Technical Update 26

Preparation pulses

1 Clause 5.3.1 of the *CWCT Standard test methods for building envelopes* states that the preparation pulses to be applied prior to the air leakage test should be the greatest of:

- Ten per cent greater than the air leakage peak test pressure,
- Ten per cent greater than the water penetration static peak test pressure,
- Fifty per cent of wind resistance serviceability peak pressure,
- 500Pa.

2 If this is done the preparation pulses can be omitted prior to the water leakage and wind resistance tests (see clauses 6.3 and 11.3) provided that the direction of application of pressure in the preparation pulses is the same as that to be applied in the test to be carried out and that the sample has not been subject to pressure in the opposite direction between application of the preparation pulses and the start of the test.

3 This Update allows pressure pulses to be related to each test in the sequence as follows:

- Air leakage,
  - Ten per cent greater than the air leakage peak test pressure,
  - 500Pa,
- Water penetration,
  - Ten per cent greater than the water penetration peak test pressure,
  - 500Pa,
- Wind load,
  - Fifty per cent of wind resistance serviceability peak pressure,
  - 500Pa.

4 In this case the magnitude of the pressure pulses may differ for subsequent tests in the sequence requiring additional preparation pulses to be applied for each test. This procedure is consistent with the European curtain wall test standards.

5 This change requires amendment of Clauses 5.3.1, 6.3, 11.3 and 12.3 of the *CWCT Test methods for systemized building envelopes*. The amended clauses are given below. In each case the clause is reproduced in full for clarity, but the amendments only apply to the underlined paragraphs.

Air leakage

Clause 5.3.1 Preparation

6 <u>Three positive air pressure pulses shall be applied; the pressure rise time shall not be less than one second and the pressure shall be maintained for at least 3 seconds. The preparation pressure should be the greater of:</u>

- <u>Ten per cent greater than the air leakage peak test pressure,</u>
- <u>500Pa.</u>

7 Preparation pulses are required prior to other tests in the sequence. An alternative to the above is to select the preparation pressure as the greatest of:

- Ten per cent greater than the air leakage peak test pressure,
- Ten per cent greater than the water penetration static peak pressure,
- Fifty per cent of wind resistance serviceability test peak pressure,
- 500Pa.

8 If this option is adopted it may reduce the need for application of preparation pulses prior to subsequent tests.

9 Any opening lights or doors to be tested should be opened and closed five times and then sealed with tape. Joints between other penetrations and the air barrier (for which air leakage is to be separately identified) should then also be sealed with tape. All trickle ventilators shall be sealed with tape, and then the complete face of the specimen should be sealed with a plastic sheet. The air chamber and ambient temperatures, ambient wind speed and barometric pressure shall then be recorded.

10 The sealed specimen should then be subjected to increasing positive differential pressure in steps lasting at least 10 seconds up to the peak pressure. The pressure levels should be 50, 100, 150, 200, 300, and then in increments of 150Pa up to the peak test pressure. At each pressure level, the differential pressure and airflow should be recorded.

11 The pressure sequence is shown diagrammatically in Figure 3.

Static water penetration

Clause 6.3 Preparation

12 Test chamber and ambient air temperatures shall be recorded. The temperature of the water used shall be maintained between +4°C and +30°C, and the water shall be clean mains water.

13 Three positive air pressure pulses shall be applied; the pressure rise time shall not be less than one second and the pressure shall be maintained for at least 3 seconds. The preparation pressure should be the greater of:

- Ten per cent greater than the water penetration static peak test pressure,
- 500Pa.

14 The preparation pulses may be omitted if the sample has already been subjected to positive pressure pulses of this magnitude for a previous test and has not subsequently been subject to negative pressure.

15 With the pressure reduced to zero, all the operating parts of the test specimen shall be opened and fully locked five times, then firmly secured in the locked position. Any tape applied to ventilators shall be removed.

Wind resistance – serviceability

Clause 11.3 Preparation

16 The ambient air temperature and, when appropriate, the test chamber air temperature shall be recorded.

17 Prior to a positive wind pressure test, three positive air pressure pulses shall be applied; the pressure rise time shall not be less than one second and the pressure shall be maintained for at least 3 seconds. The preparation pressure should be the greater of:

- Fifty per cent of the wind resistance serviceability test peak pressure,
- 500Pa.

18 The preparation pulses may be omitted if the sample has already been subjected to positive pressure pulses of this magnitude for a previous test and has not subsequently been subject to negative pressure.

19 Prior to a negative wind pressure test, three negative air pressure pulses shall be applied; the pressure rise time shall not be less than one second and the pressure shall be maintained for at least 3 seconds. The preparation pressure should be the greater of:

- Fifty per cent of the wind resistance serviceability test peak pressure,
- 500Pa.

20 The preparation pulses may be omitted if the sample has already been subjected to negative pressure pulses of this magnitude for a previous test and has not subsequently been subject to positive pressure.

21 Datum displacement readings of framing members should be measured.

Wind resistance – safety

Clause 12.3 Preparation

22 The ambient air temperature and, when appropriate, the test chamber air temperature shall be recorded.

23 Prior to a positive wind pressure test, three positive air pressure pulses shall be applied; the pressure rise time shall not be less than one second and the pressure shall be maintained for at least 3 seconds. The preparation pressure should be the greater of:

- Fifty per cent of the wind resistance serviceability test peak pressure,
- 500Pa.

24 The preparation pulses may be omitted if the sample has already been subjected to positive pressure pulses of this magnitude for a previous test and has not subsequently been subject to negative pressure.

25 Prior to a negative wind pressure test, three negative air pressure pulses shall be applied; the pressure rise time shall not be less than one second and the pressure shall be maintained for at least 3 seconds. The preparation pressure should be the greater of:

- Fifty per cent of the wind resistance serviceability test peak pressure,
- 500Pa.

26 The preparation pulses may be omitted if the sample has already been subjected to negative pressure pulses of this magnitude for a previous test and has not subsequently been subject to positive pressure.

27 Datum displacement readings of framing members should be measured.

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