Prüfbericht-Nr.: *Test report no.*:	**CN238KV4 001**	**Auftrags-Nr.:** *Order no.*: 302101951	Seite 1 von 16 Page 1 of *16*
Kunden-Referenz-Nr.: *Client reference no.*:	N/A	**Auftragsdatum** *Order date:* 2023.06.28	
Auftraggeber: *Client*:	BESTWAY BUILDING MATERIALS CO., LTD. NO.271-3-1, QINGNIAN NAN ROAD, ZHIFU, YANTAI, SHANDONG, P. R. China		
Prüfgegenstand: *Test item*:	Natural Stone Product		
Bezeichnung / Typ-Nr.: *Identification / Type no.*:	Type: HXB01, Colour: BLACK, Serial No.: 1301004 Petrographic: Sedimentary rocks (oolitic limestone)		
Auftrags-Inhalt: *Order content*:	Type examination		
Prüfgrundlage: *Test specification*:	EN 12057:2015 EN 12058:2015 EN 1469:2015 EN 1341:2012 EN 1342:2012 EN 1343:2012		

Wareneingangsdatum: *Date of sample receipt*:	2023.06.22
Prüfmuster-Nr.: *Test sample no:*	2306017
Prüfzeitraum: *Testing period*:	2023.06.27 - 2023.08.24
Ort der Prüfung: *Place of testing*:	TÜV Rheinland/CCIC (Fujian) Co.,Ltd. Xiamen Branch
Prüflaboratorium: *Testing laboratory:*	TÜV Rheinland/CCIC (Fujian) Co.,Ltd. Xiamen Branch
Prüfergebnis*: *Test result**:	Pass

geprüft von: *tested by:*	**genehmigt von:** *authorized by*:
Datum: *Date:* 2023.09.06	**Ausstellungsdatum:** *Issue date:* 2023.09.06
Stellung / Position: Arya Zhang / PE	**Stellung** / Position: Libin Luo / Reviewer

Sonstiges / *Other*:
1. The test sample also complied with the requirements of EN 12057:2004, EN 12058:2004.

Zustand des Prüfgegenstandes bei Anlieferung: *Condition of the test item at delivery*: Prüfmuster vollständig und unbeschädigt *Test item complete and undamaged*

* Legende:	P(ass) = entspricht o.g. Prüfgrundlage(n)	F(ail) = entspricht nicht o.g. Prüfgrundlage(n)	N/A = nicht anwendbar	N/T = nicht getestet
** Legend:*	*P(ass) = passed a.m. test specification(s)*	*F(ail) = failed a.m. test specification(s)*	*N/A = not applicable*	*N/T = not tested*

Anmerkungen
Remarks

1	Alle eingesetzten Prüfmittel waren zum angegebenen Prüfzeitraum gemäß eines festgelegten Kalibrierungsprogramms unseres Prüfhauses kalibriert. Sie entsprechen den in den Prüfprogrammen hinterlegten Anforderungen. Die Rückverfolgbarkeit der eingesetzten Prüfmittel ist durch die Einhaltung der Regelungen unseres Managementsystems gegeben. Detaillierte Informationen bezüglich Prüfkonditionen, Prüfequipment und Messunsicherheiten sind im Prüflabor vorhanden und können auf Wunsch bereitgestellt werden. *The equipment used during the specified testing period was calibrated according to our test laboratory calibration program. The equipment fulfils the requirements included in the relevant standards. The traceability of the test equipment used is ensured by compliance with the regulations of our management system.* *Detailed information regarding test conditions, equipment and measurement uncertainty is available in the test laboratory and could be provided on request.*
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3	Prüfklausel mit der Note * wurden an qualifizierte Unterauftragnehmer vergeben und sind unter der jeweiligen Prüfklausel des Berichts beschrieben. Abweichungen von Prüfspezifikation(en) oder Kundenanforderungen sind in der jeweiligen Prüfklausel im Bericht aufgeführt. *Test clauses with remark of * are subcontracted to qualified subcontractors and descripted under the respective test clause in the report.* *Deviations of testing specification(s) or customer requirements are listed in specific test clause in the report.*
4	Die Entscheidungsregel für Konformitätserklärungen basierend auf numerischen Messergebnisen in diesem Prüfbericht basiert auf der "Null-Grenzwert-Regel" und der "Einfachen Akzeptanz" gemäß ILAC G8:2019 und IEC Guide 115:2021, es sei denn, in der auf Seite 1 dieses Berichts genannten angewandten Norm ist etwas anderes festgelegt oder vom Kunden gewünscht. Dies bedeutet, dass die Messunsicherheit nicht berücksichtigt wird und daher auch nicht im Prüfbericht angegeben wird. Zu weiteren Informationen bezueglich des Risikos durch diese Entscheidungsregel siehe ILAC G8:2019. *The decision rule for statements of conformity, based on numerical measurement results, in this test report is based on the “Zero Guard Band Rule” and “Simple Acceptance” in accordance with ILAC G8:2019 and IEC Guide 115:2021, unless otherwise specified in the applied standard mentioned on Page 1 of this report or requested by the customer. This means that measurement uncertainty is not taken in account and hence also not declared in the test report. For additional information to the resulting risk based of this decision rule please refer to ILAC G8:2019.*

Produktbeschreibung
Product description

1	**Type**	HXB01
2	**Color**	BLACK
3	**Serial No.**	1301004
4	**Petrographic**	Sedimentary rocks (oolitic limestone）
5	**Quarry location**	Dalu Town, Cangshan County, Linyi City, Shandong Province, P. R. China
6	**Prüfmusterbereitstellung:** *Test sample obtaining:*	☒ Sending by customer ☐ Sampling by TÜV Rheinland Group ☐ others:
7	**Others**	Place of testing: 1. Technology Center of Xiamen Customs 2. China National Quality Supervision and Testing Center for Stone Products (Guangdong)

	N/A
N/A	N/A

1. Apparent Density and Open Porosity

Test Period:	31.07.2023 - 04.08.2023
Test Method:	EN 1936:2006
Specimen Dimension:	50mm×50mm×50mm

Specimen No.	m_d 1) (g)	m_h 2) (g)	m_s 3) (g)	Apparent Density (kg/m^3)	Open Porosity (%)
1	350.03	221.74	350.15	2720	0.1
2	349.41	222.13	349.56	2740	0.1
3	342.66	217.31	342.76	2730	0.1
4	348.40	220.99	348.56	2730	0.1
5	350.31	222.00	350.48	2720	0.1
6	348.85	221.43	349.04	2730	0.1
Mean value				2730	0.1

1) Mass of the dry specimen
2) Mass of the specimen immersed in water
3) Mass of the saturated specimen

2. Water Absorption under Atmospheric Pressure

Test Period:	31.07.2023 - 05.08.2023
Test Method:	EN 13755:2008
Specimen Dimension:	50mm×50mm×50mm

Specimen No.	Length (mm)	Width (mm)	Thickness (mm)	m_d 1) (g)	m_s 2) (g)	Water Absorption (g)	Water Absorption Rate (%)	
							Based on Weight	Based on Volume
1	50.2	50.4	50.2	347.15	347.29	0.14	0.04	0.1
2	50.5	50.0	50.0	343.62	343.77	0.15	0.04	0.1
3	50.3	50.5	50.7	349.20	349.39	0.19	0.05	0.1
4	50.6	50.5	50.4	350.78	350.91	0.13	0.04	0.1
5	50.0	50.0	50.4	344.49	344.65	0.16	0.05	0.1
6	50.3	50.2	50.3	344.19	344.40	0.21	0.06	0.2
Mean value						0.16	0.05	0.1
Higher expected value						/	0.07	0.2

1) Mass of the dry specimen
2) Mass of the saturated specimen

3. Abrasion Resistance

Test Period:	16.08.2023 - 21.08.2023
Test Method:	EN 14157: 2017 Method A - Wide wheel abrasion
Specimen Dimension:	150mm×100mm×20mm
Surface finish	Sawn
Load Type:	☒ Isotropic specimen ☐ Perpendicular to the planes of anisotropy ☐ Parallel to the planes of anisotropy ☐ Perpendicular to the edges of the planes of anisotropy

Specimen No.	Specimen Dimension			Mean Value of Groove Width after Calibration (mm)
	Length (mm)	Width (mm)	Thickness (mm)	
1	151.1	100.7	22.2	20.0
2	151.0	99.5	21.6	20.5
3	151.2	99.9	21.9	19.5
4	150.8	100.1	21.8	21.5
5	150.8	100.5	22.1	18.5
6	150.7	100.2	21.8	20.0
Mean value				20.0
Higher expected value				22.5

4. Slip Resistance by Means of the Pendulum Tester

Test Period:	24.08.2023
Test Method:	CEN/TS 16165: 2012, Annex C
Slider Material:	Slider 57
Specimen Dimension:	200mm×150mm×20mm
Surface finish:	Sawn

Specimen No.	Surface condition	Test result	Unit
1	Dry	56	PTV-Unit
2		59	
3		61	
4		62	
5		63	
6		64	
Temperature correction		0.00	
Mean value (PTV "dry")	**Dry**	61	**PTV-Unit**

Specimen No.	Surface condition	Test result	Unit
1	Wet	57	PTV-Unit
2		60	
3		60	
4		59	
5		60	
6		60	
Temperature correction		0.00	
Mean value (PTV "wet")	**Wet**	59	**PTV-Unit**

5. Slip Resistance by Means of the Pendulum Tester

Test Period:	24.08.2023
Test Method:	EN 14231:2003
Slider Material:	Slider 57
Specimen Dimension:	200mm×150mm×20mm
Surface finish:	Sawn

Specimen No.	Surface condition	Test result	Unit
1	Dry	56	SRV-Unit
2		59	
3		61	
4		62	
5		63	
6		64	
Temperature correction		0.00	
Mean value (SRV "dry")	**Dry**	61	**SRV-Unit**

Specimen No.	Surface condition	Test result	Unit
1	Wet	57	SRV-Unit
2		60	
3		60	
4		59	
5		60	
6		60	
Temperature correction		0.00	
Mean value (SRV "wet")	**Wet**	59	**SRV-Unit**

6. Compressive Strength

Test Period:	18.08.2023 - 21.08.2023
Test Method:	EN 1926:2006
Specimen Dimension:	50mm×50mm×50mm
Surface finish:	Sawn
Loading Rate:	(1.0 ± 0.5) MPa/s
Load Type:	☒ Isotropic specimen ☐ Normal to the planes of anisotropy ☐ Parallel to the planes of anisotropy

Specimen No.	Specimen Dimension (mm)			Load (kN)	Compressive Strength (MPa)
	Length	Width	Thickness		
1	50.0	50.2	50.4	380	151
2	50.8	50.2	50.3	360	141
3	50.2	50.1	50.7	383	152
4	50.3	50.3	50.4	426	168
5	50.4	50.3	50.4	401	158
6	50.0	50.2	47.1	342	136
7	50.4	50.2	50.4	339	134
8	50.3	50.4	50.4	408	161
9	50.0	49.8	50.5	407	163
10	50.3	50.2	50.5	325	129
Mean Value (MPa)					149
Standard Deviation (MPa)					14
Variation Coefficient					0.09
Lower expected value (MPa)					123

7. Flexural Strength

Test Period:	31.07.2023 - 03.08.2023
Test Method:	EN 12372:2022
Specimen Dimension:	300mm×50mm×50mm
Surface finish:	Sawn
Loading Rate:	(0.25 ± 0.05) MPa/s
Load Type:	☒ Isotropic specimen ☐ Perpendicular to the planes of anisotropy ☐ Parallel to the planes of anisotropy ☐ Perpendicular to the edges of the planes of anisotropy

Specimen No.	Span	Fracture Plane (mm)		Fracture Position[1)]	Fracture Orientation[2)]	Load (N)	Flexural Strength (MPa)
		Width	Thickness				
1	250	50.7	50.2	m	r	6740	19.8
2	250	50.6	50.5	m	r	8740	25.4
3	250	50.4	50.9	m	r	5690	16.3
4	250	50.5	50.8	m	r	5460	15.7
5	250	50.6	50.6	m	r	7430	21.5
6	250	50.2	50.5	m	r	7040	20.6
7	250	50.4	50.5	m	r	7770	22.7
8	250	50.2	50.3	m	r	6470	19.1
9	250	50.3	47.4	m	r	6050	20.1
10	250	50.2	50.3	m	r	5360	15.8
Mean Value (MPa)							19.7
Standard Deviation (MPa)							3.1
Variation Coefficient							0.16
Lower expected value (MPa)							13.9

1) "m"= ca. middle between supports, "number"= ca. distance to middle.

2) "r" = ca. rectangular to sample piece, "sch" = sloped to sample axis, "F" = surface defect in area of breaking.

8. Frost Resistance

Test Period:	04.07.2023 - 08.08.2023
Test Method:	EN 12371:2010
Specimen Dimension:	50mm×50mm×50mm
Freezing-thawing cycles:	56

Specimen No.	Change in Apparent Volume after Freezing-thawing cycles (%)
1	0.0
2	0.0
3	0.0
4	0.0
5	0.0
6	0.0
7	0.0
8	0.0
9	0.0
10	0.0

Observation depends on appearance	
During frost-thaw-cycles:	Intact
After frost-thaw-cycles:	Intact

9. Compressive Strength after Freezing-thawing cycles

Test Period:	18.08.2023 - 21.08.2023	Specimen Dimension:	50mm×50mm×50mm
Test Method:	EN 12371:2010 & EN 1926:2006	Freezing-thawing cycles:	56
Loading Rate:	(1.0 ± 0.5) MPa/s	Surface finish:	Sawn
Load Type:	☒ Isotropic specimen ☐ Normal to the planes of anisotropy ☐ Parallel to the planes of anisotropy		

Specimen No.	Specimen Dimension (mm)			Load (kN)	Compressive Strength (MPa)
	Length	Width	Thickness		
1	50.3	50.3	50.4	396	157
2	50.4	50.4	50.6	373	147
3	50.1	50.1	50.5	344	137
4	50.3	50.6	50.8	381	150
5	50.3	50.3	50.7	393	155
6	50.3	50.4	50.5	380	150
7	50.3	50.2	50.8	384	152
8	50.3	50.2	50.4	394	156
9	50.3	50.4	50.4	355	140
10	50.2	50.1	50.4	349	139
Mean Value (MPa)					148
Standard Deviation (MPa)					7
Variation Coefficient					0.05
Lower expected value (MPa)					133

The test comparison under frost affect:		
Without Frost	Mean Value	149MPa
After Frost	Mean Value	148MPa
Change in Compressive Strength		0.7%

10. Flexural Strength after Freezing-thawing cycles

Test Period:	06.08.2023 - 10.08.2023	Specimen Dimension:	300mm×50mm×50mm
Test Method:	EN 12371:2010 & EN 12372:2022	Freezing-thawing cycles:	56
Loading Rate:	(0.25 ± 0.05) MPa/s	Surface finish:	Sawn
Load Type:	☒ Isotropic specimen ☐ Perpendicular to the planes of anisotropy ☐ Parallel to the planes of anisotropy ☐ Perpendicular to the edges of the planes of anisotropy		

Specimen No.	Span	Fracture Plane (mm)		Fracture Position	Fracture Orientation	Load (N)	Flexural Strength (MPa)
		Width	Thickness				
1	250	50.6	50.8	m	r	6120	17.6
2	250	50.2	50.2	m	r	5310	15.7
3	250	50.0	50.2	m	r	6580	19.6
4	250	50.3	47.3	m	r	4720	15.7
5	250	50.1	50.4	m	r	7060	20.8
6	250	50.3	50.9	m	r	5980	17.2
7	250	50.1	50.8	m	r	5880	17.1
8	250	50.0	50.4	m	r	5700	16.8
9	250	50.8	50.6	m	r	5200	15.0
10	250	50.3	50.3	m	r	6210	18.3
Mean Value (MPa)							17.4
Standard Deviation (MPa)							1.8
Variation Coefficient							0.10
Lower expected value (MPa)							14.0

The test comparison under frost affect:		
Without Frost	Mean Value	19.7MPa
After Frost	Mean Value	17.4MPa
Change in Flexural Strength		11.7%

11. Breaking Load at Dowel Hole

Test Period:	08.17.2023 - 23.08.2023	Hole Diameter:	10mm
Test Method:	EN 13364:2001	Dowel Diameter:	6mm
Specimen dimension:	200mm×200mm×30mm	Anchoring Depth:	25mm
Loading Rate:	(50 ± 5) N/s	Anchoring of Dowel:	in cement
Surface finish:	Sawn	Bearing Length:	120mm
Load Type:	☒ Isotropic specimen ☐ Perpendicular to the planes of anisotropy ☐ Parallel to the planes of anisotropy ☐ Perpendicular to the edges of the planes of anisotropy		

Specimen No.	Specimen thickness	Fragment dimension (mm)		Breaking Load (N)
		Distance from hole to face, d_1	Max distance from hole center to edge, b_A	
1	29.2	10.5	35.4	2950
2	28.9	10.5	62.5	2850
3	28.9	10.5	42.2	2550
4	29.1	10.5	42.0	3150
5	32.3	10.5	46.4	3050
6	31.8	10.5	44.2	2600
7	32.3	10.5	56.0	2800
8	31.9	10.5	42.3	2550
9	31.8	10.5	43.6	2850
10	32.5	10.5	51.4	2700
Mean Value		10.5	46.6	2800
Standard Deviation (N)				207
Variation Coefficient				0.07
Lower Expected Value (N)				2397

12. Petrographic Examination

Test Period:	2023.06.27 – 2023.07.27
Test Method:	EN 12407:2019
Specimen Dimension:	50mm×50mm×50mm, 2pcs

Hand Sample Description

The rock is grey with visible oolitic particles.

Texture

Microcrystalline crystalline texture, stratified structure.

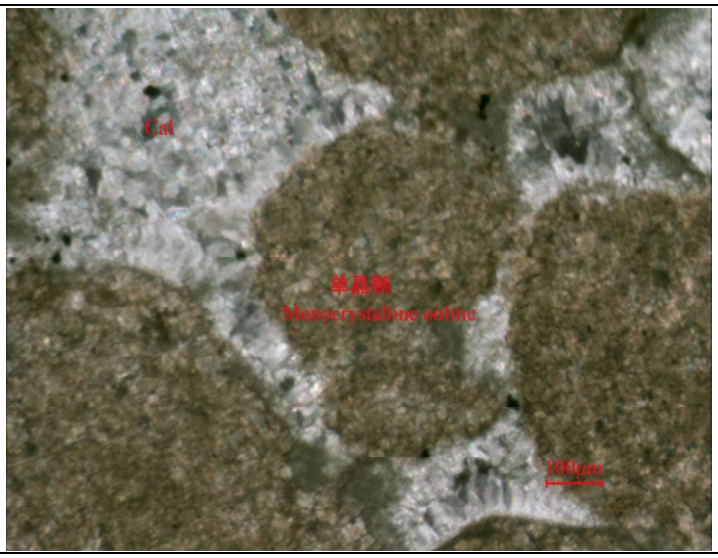
Component & microscopic description

	Component	Mineral abbreviation	Content	Crystal shape	Grain size (mm)	Microscopic description
Main components	Carbonate mineral	Cal	100	——	<0.02	Order of interference color is advanced white, double grain parallel rhomboid cleavage long diagonal, and the pseudo - absorption is obvious.

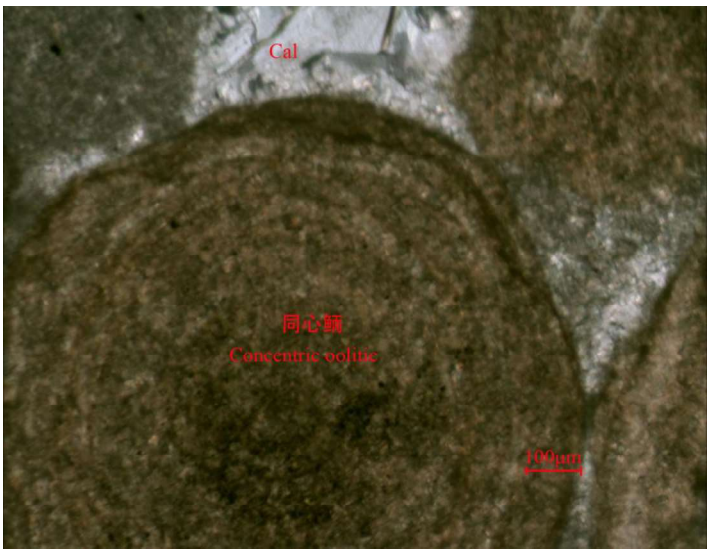
Analysis:
Oolith is a spherical or ellipsoidal particle with a particle size of less than 2mm, composed of a core and acladding. The oolitic particle size in the rock is 0.6mm ~ 1.8mm, spherical. See monocrystalline oolitic accounting for 70%. This oolitic is mostly the result that the newly formed oolitic is leachated by fresh water in theearly stage of diagenesis, and its core and concentric layer are dissolved and then filled. See normal oolith (concentricoolith), accounting for 30%, with concentric layers, this oolith is formed under high energy conditions.

Result: Sedimentary rocks (oolitic limestone)

Absatz	EN 12057, EN 12058, EN 1469, EN 1341, EN 1342, EN 1343	Messergebnisse - Bemerkungen	Bewertung
Clause	Anforderungen - Prüfungen / *Requirements - Tests*	*Measuring results - Remarks*	*Evaluation*



The rocks are mainly composed of carbonate minerals, and the oolitic particles are 0.6mm ~ 1.8mm indiameter. The oolitic particles in the figure are monocrystalline oolitic. Orthogonal polarization light.



The rocks are mainly composed of carbonate minerals, and the oolitic particles are 0.6mm ~ 1.8mm indiameter. The oolitic particles in the figure are concentric oolitic. Orthogonal polarization light.

END OF TEST REPORT