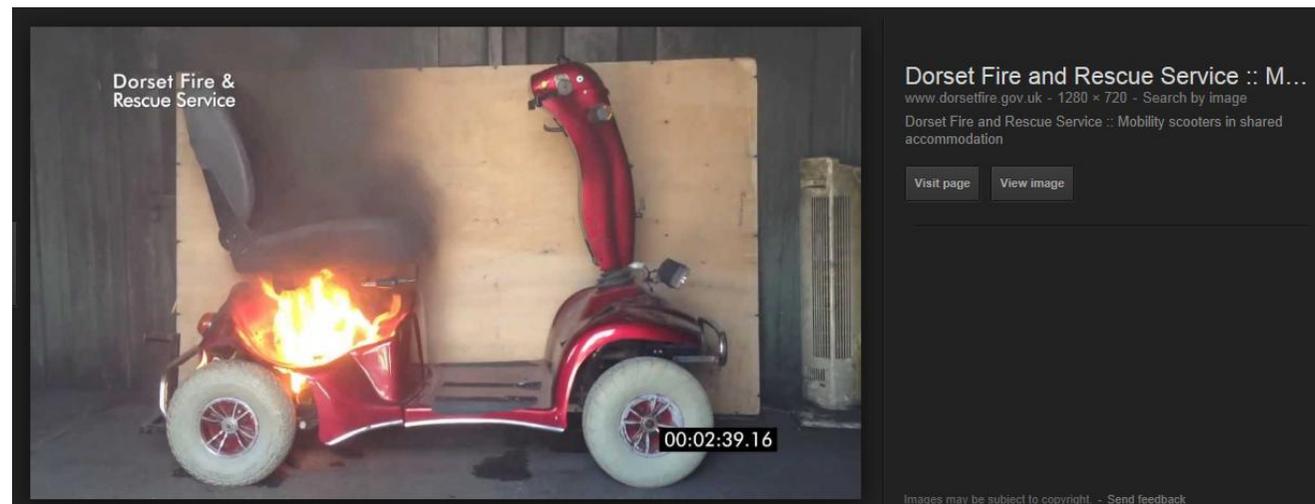
- Mobility scooters can now be found in a wide variety of premises.
- Their presence in the common areas of flats and care homes (corridors, stairways and other circulation spaces) and sheltered accommodation with common areas that is causing particular concern.
- Not all elderly users of mobility scooters appreciate the risks presented to their fellow residents.

The problem

- The (non-fire) safety risks of mobility scooters are being questioned and those injured by these machines seek compensation.
- There have been a number of fire incidents involving mobility scooters already reported:
 - A fatal fire involving a mobility scooter left on charge overnight.
 - A case of a fatal fire that was a result of an arson attack on a scooter.
 - In one case, it is reported that the scooter “exploded”.

The problem

- The fire risks of mobility scooters are already recognised by fire and rescue services and other agencies who provide advice.
- South Yorkshire Fire and Rescue Service have released some results of a survey looking into fires involving mobility scooters.



By permission of Dorset Fire & Rescue Service

bre

Objective

- To quantify the rate of production of quantities of smoke and heat from burning mobility scooters.

Clients

- Welwyn Garden City Housing Association (WGC HA) provides a range of housing, care and support options, mostly for local older people.
- The BRE Trust is a research and education charity for the public benefit. The BRE Trust funds and manages a strategic research programme in the built environment sector

Method

- Carry out experimental measurements of heat release rate and smoke production from burning two mobility scooters located in a short “corridor” under the BRE 9m Calorimeter.
- Large scale fire experiment carried out in a “corridor” experimental rig under the large calorimeter hood in the BRE Burn Hall.
- Two scooters were located in the experimental rig, next to each other along one side of the rig, as if parked for charging.

Method

- Instrumentation and cameras were started and then a fire was initiated in the charging point of scooter 1 and allowed to develop.
- The fire initiation was intended to simulate an arson attack.

The Scooters

- The mobility scooters used in the fire experiment and provided to BRE by WGC HA.
- The scooters used were in full running order (though not necessarily legally roadworthy).
- For added realism, a charger unit was attached to scooter 2, but not connected to the mains.

Disclaimer

- The mobility scooters used in the fire experiment in this research programme were selected solely on the basis of availability.
- Neither scooter was selected on the basis of make or model.
- None of the findings in this research programme should be taken as suggesting that any particular make or model of mobility scooter performs better or worse in fire, compared with any other make or model.

bre

Scooter 1

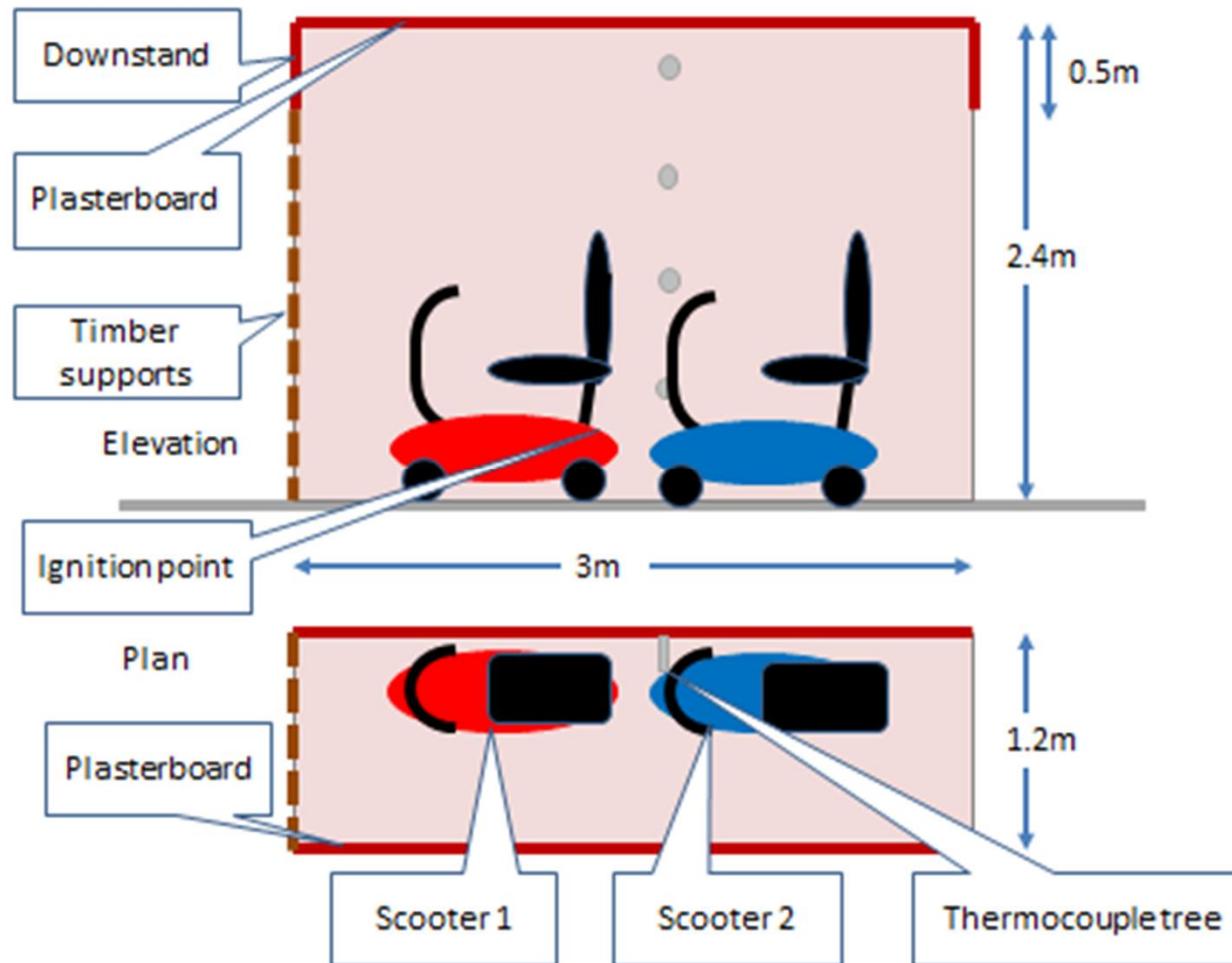


bre

Scooter 2



Experimental rig



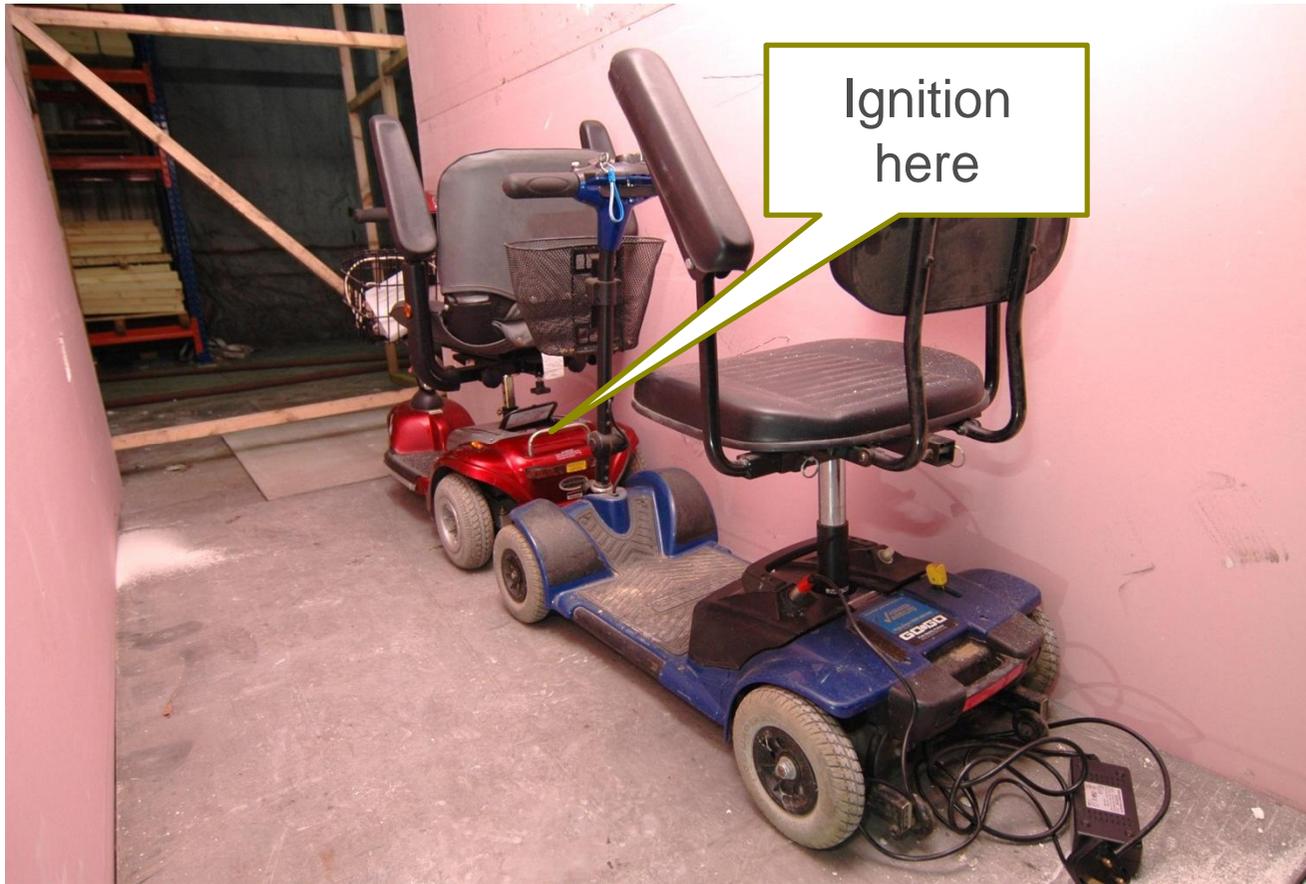
bre

Scooters in rig



bre

Scooters in rig



bre

Ignition, and after 2 minutes



bre

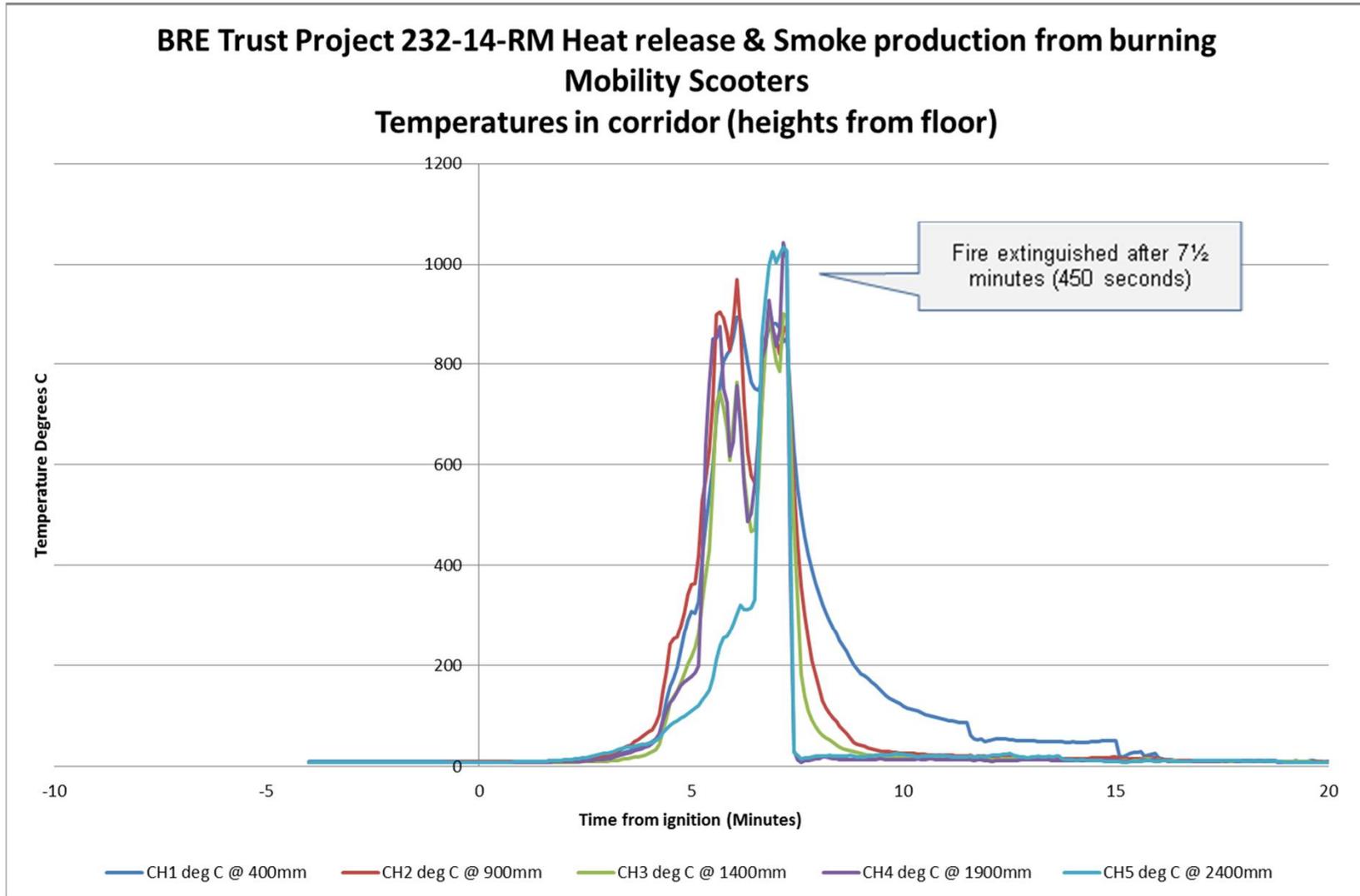
After 7½ minutes



Remains

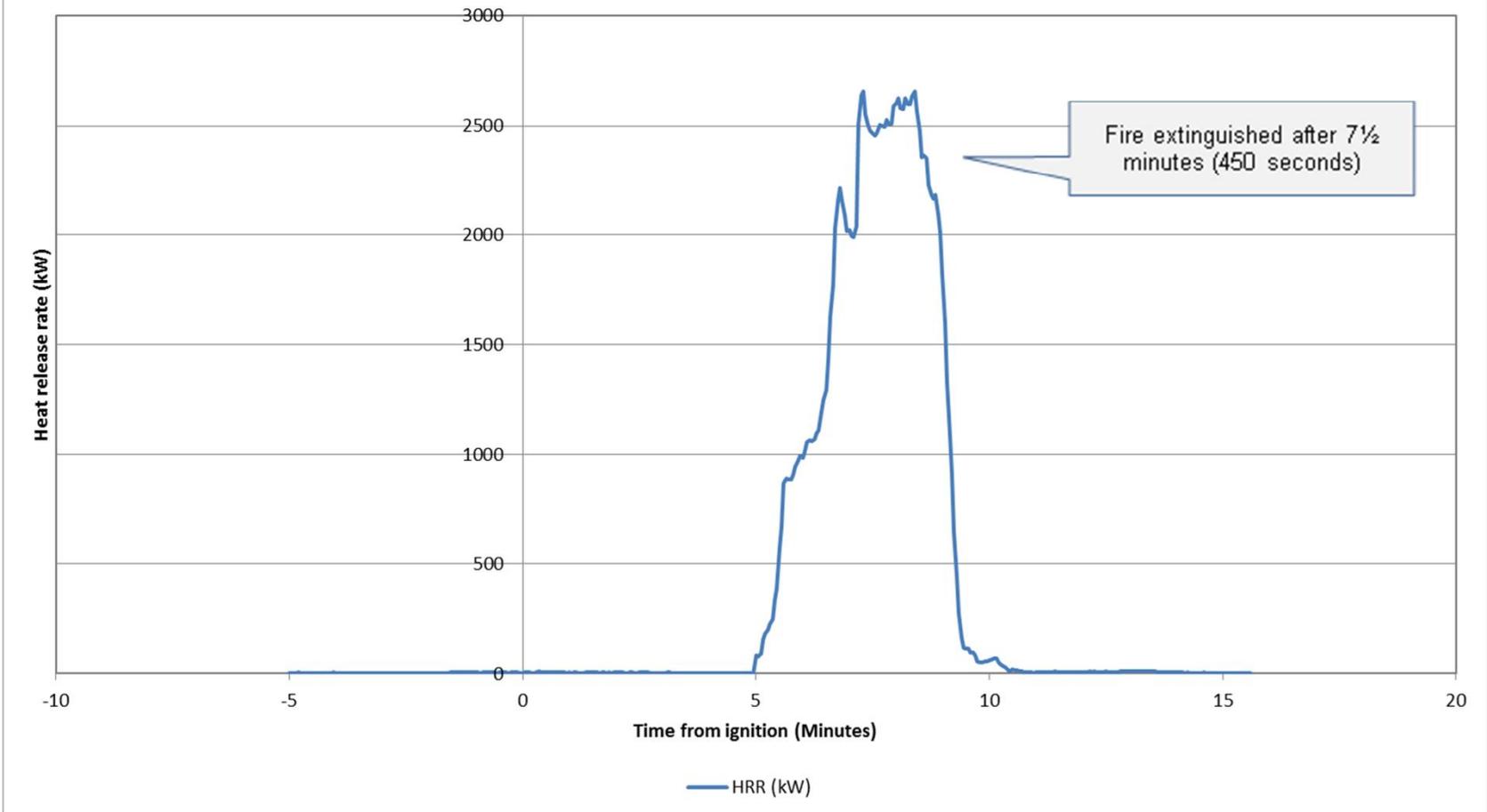


Results



Results

BRE Trust Project 232-14-RM
Heat release & Smoke production from burning Mobility Scooters
The Heat Release Rate



Conclusions

- It is evident that a fire involving mobility scooters, within the confines of a corridor or stairway, will create a substantial risk to occupants since the smoke and heat will make such routes impassable and put at risk any occupants who open their doors.
- The findings from this research provide a data resource for the fire safety engineering of flats, care homes and sheltered accommodation and other types of occupancies where mobility scooters may be expected to be found.

Conclusions

- While providing a valuable bench-mark, the experimental results are necessarily subject to the types and number of mobility scooters used.
- It follows that bigger scooters (or a greater number of scooters) are likely to lead to far more severe fires and quantities of smoke. Further work to examine a range of types of scooter would be of value.

Conclusions

- The data should be of value to fire engineers, designers, fire risk assessors, and enforcers working in the care home sector.
- It provides design parameters and allow an objective assessment to be made of the real fire risks from these machines.
- It should inform decision-makers in properties in which mobility scooters are used, in providing information to assist them in determining and managing an appropriate fire safety regime.

Conclusions

- This will enable better founded decisions to be made for fire safety in flats, care homes and sheltered accommodations and assist in providing an appropriate level of fire safety for residents with minimal detriment to normal life.
- The data will also be of benefit to other occupancy types where mobility scooters are in common use such as supermarkets and shopping centres.

Acknowledgements

- Particular thanks go to Reg Bek and Graham Lale of Welwyn Garden City Housing Association for their support and contribution to this project.
- The laboratory work was funded by the BRE Trust.
- The experimental work and data processing was carried out by Phil Clark assisted by Harry Granados, BRE Global, Fire Safety Group.



Thank you

Martin Shipp
Technical Development Director, Fire Safety
BRE Global Limited

BRE Global Limited, Bucknalls Lane, Watford,
Hertfordshire, WD25 9XX, UK
T: +44 (0) 1923 664960 F: +44 (0) 1923 664910
E: shippm@bre.co.uk W: www.bre.co.uk/fire