

## ADVANTAGES OF TECHNICAL ASSESSMENTS FOR NEW PRODUCTS - CASE STUDY FOR COMPOSITE FIBERGLASS AND POLYESTER RESIN FITTINGS USED IN THE CONSTRUCTION FIELD

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**Rezumat.** *Utilizarea și comercializarea produselor utilizate în construcții este reglementată și legiferată atât în România cât și pe piața europeană. Agrementul tehnic național (AT) – parte a sistemului calității în construcții - este documentul care stă la baza introducerii pe piața românească a produselor, procedeelelor și echipamentelor.*

**Abstract.** *The use and marketing of products used in construction is regulated both in Romania and on the European market. The National Technical Assessment (AT) - part of the quality system in construction - is the document underlying the introduction of products, processes and equipment on the Romanian market.*

**Keywords:** Fibre Reinforced Polymer (FRP), long lasting, corrosion resistant, electromagnetically non-conductive.

### 1. Introduction

The manufacturers or distributors of a new construction product need to know which are the steps in order to introduce on the market their products in accordance with the rules and regulations for the construction materials market.

The use and marketing of construction products is regulated both in Romania and on the European market.

In Romania, Law 10/1995 for Quality in Construction \*), republished, stipulates the obligations of all parties involved in the design, verification, execution and acceptance stages of construction projects, establishing the quality system in constructions and aiming at the realization and maintenance over the entire life of constructions of fundamental performances set out by technical regulations. Construction products without a Constancy Performance Certificate and a Declaration of Performance are forbidden for usage in any construction projects.

### 2. Overall View on the Quality Management System of New Construction Products

The Construction Products Regulation (EU) No 305/2011 laying down harmonized conditions for the marketing of construction products sets the requirements for the marketing of products as well as the certification or

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assessment process for issuing the Declaration of Performance (DoP) for the product on its essential characteristics.

A new product can be found in one of the following situations:

- covered by a harmonized standard: a Constancy Performance Certificate may be obtained - through a Body of assessment and verification of performance constancy (OEVCP), based on the test reports issued by authorized laboratories. CE marking makes the product possible to be used in the EU space.
- not or not fully covered by any harmonised European Standard (hEN): a National Technical Assessment (AT) or a European Technical Assessment (ETA) can be requested. AT - may be required from a National TAB (Technical Assessment Body). The ETA can be obtained upon request by a manufacturer (or its authorised representative) in countries where a Technical Assessment Body (TAB) has been designated according to the Construction Products Regulation.

The National Technical Assessment - part of the quality system in construction - is the document underlying the introduction of products, processes and equipment on the Romanian market. The issued AT becomes a national standard, which is not recognized in the EU.

The Standing Technical Council for Construction (CTPC) - a non-legal entity that works alongside MDRAP - is coordinating the development of the AT and the endorsement of its final form - by issuing the Technical Opinion.

Companies and entities involved in the manufacture, supply and use of new construction products, processes and equipment, made in Romania or imported, submit an application and a preliminary file according to the rules existing at the level of the elaborating Body. The Body must be authorised for the product area.

INCERTRANS is empowered by MDRAP to develop construction technical assessments. INCERTRANS is notified to the European Commission as a European Technical Product Assessment Body (TAB) for 34 product categories.

INCERTRANS is also accredited as OEVCP and has also accredited its Testing Laboratory.

The minimum time limit to obtain a national AT is three months depending on the complexity of the product and the need to perform laboratory tests to assess the performance of the product.

To use and sell a new product outside Romania, a TAB - Technical Assessment Body may be required to issue an ETA (European Technical Assessment).

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ETA - European Technical Assessment is the documented assessment of the performance of a construction product in relation to its essential characteristics in accordance with the European Assessment Document (EAD). It represents the basis for the drafting of the performance declaration to be made by the manufacturer for marketing.

Requesting a European Technical Assessment is not a legal obligation, but it is mandatory for a product to be marketed in the EU.

ETA can only be issued if there is a European Assessment Document, EAD, for the product.

If it does not exist, the EAD is being elaborated in parallel with the ETA, but the process has a longer duration, both of which require time for analysis in the EOTA specialized technical committees. The new product thus receives its own reference, on the basis of which it is subsequently supervised and controlled during the production at the factory, a mandatory condition for maintaining the technical approval issued.

The time needed for the release of an ETA is 6 to 12 months, depending on the complexity of the product and the obligation to go through some steps on the drafting of the EOTA working draft.

ETA provides the manufacturer with a voluntary EC mark for a construction product. It may be issued if the construction product is not or not fully covered by a harmonized European standard (hEN), and the assessment methods and criteria are set out in a European Assessment Document (EAD).

The ETA is valid in all 28 EU Member States and in the European Economic Area, as well as in Switzerland and Turkey. ETA can be obtained at the request of a manufacturer (or his authorized representative) in countries where a Technical Assessment Body (TAB) has been designated in accordance with the Construction Products Regulation.

### **3. Case Study**

Introducing on the Romanian market - by national approval - a GFRP (*Glass Fiber Reinforced Polymer*) product - composite fiberglass reinforcements.

GFRP - The fiberglass and polyester resin reinforcement successfully replaces the classic steel reinforcement having the following advantages:

- It is not corrosive and can be used in places where corrosion is particularly expected: buildings in the vicinity of the sea, with a strong saline medium,
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ponds, pools, irrigation channels or similar, constructions in the chemical industry;

- It is not magnetic or conducting of electricity, which is why it can be used: in places where it is desired not to disturb electric and magnetic fields; in areas with electrocorrosion dangers (underground, railway, tramway, etc.);
- It is much lighter than steel reinforcement, thus requiring the use of simpler equipment and easier workmanship;
- It has lower costs than steel reinforcements;
- The initial cost of the investment is much lower than that for concrete reinforcements and is more environmentally friendly.
- Increased product life: 80-100 years.

Characteristic	UM	FRP bars	Steel bars	Stainless steel bars
Tensile strength	Mpa	1000	550	550
Density	g/cm	2.0	7.85	7.85
Electrical conductivity	-	dielectric	yes	yes
Magnetic features	-	non-magnetic	magnetic	magnetic
Thermal conductivity	W/mk	< 0.56	56	17
Resistance to fire	0 C	Max 300	Max 600	Max 600
Resistance to corrosion	-	high	low	high

Since the GFRP solution is relatively recent, having commercial recognition in the 1980s and used in structural applications only at the end of the 1990s in the USA and Canada, there are no harmonized standards at national level. Products which fall under this category to be marketed and incorporated into constructions are placed on the market by technical approval in accordance with the provisions of Law 10/1995 on quality in construction and Regulation (EU) 305/2011.

INCERTRANS, as an authorized Body to issue technical assessments, has developed at national level in order to introduce a product of this category on the Romanian market. The intended uses of this product are:

- Civil buildings
- Industrial buildings

- Buildings requiring low electrical conductivity;
  - niches for electrical and telephone communication equipment;
- Lightweight construction:
  - concrete construction in low-load bearing areas, remote geographic areas;
- Constructions subject to contact with other corrosive agents:
  - sewage treatment plants;
  - fossil fuel tanks;
  - cooling towers;
  - chimneys;
  - landfills.
- Buildings exposed to thermal temperature oscillations:
  - decks on the terraces of the dwellings, thermally insulated concrete houses;
  - heated floors and air-conditioned rooms.
- Structures exposed to chemical deflections, aggressive environments, underground waters, chlorides
- Road bridges
- Parapets and supporting walls
- Support walls

#### **4. Conclusions**

The technical assessment is necessary when a product is to be brought onto a new market before a harmonized standard (CE marking) exists at European or national level.

It is recommended that you perform your own laboratory tests or purchase of this test service before commencing the product assessment process.

European assessment follows a more labour-intensive procedure (minimum 6 months and depends on EOTA / EU Regulation 305/2011 on the basis of a European Assessment Document) and must contain initial type tests and costs of about 10x or higher than those for national assessment.

It is recommended to approve the products in order for them to penetrate the national market. Later on, depending on the emergence and the demand on the market (after the 3 years of validity of the national assessment), a European Technical Assessment can be requested.

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In the case study for fiberglass reinforcement, the national assessment led to an increase in the number of beneficiaries, which replaced the classic steel reinforcement with the composite material.

#### **Notations and/or Abbreviations**

AT - National Technical Assessment

EAD - European Assessment Document

EOTA – European Organisation for Technical Assessment

ETA - European Technical Assessment

GFRP - Glass Fibre Reinforced Polymer

MDRAP - Ministry of regional development and public administration

OEVCPC - Notified Body pursuant to the Construction Products Regulation

## **R E F E R E N C E S**

- [1] Official Journal of the European Union, (4.4.2011).
  - [2] <https://www.eota.eu>; Accessed on 20.05.2018.
  - [3] REGULATION (EU) No 305/2011 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 9 March 2011 laying down harmonised conditions for the marketing of construction products and repealing Council Directive 89/106/EEC.
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