BFRP Technologies Strength Forged by Nature

MATERIALS / DURABILITY / APPLICATIONS

Reinforcing a more durable future.

Basalt FRP and the wider role of fibre-reinforced polymer reinforcement in concrete infrastructure.

BASALT FRP

A technical perspective

Material behaviour.
Research evidence.
Project considerations.



Basalt reinforcing-bar specimens.

FRP reinforcement technical overview
Materials, research and project considerations

01 / THE MATERIAL

Why consider FRP reinforcement?

Corrosion resistance is central to the case for alternative concrete reinforcement.

Chlorides from de-icing salts and seawater can penetrate concrete and reach steel reinforcement. FRP offers a non-metallic reinforcement option for environments where steel corrosion is a major durability concern.

01

Durability-led selection

Bridge decks, parking structures, waterfront assets and water-treatment facilities are applications where corrosion resistance matters.

02

Whole-life thinking

Consider transport, installation, maintenance and service life together. Benefits depend on the product and project.

WHAT MAKES AN FRP BAR?

Fibre

Glass (GFRP), basalt (BFRP) or carbon (CFRP).

Polymer matrix

Resin binds and protects the reinforcing fibres.

Interface

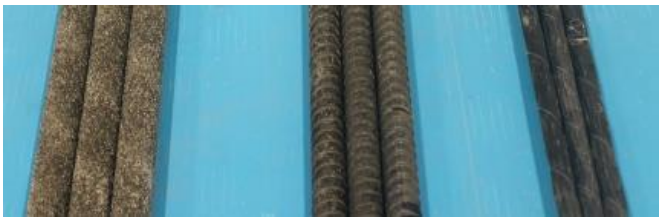
The fibre-matrix bond influences long-term behaviour.

Material identity matters. BFRP and GFRP belong to the FRP family, but their properties and qualification evidence must be assessed separately.

02 / BASALT-SPECIFIC RESEARCH

BFRP in the laboratory

Selected basalt-bar properties reported for the lightweight self-consolidating concrete beam research programme.



BFRP research specimens.

Beam research compares basalt and glass reinforcement through deflection, crack-width and strain measurements.

BFRP bar / surface	Diameter mm	Area mm²	Modulus GPa	Tensile MPa
#6 / Sand-coated	19.1	285	63.7	1,646
#5 / Helically grooved	15.9	199	64.8	1,724
#3 / Thread-wrapped	9.5	71	47.8	911

Research results, not a product datasheet. Values above describe the tested research specimens. They are not certified properties of BFRP Technologies products and are not design allowables.

The spread in the reported values reinforces the need to identify the exact bar type, size, surface treatment and manufacturing system when reviewing material data.

Design for the material

FRP reinforcement changes the design checks. Direct substitution for steel requires material-specific redesign.

FRP remains essentially linear elastic to failure.
It does not provide the yielding behaviour of steel.

01

Serviceability

Evaluate crack widths, short-term deflection and long-term deflection. Stiffness can govern member design.

02

Strength and detailing

Check member resistance, bond, anchorage and reinforcement layout using material-specific properties.

03

Sustained and cyclic loads

Review sustained stress, creep rupture and fatigue using provisions applicable to the selected material.

04

Exposure and fire

Consider environmental reductions, concrete cover and fire resistance as part of the complete design.

04 / LONG-TERM PERFORMANCE

Durability is a system property.

Fibre, resin, sizing and the interface between them all influence the behaviour of an FRP bar over time.



Conditioning equipment used in GFRP/BFRP research.

Testing beyond initial strength

Durability research examines alkaline exposure, salt-solution conditioning, elevated temperatures, creep rupture and field samples.

THREE QUESTIONS FOR THE EVIDENCE

01 What was tested?

Match the fibre, resin, sizing, bar size and manufacturing process to the proposed product.

02 Under which conditions?

Check exposure, temperature, load level and duration before applying a reported result.

03 How was it interpreted?

Accelerated-ageing predictions depend on assumptions. Field observations and modelled service life are different forms of evidence.

05 / FIELD EXPERIENCE

FRP in infrastructure

Two GFRP examples illustrate the wider application landscape.



GFRP / BRIDGE DECK

Nipigon River Bridge

Ontario, Canada
Precast deck panels combine GFRP reinforcement, high-performance concrete and ultra-high-performance fibre-reinforced concrete closure joints.



GFRP / MARINE STRUCTURE

Flagler Beach seawall

Florida, United States
A 1.5 km secant-pile seawall uses GFRP bars and spirals in a coastal marine environment. Project dates: 2019-2020.

Context, not a company portfolio. These are glass-FRP examples, not BFRP installations or projects attributed to BFRP Technologies.

From research to specification

Define the product evidence, project requirements and acceptance criteria before procurement.

01 Material identification

Confirm fibre and resin systems, bar sizes, surface profiles, bent shapes and traceable production lots.

02 Qualification evidence

Review tensile and bond performance, shear and bent-bar properties, resin cure and durability testing appropriate to the specified material.

03 Design acceptance

Confirm the applicable material specification and design provisions for the structure, jurisdiction and FRP type.

04 Delivery and installation

Agree inspection, handling, cutting, supports and placement requirements. Establish where independent testing is needed.

A dated standards snapshot
This overview reflects research available in April 2023. Confirm current standards and their scope for the selected material and application.

BFRP Technologies Strength Forged by Nature

BFRP TECHNOLOGIES

Start with the right technical questions.

Explore basalt FRP with a clear understanding of material evidence, structural requirements and the intended exposure environment.

bfrptech.com

PLAN YOUR NEXT PROJECT

Define the application
Identify the structure, exposure conditions and intended service life.

Review the material evidence
Confirm the proposed bar properties, qualification testing and manufacturing controls.

Coordinate the design
Align the reinforcement choice with applicable standards and project-specific engineering requirements.

Educational overview. Research values are not product certifications or project design specifications.