



# DOORS, WINDOWS AND HARDWARE TESTING

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Making tomorrow safer than today

Element is one of the fastest growing testing, inspection, certification and calibration businesses in the world. Globally we have over 7,000 brilliant minds operating from 200 sites across more than 30 countries. Together we share an ambitious purpose to 'Make tomorrow safer than today'.

# DOORS AND VINDOWS TESTING

Element's UKAS-accredited door, window and hardware facility is based in Wednesbury in the United Kingdom, offering enhanced security, weathertightness, mechanical strength, durability and thermal performance of doors, windows, roller shutters and associated products. We also provide testing for security, corrosion, mechanical strength, durability and thermal performance of building hardware products.

With over 100 years of combined testing experience, Element Wednesbury has experts who sit on test standard panels to ensure we are in the best position to offer a quality and up-to-date service to our clients.

# **OUR TECHNICAL CAPABILITIES**

#### Weathertightness testing

- Air permeability / air leakage testing of doors and windows under positive and negative pressure, typically up to 600Pa
- Watertightness testing under positive pressure
- Wind load testing under positive and negative pressure typically up to 4000 Pa
- Wind load testing of permeable roller shutters via inflatable bags or weights

#### **Physical security testing**

- Manual burglary attempts with typical burglary tools
- Bi-directional static / mechanical loading
- Dynamic / impact loading with 50kg steel impactor / 30kg sand bag / 50kg dual tyre impactor with varied drop height and impact energy

#### Mechanical strength and operational testing

- Accidental loading / abuse tests including overload, impact and distortion / deformation
- Measurement of operating forces to open and close opening element and operate hardware through applied force or torque
- Durability (repeated opening and closing) typically from 5,000 cycle to 1,000,000

#### **Thermal transmittance**

 Calculation of U-value (thermal transmittance) of windows (UW), doors (UD), associated frame members (UF), glazing (UG) and opaque panels (UP)

#### **On-site testing**

 Inspection and verification of safety aspects of roller shutters and confirmation of lifecycle performance of fire curtains



# **TESTING AND CERTIFICATION**

Through BM TRADA and Warringtonfire, we offer certification for enhanced security products.

### Certification offered for doors and windows:

- Q-Mark Enhanced Security Door Scheme
- Q\_Mark Enhanced Security Window Scheme
- Certisecure STS201 Certification of residential doorsets to PAS24
- Certisecure STS 202 Certification of burglar resistance for doorsets, curtain walling, grilles, garage doors and shutters
- Certisecure STS204 Certification of residential windows to pAS24
- Certisecure STS 205 Certification of burglar resistance for cabinets, enclosures and boxes
- Certisecure STS217 Certification of enhanced security cylinders
- Certisecure STS218 Certification of enhanced security letter plates
- Certisecure STS219 Certification of enhanced security letter boxes

An assessment of the physical security of construction products is vital to not only make the homeowner feel secure in their own property, but also for compliance with regulatory requirements.



# **PHYSICAL SECURITY TESTING**

Our bespoke security test rigs are manufactured to accept samples up to five metres wide and three metres high. We carry out physical security and burglar resistance testing to a range of UK industry and European standards on not only doors and windows but also garage doors, roller shutters, letter plates, letter boxes, lock cylinders and handles.

The above offers compliance with the regulatory requirements of Document Q of the building regulations and for entry into the Secured by Design licence scheme.

- PAS24 Security hardware test
- PAS24 Infill removal testing
- PAS24 Manipulation testing
- PAS24 Manual attack testing
- PAS24 Bidirectional mechanical loading
- PAS24 Soft & heavy body impact testing
- PAS24 Hard body impact testing
- TS007 Enhanced security cylinders
- TSoo8 Enhanced security letter plates
- TSoo9 Enhanced security letter boxes

- BS EN 1627 / BS EN 1628 Static loading
- BS EN 1627 / BS EN 1629 Dynamic loading
- BS EN 1627 / BS EN 1630 Manual burglary
- STS202 Burglar resistance for doorsets, curtain walling, grilles, garage doors and shutters
- STS205 Burglar resistance for cabinets, enclosures and boxes
- STS501 Security Testing Standard for mechanical immobilisers
- STS502 Security Testing Standard for bicycle security systems
- STS503 Security Testing Standard for ground anchors
- BS6375-3 Basic security



## WEATHERTIGHTNESS TESTING

It is important that doors and windows are fit for use for the homeowner to have confidence in the product, preventing draughts, rain ingress and damage under wind load.

### Standards we test to:

- BS6375-1 / BS EN 1026 Air permeability test of doors and windows
- BS6375-1 / BS EN 1027 Watertightness test of doors & windows
- BS6375-1 / BS EN 12211 Wind deflection, wind cycle and wind safety test of doors and windows
- BS EN 13241 / BS EN 12444 Resistance to wind load of industrial doors
- BS EN 13241 / BS EN 12427 Air permeability of industrial doors
- BS EN 13241 / BS EN 12489 Resistance to water penetration of industrial doors

We have two state of the art K Schulten weather test rigs, with capacity up to five metres wide and four metres high, for testing doors, windows, industrial doors and shutters for air permeability, watertightness and wind resistance.



### MECHANICAL STRENGTH AND OPERATIONAL TESTING

Doors and windows need to withstand daily usage relevant to their intended use, ensuring all other desired performances are not compromised through the full life cycle of the product.

We test the serviceability of doors and windows with a range of accidental loading and abuse tests, plus full life cycle durability testing. We have the highest capacity in the UK for durability testing, with three dedicated window test rigs, four dedicated single door rigs, three dedicated double doorset / sliding doorset test rigs and two large-scale rigs for bifolding / biparting or large sliding doorsets.

- BS6375-2 / BS EN 12046-1 Operating forces of windows
- BS6375-2 / BS EN 14608 Resistance to racking of windows
- BS6375-2 / BS EN 14609 Resistance to static torsion of windows
- BS6375-2 / BS EN 13049 Impact resistance of windows
- BS6375-2/BS EN 12046-2 Operating forces of doorsets
- BS6375-2 / BS EN 947 Resistance to vertical loads of doorsets
- BS6375-2 / BS EN 948 Resistance to static torsion of doorsets
- BS6375-2 / BS EN 949 Resistance to soft and heavy body impact of doors
- BS6375-2 / BS EN 950 Resistance to hard body impact of doorleaves
- BS6375-2 / BS EN 1191 Repeated opening and closing

- BS6375-2/BS EN 14351-1 Loadbearing capacity of safety devices
- BS6375-3 Closure against obstruction
- BS8613 Finger protection devices for pedestrian doorsets
- DD171 Slamming shut impact of doorsets
- D171 Slamming open impact of doorsets
- DD171 Heavy body impact of doorsets
- DD171 Hard body impact of doorsets
- DD171 Torsion of doorsets
- DD171 Downward deformation of doorsets
- DD171 Resistance to jarring and vibration of doorsets
- DD171 Abusive forces on door handles



# THERMAL TRANSMITTANCE

Energy conservation is a growing concern in the current climate and is mandated by Approved Document L of the Building Regulations.

We carry out calculations for U-values by thermal simulation and calculation using THERM simulation software for compliance with the conservation of energy requirements of Document L of the building regulations. Our trained thermal simulators can also generate window energy ratings for the BFRC energy rating scheme.

- BS EN ISO 10077-1 Thermal performance of windows doors and shutters general
- BS EN ISO 10077-2 Thermal performance of windows doors and shutters numerical method for frames
- BS EN 673 Calculation of thermal transmittance of glazing



# **INDUSTRIAL DOORS**

The safety of industrial doors is paramount and mandated by UKCA marking requirements.

We carry out laboratory-based and onsite testing of industrial doors, assessing their safety performance for UKCA marking purposes.

Mandatory testing includes resistance under wind load, measurement of operating forces for manual operation and the safety performance of anti-drop devices and safety edges. We can also carry out non-mandatory aspects such as air permeability.

- BS EN 13241 / BS EN 12444 Resistance to wind load of industrial doors
- BS EN 13241 / BS EN 12445 / BS EN 12453 Safety in use
- BS EN 13241 / BS EN 12605 Mechanical aspects
- BS EN 13241 / BS EN 12427 Air permeability of industrial doors
- BS EN 13241 / BS EN 12489 Resistance to water penetration of industrial doors



# **OUR TECHNICAL CAPABILITIES**

#### Security testing

- Mechanical loading up to 50kN
- Resistance to attack by twisting, chisel, drilling and plug extraction

#### **Corrosion testing**

- BS EN 1670
- BS EN ISO 9227

#### **Durability testing**

- Repeated operational cycling, typically between 5000 and 1,000,000 cycles
- Electrical release and temperature rise of electrically operated devices

#### **Thermal testing**

 Environmental conditioning and operation of hardware between -40°C and 200°C

#### Mechanical strength testing

- Accidental loading / abuse tests, including overload, impact and distortion / deformation
- Measurement of operating forces to operate hardware through applied force or torque



# **CE MARKING AND CERTIFICATION**

Through our partnership with Warringtonfire we are able to offer certification and CE marking for Attestation of Conformity Level 1 for building hardware products for the following:

### **CE Marking offered:**

- Controlled door closers to EN1154
- Electrically powered hold open devices to EN1155
- Door coordinator devices to EN1158
- Mechanically operated locks to EN12209

- Electromechanically operated locks to EN14846
- Single Axis hinges to EN1935a
- Emergency exit devices to EN179 Panic exit devices to EN1125

### **Certification offered:**

- TS16 Smoke vents
- TS23 Locks and latches
- TS24 Single axis hinges
- TS26 Panic exit devices, operated by a horizontal bar TS32 Letter plates
- TS 31 Emergency exit devices operated by a lever handle or push pad

- TS33 Door coordinators
- TS34 Controlled door closing devices
- TS80 Top and bottom pivots
- TS81 Electromechanically operated locks and strikes
- TS82 Lever handles and knob furniture
- TS83 Variable geometry unsprung and concealed hinges



## **DOOR CLOSER TESTING**

### Closing devices need to withstand daily usage relevant to their intended use, ensuring all other desired performances are not compromised through the full life cycle of the product.

Element Wednesbury's dedicated door closing testing equipment comprises of 27 durability rigs, one environmental chamber and two auto recording doors allowing us to test overhead devices, concealed hardware, pivots and floor springs in both directions.

### **Testing performed:**

# BS EN 1154 Controlled door closer devices

- Operation at extreme temperature
- Mechanical performance and durability
- Delayed action performance
- Back check performance
- Closing overload
- Corrosion resistance

# BS EN 1155 Electrically powered hold open devices

- Settle back at 90° hold open
- Manual release
- Electrical release
- Temperature rise
- Opening overload
- Durability
- Continuous hold open
- Corrosion resistance

# BS EN 1158 Door Coordinator devices

- Overload performance
- Manipulation
- Waiting position
- Durability
- Corrosion resistance



## **PANIC EXIT TESTING**

# It is important that life safety devices are rigorously tested to ensure the safety of everyone and that they work when it matters first time.

Element Wednesbury has ten panic exit testing rigs, allowing us to test single door, double door and concealed products on both left and right hung doorsets.

### **Testing performed:**

BS EN 179 Emergency exit devices operated by a lever handle or push pad for use on escape routes

- Operation at extreme temperature
- Corrosion resistance
- Release tests
- Re-engaging test
- Durability
- Abuse resistance
- Security

BS EN 1125 Panic exit devices operated by a horizontal bar for use on escape routes

- Operation at extreme temperature
- Corrosion resistance
- Release tests
- Re-engaging test
- Durability
- Abuse resistance



### **HINGE AND LEVER FURNITURE TESTING**

# Ensuring the ease and safe opening of doors and windows is paramount to the operation of the end product.

We use our knowledge and experience to test the operational and functionality of the products with six dedicated hinge rigs, two handle durability rigs and one security overload rig.

### **Testing performed:**

#### BS EN 1935 Single axis hinges - Product measurements

- Load deformation
- Overload resistance
- Shear strength
- Endurance
- Corrosion resistance

#### BS EN 1906 Lever furniture and knob furniture

- Spindle and fastening element checks
- Axle strength of lock or latch furniture and fastening elements
- Free play and safety
- Free angular movement or misalignment
- Torque of return of mechanism
- Durability
- Axial strength and method of fastening of special furniture
- Rotational strength
- Corrosion resistance



# LOCK AND CYLINDER TESTING

The security of property is vital to protecting equipment and public from unauthorised intruders. Through compliance with the regulatory requirements we can meet the desired standard and also feel more secure in our property.

We have 15 lock, latch and cylinder rigs allowing us to test all locks of different shapes and sizes to operational, strength, durability, thermal, corrosion and strength resistance.

- BS EN 1303 Cylinders for locks
- BS EN 12209 Locks and latches mechanically operated locks, latches and locking plates
- BS EN 14846 Locks and latches electromechanically operated locks and striking plates
- BE 3621 Lock assemblies operated by key from both inside and outside of the door
- BS 8621 Lock assemblies operated by the key from the outside of the door and by handle or thumb turn from the inside of the door
- BS 10621 Lock assemblies in which the operating mode can be switched between the normal BS 8621 operating mode and a secure mode in which no egress is possible

### **CONTACT US TO FIND OUT MORE**

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