



Full legal entity / Tam şirket unvanı
KISIKA YAPI MALZEMELERİ SANAYİ VE TİCARET ANONİM ŞİRKETİ

KISIKA GFRP REBAR

Advanced Composite Reinforcement

Gelişmiş Kompozit Betonarme Donatısı



KISIKA GFRP REBAR

KISIKA GFRP Rebar is a glass fiber reinforced polymer reinforcement consisting of continuous high-strength glass fibers embedded in a durable epoxy resin matrix.

The ribbed surface provides bond with concrete and enables use in reinforced concrete applications where corrosion-free performance is required.



- CORROSION RESISTANT**
100% non-corrosive in chloride and harsh environments.
- LIGHTWEIGHT**
Up to 75% lighter than steel for easier handling and installation.
- HIGH STRENGTH**
Tensile strength 800 – 1,100 MPa for demanding application.
- LONG SERVICE LIFE**
Designed for 80 – 100+ years with minimal maintenance.
- NON-CONDUCTIVE & NON-MAGNETIC**
Ideal for data centres, substations and sensitive facilities.

PRODUCT STRUCTURE

- RIBBED SURFACE**
Ensures strong bond with concrete
- EPOXY RESIN MATRIX**
Binds and protects the glass fibers
- CONTINUOUS GLASS FIBERS**
High-strength fibers provide structural performance

IDEAL FOR APPLICATIONS


BRIDGES


DATA CENTERS


SUBSTATIONS


MARINE STRUCTURES


WATER TREATMENT PLANTS


INDUSTRIAL FACILITIES


FOUNDATIONS & SLABS

DESIGNED IN ACCORDANCE WITH

- ACI 440.11-22
- CAN/CSA S806
- ACI 440.5-22
- IS 18255:2023
- FIB Bulletin 40
- IS 18256:2023



STRONGER. LIGHTER. LONGER LASTING.

Corrosion-Free Reinforcement for a Sustainable Future.

www.kisikagroup.com

Document type / Belge türü	Technical specification for business partners / İş ortakları için teknik spesifikasyon
Audience / Hedef kitle	Distributors, contractors, consultants, project owners / Distribütörler, yükleniciler, müşavirler, yatırımcılar
Official product page / Resmi ürün sayfası	https://kisikagroup.com/gfrp-rebar

Partner note | İş ortağı notu

This document supports technical first discussions, partner onboarding, tender preparation and project qualification. KISIKA is used as the abbreviated commercial name / potential product brand. Final structural design must be performed by qualified engineers according to local codes, project requirements and approved test certificates.

Bu doküman teknik ilk görüşmeler, iş ortağı kabul süreci, ihale hazırlığı ve proje ön değerlendirmesi için hazırlanmıştır. KISIKA, ticari kısaltma / potansiyel ürün markası olarak kullanılmaktadır. Nihai statik tasarım; yerel yönetmelikler, proje gereklilikleri ve onaylı test sertifikalarına göre yetkin mühendisler tarafından yapılmalıdır.

1. Overview | Genel Bakış

KISIKA GFRP Rebar is an advanced Glass Fiber Reinforced Polymer reinforcement developed as a durable, corrosion-free, non-magnetic and electrically non-conductive alternative to conventional steel reinforcement.

KISIKA GFRP Rebar, geleneksel çelik donatıya karşı dayanıklı, korozyonsuz, manyetik olmayan ve elektriksel olarak yalıtkan bir alternatif olarak geliştirilmiş gelişmiş cam elyaf takviyeli polimer donatıdır.

It is designed for concrete structures exposed to chlorides, seawater, de-icing salts, stray currents, aggressive chemicals, high maintenance risk and long design service-life requirements.

Klorürlere, deniz suyuna, buz çözücü tuzlara, kaçak akımlara, agresif kimyasallara, yüksek bakım riskine ve uzun tasarım ömrü gereksinimlerine maruz kalan betonarme yapılar için tasarlanmıştır.

2. Material Composition & Chemical Structure | Malzeme Bileşimi ve Kimyasal Yapı

Component	Technical Description	Bileşen	Teknik Açıklama
Reinforcing fiber	Continuous high-strength glass fiber, typically E-glass or E-CR glass according to approved production specification.	Takviye elyafı	Onaylı üretim spesifikasyonuna göre genellikle E-glass veya E-CR glass tipi sürekli yüksek dayanımlı cam elyafı.
Polymer matrix	Thermoset polymer resin matrix; epoxy resin, vinyl ester resin or equivalent chemically resistant system depending on project requirement.	Polimer matris	Thermoset polimer reçine matrisi; proje gerekliliğine göre epoksi reçine, vinil ester reçine veya eşdeğer kimyasal dayanımlı sistem.
Fiber-matrix interface	Silane coupling agent and fiber sizing system to improve adhesion between glass fibers and resin matrix.	Elyaf-matris arayüzü	Cam elyafları ile reçine matrisi arasındaki aderansı artırmak için silan bağlayıcı ajan ve elyaf kaplama sistemi.
Surface profile	Ribbed, helically wound, sand-coated or hybrid surface to increase mechanical interlock and bond with concrete.	Yüzey profili	Betonla mekanik kilitlenmeyi ve aderansı artıran nervürlü, helisel sarımlı, kum kaplamalı veya hibrit yüzey.
Chemical protection	Matrix system designed to limit moisture diffusion, alkaline attack and chemical degradation in concrete exposure conditions.	Kimyasal koruma	Beton ortamında nem difüzyonunu, alkali saldırıyı ve kimyasal bozunmayı sınırlamak üzere tasarlanmış matris sistemi.

Specification terminology | Spesifikasyon terminolojisi

Recommended technical terms include glass fibers, thermoset polymer matrix, epoxy resin, vinyl ester resin, silane coupling agent, chloride ions (Cl⁻), sulfate ions (SO₄²⁻), sodium chloride (NaCl), magnesium chloride (MgCl₂), calcium hydroxide Ca(OH)₂ and alkaline concrete pore solution.

Önerilen teknik terimler: cam elyafları, termoset polimer matris, epoksi reçine, vinil ester reçine, silan bağlayıcı ajan, klorür iyonları (Cl⁻), sülfat iyonları (SO₄²⁻), sodyum klorür (NaCl), magnezyum klorür (MgCl₂), kalsiyum hidroksit Ca(OH)₂ ve alkali beton boşluk suyu.

3. Key Advantages | Temel Avantajlar

- Corrosion-free: no rust, no steel-type electrochemical corrosion and no concrete spalling caused by corroding reinforcement.
- Up to 75% lighter than steel, reducing transport, handling, lifting and installation effort.
- High tensile strength with durable performance in aggressive environments.
- Electrically non-conductive and non-magnetic for energy, rail, data center and sensitive technical assets.
- Resistant to chlorides, seawater, de-icing salts and many chemically aggressive exposures.
- Low thermal conductivity; can reduce metallic thermal bridging in suitable applications.
- Long service life with minimal corrosion-related maintenance and reduced life-cycle cost.

- Korozyonsuz: paslanma, çeliğe özgü elektrokimyasal korozyon ve korozyon kaynaklı beton dökülmesi oluşturmaz.
- Çeliğe göre %75'e kadar daha hafiftir; nakliye, taşıma, kaldırma ve montaj yükünü azaltır.
- Agresif ortamlarda yüksek çekme dayanımı ve dayanıklı performans sağlar.
- Enerji, demiryolu, veri merkezi ve hassas teknik tesisler için elektriksel olarak yalıtkan ve manyetik değildir.
- Klorürlere, deniz suyuna, buz çözücü tuzlara ve birçok kimyasal agresif ortama dayanıklıdır.
- Düşük ısı iletkenliği sayesinde uygun uygulamalarda metalik ısı köprülerini azaltabilir.
- Uzun servis ömrü, minimum korozyon kaynaklı bakım ve daha düşük yaşam döngüsü maliyeti sunar.

4. Indicative Technical Properties | Gösterge Niteliğinde Teknik Özellikler

Property	Typical / Indicative Value	Özellik	Tipik / Gösterge Değer
Material type	Glass Fiber Reinforced Polymer (GFRP), pultruded composite reinforcement	Malzeme tipi	Cam elyaf takviyeli polimer (GFRP), pultrüzyon yöntemiyle üretilen kompozit donatı
Nominal diameter range	Typically 4-40 mm; final range subject to factory production program	Nominal çap aralığı	Genellikle 4-40 mm; nihai aralık fabrika üretim programına bağlıdır
Density	Approx. 1.9-2.2 g/cm ³	Yoğunluk	Yaklaşık 1,9-2,2 g/cm ³
Weight versus steel	Approx. 20-25% of steel weight; up to 75% lighter	Çeliğe göre ağırlık	Çelik ağırlığının yaklaşık %20-25'i; %75'e kadar daha hafif
Tensile strength	Typically 800-1,100 MPa depending on diameter, product grade and approved test certificate	Çekme dayanımı	Çap, ürün sınıfı ve onaylı test sertifikasına bağlı olarak genellikle 800-1.100 MPa
Elastic modulus	Typically >50 GPa; commonly approx. 50-60 GPa depending on fiber volume and grade	Elastisite modülü	Genellikle >50 GPa; elyaf hacmi ve ürün sınıfına bağlı olarak çoğunlukla 50-60 GPa
Bond strength	Indicative approx. 12.5 MPa; final value depends on surface profile and test method	Aderans dayanımı	Gösterge değer yaklaşık 12,5 MPa; nihai değer yüzey profiline ve test metoduna bağlıdır
Ultimate strain	Typically 1.5-2.5%	Kopma uzaması	Genellikle %1,5-2,5
Electrical behavior	Dielectric / non-conductive; indicative electrical resistivity >200 x 10 ¹⁰ Ohm*m	Elektriksel davranış	Dielektrik / yalıtkan; gösterge elektriksel özdirenç >200 x 10 ¹⁰ Ohm*m
Magnetic behavior	Non-magnetic; relative magnetic permeability near 1	Manyetik davranış	Manyetik değildir; bağlı manyetik geçirgenlik yaklaşık 1
Thermal conductivity	Low compared with steel; indicative value <1 W/(m*degC)	Isı iletkenliği	Çeliğe kıyasla düşüktür; gösterge değer <1 W/(m*degC)
Service life	Designed for 100+ years in suitable exposure classes, subject to design and testing	Servis ömrü	Uygun maruziyet sınıflarında, tasarım ve testlere bağlı olarak 100+ yıl için tasarlanmıştır
Maintenance	Minimal; no typical steel-corrosion repair cycle	Bakım	Minimum; çelik korozyonuna özgü tipik onarım döngüsü yoktur

4.1 Technical Comparison with Steel | Çelik Donatı ile Teknik Karşılaştırma

Criterion	Conventional Steel Rebar	KISIKA GFRP Rebar	Kriter
Tensile strength	Typically approx. 500-600 MPa for common reinforcement grades	Typically approx. 800-1,100 MPa according to certificate	Çekme dayanımı
Density / unit weight	Approx. 7.85 g/cm ³	Approx. 1.9-2.2 g/cm ³ ; about 20-25% of steel weight	Yoğunluk / birim ağırlık
Elastic modulus	Approx. 160-200 GPa	Typically >50 GPa; serviceability deflection must be checked	Elastisite modülü
Bond strength	Depends on rib geometry and concrete conditions	Indicative approx. 12.5 MPa; final value by approved test method	Aderans dayanımı
Thermal conductivity	Approx. 54 W/(m*degC)	Indicative <1 W/(m*degC); reduces metallic heat-transfer path	Isı iletkenliği
Ultimate strain	Ductile yielding behavior; high elongation after yield	Linear elastic up to rupture; typically approx. 1.5-2.5%	Kopma uzaması
Corrosion	Susceptible to rust, chloride attack and carbonation corrosion	No steel-type rusting; resin/glass system must be qualified for exposure class	Korozyon
Electrical behavior	Conductive	Dielectric / electrically non-conductive	Elektriksel davranış
Magnetic behavior	Magnetic depending on steel grade	Non-magnetic; suitable for sensitive technical environments	Manyetik davranış

5. Data Center & Electrical Infrastructure Benefits | Veri Merkezi ve Elektrik Altyapısı Avantajları

KISIKA GFRP Rebar offers specific advantages for critical electrical infrastructure where steel reinforcement may create conductive paths, stray-current corrosion, magnetic influence or maintenance risk.

KISIKA GFRP Rebar, çelik donatının iletken yollar, kaçak akım korozyonu, manyetik etki veya bakım riski oluşturabileceği kritik elektrik altyapısında özel avantajlar sunar.

<p>Electrically non-conductive</p> <p>No reinforcement-related conductive path in concrete around sensitive electrical assets.</p> <p>Elektriksel olarak yalıtkan</p> <p>Hassas elektriksel ekipman çevresindeki beton elemanlarda donatı kaynaklı iletken yol oluşturmaz.</p>	<p>Non-magnetic</p> <p>Supports use in data centers, substations, rail systems, transformers and control environments.</p> <p>Manyetik değildir</p> <p>Veri merkezleri, trafo merkezleri, demiryolu sistemleri, transformatörler ve kontrol ortamlarında kullanımı destekler.</p>
<p>Stray-current resistant</p> <p>Suitable for environments where stray current may accelerate steel deterioration.</p> <p>Kaçak akıma dayanıklı</p> <p>Kaçak akımın çelik bozulmasını hızlandırabileceği ortamlar için uygundur.</p>	<p>Critical asset reliability</p> <p>Reduces corrosion-driven maintenance risk in mission-critical infrastructure.</p> <p>Kritik varlık güvenilirliği</p> <p>Görev kritik altyapılarda korozyon kaynaklı bakım riskini azaltır.</p>



ELECTRICAL SAFETY BENEFITS

NON-CONDUCTIVE. SAFE. RELIABLE.



KISIKA GFRP Rebar is electrically non-conductive, eliminating the risk of electrical conduction, stray current corrosion and magnetic interference. It is the ideal reinforcement solution for critical electrical infrastructure.



KEY ELECTRICAL SAFETY BENEFITS

 ELECTRICALLY NON-CONDUCTIVE <small>GFRP rebar does not conduct electricity, ensuring maximum electrical safety.</small>	 NO REINFORCEMENT-RELATED CONDUCTIVE PATH <small>Eliminates the risk of current leakage through concrete structures caused by steel reinforcement.</small>	 NO MAGNETIC INFLUENCE <small>Non-magnetic material avoids electromagnetic interference with sensitive equipment and systems.</small>	 CORROSION & STRAY CURRENT RESISTANT <small>Unaffected by stray currents and electrochemical activity – no corrosion, no degradation.</small>	 ENHANCED RELIABILITY & LONG SERVICE LIFE <small>Improves system reliability and reduces maintenance in critical electrical environments.</small>
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GFRP REBAR vs STEEL REBAR

	GFRP REBAR	STEEL REBAR
Non-conductive	 ELECTRICAL CONDUCTIVITY	Conductive
No conductive path	 CONDUCTIVE PATH RISK	Creates conductive path
Non-magnetic	 MAGNETIC INFLUENCE	Magnetic - potential interference
Resistant to stray currents	 STRAY CURRENT EFFECT	Susceptible to stray currents & corrosion
Ideal for critical electrical assets	 OVERALL SAFETY PERFORMANCE	Higher risk in electrical environments

IDEAL FOR CRITICAL ELECTRICAL INFRASTRUCTURE



TRANSFORMER STATIONS
Non-conductive reinforcement improves electrical safety and protects structures from stray current effects.




RAILWAY INFRASTRUCTURE
Prevents stray current corrosion, ensuring long-term reliability of track foundations, bridges and tunnels.




DATA CENTERS
Non-conductive properties provide safety for sensitive electrical systems and ensure uninterrupted operations.

 **KISIKA GFRP REBAR ENHANCES ELECTRICAL SAFETY, PROTECTS CRITICAL ASSETS AND SUPPORTS RELIABLE PERFORMANCE IN HIGH-TECH INFRASTRUCTURE.**


 **SAFE. SUSTAINABLE. FUTURE-READY.**
KISIKA GFRP Rebar supports safer infrastructure with long-term durability, lower maintenance and a reduced environmental footprint.

 **SAFER INFRASTRUCTURE**
Enhanced electrical safety for people and assets.

 **LOWER MAINTENANCE**
No corrosion, no degradation, long service life.

 **LOWER LIFE-CYCLE COST**
Reduced maintenance and operational risks.

 **SUSTAINABLE SOLUTION**
Non-corrosive, durable and environmentally responsible.

 **KISIKA**
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6. Site Logistics & Installation Advantages | Şantiye Lojistiği ve Montaj Avantajları

The low weight of GFRP improves site logistics, manual handling, storage, crane planning and prefabrication workflows. For distributors, the lower logistics weight can also improve container planning and regional stock handling.

GFRP'nin düşük ağırlığı şantiye lojistiğini, elle taşımayı, depolamayı, vinç planlamasını ve prefabrikasyon süreçlerini iyileştirir. Distribütörler için daha düşük lojistik ağırlık konteyner planlamasını ve bölgesel stok yönetimini de iyileştirebilir.

<p>Lower bundle weight</p> <p>Easier on-site movement and reduced dependence on heavy lifting equipment in suitable workflows.</p> <p>Daha düşük demet ağırlığı</p> <p>Uygun iş akışlarında şantiyede daha kolay taşıma ve ağır kaldırma ekipmanına daha az bağımlılık.</p>	<p>Transport efficiency</p> <p>Reduced logistics weight may improve truck and container economics.</p> <p>Nakliye verimliliği</p> <p>Daha düşük lojistik ağırlık kamyon ve konteyner ekonomisini iyileştirebilir.</p>
<p>Improved handling</p> <p>Useful in confined areas, basements, formwork zones and infrastructure projects.</p> <p>Gelişmiş elleçleme</p> <p>Dar alanlar, bodrumlar, kalıp bölgeleri ve altyapı projelerinde avantaj sağlar.</p>	<p>Prefabrication support</p> <p>Factory-made stirrups, coils and special shapes can reduce site complexity.</p> <p>Prefabrikasyon desteği</p> <p>Fabrika üretimi etriyeler, kangallar ve özel şekiller şantiye karmaşıklığını azaltabilir.</p>



SITE LOGISTICS BENEFITS

SMARTER TRANSPORT. EASIER HANDLING. BETTER PERFORMANCE.

KISIKA GFRP Rebar offers significant site logistics advantages compared with steel reinforcement, contributing to safer, more efficient and cost-effective project execution.



**SAFETY BY CHOICE
NOT BY CHANCE**



LOWER BUNDLE WEIGHT

Supports easier on-site movement and reduces manual handling strain.



REDUCED TRANSPORT & LIFTING DEMAND

Potential reduction in truck loads, crane hours and storage stress – saving time and cost.



IMPROVED HANDLING

Better maneuverability on formwork, scaffolds and confined site areas.



SIMPLIFIED PREFABRICATION & STAGING

Lower material weight may simplify prefabrication, handling and staging processes.

COMPARISON: GFRP REBAR vs STEEL REBAR

STEEL REBAR	VS	KISIKA GFRP REBAR
 Heavy bundles		 Lightweight bundles
 More truck loads		 Fewer truck loads
 Higher crane hours		 Lower crane hours
 More handling effort		 Easier handling
 More storage space required		 Less storage space required

KEY LOGISTICS ADVANTAGES ON SITE



 Easier to carry and position by hand – even in tight areas.



 Fewer truck loads reduce transport time and emissions.



 Improved handling on formwork and scaffolds enhances productivity.



 Lower weight supports efficient prefabrication and staging.

RESULTS YOU CAN EXPECT

-  Safer site operations
-  Reduced project delays
-  Lower operational costs
-  More sustainable construction



LIGHTER MATERIAL.
BETTER LOGISTICS. STRONGER PROJECTS.



BUILT FOR PERFORMANCE.
DESIGNED FOR THE FUTURE.



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7. Sustainability, Life-Cycle & Thermal Performance | Sürdürülebilirlik, Yaşam Döngüsü ve Isıl Performans

KISIKA GFRP Rebar can support sustainable construction by reducing corrosion-related repair cycles, lowering logistics weight and improving long-term durability in aggressive exposure environments.

KISIKA GFRP Rebar, korozyon kaynaklı onarım döngülerini azaltarak, lojistik ağırlığı düşürerek ve agresif maruziyet ortamlarında uzun vadeli dayanıklılığı artırarak sürdürülebilir inşaatı destekleyebilir.

<p>Longer service life</p> <p>Corrosion-free behavior reduces repair cycles and material replacement over the life cycle.</p> <p>Daha uzun servis ömrü</p> <p>Korozyonsuz davranış, yaşam döngüsü boyunca onarım döngülerini ve malzeme değişimini azaltır.</p>	<p>Lower life-cycle cost</p> <p>Reduced maintenance, downtime and corrosion repair can improve total cost of ownership.</p> <p>Daha düşük yaşam döngüsü maliyeti</p> <p>Daha az bakım, duruş ve korozyon onarımı toplam sahip olma maliyetini iyileştirebilir.</p>
<p>Lower logistics weight</p> <p>Less weight reduces transport effort, lifting demand and site complexity.</p> <p>Daha düşük lojistik ağırlık</p> <p>Daha az ağırlık nakliye yükünü, kaldırma ihtiyacını ve şantiye karmaşıklığını azaltır.</p>	<p>Thermal performance</p> <p>Low thermal conductivity can reduce metallic thermal bridging in suitable applications.</p> <p>Isıl performans</p> <p>Düşük ısı iletkenliği uygun uygulamalarda metalik ısı köprülerini azaltabilir.</p>

Fire and elevated-temperature note | Yangın ve yüksek sıcaklık notu

Fire behavior, glass transition temperature (T_g), heat deflection behavior and load-bearing performance under elevated temperatures must be verified according to the resin system, project exposure and approved tests.

Yangın davranışı, cam geçiş sıcaklığı (T_g), ısı altında deformasyon davranışı ve yüksek sıcaklıkta taşıyıcılık performansı; reçine sistemi, proje maruziyeti ve onaylı testlere göre doğrulanmalıdır.



ENVIRONMENTAL AND GSG BENEFITS

SUSTAINABLE TODAY. RESILIENT TOMORROW.

KISIKA GFRP Rebar supports greener construction by reducing environmental impact, extending service life and contributing to long-term value creation.



LONGER SERVICE LIFE
REDUCES REPAIR CYCLES AND REPLACEMENT MATERIALS.

High durability and corrosion-free performance extend the life of structures and reduce the need for repairs and material replacements.



LOWER LOGISTICS WEIGHT
CAN REDUCE TRANSPORT-RELATED EMISSIONS.

Up to 70-80% lower weight vs. steel can reduce the number of truck loads, fuel consumption and associated CO₂ emissions.



CORROSION-FREE BEHAVIOR
REDUCES MAINTENANCE INTERVENTIONS.

Eliminates corrosion-related deterioration, reducing maintenance activities, site disruptions and use of chemicals.



LIFECYCLE PROCUREMENT
CONSIDERS TOTAL COST, DURABILITY AND OPERATIONAL RESILIENCE.

Enables smarter procurement decisions based on total lifecycle cost, longer durability and improved asset resilience.



LIFECYCLE IMPACT: BUILDING A SUSTAINABLE FUTURE



LOWER IMPACT. HIGHER VALUE. SUSTAINABLE BY DESIGN.

ENVIRONMENTAL AND GSG COMPARISON

CRITERIA	STEEL REBAR	KISIKA GFRP REBAR
SERVICE LIFE	Frequent repairs and replacements	Longer life, fewer interventions
TRANSPORT & LOGISTICS	Higher weight, more emissions	Up to 70-80% lighter, lower emissions
CORROSION & MAINTENANCE	Corrosion prone, high maintenance	Corrosion-free, minimal maintenance
LIFECYCLE COST	Higher total cost over lifecycle	Lower total cost, better value
SUSTAINABILITY IMPACT	Higher carbon footprint and resource use	Lower footprint, sustainable solution

SUPPORTING GLOBAL GOALS

- CLIMATE ACTION: Reduce emissions and support low-carbon construction
- RESPONSIBLE CONSUMPTION: Optimize resource use and reduce waste
- SUSTAINABLE INFRASTRUCTURE: Build durable, resilient and future-ready assets

BUILD GREENER.
BUILD STRONGER.
BUILD FOR GENERATIONS.

DURABLE SOLUTIONS
FOR A RESILIENT
FUTURE.

BETTER FOR THE PLANET.
BETTER FOR PEOPLE.
BETTER FOR BUSINESS.

SUSTAINABLE TODAY.
RESILIENT TOMORROW.



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8. Chemical & Environmental Resistance | Kimyasal ve Çevresel Dayanım

Exposure / Chemical Attack	Expected Performance	Maruziyet / Kimyasal Etki	Beklenen Performans
Chloride ions (Cl ⁻), de-icing salts	Very high resistance; no chloride-induced steel-type rusting.	Klorür iyonları (Cl ⁻), buz çözücü tuzlar	Çok yüksek dayanım; klorür kaynaklı çelik tipi paslanma oluşmaz.
Seawater: NaCl, MgCl ₂ and marine salts	Suitable for marine and coastal concrete when correctly designed and tested.	Deniz suyu: NaCl, MgCl ₂ ve deniz tuzları	Doğru tasarım ve test ile deniz ve kıyı betonarme elemanları için uygundur.
Sulfate ions (SO ₄ ²⁻)	High resistance against steel-type corrosion mechanisms; concrete durability must still be designed.	Sülfat iyonları (SO ₄ ²⁻)	Çelik tipi korozyon mekanizmalarına karşı yüksek dayanım; beton dayanıklılığı ayrıca tasarlanmalıdır.
Alkaline concrete pore solution: Ca(OH) ₂ , NaOH, KOH	Glass/resin system must be qualified for alkaline exposure by approved long-term testing.	Alkali beton boşluk suyu: Ca(OH) ₂ , NaOH, KOH	Cam/reçine sistemi alkali maruziyet için onaylı uzun dönem testlerle doğrulanmalıdır.
Carbonation and moisture	No steel-type carbonation corrosion; moisture diffusion limited by resin matrix.	Karbonatlaşma ve nem	Çelik tipi karbonatlaşma korozyonu oluşmaz; nem difüzyonu reçine matrisi ile sınırlanır.
Acids, solvents, hydrocarbons	Project-specific evaluation required depending on concentration, temperature and duration.	Asitler, solventler, hidrokarbonlar	Konsantrasyon, sıcaklık ve süreye bağlı olarak proje özelinde değerlendirme gereklidir.
UV exposure before installation	Avoid prolonged unprotected outdoor storage; store according to KISIKA handling guidance.	Montaj öncesi UV maruziyeti	Uzun süre korumasız dış ortam depolamasından kaçınılmalı; KISIKA taşıma/depolama önerilerine uyulmalıdır.



9. Typical Applications | Tipik Kullanım Alanları

Sector	Typical Applications	Sektör	Tipik Uygulamalar
Energy & utility infrastructure	Transformer stations, substations, data centers, switchgear facilities, cable ducts, power distribution assets.	Enerji ve altyapı tesisleri	Trafo merkezleri, şalt sahaları, veri merkezleri, elektrik dağıtım tesisleri, kablo kanalları, enerji dağıtım varlıkları.
Infrastructure	Bridges, tunnels, retaining walls, transport structures, railway and metro infrastructure.	Altyapı	Köprüler, tüneller, istinat duvarları, ulaşım yapıları, demiryolu ve metro altyapısı.
Building construction	Residential and commercial buildings, parking structures, basements, slabs, foundations and facade elements.	Bina inşaatı	Konut ve ticari binalar, otopark yapıları, bodrumlar, döşemeler, temeller ve cephe elemanları.
Water & industrial projects	Wastewater plants, water treatment facilities, chemical plants, ports, harbors, coastal and marine structures.	Su ve endüstriyel projeler	Atıksu tesisleri, su arıtma tesisleri, kimya tesisleri, limanlar, kıyı ve deniz yapıları.





10. Design, Standards & Testing References | Tasarım, Standartlar ve Test Referansları

Final design must be performed by qualified engineers according to the project country, applicable building code, client specifications, approved product certificates and test reports. The references below are technical design and testing references, not a statement of certification unless a valid certificate is provided.

Nihai tasarım; projenin bulunduğu ülke, geçerli yapı yönetmeliği, işveren şartnameleri, onaylı ürün sertifikaları ve test raporlarına göre yetkin mühendisler tarafından yapılmalıdır. Aşağıdaki referanslar teknik tasarım ve test referanslarıdır; geçerli sertifika sunulmadıkça belgelendirme beyanı değildir.

- Relevant references may include ACI 440.11-22, ACI 440.5-22, ACI 440.1R, ASTM D7957/D7957M, ASTM D7205/D7205M and ISO 10406-1.
- Additional project references may include CSA S806, CAN/CSA S6 and FIB Bulletin 40, depending on market and project authority.
- Documentation package should include factory QC, material test reports, tensile tests, bond tests, durability tests and third-party laboratory reports where required.

- İlgili referanslar ACI 440.11-22, ACI 440.5-22, ACI 440.1R, ASTM D7957/D7957M, ASTM D7205/D7205M ve ISO 10406-1 dokümanlarını içerebilir.
- Pazar ve proje otoritesine bağlı olarak CSA S806, CAN/CSA S6 ve FIB Bulletin 40 ek proje referansları olarak kullanılabilir.
- Dokümantasyon paketi gerektiğinde fabrika kalite kontrol kayıtları, malzeme test raporları, çekme testleri, aderans testleri, dayanıklılık testleri ve üçüncü taraf laboratuvar raporlarını içermelidir.



DESIGN STANDARDS

International References for GFRP Reinforcement

KISIKA GFRP Rebar is designed and manufactured in accordance with leading international standards and recommendations for fiber reinforced polymer (FRP) reinforcement in concrete structures.



ENGINEERED
TO GLOBAL
STANDARDS



**SAFE
& RELIABLE**
Proven performance
under global codes



**GLOBAL
ACCEPTANCE**
Recognized by leading
engineering standards



**ENGINEER
WITH CONFIDENCE**
Design with internationally
accepted guidelines



**SUSTAINABLE
CHOICE**
Long service life and
corrosion-free performance



**WIDELY
ADOPTED**
Used in infrastructure,
industrial and energy projects
worldwide

RELEVANT INTERNATIONAL DESIGN STANDARDS & REFERENCES



ACI 440.11-22
Building Code
Requirements for
Structural Concrete
Reinforced with FRP Bars



ACI 440.5-22
Specification for
Construction with
FRP Bars



ACI 440.1R-15
Guide for the Design
and Construction of
Structural Concrete
Reinforced with FRP Bars



FIB Bulletin 40
FRP Reinforcement
in RC Structures –
Design Guidance



CAN/CSA S806
Design and Construction
of Building Components
with Fibre-Reinforced
Polymers



CAN/CSA S6
Canadian Highway
Bridge Design Code
(FRP Rebar Design
Considerations)



IS 18255:2023
GFRP Bars for Concrete
Reinforcement –
Specification



IS 18256:2023
GFRP Bars for Concrete
Reinforcement –
Test Methods



COMPLIANT. TRUSTED. FUTURE-READY.
KISIKA GFRP Rebar meets the performance, durability and safety expectations of international engineering standards, enabling designers to build with confidence worldwide.



INFRASTRUCTURE



INDUSTRIAL



ENERGY



MARINE



COMMERCIAL



For detailed technical
information and project
support, contact KISIKA.
www.kisikagroup.com

11. Handling, Cutting & Installation Guidance | Taşıma, Kesme ve Montaj Rehberi

Topic	Recommended Practice	Konu	Önerilen Uygulama
Storage	Store bundles on level supports, protected from contamination, impact damage and prolonged direct UV exposure.	Depolama	Demetleri düz destekler üzerinde, kirlenme, darbe hasarı ve uzun süreli doğrudan UV maruziyetinden koruyarak depolayın.
Handling	Do not drag bars over abrasive surfaces; avoid impact, point loading and uncontrolled bending.	Taşıma	Donatıları aşındırıcı yüzeylerde sürüklemeyin; darbe, noktasal yüklemeye ve kontrolsüz bükmeden kaçının.
Cutting	Use diamond blade or carbide tools with local dust extraction or dust-controlled process.	Kesme	Yerel toz emişi veya toz kontrollü işlem ile elmas disk veya karbür takımlar kullanın.
PPE	Use safety glasses, gloves, long sleeves and FFP2/FFP3 respiratory protection where dust exposure is possible.	Kişisel koruyucu ekipman	Toz maruziyeti olabilecek durumlarda koruyucu gözlük, eldiven, uzun kollu iş kıyafeti ve FFP2/FFP3 solunum koruması kullanın.
Bending and shapes	Factory-formed bends, stirrups and special shapes should follow approved bend radius and production specifications.	Büküm ve özel şekiller	Fabrika üretimi bükümler, etriyeler ve özel şekiller onaylı büküm yarıçapı ve üretim spesifikasyonlarına göre yapılmalıdır.



INSTALLATION GUIDANCE KISIKA GFRP REBAR

KISIKA GFRP Rebar is lightweight, easy to handle and designed for efficient installation. Follow these guidelines to ensure safe handling, proper cutting and correct shaping on site.



LIGHTWEIGHT
Up to 75% lighter than steel for easier transport and installation.



CORROSION RESISTANT
No rust, no coating, long service life and low maintenance.



COST EFFICIENT
Reduced labor time, equipment needs and transportation costs.



EASY HANDLING
Simple to cut, shape and install using standard procedures.



SUSTAINABLE SOLUTION
Lower emissions and improved environmental performance.

1. TRANSPORT & HANDLING



- ☑ GFRP bars are lightweight and easy to transport.
- ☑ Carry and store in bundles on smooth, level surfaces.
- ☑ Avoid dragging bars on the ground.
- ☑ Protect from prolonged exposure to direct sunlight.



Handle with care to avoid impact damage.

2. CUTTING GUIDELINES



- ☑ Use appropriate cutting tools (diamond blade or carbide blade).
- ☑ Always use dust extraction to minimize glass fiber dust.
- ☑ Wear eye protection, gloves and respiratory protection (FFP2/FFP3).
- ☑ Secure the bar properly before cutting.



NEVER cut GFRP bars without PPE and dust extraction.

3. BENDING & SHAPING



- ☑ Bends should be made using appropriate bending machines or heat bending methods as per project requirements.
- ☑ Follow the minimum bend radius recommended by KISIKA for each bar diameter.
- ☑ Ensure all special shapes are manufactured according to project drawings and specifications.

PERSONAL PROTECTIVE EQUIPMENT (PPE)



SAFETY GLASSES
Protect eyes from flying particles.



RESPIRATORY PROTECTION
Use FFP2/FFP3 mask when cutting to avoid inhaling glass fiber dust.



GLOVES
Protect hands from abrasion and sharp edges.



SAFETY FOOTWEAR
Ensure stable footing and protect from falling materials.



HI-VIS CLOTHING
Improves visibility and overall safety on site.

IMPORTANT NOTE



Glass fiber dust may cause irritation. Always follow site safety rules and local regulations.



SAFE INSTALLATION. STRONG PERFORMANCE.

Proper handling and installation ensure the highest structural performance and long-term durability.



www.kisikagroup.com

12. KISIKA Quality Commitment | KISIKA Kalite Taahhüdü

KISIKA GFRP Rebar has been developed to provide engineers, contractors, investors and distributors with a durable and cost-effective reinforcement solution for modern concrete structures.

Its combination of high tensile strength, corrosion resistance, lightweight handling and long-term durability supports sustainable construction and significantly reduced maintenance exposure throughout the project life cycle.

KISIKA GFRP Rebar; mühendisler, yükleniciler, yatırımcılar ve distribütörler için modern betonarme yapılarda dayanıklı ve maliyet etkin bir donatı çözümü sunmak üzere geliştirilmiştir.

Yüksek çekme dayanımı, korozyon direnci, hafif taşıma avantajı ve uzun vadeli dayanıklılık kombinasyonu; sürdürülebilir inşaatı ve proje yaşam döngüsü boyunca önemli ölçüde daha düşük bakım maruziyetini destekler.



KISIKA Quality Commitment

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CORROSION RESISTANT



LIGHTWEIGHT & EASY TO HANDLE



HIGH TENSILE STRENGTH



LONG-TERM DURABILITY



SUSTAINABLE SOLUTION



Non-Corrosive
No Rust



High Strength
to Weight Ratio



Electric & Thermal
Insulation



Easy Cutting
& Installation



Reduced Maintenance
& Longer Service Life



LOWER LIFE CYCLE COST

13. Why KISIKA GFRP Rebar? | Neden KISIKA GFRP Rebar?

<p>Corrosion-free</p> <p>No rust, no chloride-induced steel corrosion and reduced repair exposure.</p> <p>Korozyonsuz</p> <p>Paslanma ve klorür kaynaklı çelik korozyonu oluşturmaz; onarım riskini azaltır.</p>	<p>Non-conductive & non-magnetic</p> <p>Suitable for electrical, digital, rail and sensitive technical environments.</p> <p>Yalıtkan ve manyetik değil</p> <p>Elektrik, dijital altyapı, demiryolu ve hassas teknik ortamlar için uygundur.</p>
<p>Lightweight</p> <p>Approx. 20-25% of steel weight, improving logistics and installation handling.</p> <p>Hafif</p> <p>Çelik ağırlığının yaklaşık %20-25'i; lojistik ve montaj taşımalarını iyileştirir.</p>	<p>Durable and sustainable</p> <p>Designed for long service life, lower maintenance and better life-cycle value.</p> <p>Dayanıklı ve sürdürülebilir</p> <p>Uzun servis ömrü, daha düşük bakım ve daha iyi yaşam döngüsü değeri için tasarlanmıştır.</p>

KISIKA

CORROSION-FREE
KOROZYONSUZ

NON-CONDUCTIVE & NON-MAGNETIC
YALITKAN VE MANYETİK DEĞİL

LIGHTWEIGHT
HAFİF

DURABLE AND SUSTAINABLE
DAYANIKLI VE SÜRDÜRÜLEBİLİR