



Empowered lives.
Resilient nations.

Contract UNDP 008 / 2013 – deliv. 4

[list them as referred to in the TOR]

Report Containing Assistance for Certifying Sustainable Buildings Materials

Certification of materials identified as feasible to be produced locally in the two counties, used for building purposes and in increasing the energy efficiency of the existing buildings, in accordance with the applicable standards.

Oct. -Nov. 2013

PROJECT TITLE:

Improving the energy efficiency in low-income households and communities in Romania

Report on the technical assistance, stages and actions for the certification / technical agreement, of sustainable materials identified* as feasible to be produced locally in the two pilot areas **, used for constructions and for increasing the energy efficiency of existing buildings.

DRAWN UP BY: Constantin Miron

**Iasi,
October - November, 2013**

* sustainable materials for constructions and building insulations, potentially available and that can be produced locally,
** Dolj and Hunedoara Counties

CONTENTS

Chapter 1. Legal framework for the certification, marketing and use of building products. European and national regulations concerning the certification/technical agreements sustainable building materials and products. Pag. 3

Chapter 2. Specific requirements of the European/national legislation imposed on building products. Pag. 8

Chapter 3. Requirements regulated by the certification document - *Technical agreement 001SI-02/215-2013: COMPOSITE, ECOLOGICAL, THERMAL AND SOUND INSULATING PRODUCTS OF MOPATEL® AND ECOPIERRA® BRANDS FOR ENERGY EFFICIENT BUILDINGS* concerning sustainable materials identified* as feasible to be produced locally in the two pilot areas, used for durable constructions and for increasing the energy efficiency of existing buildings, according to applicable norms. Pag. 11

Bibliography Pag. 17

APPENDIX 1. Technical Agreement 001SI-02/215-2013: COMPOSITE, ECOLOGICAL, THERMAL AND SOUND INSULATING PRODUCTS OF MOPATEL® AND ECOPIERRA® BRANDS FOR ENERGY EFFICIENT BUILDINGS - PDF document 17 pages

APPENDIX 2. TECHNICAL FILE Technical Agreement 001SI-02/215-2013 - COMPOSITE, ECOLOGICAL, THERMAL AND SOUND INSULATING PRODUCTS OF MOPATEL® AND ECOPIERRA® BRANDS FOR ENERGY EFFICIENT BUILDINGS -

PDF document 106 pages

CHAPTER 1.

LEGAL FRAMEWORK FOR THE CERTIFICATION, MARKETING AND USE OF BUILDING PRODUCTS. EUROPEAN AND NATIONAL REGULATIONS CONCERNING THE CERTIFICATION/TECHNICAL AGREEMENTS FOR SUSTAINABLE BUILDING MATERIALS AND PRODUCTS

LEGISLATION:

In the spirit of the **DIRECTIVE of the COUNCIL (89/106/CEE) CONCERNING BUILDING PRODUCTS**, its objectives refer to the establishment of harmonised standards for building products and the issue of European/national technical agreements.

Directive 89/106/CEE of the Council from the 21st of December 1988 concerning the harmonisation of the lawful acts and administrative acts of the member states concerning building products has sought to eliminate the technical barriers in the path of commerce with building products, with the purpose of favouring their free circulation on the internal market (Regulation 305/2011- paragraph 6).

Directive 89/106/CEE has been replaced, in order to simplify and clarify the existing framework, as well as to increase the transparency and efficiency of the effective measures in place in member states (Regulation 305/2011- paragraph 7), by:

REGULATION (EU) NO. 305/2011 OF THE EUROPEAN PARLIAMENT AND COUNCIL FROM MARCH 9, 2011, ESTABLISHING SOME HARMONISED CONDITIONS FOR THE MARKETING OF BUILDING PRODUCTS AND ABOLISHING DIRECTIVE 89/106/CEE OF THE COUNCIL

This document establishes the conditions for the introduction on the market of construction products, drawing up harmonised dispositions concerning the way in which the performance of construction products is expressed concerning their essential characteristics and the use of the EC mark applied on the respective products (Regulation 305/2011 - paragraph 1).

According to the new regulation to be applied starting from the 1st of July 2013, the introduction on the market of a building product must be accompanied by a **declaration of performance** concerning the essential characteristics of the product, according to the relevant harmonised technical specifications.

It is essential to specify that the new regulation, mandatory for all EU countries, states that the **declaration of performance** must include information referring to the content of dangerous substances of the building product in order to improve possibilities in terms of sustainable buildings and to facilitate the development of **ecological products**, so that a high level is ensured for the **protection of the health** and safety of workers that are using the building products and of the inhabitants of the buildings, including the demands for recycling and/or reuse of parts or materials (Regulation 305/2011- paragraph 25).

The declaration of performance expresses the performance of building products in terms of their essential characteristics, according to the relevant harmonised technical specifications (Regulation 305/2011- art. 6 - paragraph1).

The DECLARATION OF PERFORMANCE must contain the following information:

1. The unique identification code of the type-product.
2. The type, batch or serial number or any other element that allows the identification of the building product.
3. The foreseen use or uses of the building product, according to the applicable technical specification, as specified by the manufacturer.
4. Name, social designation or the registered trademark and contact details of the manufacturer.
5. As required, the name and address of the authorised representative.
6. The system or systems for the evaluation and verification of the constant performance of the building product.
7. In the case of a declaration of performance for a building product that has issued a European technical evaluation (technical agreement), the name and identification number of the technical evaluation body (author of the technical agreement).
9. The declared performance consists of:
 - the list of essential characteristics, as established in the technical specifications
 - for each essential characteristic, the declared performance is expressed in levels, classes or descriptions.
 - for each essential characteristic enumerated, the following will be specified: the dated reference of the corresponding harmonised standard and the reference number of the specific technical documentation.

The declaration of performance is signed for and in the name of the manufacturer by their legal representative.

The national legislation that regulates the use of construction products, from design, constructive and rehabilitation (including thermo-energetical rehabilitation) solutions, to the laying, exploitation, maintenance, and decommissioning, contains a series of acts that include the technical agreements for products that are not covered by the harmonised standards, as is the case of sustainable, ecological materials.

The applicable national legislation that transposes the relevant EU legislation consists of:

- REGULATION from November 21, 1997 concerning the agreement for new construction products, procedures and equipment - effective from March 14, 2006 - Approved by Decision 766/1997
- REGULATION from November 21, 1997 concerning the metrological activity in constructions - Approved by Decision 766/1997
- REGULATION from November 21, 1997 concerning the conducting and ensuring of quality in constructions - Approved by Decision 766/1997
- REGULATION from November 21, 1997 concerning the establishing of the importance category of buildings - Approved by Decision 766/1997
- REGULATION from November 21, 1997 concerning the monitoring of behaviour during exploitation, interventions during and after use of building - Approved by Decision 766/1997
- REGULATION from August 26, 2004 concerning the attestation of the conformity of construction products - Approved by Order 1558/2004
- REGULATION concerning the classification and framing of construction products based on their reaction to fire - October 7, 2004
- REGULATION (EC) no. 764/2008 of the European Parliament and Council from July 9, 2008 establishing procedures for the application of certain national technical norms for products sold legally in another country and abolishing Decision no. 3052/95/CEE
- REGULATION (CE) no. 765/2008 of the European Parliament and Council from July 9, 2008 establishing the requirements for accreditation and market survey concerning product marketing and abolishing Regulation (CEE) no. 339/93/CEE
- REGULATION “Technical specification concerning steel products used for reinforcement: performance requirements and criteria”, ST 009-2011 index approved by order 683 from April 10, 2012
- REGULATION concerning the European Technical Agreement for construction products

LAWS

- LAW no.10 from January 18, 1995 concerning quality in constructions - effective from March 14, 2006

DECISIONS

- DECISION no. 167 from March 13, 2012 for the modification and completion of the Government Decision no. 622/2004 concerning the establishment of the conditions for the market introduction of construction products
- DECISION no. 622 from April 21, 2004 concerning the establishment of the conditions for the market introduction of construction products - Republishing
- DECISION no. 766 from November 21, 1997 for the approval of certain regulations concerning quality in constructions - effective from March 14, 2006

ORDERS

- ORDER no. 20 from August 18, 2010 establishing measures for the unified application of EU legislation harmonising the marketing conditions for products

PROCEDURES

- PROCEDURE from November 17, 2004 designating the bodies for the conformity attestation of construction products - Approved by Order 2134/2004
- PROCEDURE for evaluation in order to designate the bodies for the conformity attestation of construction products – PEC
- PROCEDURE for technical agreements for new construction products, procedures and equipment P.A.T. 1 – 2004
- PROCEDURE for the qualification of bodies authoring technical agreements for constructions - P.A.T. 2-2004
- PROCEDURE concerning the approval of technical agreements in constructions - P.A.T.3 - 2004
- PROCEDURE for evaluating and designating the bodies authorised to issue European technical agreements for construction products
- PROCEDURE for surveying the bodies attesting the conformity of construction products - PSo
- PROCEDURE for recognizing the national technical specifications in the area of construction products

- Modification and completion of the Procedure for evaluating and designating the bodies authorised to issue European technical agreements for construction products approved by Order of the Minister for transportation, constructions and tourism no. 270/2005 - Order 908/2012
- PROCEDURE concerning the designation of bodies that evaluate the conformity of construction products approved by Common Order of MDRT and MAI 909/117/2012

The Romanian language version of *Regulation no.305/2011 of the European Parliament and Council from March 9, 2011 establishing harmonised conditions for the marketing of construction products and the abolishing of Directive 89/106/CEE of the Council*, has been published in the Official Journal of the European Union no. 88 from 04.04.2011.

Regulation (EU) no.305/2011 applies fully starting on July 1st, 2013.

Regulation (EU) no.305/2011 contains, in comparison to Directive 89/106/CEE, some differences and some additional requirements for:

- competence of the notified bodies
- evaluation and verification of the constant performance of construction products.

RENAR (Romanian Association for Accreditation designated as National Accreditation Body) has created the specific regulation for the accreditation of bodies that evaluate and verify the constant performance of construction products, available on the RENAR website, www.renar.ro.

CHAPTER 2.

SPECIFIC REQUIREMENTS OF THE EUROPEAN/NATIONAL LEGISLATION IMPOSED ON BUILDING PRODUCTS.

Regulation (EU) no.305/2011 contains, as stated above, in comparison to Directive 89/106/CEE, additional requirements ensuring that construction products can be applied and used in solutions of design, laying, exploitation, recovery – reuse – final elimination for new buildings, including solutions that can be used for eco-sustainable rehabilitation, as is the case of sustainable materials.

In special conformity with the need to protect human health and the integrity of the environment, Regulation (EU) no. 305/2011 states in *APPENDIX I- FUNDAMENTAL REQUIREMENTS APPLICABLE TO CONSTRUCTIONS*, in addition to other five mandatory requirements, the following two fundamental requirements to which sustainable materials (subject of this project) also adhere:

Requirement 3. Hygiene, health and environment

Buildings must be designed and executed so that they do not represent a threat for the hygiene or health of workers, inhabitants or neighbours, or exert an exaggerated impact on the quality of the environment or climate, over their entire lifecycle, during building, use and demolition, especially as a result of any of the following:

- (a) toxic gas emissions;
- (b) emissions of dangerous substances, volatile organic compounds, (VOC), greenhouse gases and dangerous particles in the interior air or in the atmosphere;
- (c) dangerous radiation emissions;
- (d) leaks of dangerous substances into ground water, sea water, surface water or soil;
- (e) leaks of dangerous substances into potable water or of substances that have a different negative impact on potable water;
- (f) defective disposal of residual water, smoke or solid/liquid waste;
- (g) the presence of humidity in certain parts of the building or on its interior surfaces.

Requirement 7. Sustainable use of natural resources

Buildings must be designed, executed and demolished so that the use of natural resources is sustainable and ensures the following:

- (a) reuse or recycling of buildings, materials and components after demolition;
- (b) durability of buildings;
- (c) use in construction of raw and secondary matter that is compatible with the environment.

The other 5 requirements are:

1. Mechanical resistance and stability

Buildings must be designed and executed so that the loads that can be exerted upon them during construction and use do not cause any of the following events:

- (a) collapse of the whole building or of part of it;
- (b) deformation of unacceptable size;
- (c) deterioration of other parts of the construction or installation or installed equipment as a result of major deformation of load-bearing elements;
- (d) disproportionate deterioration in comparison to the event that caused it.

2. Fire safety

Buildings must be designed and executed so that the following conditions are met in case of fire:

- (a) the stability of the load-bearing elements of the building can be assumed for a determined period;
- (b) the onset and spreading of fire and smoke inside the building must be limited;
- (c) the expansion of fire to neighbouring buildings must be limited;
- (d) the inhabitants can leave the building or they can be rescued by other means;
- (e) the safety of rescue teams must be considered.

4. Safety and accessibility in exploitation

Buildings must be designed and executed so that they do not present unacceptable risks of accidents or damage during their operation or use, such as slipping, falling, bumps, burns, electrocution, lesions caused by explosions, or robberies. Buildings must be especially designed and executed so that they are accessible to disabled persons.

5. Protection against noise

The building must be designed and executed so that the noise perceived by its inhabitants or by persons in its vicinity is kept at a level that does not endanger their health and allows them to fall asleep, to rest and work under satisfactory conditions.

6. Energy saving and thermal insulation

Buildings, with their heating, cooling, illumination and ventilation installations, must be designed and executed so that the consumption of energy necessary for its operation is small, considering the inhabitants and local climate. Buildings must also be energy efficient, and consume as little energy as possible during their construction and dismounting.

CHAPTER 3.

REQUIREMENTS REGULATED BY THE CERTIFICATION DOCUMENT – TECHNICAL AGREEMENT 001SI-02/215-2013 : COMPOSITE, ECOLOGICAL, THERMAL AND SOUND INSULATING PRODUCTS OF MOPATEL® AND ECOPIERRA ® BRANDS FOR ENERGY EFFICIENT BUILDINGS, CONCERNING SUSTAINABLE MATERIALS IDENTIFIED* AS FEASIBLE TO BE PRODUCED LOCALLY IN THE TWO PILOT AREAS, USED FOR DURABLE CONSTRUCTIONS AND FOR INCREASING THE ENERGY EFFICIENCY OF EXISTING BUILDINGS, ACCORDING TO APPLICABLE NORMS.

As specified by TOR, the materials necessary to reach the targets of the PNUD-GEF project: *"Improving the energy efficiency in low-income households and communities in Romania"*, in the two targeted counties, must fit within the boundaries of the aims proposed by the project, as follows:

- materials are based on sustainable – durable resources
- materials are based on raw matter that is accessible locally,
- materials can be used for durable buildings
- materials can be produced /processed locally in the two pilot areas
- materials can be used for building in conformity with the applicable standards.
- durable building materials must have sustainable material characteristics.
- the materials identified as possible to be produced locally in the two counties must have a lifecycle based on the supply with sustainable raw matter, available locally and able to be processed with technologies feasible for the given context (simple technologies, inexpensive production lines, employing processes without great consumptions of energy, using local work force), materials that are recyclable, reusable or have little impact on the environment.
- materials can be used to increase the energy efficiency of buildings.
- materials should imply costs adapted to limited resource communities.
- materials must be evaluated technically/certified and technical agreements must be created for them

According to the mandatory requirements given by the legislation for construction products, in addition to the requirements derived from the objectives of the project, it is mandatory to meet the 7 fundamental requirements imposed by the Regulation (EU) no.

305/2011 and stated in paragraph 2.

The requirements that must be met by sustainable materials which can be proposed for use in order to achieve the objectives of the project and to conform to the fundamental requirements from Regulation (EU) no.305/2011, with mandatory application starting from July 1st, 2013, are described below.

A. Requirements specific to the project application

1. The Basic requirement is for construction materials to have **sustainable characteristics**:

According to the definition of the term, **SUSTAINABILITY** is the ability of an anthropic activity to unfold without exhausting the available resources and without destroying the environment, so without compromising the chance of future generations to fulfil their needs. The worldwide conference on the environment from Rio de Janeiro in 1992 paid special attention to this concept, which implies establishing a balance between economic growth and the *protection of the environment as well as finding alternative resources*. Project applications fall within the same context.

2. The requirement for **local accessibility and availability** of raw matter in the two areas.

3. Raw matter should be ensured as much as possible from alternative, renewable resources, they should make the best use possible of secondary, natural resources, resulting as ecological waste from the primary processing of other raw matter exploited locally.

4. The materials must be durable in relation to environment actions (climatic, seismic actions) and to the exploitation of buildings.

5. The materials must be able to be produced/processed locally, with technologies that are feasible in the given context (simple technologies, inexpensive production lines, employing processes without great consumptions of energy, using local work force)

6. The materials must be recyclable, reusable or can be disposed of at the end of their life without having any impact on the environment, in comparison to other materials.

7. The materials can be used for building in conformity with the applicable standards.

8. The materials must be able to be used for the entire range of applications in new buildings and rehabilitation projects, as products for masonry, thermal- and soundproofing closings as well as for exterior and interior covering, destined to increase the energy efficiency of buildings by means of eco-sustainable solutions and materials.

9. The materials must imply costs that are limited and adapted to low-income communities.

10. The materials have to be certified.

B. Fundamental requirements, mandatory according to Regulation (EU) no. 305/2011.

1. Mechanical resistance and stability.

For stress and deformation resulting from seismic events, loads from wind pressure, snow, deliberate mechanical actions, etc., the mechanical resistance and stability of the building or of its thermal-insulating elements is ensured by design calculus according to the technical regulations and with the instructions of the producer:

- C203 – 91 – Technical instructions for the design and execution of thermal insulation improvement and remedies for condensation on the walls of existing buildings.
- CR 0/2012 – Design code. Basics of building design.
- CR 1-1-4 /2012 – Design code for evaluating the action of wind on buildings;
- CR 6 - 2013 - Design code for masonry structures
- P 100-1/2013 – Seismic design code – Part I. Provisions for building design
- P 100-1/2013 – Seismic design code – Part I. Provisions for building design
- SR EN 1991-1-1:2004 – Building stress. Wind loads.
- SR EN 1991-1-3:2005 and National Appendix to SR EN 1991-1-3NA : 2006 - Eurocode 1: Actions on structures. Part 1-3: General actions. Snow loads
- SR EN 1991-1- 5:2004/ NA:2008. Eurocode 1: Actions on structures. Part 1-5: General actions. Thermal actions. National appendix.

2. Fire safety:

Class of reaction to fire – minimum B (better than B)

Fire resistance, a minimum of 15 minutes.

2. Hygiene, health and environment:

According to Regulation (EU) no. 305/2011, the materials used must not represent, over their entire life cycle, a threat to the hygiene, health or safety of workers, inhabitants or neighbours, they must exert a minimal impact on the quality of the environment or climate, during construction, use, demolition, especially as a result of any of the following causes:

- (a) toxic gas emissions;
- (b) emissions of dangerous substances, volatile organic compounds, (VOC), greenhouse gases and dangerous particles in the interior air or in the atmosphere;

- (c) dangerous radiation emissions;
- (d) leaks of dangerous substances into ground water, sea water, surface water or soil;
- (e) leaks of dangerous substances into potable water or of substances that have a different negative impact on potable water;
- (f) defective disposal of residual water, smoke or solid/liquid waste;
- (g) the presence of humidity in certain parts of the building or on its interior surfaces.

The materials must not be toxic, polluting, or radioactive, they must not release noxious gases, they must not be on the list of carcinogenic or potentially carcinogenic substances and they must not pose a risk for human health.

These materials must meet the essential requirement for air purity as specified in Regulation (EC) 1907/2006, with the generic name of REACH (Registration, Evaluation, Authorisation and Restriction of Chemicals).

The component raw matters must have the best qualities for depollution (by absorbing CO₂ polluting emissions) and as an agent effective against the growth of bacteria, microorganisms, over the entire life of the building.

The materials must meet the conditions required by the relative legislation, as follows:

- Order 1162/2012, HG 933/2010 that modifies and completes GD 956/2005 concerning the introduction on the market of biocide products,
- Law of Work Safety and Health no. 319/2006, HG 955 / 2010 that modifies and completes the Methodological norms for applying the provisions of the Law of work safety and health no. 319/2006, approved by GD 1425/2006,
- Law of Environment Protection no. 265/2006.

The materials must not represent a polluting factor for the environment, according to law 211/2011 concerning the treatment of waste.

4. Exploitation safety

The used materials must be conducive to obtaining construction work that, through design and execution, does not present unacceptable risks of accidents or damage during operation or use, such as sliding, falling, dismantling, bumps, burns, electrocution, lesions caused by explosions or forced entry.

5. Protection against noise

The construction products made from sustainable materials must ensure, together with the existing constructive elements in the case of rehabilitation, complete insulation against aerial noise according to the effective regulations and norms.

The building and its elements must be designed and executed so that the noise perceived by its inhabitants or by persons in its vicinity is kept at a level that does not endanger their health and allows them to rest and work under satisfactory conditions. Sound insulation depends directly on the density of materials and on the conformity of insulation products.

6. Energy saving and thermal insulation

By designing the constructive elements and thermal insulation elements using sustainable materials, the necessary thickness is considered in order to achieve the required levels of thermal insulation and energy saving according to the effective regulations, namely:

- Norm C 107-2005 – Part 3 – Norm concerning the calculation of the thermo-energetical performance of the constructive elements of the buildings (C 107/3), with the subsequent modifications and completions,

- Part 1 – Norm concerning the calculation of the global thermal insulation coefficients in residential buildings (C 107/1), respectively in

- Part 2 - Norm concerning the calculation of the global thermal insulation coefficients in non-residential buildings (C 107/2).

The evaluation of the energy performance of buildings whose envelope includes either thermal-insulating covering elements, or constructive elements from sustainable materials is done according to the “Methodology for the calculation of the energy performance of buildings” – index MC 001/1, 2, 3 – 2006, with the subsequent modifications and completions.

In order to ensure the corresponding conditions of behaviour to thermal transfer, from the point of view of satisfying the requirement for energy saving and thermal stability of buildings, certain conditions have to be met concerning the thermal conductivity of the materials destined for increasing the energy efficiency of buildings by means of solutions with eco-sustainable materials and with effect on the thermal mass, which depends on density.

Thus :

- to ensure the reduction of energy loss, the thermal conductivity of thermal insulating materials must be lower than the value 0,055..0,06 W/mK.

- for the thermal insulating elements of the building envelope made of sustainable materials must be designed in a way that will allow them to reach the minimal values specified in the norm C107 (attached extract).

- to ensure the conditions for thermal stability and sound insulation, the density of the materials has to be as high as possible for thermal insulating materials.

7. Durability and maintenance of the product. Sustainable use of natural resources The materials used must ensure that the resulting buildings are designed, executed and demolished so that the use of natural resources is sustainable and ensures the following in particular:

- (a) reuse or recycling of buildings, materials and components, after demolition;
- (b) durability of the buildings;
- (c) building with raw and secondary matter that is compatible with the environment.

The quality and nature of the used materials must provide stability and durability against mechanical stress and climatic actions.

The maintenance during exploitation must not pose problems other than those that usually occur with similar traditional elements.

The life duration of the closing elements made of sustainable materials must be a minimum of 50 years from laying time, when observing the conditions imposed by the design of the building and the maintenance conditions specific to their exploitation.

The warranty given by the manufacturer must be of a minimum of 10 years, under the specified conditions.

The essential durability criteria refer to the endurance in time of the thermal and physical properties specific to thermal and sound insulating ecological products, as well as to the preservation of the mechanical qualities, when observing the instructions of the manufacturer for laying, exploitation and maintenance.

BIBLIOGRAPHY:

1. Technical Agreement 001SI-02/215-2013: COMPOSITE, ECOLOGICAL, THERMAL AND SOUND INSULATING PRODUCTS OF MOPATEL® AND ECOPIERRA ® BRANDS FOR ENERGY EFFICIENT BUILDINGS

2. TECHNICAL FILE Technical Agreement 001SI-02/215-2013 - COMPOSITE, ECOLOGICAL, THERMAL AND SOUND INSULATING PRODUCTS OF MOPATEL® AND ECOPIERRA ® BRANDS FOR ENERGY EFFICIENT BUILDINGS

3. REGULATION (UE) NO. 305/2011 OF THE EUROPEAN PARLIAMENT AND COUNCIL FROM MARCH 9, 2011, ESTABLISHING SOME HARMONISED CONDITIONS FOR THE MARKETING OF BUILDING PRODUCTS AND ABOLISHING DIRECTIVE 89/106/CEE OF THE COUNCIL,

4. TEST REPORT FOR MASONRY FROM MOPATEL® COMPOSITE ECOLOGICAL BLOCKS, 40 CM THICK, COVERED OR NOT WITH MOPATEL® DOUBLE-LAYER THERMAL INSULATING PLATES – Laboratory for Research and Hygrothermal, Climatic, Mechanical and Seismic Testing for Buildings - INCD URBAN INCERC – Iași Branch August- Oct .2013

5. ETAG 004 Edition 2000- Amended August 2011 - Amended February 2013 - GUIDELINE FOR EUROPEAN TECHNICAL APPROVAL of EXTERNAL THERMAL INSULATION COMPOSITE SYSTEMS (ETICS) WITH RENDERING

6. www.renar.ro - legislation, norms, procedures

7. www.ctpc.ro - legislation, norms, procedures, CTPC Unique Register documents CTPC

**APPENDIX 1. – PDF Document. Technical agreement -
17 pages**

Technical Agreement

001SI-02/215-2013

**PRODUSE ECOLOGICE COMPOZITE TERMO-FONO EFICIENTE MARCA
MOPATEL® SI ECOPIERRA® PENTRU CLĂDIRI EFICIENTE ENERGETIC**

COMPOSITE SOUND- AND THERMAL-EFFICIENT PRODUCTS OF BRAND MOPATEL® AND
ECOPIERRA® FOR ENERGY-EFFICIENT BUILDINGS

ELEMENTS COMPOSITES PHONO- ET THERMOISOLANTS DE TYPE MOPATEL® ET
ECOPIERRA® POUR DES BATIMENTS A EFFICACITE ENERGETIQUE

GERÄUSCH- UND WÄRMEISOLIERENDE COMPOSITE-ELEMENTE TYP MOPATEL® UND
ECOPIERRA® FÜR ENERGIEEFFIZIENTE GEBÄUDE

Product code - certification conf. Unique Register: *Appendix 2: 2.24*

APPENDIX 2. – PDF Document - 106 pages.

TECHNICAL FILE

Technical Agreement
001SI-02/215-2013

**COMPOSITE, ECOLOGICAL, THERMAL AND SOUND
INSULATING PRODUCTS OF MOPATEL® AND ECOPIERRA
® BRANDS FOR ENERGY EFFICIENT BUILDINGS**