

TECHNICAL UPDATE

MAJOR PROJECTS: ON-SITE WATER TESTING FOR CURTAIN WALLING AND RAINSCREEN CLADDING



Major Projects: On site water testing for curtain walling and rainscreen cladding

Introduction

This guidance provides information to designers, developers and surveyors to assist in meeting the functional requirements of the LABC Warranty Technical Manual where rainscreen cladding and or curtain walling is proposed on a project covered by our warranty.

On site water testing is a critical element of the build process. This update will provide guidance on the type and amount of testing that will be required along with guidance on how and when this should be completed.

Definitions

Curtain wall - a form of predominantly vertical building envelope which supports no load, other than its own weight and the environmental forces which act upon it.

Rainscreen cladding - is the attachment of an outer skin of rear-ventilated cladding to a new or existing building. The system is a form of double-wall construction that uses an outer layer to keep out the rain and an inner layer to provide thermal insulation, prevent excessive air leakage and carry wind loading.

Design requirements

Site water testing is required to all rainscreen interfaces with an opening and to curtain wall elements. Test locations and method of testing to be submitted and approved by LABC Warranty **prior** to testing. The total area to be tested should constitute **at least** 5% by lengths of all joints the specifier considers to be critical.

Where more than one façade type is used, the minimum of 5% must be applied to **each** type. The locations of testing must be spread across each elevation and include the upper quarter of each building.

The first completed area should always be tested for benchmarking purposes **along with the last completed area**. Testing to be in accordance with CWCT standard for systemised building envelopes and in accordance with CWCT Technical Note 41.

Site testing should always be carried out before internal finishes are applied, hence the need for areas, location and method of testing to be agreed as early as possible at the design stage. *Please refer to references and further guidance section for requirements where traditional brick facades are proposed.

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Test methods:

All on site testing should be carried out by UKAS accredited testing organisation with evidence of current membership provided.

Hose pipe

Hose testing (CWCT Section 9, AAMA 501.2-09)

- Hose testing utilises a compressor to force a consistent flow of water through a nozzle, to produce a standard jet of water.
- The nozzle shape and the pressure of water entering it, determines the flow rate of the water passing to the façade.



Hose pipe test attempts to replicate a negative internal pressure by spraying water at pressure. It is suitable for fixed joints only (sealed permanent joints). This test is not suitable for opening vents (windows/doors, as gaskets are too soft).

Hose pipe testing is suitable for curtain walling.

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Spray bar

Spray bar testing (CWCT section 10, BS EN 13051) +

- The spray bar test is a 'deluge' test for resistance against water penetration from water runoff, by developing a spray of water over the face of a cladding system.
- Does not replicate a negative internal pressure.
- Suitable for testing opening joints (windows/doors), or for testing 'protected' elements such as: joints that are protected from wind driven rain, breather membrane installations* and sheathing board installations.*

*Prior to insulation and rainscreen or render systems being installed.



Spray bar testing is suitable for open-jointed systems (e.g. rainscreen cladding and unsealed patent glazing) and opening joints, as water is not forced into the joint.

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Testing and subsequent results:

Testing:

- Before testing, the area to be tested should always be washed with a mild detergent and then rinsed with clean water.
- Site testing should always be carried out before internal finishes are applied - internal finishes prevent observation of the internal surface of the cladding, and would have to be removed anyway if remedial work is necessary.
- It is very easy with hose and spray bar testing for the observer on the inside of the building to be looking at a section of cladding remote from that where the hose or spray bar is actually applied. Good coordination is required, and radio communication between assessor and observer is essential.
- Confirm which site testing techniques are to be used and agreed at the design stage, if they allow fine tuning, what form/modification to the standard sequence is to be used.
- Site test a laboratory mock-up of the sample which has already passed all other specified tests.
- Agree a suitable procedure for remedial action should problems be found.
- Consider how water runoff will be managed to prevent flooding or damage to elements not designed to be wetted, proceed with test.

Results:

- UKAS accredited testing report to be provided with evidence of current accreditation.
- Elevation drawings showing type and area of test as agreed with LABC Warranty surveyor prior to façade works commencing.
- Photographic evidence of internal and external tested areas to be provided within report.
- Test results must confirm if the area tested has passed or failed. No water ingress observed (NWO) – testers must be able to fully inspect the interface seals before they can issue a pass. If it is not possible to completely monitor the inside of the test area(s) due to restricted view, LABC Warranty will not accept a NWO classification.
- If a test fails and then subsequently passes, full evidence of remedial works to be provided to LABC Warranty surveyor so workmanship can be reviewed on site where required.

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Modular construction

As part of LABC Warranty acceptance of modular systems, they are required to complete off-site water testing within the factory which may include cabinet testing, spray bar testing or a combination of the both, depending on the specific modular system in question.

In addition to off-site testing, on site water testing will always be required to test interfaces such as joints between modules along with any penetrations in the modules as a result of any completed façade (rainscreen brackets, mechanical cavity barrier fixings through EPDMs, etc.). On site water testing can also determine any leaks due to damage to systems during the delivery and or erection process.

References and further guidance:

References (as of June 2021)

The current CWCT guidance is now somewhat outdated. Please be advised CWCT are currently reviewing these requirements to fall in line with modern construction techniques. Updated guidance projected for 2022.

*Brickwork - please be advised non-load bearing construction with brickwork façade may require testing depending on building height, porosity of brickwork and workmanship concerns. Please speak to your Major Projects Manager should you have any questions.

CWCT Standard test methods for building envelopes

CWCT Standard for systemised building envelopes Part 8

BS EN 13051 Curtain walling - Watertightness - Field test Without Air Pressure Using A Water Spray Bar, British Standards Institution.

CWCT Technical Note 41

CWCT Technical Update 24 - Hose testing

BS 5368 Methods of testing windows, Part 2, 1980, Watertightness test under static pressure, British Standards Institution.

Every care was taken to ensure information in this article was correct at the time of writing (June 2021). Guidance provided does not replace the reader's professional judgement and any construction project should comply with the relevant building regulations or applicable technical standards. For the most up to date LABC Warranty Major Projects technical guidance please refer to your Major Projects Manager.