

## STUDIES ON THE ELABORATION OF THE WOODEN WINDOW TESTING PROCEDURE

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### ABSTRACT

*The studies were performed at the National Institute of Wood in Bucharest and referred to the following aspects: the improvement of verification and testing methodologies for windows and doors in laboratory conditions, their alignment to international normative acts and the producing of new testing installations. The work presents the results regarding the elaboration of the procedure for wooden window testing in the laboratory of door and window testing of N.I.W.(I.N.L.) Bucharest. This laboratory is representative for the performance of such activities in this field in Romania. The infrastructure of the laboratory was accomplished by the specialists of the Institute as part of the research contracts, ensuring the tests of permeability at air and water, the reliability, the mechanical resistance, etc, according to the regulations of the above- mentioned procedure.*

### 1. OBJECT

The procedure establishes the methods for verifying the quality of wooden windows with accessories and mounted glass, with or without isolation. This procedure can be extended for windows made of other materials. The accessories and the equipment for windows are mounted on products and are tested at the same time with these, by means of the same procedure.

### 2. APPLICATION FIELD

The procedure is applied in the door and window testing laboratory of the Institute, and is used by the Institute employees, by the quality responsible and by persons from the exterior representing inspection and accreditation organisms, authorized for control with the approval of the laboratory head and of the Institute management.

### 3. REFERENCE DOCUMENTATION

- |     |                |  |
|-----|----------------|--|
| [1] | SR EN 42: 1996 | Window testing methods. Testing at air permeability    |
| [2] | SR EN 77: 1999 | Window testing methods. Wind resistance testing        |
| [3] | SR EN 78: 1996 | Window testing methods. Presentation of testing report |

[4]	SR EN 86: 1998	Window testing methods. Water insulation testing at static pressure
[5]	SR EN 107: 1998	Window testing methods. Mechanical testing
[6]	STAS 799: 1998	Wooden windows and doors. General quality technical conditions
[7]	*STAS 6161/2 - 1989	Constructions acoustics. The measurement of the insulation capacity to noise. Measuring method
[8]	*STAS 7771/1 - 1981	Safety measures against fire. The determination of the resistance to fire of the constructive elements
[9]	*STAS 7771/2 - 1975	Safety measures against fire. The determination of the resistance to fire of windows
[10]	STAS 9317/1 - 1987	Joinery for civil and industrial constructions. Methods for quality verification
[11]	STAS 9322 – 1989	Doors and windows. Classification and terminology
[12]	MC - T – I.N.L.	The quality manual for I.N.L. labs
[13]	PG - T – I.N.L. – 01	The general procedure of elaboration, spreading and control of a working procedure.
[14]	PG – T – I.N.L. – 02	The general procedure of order reception and testing performance
[15]	PG – T – I.N.L. - 03	The general procedure of elaborating testing reports

#### **4. TERMINOLOGY**

Terminology for windows - according to STAS 9322-1989  
Quality terminology - according to MC-T-INL. Quality dictionary.

#### **5. PROCEDURE RULES**

##### **5.1. Initiation conditions** -according to PG-T-INL-02

For the fire resistance testing, a collaboration contract is elaborated with the units which have special labs.

##### **5.2. Testing preparations**

For the testing, the following are prepared:

- STAS 9317/1–1987
- SR EN 42: 1996
- SR EN 77: 1999
- SR EN 86: 1998
- STAS 799:1988
- the testing devices and equipment must be in perfect functioning state
- the tested products, according to STAS 799–1988, paragraph 3.2.

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\* The fire and acoustic testing for windows are not executed in INL Bucharest, these representing the object of collaboration with specialized labs (INCERC Bucharest), which have the specified equipment in the mentioned standards and have the authorization of the Fire Department (STAS 7771/1 – 1981, paragraph 3.1.2)

- the registration sheet of the testing parameters—according to the APPENDIX of the window testing bulletin.
- the product documentation which specifies the reference level of the values of the testing parameters (in absence, the reference is STAS 799 – 1988)

## **6. PROCEDURE**

The following characteristics are verified, according to STAS 9317/1 – 1987:

- dimensions – according to 2.1
- wooden material defects - according to 2.2
- humidity – according to 2.3
- processing manner - according to 2.4
- straightness of frames - according to 2.5
- rectangularity of frames - according to 2.6

For these verifications the equipment and the devices below are used:

- working table for the verification of doors and windows;
- caliper 0-150mm or 0-300mm, div. 0.1mm
- indicator dial 0-10mm, div. 0.1mm, RDG
- Feutron electric humid-meter – 2003 (0 - 40%, div. 1%)
- square, tape measure
- air permeability - according to SR EN 42: 1996
- wind resistance – according to SR EN 77: 1999
- testing water insulation at static pressure – according to SR EN 86: 1998.

The automatized stand is used in order to test the window tightness in wind and rain conditions.

Mechanical testing – according to STAS 9317/1: 1987.

- resistance to bending in vertical plane of closed leaf frame and pulling out resistance of the fastening device – according to 2.8.2
- resistance to bending in vertical plane of the frame with the 90° open leaf – according to 2.8.3
- resistance of hinges to pulling out – according to 2.8.4
- resistance of the frame and closing accessories to repeated closing-opening actions – according to 2.8.5

The mechanical window testing stand is used, this being equipped with specialized devices:

- caliper 0-150 mm or 0-300 mm, div. 0.1mm
- micrometer with comparator 0-10 mm, div 0.1mm

## **7. ATTRIBUTIONS AND RESPONSABILITIES - according to PG – T – I.N.L. - 02**

## **8. REPORTS, REGISTRATIONS, CODIFICATIONS** – according to PG – T – I.N.L. – 03

The elaboration method of the testing report and appendices is specified in PG – T – I.N.L. - .03; the model of the window testing bulletin is established by common agreement between the person in charge with quality for the testing labs and the lab supervisor.

## **9. REFERENCES**

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- [3] Grecu V., David G. : Elaborare, revizuire și examinare de standarde naționale din profilul industriei lemnului cu armonizarea sau adaptarea de standarde ISO și CEN pentru principalele produse. Contract nr. 49/ A.31, INL Bucuresti, 1995.,
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