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BPN B.V.

DECLARATION BY KIWA

This qualification declaration for product certificate with attestation is based on BRL 2812 'Agricultural Concrete Products', dated 21 March 2014, including amendment dated 31 Dec 2014, issued in accordance with the Kiwa Regulations for Product Certification.

The quality system and the product characteristics for agricultural concrete products are periodically controlled and the performance of agricultural concrete products assessed in their application and the assumptions of the assessment periodically controlled.

Based on this, Kiwa declares that

- it has every reason to believe that the agricultural concrete products supplied by the certificate holder meet the requirements set out in the BRL, providing that they bear the KOMO[®] mark as described in this quality declaration.
- The essential characteristics set out in the applicable European standard are not part of this declaration.
- The construction parts that are made from these agricultural concrete products will perform as described in this KOMO quality declaration and fulfil the requirements, providing that:
 - the application conditions and technical specifications described in this KOMO quality declaration are met;
 - the construction parts are processed in accordance with the regulations and/or processing methods set out in this KOMO quality declaration;

Kiwa declares that, considering the above, agricultural concrete products meet in their application the requirements of the Dutch Building Decree as specified on page 3 of this quality declaration.

Within the framework of this KOMO quality declaration, the production of the other parts of the building elements and the processing of the agricultural concrete products in the construction parts will not be controlled.



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Kiwa

This quality declaration has been added to the list on the website of Stichting KOMO:
www.komo.nl.

Recommendation: See www.kiwa.nl to find out whether this quality declaration is valid.

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The following has been assessed:
quality system
product
Periodic check

Agricultural Concrete Products

TABLE OF CONTENTS

1. **BUILDING DECREE CERTIFICATE**
2. **TECHNICAL SPECIFICATIONS**
 - 2.1 **Subject**
 - 2.2 **Required characteristics**
 - 2.3 **Product characteristics**
 - 2.4 **Marks**
 - 2.5 **Specifications of agricultural structures**
3. **PROCESSING**
4. **PERFORMANCE UNDER THE BUILDING DECREE**
5. **TIPS FOR THE USER**
6. **LIST OF DOCUMENTS MENTIONED**
7. **OVERVIEW OF AGRICULTURAL CONCRETE PRODUCTS**

Agricultural Concrete Products

1. **BUILDING DECREE CERTIFICATE**

No.	section	limit value/determination method	performance in accordance with quality declaration	comments related to application
Chapter 2 – Technical building regulations regarding safety				
2.1	General strength of the structure	The strength of agricultural concrete products is to be calculated according to NEN-EN 1992-1-1. In addition to the calculations, tests may be carried out on the condition that they are in accordance with NEN-EN 1990 Appendix D.	The quality declaration states the conditions under which agricultural concrete products meet the strength requirements.	

2. **TECHNICAL SPECIFICATIONS**

2.1 **SUBJECT**

Agricultural structures that are made of one or more of the following concrete elements:
- clamp silo wall elements.

The agricultural concrete elements are covered by consequential class CC1/reliability class RC1 and have a design lifetime of 15 years.

2.2 **REQUIRED CHARACTERISTICS**

2.2.1 **Required characteristics clamp silo wall elements within the scope of NEN-EN 15258**

The statements in Chapter 4 of this quality declaration for clamp silo wall elements that are within the scope of NEN-EN 15258 as appropriate for use in agricultural building structures apply if the product meets the below conditions:

Our reference	Determination methods	Requirement
Concrete compressive strength	NEN-EN 12390-3	$f_{ck} \geq 60 \text{ N/mm}^2 / f_{ck,cube} \geq 75 \text{ N/mm}^2$ (C60/75)
Tensile strength and yield point for reinforcing steel	NEN-EN-ISO 6892-1	Yield point $\geq 500 \text{ N/mm}^2$ (B500)
Mechanical strength	NEN-EN 1992-1-1	Within the conditions of Article 4.3.3 of NEN-EN 15258
Specifications	NEN 3682	Within the dimension tolerances of Article 4.3.1 of NEN-EN 15258
Durability	NEN 206-1	Within the conditions of Article 4.3.7 of NEN-EN 15258

2.3 **PRODUCT CHARACTERISTICS**

The products meet BRL 2812.

2.3.1 **Shape and composition**

The agricultural concrete products are composed of the materials mentioned in sections 2.3.3 and 2.3.4.

2.3.2 **Type and dimensions**

Chapter 7 lists the below information for the types of agricultural concrete elements that are covered by the quality declaration:

- type description;
- load class;
- total height in mm;
- total width in mm;
- total length in mm;
- manufacturer's type designation (if applicable).

2.3.3 **Concrete**

Concrete in conformity with NEN-EN 206-1 and NEN 8005. In deviation to the provisions of Article 5.3.2 of NEN-EN 206-1 and NEN 8005, the minimum amount of fine material can be decreased by a maximum of 10%.

2.3.4 **Reinforcing steel**

Reinforcing steel is in conformity with NEN 6008, quality B500A or B500B in accordance with BRL 0501.

2.3.5 **Clamp silo wall elements**

The clamp silo wall elements are manufactured in accordance with NEN-EN 206-1 and NEN 8005 and NEN-EN13670.

Agricultural Concrete Products

2.4 MARKS

- name of manufacturer and/or registered trademark;
- production date or code;
- type designation;
- weight > 800 kg;
- KOMO[®] logo and certificate number;

The mark is applied as follows:



The following must be stated on the delivery documents:

- name of supplier/manufacturer;
- production site;
- KOMO[®] mark and certificate number;

The mandatory designations are placed on the product and/or packaging and/or delivery documents.

2.5 SPECIFICATIONS OF AGRICULTURAL STRUCTURES

2.5.1 Clamp silo walls

The elements are intended for the construction of storage areas for roughage.

Flatness

The flatness must comply with the requirements set out in NEN 2889.

Joint width between the elements

The joint width between the elements must be nil. Any play in the V-joint between the elements must be sealed with the appropriate joint filler. The V-joint is max. 25 mm.

Joint filler

The vertical joints between the wall elements are sealed at the concave and convex joint with elastic cement or an equivalent watertight mortar filler.

Recesses

For the recesses that are to be made with max. ≤ 200 mm, the missing reinforcement and/or cut away reinforcement must be placed beside the recess.

For recesses with > 200 mm, the reduction of the pressure zone must be taken into account in the calculation. This also applies when multiple recesses are placed together. The numbers and diameters of the bars around the recesses follow from the calculation.

Weight of the clamp silo wall

For the strength and deflection calculations a density of reinforced concrete of 2400 kg/m³ is used.

Agricultural Concrete Products

3. PROCESSING

3.1 General

The manufacturer has agreed with Kiwa to assure the quality of the agricultural concrete product between its final inspection in the factory and its delivery to the delivery site.

The manufacturer will make sure that the buyer is given all of the relevant documentation, such as guidelines for handling and use, quality declarations and the like in good time before the delivery. The manufacturer undertakes to ensure the correct contents of this documentation.

3.2 Transport and mounting

During transport and mounting, the self-supporting concrete and other elements must be handled in a way that does not affect their quality. The self-supporting concrete elements, with the running side up, must be lifted at two points, whereby protrusions may not exceed one-fourth of the length of the element.

It is forbidden to drive on self-supporting concrete elements during mounting unless they are designed to handle it.

3.3 Storage

The other concrete elements are to be stacked as follows:

- Clamp silo walls free from the ground on cross beams stacked on top of each other.

3.4 Joint filler

The V-joint between the clamp silo wall elements is pre-treated with a primer and sealed with an elastic cement.

3.5 Delivery and putting into use

Agricultural concrete products that are not yet 28 days old may be delivered when 70% of the intended final strength of the concrete has been reached. The manufacturer must inform the buyer in writing that putting into use or loading is only allowed once the intended final strength of the concrete has been reached.

4. PERFORMANCE UNDER THE BUILDING DECREE

4.1 Strength of the structure, Building Decree section 2.1

4.1.1 Clamp silo wall elements

If the clamp silo wall elements fulfil the conditions set out in section 2.2, the products may be used in agricultural building structures as far as the strength under the building decree is concerned.

5. TIPS FOR THE USER

Products listed in the 'Technical specifications' must be inspected upon receipt for the following:

- delivery as agreed;
- correct mark and marking method;
- any visible defects of the product as a result of transport and the like.

Upon receipt of the delivery, make sure that the products listed in 'Handling' meet the specifications described in that section.

If you reject the products based on the aforementioned, please contact:

- BPN B.V.
- and, if necessary:
- Kiwa Nederland B.V.

The products must be stored, transported and handled in accordance with the provisions stated under 'Handling'.

Observe the conditions for use mentioned under 'Performance'.

The correctness of the performance of the essential characteristics will not be checked under this quality declaration.

The statements in this quality declaration may not be used to replace the CE marking and/or the corresponding mandatory Declaration of Performance.

Agricultural Concrete Products

6. LIST OF DOCUMENTS MENTIONED*

Standard:	Title:
BRL 5070 Criteria 73	Precast concrete elements Requirements to be set for the quality system for a product certificate for precast constructive concrete elements, including amendment. Issued by Kiwa
NEN 2873: 1999	Testing of stone-like materials - Determine stiffness according to Leroux and determine stiffness of surfaces, February 1999.
NEN 2889: 1990	Concrete elements. Maximum allowable deviations of dimensions, December 1990.
NEN 3550: 2012	Cement according to NEN-EN 197-1, NEN-EN 197-4 or NEN-EN 14216, with additional special properties - Definitions and requirements, September 2012.
NEN 3682: 1990	Dimensions check in the building sector. General rules and instructions, December 1990.
NEN 8005: 2011	Dutch interpretation of NEN-EN-206-1: Concrete Part 1: specifications, features, manufacture and conformity, including amendment A1, March 2011
NEN 9997-1:2011	Geotechnical design of constructions - Part 1: General rules, including correction sheet C1, April 2012
NEN-EN 1168:2011	Precast concrete products – Hollow core slab floors, including amendment A3, March 2011
NEN-EN 1990:2011	Euro Code: Principles of the constructive design, including amendment A1, correction sheet C2 and National Appendix, December 2011.
NEN-EN-1991-1-1:2011	Euro Code 1: Loads on constructions - Part 1-1: General loads - Volumetric masses, own mass and imposed loads for buildings, including correction sheet C1 and National Appendix, December 2011
NEN-EN-1991-4:2012	Euro Code 1: Loads on constructions - Part 4: Silos and storage tanks, including National Appendix, May 2012
NEN-EN 1992-1-1:2011	Euro Code 2: Design and calculation of concrete structures - Part 1-1: General rules and rules for buildings, including correction sheet C2 and National Appendix, November 2011
NEN-EN 12390-8:2009	Testing of hardened concrete - Part 8: Depth of penetration of water under pressure, March 2009.
NEN-EN 12737: 2008	Precast concrete products – Grid floors for stable buildings, including amendment A1, March 2008
NEN-EN 13225:2007	Precast concrete products - Beams and columns, including correction sheet C1, January 2007.
NEN-EN 13369: 2007	General stipulations for precast concrete products, including correction sheet C2, November 2007
NEN-EN 13670:2009	The manufacture of concrete constructions, December 2009
NEN-EN 13747:2010	Precast concrete products – Broad slab floors, including amendment A2, April 2010
NEN-EN 14992:2012	Precast concrete products – Wall elements, including amendment A1, June 2012
NEN-EN 15258:2008	Precast concrete products – Retaining walls, November 2008
NEN-EN-ISO-868:2003	Plastics and ebonite - Determination of the indentation hardness with a durometer (Shore hardness), April 2003.
NEN-EN-ISO 9001:2009	Quality management systems – Requirements, including correction sheet C1, September 2009.
NTA 7909:2003	Floor slip resistance - Testing and requirements protocol, May 2003.

For the correct version of the above-mentioned documents, please see the last amendment to BRL 2812 or the last version of BRL 2812.

Agricultural Concrete Products

7. OVERVIEW OF AGRICULTURAL CONCRETE PRODUCTS

Table 1 - Overview of clamp silo walls covered by the quality declaration

Description of the type / Strength class concrete	Total height (mm)	Total width (mm)	Useful Base (mm)
Clamp silo Straight C60/75 – Upper load axle load 15 tons			
SL100R	1000 *	1200	750
SL125R	1250 *	1200	750
SL150R	1500 *	1500	1000
SL175R	1750 *	1550	1000
SL200R	2000 *	1800	1250
Clamp silo Slanting C60/75 – Upper load axle load 15 tons			
SL150S	1500 *	1500	1000
SL175S	1750 *	1550	1000
Clamp silo T C60/75 – Upper load axle load 15 tons			
SL200T	2000 *	2000	1500
SL250T	2500 *	2350	1750
SL300T	3000 *	2650	2050
T-walls C60/75 – Upper load axle load 15 tons			
TW 100	1000 *	1200	500
TW 125	1250 *	1200	500
TW 150	1500 *	1200	500
TW 175	1750 *	1700	750
TW 200	2000 *	1750	750
TW 250	2500 *	2250	1000
TW 300	3000 *	2250	1000
TW 400	4000 *	2500	1100
U-walls C60/75 – Upper load axle load 15 tons			
U100	1000	1250	1005
U125	1250	1250	994
U150	1500	1250	982
U150heel	1500	1450	982
U175heel	1750	1450	970
U200heel	2000	1550	959
U250heel	2500	1900	1186
U300heel	3000	2150	1417
L-wall C60/75 – Upper load 2.0 kN/m²			
L050	500	400	285
L075	750	600	488
L100	1000	600	489
L125	1250	700	577
L150	1500	850	716
L175	1750	1000	850
L200	2000	1150	985
L250	2500	1400	1200
L300	3000	1700	1466
L-wall-heel C60/75 – Upper load axle load 10 tons			
L075heel	750	800	488
L100heel	1000	800	490
L125heel	1250	900	575
L150heel	1500	1050	716
L175heel	1750	1200	840
L-wall-heel C60/75 – Upper load axle load 15 tons			
L200heel	2000	1350	985
L250heel	2500	1600	1200
L300heel	3000	1900	1466
L350heel	3500	2050	1589
L400heel	4000	2450	1810

Table 1 continues on the next page.

Remark:

* The height of a clamp silo wall element is related to the total height minus the base thickness.

Agricultural Concrete Products

Table 1 continued - Overview of clamp silo walls covered by the quality declaration

Description of the type / Strength class concrete	Total height (mm)	Total width (mm)	Useful Base (mm)
LA C60/75 – Upper load axle load 20 tons			
LA100	1000 *	1430	1050
LA125	1250 *	1580	1200
LA150 dam wall	1500 *	1180	800
LA150 free-standing	1500 *	1680	1300
LA200 dam wall	2000 *	1470	1050
LA200 free-standing	2000 *	2070	1650
LA250 dam wall	2500 *	1710	1250
LA250 free-standing	2500 *	2310	1850
LA300 dam wall	3000 *	2100	1500
LA300 free-standing	3000 *	2700	2100
TWA C60/75 – Upper load axle load 20 tons			
TWA100	1000 *	1280	550
TWA125	1250 *	1480	650
TWA150	1506 *	1680	750
TWA175	1750 *	1900	850
TWA200	2000 *	2020	900
TWA250	2500 *	2260	1000
TWA300	3000 *	2600	1150

Remark:

* The height of a clamp silo wall element is related to the total height minus the base thickness.

Note: When using the clamp silo wall elements, the instructions of use apply.