

## GFRP CONCRETE REINFORCEMENT

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# GFRP Concrete Reinforcement

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**ABOUT  
UNITECH**

# Unitech Introduction

Unitech is a Saudi based Multinational Company providing building and construction solutions that is empowering the region's construction industry for the past 40+ years. We have been successfully providing solutions through mastering our main business activities: Design, Manufacture and Trade.

**Design:**

Provide Design & Engineering Solution to the construction sector, complying with international & local standards.

**Manufacture:**

Operating with Global Standards, we are widely recognized for our advanced light steel solutions and Hot-Dip Galvanization Facility.

**Trade:**

We are one of the region's largest Importer/Exporter of Building & Construction Materials.

Unitech is an **ISO QMS 9001:2015** certified company and is a member of the US Green Building Council. Our experienced teams and operations are present across the Middle-East North Africa regions (MENA) and Pakistan, giving us an extensive regional network that benefits our clients and partners. We are also present in Europe via our design and engineering office in Stuttgart.

For more information, please visit: [www.unitech-ikk.com](http://www.unitech-ikk.com)

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# Mission & Vision

**Mission**

UNITECH is committed to transforming the construction and building sector by equipping engineers with advanced solutions and expert support at every project stage. As a leading industry provider, we empower our team to deliver exceptional service that consistently exceeds expectations. By fostering a cohesive and forward-focused culture, we attract and retain top talent, driving our mission forward. Our innovative, customer-centric products set new industry benchmarks and pave the way for future progress.

**Vision**

To be the Customer's First Choice...

# Our Strategy

Unitech's strategy continues to focus on accelerating its business throughout the region, to service the construction sector via superior products & solutions, backed up by a group of highly experienced people in the field. Unitech also aims to enhance its geographical presence in its areas of interest and where opportunities exist.

We combine a deep understanding of building and construction materials markets with a successful history of upgrading our products and developing our processes.

We have the qualified employees, the know-how and the products to service major construction projects, medium sized to mega projects taking in care our positive contribution to our societies.

**We thrive towards excellence by acknowledging:**



Customer Satisfaction



Partner and Supplier Relations



Employee Retention



Positive Influence on Society and Environment

## Our Employees

We are a company that prides itself on its 'family' culture and we seek out high-caliber people. We are a company that has, at its core, a team philosophy that is clearly apparent each and every day - there is a real sense of being there for one another.

We believe in nurturing the skills of our team members and providing growing levels of responsibility. Our people bring unique skills, energy, expertise, experience and perspectives to our workforce.

Unitech's family of employees consists of experienced, well-motivated and dedicated team of engineers, technicians, sales executives and management staff. This team is committed to serve our customers, with the best solutions available in the market.

# Our Journey

## 40+ Years of Excellence

Since 1979, having been set to become an independent company under the framework developed by Sheikh Isam Kabbani, Unitech started its journey of success with confidence and enthusiasm, hard work and care to detail and a commitment to become the best within its industry.

Its dedicated people could only imagine what the future could bring to this newly established entity. Unitech's journey of success has been marked with outstanding achievements and superior accomplishments. Year by year, Unitech has been acknowledged as the "First Choice for Building & Construction Material" by major construction consultants in the region, governmental authorities, well-known contracting and project development corporations.

We have obtained invaluable knowledge about the construction industry in general, providing specialized solutions to construction projects throughout MENA region. From a couple of outlets in Saudi Arabia, Unitech today is present all over the Kingdom and in several countries throughout the region providing its products and solution to various locations worldwide.



**Est. 1979**

### THE BEGINNING

Unitech was established in the Western Region of KSA as a Sales Company selling basic construction material.

During the same year, another branch was established in the heart of the kingdoms capital, Riyadh.



**1980 to 1989**

### AGE OF GREAT RISK

Unitech Dammam was open for business in the oil-rich eastern coast of Saudi Arabia.

Within these 10 years the idea of in-house manufacturing facility was born and Specialized Factory for Steel Products (SFSP) was established in Riyadh.



**1990 to 1999**

### AGE OF GROWTH

Branches of Unitech were established in Makkah, Madina, Khamis Mushayt and Jubail.

The need to increase its range of products and the necessity to have production lines for mass production lead to the decision to move the SFSP Factory from Riyadh to Jeddah.

# Pioneering Construction Since 1979

We are constantly evolving in order to become more flexible in our operations, more sustainable in our societies, and more innovative in conducting our business.

By delivering superior products tailored to the specific construction needs, ambitious solutions, and an outstanding customer service, we serve today's needs through developing tomorrow's markets.

Helping construction projects experience success is what fueled its days. Unitech is keen to continue offering superior products, a wide spectrum of solutions, governed by our top-notch management style.

Such aspirations require trust in our responsibilities. Our Responsibilities for the future and with this in mind we continue to target excellence with committed efforts.



## 2000 to 2015

### AGE OF CONSTRUCTION BOOM

Qassim, Hofuf and Yanbu Branches were inaugurated in KSA and branches outside KSA were established in UAE, Egypt, Lebanon, Oman, Jordan and Germany in order to facilitate the construction boom in the Middle East.

During this period SFSP state of the art facilities were launched in DIC UAE and Unitech thrived, marking some of the best years in business.



## 2016 to 2019

### AGE OF GREAT CHANGE

This period, marked the age of great change in order to align with the economic shift in the GCC and the world in general.

Company wide right sizing initiatives were taken especially in KSA to align with the kingdom's ambitious vision 2030 and during this period the upgraded SFSP state of the art facilities were launched in JIC 3 KSA.



## 2020 & Beyond

### NEW FRONTIER

This period marks the expansion of Unitech into the South and Central Asian territories. We aim to cater these markets and play an active role in these countries development.

During 2020, Unitech Pakistan was officially inaugurated and marked the entrance of Unitech into Asian Market.



**ABOUT  
MATEENBAR**

# Company Profile

## Overview

IKK Mateenbar is a technology firm that prides itself on process innovation and expertise enabling it to produce premium products at the lowest cost. Mateen, "متين" in Arabic means strong & durable. It is the proven solution to concrete corrosion replacing steel rebar with non-metallic bars for concrete reinforcement.

## Product

IKK Mateenbar manufactures a structurally durable & high performance product called Mateenbar™, which is **Glass Fiber Reinforced Polymer (GFRP) rebar**, also known as Fiberglass rebar. Our products remove the risk of concrete corrosion in highly aggressive environments. They provide large cost savings by eliminating maintenance costs and increasing the design life of concrete structures to 100+ years.

## Partners

IKK Mateenbar is a joint venture between Isam K. Kabbani (IKK) Group of Companies and New Zealand company, Pultron Composites. Mateenbar™ technology was designed and developed at Pultron Composites by an engineering team with decades of product development experience who continue to provide R&D support and expertise.



## Global Presence

Mateenbar™ is recognized globally for delivering the best price-performance ratio. It is a market leader in durable concrete reinforcement having supplied over 270 projects in 35 countries, supported by global approvals and references.

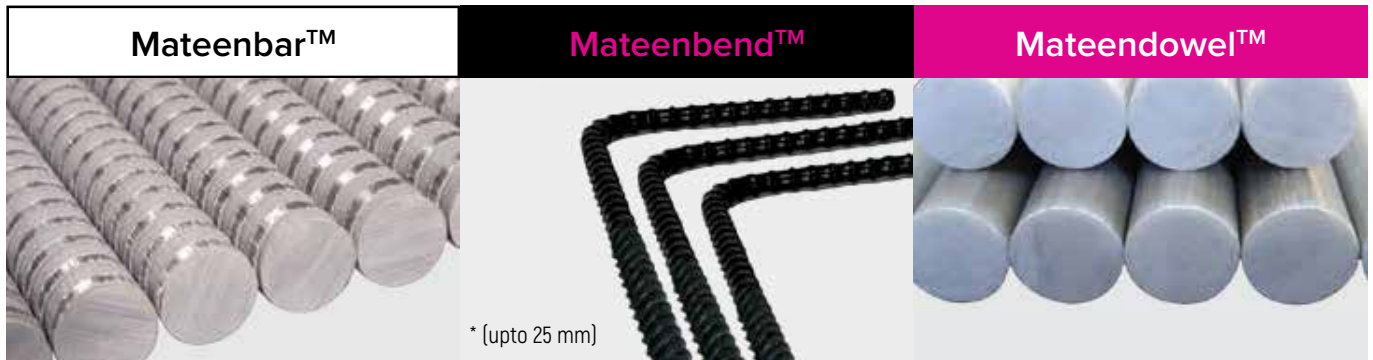


Facility is located in the 3rd Industrial City, Dammam, Eastern Province, Kingdom of Saudi Arabia.



# Product Range

(8 mm to 38 mm diameter)



## GFRP Advantages



### Corrosion Free

- Exceptional resistance to water & salinity
- Does not rust or leach



### No Thermal Cycling Impact

- Thermal expansion close to concrete



### Non-electromagnetic

- Non-conductive and electro-magnetically neutral



### Highly Chemical Resistant

- Exceptionally resistant to a range of chemicals



### High Tensile Strength

- Twice the strength of steel



### Non-magnetic

- No interference with sensitive equipment



### Easy to cut and install

- Cut on-site using standard std. tools
- Bends delivered preformed



### Whole of Life Savings

- Design life cycle is 100 years
- Zero maintenance cost



### Lightweight

- ¼ the weight of steel



### Low Thermal Conductivity

- Maintains good thermal insulation values



### Highly Durable

- Over 100 years retention of strength & modulus in high pH environments

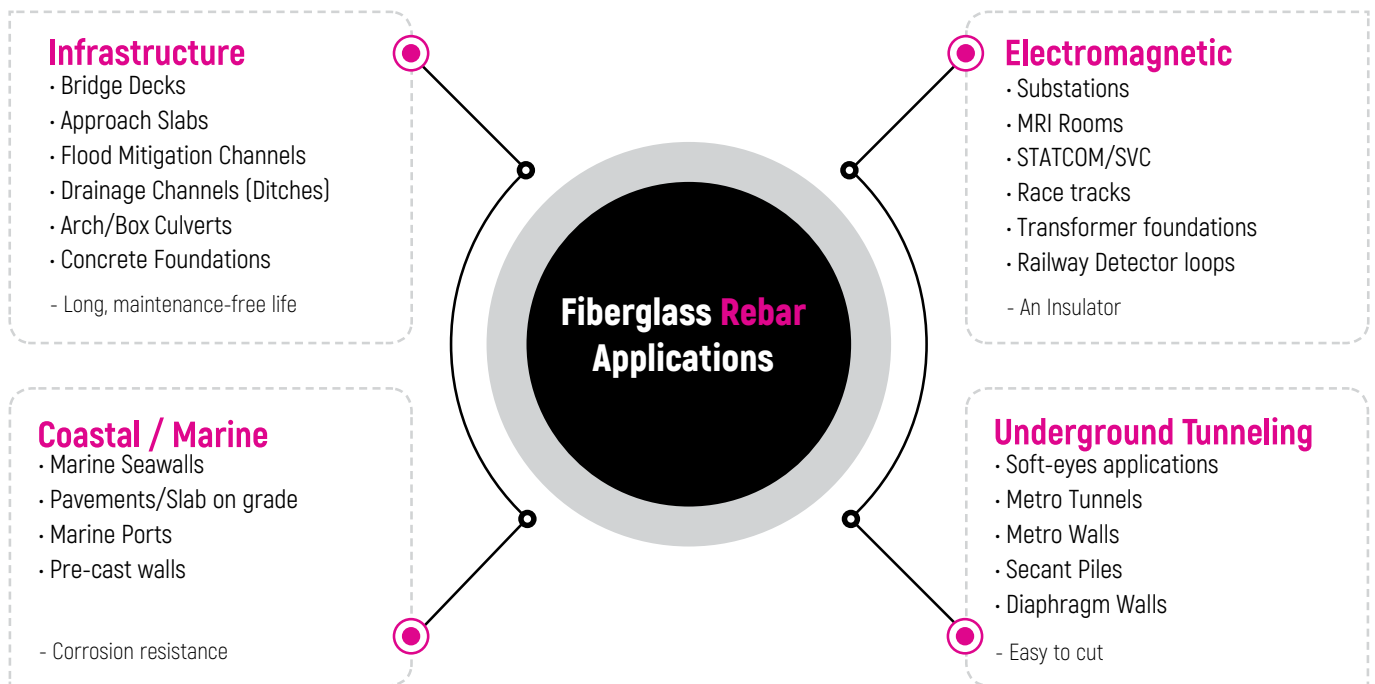


### Low Environmental Impact

- Consumes approximately 70% the embodied energy of steel



# Project Applications



## Design Standards

<b>Saudi Arabia</b>	Saudi Aramco Engineering Standards (SAES-Q-001 and 12-SAMSS-027)
<b>USA</b>	ACI 440.1R: Guide for the design and Construction of Structural Concrete Reinforced with FRP Bars AASHTO LRFD: Bridge Design Specifications for GFRP-Reinforced Concrete Bridge Decks and Traffic Railing ASTM D7957/D7957M-17: Standard Specification for Solid Round Glass Fiber Reinforced Polymer Bars for Concrete Reinforcement <sup>1</sup>
<b>Europe</b>	FIB Task Group 9.3 - Bulletin 40 - FRP Reinforcement in RC Structures
<b>Canada</b>	CAN/CSA S806: Design of Buildings with Fiber Reinforced Polymers CAN/CSA S6: Canadian Highway Bridge Design Code
<b>Japan</b>	JSCE: Recommendation for Design and Construction of Concrete Structures Using Continuous Fiber Reinforced Materials



# Sustainability Cycle

## Fiberglass rebar compared to steel



### Raw Material

- Consumes 70% the embodied energy of steel
- GFRP Tg (120 °C) < Iron melting point (1500 °C)



### Manufacturing

- Less heat and electrical energy consumed
- Lower CO<sub>2</sub> emissions
- No water / gas consumption in production



### Distribution

- 70% less transportation fuel/gas (Light weight)
- Lowers truck tailpipe / lifting crane CO<sub>2</sub> emissions



### Use

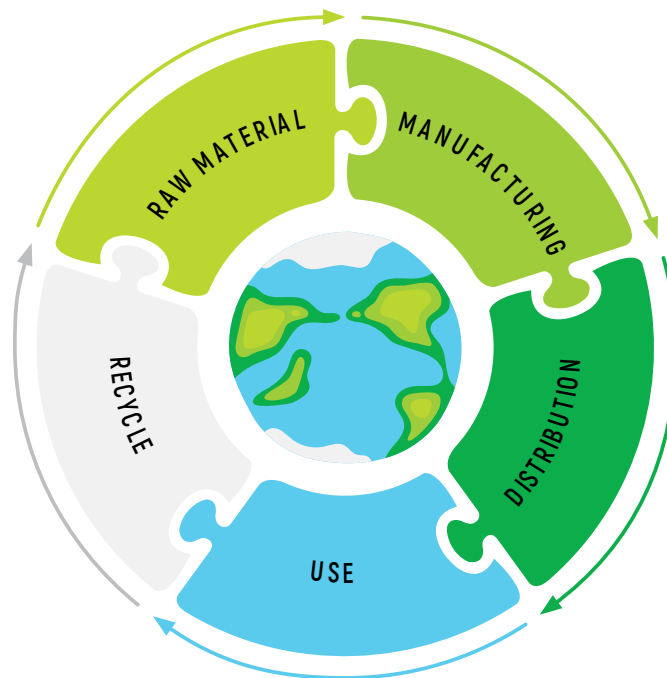
- Longer design file
- No maintenance
- Less cement content
- Lower project schedule
- Seawater (saves freshwater)
- Less energy consumption



### Recycle

- At end of life, it can be crushed & used as coarse aggregate in concrete

## Life Cycle Assessment



## Material properties comparisons: Mateenbar™ vs Steel

Material Properties	Units	Mateenbar™	Steel (ASTM A615)
Tensile strengthM	Pa	800 - 1100	420
Unit weight	kg/m <sup>3</sup>	2100	7850
Bond strengthM	Pa	10	10
Thermal conductivity	W/ (m· °C)	< 1 <sup>(1)</sup>	54
Electrical resistivity	Ω·m	> 200 x 10 <sup>-10</sup>	1.5 x 10
Modulus of Elasticity	GPa>	50	200

(1) Approximate value



# Technical Data

## Mateenbar™

Nominal Diameter	ASTM Bar Designation No.	Nominal Cross Sectional Area	Product Weight	Guaranteed Ultimate Tensile Strength ( $F_{tu}^*$ )	Ultimate Tensile Strength	Ultimate Tensile Strain	Modulus of Elasticity ( $E_f$ )
mm	#	mm <sup>2</sup>	g/m	MPa	MPa	%	GPa
8		49	100	850	>900	1.6	52
M10	[3]	76	160	850	>900	1.6	52
12		106	224	850	>900	1.6	52
M13	[4]	123	256	850	>900	1.6	52
14		149	315	850	>900	1.6	52
M16	[5]	194	415	850	>900	1.6	52
M19	[6]	273	590	800	>850	1.5	54
M22	[7]	358	770	800	>850	1.5	54
M25	[8]	479	1,030	800	>850	1.5	54
M32	[10]	752	1,620	800	>850	1.5	54
38		1,068	2,270	800	>850	1.5	54

$F_{tu}^*$  = Tensile strength minus 3 standard deviations (ACI440.1R-2015)

M = Metric sizes derived from Table 3 of ASTM D7957

$E_f$  = Design or guaranteed modulus of elasticity of FRP

We reserve the right to provide updated product data as per current production batch properties that meet and/or exceed client standards as per project requirements. Please contact our team for more information on the material properties, shape availability and dimensional limitations of bent bars.

## Mateenbar™ Material Properties

Bond Strength	Thermal Conductivity	Electrical Resistivity	Density	Fibre Mass Content	Moisture Absorption (24hr at 50 °C)	Glass Transition Temp. (DSC)	Shear Strength
MPa	W/m °C	Ωm	kg/m <sup>3</sup>	%	%	°C	MPa
>10	<1	>200x10 <sup>10</sup>	2,100	≥80	≤0.1	≥110	≥180

## Mateendowel™

Nominal Diameter	Nominal Cross Sectional Area	Product Weight	Transverse Shear Strength (Double Shear)	Longitudinal Shear Strength (Short Beam Shear)
mm	mm <sup>2</sup>	g/m	MPa	MPa
8.2	53	90	> 150	> 50
10.0	79	150	> 150	> 50
11.8	109	220	> 150	> 50
12.7	127	250	> 150	> 50
14.0	154	310	> 150	> 50
16.0	201	420	> 150	> 50
19.0	284	580	> 150	> 50
21.8	373	750	> 150	> 50
25.0	491	1,020	> 150	> 50
28.0	616	1,270	> 150	> 50
31.4	774	1,600	> 150	> 50
37.5	1,104	2,200	> 150	> 50

Material Properties (per ASTM D7205-06)

Transverse Shear Strength = ASTM D7617 / D7617M

Longitudinal Shear Strength = ASTM D4475

## Mateendowel™ Material Properties

Thermal Conductivity	Electrical Resistivity	Density	Fibre Mass Content	Moisture Absorption (at 50 °C)	Glass Transition Temp. (DSC)
W/m °C	Ωm	kg/m <sup>3</sup>	%	%	°C
< 1	> 200x10 <sup>10</sup>	2,100	≥ 70	≤ 0.1	≥ 100



# Project Snapshots



Emerging Man, UAE



Saudi Innovation Center, KSA



SPARK Bridge, KSA



ARAMCO Jizan Flood Channel, KSA



Port of Rotterdam, Netherlands



Yas Island Formula 1, UAE



Mina Zayed Road Network, UAE



Grand Paris Express, France



Golden Gate, USA

All Mateenbar™ products have been tested according to ASTM, ACI and/or recommended CSA methods. Mateenbar™ products are sold subject to Mateenbar Limited standard warranty and nothing herein shall expand or extend such warranty. The data contained herein is considered representative of current production and believed to be reliable. Mateenbar Limited reserves the right to make improvements in the product and process which may result in benefits and/or changes to some physical and mechanical properties.

**CONTACT  
INFORMATION**



# Contact Information

## Sales Offices/Entities

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#### Mad inah

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#### Yanbu

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## SFSP Factories

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### SFSP - KSA

Specialized Factory for Steel Products

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#### 3<sup>rd</sup> Industrial City / Jeddah

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### SFSP / EGYPT

Specialized Factory for Steel Products

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#### 6<sup>th</sup> of October City Giza

Tel : +20 2 3820 6477

### SFSP / UAE

SIGMA Factory for Steel Products

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#### DIC (Dubai Industrial City)

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