

Overview of the UK residential ventilation market and initiatives to improve the quality of the Installed systems

25-9-2013



**Presented by
Alan Gilbert**



ABOUT BSRIA – BUILDING SERVICES RESEARCH AND INFORMATION ASSOCIATION

What?

Who?

Where?

Member based
Association

Consultancy, test,
instrumentation
and research

Building services
and construction
industry

ABOUT BSRIA – BUILDING SERVICES RESEARCH AND INFORMATION ASSOCIATION

Formed as the H&V
Research Council

Became the
Building
Services Research
And Information
Association

BSRIA trading
name established

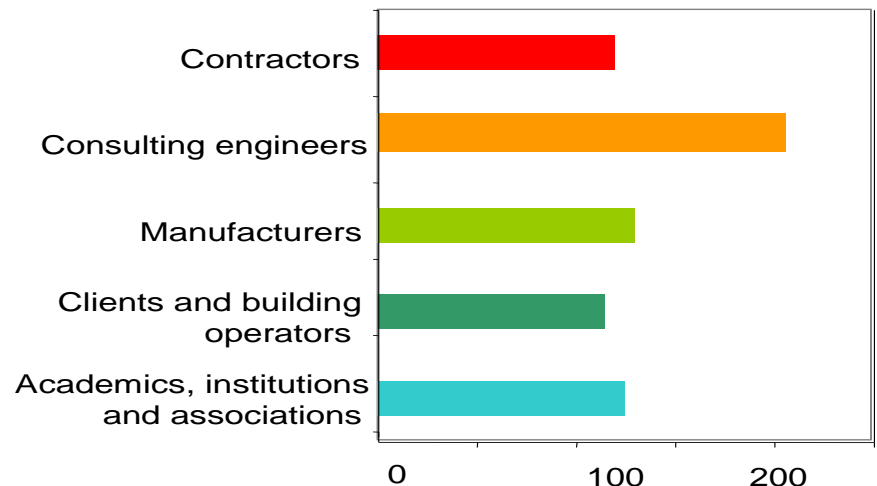
1955

1975

2000

ABOUT BSRIA – BUILDING SERVICES RESEARCH AND INFORMATION ASSOCIATION

- £12.0 M turnover
- 170 staff
- 4,000 sq metres of laboratory space
- Offices in UK, China, North America, Germany, France and Spain; and Associates in Northern Ireland, Japan, Brazil and Australia
- Over 600 corporate members



**BUILDING REGULATION
COMPLIANCE TESTING**

Part E: Sound Insulation
Part F: Ventilation
Part L: Air Tightness



AIRTIGHTNESS – PART L1 – KEY STATISTICS

- 2011 – BSRIA tested approximately 8,500 domestic properties
- 2012 – BSRIA tested approximately 10,000 domestic properties
- 2013 – BSRIA will test approximately 20,000 domestic properties (approx' 35% total tested)



UK HOUSING SECTOR

– KEY STATISTICS (12 MONTHS TO MARCH 2012)

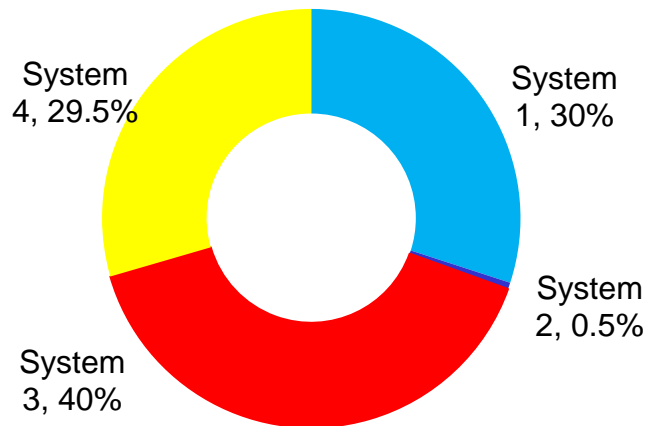
-LAST FULL YEAR OF DATA

- 130,000 dwellings completed
- 27.4 million total number of dwellings in UK =
17.4 million privately owned, 4.7 million
privately rented, 2.7 million rented from housing
authorities and remainder rented from local
authorities



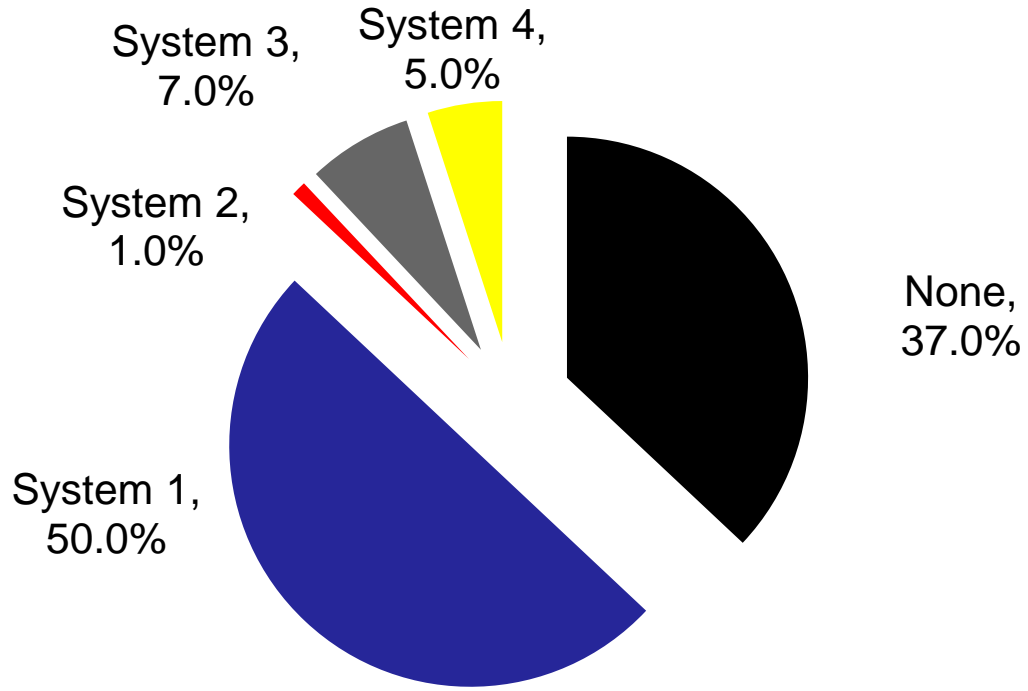
VENTILATION – UK REGULATIONS PART F – KEY STATISTICS

Type	Description	Background (trickle) ventilation	Comments
System 1	Background ventilators and intermittent extract fans including single room heat recovery ventilators	Yes	Size as per tables in Regulations based on floor area and number of bedrooms
System 2	Passive stack ventilation (PSV)	Yes	As above
System 3	Continuous mechanical extract (MEV): centralised and de-centralised	Yes and No	Size as per tables in Regulations or if air permeability $>5\text{m}^3/(\text{m}^2)$ none is required
System 4	Continuous mechanical supply and extract with heat recovery (MVHR): centralised and single room	No	



Estimated percentage mix of new build ventilation system types in 2012

VENTILATION – ESTIMATED PERCENTAGE MIX OF VENTILATION SYSTEM TYPES IN TOTAL UK STOCK



VENTILATION – UK REGULATIONS PART F – KEY STATISTICS

- In 2011 BSRIA tested less than 100 dwellings for airflow performance (completed systems and are post commissioning i.e. completed)
- In 2012 quantity increased to 500 dwellings
- In 2013 approximately 1000 dwellings will be tested for airflow performance



VENTILATION – PART F – KEY STATISTIC (X40 RANDOM SAMPLE)

In 2011 **95%** of all dwellings when initially tested **FAILED** to meet the requirements contained in the Building Regulations. *In 2012 this high % improved but only a little ! 2013 ?*

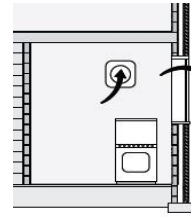
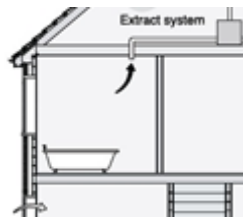


VENTILATION

– KEY FAILURE MODES (X40 RANDOM SAMPLE)

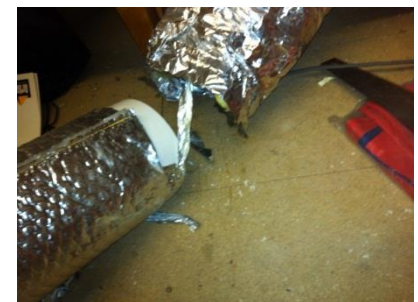
Value	Description
33 (82.5%)	Ductwork incorrectly fitted (kinked / bent / poor joints / excessive length)
10 (25%)	Undersized fans to meet the minimum ventilation requirement
6 (15%)	Insufficient fans or terminal outlets for dwelling type
3	No boost function
3	Incorrect installation data
2	Missing ductwork
1	Blocked ductwork

NOTE : Some dwellings had multiple failure modes



VENTILATION – KEY FAILURE MODES

Poorly installed ductwork is without question one of the largest causes of systems not performing properly.

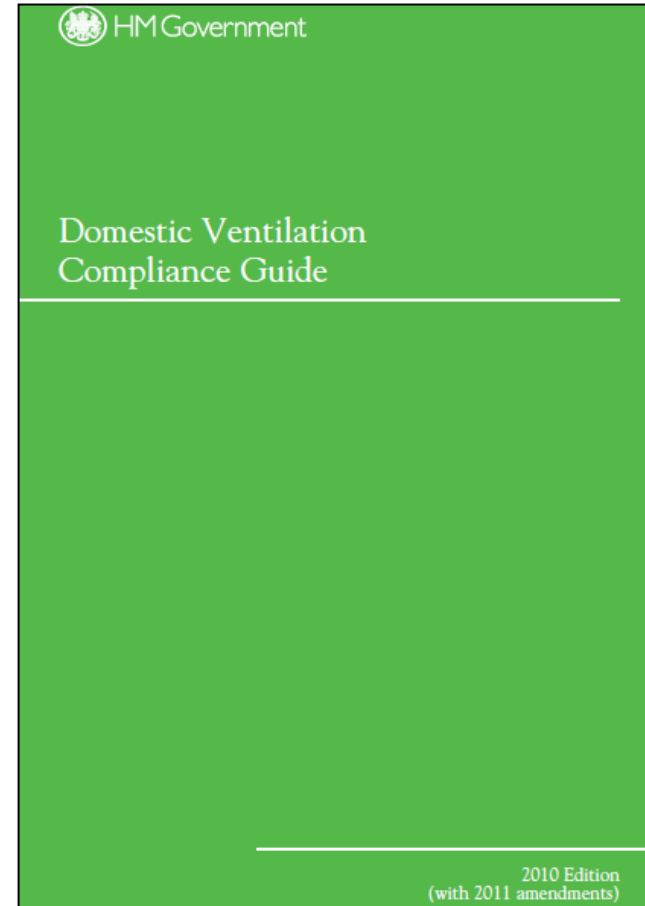


VENTILATION – PART F – KEY STATISTIC (2013 SAMPLE)

- In house study of 242 dwellings % level of failure similar to 2011 92% initially failed to meet the requirements in the Building Regulations



UK DOCUMENTS



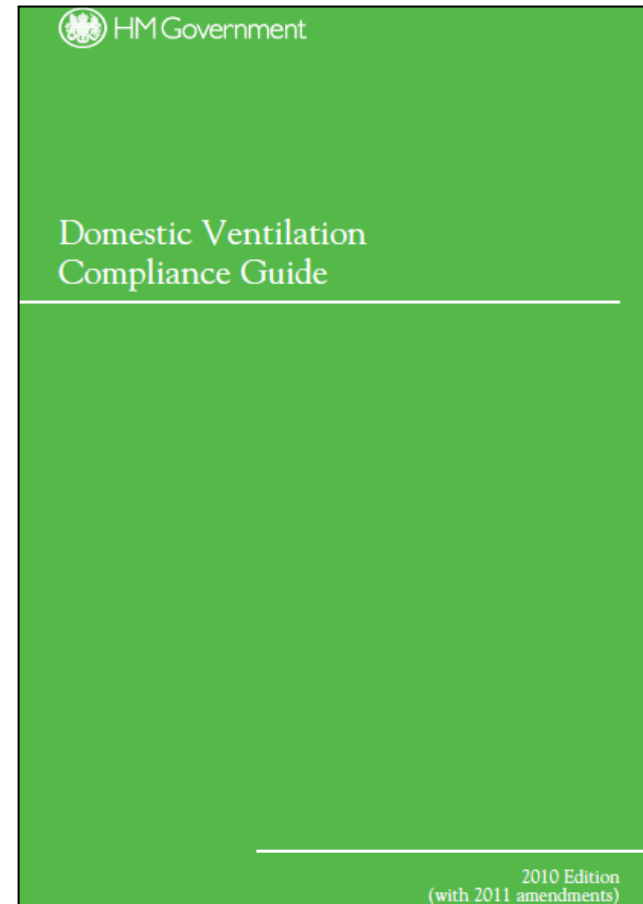
APPROVED DOCUMENT F



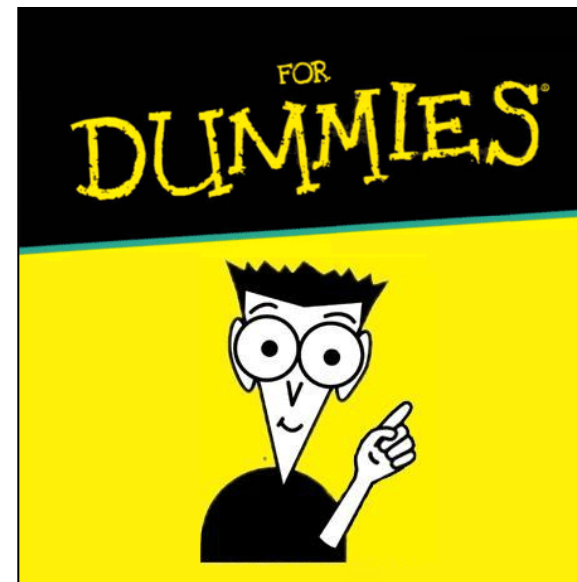
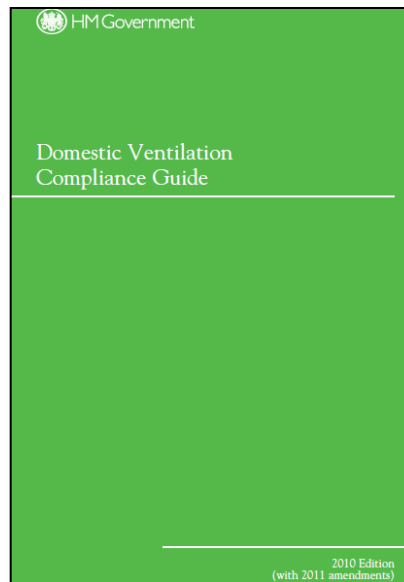
There shall be adequate means of ventilation provided for people in the building” and “Fixed systems for mechanical ventilation and any associated controls must be commissioned by testing and adjusted as necessary”.

DOMESTIC VENTILATION COMPLIANCE GUIDE

Covers installation and commissioning and copies of completed forms should be left in dwelling + submitted to the Building Control Body as evidence that the work has been correctly undertaken.

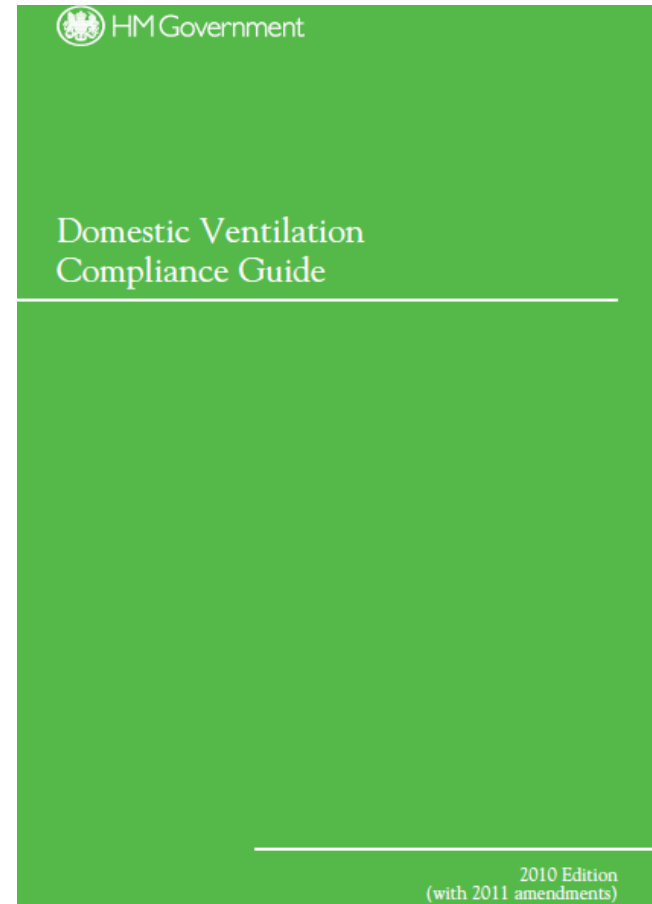


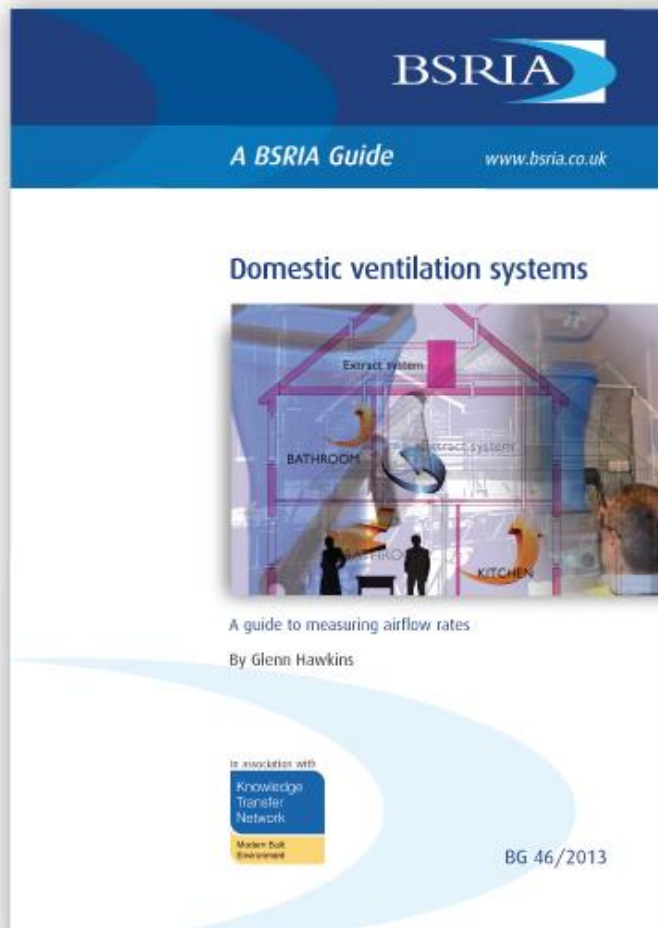
WHAT NEXT ?



WHY DO WE NEED MORE GUIDANCE ?

The Domestic Ventilation Compliance Guide Section 5.2 states “Measurement of air flows should be performed using equipment that has been calibrated at a UKAS accredited calibration centre”.

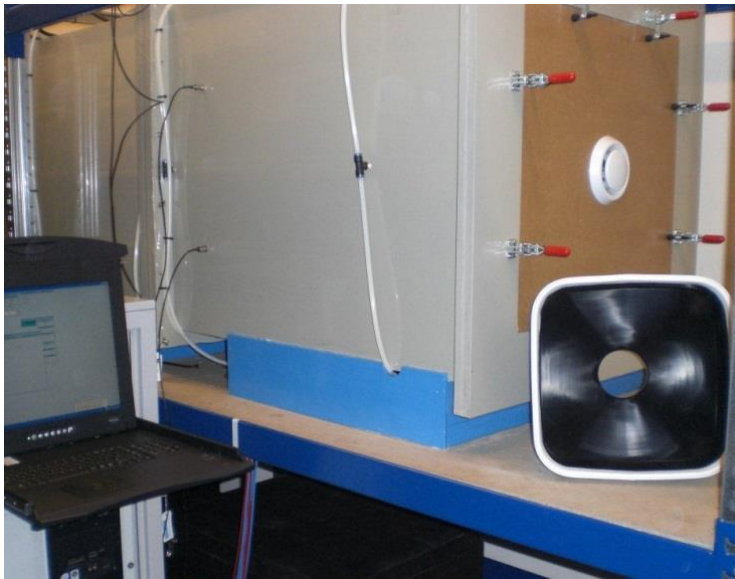




The aim of the guide is to improve the standard of domestic ventilation installations. In particular, it focuses on making sure that the methods used for measuring airflow rates are fit for purpose.

www.bsria.co.uk

LABORATORY STUDY - STEP 1



Laboratory investigation into the market leading vane anemometer & hood assembly measurement accuracies

LABORATORY STUDY - STEP 2



Flow Measurement for Domestic Ventilation Fans

Final Report 57015/2

Carried out for
BSRIA Ltd

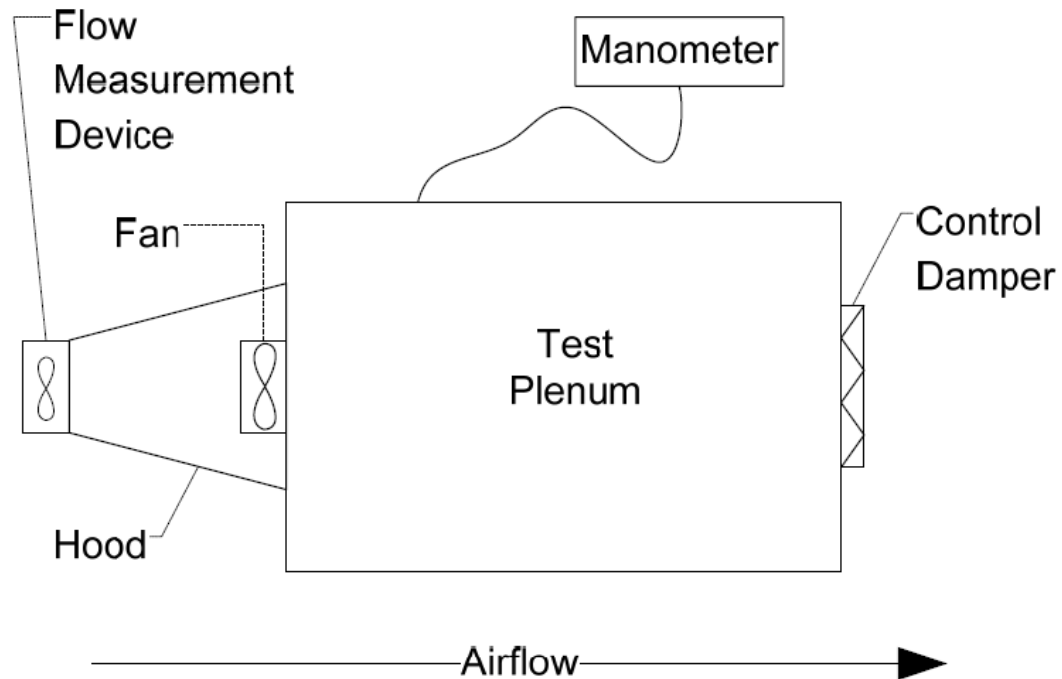
By Mark Roper
16 January 2013



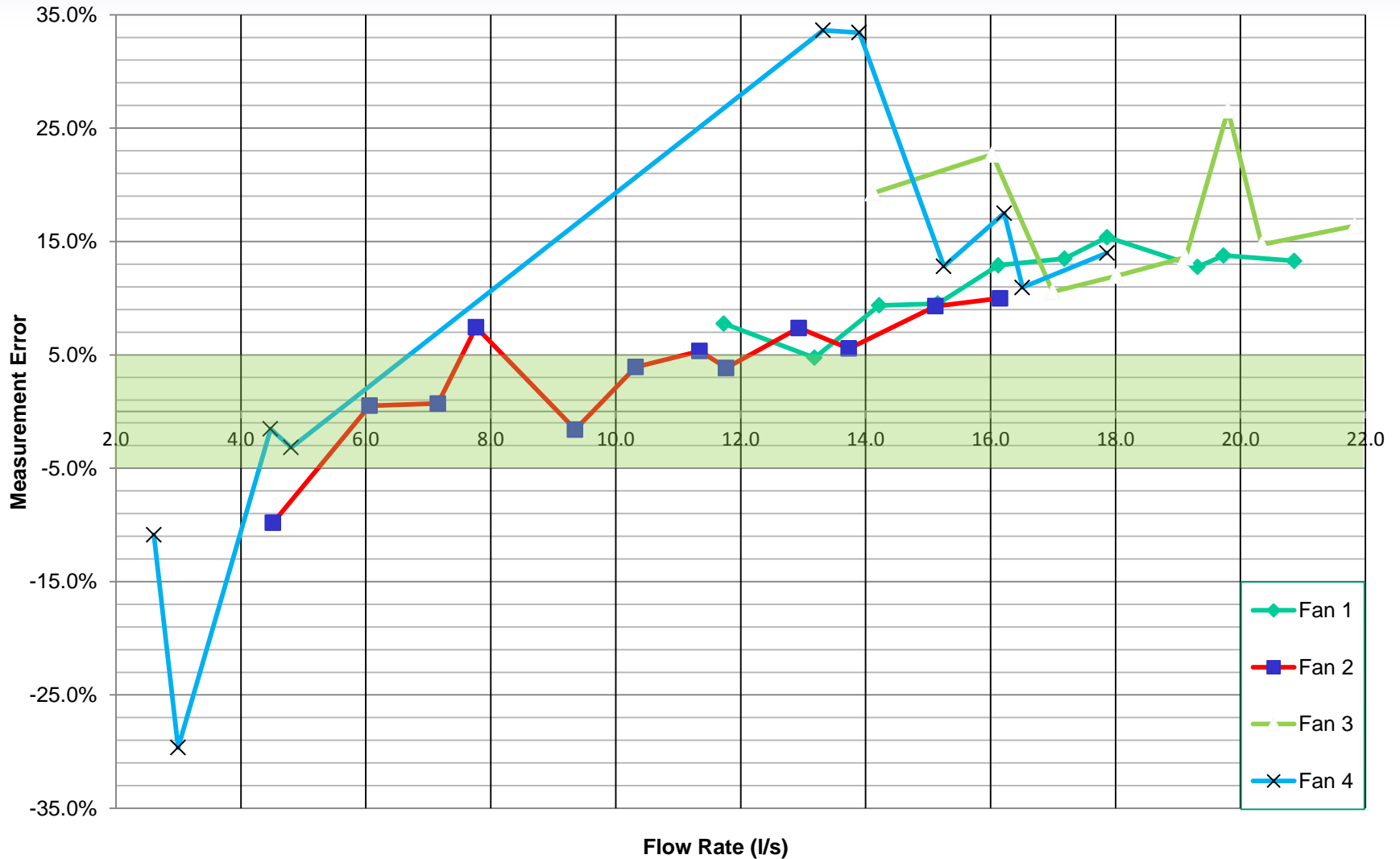
Laboratory investigation into various instruments and how they influenced the performance of typical fans in the marketplace

STEP 2 – TEST SET-UP

Figure 1 Test Rig Schematic



Measurement errors using a UKAS calibrated anemometer - Instrument 1



THE UNCONDITIONAL METHOD - THE PREFERRED METHOD -

- Free from site-specific conditions such as fan type and model, airflow direction and instrumentation characteristics
- Uses a powered hood assembly to eliminate back pressure and turbulent flow effects
- Devices based on a zero-pressure method

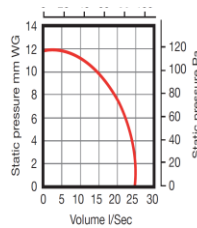


THE CONDITIONAL METHOD

Must take into account specific site conditions such as fan performance characteristics, the resistance to airflow created by the measuring device, correction and conversion factors depending on the instrument used. **This information is currently not available !!!!!**



THE CONDITIONAL METHOD



VIDEO AT www.bsria.co.uk

True air volume

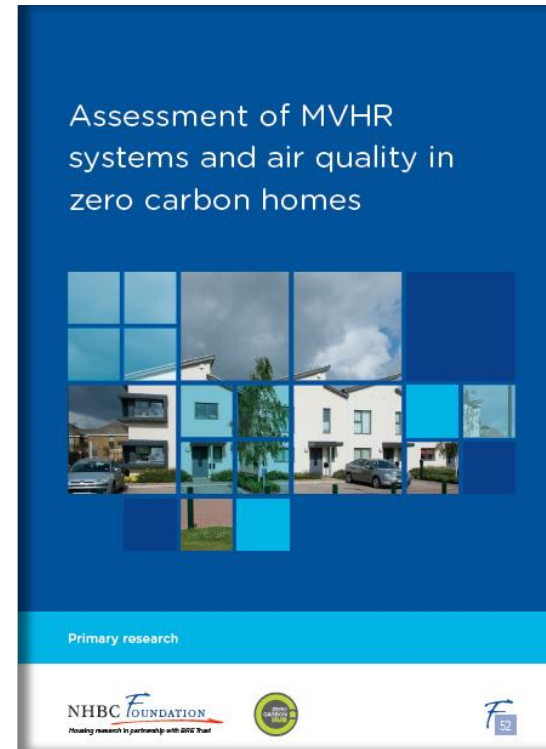
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corrections for the
anemometer + hood
+ fan system

=

Lots of unknowns
especially in
centralised fan
systems with
multiple grilles

WHAT IS INDUSTRY DOING NOW ?



+
NHBC Guidance
(October 2013)

VENTILATION – A FUTURE KEY STATISTIC ?

In 2014 **95%** of all dwellings when initially tested **PASSED** the requirements contained in the UK Building Regulations.



