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Agrément Certificate
21/5887
Product Sheet 1 Issue 1

MASTER BUILDER SOLUTIONS WATERTIGHT CONCRETE SYSTEM

MASTERLIFE WP 799 WATERTIGHT CONCRETE POWDER

This Agrément Certificate Product Sheet(1) relates to MasterLife WP 799 Watertight Concrete Powder, a water-resisting and super-plasticising admixture powder for use in concrete mixes to provide watertight concrete suitable for basements, roofs, swimming pools, tunnels, and culverts.

(1) Hereinafter referred to as 'Certificate'.

CERTIFICATION INCLUDES:

- factors relating to compliance with Building Regulations where applicable
- factors relating to additional non-regulatory information where applicable
- independently verified technical specification
- assessment criteria and technical investigations
- design considerations
- installation guidance
- regular surveillance of production†
- formal three-yearly review†.

KEY FACTORS ASSESSED

Water penetration and absorption, and water vapour permeability — concrete containing the product has reduced permeability when compared to equivalent plain concrete (see section 6 and 7).

Reinforcement protection — concrete containing the product has enhanced resistance to reinforcement corrosion when compared to equivalent plain concrete (see section 8).

Mechanical properties — the compressive strength of concrete is not adversely affected by the incorporation of the product, but the flexural strength is reduced (see section 9).

Durability — concrete containing the product is more durable than an equivalent plain concrete mix, owing to its reduced permeability (see section 18).

The BBA has awarded this Certificate to the company named above for the product described herein. This product has been assessed by the BBA as being fit for its intended use provided it is installed, used and maintained as set out in this Certificate.

On behalf of the British Board of Agrément

Date of First issue: 29 April 2021

Hardy Giesler
Chief Executive Officer

Certificate amended on 11 August 2023 to update email address.
Certificate amended on 4 July 2025 to update email address, telephone number and NHBC statement.

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Regulations

In the opinion of the BBA, the use of MasterLife WP 799 Watertight Concrete Powder is not subject to the national Building Regulations.

Construction (Design and Management) Regulations 2015
Construction (Design and Management) Regulations (Northern Ireland) 2016

Information in this Certificate may assist the client, designer (including Principal Designer) and contractor (including Principal Contractor) to address their obligations under these Regulations.

See sections: 3 *Delivery and site handling* (3.1, 3.2, 3.4 and 3.5) and 22 *Placing* (22.1) of this Certificate.

Additional Information

NHBC Standards 2021

In the opinion of the BBA, MasterLife WP 799 Watertight Concrete Powder, if installed, used and maintained in accordance with this Certificate, can satisfy or contribute to satisfying the relevant requirements in relation to *NHBC Standards*, Chapter 5.4 *Waterproofing of basements and other below ground structures*.

Unless it can be demonstrated that the water table is permanently below the underside of the slab, the product should be used in combination with either a Type A or C waterproofing protection where Grade 3 protection is required and the below ground wall retains more than 600 mm (measured from the top of the retained ground to the lowest finished floor level).

The opinion of the BBA does not amount to any endorsement or approval by NHBC and does not in any way guarantee that NHBC will approve such product / system as compliant with the NHBC Technical Requirements and Standards.

CE marking

The Certificate holder has taken the responsibility of CE marking the product in accordance with harmonised European Standard BS EN 934-2 : 2009 (Table 9).

Technical Specification

1 Description

MasterLife WP 799 Watertight Concrete Powder is a combined water-resisting and super-plasticising admixture, for incorporation into concrete mixes to enhance the water resistance and durability properties of the hardened concrete.

2 Manufacture

2.1 The product is manufactured by a blending process.

2.2 As part of the assessment and ongoing surveillance of product quality, the BBA has:

- agreed with the manufacturer the quality control procedures and product testing to be undertaken
- assessed and agreed the quality control operated over batches of incoming materials
- monitored the production process and verified that it is in accordance with the documented process
- evaluated the process for management of nonconformities
- checked that equipment has been properly tested and calibrated
- undertaken to carry out the above measures on a regular basis through a surveillance process, to verify that the specifications and quality control operated by the manufacturer are being maintained.

2.3 The management system of Master Builders Solutions UK Ltd has been assessed and registered as meeting the requirements of BS EN ISO 9001 : 2015 by BSI (Certificate FM01779).

3 Delivery and site handling

3.1 The product is supplied in 875 g sachets, of which 16 are packed into a 20-litre container. Each container weighs approximately 15 kg. There are 18 containers on each pallet, with a total weight of approximately 300 kg per pallet.

3.2 Each 20-litre container bears the Certificate holder's and product name, batch number, health and safety information and the BBA logo incorporating the number of this Certificate.

3.3 The product must be stored sealed in their original containers in a dry environment at temperatures between 2 and 35°C. When stored under these conditions, the product has a shelf-life of 18 months.

3.4 The Certificate holder has taken the responsibility of classifying and labelling the product under the *CLP Regulation (EC) No 1272/2008* on the *classification, labelling and packaging of substances and mixtures*. Users must refer to the relevant Safety Data Sheet(s).

3.5 When handling, the normal health and safety procedures associated with cementitious materials should be observed.

Assessment and Technical Investigations

The following is a summary of the assessment and technical investigations carried out on MasterLife WP 799 Watertight Concrete Powder.

Design Considerations

4 Use

4.1 The product is satisfactory for use in concrete mixes at an addition rate of 1.75 kg·m^{-3} of concrete, to provide watertight concrete for basements, roofs, swimming pools, tunnels, and culverts.

4.2 The effect of the product on the properties of concrete designed to BS EN 480-1 : 2006 is shown in Table 1 of this Certificate.

Table 1 Effects of the product on the properties of fresh wet concrete[(1)]

Property (unit)	Control concrete	MasterLife WP 799 (1.75 kg·m^{-3})
Water/cement ratio	0.50	0.45
Slump (mm)		
0 minimum	130	150
30 minimum	85	135
Plastic density (kg·m^{-3})	2396	2435
Air content (%)	1.6	1.0

(1) The specific effect of the product on these properties, for a particular mix and site conditions, should be evaluated through site-specific trials prior to use.

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4.3 Concrete containing the product should be designed in accordance with BS EN 206 : 2013 and BS 8500-2 : 2015 for use as all normal types, including precast, pre-stressed, post-tensioned, ready-mixed, reinforced, slip-formed, sprayed and pumped concretes.

4.4 The product is compatible with cement blends containing pulverised-fuel ash, ground granulated blast furnace slag and silica fume blends as defined in BS EN 197-1 : 2011.

4.5 The use of the product with an air-entraining agent is not covered by this Certificate.

4.6 Joints should be designed with waterstops as recommended in BS 8102 : 2009, in particular Section 9.2.1.4. Only waterstops that have been independently assessed as being capable of meeting the correct grade of waterproofing protection must be considered. See BBA Certificate 18/5556.

5 Practicability of installation

Concrete mixes containing the product can be placed, compacted and cured by operatives with experience of conventional concreting methods and equipment.

6 Water penetration and absorption

6.1 Concrete containing the product has greater resistance to water penetration and water absorption than an equivalent plain concrete.

6.2 Tests on a concrete containing the product at an addition rate of 1.75 $kg \cdot m^{-3}$ showed a water permeability(1) of 2.75 x 10^{-13} $m \cdot s^{-1}$, compared to 3.84 x 10^{-13} $m \cdot s^{-1}$ for the control concrete.

6.3 Tests on a concrete containing the product at an addition rate of 1.75 $kg \cdot m^{-3}$ showed a capillary absorption(1) of 26% by mass of the control concrete at 7 days and 29% by mass of control at 90 days.

(1) The specific effect of the product on these properties for a particular mix and site conditions should be evaluated through site trials prior to use.

7 Water vapour permeability

7.1 Concrete containing the product has a similar resistance to water vapour diffusion to an equivalent plain concrete. For specific cases, advice should be sought from the Certificate holder.

7.2 Tests on concrete containing the product at an addition rate of 1.75 $kg \cdot m^{-3}$ showed a water vapour resistivity of 1625 $MN \cdot s \cdot g^{-1} \cdot m^{-1}$, compared to 1685 $MN \cdot s \cdot g^{-1} \cdot m^{-1}$ for the control concrete.

7.3 The specific effect of the product on this property for a particular mix and site conditions should be evaluated through site trials prior to use.

7.4 The appropriate thickness for concrete with a specific resistivity to achieve a water vapour resistance of 200 $MN \cdot s \cdot g^{-1}$ or 550 $MN \cdot s \cdot g^{-1}$ is given by:

For 200 $MN \cdot s \cdot g^{-1}$ — t = 200 $MN \cdot s \cdot g^{-1}$ / vapour resistivity, or t = 200 $MN \cdot s \cdot g^{-1}$ / 5 x μ
For 550 $MN \cdot s \cdot g^{-1}$ — t = 550 $MN \cdot s \cdot g^{-1}$ / vapour resistivity, or t = 550 $MN \cdot s \cdot g^{-1}$ / 5 x μ

where:

t = concrete thickness (m)
μ = water vapour resistance factor.

8 Reinforcement protection

8.1 The high alkalinity required to prevent corrosion of the reinforcement (pH >13) will not be adversely affected by the incorporation of the product into concrete.

8.2 Corrosion of reinforcement is normally caused by the ingress of chloride to the steel or by the reduction in alkalinity of the concrete by the diffusion of carbon dioxide. The reduced water permeability of concrete containing the product will slow down diffusion of chloride into the concrete and so give improved protection against reinforcement corrosion.

8.3 The Certificate holder has declared the chloride ion content of the product as <0.1%.

8.4 The Certificate holder has declared that the product complies with the corrosion behaviour requirements given in BS EN 934-1 : 2008, Clause 5.1, and the containers are labelled accordingly.

9 Mechanical properties

9.1 The compressive strength of concrete containing the product is higher than that of equivalent plain concrete with the same consistence.

9.2 The flexural strength of concrete containing the product is lower than that of equivalent plain concrete. For specific cases, advice should be sought from the Certificate holder.

9.3 The static modulus of elasticity of concrete containing the product is similar to that of equivalent plain concrete.

9.4 The effect of the product on the mechanical properties of concrete designed to BS EN 480-1 : 2006 is shown in Table 2.

Table 2 Effects of the product on the mechanical properties of hardened concrete(1)

Property (unit)	Control concrete	MasterLife WP 799 (1.75 kg·m^{-3})
Compressive strength (N·mm^{-2})		
24 hours	14.0	18.7
28 days	45.7	54.7
Flexural strength (N·mm^{-2})		
24 hours	2.6	2.8
28 days	5.9	4.8
Modulus of elasticity (N·mm^{-2})		
28 days	36800	36500

(1) The specific effect of the product on these properties for a particular mix and site conditions should be evaluated through site trials prior to use.

10 Setting and hardening characteristics

10.1 The effect of the product for a specific mix and site conditions should be evaluated through site trials prior to use.

10.2 The setting time of concrete mixes containing the product will be similar to that of an equivalent plain concrete.

10.3 The effect of the product on the setting properties of concrete designed to BS EN 480-1 : 2006 is shown in Table 3 of this Certificate.

Table 3 Effects of the product on the setting properties of fresh wet concrete(1)

Property (unit)	Control concrete	MasterLife WP 799 (1.75 kg·m^{-3})
Water/cement ratio	0.50	0.45
Setting time (minute)		
initial set	210	195
final set	300	280

(1) The specific effect of the product on these properties for a particular mix and site conditions should be evaluated through site trials prior to use.

11 Carbonation resistance

Concrete containing the product has a similar resistance to carbon dioxide diffusion, to that of an equivalent plain concrete.

12 Frost resistance

Concrete containing the product has a similar resistance to freeze/thaw resistance to that of an equivalent plain Concrete, but during tests some scaling occurred.

13 Sulfate resistance

The lower permeability of concrete containing the product reduces the ingress of sulfates. However, if sulfate-resistant concrete is required, the advice of the Certificate holder should be sought.

14 Alkali/silica reaction (ASR)

14.1 Concrete containing the product should be designed in accordance with BS EN 206 : 2013 Section 5.2.3.5, and BS 8500-2 : 2015 Section 5.2.

14.2 The Certificate holder's declared value of <13.5% should be used when calculating the contribution of the product to the total alkali content of a given concrete mix. In turn, this can be used to assess the susceptibility of that concrete to alkali/silica reaction.

15 Resistance to leaching

Use of the product reduces the leaching of lime from the hydrated cement in the concrete.

16 Maintenance

For a specific installation, a maintenance regime should be considered to ensure that the required design life of the concrete is achieved.

17 Durability

17.1 Under normal conditions of service, concrete containing the product, is more durable than an equivalent plain concrete owing to its reduced permeability.

17.2 Where exposure to aggressive soil conditions or chemicals is anticipated, a full assessment of the site should be made. In these situations, the Certificate holder should be consulted on the suitability of the product.

Installation

18 General

18.1 Structures built incorporating the product should be designed to the relevant sections of BS 8102 : 2009, BS EN 1992-1-1 : 2004, BS EN 1992-1-2 : 2004 and BS EN 1992-3 : 2006 and their UK National Annexes.

18.2 Concrete containing the product is suitable for Type B protection as described in BS 8102 : 2009, Table 1, and can satisfy the requirements for all grades defined in Table 2 of that Standard. For Grade 3 (where control of water vapour is required), it will be necessary to provide a mix with a sufficiently low vapour permeability in combination with an adequate section thickness (see sections 7.2 and 7.3 of this Certificate). The use of suitable ventilation, dehumidification or air conditioning, appropriate to the intended use, must also be considered.

18.3 Basements for dwellings should be designed in accordance with the guidance given in the *Guidance Document — Basements for dwellings*(1).

(1) Published by the Basement Information Centre, Product code: TBIC/007.

19 Mix design

19.1 Concrete containing the product is normally supplied as ready-mixed concrete but may be prepared on sites where there is adequate mix control(1). Concrete preparation on site should be carried out in accordance with BS 8000-0 : 2014, the Certificate holder's instructions and this Certificate.

(1) NHBC will only accept use of the admixture where included at the concrete batching plant, which must also be either QSRMC or BSI Kitemark registered.

19.2 The concrete must have a minimum cement content of 350 $kg \cdot m^{-3}$, be batched with a maximum water/cement ratio of 0.45 and have a minimum consistence of S3 as in BS EN 206 : 2013. Further details of suitable mixes can be obtained from the Certificate holder.

19.3 Once the fresh concrete is mixed, further materials must not be added.

19.4 The consistency of the concrete can be adjusted using a suitable(1) water-reducing or super-plasticising admixture complying with BS EN 934-2 : 2009, to ensure the maximum water/cement ratio given in section 20.2 is not exceeded. Specific admixtures have not been considered and are outside the scope of this Certificate.

(1) The Certificate holder's advice should be sought regarding the suitability and compatibility of water-reducing or super-plasticising admixtures. Admixtures should be evaluated before use, and site trials carried out to establish the appropriate dose required.

20 Site mixing

20.1 The product is added to the mixer at the correct dose (see section 4.1), prior to batching the concrete constituents.

20.2 When an additional super-plasticiser is required, it should be added after the addition of the product.

20.3 The resulting concrete should be mixed for a minimum of five minutes to ensure even distribution of the product throughout the concrete.

20.4 Where the product is to be added to concrete on site, care must be taken to ensure that adequate mix control is available.

21 Placing

21.1 Concrete containing the product is placed in the same way as normal concrete, in accordance with BS 8000-0 : 2014, BS EN 13670 : 2009, the Certificate holder's health and safety guidance, and the normal routine precautions for handling concrete.

21.2 Concrete containing the product should not be placed in temperatures of 5°C or below.

21.3 Concrete containing the product should be fully compacted.

22 Curing

The concrete should be cured strictly in accordance with BS EN 13670 : 2009, BS EN 1992-1-1 : 2004 and its UK National Annex, and the Certificate holder's recommendations where site-specific information exists.

23 Joints

23.1 Joints should be designed with waterstops as recommended in BS 8102 : 2009, to maintain watertightness of the whole structure. The advice of the Certificate holder should be sought on particular applications. See BBA Certificate 18/5556.

23.2 Penetrations of the concrete, such as pipe entries or formwork ties, must also be securely sealed to maintain watertightness. The advice of the Certificate holder should be sought on suitable systems.

24 Finishes

When water-based products are used to coat the hardened concrete, a bonding agent may be needed. For specific cases, advice should be sought from the Certificate holder.

Technical Investigations

25 Tests

25.1 Tests were conducted on concrete designed to BS EN 480-1 : 2006, both with and without MasterLife WP 799 Watertight Concrete Powder, to determine:

- water/cement ratio
- slump
- plastic density
- air content
- setting time
- water permeability
- capillary absorption
- drying shrinkage
- wetting expansion
- freeze/thaw
- compressive strength
- flexural strength
- modulus of elasticity.

25.2 Tests were carried out and the results assessed to determine:

Characteristics of the admixture

- conventional dry material content
- pH
- total chloride content
- water soluble chloride content
- alkali content
- corrosion behaviour

Fresh concrete state

- setting time
- workability
- air content
- slump
- density

Hardened concrete state

- compressive strength
- flexural strength
- modulus of elasticity
- bond to steel
- freeze/thaw resistance
- drying shrinkage
- wetting expansion
- water vapour permeability
- liquid water permeability
- efflorescence
- capillary absorption.

26 Investigations

26.1 The manufacturing process was evaluated, including the methods adopted for quality control, and details were obtained of the quality and composition of the materials used.

26.2 A user survey was conducted to investigate the performance of the product in service.

Bibliography

BS 8000-0 : 2014 *Workmanship on construction site — Introduction and general principles*

BS 8102 : 2009 *Code of practice for protection of below ground structures against water from the groun*d

BS 8500-2 : 2015 + A1 : 2016 *Concrete — Complementary British Standard to BS EN 206 — Specification for constituent materials and concrete*

BS EN 197-1 : 2011 *Cement — Composition, specifications and conformity criteria for common cements*

BS EN 206 : 2013 + A1 : 2016 *Concrete — Specification, performance, production and conformity*

BS EN 480-1 : 2006 + A1 : 2011 *Admixtures for concrete, mortar and grout — Test methods — Reference concrete and reference mortar for testing*

BS EN 934-1 : 2008 *Admixtures for concrete, mortar and grout — Common requirements*
BS EN 934-2 : 2009 *Admixtures for concrete, mortar and grout — Concrete admixtures — Definitions and requirements, conformity, marking and labelling*

BS EN 1992-1-1 : 2004 Eurocode 2 : Design of concrete structures — *General rules and rules for buildings*
NA to BS EN 1992-1-1 : 2004 UK National Annex *to Eurocode 2 : Design of concrete structures — General rules and rules for buildings*
BS EN 1992-1-2 : 2004 Eurocode 2 : *Design of concrete structures — General rules — Structural fire design*
NA to BS EN 1992-1-2 : 2004 UK National Annex to Eurocode 2: *Design of concrete structures — Structural fire design*
BS EN 1992-3 : 2006 Eurocode 2: Design of concrete structures — *Liquid retaining and containing structures*
NA to BS EN 1992-3 : 2006 UK National Annex to Eurocode 2: *Design of concrete structures — Liquid retaining and containing structures*

BS EN 13670 : 2009 *Execution of concrete structures*

BS EN ISO 9001 : 2015 *Quality m*anagement systems — *Requirements*

Conditions of Certificate

Conditions

1 This Certificate:

- relates only to the product that is named and described on the front page
- is issued only to the company, firm, organisation or person named on the front page – no other company, firm, organisation or person may hold or claim that this Certificate has been issued to them
- is valid only within the UK
- has to be read, considered and used as a whole document – it may be misleading and will be incomplete to be selective
- is copyright of the BBA
- is subject to English Law.

2 Publications, documents, specifications, legislation, regulations, standards and the like referenced in this Certificate are those that were current and/or deemed relevant by the BBA at the date of issue or reissue of this Certificate.

3 This Certificate will be displayed on the BBA website, and the Certificate Holder is entitled to use the Certificate and Certificate logo, provided that the product and its manufacture and/or fabrication, including all related and relevant parts and processes thereof:

- are maintained at or above the levels which have been assessed and found to be satisfactory by the BBA
- continue to be checked as and when deemed appropriate by the BBA under arrangements that it will determine
- are reviewed by the BBA as and when it considers appropriate.

4 The BBA has used due skill, care and diligence in preparing this Certificate, but no warranty is provided.

5 In issuing this Certificate the BBA is not responsible and is excluded from any liability to any company, firm, organisation or person, for any matters arising directly or indirectly from:

- the presence or absence of any patent, intellectual property or similar rights subsisting in the product or any other product
- the right of the Certificate holder to manufacture, supply, install, maintain or market the product
- actual installations of the product, including their nature, design, methods, performance, workmanship and maintenance
- any works and constructions in which the product is installed, including their nature, design, methods, performance, workmanship and maintenance
- any loss or damage, including personal injury, howsoever caused by the product, including its manufacture, supply, installation, use, maintenance and removal
- any claims by the manufacturer relating to UKCA, UKNI or CE marking.

6 Any information relating to the manufacture, supply, installation, use, maintenance and removal of this product which is contained or referred to in this Certificate is the minimum required to be met when the product is manufactured, supplied, installed, used, maintained and removed. It does not purport in any way to restate the requirements of the Health and Safety at Work etc. Act 1974, or of any other statutory, common law or other duty which may exist at the date of issue or reissue of this Certificate; nor is conformity with such information to be taken as satisfying the requirements of the 1974 Act or of any statutory, common law or other duty of care.

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