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جيسوم جي آر سي • ديڪور



VORACO

GYPSUM • GRC • DECOR

C. R. : 78983 - 02

GRC Material Report

E-Mail : info@voracobh.com
Website : www.voracobh.com

Bldg 1349, Road 1224, Block 1012,
Al Hamala, Kingdom of Bahrain

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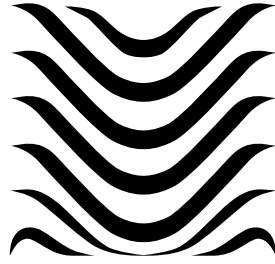
GRC MATERIAL REPORT

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3.1	J.K White Cement: Yousif Hassan Ali & Sons
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3.3	Glass Fiber: Nippon Electric Glass Co.,Ltd.
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3.7	Primer- Hempel
3.8	Basic Fixing Accessory- S.S. Rod 6mm Dia. Grade: 304: Atlas Steel

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01

GRC METHOD OF STATEMENT

GRC METHOD OF STATEMENT

GRC Manufacturing Method of Statement

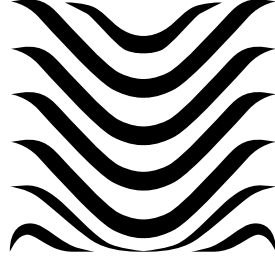
- Master piece is prepared by machine or by skilled worker which is same as the design approved by the client.
- Finishing and levelling is done with putty and paint to make the surface of master piece smooth and non-sticky.
- Rubber Mold, Cement Mold or Wooden Mold is prepared as per the detailing & size of the Design.
- GRC mix batch with specific proportions is prepared in a mixing machine.
- GRC mix is spread on top of the mold manually or by machine & vibrated to remove air bubbles.
- GRC is kept for setting for 8 to 10 Hours.
- GRC is removed from the mold & kept for curing with a covered damp cloth for 24 Hours.
- GRC is finished & levelled with stucco putty for any undulations & imperfections.
- Finally Approved Primer is applied over the finished GRC product.

GRC Fixing Method of Statement

- NOTE: GRC Products are made as per the site condition measurements if minor editing of GRC is required it is done at site itself with the help of appropriate tools.
- Fixing location is measured, marked properly & matched with the GRC Product.
- Holes are marked & drilled diagonally across the borders of GRC Product.
- GRC Product is lifted and placed at the fixing location manually by labor or with the aid of chain pulley.
- GRC is levelled with the previously marked location.
- Holes are again drilled in the wall through previously drilled GRC Holes.
- Stainless Steel Rod is trimmed as per the hole size and inserted inside the hole between GRC and the base of the wall.
- Holes and gaps between GRC and wall are filled with GRC filler.
- After the filler has dried the GRC is sanded and levelled.
- NOTE: In case of joints between Two GRC Panels; GRC is grinded between joint and S.S. Rod with GRC Epoxy Glue is applied for a strong bond between GRC products.

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02

GRC MATERIAL SPECIFICATION &
TEST REPORT

**VORACO** GYPSUM · GRC · DECOR

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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 ³	2.1	2.0
Compressive Stgth	N/mm ²	50 - 75	40 - 44
Bending Stgth (MDR)	N/mm ²	20 - 30	10 - 14
Bending Elastic Lmt (KIO)	N/mm ²	7 - 11	5 - 8

Typical Design Stresses

Property	Unit	Hand/Machine	
		Spray	Premix
Compressive	N/mm ²	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 with 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	negligible / max 10 W/MK
Fire	combustibility / ignitability	non combustibile / very low
Moisture	Permeability / absorption	negligible / max 15% up to saturation
Acoustic	Sound absorption	very low

Material Sample Example

GRC 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%
	Total Wet Weight:	2.350 Kg	100%



MATERIAL APPROVAL CERTIFICATE (MAC)

PROJECT TITLE		Proposed New Coast Guard Base At Muharraq.	
CONTRACTOR		Projects Construction Co. W.L.L	
JOB NO.		112491/D	
WD SUPERVISOR		Adel Ahmadi Associates.	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 st 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: RAW MATERIALS CONFORM TO SPECIFICATION			<input checked="" type="checkbox"/>	RECOMMENDED
				NOT RECOMMENDED
NAME C.V. THOMAS	SIGNATURE 	DATE: 18-09-2018		RECOMMENDED WITH COMMENTS

ELECTRICAL/MECHANICAL / HVAC ENGINEER

COMMENTS: Apply As per The attached Data Sheets.			<input checked="" type="checkbox"/>	RECOMMENDED
				NOT RECOMMENDED
NAME	SIGNATURE	DATE:	<input checked="" type="checkbox"/>	RECOMMENDED WITH COMMENTS

WD COMMITTEE APPROVAL

NAME M. TA	NAME Riyadh	NAME Subhi		APPROVED
SIGNATURE 	SIGNATURE 	SIGNATURE 		NOT APPROVED
			<input checked="" type="checkbox"/>	APPROVED WITH COMMENTS

NOTES:

1	This approval relates only to identical materials. Not similar materials.
2	Materials which have not been approved are deemed to have been rejected
3	Approval of items does not any way relieve the Contractor from Complying with all the requirements of the contract Terms, Specification and Project Design
4	Approval of Materials is not a Variation Order approval

TEST REPORT

Cert. Number:

UR4 - 7287

Page 1 of 2

CALIBRATION & TESTING
LABORATORIES**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

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)	SPAN mm	MOR LOAD N	LIMIT OF PROPORTIONALITY N/mm ²	MODULUS OF RUPTURE N/mm ²	DIRECTION OF LOADING
	L x W x T					
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	y
24-02-18/4	302 x 103 x 30.1	251	7000	13.8	22.7	y

NOTE: x mould face of the specimen in contact with the major span rollers
 y mould face of the specimen in contact with the minor span rollers



Seal: _____

Verified by: _____
Testing LaboratoryApproved by: _____
General Manager

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Results only related to the sample tested.
Reports without the signature and the seal of the issuing laboratory are not valid.
This report complies with the requirements of ISO 17025

TEST REPORT

Cert. Number:

UR4 - 7287

Page 2 of 2

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LABORATORIES**Universal Laboratories (Bahrain) WLL**

Gate No: 1006, Villa No.2 Road 3221, Mahooz-332

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E-mail: bahrain@universallab.co

Approved Signatory

K.T.Noushad

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	:	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)	MAXIMUM LOAD @ FAILURE N	COMPRESSIVE STRENGTH N/mm ²
	L x W x H		
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 - 02 - -18 / 3	102 x 101 x 100	435100	42.2
24 - 02 - 18 / 4	101 x 100 x 102	435900	42.3



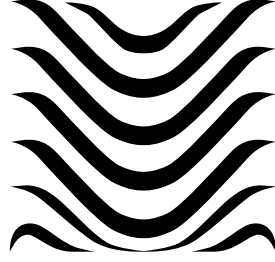
Seal: _____

Verified by: _____
Testing LaboratoryApproved by: _____
General Manager

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03

GRC RAW MATERIAL BREAKUP
SPECIFICATIONS



Consultancy & Research Section

Material Compliance Report (MCR) 2799/2017 (For Ministry of Works projects)

Material Detail:	White Portland Cement
Manufacturer:	J. K. Cement Works (Fujairah) FZC (UNITED ARAB EMIRATES)
Applicant:	YOUSIF HASSAN ALI & SONS P. O. Box 22154 Muharraq, Kingdom of Bahrain

Following MED standard procedures for assessment and technical evaluations of the above Material, as to compliance with the Ministry of Works' specifications and requirements, we advise as per the following details:

i. Compliance with Relevant Standards & Specifications

✓	Acceptable
---	------------

ii. Adequacy for use in Ministry of Works projects

✓	Adequate. The Material is suitable for use in Ministry of Works' projects.
---	---

iii. Comments

- The Product when tested should adhere to **GSO 488:1994** and shall always conform to the Standard Specifications for Construction Works - 2009 of the MOW projects.
- This compliance report does in no way relieve the supplier or contractor of their obligation with respect to obtaining the necessary approval of the concerned Project Engineer for a specific project.
- The material will be subject to factory inspection and periodic quality control assessment by the Materials Engineering Directorate personnel.

Note:

This Report is valid for maximum of 1 year(s) from the date of this Report **unless otherwise stated** or there is a change / revision in the material technical specifications, manufacturing process or relevant Standards & Specifications requirements.

Signed & stamped by,

Date: 20/12/17

MAS File 3625/CEMCG



Director, Materials Engineering Directorate



www.jkcementuae.com

BS EN 197-1 CEM I / 52.5 N

At JK White Cement we continuously strive for development of products with highest quality and perfection through our pioneering research and development, which far exceed the customer expectations.

We trust in the principal of product driven by the market needs. Thus, resulting in products which are developed that best suit the applications and requirements by constant innovation and research.



Description of JK White Cement - BS EN 197-1 CEM I / 52.5 N

"We shape our buildings, thereafter they shape us - by Winston Churchill"

JK White Cement in its basket of leadership products has provided the construction industry with a product which is designated under British Standards as EN 197-1 CEM I / 52.5 N. Our CEM I is highly accepted and used world-wide in numerous applications such as GFRC, Pre-cast panels, Aesthetic concrete, Mosaic Tiles, Masonry usage, Decorative products, etc.

Applications of JK White Cement CEM I 52.5 N

- Architectural & Decorative Concrete:- Coloured concrete cast in moulds/forms, Fountains, Border Stones Railing, Entrance Pillar, Cast Stone



Glass Fiber Reinforced Concrete

- Pre-cast panels for exterior facade
- Designer Flooring:- Paving stones, Garden walkways, Pavement, Mosaic Tiles
- Masonry Application:- Plasters, Pointing Mortar, Tile Adhesive and Tile Grouts

Packaging available

- 25 Kg Paper and PP bag
- 40 Kg Paper and PP bag
- 50 Kg Paper and PP bag
- Jumbo packaging from 0.5 MT to 1.5 MT
- Loose Cement (Bulker)



Key attributes of JK White Cement CEM I 52.5 N

- High early strength
- It has min. whiteness of 90%
- It is produced from the raw material with highest purity
- Prolonged durability
- High reflectance

Benefits of using JK White Cement CEM I 52.5 N

- Superior quality and high durability
- Production of White coloured concrete (with suitable colour pigments), plaster or mortar
- Resulting in saturated colour & fine surface textures
- High strength and an unlimited formability
- Decorative harmony and universal use



Safety Precaution

Warning - Keep out of reach of children, avoid contact with eyes, skin and respiratory. Wear appropriate personal protection equipment like safety gloves, goggles, protection clothing and respiratory protection mask.

First aid -

Eyes contact: Rinse eyes thoroughly with water for at least 15 minutes, including under lids to remove all particles. Seek medical attention for abrasions and burns.

Skin contact : Wash with cool water and apH neutral soap or a mild skin detergent. Seek medical attention for rash, burns, irritation, dermatitis and prolonged unprotected exposures to wet cement, cement mixtures or liquids from wet cement.

Inhalation : Move person to fresh air. Seek medical attention for discomfort or if coughing or other symptoms do not subside.

Ingestion : Do not induce vomiting. If conscious, have person drink plenty of water, medical attention, seek or contact poison control centers immediately.

Technical Support

Further information and advice on this product and the full range of JK White Cement products can be obtained through putting your comments over sales.fuj@jkcement.com

Note

The aforesaid information is based on our present state of knowledge and shall inform about our products and their application possibilities. Value and characteristics provided are typical and approximate size. It should not therefore be construed as guaranteeing specific properties of the product described or their suitability for a particular application. Subject to change without prior notice.




**TEST REPORT ON ATTERBERG LIMITS
BY CONE PENETRATION METHOD**


METHOD : BS 1377 Part 2 – '90 Cl. 4.3 & Cl. 5.0



PROJECT	: GENERAL
SAMPLE DESCRIPTION	: DOUBLE WASH SAND (PLASTER WORKS)
SAMPLE LOCATION	: NOT SPECIFIED
SAMPLING DATE	: 25.07.2018
DATE SUBMITTED	: 25.07.2018
DATE TESTED	: 30.07.2018
Location of Test Specimen within the Original Sample	: BULK SAMPLE
	: SAMPLED BY: AAS

TEST PARAMETERS	RESULTS
Liquid Limit, %	21
Plastic Limit, %	Non-Plastic
Plasticity Index	Non-Plastic
% Material retained on 425 µm sieve	13.3
Visual Description of the sample	No unusual features/dry
Natural Moisture Content	8.3
History of the sample	Sieved on 425µm sieve
Air/Oven Dry Temp, °C	Oven Dried at 105

Checked by:  /MDC

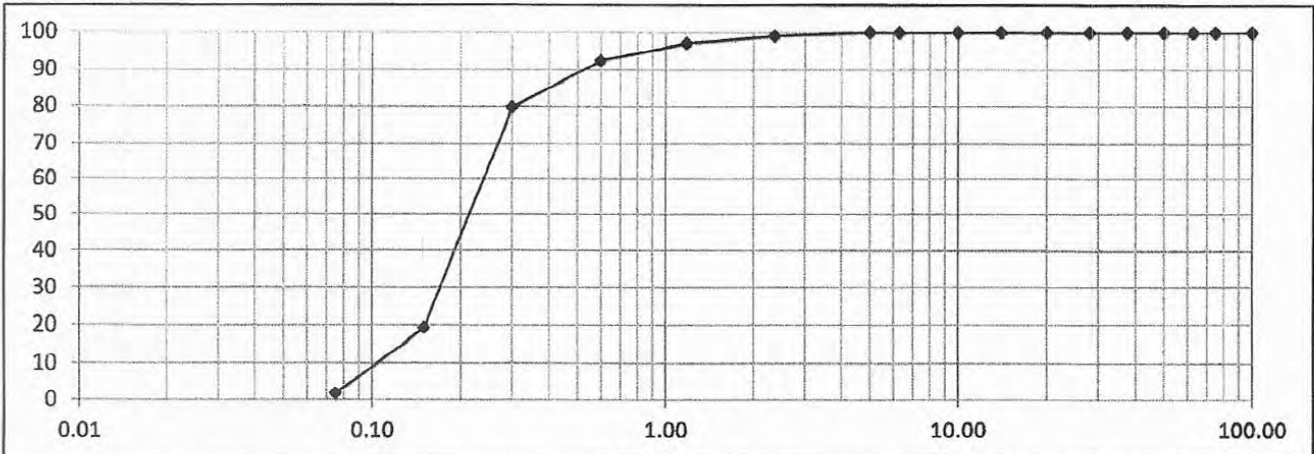

NITIL K. SHRIVASTAVA
Material Laboratory Manager

DISCLAIMER
The test reports / certificates issued by AAS are 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 though declared to be identical. Test report / certificate if reproduced, for any purpose commercial or otherwise, should be reproduced by AAS. 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 valid only at the time of and under the stated conditions of the testing. Measurements are traceable to National/International Standards.





Project : GENERAL
Material description : DOUBLE WASH SAND Sample ID: PLASTER WORK
Sample location : NOT SPECIFIED
Sampling date : 25.07.2018 Method of test used : WET SIEVING
Condition of the sample upon receipt : SATISFACTORY Date received : 25.07.2018
Source / Supplier : NOT SPECIFIED Test Date : 28.07.2018



Sieve Size	Cumm. Passing, %	SAND			GRAVEL			COBBLE
		FINE	MEDIUM	COARSE	FINE	MEDIUM	COARSE	



Sieve Size mm	Cumm. Passing, %
100	100
75	100
63	100
50	100
37.5	100
28	100
20	100
14	100
10	100
6.3	100
5.0	100
2.36	99
1.18	97
0.600	92
0.300	79
0.150	19
0.075	2

(Signature)
NITIL K. SHRIVASTAVA
Material Laboratory Manager

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Checked by: *(Signature)*
/MDC



AL HOTY ANALYTICAL SERVICES W.L.L. 	CERTIFICATE OF ANALYSIS	DATE : 01.08.2018
		REQ. NO. : SQ-180726/4633
	AL NOSAIF CONTRACTING	SAMPLE NO. : S-180726/1
		REPORT NO. : SR-180726/6812
Manama, Kingdom of Bahrain		

AGGREGATE ANALYSIS


PROJECT/LOCATION : General
 SAMPLE DESCRIPTION : Double Washed Sand
 DATE SUBMITTED : 25.07.2018
 DATE TESTED : 31.07.2018 - 01.08.2018

S. NO.	PARAMETER	TEST METHOD	UNIT	RESULT	MOH Specifications of Sand for Concrete
1	Total Sulphate Content (Acid Soluble) as SO ₃ % by mass of dry Aggregate	BS 812 Part118:1988 Clause 6	%	0.21	Max. 0.4
2	Total Chloride Content of the Aggregate as % by mass of dry Aggregate	BS 812 Part 117:1988 APPENDIX C	%	0.04	Max. 0.06

Remarks: The tested double washed sand meets the Ministry of Housing (MOH) Specifications.



SAPPANI MUTHIAH
 Chemistry Laboratory Manager

Checked by: 
/Cza

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 Measurements are traceable to National/International Standards.



NEG ARG FIBRE

Chopped Strands

ACS25PH-950X(20)/V



ACS25PH-950X(20)/V is made of glass, which contains the largest content of ZrO_2 commercially available.

ACS25PH-950X is a high integrity strand to meet the requirements of conventional "premix" products. Chopped fibres disperse as strands in a matrix of mortar. The excellent strand integrity of ACS25PH950X allows longer mixing time, and insures uniform dispersion in the matrix and stable bending strength of GRC. Excellent strand integrity also allows keeping good moldability of mortar containing glass fibres regardless of varying mixing time.

ACS25PH-950X has quality approval by DIBt (Deutsches Institut für Bautechnik) No. Z-3.72-1730.

■ Product Specifications

Type of Glass	Alkali Resistant glass
Nominal tex (g/1000m)	138
Cut length (mm)*	25
Moisture content (%)*	less than 0.5

*Data measured by JIS (Japanese Industrial Standard)

■ Process

Premix, Casting

■ Applications

Glass fibre reinforced concrete (GRC)

■ GRC Products Using NEG ARG Fibre ACS25PH-950X Include:

For Architecture

Distribution box, balcony element, parapet panel, flooring, roofing tile, etc.

For Civil Engineering

Cable trough, water trough, etc.

For Other Application

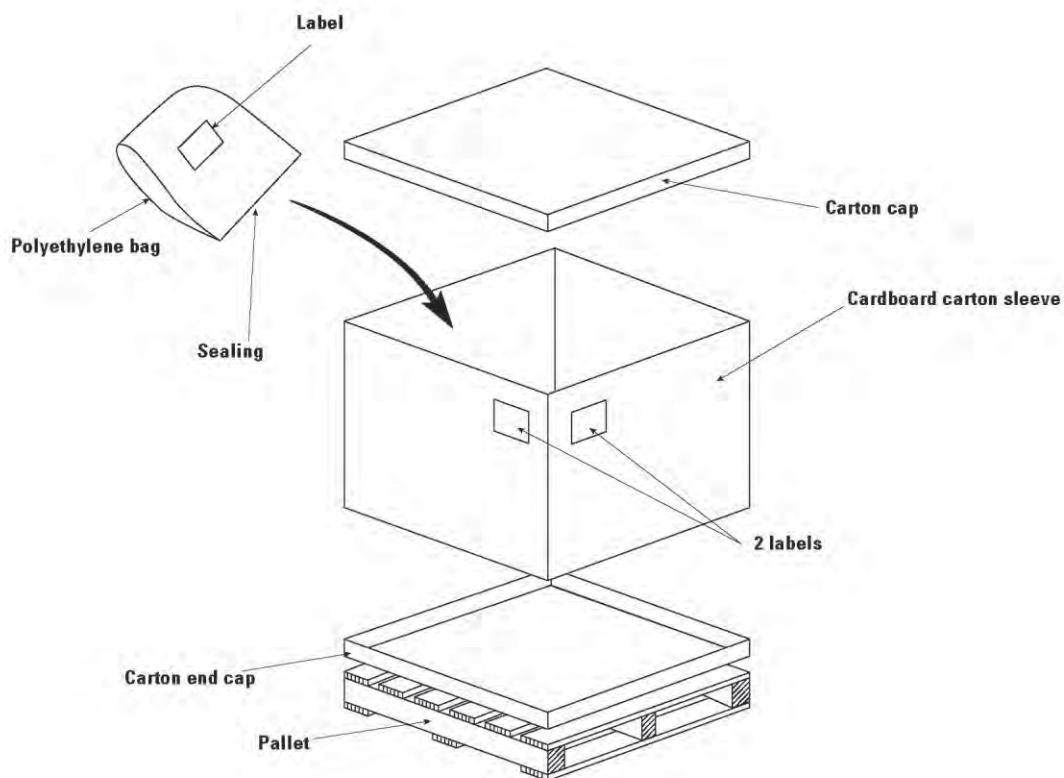
Garden furniture, artificial rock, fence, etc.

■ Packaging Data

20 kg in a polyethylene bag

■ Palletizing Data

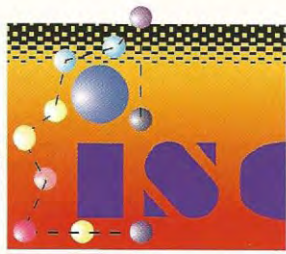
Number of packages/pallet	36
Pallet Dimensions (mm)	
Length	1440
Width	1150
Height	1070



■ Storage Conditions

ACS25PH-950X should be stored in an upright position in a dry area in its original packaging.
ACS25PH-950X should be sheltered from the direct sunlight.

* NEG reserves the right to change the features and specifications of its products without prior notice



ISOPOX TECHNICAL INFORMATION

ISO 9001 :2008



CAT. No. CONREP-06-0301

ISOPOX IH 3010 Two-Component Epoxy System

ISOPOX IH 3010 is a high modulus, two-component epoxy bonding system consisting of epoxy resin and amine-type hardener. It is a 100% reactive system and solvent-free. It is designed as a moisture-insensitive adhesive and binder for numerous application needs and available in low viscosity (LV), medium viscosity (MV), and mastic (GEL) consistency.

APPLICATIONS

LV

- Sealing Porous Concrete
- Priming
- Binder for epoxy mortars and epoxy concrete
- Sealing horizontal cracks

MV

- Priming
- Universal glue/adhesive

GEL

- Universal glue/adhesive (e.g. bonding wood-wood, wood-steel, steel-concrete, ceramics etc.)

SPECIFICATIONS

LV grade complies with ASTM C881, Types 1,3,4, Grade 1, Class B,C,D,E and F
 MV grade complies with ASTM C881, Types 1,2,3,4,5, Grade 2, Class B,C,D,E, and F
 GEL grade complies with ASTM C881, Types 1,2,3,4, Grade 3, Class B,C,D,E, and F.

ADVANTAGES

- High Mechanical Strengths
- Highly resistant to aggressive chemicals
- Corrosion / Abrasion resistant
- Universal adhesive
- Waterproof
- Moisture insensitive
- Service Temperature from -30 to 100° Celsius (dry heat)

TYPICAL PROPERTIES

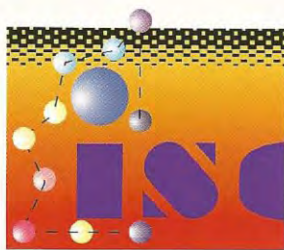
- Solids content 100%
- Pot life @45/35/25°C 15/30/60 minutes
- Touch dry within 6 hours
- Volume shrinkage nil
- Full Cure 3-7days

	LV	MV	GEL
● Specific Gravity, mixed	1.07	1.27	1.15
● Compressive Strength, N/sq.mm	85	96	95
● Flexural Strength, N/sq.mm	45	43	43
● Tensile Strength, N/sq.mm	35	33	33
(Note * Mechanical strengths tested at 7 days)			
● Water absorption, % by mass	0.50	0.56	0.54
● Bond Strength (direct pullout), N/sq.mm	+3 (greater than cohesive strength of concrete)		

DIRECTIONS FOR USE

SURFACE PREPARATION

- Concrete: Shall be structurally sound, clean and free from dust, oil, laitance, grease, curing compounds, sealers and other foreign matter, shall be dry and fairly rough.
- Steel/Metal: Shall be clean and free from oil, grease, or loose rust. Chemical degreasing may be required in some cases.
- Wood: Shall be free from varnish, lacquer coating. Shall be roughened/abraded with emery paper.



ISOLA TECHNICAL INFORMATION

MIXING

Stir the contents of Part B and transfer to Part A container. Mix manually for at least 3 minutes then transfer to a shallow container. Use immediately within the indicated pot life. Part mixing is not recommended.

- Bonding Skid - Resistant material to concrete:
 - Use LV applied at the rate of 4-4.5 sq. m per kg.
- Bonding Epoxy Mortar to Concrete:
 - Use LV applied at the rate of 4.5 sq. m per kg.
 - Use MV applied at the rate of 4 sq. m per kg (best used on vertical applications).
- Binder in Epoxy Mortars/Concrete:
 - LV can be used at varying resin-filler ratios, consult ACI for specific applications.
- Bonding wood to wood or as a universal adhesive:
 - Use GEL applied at the rate of 4 sq. m per kg
- Sealing Porous Concrete:
 - Use LV diluted with Xylene (10% by volume of total). Apply at the rate of 5-6 sq. meters per kg.

CLEANING

Fresh epoxy can be cleaned-off from tools using ISOKLEEN.

PACKING / COVERAGE

	0.45 kg kit	0.8 kg kit
LV	1.8-2sq.m	3.2- 3.6sq.m.
MV	1.8sq.m	3.2sq.m
GEL	1.8sq.m	3.2sq.m

(Note: Coverages are theoretical only and applies to smooth, non-absorbent substrate. For estimating, allow at least 10-15% extra material to account for wastage and substrate irregularities.)

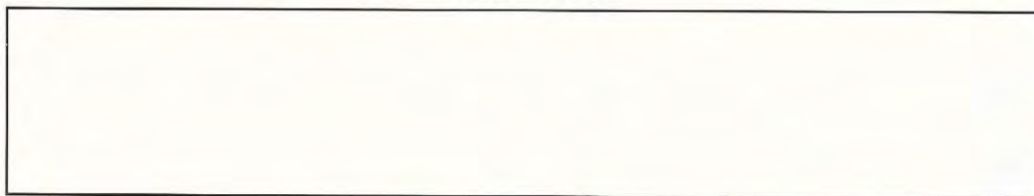
SHELF LIFE

At least one (1) year in original, unopened container stored in warehouse below 32°Celsius.

HEALTH / SAFETY

Epoxy resins are considered skin irritants. Always wear protective clothing, rubber hand gloves and eye goggles when using epoxies. Avoid contact with skin or eyes. If spilled on the skin, wash immediately with water and soap. Accidental splashes to the eyes should be cleaned immediately with water. . If eye irritation persist, consult physician. For more details refer to separate material safety data sheet. Refer to MSDS for more information.

DISTRIBUTOR



OUR TECHNICAL DEPARTMENT IS ALWAYS AVAILABLE TO GIVE ASSISTANCE

Technical information, data are to be considered as typical values and not sales specification: Actual measured value may vary due to factors beyond our control. Indications concerning function and application of the products are empirical. Although the information is believed to be accurate, there is no warranty by ACI. None of the recommendations becomes part of the warranted quality of the products. Due to the fact that the conditions of individual use are beyond ACI's direct and continuous control, ACI disclaims all responsibility in connection with the use of its product and does not warrant against any loss direct or consequential.

ARABIAN CHEMICAL INDUSTRIES

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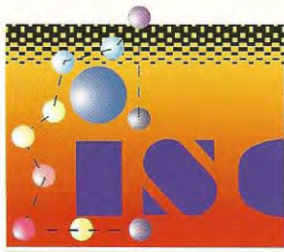


الشركة العربية لصناعة الكيماويات

ص.ب: ٥٣٠ - مملكة البحرين تليفون: ١٧٧٨٤٧٧٧ / ١٧٥٥١١١١

فاكس: ١٧٧٨٥٧٥٣

www.arabianchemical.com



ISOPOL TECHNICAL INFORMATION

ISO 9001 :2008



CAT. No. ST-11-0301

ISOCRETE 110 Cementitious Wall Putty

ISOCRETE 110 is a special blend of cement, micronized fillers, and polymer additives that only require the addition of water at the site to produce a high strength, water-resistant, and smooth finishing, levelling compound for concrete walls, bricks, and masonry surfaces. Built-in polymer additives ensures excellent adhesion, and long-term crack resistance even at high ambient temperature.

APPLICATION

ISOCRETE 110 is used to level and smoothen surface imperfection, voids and rough spots on concrete walls, bricks, and masonry prior to coating with oil based or water based paints.

ADVANTAGES

- Ready-to-use; just add water at the site.
- Polymer additives ensure excellent adhesion.
- "All fines" formula - can be applied down to 0.1 mm, feather-edge thickness.
- High strength and non-shrink formulation.
- Suitable for internal and external application.

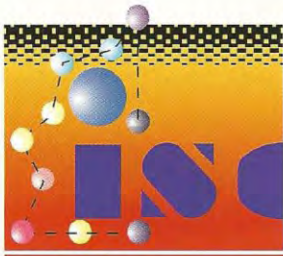
DIRECTIONS FOR USE

SURFACE PREPARATION

Surface should be clean and free from dust, coatings, curing compounds and other loose debris. Surface should be reasonably smooth and free from blow holes or large voids. When using over masonry hollow blocks, first apply 1 : 3, (Cement : Sand) render over the blocks and allow to cure at least 3 days prior to levelling with ISOCRETE 110. ISOCRETE 110 can be directly applied over cast-in place or precast wall panels not less than 28- day old.

MIXING

One bag (25 kg.) of ISOCRETE 110 will require 8.5 - 9 liters of cool, clean water. Do not add more water than is required. Water is added first in the mixing container followed by powder. Mixing is best achieved using power drill fitted with a paddle running at slow speed (200 - 300 RPM or less) Small quantities can be mixed by blending one part water and three parts ISOCRETE 110 by volume (ex. :1 liter water and 3 liters ISOCRETE 110). Mix quantities that can be applied within 30 minutes at 30 degree centigrade. When using externally, it is recommended to replace part of the mixing water with ISOFIX. (1 part ISOFIX: 3 parts water by volume)



ISOLA TECHNICAL INFORMATION

APPLICATION

Surface to be levelled should first be wetted with water at least one (1) hour prior to application of ISOCRETE 110. Area that dries out fast should be frequently wetted. As a general rule surface should be damp before application of levelling compound. Apply ISOCRETE 110 on the damp surface using painter's putty knife. Do not use masons trowel. Build up the coat in thin layers until any surface irregularities, protrusions has been completely covered. This may require 2-3 build-up coats. Allow each coat to dry for 20-25 minutes prior to recoating. Final coat should be abraded with fine-grained sand paper after ISOCRETE 110 has dried for at least one hour. Immediately after drying, apply a mist spray of clean water over the putty. Completely saturate with water then allow to dry for at least 24 hours before application of coating. When applying over primed substrate, apply a fresh bond coat of ISOFIX over the dry emulsion-based primer and immediately apply putty.

(Note: Fresh putty can be cleaned-off from tools using water).

PACKING/COVERAGE

5Kg pack 8 sq. m. @0.5mm thick approx.
25Kg pack 40 sq. m @0.5mm thick approx.

COLOR

Available in white and grey color.
ISOCRETE 110 should be applied by a skilled painter and not mason.

HEALTH/SAFETY

Avoid inhalation of dust. Always wear dust mask when using. Refer to MSDS for more information.

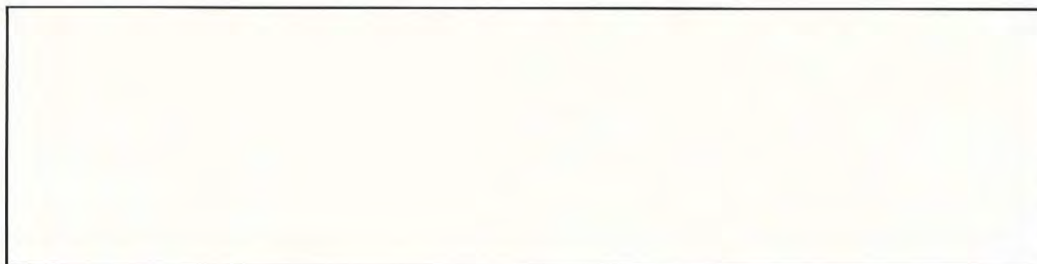
STORAGE

Store as in cement in dry, covered area.

SHELF LIFE

Twelve months although small lumps may occur due to warehouse set.

DISTRIBUTOR



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الشركة العربية لصناعة الكيماويات

ص.ب: ٥٣٠ - مملكة البحرين تليفون: ١٧٧٨٤٧٧٧ / ١٧٥٥١١١١

فاكس: ١٧٧٨٥٧٥٣

www.arabianchemical.com

Description:	Topaz Crack Filler is a unique formulation based on synthetic polymers and special fillers. It is recommended to be used as filler for cracks and crevices of up to 5mm width, and as levelling compound on uneven surfaces.
Recommended use:	Ideal as filler for interior and exterior surfaces to fill cracks in walls, ceilings, partitions, etc.
Substrates:	Concrete, masonry, gypsum boards, plaster, wood, etc.
Features:	Fill cracks up to 5mm width Outstanding filling properties Excellent sanding properties Perfect levelling compound
Certificates/approvals:	Complies with ASTM G53.
Shelf life/storage conditions:	12 months from date of production. The product must be stored as per local storage regulations and should be kept in dry and well-ventilated location far from heat and direct sunlight.
Availability:	Available in 0.5Kg, 1Kg, 3Kg. (Packing may vary from country to country depending on local requirements)

Physical constants:*

Colours/shade nos:	Off-white/11630		
Finish:	Matt		
Volume solids, %:	61±2%		
Theoretical spreading rate:	2.2 m ² /kg - 200 microns**		
Flash point:	>93.3°C		
Specific gravity:	1.38 kg/l		
Surface dry:	4 hours (10°C)	2 hours (20°C)	1 hour (40°C)
Through-dry:	10 hours (10°C)	6 hours (20°C)	4 hours (40°C)
Ready to sand:	10 hours (10°C)	6 hours (20°C)	4 hours (40°C)
VOC content	25.4 g/l		

Application details:

Application method:	Spatula/Filling knife/Steel trowel		
Thinner (max vol):	None		
Cleaning of tools:	Fresh water		
Indicated film thickness, dry:	200 microns		
Indicated film thickness, wet:	328 microns		
Recoat interval, min:	10 hours (10°C)	6 hours (20°C)	4 hours (40°C)
Recoat interval, max:	None	None	None

Safety:	Handle with care. Before and during use, observe all safety labels on packaging and paint containers, consult Hempel material safety data sheets and follow all local or national safety regulations. Avoid inhalation, avoid contact with skin and eyes and do not swallow. Take precautions against possible risks of fire or explosions as well as protection of the environment. Apply only in well-ventilated areas.
Surface preparation:	The surface should be stable, firm, dry, and free of dust, sand, loose old paint, laitance, dirt, grease and oil. It is recommended to apply a primer/sealer prior to the specified filling procedure.
Application conditions:	Use only where application and drying can proceed at temperatures above 5°C, and relative humidity is below 75%
Remarks:	Drying data given is on the assumption that proper ventilation is provided.

Note:

*The physical constants stated are nominal data according to the Hempel Group's approved formulas. They are subject to normal manufacturing tolerances and where stated, being standard deviation according to ISO 3534-1.

**The theoretical spreading rate has been calculated for the stated volume solids and dry film thickness. A practical spreading rate will depend on the actual dry film thickness, the nature of the substrate and the relevant consumption factor. The physical constants are subject to normal manufacturing tolerances. Further reference is made to 'explanatory notes'.

Issued by: HEMPEL MIDDLE EAST

This Product Data Sheet supersedes those previously issued.

For explanations, definitions and scope, see 'Explanatory Notes' available on www.hempel.com. Data, specifications, directions and recommendations given in this data sheet represent only test results or experience obtained under controlled or specially defined circumstances. Their accuracy, completeness or appropriateness under the actual conditions of any intended use of the products herein must be determined exclusively by the Buyer and/or User.

The Products are supplied and all technical assistance is given subject to Hempel's general conditions of sales, delivery and service, unless otherwise expressly agreed in writing. The Manufacturer and Seller disclaim, and Buyer and/or User waive all claims involving, any liability, including but not limited to negligence, except as expressed in said general conditions for all results, injury or direct or consequential losses or damages arising from the use of the products as recommended above, on the overleaf or otherwise. Product data are subject to change without notice and become void five years from the date of issue.

05990: BASE 05999: CURING AGENT 95040

Description:	HEMPADUR SEALER 05990 is a low viscosity, two pack epoxy varnish with good penetration properties.
Recommended use:	For saturation of well cleaned concrete surfaces before application of pigmented paints. Must be applied in such an amount that the surface is just saturated. The surface should not appear "glossy" in any way. Also suitable for sealing of thermally sprayed metallic coatings. HEMPADUR SEALER 05993 is intended for use in cold/temperate climates.
Service temperature:	Maximum, dry exposure only: 140°C/284°F
Certificates/Approvals:	Complies with EU Directive 2004/42/EC: subcategory h.
Availability:	Part of Group Assortment. Local availability subject to confirmation.

PHYSICAL CONSTANTS:

Shade nos/Colours:	00000 Transparent
Finish:	Flat
Volume solids, %:	29 ± 1
Theoretical spreading rate:	Not relevant see REMARKS overleaf
Flash point:	25 °C [77 °F]
Specific gravity:	0.9 kg/litre [7.7 lbs/US gallon]
Dry to touch:	3 - 4 approx. hour(s) 20°C/68°F
Fully cured:	7 day(s) 20°C/68°F
VOC content:	606 g/l [5 lbs/US gallon]

The physical constants stated are nominal data according to the HEMPEL Group's approved formulas.

APPLICATION DETAILS:

Version, mixed product:	05990
Mixing ratio:	BASE 05999: CURING AGENT 95040 4 : 1 by volume
Application method:	Airless spray / Brush
Thinner (max.vol.):	08450 (5%) / 08450 (5 %)
Pot life:	8 hour(s) 20°C/68°F
Nozzle orifice:	0.017 - 0.21 "
Nozzle pressure:	100 bar [1450 psj] (Airless spray data are indicative and subject to adjustment)
Cleaning of tools:	HEMPEL'S TOOL CLEANER 99610
Indicated film thickness, dry:	Not relevant
Indicated film thickness, wet:	Not relevant see REMARKS below
Overcoat interval, min:	According to specification.
Overcoat interval, max:	According to specification.

Safety:	Handle with care. Before and during use, observe all safety labels on packaging and paint containers, consult HEMPEL Safety Data Sheets and follow all local or national safety regulations.
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Product Data

HEMPADUR SEALER 05990



SURFACE PREPARATION: **Concrete:** Remove slip agent and other possible contaminants by emulsion washing followed by high pressure hosing with fresh water. Remove scum layer and loose matter to a hard, rough and uniform surface, preferably by abrasive blasting, possibly by other mechanical treatment or acid etching. Seal surface with suitable sealer, as per relevant painting specification.
Thermally sprayed metallic coatings: Should be applied shortly after the metal coat has been applied and approved to prevent possible contamination of the porous coating.

APPLICATION CONDITIONS: Apply only on a dry and clean surface with a temperature above the dew point to avoid condensation. Use only where application and curing can proceed at temperatures above: 10°C/50°F. Minimum relative humidity: 30%. The temperature of paint itself should be 15°C/59°F or above. In confined spaces provide adequate ventilation during application and drying.

SUBSEQUENT COAT: None, or as per specification.

REMARKS:

VOC - EU Directive 2004/42/EC:

Product	As supplied	5 vol. % thinning	Limit phase II, 2010
0599000000	606 g/l	618 g/l	750 g/l

For VOC of other shades, please refer to Safety Data Sheet.

Application(s): For saturation of the absorbent substrate surface use: HEMPADUR SEALER 05990. Application should be initiated by assessing the degree of dilution in order to obtain a correct result. In any case a glossy surface must not appear and such surplus of the product must be removed by sanding, abrasive sweep-blasting or similar methods before painting takes place.
For practical purposes, depending on the surface roughness, porosity of the substrate and the application method, the indicated spreading rate is 20 m²/litre (820 sq.ft/US gallon).

Film thicknesses/thinning: The actual amount of thinner required will depend on temperatures, the surface and type of the substrate and the actual application technique.

Note: **HEMPADUR SEALER 05990 For professional use only.**

ISSUED BY: HEMPEL A/S 0599000000

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For explanations, definitions and scope, see "Explanatory Notes" available on www.hempel.com. Data, specifications, directions and recommendations given in this data sheet represent only test results or experience obtained under controlled or specially defined circumstances. Their accuracy, completeness or appropriateness under the actual conditions of any intended use of the Products herein must be determined exclusively by the Buyer and/or User.
The Products are supplied and all technical assistance is given subject to HEMPEL's GENERAL CONDITIONS OF SALES, DELIVERY AND SERVICE, unless otherwise expressly agreed in writing. The Manufacturer and Seller disclaim, and Buyer and/or User waive all claims involving, any liability, including but not limited to negligence, except as expressed in said GENERAL CONDITIONS for all results, injury or direct or consequential losses or damages arising from the use of the Products as recommended above, on the overleaf or otherwise. Product data are subject to change without notice and become void five years from the date of issue.

Stainless steel round bar – ASTM A276

Condition: 25.4mm and less generally drawn, above 25.4mm and less than 101.6mm is generally annealed, turned and polished. Sizes above 101.6mm are generally rough turned to k12 tolerance.

Grades 431 and 2205 are often stocked in a smooth turned or centreless ground finish.

Diameter		Weight (kg/m)	Grades					
mm	inches		Ugima / Improved Machinability Bar				431 H and T	2205
			303	304/304L	316/316L	316/316L CG		
3.00	0.118	0.06						
3.18	0.125	0.06						
3.97	0.156	0.10						
4.00	0.157	0.10						
4.76	0.187	0.14						
4.90	0.193	0.15						
5.00	0.197	0.15						
6.00	0.236	0.22						
6.35	0.250	0.25						
7.94	0.313	0.39						
8.00	0.315	0.39						
9.00	0.354	0.50						
9.52	0.375	0.56						
10.00	0.394	0.62						
11.11	0.437	0.76						
12.00	0.472	0.89						
12.70	0.500	1.01						
14.00	0.551	1.21						
14.28	0.562	1.26						
15.87	0.625	1.55						
16.00	0.630	1.58						
17.46	0.687	1.88						
18.00	0.709	2.00						
19.05	0.750	2.24						
20.00	0.787	2.47						
22.00	0.866	2.99						
22.23	0.875	3.05						
24.00	0.945	3.56						
25.00	0.984	3.86						
25.40	1.000	3.98						
28.58	1.125	5.04						
30.00	1.181	5.56						





Stainless Steel Bar 304-304L

Colour code: Lilac/Turquoise

Introduction

Grade 304 is the standard "18/8" stainless. It has excellent forming and welding characteristics.

Grade 304L, the low carbon version of 304, does not require post-weld annealing and so is extensively used in heavy gauge components. The austenitic structure also gives these grades excellent toughness, even down to cryogenic temperatures.

Related Specifications

Grade	UNS No	British BS	Euronorm		Swedish SS	Japanese JIS
			No	Name		
304	S30400	304S31	1.4301	X5CrNi18-10	2332	SUS 304
304L	S30403	304S11	1.4306	X2CrNi19-11	2352	SUS 304L

These comparisons are approximate only. The list is intended as a comparison of functionally similar materials **not** as a schedule of contractual equivalents. If exact equivalents are needed original specifications must be consulted.

Chemical Composition

Specification values in %, according to ASTM A276

Grade	C	Mn	Si	P	S	Cr	Mo	Ni	N
304	≤0.08	≤2.0	≤1.00	≤0.045	≤0.030	18.0-20.0		8.0-11.0	
304L	≤0.03	≤2.0	≤1.00	≤0.045	≤0.030	18.0-20.0		8.0-12.0	

Atlas304 bar is generally stocked in "Dual Certified" form. These products have chemical and mechanical properties complying with both 304 and 304L specifications. Such dual certified product does not meet 304H specifications and may be unacceptable for high temperature (over about 500°C) applications.

Conditions of Supply – Specified Mechanical Properties

Values below are specified values according to ASTM A276, condition A, for cold finished 304 bars.

Diameter (mm)	Tensile Strength (MPa) min	0.2% Proof Stress (MPa) min	Elongation (% in 50mm) min	Reduction of Area (%) min
≤12.70	520	310	30	40
>12.70	515	205	30	40

Conditions of Supply – Typical Physical Properties

Density (kg/m ³)	Elastic Modulus (GPa)	Mean Coefficient of Thermal Expansion			Thermal Conductivity		Specific Heat (J/kg.K)	Electrical Resistivity (nΩ.m)
		0-100°C (µm/m/°C)	0-315°C (µm/m/°C)	0-538°C (µm/m/°C)	at 100°C (W/m.K)	at 500°C (W/m.K)		
7900	193	17.2	17.8	18.4	16.3	21.5	500	720

Corrosion Resistance

Excellent in a wide range of atmospheric environments and many corrosive media. Subject to pitting and crevice corrosion in warm chloride environments, and to stress corrosion cracking above about 50°C. Considered resistant to potable water with up to about 200mg/L chlorides at ambient temperatures, reducing to about 150mg/L at 60°C. Consult Atlas Technical Assistance for specific environmental recommendations.

Heat Resistance

Good oxidation resistance in intermittent service to 870°C and in continuous service to 925°C. Continuous use of 304 in the 425-860°C range is not recommended if subsequent aqueous corrosion resistance is important, but 304L and dual certified product 304/304L does not suffer from this problem. For temperatures above 500°C specific high-temperature grades would normally be chosen such as 304H, 321H, 310 or S30815.

Conditions of Supply – Finish, Dimensions and Tolerances

Surface Finish

Round bar up to 25.4mm diameter is all cold drawn. Round bars over 25.4 and up to 127.00mm diameter are smooth-turned and polished. Round bars over 127.00mm diameter are all peeled.

All hexagon bar and all square bar is cold drawn.

Diameter and A/F tolerances

Round Bar: Cold drawn h9; Smooth-turned and Polished h10; Peeled up to 160mm k12; Peeled over 160mm +1.5mm/-0; Centreless ground h9 or h8
Square Bar: h11; Hex Bar: h11.

Straightness – maximum deviation from a straight line

Round Bar: 1.5mm in 1500mm and may not exceed: 1.5mm x length in mm / 1500mm

Squares and Hexagon: 1.5mm in 1500mm and may not exceed: 1.5mm x length in mm / 1500mm

Other tolerances may be supplied for more critical applications upon enquiry.

Length Tolerance

Sizes up to 25.4mm:	Mill Lengths and Set Lengths, +50mm/-0
Sizes up from 25.4mm to 50.8mm:	Mill Lengths and Set Lengths, +100mm/-0
Sizes over 50.8mm: (varies depending on size)	Mill Lengths and Set Lengths, +/- 300mm

UGIMA® 304 for top performance in machining

A **UGIMA**® improved machinability version of grade 304 is available in round, hexagon and square bar. **UGIMA**® 304 machines significantly better than standard 304 or 304L, enabling a higher rate of metal removal and lower tool wear in many operations. Surface quality and reliability of machining results will improve too when using **UGIMA**® 304. For **UGIMA**® 304 detailed set-up table are available on request, specifying machining parameters (surface speed, feed rate, depth of cut and type of tool) for high-speed steel tooling and carbide insert tooling for the most common machining operations (roughing, finishing, drilling, parting-off etc.). Machinability assistance is available for optimal set-up and problem-solving for specific machining jobs.

Atlas Specialty Metals

Stainless Steel Bar 304-304L

Heat Treatment

The following temperature ranges are applicable for the respective heat treatment operations.

Forging	Annealing
900 – 1200°C	1010 – 1120°C

Cool rapidly rapidly after annealing. Atlas304 cannot be hardened by thermal treatment.

Welding

Excellent weldability by all standard fusion methods, both with and without filler metals. AS 1554.6 pre-qualifies welding of 304 with Grade 308 and 304L with 308L rods or electrodes (and with their high silicon equivalents). Heavy welded sections in Grade 304 may require post-weld annealing for maximum corrosion resistance. This is not required for Grade 304L.

Applications of Atlas 304

Food processing equipment, particularly in beer brewing, milk processing & wine making. Kitchen appliances and equipment. Heat exchanger components. Threaded fasteners. Springs.

Possible Alternative Grades

Grade	Why it may be chosen instead of 304/L
304Cu	Lower work hardening rate is needed for cold forging of screws, bolts and rivets. Higher machinability than 304/L.
303	Higher machinability needed, and the lower corrosion resistance, formability and weldability are acceptable.
316	Higher resistance to pitting and crevice corrosion is required, in chloride environments.
430	A lower cost is required, and the reduced corrosion resistance and fabrication characteristics are acceptable.

Disclaimer

Whilst every effort has been made to ensure accuracy of the information in this Datasheet, Atlas Specialty Metals accepts no liability for damages arising from its use.