



Performance Macro & Micro Fiber

ZeMACRO’s are a reduced size ZeBAR™ engineered to only 1 mm in diameter, like a mini rebar, to provide the highest toughness and residual performance (Fe₃) value of any Macro or steel Fiber “pound for pound”.



Toughness is measured as equivalent flexural residual strength, in a ratio that can be used for the design of concrete elements under ACI published guidelines. This key and important quality allows the load to transfer from the concrete to the reinforcement when a crack occurs. The toughness of ZeMACRO allows the load to be carried post first crack, providing ductility and support by bridging the cracks and maintaining the concrete’s designed strength. This energy absorption increases the concrete’s flexural capacity and helps control the cracking mechanism.

ZeMACRO’s are manufactured in compliance with building codes and ASTM C116 “Standard specification for fiber reinforced concrete and shotcrete.”

Typical Applications and Uses in Concrete

- Residential, Commercial & Industrial SOG’s
- Precast Products and Tilt Up Walls
- Engineered Cementitious Composites (BFRC)
- Architectural and Lightweight Concrete
- Coatings, Overlays, and White Toppings
- Asphalt, Mill and Fill and Micro/Slurry Seal
- Harsh Environments: Chemical & Waste Water
- Underground Structures for Black Water
- Coastal Concrete; Sea Walls; Docks; Canals
- For Tough Surface Performance & Crack Control
- Shotcrete, Stucco, and Spray Up Applications
- Aerated and Autoclaved Concrete

Physical Properties		Benefits of using Basalt Fibers
Density	2.63 g/cm ³	Excellent mechanical strength
Filament Diameter (µm)	17 – 19	Non-corrosive – never rust
Moisture Content	< 0.1%	Green Technology; non-toxic to user
Tensile Strength (ASTM D2343)	3000 MPa	Excellent chemical resistance
Tensile Modulus (ASTM D2343)	86 – 90 GPa	High thermal resistance and stability
Tenacity	> 60 cN/tex	Absorbs handling stresses in precast
Elongation at Break (%)	3 – 3.5	Excellent adhesion to cement & resins

Coefficient of thermal expansion and contraction is similar to concrete and its internal aggregates making Mini Z’s a more homogeneous reinforcing product than steel fiber or other polymer fibers. This further helps to reduce and control plastic shrinkage and plastic settlement cracking. Further, when combined with ZeBAR™BFRP Rebar, you’ve engineered a 100% non-corrosive reinforcement system that changes the behavior of the concrete, making it more ductile, with greater capacity to absorb stress, causing a 100+ year useful lifecycle for that concrete element!