

PITCHED ROOF WINDOWS

Technical Document 99004-01

Certified characteristics and conditions for performing tests

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MODIFICATION HISTORY

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The purpose of this Technical Document is to specify the certified characteristics and conditions for performing tests as set out in the QB 04 – Pitched Roof Windows reference system.

1 CERTIFIED CHARACTERISTICS

1.1 QB CERTIFIED CHARACTERISTICS

1.1.1 Air permeability

This measurement is used to characterise the behaviour of a pitched roof window when subjected to positive and negative test pressures.

Testing must be performed in compliance with standard NF EN 1026, with the test specimen positioned at 90°, by default, or at the maximum pitch described in the Technical Application Document's accepted field of application.

The classification is established according to classification standard NF EN 12207 and must be at least A*2 (minimum level in the Technical Application Document or DTA), in the knowledge that the symbols for this result are expressed according to standard NF P20-302.

1.1.2 Watertightness

This measurement is used to characterise the watertightness of a pitched roof window when subjected to positive test pressures.

Testing must be performed in compliance with standard NF EN 1027, with the test specimen positioned at 15°, by default, or at the minimum pitch described in the Technical Application Document's accepted field of application.

The classification is established according to classification standard NF EN 12208 and must be at least E*8A (minimum level in FD DTU 36.5 P3 9.5.1.1), in the knowledge that the symbols for this result are expressed according to standard NF P20-302.

1.1.3 Resistance to wind load

This measurement is used to characterise the resistance to wind load of a pitched roof window when subjected to positive and negative test pressures.

Testing must comply with standard NF EN 1221. The deflection measurements are taken at the time of admission testing in the mark laboratory.

The classification is established according to classification standard NF EN 12210 and must be at least V*A2 (minimum level in the DTA), in the knowledge that the symbols for this result are expressed according to standard NF P20-302. If no deflection measurements are taken during follow-up testing, the normal relative deflection classification (class A, B or C) shall no longer appear on the A*E*V* test summaries.

1.2 QB CERTIFIED CHARACTERISTICS COMBINED WITH THE ACOTHERM LABEL

The following requirements must first be fulfilled for a pitched roof window to be granted the ACOTHERM label, in addition to the QB certification mark (if this requirement has not yet been verified):

- Air permeability concerning the certified characteristic of the QB mark (cf. section 1.1.1);
- Functioning (Operating Forces and Mechanical Strength) at the level of the QB certification requirement.

Note: the measured and calculated performances associated with the ACOTHERM label may differ from performances when implemented, as these latter depend on the nature of the structural works as well as the mode of implementation in which the products are inserted and the sub-assemblies with which they may be combined (e.g. rolling shutter casings).

1.2.1 Sound attenuation

This measurement is used to characterise the soundproofing to airborne sound of a pitched roof window.

Testing must be performed in accordance with the NF EN ISO 10140-1, NF EN ISO 10140-2, NF EN ISO 10140-4 and NF EN ISO 10140-5 standards, as amended, and according to the conditions set out in the ACOTHERM reference system.

The results are presented according to classification standard NF EN ISO 717-1. The level of the weighted sound attenuation characteristics is indicated by a rating that sets the product's performances (supplemented by the $R_{A,tr}$ or R_A value).

1.2.2 Surface heat loss

This calculation is used to evaluate the heat transfer coefficient of a pitched roof window.

The calculation is performed in compliance with standards NF EN 10077- 1, NF EN ISO 10077-2 and NF EN 673. Only calculation methods taken from these standards are permitted by the QB 04 Specific Committee. The selected values are:

- Those calculated by the Certifying Body according to the above standards;
- Those calculated by the applicant or process development engineer and validated by the certifying body according to the procedure defined by the latter;
- Those provided in the reference Technical Application Document, where appropriate.

Note: standard NF EN 410 is used to determine the light and solar characteristics of glass.

The level of the surface heat loss characteristics is indicated by a T_h class rating that sets the product's performances (supplemented by the U_w value).

1.2.3 Radiation properties

These calculations are used to evaluate the solar and daylight characteristics of a pitched roof window.

The calculations must be performed in compliance with standards NF EN 52022-3 and NF P50-777. Only calculation methods taken from these standards are permitted by the QB 04 Specific Committee. The selected values are:

- Those calculated by the Certifying Body according to the above standards;
- Those calculated by the applicant or process development engineer and validated by the certifying body according to the procedure defined by the latter;
- Those provided in the reference Technical Application Document, where appropriate.

Note: standard NF EN 410 is used to determine the light and solar characteristics of glass.

The calculated value indicates the level of the shading factor (FSh) and total light transmission factor (LT) characteristics.

1.3 CHARACTERISTICS CHECKED FOR GRANTING THE QB MARK

1.3.1 Functioning (Operating Forces)

On a pitched roof window, this measurement is used to measure the minimum static force or torque required to:

- lock or unlock hardware (latches with handle(s), bar handle or any other apparatus);
- to start opening the leaf;
- to fully close the leaf.

Testing must be performed in compliance with standard NF EN 12046-1, with the test specimen positioned at 90°, by default, or at the maximum pitch described in the Technical Application Document's accepted field of application, considering:

- the engaging and disengaging of the hardware is measured by applying a force connected to a sensor in the most favourable direction to consider the natural wrist movement and bar handle rotation. As such, if using a bar handle, the measurements are taken in relation to its rotational axis. Furthermore, since the leaf can only be closed via dynamic action (to counteract the gravitational potential energy of the design), a force is applied to the leaf to put it in position prior to taking the static engagement measurement. This force is the minimum effort needed to begin engaging the hardware;
- the measurement for opening the leaf across the first 100 mm is always considered to be zero due to the gravitational potential energy of the design;
- the measurement for closing the leaf across 100 mm is taken along the most discriminative path between the leaf's balanced position and the position at which it comes into contact with the hardware's strike plates;
- the leaf position measurement is taken if operating the leaf using a bar handle when the fasteners are triggered, with the bar remaining open.

The classification is established in accordance with classification standard NF EN 13115 and must be class 1 (minimum level FD DTU 36.5 P3 11.2.1).

1.3.2 Functioning (mechanical strength)

This measurement is used to determine a pitched roof window's resistance to racking and static torsion.

The tests must be performed in accordance with standards NF EN 14608 and NF EN 14609 with the maximum thicknesses of each glass component in accordance with the DTA's description.

The classification is established in accordance with classification standard NF EN 13115 and must be class 2 (minimum level FD DTU 36.5 P3 11.2.2).

1.3.3 Load-bearing capacity of safety devices

This test is used to verify whether the safety devices, all of which are engaged, are able to hold the leaf in place for 60 s with 350 N applied in the least favourable manner (position, direction).

Testing must comply with standard NF EN 14609.

The strength is verified according to requirements in standard NF P 20-501 5.2.6.

1.3.4 Performance test of the opening edges

If there is an opening edge system, systematically for hinged windows, this test is used to characterize the stopping performance and balance of the swing leaf when 50 daN of force is applied to it.

Testing shall be carried out in line with standard NF P 20-302 5.2.1.

The performance is verified according to the requirements in standard NF P 20-501 5.3.4.

1.4 CHARACTERISTICS CHECKED FOR GRANTING THE QB MARK COMBINED WITH THE ACOTHERM LABEL

The following requirements must first be fulfilled for a pitched roof window to be granted the ACOTHERM label, in addition to the QB certification mark (if this requirement has not yet been verified):

- Air permeability concerning the certified characteristic of the QB mark (cf. section 1.1.1);
- Functioning (Operating Forces) compatible with the requirements of the QB mark for a leaf fitted with insulated glazing having a cumulative thickness of each glass component greater than or equal to the maximum thickness tested in the acoustic tests.

Note: the measured and calculated performances associated with the ACOTHERM label may differ from performances when implemented, as these latter depend on the nature of the structural works as well as the mode of implementation in which the products are inserted and the sub-assemblies with which they may be combined (e.g. rolling shutter casings).

1.4.1 Functioning (mechanical strength)

This measurement is used to determine a pitched roof window's resistance to racking and static torsion.

Testing must comply with standards NF EN 14609 and NF EN 14608 for a leaf fitted with insulated glazing having a cumulative thickness of each glass component greater than or equal to the maximum thickness tested in the acoustic tests presented.

The classification is established in accordance with classification standard NF EN 13115 and must be class 2 (minimum level FD DTU 36.5 P3 11.2.2).

1.4.2 Functioning (Endurance)

This measurement is used to determine the endurance for repeated opening and closing operations on roof windows.

Testing must comply with standard NF EN 1191 for a leaf fitted with insulated glazing having a cumulative thickness of each glass component greater than or equal to the maximum thickness tested in the acoustic tests.

The classification is established in accordance with classification standard NF EN 12400 and must be class 2 (minimum level FD DTU 36.5 P3 11.2.3).

2 CONDITIONS FOR PERFORMING TESTS

2.1 List of equipment

The Applicant/Holder must have the inspection, measuring and testing equipment needed to ensure such equipment is used in accordance with the standard or test method to which it refers.

To demonstrate the product's compliance with the technical specifications, the Applicant/Holder must be able to ensure the inspection, measuring and testing equipment is properly calibrated, whether or not they own this equipment.

2.2 Verification schedule

The Applicant/Holder must be able to confirm that the inspection equipment and gauges are regularly used and calibrated.

The calibration operations on the A*E*V* test station available to the Applicant/Holder and on the torque wrench (and/or torquemeter) for the operating forces must be verified at least every 3 years by CSTB, by a body whose equipment undergoes metrological calibration operations, according to a clearly defined, recognised and validated procedure with COFRAC accreditation, or by a member of the EA (European cooperation for Accreditation) or of the IAF (International Accreditation Forum) – see signatories on the COFRAC website: www.cofrac.fr for the in-situ air flow measurements.

For other inspection equipment, the calibration intervals are left to the discretion of the Applicant/Holder, based on the frequency of use. However, if the intervals are greater than one year, the Applicant/Holder must carry out verifications in the meantime.

Note: if the product has heat-welded PVC frames, the metrological calibration operations follow the same 3-year interval and include the equipment used to apply breaking stress to PVC corners as well as the temperature sensor of the welding plates.

2.3 Proof of verifying and calibrating equipment

Testing must be performed at a regularly verified A*E*V* test station. Immediately after calibration, the Applicant/Holder shall also set the reference values and, every 6 months, shall conduct an in-house self-inspection on the station under positive and negative pressure.

If there is no calibration certificate for test and inspection equipment that complies with existing standards, the auditor arranges for this calibration to be performed.

2.4 Competence of staff

For the follow-up A*E*V* tests, the auditor must verify the competence of staff in charge of these tests in-house and possibly at the premises of the designers/process development engineers and manufacturers equipped with an authorised station.