# VORACO GYPSUM·GRC·DECOR فوراکو جيبسوم جي آر سي ديکور

### **Material Specifications**

Property	Unit	Percentage
White Cement (JK White)	% by wt	42
Sand Double Wash	% by wt	38
Fiber Content (ACS 25PH-901X(20)/V) (JAPAN)	% by wt	5
Water Content	% by wt	15

#### **Principal Mechanical Properties**

Property	Unit	Hand/Machine Spray	Premix
Fibre Content	% by wt	(mx)5	(mx)3
Density	Tonnes/mm <sup>3</sup>	2.1	2.0
Compressive Stgth	N/mm <sup>2</sup>	50 - 75	40-44
Bending STgth (MDR)	N/mm <sup>e</sup>	20~30	10 - 14
Bending Elastic Lmt (KIO)	N/mm <sup>a</sup>	7 - 11	5-8

#### **Typical Design Stresses**

Property	Unit	Hand/Machine Spray	Premix
Compressive	N/mm°	12	12
Bending	$N/mm^{2}$	6	4
Shear	$N/mm^2$	1	1

it should be noted that generally mechanical properties of GRC varies from their original levels withg time depending on the environment, there is little or no change in dry conditions but in moist or wet conditions there is a tendency for some loss of strength on ageing.

#### **Physical Properties**

Property		Performance
Thermal	expansion / conductivity	neguligible/max10W/MK
Fire combustibility / ignitability non combustible /		non combustible / very low
Moisture Permeability/absorption negligible/max15%up		negligible / max 15% up to saturation
Acoustic Sound absorption very low		very low

#### **Material Sample Example**

<b>GRC</b> Material Description	Material Breakup	Weight/Vol.	% /Vol.
GRC Cube	White Cement	1.410 Kg	60.0%
size: 100x100x100mm	Aggregates (Sand)	0.705 Kg	30.0%
Volume: 0.001 Cu Mt	Glass fiber (Chopped)	0.070 Kg	3.0%
Weight: 2.350 Kg	Water	0.160 Lit	6.8%
	Admixtures	0.005 kg	0.2%
tx .	Total Wet Weight:	2.350 Kg	100%

#### K<sup>T</sup> JGDOM OF BAHRAIN MIN JSTKY OF INTERIOR WORKS DIRECTORATE



### MATERIAL APPROVAL CERTIFICATE (MAC)

PROJECT TITLE	Propo	Proposed New Coast Guard Base At Muharraq.							
CONTRACTOR	Projec	Projects Construction Co. W.L.L							
JOB NO.	11249	112491/D							
WD SUPERVISOR	Adel	Ahmadi As	ssociates.			DATE: 19-09-2018			
Civil C	Elect	E	Mech	M	Submittal No:	A-016 R-00			

We Request approval for the following materials for use in the above Contract

1	Material Description	GRC Panel Raw materials and Accessories
2	Particular Specification/General specification as per Contract	Particular Specification
3	Submitted Sample	No
4	Does the submittal meet the particular Standards/General Specifications	Yes
5	Location	Administration Building
6	Manufacturer	VORACO-Gypsum-GRC-Décor, Kingdom of Bahrain
7	Local Supplier	VORACO-Gypsum-GRC-Décor, Kingdom of Bahrain
8	Standard Reference	MOI Specification
9	Estimated Delivery Time	6 Months
10	Estimated Date Required at site	1 <sup>st</sup> March 2019
11	Enclosures	GRC Raw materials breakup details, GRC Test reports & GRC Fixing method of
		statement
12	Warranty	Attached Guarantee Letter From VORACO

#### **QUALITY ASSURANCE ENGINEER / SITE SUPERVISOR**

COMMENTS: a Aul	NATERIALS (ONF	ORM TO SPECIFICATION	V	RECOMMENDED
Rillo				NOT RECOMMENDED
NAME C.V. THOMAS	SIGNATURE OTNES	DATE: 18-07-2018		RECOMMENDED WITH COMMENTS
	ELECTRICAL/M	ECHANICAL / HVAC EN	IGINEER	

COMMENTS:	ADD P.I A.D. TP.	Nul In I		RECOMMENDED
	Apply As par The a Shoefs.	1 tached Data	-	NOT RECOMMENDED
NAME	SIGNATURE	DATE:	-	RECOMMENDED WITH COMMENTS

#### WD COMMITTEE APPROVAL

NAME C	NAME	NAME	APPROVED
MARI	Eizadh /	Subly.	NOT APPROVED
SIGNATURE	SIGNATURE	SIGNATURE	APPROVED WITH COMMENT
2/10/18	SVi.	102 P	L
	2/10/2018	1018	
Materials which have no	ot been approved are deemed	to have been rejected	
Approval of items does Specification and Project	not any way relive the Contrac	ctor form Complying with a	all the requirements of the contract Terms,
	Materials which have no Approval of items does	M TA SIGNATURE 2/10/18 FES: 2/10/20(8 This approval relates only to identical materials. Not so Materials which have not been approved are deemed	MTA SIGNATURE 2/10/18 ES: 2/10/26(8 SIGNATURE 2/10/26(8 SIGNATURE 2/10/26(8 SIGNATURE 2/10/26(8 SIGNATURE 2/10/26(8 SIGNATURE 2/10/26(8 SIGNATURE 2/10/26(8 SIGNATURE 2/10/26(8 SIGNATURE 2/10/26(8) S

4 Approval of Materials is not a Variation Order approval

# **TEST REPORT**

Cert. Number:

### UR4 - 7287

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#### Universal Laboratories (Bahrain) WLL

Gate No: 1006, Villa No.2 Road 3221, Mahooz-332 Tel: +973 17720117 Fax: +973 17162830 E-mail: bahrain@universallab.co

Approved Signatory

K.T.Noushad

#### CALIBRATION & TESTING LABORATORIES

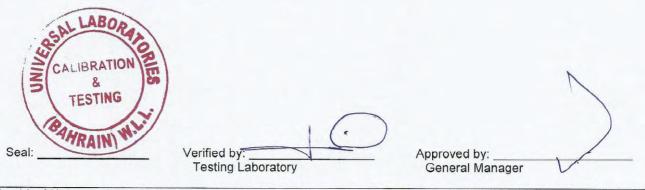
WORK ORDER NO.	:	65129		
Client	:	VORACO – Gypsum – GRC - Decor		
Address	:	Building 1349, Road 1224, Block 1012, Al Hamala, Bahrain		
Date Received	:	22 February 2018		
Certificate issued on	:	25 February 2018		
PROJECT	:	General Purposes		
SAMPLE DESCRIPTION	:	GLASSFIBRE REINFORCED CONCRETE		
TYPE OF TEST	:	FLEXURAL PROPERTIES OF GLASSFIBRE REINFORCED		
PLACE OF TEST	:	Universal Permanent Laboratory		
DATE OF TEST	:	25 February 2018		
METHOD OF COMPACTION	:	Premix		
METHOD / STANDARD	:	GCRA Methods of Testing Glassfibre Reinforced Concrete (GRC) Material		
CONDITION OF SPECIMEN WHEN RECEIVED	:	SATISFACTORY		
ENVIRONMENTAL CONDITION	:	Temperature 22.0 ° C Relative Humidity 48.0 %		

SAMPLE NO	DIMENSIONS(mm) L x W x T	SPAN mm	MOR LOAD N	LIMIT OF PROPORTIONALITY N/mm <sup>2</sup>	MODULUS OF RUPTURE N/mm <sup>2</sup>	DIRECTION OF LOADING
11-02-18/1	301 x 102 x 30.2	252	5550	14.6	18.0	x
11-02-18/2	303 x 101 x 30.3	251	6450	15.2	21.1	x
24-02-18/3	302 x 101 x 30.4	254	7950	16.8	25.7	у
24-02-18/4	302 x 103 x 30.1	251	7000	13.8	22.7	У

NOTE:

mould face of the specimen in contact with the major span rollers

mould face of the specimen in contact with the minor span rollers



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Results only related to the sample tested.

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This report complies with the requirements of ISO 17025

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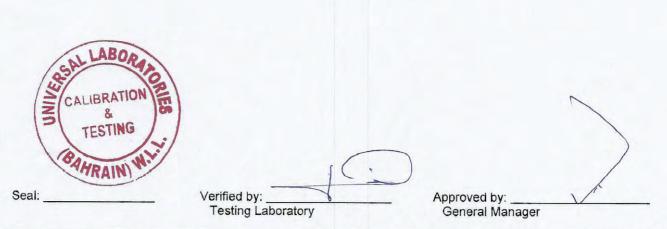
Approved Signatory

K.T.Noushad

#### CALIBRATION & TESTING LABORATORIES

WORK ORDER NO.	;	65129	
Client	:	VORACO Gypsum – GRC - Decor	
Address	:	Building 1349, Road 1224, Block 1012, Al Hamala, Bahrain	
Date Received	:	22 February 2018	
Certificate issued on	:	25 February 2018	
PROJECT	1:	General Purposes	
SAMPLE DESCRIPTION	:	GLASSFIBRE REINFORCED CONCRETE	
TYPE OF TEST	:	COMPRESSIVE STRENGTH OF GLASSFIBRE REINFORCED	
PLACE OF TEST	:	Universal Permanent Laboratory	
DATE OF TEST	:	25 February 2018	
METHOD OF COMPACTION	:	Premix	
METHOD / STANDARD	:	BS EN 12390 - 3	
CONDITION OF SPECIMEN WHEN RECEIVED	:	SATISFACTORY	
ENVIRONMENTAL CONDITION	:	Temperature 22.0 ° C Relative Humidity 48.0 %	

SAMPLE NO.	DIMENSIONS (mm) L x W x H	MAXIMUM LOAD @ FAILURE N	COMPRESSIVE STRENGTH N/mm <sup>2</sup>
11-02-18/1	101 x 102 x 100	425050	41.3
11-02-18/2	100 x 101 x 102	431050	41.8
24-0218/3	102 x 101 x 100	435100	42.2
24-02-18/4	101 × 100 × 102	435900	42.3



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UR4 - 7287

AL HOTY		FISCHER FIXING SYSTEMS	DATE: 08,10.2016	
ANALYTICAL SERVICES W.L.L.			REF:	
الحوطيي AL HOTY	STRENGT	ORT ON TENSILE STRENGTH OF CONCRETE SURFACES AND BOND TH OR TENSILE STRENGTH OF CONCRETE REPAIR AND OVERLAY	SAMPLE NO.:OTHS-161008/866-1-2	
		MATERIALS BY DIRECT TENSION (Pull-Off Method) <sup>1</sup>	REQ.NO.: OTHQ-161008/866	
الخدمات التحليسل ANALYTICAL SERVICES		METHOD : BS 1881-207	REPORT NO.: OTHR-161008/866	
Project / Lo	ocation	: K.F.C.D. – The Avenues		
Test Locat	ion	Concrete Filled Blocks		
Sample De	escription	; Fischer Anchor SXR 10x80 A4		
Source		: Fischer		
Weather C	ondition	: Clear		
Equipment	used	: Proceq Z16		
Date Rece	ived	: 06.10.2016		
Date Teste	ed	: 06.10.2016		

#### **RESULTS:**

	Test 1	Test 2
Age of Curing, Days		14
Diameter of the specimen, mm	10	10
Test Conditions	Smooth	Smooth
Location of test	Exterior Wall	Exterior Wall
Surface Temperatures,°C	32	32
Tensile Load, kN	3	4
Failure Mode	No visual defect was observed	No visual defect was observed
Remarks	Satisfactory	Satisfactory



Checked by:

DISCLAIMER The feat reports / certificates issued by AAS the records of the actual test conducted on sample and the details submitted to us for testing and the results thereof. The results are applicable only to those sample's, which have been tested and do not apply to other sample's even through declared to be identical. The results are applicable only to those sample's, which have been tested and do not apply to other sample's even through declared to be identical. The results are applicable only to those sample's which have been tested and do not apply to other sample. AAS shall not be liable for any changes in reported factual data due to any cause related to sample tested after the report / certificate, in respect of it, has been issued The results reported in the test report / certificates are valued only at the time of and under the stated conditions of the testing. Measurements are traceable to National/International Stendard.

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