

METAKAO

Premium metakaolin additive



Enhanced performance and value compared to fly ash, slag and silica fume

METAKAO™ is a premium metakaolin additive engineered to provide a high-level of pozzolanic reactivity, thus enhancing concrete and cement-based product performance. METAKAO is a proven, readily available, highly reactive alternative to fly ash, slag and silica fume.

Performance beyond standard pozzolans

The METAKAO additive reacts with the free-lime in Portland cement to increase the formation of calcium silicate hydrate (CSH). The additional CSH formed increases the cementitious bonds in concrete to make it stronger, more durable and less porous.

Engineered for increased pozzolanic reactivity

METAKAO additive is an ultra-fine material produced from the aluminum silicate mineral kaolin that meets the technical specifications for ASTM C-618 and AASHTO M295-11, Class N pozzolans. Our proprietary manufacturing process optimizes pozzolanic reactivity and ensures the product meets the highest standards of quality and consistency.

	Typical properties	ASTM C-618-17a specification
Particle structure	Amorphous	
325 mesh residue, wt%	0.6	34.0 max
Particle size, Sedigraph D50 (µm)	3.5	
Free moisture, wt%	1.1	3.0 max
Specific gravity	2.69	
pH (20% solids)	4.8	
Bulk density, lb/ft ³	25.4 (loose), 32.3 (tapped)	
Chemistry, wt% (via ICP)		
SiO ₂	50-53	
Al ₂ O ₃	42-45	
Fe ₂ O ₃	<2.5	
TiO ₂	<3.0	
SiO ₂ +Al ₂ O ₃ +Fe ₂ O ₃	>95	70.0 min

Applications:

- High-performance, high-strength and lightweight concrete
- Precast and poured-mold concrete products
- Oilfield cement and drilling fluids
- Dry-bagged products
- Fibercement and ferrocement products
- Metal casting
- Specialty uses

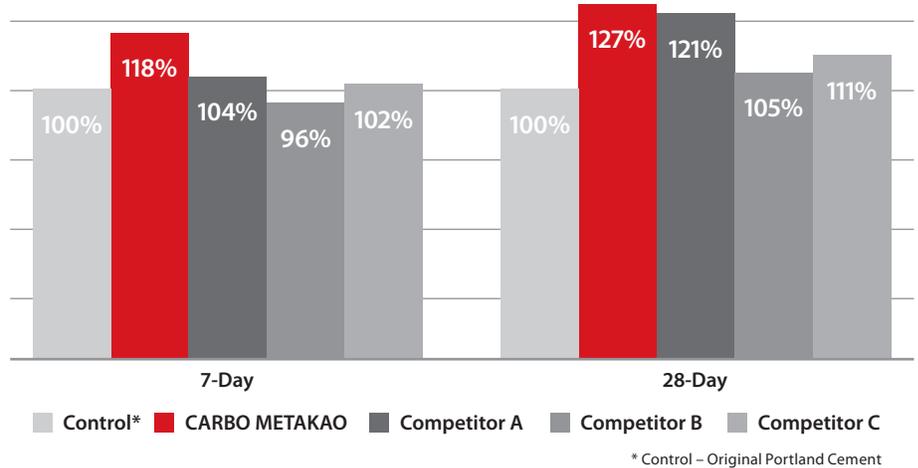
Benefits:

- Improves strength, durability, and workability of Portland concrete
- Produces a smoother finish, minimizing cracking and shrinkage
- Reduces permeability, alkali silica reactions (ASR) and efflorescence
- Improves chemical and moisture resistance
- Inert material that is safe and easy to handle
- Available in 50 lb bags, 2,000 lb super sacks and bulk delivery

Compressive strength

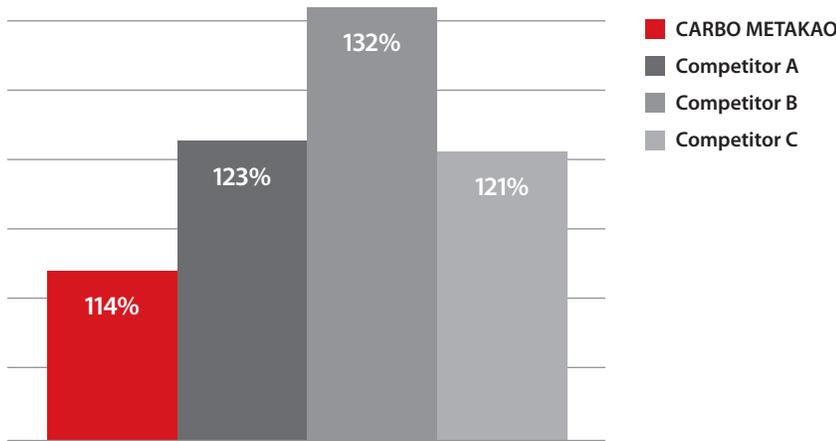
The quality of concrete is typically judged by its strength characteristics. The ability of METAKAO to produce very high compressive strength provides several economic and performance benefits to a variety of concrete applications.

- Increased early high-strength, allowing for quicker removal of framework
- Improved durability by reducing permeability and mitigating ASR and sulfate attacks
- Improved pumpability and workability of concrete mixtures
- Reduced amount of materials needed for concrete vertical column loading



Water demand

METAKAO requires the lowest water demand of the metakaolins tested. When cured properly, the water-to-cement ratio largely determines the strength and durability of concrete. Typically the compressive, tensile and flexural strengths of a concrete mix increase as water demand decreases. Concretes with low water requirements are usually high in strength and quality, and less susceptible to shrinkage and cracking.



Talk to CARBO to find out how we can help you enhance your performance.

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