



Project Number: 285463 SUS-CON CP-IP

Sustainable, Innovative and Energy-Efficient Concrete, based on the Integration of All-Waste Materials

Deliverable D8.2

Procedures for results certification

Advice on procedures to be followed in order to guarantee the future certificability of the project results

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¹ PU: Public, RE: restricted to a group specified by the consortium CO: Confidential, only for members of the consortium; Commission services always included.

² Draft, Revised, Final



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1. INTRODUCTION

The aim of this document is to report the rules for the future certificability of SUS-CON components and materials in European Regulation, in particular for aggregates, binder and concrete as results of SUS-CON project, performing a deep and complete analysis of such issues at EU level and providing a clear outline of the certifications to be sought, including HSE implication.

According to the development of the project, Deliverable D8.2 has been divided in two different deliverables:

- D 8.2 “Procedures for results certification - *Advice on procedures to be followed in order to guarantee the future certificability of the project results*”,
- D 8.4 “Procedures for results certification - *Results of test regarding H&S of the end user*”.

At the beginning of the SUS-CON project the main reference in Europe was the Directive 89/106/EEC “Construction Products Regulation” (CPR), that was replaced by the Regulation EU n. 305/2011 “Construction Products Regulation” (CPR).

CPR, took in force since 1st July 2013, provides for the CE marking for construction product, put in European market.

The CE marking of materials aims to achieve the conformity for specific products for specific uses in the building. The CE marking is not a quality mark, but it shows that the product complies with the minimum requirements established by law.

In this report it is given a Guideline to the certification process of the SUS-CON binders (Pulverized Fly Ash PFA, Ground Granulated Blast furnace Slag GGBS), aggregates (Polyurethane PU, Remix RX, Tyre Rubber TR) and final products (floor screed underlay, panels for facades, blocks).

Moreover, the Laboratory PH, a subsidiary company of TUV Italia, is in charge to carry out HSE tests to determine the safety of SUS-CON aggregates and final products. Results will be included in deliverable D8.4 “Procedures for results certification - Results of test regarding H&S of the end user”. It was agreed to consider the binders as a mixture of components already on the market with their Material Safety Data Sheet (MSDS) and subjected to CE marking according CPR, so any further test is needed.



2. OVERVIEW OF THE CERTIFICATION PROCESS

The construction products are subject to the rules of free exchange of goods in the European Union (EU) and especially to the rules relating to building safety, health, sustainability, energy saving and environmental protection. The EU Regulation 305/2011 (CPR) replaced the CPD and it aims to remove technical barriers to trade in construction products within the European Economic Area (EEA). To achieve this, the CPR provides four main elements:

- a system of harmonized technical specifications;
- an agreed system of conformity assessment for each product family;
- a framework of notified bodies;
- CE marking of products.

From 1 July 2013, under the Construction Products Regulation 2011 (CPR), it became mandatory for manufacturers to draw up a Declaration of Performance and apply CE marking to any of their construction products which is covered by a harmonized European standard (hEN) or conforms to a European Technical Assessment (ETA) which has been issued for it, when such a product is placed on the market.

As the Directive, the Regulation is binding on the Member States, which it is addressed. It shall be binding in its entirety and therefore cannot be applied in an incomplete, selective or partial way. The CPR harmonizes the methods of assessment and test, the means of declaration of product performance and the system of conformity assessment of construction products, but not national building regulations: the choice of required values for the particular intended use is left to the regulators and public / private procurers at the national level.

The CPR Regulation establishes **7 essential safety requirements** (Basic Requirements) for construction products:

1. Mechanical resistance and stability
2. Safety in case of fire
3. Hygiene, health and the environment
4. Safety and accessibility in use
5. Protection against noise
6. Energy economy and heat retention
7. Sustainable use of natural resources

The CPR differs from the other directives as the essential requirements imposed by that, do



not relate to the construction products, but to the works in which they are to be incorporated permanently.

For the mechanical resistance and stability, the construction works must be designed and built in such a way that the loadings that are liable to act on them during their constructions and use will not lead to any of the following:

- a. collapse of the whole or part of the work;
- b. major deformations to an inadmissible degree;
- c. damage to other parts of the construction works or to fittings or installed equipment as a result of major deformation of the load-bearing construction;
- d. damage by an event to an extent disproportionate to the original cause.

For safety in case of fire, the construction works must be designed and built in such a way that in the event of an outbreak of fire:

- a. the load-bearing capacity of the construction can be assumed for a specific period of time;
- b. the generation and spread of fire and smoke within the construction works are limited;
- c. the spread of fire to neighbouring construction works is limited;
- d. occupants can leave the construction works or be rescued by other means;
- e. the safety of rescue teams is taken into consideration.

For hygiene, health and environment, the construction works must be designed and built in such a way that they will, throughout their life cycle, not be a threat to the hygiene or health and safety of workers, occupants or neighbours, nor have an exceedingly high impact, over their entire life cycle, on the environmental quality or on the climate during their construction, use and demolition, in particular as a result of any of the following:

- a. the giving-off of toxic gas;
- b. the emissions of dangerous substances, volatile organic compounds (VOC), greenhouse gases or dangerous particles into indoor or outdoor air;
- c. the emission of dangerous radiation;
- d. the release of dangerous substances into ground water, marine waters, surface waters or soil;
- e. the release of dangerous substances into drinking water or substances which have an otherwise negative impact on drinking water;



- f. faulty discharge of waste water, emission of flue gases or faulty disposal of solid or liquid waste;
- g. dampness in parts of the construction works or on surfaces within the construction works.

For the safety and accessibility in use, the construction works must be designed and built in such a way that they do not present unacceptable risks of accidents or damage in service or in operation such as slipping, falling, collision, burns, electrocution, injury from explosion and burglaries. In particular, construction works must be designed and built taking into consideration accessibility and use for disabled persons.

For the protection against noise, the construction works must be designed and built in such a way that noise perceived by the occupants or people nearby is kept to a level that will not threaten their health and will allow them to sleep, rest and work in satisfactory conditions.

For energy economy and heat retention, the construction works and their heating, cooling, lighting and ventilation installations must be designed and built in such a way that the amount of energy they require in use shall be low, when account is taken of the occupants and of the climatic conditions of the location. Construction works must also be energy-efficient, using as little energy as possible during their construction and dismantling.

For sustainable use of natural resources, the construction works must be designed, built and demolished in such a way that the use of natural resources is sustainable and in particular ensure the following:

- a. reuse or recyclability of the construction works, their materials and parts after demolition;
- b. durability of the construction works;
- c. use of environmentally compatible raw and secondary materials in the construction works.

To economic operators are imposed certain obligations:

- Obligations of manufacturers: They must provide the declaration of performance and the technical documentation, and affix the CE marking on the product. Manufacturers shall ensure that their products have a type number that allows their identification. They are also expected to withdraw their products from the market, if they feel it is not in conformity with the declared performance, or to change this statement.
- Obligations of importers: verify that the product is accompanied by the technical documentation and have the CE marking. They must state their name, their registered trade name or their trademark and the address where they can be



contacted. They ensure that the product is accompanied by instructions and safety information and that transportation will not affect its performance.

- Obligations of distributors: must ensure that the product bears the CE marking and is accompanied by the documents mentioned above. If they consider that the product does not comply, they shall refrain for the placing on the market. Distributors must also ensure optimal preservation conditions of the product in order to avoid degradation.

The **harmonized standards** are used to define the methods and criteria for the evaluation of the performance of construction products. They refer to the intended use of the products to which they relate and include the technical details necessary to apply the system of assessment and verification of the constancy of performance. The references to harmonized standards are published in the Official Journal of the European Union.

If a product is not covered by a harmonized standard, a manufacturer has the possibility to request a **European Technical Assessment (ETA)** issued by the organization of Technical Assessment Bodies (TAB). The ETA is a documented assessment of the performance of a product, in relation to its essential characteristics, in accordance with the respective European Assessment Document. Member States shall designate one or more TAB on their territory, for one or several product areas. The list of TABs shall be forwarded to the European Commission that has to public it. The TAB perform the European Technical Assessment in a product area for which they were designated.

Notified Bodies shall carry out third party tasks in the process of assessment and verification of constancy of performance for construction products. These are independent bodies with legal personality. Notifying Authorities are appointed by Member States. They are responsible for the creation and implementation of the necessary procedures for the assessment and notification of Notified Bodies.

The harmonized European standards and European Assessment Document EAD contain provisions about how the manufacturer has take action to:

- Assess the compliance of the product
- Certify that the product complies with the CE marking.

The harmonized standards are drawn up with explicit request (Mandate) from the European Commission and they can be identified by the presence of Appendix ZA. The harmonized standards must permit the placing on the market of all products legally used in the Member States and they are expressed, as far as possible, in performance terms.

The **Mandates** are issued by the European Commission for each family of products and



define:

- The essential applicable requirements
- The performance features

to be covered in European Technical Specifications. They will still have to be amended and integrated in accordance with CPR.

Example of Mandate is M/100 to CEN/CENELEC concerning the standardization of precast concrete products for which these conditions are fulfilled:

- a) The products are subject to technical barriers to trade,
- b) The characteristics of the products influence the satisfaction by the construction works, in which they are to be incorporated in a permanent manner, of the essential requirements.

M/100 contains grounds, the standardization mandate and the execution of the mandate. M/100 is intended to provide for the harmonized European standards, that are needed in order to make possible the “approximation” of national laws, regulations and administrative provisions. This approximation is expected to be done by adapting the national regulations to take full account of the mandated harmonized standards.

The harmonized standards covered by M/100 are not expected to impose limitations or prescriptions (end uses, minimum values of characteristics, methods of production or installation), but should focus on the definitions of the CPR related characteristics and on the relevant methods of determination (by calculation, testing, ...).

Harmonized standards take into account all the current intended uses of the product, the evaluation of conformity and the labeling accompanying the CE marking which will contain the values of the characteristics of the product on the basis of the technical specifications.

The work programme that CEN/CENELEC has developed in response to Mandate M/100 has to be comprehensive, covering the complete package of product standards needed for the CE marking of the product. It includes the time scale for the publication of the complete package of harmonized standards and refers as far as possible to horizontal standards which cover a number of different families of products and defines the determination method of a given product performance.

Mandate M/100 fixes that the harmonized standards have to contain:

- A detailed scope and field of application,
- A detailed description of the family of products covered and the relevant intended uses of the different products,
- The definition of the characteristics of the products (expressed in performance terms) that are relevant to the satisfaction of the essential requirements,

- The methods (calculation, test methods or others) or a reference to an harmonized standard containing the methods for the determination of such characteristics,
- Guidance on the characteristics that have to be stated within the labeling that will accompany the CE marking (depending on the intended use of the product) and on the way of expressing the determined values of these characteristics,
- The classification system and the levels for the above values of characteristics,
- The system of attestation of conformity and the corresponding specific provisions of evaluation of conformity.

Among the list of products covered by Mandate, there is the product family precast/lightweight/autoclaved aerated concrete products: wall elements.

Because of the harmonized standards may address characteristics not mandatory and not regulated in any Member State (e.g. aesthetic characteristics), all hENs under the CPR include an Annex (**Annex ZA**), the first part of which (ZA.1) lists the regulated mandatory requirements according to a Mandate issued to CEN or CENELEC by the European Commission and the clauses in the standard in which they are addressed. Some of these clauses may, in turn, refer to separate supporting documents such as test methods standards. In this way, Annex ZA.1 in the hEN becomes a guide for CE marking from which the manufacturer can see all the mandatory requirements for their product and how they can be met.

Compliance with Appendix ZA allows the affixing of the CE marking necessary for the products to be freely placed on the market. Appendix ZA establishes the conditions for CE marking of the products processed in accordance with:

- In point ZA.1, the identification of the clauses of the standard required to meet the requirements of relevant mandate given under the CPR.
- In point ZA.2, the description of the systems of attestation of conformity
- In point ZA.3, the information required to accompany the CE marking.

Example of Appendix ZA of EN 13055-1 (Lightweight aggregates for concrete, mortar and grout):



Appendix ZA.1 of EN 13055-1 shows the clauses that meet the requirements of the Mandate given under the EU Construction Products Directive 89/106/EEC:

Product: Lightweight aggregates obtained by processing natural, manufactured or recycled materials and mixtures of these aggregates as covered by the scope of this standard for use in concrete, mortar and grout			
Intended use(s): Buildings, roads and civil engineering works and the manufacturing of precast concrete products			
Essential Characteristics	Requirement clauses in this and/or another standard(s)	Level(s) and/or class(es):	Notes
Particle shape	4.5 Particle shape	None	Description
Particle size	4.4 Particle size distribution	None	Declared value
Loose bulk density	4.2.1 Loose bulk density	None	Declared value
Percentage of crushed particles	4.11 Percentage of crushed particles	None	Declared value
Cleanliness	5.5 Organic contaminators	None	Declared value
Resistance to fragmentation/crushing	4.10 Crushing resistance	None	Declared value
Composition/content	5.2 Chloride	None	Declared value
	5.3.1 Acid-soluble sulfate	None	Declared value
	5.3.2 Total sulfur	None	Declared value
Volume stability	4.12 Resistance to disintegration	None	Declared value
Water absorption	4.8 Water absorption	None	Declared value
Dangerous substances:			
Emission of radioactivity (for aggregates from radioactive sources intended for use in concrete in buildings)	NOTE in ZA.1 above F.3.3 Knowledge of the raw material F.4 Management of the production	None None	See third paragraph in ZA.3
Release of heavy metals			
Release of polyaromatic carbons			
Release of other dangerous substances			
Durability against freeze/thaw	4.13 Freezing and thawing resistance	None	Declared value
Durability against alkali-silica reactivity	5.6 alkali-silica reactivity	None	Declared value

An excel form of the provided tests in the hEN standards (EN 12620 for normal aggregates and particularly EN 13055-1 for lightweight aggregates) with the relevant test methods has been forwarded to the involved partners, asking if the tests and the test methods, listed in the standards, are totally or partially applicable. Here are the results:



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		EN 12620	EN 13055-1		
Test	Prova	clause	clause	Notes	Test method
Aggregate size Grading	Analisi granulometrica	§4.2 §4.3	§4.3 §4.4+4.7		EN 933-1 (aggregates) EN 933-10 (filler)
Particle shape of coarse aggregates	Forma dell'aggregato grosso	§4.6	§4.5	fr = crashed nf = not crashed	EN 933-3 (flakiness index) EN 933-4 (shape index)
Percentage of crushed or broked particles	Percentuale di particelle frantumate		§4.11	only for coarse aggregates	EN 933-5
Cleanliness (organic contaminant)			§5.5		EN 1744-1 §15.3
Fines content	Contenuto di fini	§4.4	§4.6		EN 933-1
Fines quality	Qualità dei fini	§4.5	n.a	only for fines content > 3%	EN 933-8 (sand eq.) EN 933-9 (methylene blue v.)
Particle density	Massa volumica	§5.4.1	§4.2.1		EN 1097-6
Water absorption	Assorbimento d'acqua dei granuli	§5.4.2	§4.8		
Alkali-silica reactivity	Reattività alcali-silice	§7.5	§5.6		UNI 8520-22
Petrographic description	Descrizione petrografica	§6.2	n.a		EN 932-3
Classification of the constituents of coarse recycled aggregates	Classificazione dei costituenti degli aggregati grossi riciclati	§6.3	n.a		EN 932-11
Dangerous substances: - Emission of radioactivity (for aggregates from radioactive sources intended for use in concrete in buildings) - Release of heavy metals - Release of polyaromatic hydrocarbons - Release of other dangerous substances	Sostanze pericolose: -emissione radioattività -rilascio metalli pesanti -rilascio carburi poliaromatici	Note in ZA.1 EN 16236	Note in ZA.1 Annex F.3.3 F.4	EN 16236:2013, 5.3.4 and F.3.3. Knowledge of the raw material EN 16236:2013, 5.3.5 and F.5 Management of the production	
Resistance to fragmentation	Resistenza alla frammentazione	§5.2	§4.10	EN 12620: for high resistance concrete	EN 1097-2 (Los Angeles)
Resistance to wear	Resistenza all'usura (Micro Deval)	§5.3	n.a.	only for wear layer	EN 1097-1 (Micro-Deval)
Resistance to polishing for surface courses	Resistenza alla levigabilità	§5.6	n.a.	only for wear layer	EN 1097-8
Resistance to surface abrasion	Resistenza all'abrasione superficiale	§5.7	n.a	only for wear layer	EN 1097-8 Annex A
Resistance to abrasion from studded tyres to be used for surface course	Resistenza all'abrasione da pneumatici chiodati	§5.8	n.a	only for areas where studded tyres are used	EN 1097-9
Resistance to freezing and thawing Resistance to freezing and thawing in the presence of salt (extreme conditions)	Gelo/disgelo	§7.3.2 §7.3.3	§4.13		EN 1367-1 EN 1367-2 (sof. magn.)
Chlorides	Contenuto di cloruri	§6.4.5	§5.2		EN 1744-1 § 7
Carbonate content of fine and all-in aggregates for concrete pavement surface courses	Contenuto di carbonato di calcio	§6.6	n.a		EN 1744-1 § 12.3 EN 196-21 § 5
Shell content	Contenuto di conchiglie	§4.7	n.a	only for marine origin aggregates	EN 933-7
Volume stability - drying shrinkage	Stabilità di volume - Ritiro per essiccamento	§7.4	n.a		EN 1367-4
Acid soluble sulfates	Composti contenenti zolfo (solfati solubili in acido)	§6.4.1	§5.3.1		EN 1744-1 § 12
Total sulfur	Contenuto di solfato (zolfo totale)	§6.4.2	§5.3.2		EN 1744-1 § 11
Water soluble sulfate content of recycled aggregates	Contenuto di solfato solubile in acqua negli aggregati riciclati	§6.4.3			EN 1744-1
Constituents which alter the rate of setting and hardening of concrete Influence on initial setting time of cement (recycled aggregates)	Componenti che alterano la velocità di presa : -contenuto sostanza umica /idrossido di sodio -acido fulvico (per contenuti alti sostanza umica) -prova resistenza comparativa - tempo di presa -impurezze organiche leggere	§6.7.1			EN 1744-1 § 15.1 EN 1744-1 § 15.2 EN 1744-1 § 15.3 EN 1744-1 § 14.2
Constituents which affect the volume stability of air-cooled blastfurnace slag	Costituenti che influenzano la stabilità del volume della scoria: Disintegrazione del silicato dicalcico	§6.7.2		only for blastfurnace slag	EN 1744-1 § 19



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Test	applicability and comment by the partner: IRIDEX product: RIGID PU FOAM WASTES	applicability and comment by the partner: ACCIONA product: WASTE TYRE RUBBER	applicability and comment by the partner: CETMA product: REMIX LD	applicability and comment by the partner: CETMA product: REMIX HD	applicability and comment by the partner: CETMA product: WEEE / e-plastics	applicability and comment by the partner: CETMA product: RIGID PU FOAM WASTES	applicability and comment by the partner: CETMA product: WASTE TYRE RUBBER
Aggregate size Grading	YES	YES	YES	YES	YES	YES	YES
Particle shape of coarse aggregates	YES	YES	YES	YES (3-7 grade)	YES (4-15 grade)	YES (4-8, 8-16 grades)	YES (3-7, 8-16 grades)
Percentage of crushed or broked particles	NO	YES	YES	YES (3-7 grade)	YES (4-15 grade)	YES (4-8, 8-16 grades)	YES (3-7, 8-16 grades)
Cleanliness (organic contaminant)	NO	YES	YES	YES	YES	YES	YES
Fines content	YES	YES	YES	YES	YES	YES	YES
Fines quality	NO	NO	YES	YES	YES	YES	YES
Particle density	YES	YES	YES	YES (3-7 grade)	YES (4-15 grade)	YES (4-8, 8-16 grades)	YES (3-7, 8-16 grades)
Water absorption	YES	YES	YES	YES (3-7 grade)	YES (4-15 grade)	YES (4-8, 8-16 grades)	YES (3-7, 8-16 grades)
Alkali-silica reactivity	YES	NO (Only to natural lightweight aggregates)	YES	YES	YES	YES	YES
Petrographic description	NO	NO	NO	NO	NO	NO	NO
Classification of the constituents of coarse recycled aggregates	NO	NO					
Dangerous substances: - Emission of radioactivity (for aggregates from radioactive sources intended for use in concrete in buildings) - Release of heavy metals - Release of polyaromatic hydrocarbons - Release of other dangerous substances	YES	YES			NO *		
Resistance to fragmentation	YES	NO	YES	YES (3-7 grade)	YES (4-15 grade)	YES (4-8, 8-16 grades)	YES (3-7, 8-16 grades)
Resistance to wear	YES	NO	YES	YES (3-7 grade)	YES (4-15 grade)	YES (4-8, 8-16 grades)	YES (3-7, 8-16 grades)
Resistance to polishing for surface courses	NO	NO	YES	YES (3-7 grade)	YES (4-15 grade)	YES (4-8, 8-16 grades)	YES (3-7, 8-16 grades)
Resistance to surface abrasion	NO	NO	YES	YES (3-7 grade)	YES (4-15 grade)	YES (4-8, 8-16 grades)	YES (3-7, 8-16 grades)
Resistance to abrasion from studded tyres to be used for surface course	NO	NO	/	/	/	/	NO (no studded tyres are used)
Resistance to freezing and thawing Resistance to freezing and thawing in the presence of salt (extreme conditions)	YES	YES	YES	YES (3-7 grade)	YES (4-15 grade)	YES (4-8, 8-16 grades)	YES (3-7, 8-16 grades)
Chlorides	YES	YES	YES	YES	YES	YES	YES
Carbonate content of fine and all-in aggregates for concrete pavement surface courses	NO	NO	YES	YES	YES	YES	YES
Shell content	NO	NO	NO	NO	NO	NO	NO
Volume stability - drying shrinkage	NO	NO	YES	YES	YES	YES	YES
Acid soluble sulfates	YES	YES	YES	YES	YES	YES	YES
Total sulfur	YES	YES	YES	YES	YES	YES	YES
Water soluble sulfate content of recycled aggregates	NO	YES	YES	YES	YES	YES	YES
Constituents which alter the rate of setting and hardening of concrete Influence on initial setting time of cement (recycled aggregates)	NO	YES	YES	YES	YES	YES	YES
Constituents which affect the volume stability of air-cooled blastfurnace slag	NO	NO	NO	NO	NO	NO	NO

* The release of heavy metals and dangerous substances were performed anyway by pH

The procedures for attestation of conformity reported in Appendix ZA.2 expect a system 2+:

Product(s)	Intended use(s)	Level(s) or class(es)	Attestation of conformity system(s)
Lightweight aggregates for concrete, mortar and grout	In buildings, roads and other civil engineering works	-	2+
Lightweight aggregates fillers for concrete mortar and grout	In buildings, the manufacturing of precast concrete products, for roads and other civil engineering works	-	2+
System 2+: See Directive 89/106/EEC (CPD) annex III.2.(ii), First possibility, including certification of the factory production control by an approved body on the basis of initial inspection of factory and of factory production control as well as of continuous surveillance, assessment and approval of factory production control			

The attestation of conformity of the aggregates shall be based on the evaluation of conformity procedures indicated in the table:

Tasks		Coverage of the task	Clauses to apply
Tasks for the producer	Factory production control (F.P.C)	Parameters related to all relevant characteristics of Table ZA.1a or Table ZA.1b	7.3
	Initial type testing	All relevant characteristics of Table ZA.1a or Table ZA.1b	7.2
Tasks for the notified body	Certification of F.P.C on the basis of	Initial inspection of factory and of F.P.C	7.3
		Continuous surveillance, assessment and approval of F.P.C.	7.3

When compliance is archived, and once the notified body has drawn up the certificate, the producer shall prepare and retain a declaration of conformity, which entitles the producer to affix the CE marking. This declaration shall include:

- Name and address of the producer and the place of production;
- Description of the product (type, identification, use, ...) and a copy of the information accompanying the CE marking;
- Provisions to which the product conforms;
- Particular conditions applicable to the use of the product;
- The number of the accompanying factory production control certificate;



- Name of, and position held by, the person empowered to sign the declaration on behalf of the producer.

The declaration shall be accompanied by a factory production control certificate, drawn up by the notified body, which shall contain, in addition to the information above, the following:

- Name and address of the notified body;
- The number of the factory production control certificate;
- Conditions and period of validity of the certificate;
- Name of, and position held by, the person empowered to sign the certificate.

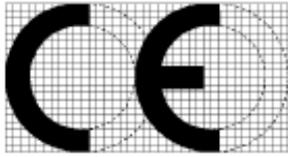
The above mentioned declaration shall be presented in the official language or languages of the Member State in which the product is to be used.

The producer is responsible for the affixing of the CE marking. The CE marking symbol to affix shall be in accordance with Directive 93/68/EC and shall be shown on the accompanying label, the packaging or on the accompanying commercial documents (e.g. delivery note). The following information shall accompany the CE marking symbol:

- Identification number of the certification body;
- Name or identifying mark and registered address of the producer;
- The last two digits of the year in which the marking is affixed;
- Number of the certificate of factory production control;
- Reference to the European Standard EN 13055-1;
- Description of the product: generic name, material, dimensions,... and intended use;
- Information on the relevant essential characteristics in table ZA.1:
 - o Declared values and, where relevant, level or class/category (including “pass” for pass/fail requirements, where necessary) to declare for each essential characteristic;
 - o “no performance determined” for characteristics where this is relevant.

The “No Performance Determined” (NPD) option may not be used where the characteristic is subject to a threshold level. Otherwise, the NPD option may be used when and where the characteristic, for a given intended use, is not subject to a regulatory requirements.

Below example of the information to be given on the label, packaging and/or commercial documents:

 01234																																																						
Any Co Ltd, PO Box 21, B-1050 02 0123-CPD-0456																																																						
EN 13055-1 Lightweight aggregates obtained by processing natural, manufactured or recycled materials and mixtures of these aggregates for use in concrete, mortar and grout																																																						
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CE conformity marking, consisting of the "CE"-symbol given in directive 93/68/EEC

Identification number of the inspection body

Name or identifying mark and registered address of the producer

Last two digits of the year in which the marking was affixed

Number of the EC certificate

No. of European Standard

Description of product

and

information on product and on regulated characteristics



Almost all the **systems of assessment** and verification of constancy of the performance require the action of third party bodies (Notified Bodies) with different features and tasks:

- System 1+: is the most complex evaluation system, that contemplates the involvement of a "Notified Body for certification of products", with tasks of: execution of type tests; perform calculations; examination of the descriptive documentation of the product; initial inspection of the production facilities and the factory production control; supervision of tests on representative samples of the production before release. The Body competence is given by the compliance with EN 45011; it should also be ensured compliance with ISO / IEC 17020, as regards the inspections, and compliance with the requirements of ISO / IEC 17025, as regard the execution / supervision of testing.
- System 1: as 1+, except for the lack of the supervision of testing. About the competence of the Body, the same applies as for the system 1+.
- System 2+: it contemplates the intervention of a "Notified Body for production control", with the task of: initial inspection of the production facilities and the factory production control; surveillance of the factory production. The Body competence can be ensured only by compliance with ISO / IEC 17020 (Inspection body of Type A).
- System 3: it contemplates the involvement of a "Notified Body Testing laboratory", with tasks: execution of type tests; perform calculations; review of descriptive documentation of the product. The Body competence is ensured by compliance with the requirements of ISO / IEC 17025, and the requirements of independence and impartiality set out in the Regulation.
- System 4: it does not require the action of the Notified Body.

Tasks	S.A.V.C.P.	1+	1	2+	3	4
Manufacturer:						
Initial Type Tests/Calculation (ITT/ITC) (1)						
Factory Production Control (FPC)						
Testing of samples according with the prescribed test plan						
Further testing of samples according with the prescribed test plan (FTP)						
Notified Body:						
Initial Type Tests/Calculation (ITT/ITC)						
Initial inspection of the manufacturing plant and of FPC						
Continuous surveillance, assessment and evaluation of FPC						
Audit-testing of samples taken before placing the product on the market						

The **Factory Production Control** (FPC) must ensure, guarantee and verify the continuity and the confirmation of product properties, in particular it includes:

- Checks on incoming raw materials;
- Controls during the process and on finished product;
- Periodic checks of production equipment and measuring instruments.

The FPC of lightweight aggregates is described in Annex F of EN 13055-1 and is divided into sections: organization; control procedures; management of the production; inspection and test; records; control of non-conforming product; handling, storage and conditioning in production areas; transport and packaging; training of personnel.

For the organization, the responsibility, authority and the interrelation between all personnel who manage, perform and check work affecting quality shall be defined and for every aggregate producing plant the producer shall appoint a person with appropriate authority. The factory production control system adopted shall be audited and reviewed at appropriate intervals by management to ensure its continuing suitability and effectiveness.

The producer shall establish and maintain a factory production control manual setting out the procedures by which the requirements for factory production control are satisfied.

Documents and data control shall include those documents and data that are relevant to the requirements of this standard covering purchasing, processing, inspection of materials and



the factory production control system documents.

A procedure concerning the management of documents and data shall be documented in the production control manual covering procedures and responsibilities for approval, issue, distribution and administration of internal and external documentation and data; and the preparation, issue and recording of changes to documentation.

If any part of the operation is sub-contracted by the producer a means of control shall be established. The producer shall retain overall responsibility for any parts of the operation sub-contracted.

There shall be documentation detailing the nature of raw materials and its source.

For the management of the production, the FPC system shall fulfill the following requirements:

- There shall be procedures to identify and control the materials;
- There shall be procedures to identify and control any hazardous materials to ensure that they do not exceed the limits in force according to the provisions valid in the place of use of the aggregate;
- There shall be procedures to ensure that material is put into stock in a controlled manner and the storage locations and their contents are identified;
- There shall be procedures to ensure that material taken from stock has not deteriorated in such a way that its conformity is compromised;
- The product shall be identifiable up to the point of sale as regards source and type.

For the inspection and test, the producer shall make available all necessary facilities, equipment and trained personnel to carry out the required inspections and tests. The producer shall be responsible for the control, calibration and maintenance of inspection, measuring and test equipment. The producer shall prepare a schedule of test frequencies.

The results of FPC shall be recorded including sampling locations, dates and times and product tested with any other relevant information, e.g. weather conditions.

For the control of non-conforming product section, following an inspection or test which indicates that a product does not conform the affected material shall be:

- Reprocessed; or
- Diverted to another application for which it is suitable; or
- Rejected and marked as non-conforming.

All cases of non-conformity shall be recorded by the producer, investigated and if necessary corrective action shall be taken.

The producer shall make the necessary arrangements to maintain the quality of the product



during handling and storage and the producer's FPC system shall identify the extent of his responsibility in relation to storage and delivery.

The producer shall establish and maintain procedures for the training of all personnel involved in the factory production system. Appropriate records of training shall be maintained.

A new version of EN 13055-1 is in draft. This new standard will be applicable to natural aggregates, by-products of industrial processes and to recycled aggregates, as the old version. In the update, however, will be defined more in detail the materials that can be reflected in the application field of the standard, and maybe SUS-CON aggregates may be excluded. In that case, CE marking with EN 13055-1 would not be possible and it will be necessary to create an European Technical Assessment (ETA) for placing in the market SUS-CON aggregates.

In system 1+, 1 and 2+, the FPC, established and maintained by the manufacturer, must be verified and certified on the basis of an initial inspection and periodic surveillance, generally annual.

The CE marking is the conclusion of a harmonized process through which it is possible to evaluate, assess and ensure - through test procedures or calculation and production control - and finally declare the performance of a construction product. The CE marking is supported by the **Declaration of Performance** (DoP).

The manufacturer will include the DoP to the supply and the statement must contain:

- a. Unique identification code of the product-type
- b. Number of type, batch, serial number or other element allowing the identification of the construction product in accordance with art. 11 § 4 of CPR
- c. Intended use or uses of the construction product in accordance with the applicable harmonized technical specification, as intended by the manufacturer
- d. Standards, trade name or registered trade mark and address of the manufacturer in accordance with Art. 11 § 5 of CPR
- e. Where appropriate, name and address of the representative, whose mandate covers the tasks of art. 12 § 2 of CPR
- f. System or systems of assessment and verification of constancy of performance of the construction product set out in Annex V of CPR
- g. the list of essential characteristics as determined in the harmonized technical specification for the declared intended use or uses;

- h. the performance at least one of the essential characteristics of the construction product, relevant for the declared intended use or uses.

In drawing up the declaration of performance, the manufacturer shall assume the responsibility of the construction product in relation to its declared performance.

The manufacturer may specify or the "declared value", that is, the level or class / category for each essential characteristic defined in Appendix ZA.1, or "NPD", for those features for which there are no national laws (Applications Decrees). The aims of the Decree include the more specific regulation of the application of national approvals, as well as related decision, markings and monitoring.

Once drafted the declaration of performance, the manufacturer must affix the CE marking on the product. Therefore, the CE marking certifies that the product conforms to the essential safety requirements set out in the Directives.

On the website of the European Community, www.europa.eu, there is a database, TRIS, that collects the national technical regulations. Using this tool it was possible to collect the decrees, sorted by nation, in relation to each material/product of SUS-CON project. The research findings are the follow:

Aggregate	Italy	2009/25/I	Decree on the application of Directive 89/106/EC on construction products transposed by Presidential Decree 246 of 21 April 1993 on the identification of products and related methods for checking compliance of "aggregates".
Aggregate	Italy	2005/236/I	Decree implementing Directive 89/106/EEC on construction products, transposed by Presidential Decree No 246 of 21 April 1993, on the identification of products and related methods for verifying the conformity of aggregates
Aggregate	Portugal	2009/3/P	Regulation of aggregates with a view to their placement on the market.

Therefore it appears that almost no Country has regulated the application of European Directives on construction products at local level. So for all the Countries for which there is no decree law, it is possible to declare "NPD – No Performance Declared" to the essential characteristics contained in Appendix ZA.1.



The Declaration of Performance (DoP) are always accompanied by **Safety Data Sheets** (SDS). They represent the most significant technical document for information on chemical substances and their mixtures, as they contain the necessary information on the physico-chemical, toxicological and danger properties for the environment necessary for the proper and safe handling of substances and mixtures. MSDSs allow the employer to determine if in the workplace are handled hazardous chemicals and then evaluate any risk to the health and safety of workers arising from their use, and allow users to take the necessary measures for the protection of health, environment and safety in the workplace.

This item will be analyzed deeply in Deliverable 8.2b

As regards SUS-CON aggregates (Polyurethane PU, Remix RX, Tyre Rubber TR), binders (Pulverized Fly Ash PFA, Ground Granulated Blast furnace Slag GGBS) and final products (floor screed underlay, panels for facades, blocks), a first broad overview was given on the distinction between voluntary certifications and mandatory Regulations (European (CPD/CPR), National, Regional) and the applicable standards were analyzed.

For the constituent material **aggregates** the standards are:

- EN 12620:2008 (normal-weight) aggregates for concrete
- EN 13055-1:2002 lightweight aggregates for concrete, mortar and grout.

The EN 12620 was updated with the issue 2013, where there were more clarifications for the use recycled aggregates from different sources, but this issue was never taken in force and it was withdrawn after few months.

An excel form based on the tests listed in the hEN standards with the relevant test methods has been developed in order to define if such tests and methods are totally or partially applicable. The existence of these harmonized standards allows the CE marking of the products according to Regulation EU 305/2011 (CPR). Moreover, the drafting of examples of CE mark and DoP for each aggregate (Remix HD and LD, Tyre rubber and PU) have been produced (see Annex 1), according to the characteristics and the data derived from Deliverables D.2.2 and D.2.4.

For SUS-CON **binders**, which are more innovative with respect to other current binders, the research has led to confirm the non-existence of an appropriate standard. The Regulation EU 305/2011 permits a voluntary way for CE marking by the European Technical Assessment; a valuation of this method is ongoing but it seems hard, long and expensive. Another possibility is the CE marking of the binders components, considering they are all already in the market, so the relevant manufacturer should affix the CE mark, issuing the Declaration of Performance (DoP). More in details:



- PFA should be CE marked according to the standard EN 450-1;
- GGBS should be CE marked according to the standard EN 15167-1;
- Silica fumes should be CE marked according to the standard EN 13263-1;
- Concrete admixtures should be CE marked according to the standard EN 934-2.

As a result of further studies only the first two binders has been chosen for the mix that compose the final products: floor screed underlay, panels for facades, blocks.

For these products are available the following standards:

- EN 13318:2002 screed material and floor screeds
- EN 14992:2007+A1:2012 precast concrete products – wall elements
- EN 771-3:2011 aggregate concrete masonry units (dense and lightweight aggregates).

The existence of these harmonized standards allows the CE marking of the products according to Regulation EU 305/2011 (CPR). Moreover, the drafting of examples of CE mark and DoP for each product have been produced (see Annex 2), according to the characteristics and the data derived from Deliverables D.4.7. For the blocks it was necessary to create two different DoPs because the system of attestation of conformity differs if the masonry unit is of a higher o lower quality. For panels, four different DoPs have been created depending if the element is structural/non-structural, with/without façade function.

EN 13318 has been prepared under the mandate M/132 “Pavements” given to CEN by the European Commission and the European Free Trade Association.

The conditions for the CE marking of screed materials and floor screeds are indicated in the table below:



Test	EN 13813	test method	Notes and units
Fire reaction	5.3.4	EN 13501-1*	A1fl - Ffl
Release of corrosive substances	-		Declaration of type of material
Water Permeability	5.3.8	EN 1062-3	
Water vapour permeability	5.3.6	EN 12086	
Mechanical strength			Threshold class ≥ C5 ≥ F1 ≤ A22 or ≤ RW300 or ≤ AR6
Compression resistance	5.2.1	EN 13892-2	
Bending resistance	5.2.2	EN 13892-2	
Wear resistance (for surfaces subject to wear)	5.2.3	EN 13892-3/4/5	
Impact sound insulation	5.3.9	EN ISO 140-6	
Sound absorption	5.3.10	EN 12354-6	
Heat insulation	5.3.7	EN 12524 EN 12664	Calculation Test
Chemical resistance	5.3.3	EN 13529	

* For material of class A1, without test, according to the Decision 96/603/EC, as amended

The system of attestation of conformity, as indicated in Appendix ZA.2, is shown in the table below. SUS-CON screed material falls in the last group “All other uses”, therefore its system of attestation is 4.

Products	Intended uses	Class (if appropriate)	Attestation of conformity system
Floor screed materials	For internal uses subject to reaction to fire regulations	A1 _f ^a , A2 _f ^a , B _f ^a and C _f ^a	1
		A1 _f ^b , A2 _f ^b , B _f ^b , C _f ^b , D _f and E _f	3
		(A1 _f to E _f) ^c and F	4
	For internal uses subject to regulations on dangerous substances	-	3
All other uses	Matching threshold classes of Table ZA.1.1 to ZA.1.5	4	

^a Products/materials for which a clearly identifiable stage in the production process results in an improvement of the reaction to fire classification (e.g. an addition of fire retardants or a limiting of organic material)

^b Products/materials not covered by footnote ^a

^c Products/materials that do not require to be tested for reaction to fire (e.g. products/materials of Class A1 according to Commission Decision 96/603/EC, as amended)

The evaluation of conformity procedures is the follow:

Tasks		Content of the task	Evaluation of conformity clauses to apply
Tasks for the manufacturer	Factory production control (F.P.C)	Parameters related to all relevant characteristics of Table ZA.1	6.3
	Initial type testing	All relevant characteristics of Table ZA.1	6.2

EN 771-3 has been prepared under the mandate M/116 "Masonry and related products" given to CEN by the European Commission and the European Free Trade Association.

The conditions for the CE marking of the aggregate concrete masonry units are indicated in the table below:

Test	EN 771-3	test method	Notes
Dimensions and dimensional tolerances (for units intended to be used in elements subject to structural requirements)	§5.2.1 dimensions §5.2.2 dimensional tolerances	EN 772-16	Declared values, in mm, and tolerance category
Configuration (for units intended to be used in elements subject to structural requirements)	§5.3.1 Configuration	EN 772-16, EN 772-2, EN 772-20	Declared configuration as illustrated or described
Compressive strength (for units intended to be used in elements subject to structural requirements)	§5.5.1 Compressive strength	EN 772-1, EN 772-6	Declared value (characteristic or mean) in N/mm ² with indication of direction of load and unit category
Dimensional stability (for units intended to be used in elements subject to structural requirements)	§5.9 Moisture movement	EN 772-14	Declared value of moisture movements in mm/m
Bond strength (for units intended to be used in elements subject to structural requirements)	§5.12 Shear bond strength	EN 1052-3	Fixed value or declared value of initial shear strength in N/mm ²
	§5.13 Flexural bond strength	EN 1052-2	Declared value
Reaction to fire (for units intended to be used in elements subject to fire requirements)	§5.11 Reaction to fire	EN 13501-1	Declared reaction to fire class A1 to F
Water absorption (for units intended to be used in damp proof courses and or in external elements with exposed face)	§5.8 Water absorption by capillarity	EN 772-11	Declared value, in g/m ² s; or declared text: "Not to be left exposed"
Water vapour permeability (for units intended to be used in external elements)	§5.10 Water vapour permeability	EN ISO 12572 or EN 1745	Declared coefficient
Direct airborne sound insulation (in end conditions)/ Density and configuration (for units to be used in elements subject to acoustic requirements)	§5.4.1 Gross density	EN 772-13	Declared value of gross density in kg/m ³
	§5.3.1 Configuration §5.2 Dimensions and tolerances	EN 772-16, EN 772-2, EN 772-20	Declared configuration as illustrated or described
Thermal resistance/ Density and configuration (for units intended to be used in elements subject to thermal insulation requirements)	§5.6 Thermal properties	EN 1745	Value of thermal conductivity ($\lambda_{10,dry,unit}$ value) in W/mK, and means of evaluation used or density and configuration
Durability against freeze/thaw	§5.7 Durability	Reference to the provisions valid in the intended place of use of the units	Declared value or declared text: "Not to be left exposed"
Dangerous substances	ZA.1 Notes 1 and 2		According to ZA.3 (penultimate paragraph)

The system of attestation of conformity, as indicated in Appendix ZA.2, is:

Product(s)	Intended use(s)	Level(s) or class(es)	Attestation of conformity system(s)
Masonry Units. Category I	In walls, columns and partitions	—	2+ ^a
Masonry Units. Category II	In walls, columns and partitions	—	4 ^b
^a See CPD, annex III.2.(ii), First possibility, including certification of the factory production control by an approved body on the basis of initial inspection of factory and of factory production control as well as of continuous surveillance, assessment and approval of factory production control.			
^b See CPD, annex III.2.(ii), Third possibility.			

The evaluation of conformity procedures is the follow:

Table ZA.3 a) — Assignment of evaluation of conformity tasks for Category I aggregate concrete masonry units (system 2+)

Tasks		Content of the task	Evaluation of conformity clauses to apply	
Tasks for the manufacturer	Factory production control (F.P.C)	Parameters related to all relevant characteristics of Table ZA.1	8.3	
	Initial type testing	All relevant characteristics of Table ZA.1	8.2	
Tasks for the notified body	Certification of F.P.C on the basis of	Initial inspection of factory and of F.P.C	Parameters related to all relevant characteristics of Table ZA.1, in particular: <i>Compressive strength</i> <i>Dimensional stability</i> <i>Bond strength</i>	8.3
		Continuous surveillance, assessment and approval of F.P.C.	Parameters related to all relevant characteristics of Table ZA.1, in particular: <i>Compressive strength</i> <i>Dimensional stability</i> <i>Bond strength</i>	8.3

Table ZA.3 b) — Assignment of evaluation of conformity tasks for Category II aggregate concrete masonry units (system 4)

Tasks		Content of the task	Evaluation of conformity clauses to apply
Tasks for the manufacturer	Factory production control (F.P.C)	Parameters related to all relevant characteristics of Table ZA.1	8.3
	Initial type testing	All relevant characteristics of Table ZA.1	8.2

EN 14992 has been prepared under the mandate M/100 “Precast Concrete Products” given to CEN by the European Commission and the European Free Trade Association.

The conditions for the CE marking of the loadbearing and non loadbearing wall elements with and without façade functions are indicated in the tables below:

Relevant clauses for loadbearing and no loadbearing wall elements WITHOUT external functions				
Test		EN 14992	test method	Notes and units
Compressive strength (of concrete)	All methods	§4.2 Production requirements	Potential strength EN 12390, EN 12350	N/mm ²
			Compressive direct structural strength EN 12504-1	N/mm ³
Mechanical resistance	Method 1	Information listed in ZA.3.2		Geometry and materials
	Method 2	§4.3.3 Mechanical resistance		kNm, kN, kN/m
	Method 3	§4.3.3 Mechanical resistance		design specification
Resistance to fire (where relevant)	Method 1	Information listed in ZA.3.2		Geometry and materials Ra/E/I
	Method 2	§4.3.4.1 Resistance to fire	EN 13501-2	min Ra/E/I
	Method 3	§4.3.4.1 Resistance to fire	EN 13501-2	Design specification Ra/E/I
Reaction to fire (where relevant)	All methods	§4.3.4.2 Reaction to fire	EN 13501-1	Euroclasses
Acoustical insulation (where relevant)	All methods	§4.3.5 Acoustic properties	EN ISO 140-3 EN ISO 140-6	dB
Thermal resistance (where relevant)	All methods	§4.3.6 Thermal properties	EN 12664 EN ISO 10456 EN ISO 8990 EN 1934	
Detailing	All methods	§4.3.1 Geometrical properties §4.3.3.1 Loadbearing design §4.3.3.2 Reinforcement detailing 8 Technical documentation		Declared classes
Durability	All methods	§4.3.7 Durability		Ambient conditions
Strength of fixture ^b	All methods	§4.3.8.5 Fixture of cladding elements		

Relevant clauses for loadbearing and no loadbearing wall elements WITHOUT external functions				
Test		EN 14992	test method	Notes and units
Compressive strength (of concrete)	All methods	§4.2 Production requirements	Potential strength EN 12390, EN 12350	N/mm ²
			Compressive direct structural strength EN 12504-1	N/mm ²
Mechanical resistance	Method 1	Information listed in ZA.3.2		Geometry and materials
	Method 2	§4.3.3 Mechanical resistance		kNm, kN, kN/m
	Method 3	§4.3.3 Mechanical resistance		design specification
Resistance to fire (where relevant)	Method 1	Information listed in ZA.3.2		Geometry and materials Ra/E/I
	Method 2	§4.3.4.1 Resistance to fire	EN 13501-2	min Ra/E/I
	Method 3	§4.3.4.1 Resistance to fire	EN 13501-2	design specification Ra/E/I
Reaction to fire (where relevant)	All methods	§4.3.4.2 Reaction to fire	EN 13501-1	Euroclasses
Acoustical insulation (where relevant)	All methods	§4.3.5 Acoustic properties	EN ISO 140-3 EN ISO 140-6	dB
Thermal resistance (where relevant)	All methods	§4.3.6 Thermal properties	EN 12664 EN ISO 10456 EN ISO 8990 EN 1934	
Detailing	All methods	§4.3.1 Geometrical properties §4.3.3.1 Loadbearing design §4.3.3.2 Reinforcement detailing 8 Technical documentation		Declared classes
Durability	All methods	§4.3.7 Durability		Ambient conditions
Strength of fixture ^b	All methods	§4.3.8.5 Fixture of cladding elements		
Water vapour permeability (where relevant)	All methods	§4.3.8.3 Water vapour permeability	EN ISO 12572	kg/(m ² •s•Pa)
Water permeability (where relevant)	All methods	§4.3.8.4 Water impermeability	annex G EN13369:2004	%

NOTE Method 1 = declaration of geometrical data and materials properties

Method 2 = declaration of the value of the product properties

Method 3 = declaration of compliance with given design specification

^a Applies only to loadbearing elements

^b Applies only to claddings



The system of attestation of conformity, as indicated in Appendix ZA.2, is:

Product(s)]	Intended use(s)	Level(s) or class(es)	Attestation of conformity system(s)
Loadbearing wall elements	Structural	–	2+
Non Loadbearing wall elements	Non structural	–	4

System 2+: See Directive 89/106/EEC (CPD) Annex III.2.(ii), First possibility, including certification of the factory production control by an approved body on the basis of initial inspection of factory and of factory production control as well as of continuous surveillance, assessment and approval of factory production control.

System 4: See Directive 89/106/EEC (CPD) Annex III.2.(ii), Third possibility.

The evaluation of conformity procedures is the follow:

Table ZA.3a — Assignment of evaluation of conformity tasks for loadbearing wall elements with and without façade functions under system 2+

Tasks		Content of the task	Evaluation of conformity clauses to apply
Tasks for the manufacturer		Factory production control (F.P.C)	6.3 of this standard
		Initial type testing by manufacturer	6.2 of EN 13369:2004
Tasks for the notified body	Certification of F.P.C on the basis of	Initial inspection of factory and of F.P.C	6.3 of EN 13369:2004 and 6.3 of this standard
		Continuous surveillance, assessment and approval of F.P.C.	6.1.3.2 b of EN 13369:2004 and 6.3 of this standard

Table ZA.3b — Assignment of evaluation of conformity tasks for non loadbearing wall elements with and without façade functions under system 4

Tasks		Content of the task	Evaluation of conformity clauses to apply
Tasks for the manufacturer	Factory production control (F.P.C)	All relevant characteristics of Table ZA.1a or of Table ZA.1b	6.3 of this standard
	Initial type testing by manufacturer	All relevant characteristics of Table ZA.1a or of Table ZA.1b	6.2 of EN 13369:2004

For products under system 2+: when compliance is archived, and once the notified body has drawn up the certificate, the producer shall prepare and retain a declaration of conformity, which entitles the producer to affix the CE marking. This declaration shall include:

- Name and address of the producer and the place of production;
- Description of the product (type, identification, use, ...) and a copy of the information accompanying the CE marking;
- Provisions to which the product conforms;
- Particular conditions applicable to the use of the product;
- The number of the accompanying factory production control certificate;
- Name of, and position held by, the person empowered to sign the declaration on behalf of the producer.

The declaration shall be accompanied by a factory control certificate, drawn up by the notified body, which shall contain, in addition to the information above, the following:

- Name and address of the notified body;
- The number of the factory production control certificate;
- Conditions and period of validity of the certificate;
- Name of, and position held by, the person empowered to sign the certificate.

For products under system 4: when compliance is archived, and once the notified body has drawn up the certificate, the producer shall prepare and retain a declaration of conformity, which entitles the producer to affix the CE marking. This declaration shall include:

- Name and address of the producer and the place of production;
- Description of the product (type, identification, use, ...) and a copy of the information accompanying the CE marking;
- Provisions to which the product conforms;
- Particular conditions applicable to the use of the product;
- Name of, and position held by, the person empowered to sign the declaration on behalf of the producer.



The above mentioned declaration shall be presented in the official language or languages of the Member State in which the product is to be used.

The producer is responsible for the affixing of the CE marking. The CE marking symbol to affix shall be in accordance with Directive 93/68/EC and shall be shown on the accompanying label, the packaging or on the accompanying commercial documents (e.g. delivery note). The following information shall accompany the CE marking symbol:

- Identification number of the certification body (only for products under system 2+);
- Name or identifying mark and registered address of the producer;
- The last two digits of the year in which the marking is affixed;
- Number of the certificate of factory production control;
- Reference to the European Standard;
- Description of the product: generic name, material, dimensions,... and intended use;
- Information on the relevant essential characteristics in table ZA.1:
 - o Declared values and, where relevant, level or class/category (including “pass” for pass/fail requirements, where necessary) to declare for each essential characteristic;
 - o “no performance determined” for characteristics where this is relevant.

The “No performance determined” (NPD) option may not be used where the characteristic is subject to a threshold level. Otherwise, the NPD option may be used when and where the characteristic, for a given intended use, is not subject to a regulatory requirements.

Below examples of the information to be given on the label, packaging and/or commercial documents:



CE
AnyCo Ltd, PO Box 21, B-1050 11
EN 771-3:2011 Category II, xxx·yyy·zz mm aggregate concrete masonry unit Dimensions: length (mm), width (mm), height (mm) Dimensional tolerances: Category: D1 Flatness: NPD Plane parallelism: NPD Configuration: As in attached drawing Compressive strength: mean: xx N/mm ² (⊥ bedface), xx N/mm ² (⊥ header). (Cat II) Dimensional stability: moisture movement: NPD Shear bond strength: Fixed value xx (N/mm ²) Flexural bond strength: ... xx (N/mm ²) Reaction to fire: Euroclass A1 Water absorption: xxx g/m ² s Water vapour diffusion coefficient: xxx Direct airborne sound insulation: <u>Gross dry density</u> xxxx - kg/m ³ <u>Configuration</u> As above Thermal conductivity: xx W/mK ($\lambda_{10, dry, unit}$ S1) Durability against freeze-thaw: NPD Dangerous substances: See Note below

CE conformity marking, consisting of the "CE"-symbol given in Directive 93/68/EEC.

Name or identifying mark and registered address of the producer

Last two digits of the year in which the marking was affixed

Dated version of European Standard

Description of product

and

information on regulated characteristics



3. CONCLUSION

The document describes rules for future certificability of SUS-CON components and materials in European Regulation.

The document refers to aggregates, binder and concrete as results of SUS-CON project, performing a deep and complete analysis at EU level and providing a clear outline of the certifications to be sought.

As annexes of this deliverable, the CE mark e DoP documents for the Sus-Con aggregates (PU, RX, TR) and components (blocks, panels, screed) are reported.

According to the development of the project, Deliverable D8.2 has been divided in two different deliverables:

- D 8.2 “Procedures for results certification - *Advice on procedures to be followed in order to guarantee the future certificability of the project results*”,
- D 8.4 “Procedures for results certification - *Results of test regarding H&S of the end user*”.



4. REFERENCES

- [1] Deliverables D3.3; D3,4; D4.3; D4.6; D4.7; D7.10
- [2] EN 13055-1 - Lightweight aggregates. Lightweight aggregates for concrete, mortar and grout.
- [3] EN 12620 - Aggregates for concrete.
- [4] EN 450-1 - Fly ash for concrete. Definition, specifications and conformity criteria.
- [5] EN 15167-1 - Ground granulated blast furnace slag for use in concrete, mortar and grout. Definitions, specifications and conformity criteria.
- [6] EN 13263-1 - Silica fume for concrete. Definitions, requirements and conformity criteria.
- [7] EN 934-2 - Admixtures for concrete, mortar and grout . Concrete admixtures. Definitions, requirements, conformity, marking and labeling.
- [8] EN 13813 - Screed material and floor screeds. Screed material. Properties and requirements.
- [9] EN 14992 - Precast concrete products. Wall elements.
- [10] EN 771-3 - Specification for masonry units. Aggregate concrete masonry units (dense and lightweight aggregates).
- [11] <http://ec.europa.eu>
- [12] <https://osha.europa.eu>



5. ANNEXES

As annexes of this deliverable, the CE marked DoP documents for the Sus-Con aggregates (PU, RX, TR) and components (blocks, panels, screed) are reported.



0000

Polyurethane
IRIDEX

15

0123-CPR-4567

EN 13055-1

Lightweight aggregates obtained by processing natural, manufactured or recycled materials and mixtures of these aggregates for use in concrete, mortar and grout.

Particle shape			
Particle size distribution (mm)	0/4	4/8	8/16
Loose bulk density (kg/mc)	117	144	75
Percentage of crushed particles			
Cleanliness			
Resistance to fragmentation (N/mm ²)	-	1,35	1,59
Composition/content			
Chloride (%)	0.031	0.031	0.031
Acid-soluble sulfate (%)	0.177	0.177	0.177
Total sulfur (%)	0.134	0.134	0.134
Volume stability			
Water absorption (%)	-	10.11	11.11
Emission of radioactivity			
Release of heavy metals			
Release of polyaromatic carbons			
Release of other dangerous substances			
Durability against freeze-thaw			
Resistance against alkalisilica reactivity			

DECLARATION OF PERFORMANCE

In accordance with Annex III of Regulation (EU) n.305/2011 – Construction Product Regulation

1 – Unique identification code of the product-type: **PU**

2 - Type, batch or serial number or any other element allowing identification of the construction product as required pursuant to Article 11(4): **Rigid Polyurethane foams**

3 – Intended use or uses of the construction product in accordance with the applicable harmonized technical specification, as foreseen by the manufacturer: **Aggregate for concrete**

4 - Name, registered trade name or trademark and address of the manufacturer in accordance with Article 11(5):

IRIDEX

5 – Where relevant, name and address of the authorized representative whose mandate covers the tasks described in Article 12(2): **n/a**

6 - System of assessment and verification of constancy of performance of the construction product set out in Annex V: **System 2+**

7 - In case of a declaration of performance concerning a construction product that falls within the scope of a harmonized standard:

EN 13055-1 – Lightweight aggregates. Lightweight aggregates for concrete, mortar and grout.

xxxxx, notified body for the certification of production control n° 0000, has performed the initial inspection of the manufacturing and production control, the surveillance, the verification and the continuous evaluation of production control according to system 2+ and issued the certificate of conformity of production control No. 0000-CPR-NNNN.

8 - In case of a declaration of performance concerning a construction product for which has been issued an European Technical Assessment: **n/a**

9 – Declared Performance:

Essential characteristics	Performance			Harmonized technical specification
Particle shape				EN 13055-1:2002
Particle size distribution (mm)	0/4	4/8	8/16	
Loose bulk density (kg/mc)	117	144	75	

Company logo

Essential characteristics	Performance			Harmonized technical specification
Percentage of crushed particles				
Cleanliness				
Resistance to fragmentation (N/mm²)	-	1,35	1,59	
Composition/content				
Chloride (%)	0.031	0.031	0.031	
Acid-soluble sulfate (%)	0.177	0.177	0.177	
Total sulfur (%)	0.134	0.134	0.134	
Volume stability				
Water absorption (%)	-	10.11	11.11	
Emission of radioactivity				
Release of heavy metals				
Release of polyaromatic carbons				
Release of other dangerous substances				
Durability against freeze-thaw				
Resistance against alkalisilica reactivity				

10 - The performance of the product identified in points 1 and 2 is in conformity with the declared performance in point 9. This declaration of performance is issued under the sole responsibility of the manufacturer identified in point 4.

Signed for and on behalf of the manufacturer by:

Mr. John White

Place, date



0000

Remix High Density
CETMA

15

0123-CPR-4567

EN 13055-1

Lightweight aggregates obtained by processing natural, manufactured or recycled materials and mixtures of these aggregates for use in concrete, mortar and grout.

Particle shape		
Particle size distribution (mm)	0/2	1/4
Loose bulk density (kg/mc)	280-350	280-350
Percentage of crushed particles		
Cleanliness		
Resistance to fragmentation (N/mm ²)	2.54	2.54
Composition/content		
Chloride (%)	0.125	0.125
Acid-soluble sulfate (%)	0.011	0.011
Total sulfur (%)	0.03	0.03
Volume stability		
Water absorption (%)	10	10
Emission of radioactivity		
Release of heavy metals		
Release of polyaromatic carbons		
Release of other dangerous substances		
Durability against freeze-thaw		
Resistance against alkalisilica reactivity		

Company logo

DECLARATION OF PERFORMANCE

In accordance with Annex III of Regulation (EU) n.305/2011 – Construction Product Regulation

1 – Unique identification code of the product-type: **RX-HD**

2 - Type, batch or serial number or any other element allowing identification of the construction product as required pursuant to Article 11(4): **Remix High Density**

3 – Intended use or uses of the construction product in accordance with the applicable harmonized technical specification, as foreseen by the manufacturer: **Aggregate for concrete**

4 - Name, registered trade name or trademark and address of the manufacturer in accordance with Article 11(5):

CETMA

5 – Where relevant, name and address of the authorized representative whose mandate covers the tasks described in Article 12(2): **n/a**

6 - System of assessment and verification of constancy of performance of the construction product set out in Annex V: **System 2+**

7 - In case of a declaration of performance concerning a construction product that falls within the scope of a harmonized standard:

EN 13055-1 – Lightweight aggregates. Lightweight aggregates for concrete, mortar and grout.

XXXX, notified body for the certification of production control n° 0000, has performed the initial inspection of the manufacturing and production control, the surveillance, the verification and the continuous evaluation of production control according to system 2+ and issued the certificate of conformity of production control No. 0000-CPR-NNNN.

8 - In case of a declaration of performance concerning a construction product for which has been issued an European Technical Assessment: **n/a**

9 – Declared Performance:

Essential characteristics	Performance		Harmonized technical specification
Particle shape			EN 13055-1:2002
Particle size distribution (mm)	0/2	1/4	
Loose bulk density (kg/mc)	280-350	280-350	

Company logo

Percentage of crushed particles			
Cleanliness			
Resistance to fragmentation (N/mm²)	2.54	2.54	
Composition/content			
Chloride (%)	0.125	0.125	
Acid-soluble sulfate (%)	0.011	0.011	
Total sulfur (%)	0.03	0.03	
Volume stability			
Water absorption (%)	10	10	
Emission of radioactivity			
Release of heavy metals			
Release of polyaromatic carbons			
Release of other dangerous substances			
Durability against freeze-thaw			
Resistance against alkalisilica reactivity			

10 - The performance of the product identified in points 1 and 2 is in conformity with the declared performance in point 9. This declaration of performance is issued under the sole responsibility of the manufacturer identified in point 4.

Signed for and on behalf of the manufacturer by:

Mr. John White

Place, date

CE

0000

Remix Low Density
CETMA

15

0123-CPR-4567

EN 13055-1

Lightweight aggregates obtained by processing natural, manufactured or recycled materials and mixtures of these aggregates for use in concrete, mortar and grout.

Particle shape	
Particle size distribution (mm)	8/12.5
Loose bulk density (kg/mc)	333-359
Percentage of crushed particles	
Cleanliness	
Resistance to fragmentation (N/mm ²)	2.15
Composition/content	
Chloride (%)	
Acid-soluble sulfate (%)	
Total sulfur (%)	0.764
Volume stability	
Water absorption (%)	22
Emission of radioactivity	
Release of heavy metals	
Release of polyaromatic carbons	
Release of other dangerous substances	
Durability against freeze-thaw	
Resistance against alkalisilica reactivity	

DECLARATION OF PERFORMANCE

In accordance with Annex III of Regulation (EU) n.305/2011 – Construction Product Regulation

1 – Unique identification code of the product-type: **RX-LD**

2 - Type, batch or serial number or any other element allowing identification of the construction product as required pursuant to Article 11(4): **Remix Low Density**

3 – Intended use or uses of the construction product in accordance with the applicable harmonized technical specification, as foreseen by the manufacturer: **Aggregate for concrete**

4 - Name, registered trade name or trademark and address of the manufacturer in accordance with Article 11(5):

CETMA

5 – Where relevant, name and address of the authorized representative whose mandate covers the tasks described in Article 12(2): **n/a**

6 - System of assessment and verification of constancy of performance of the construction product set out in Annex V: **System 2+**

7 - In case of a declaration of performance concerning a construction product that falls within the scope of a harmonized standard:

EN 13055-1 – Lightweight aggregates. Lightweight aggregates for concrete, mortar and grout.

XXXX, notified body for the certification of production control n° 0000, has performed the initial inspection of the manufacturing and production control, the surveillance, the verification and the continuous evaluation of production control according to system 2+ and issued the certificate of conformity of production control No. 0000-CPR-NNNN.

8 - In case of a declaration of performance concerning a construction product for which has been issued an European Technical Assessment: **n/a**

9 – Declared Performance:

Essential characteristics	Performance	Harmonized technical specification
Particle shape		EN 13055-1:2002
Particle size distribution (mm)	8/12.5	
Loose bulk density (kg/mc)	333-359	

Company logo

Percentage of crushed particles		
Cleanliness		
Resistance to fragmentation (N/mm²)	2.15	
Composition/content		
Chloride (%)		
Acid-soluble sulfate (%)		
Total sulfur (%)	0.764	
Volume stability		
Water absorption (%)	22	
Emission of radioactivity		
Release of heavy metals		
Release of polyaromatic carbons		
Release of other dangerous substances		
Durability against freeze-thaw		
Resistance against alkalisilica reactivity		

10 - The performance of the product identified in points 1 and 2 is in conformity with the declared performance in point 9. This declaration of performance is issued under the sole responsibility of the manufacturer identified in point 4.

Signed for and on behalf of the manufacturer by:

Mr. John White

Place, date



0000

Tyre Rubber
ACCIONA

15

0123-CPR-4567

EN 13055-1

Lightweight aggregates obtained by processing natural, manufactured or recycled materials and mixtures of these aggregates for use in concrete, mortar and grout.

Particle shape					
Particle size distribution (mm)	0/0,6	0,6/2	2/4	3/7	8/16
Loose bulk density (kg/mc)	333	403	422	459	419
Percentage of crushed particles					
Cleanliness					
Resistance to fragmentation (N/mmq)				0.2	0.18
Composition/content					
Chloride (%)	0.019	0.019	0.019	0.019	0.019
Acid-soluble sulfate (%)	0.084	0.084	0.084	0.084	0.084
Total sulfur (%)	0.274	0.274	0.274	0.274	0.274
Volume stability					
Water absorption (%)				5.66	5.14
Emission of radioactivity					
Release of heavy metals					
Release of polyaromatic carbons					
Release of other dangerous substances					
Durability against freeze-thaw					
Resistance against alkalisilica reactivity					

DECLARATION OF PERFORMANCE

In accordance with Annex III of Regulation (EU) n.305/2011 – Construction Product Regulation

1 – Unique identification code of the product-type: **TR**

2 - Type, batch or serial number or any other element allowing identification of the construction product as required pursuant to Article 11(4): **Tyre rubber**

3 – Intended use or uses of the construction product in accordance with the applicable harmonized technical specification, as foreseen by the manufacturer: **Aggregate for concrete**

4 - Name, registered trade name or trademark and address of the manufacturer in accordance with Article 11(5):

ACCIONA

5 – Where relevant, name and address of the authorized representative whose mandate covers the tasks described in Article 12(2): **n/a**

6 - System of assessment and verification of constancy of performance of the construction product set out in Annex V: **System 2+**

7 - In case of a declaration of performance concerning a construction product that falls within the scope of a harmonized standard:

EN 13055-1 – Lightweight aggregates. Lightweight aggregates for concrete, mortar and grout.

XXXX, notified body for the certification of production control n° 0000, has performed the initial inspection of the manufacturing and production control, the surveillance, the verification and the continuous evaluation of production control according to system 2+ and issued the certificate of conformity of production control No. 0000-CPR-NNNN.

8 - In case of a declaration of performance concerning a construction product for which has been issued an European Technical Assessment: **n/a**

9 – Declared Performance:

Essential characteristics	Performance					Harmonized technical specification
Particle shape						EN 13055-1:2002
Particle size distribution (mm)	0/0,6	0,6/2	2/4	3/7	8/16	
Loose bulk density (kg/mc)	333	403	422	459	419	

Company logo

Percentage of crushed particles						
Cleanliness						
Resistance to fragmentation (N/mm²)				0.2	0.18	
Composition/content						
Chloride (%)	0.019	0.019	0.019	0.019	0.019	
Acid-soluble sulfate (%)	0.084	0.084	0.084	0.084	0.084	
Total sulfur (%)	0.274	0.274	0.274	0.274	0.274	
Volume stability						
Water absorption (%)				5.66	5.14	
Emission of radioactivity						
Release of heavy metals						
Release of polyaromatic carbons						
Release of other dangerous substances						
Durability against freeze-thaw						
Resistance against alkalisilica reactivity						

10 - The performance of the product identified in points 1 and 2 is in conformity with the declared performance in point 9. This declaration of performance is issued under the sole responsibility of the manufacturer identified in point 4.

Signed for and on behalf of the manufacturer by:

Mr. John White

Place, date



0000

ISTON / MAGNETTI

15

0123-CPR-4567

EN 771-3

Aggregate concrete masonry units with lightweight aggregates

	<i>PU4</i>	<i>PU11</i>	<i>PU30</i>	<i>RX11</i>	<i>TR4</i>
Dimensions and dimensional tolerances (for units intended to be used in elements subject to structural requirements)					
Configuration (for units intended to be used in elements subject to structural requirements)					
Compressive strength (for units intended to be used in elements subject to structural requirements) (MPa)	5,6	8,3	15,1	18,2	4,2
Dimensional stability (for units intended to be used in elements subject to structural requirements)					
Bond strength (for units intended to be used in elements subject to structural requirements)					
Reaction to fire (for units intended to be used in elements subject to fire requirements)					
Water absorption (for units intended to be used in damp proof courses and or in external elements with exposed face)					
Water vapour permeability (for units intended to be used in external elements)					
Direct airborne sound insulation (in end conditions)/ Density and configuration (for units to be used in elements subject to acoustic requirements)					
Thermal resistance/ Density and configuration (for units intended to be used in elements subject to thermal insulation requirements) (K/W)	0,44	0,22	0,34	0,26	0,22
Durability against freeze/thaw					
Dangerous substances					

DECLARATION OF PERFORMANCE

In accordance with Annex III of Regulation (EU) n.305/2011 – Construction Product Regulation

1 – Unique identification code of the product-type: **Blocks**

2 - Type, batch or serial number or any other element allowing identification of the construction product as required pursuant to Article 11(4): **Masonry units. Category I**

3 – Intended use or uses of the construction product in accordance with the applicable harmonized technical specification, as foreseen by the manufacturer: **In walls, columns and partitions**

4 - Name, registered trade name or trademark and address of the manufacturer in accordance with Article 11(5):

ISTON / MAGNETTI

5 – Where relevant, name and address of the authorized representative whose mandate covers the tasks described in Article 12(2): **n/a**

6 - System of assessment and verification of constancy of performance of the construction product set out in Annex V: **System 2+**

7 - In case of a declaration of performance concerning a construction product that falls within the scope of a harmonized standard:

EN 771-3 – Aggregate concrete masonry units

xxxxx, notified body for the certification of production control n° 0000, has performed the initial inspection of the manufacturing and production control, the surveillance, the verification and the continuous evaluation of production control according to system 2+ and issued the certificate of conformity of production control No. 0000-CPR-NNNN.

8 - In case of a declaration of performance concerning a construction product for which has been issued an European Technical Assessment: **n/a**

9 – Declared Performance:

Essential characteristics	Performance					Harmonized technical specification
	PU4	PU11	PU30	RX11	TR4	
Dimensions and dimensional tolerances (for units intended to be used in elements subject to structural requirements)						
Configuration (for units						

Company logo

Essential characteristics	Performance					Harmonized technical specification
intended to be used in elements subject to structural requirements)						EN 771-3:2011
Compressive strength(for units intended to be used in elements subject to structural requirements) (MPa)	5,6	8,3	15,1	18,2	4,2	
Dimensional stability (for units intended to be used in elements subject to structural requirements)						
Bond strength (for units intended to be used in elements subject to structural requirements)						
Reaction to fire (for units intended to be used in elements subject to fire requirements)						
Water absorption (for units intended to be used in damp proof courses and or in external elements with exposed face)						
Water vapour permeability(for units intended to be used in external elements)						
Direct airborne sound insulation (in end conditions)/ Density and configuration (for units to be used in elements subject to acoustic requirements)						
Thermal resistance/ Density and configuration (for units intended to be used in elements subject to thermal insulation requirements) (K/W)	0,44	0,22	0,34	0,26	0,22	
Durability against freeze/thaw						
Dangerous substances						

Company logo

10 - The performance of the product identified in points 1 and 2 is in conformity with the declared performance in point 9. This declaration of performance is issued under the sole responsibility of the manufacturer identified in point 4.

Signed for and on behalf of the manufacturer by:

Mr. John White

Place, date

DECLARATION OF PERFORMANCE

In accordance with Annex III of Regulation (EU) n.305/2011 – Construction Product Regulation

1 – Unique identification code of the product-type: **Blocks**

2 - Type, batch or serial number or any other element allowing identification of the construction product as required pursuant to Article 11(4): **Masonry units. Category II**

3 – Intended use or uses of the construction product in accordance with the applicable harmonized technical specification, as foreseen by the manufacturer: **In walls, columns and partitions**

4 - Name, registered trade name or trademark and address of the manufacturer in accordance with Article 11(5):

ISTON / MAGNETTI

5 – Where relevant, name and address of the authorized representative whose mandate covers the tasks described in Article 12(2): **n/a**

6 - System of assessment and verification of constancy of performance of the construction product set out in Annex V: **System 4**

7 - In case of a declaration of performance concerning a construction product that falls within the scope of a harmonized standard:

EN 771-3 – Aggregate concrete masonry units

8 - In case of a declaration of performance concerning a construction product for which has been issued an European Technical Assessment: **n/a**

9 – Declared Performance:

Essential characteristics	Performance					Harmonized technical specification
	PU4	PU11	PU30	RX11	TR4	
Dimensions and dimensional tolerances (for units intended to be used in elements subject to structural requirements)						
Configuration (for units intended to be used in elements subject to structural requirements)						
Compressive strength(for units intended to be used in	5,6	8,3	15,1	18,2	4,2	

Company logo

Essential characteristics	Performance					Harmonized technical specification
elements subject to structural requirements) (MPa)						EN 771-3:2011
Dimensional stability (for units intended to be used in elements subject to structural requirements)						
Bond strength (for units intended to be used in elements subject to structural requirements)						
Reaction to fire (for units intended to be used in elements subject to fire requirements)						
Water absorption (for units intended to be used in damp proof courses and or in external elements with exposed face)						
Water vapour permeability(for units intended to be used in external elements)						
Direct airborne sound insulation (in end conditions)/ Density and configuration (for units to be used in elements subject to acoustic requirements)						
Thermal resistance/ Density and configuration (for units intended to be used in elements subject to thermal insulation requirements) (K/W)	0,44	0,22	0,34	0,26	0,22	
Durability against freeze/thaw						
Dangerous substances						

10 - The performance of the product identified in points 1 and 2 is in conformity with the declared performance in point 9. This declaration of performance is issued under the sole responsibility of the manufacturer identified in point 4.

Company logo

Signed for and on behalf of the manufacturer by:

Mr. John White

Place, date

CE

0000

ISTON / MAGNETTI

15

0123-CPR-4567

EN 14992

Precast concrete products – Wall elements without façade functions

	<i>PU21a</i>	<i>PU21b</i>	<i>RX4</i>
Compressive strength (of concrete) (MPa)	6,2	6,6	6,8
Mechanical resistance			
Resistance to fire (where relevant)			
Reaction to fire (where relevant)			
Acoustical insulation (where relevant)			
Thermal resistance (where relevant)			
Detailing			
Durability			
Strength of fixture ^b			

^a Applies only to loadbearing elements

^b Applies only to claddings

DECLARATION OF PERFORMANCE

In accordance with Annex III of Regulation (EU) n.305/2011 – Construction Product Regulation

1 – Unique identification code of the product-type: **Panels**

2 - Type, batch or serial number or any other element allowing identification of the construction product as required pursuant to Article 11(4): **Precast concrete products – Wall elements with façade functions**

3 – Intended use or uses of the construction product in accordance with the applicable harmonized technical specification, as foreseen by the manufacturer: **Non loadbearing wall element with façade functions**

4 - Name, registered trade name or trademark and address of the manufacturer in accordance with Article 11(5):

ISTON / MAGNETTI

5 – Where relevant, name and address of the authorized representative whose mandate covers the tasks described in Article 12(2): **n/a**

6 - System of assessment and verification of constancy of performance of the construction product set out in Annex V: **System 4**

7 - In case of a declaration of performance concerning a construction product that falls within the scope of a harmonized standard:

EN 14992 – Precast concrete products – Wall elements

8 - In case of a declaration of performance concerning a construction product for which has been issued an European Technical Assessment: **n/a**

9 – Declared Performance:

Essential characteristics	Performance			Harmonized technical specification
	PU21a	PU21b	RX4	
Compressive strength (of concrete) (MPa)	6,2	6,6	6,8	EN 14992:2007
Mechanical resistance				
Resistance to fire (where relevant)				
Reaction to fire (where relevant)				
Acoustical insulation (where relevant)				

Company logo

Essential characteristics	Performance			Harmonized technical specification
<i>Thermal resistance (where relevant)</i>				
<i>Detailing</i>				
<i>Durability</i>				
<i>Water vapour permeability (where relevant)</i>				
<i>Water permeability (where relevant)</i>				
<i>Strength of fixture^a</i>				

^a Applies only to claddings

10 - The performance of the product identified in points 1 and 2 is in conformity with the declared performance in point 9. This declaration of performance is issued under the sole responsibility of the manufacturer identified in point 4.

Signed for and on behalf of the manufacturer by:

Mr. John White

Place, date

DECLARATION OF PERFORMANCE

In accordance with Annex III of Regulation (EU) n.305/2011 – Construction Product Regulation

1 – Unique identification code of the product-type: **Panels**

2 - Type, batch or serial number or any other element allowing identification of the construction product as required pursuant to Article 11(4): **Precast concrete products – Wall elements without façade functions**

3 – Intended use or uses of the construction product in accordance with the applicable harmonized technical specification, as foreseen by the manufacturer: **Non loadbearing wall element without façade functions**

4 - Name, registered trade name or trademark and address of the manufacturer in accordance with Article 11(5):

ISTON / MAGNETTI

5 – Where relevant, name and address of the authorized representative whose mandate covers the tasks described in Article 12(2): **n/a**

6 - System of assessment and verification of constancy of performance of the construction product set out in Annex V: **System 4**

7 - In case of a declaration of performance concerning a construction product that falls within the scope of a harmonized standard:

EN 14992 – Precast concrete products – Wall elements

8 - In case of a declaration of performance concerning a construction product for which has been issued an European Technical Assessment: **n/a**

9 – Declared Performance:

Essential characteristics	Performance			Harmonized technical specification
	PU21a	PU21b	RX4	
Compressive strength (of concrete) (MPa)	6,2	6,6	6,8	EN 14992:2007
Mechanical resistance				
Resistance to fire (where relevant)				
Reaction to fire (where relevant)				
Acoustical insulation (where relevant)				

Company logo

Essential characteristics	Performance			Harmonized technical specification
<i>Thermal resistance (where relevant)</i>				
<i>Detailing</i>				
<i>Durability</i>				
<i>Strength of fixture^a</i>				

^a Applies only to claddings

10 - The performance of the product identified in points 1 and 2 is in conformity with the declared performance in point 9. This declaration of performance is issued under the sole responsibility of the manufacturer identified in point 4.

Signed for and on behalf of the manufacturer by:

Mr. John White

Place, date

DECLARATION OF PERFORMANCE

In accordance with Annex III of Regulation (EU) n.305/2011 – Construction Product Regulation

1 – Unique identification code of the product-type: **Panels**

2 - Type, batch or serial number or any other element allowing identification of the construction product as required pursuant to Article 11(4): **Precast concrete products – Wall elements with façade functions**

3 – Intended use or uses of the construction product in accordance with the applicable harmonized technical specification, as foreseen by the manufacturer: **Loadbearing wall element with façade functions**

4 - Name, registered trade name or trademark and address of the manufacturer in accordance with Article 11(5):

ISTON / MAGNETTI

5 – Where relevant, name and address of the authorized representative whose mandate covers the tasks described in Article 12(2): **n/a**

6 - System of assessment and verification of constancy of performance of the construction product set out in Annex V: **System 2+**

7 - In case of a declaration of performance concerning a construction product that falls within the scope of a harmonized standard:

EN 14992 – Precast concrete products – Wall elements

xxxxx, notified body for the certification of production control n° 0000, has performed the initial inspection of the manufacturing and production control, the surveillance, the verification and the continuous evaluation of production control according to system 2+ and issued the certificate of conformity of production control No. 0000-CPR-NNNN.

8 - In case of a declaration of performance concerning a construction product for which has been issued an European Technical Assessment: **n/a**

9 – Declared Performance:

Essential characteristics	Performance			Harmonized technical specification
	PU21a	PU21b	RX4	
Compressive strength (of concrete) (MPa)	6,2	6,6	6,8	EN 14992:2007
Mechanical resistance				
Resistance to fire (where relevant)				

Company logo

Essential characteristics	Performance			Harmonized technical specification
Reaction to fire (where relevant)				
Acoustical insulation (where relevant)				
Thermal resistance (where relevant)				
Detailing				
Durability				
Water vapour permeability (where relevant)				
Water permeability (where relevant)				
Strength of fixture^a				

^a Applies only to claddings

10 - The performance of the product identified in points 1 and 2 is in conformity with the declared performance in point 9. This declaration of performance is issued under the sole responsibility of the manufacturer identified in point 4.

Signed for and on behalf of the manufacturer by:

Mr. John White

Place, date

DECLARATION OF PERFORMANCE

In accordance with Annex III of Regulation (EU) n.305/2011 – Construction Product Regulation

1 – Unique identification code of the product-type: **Panels**

2 - Type, batch or serial number or any other element allowing identification of the construction product as required pursuant to Article 11(4): **Precast concrete products – Wall elements without façade functions**

3 – Intended use or uses of the construction product in accordance with the applicable harmonized technical specification, as foreseen by the manufacturer: **Loadbearing wall element without façade functions**

4 - Name, registered trade name or trademark and address of the manufacturer in accordance with Article 11(5):

ISTON / MAGNETTI

5 – Where relevant, name and address of the authorized representative whose mandate covers the tasks described in Article 12(2): **n/a**

6 - System of assessment and verification of constancy of performance of the construction product set out in Annex V: **System 2+**

7 - In case of a declaration of performance concerning a construction product that falls within the scope of a harmonized standard:

EN 14992 – Precast concrete products – Wall elements

xxxxx, notified body for the certification of production control n° 0000, has performed the initial inspection of the manufacturing and production control, the surveillance, the verification and the continuous evaluation of production control according to system 2+ and issued the certificate of conformity of production control No. 0000-CPR-NNNN.

8 - In case of a declaration of performance concerning a construction product for which has been issued an European Technical Assessment: **n/a**

9 – Declared Performance:

Essential characteristics	Performance			Harmonized technical specification
	PU21a	PU21b	RX4	
Compressive strength (of concrete) (MPa)	6,2	6,6	6,8	EN 14992:2007
Mechanical resistance				
Resistance to fire (where relevant)				

Company logo

Essential characteristics	Performance			Harmonized technical specification
Reaction to fire (where relevant)				
Acoustical insulation (where relevant)				
Thermal resistance (where relevant)				
Detailing				
Durability				
Strength of fixture^a				

^a Applies only to claddings

10 - The performance of the product identified in points 1 and 2 is in conformity with the declared performance in point 9. This declaration of performance is issued under the sole responsibility of the manufacturer identified in point 4.

Signed for and on behalf of the manufacturer by:

Mr. John White

Place, date

CE

0000

ISTON

15

0123-CPR-4567

EN 13813

Cementitious screed material for use internally in buildings

Reaction to Fire	
Release of corrosive substances	
Water permeability	
Water Vapour permeability	
Compressive Strength (MPa)	7,6 at 14 days
Wear resistance	
Sound insulation	
Sound absorption	
Thermal resistance	0,38986
Chemical resistance	

DECLARATION OF PERFORMANCE

In accordance with Annex III of Regulation (EU) n.305/2011 – Construction Product Regulation

1 – Unique identification code of the product-type: **Floor screed underlay**

2 - Type, batch or serial number or any other element allowing identification of the construction product as required pursuant to Article 11(4): **Floor screed underlay**

3 – Intended use or uses of the construction product in accordance with the applicable harmonized technical specification, as foreseen by the manufacturer: **Screed material and floor screeds**

4 - Name, registered trade name or trademark and address of the manufacturer in accordance with Article 11(5):

ISTON

5 – Where relevant, name and address of the authorized representative whose mandate covers the tasks described in Article 12(2): **n/a**

6 - System of assessment and verification of constancy of performance of the construction product set out in Annex V: **System 4**

7 - In case of a declaration of performance concerning a construction product that falls within the scope of a harmonized standard:

EN 13813 - Cementitious screed material for use internally in buildings

8 - In case of a declaration of performance concerning a construction product for which has been issued an European Technical Assessment: **n/a**

9 – Declared Performance:

Essential characteristics	Performance	Harmonized technical specification
Reaction to Fire		EN 13813:2004
Release of corrosive substances		
Water permeability		
Water Vapour permeability		
Compressive Strength (MPa)	7,6 at 14 days	
Wear resistance		
Sound insulation		
Sound absorption		

Company logo

Essential characteristics	Performance	Harmonized technical specification
<i>Thermal resistance</i>	<i>0,38986</i>	
<i>Chemical resistance</i>		

10 - The performance of the product identified in points 1 and 2 is in conformity with the declared performance in point 9. This declaration of performance is issued under the sole responsibility of the manufacturer identified in point 4.

Signed for and on behalf of the manufacturer by:

Mr. John White

Place, date