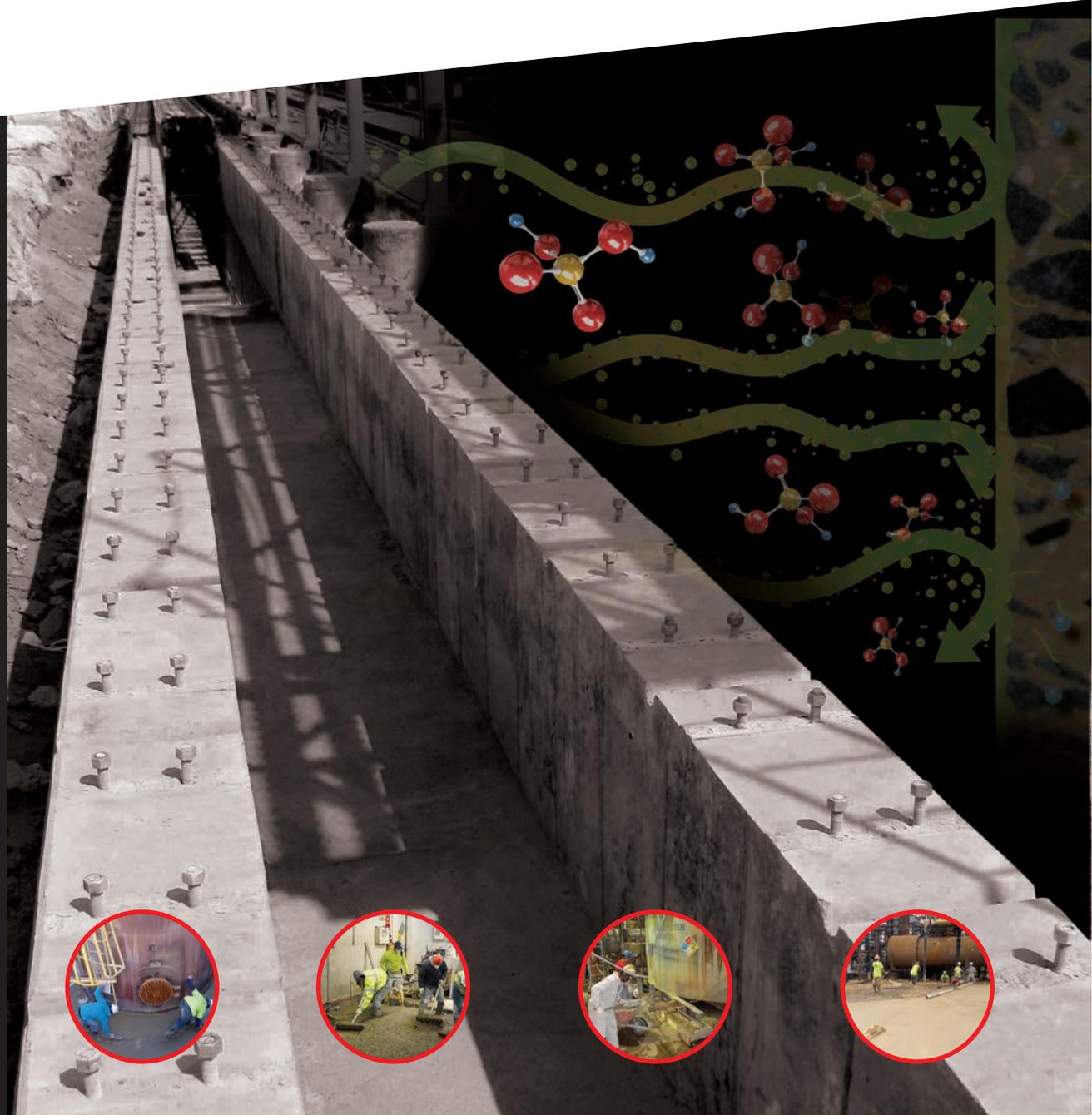


KEMROK™

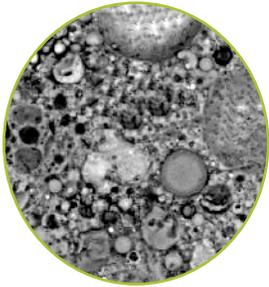
CHEMICAL RESISTANT CONCRETE



USA
CERATECH
Better Cement. Better Concrete

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CERATECH's KEMROK™ concrete technology forms a dense matrix comprised of interlocking crystals and a discontinuous pore structure. These properties restrict access to ingress and transport of corrosive liquids through the concrete and reduces the potential of reinforcing steel corrosion.



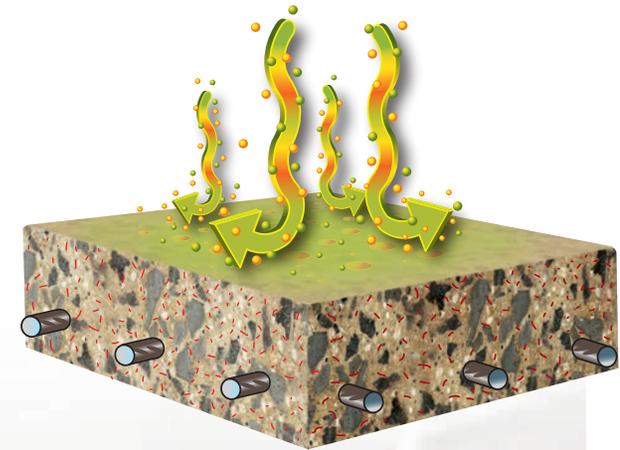
KEMROK's superior durability and rapid return to service attributes make it the material of choice for placement in industrial and chemical environments where deteriorated concrete creates costly shutdowns and frequent maintenance issues.

Traditionally, portland cement based concrete structures exposed to harsh chemical environments would employ specialty cement blends that included silica fume, slag powder and special liquid admixtures to enhance the service life of the structure.

Expensive liners and labor intensive epoxy coatings are also used to protect and extend the service lives of portland cement concrete.

CERATECH's KEMROK™ rapid return to service cement concrete technology is an ideal alternative to these traditional approaches to concrete durability and longevity as these mix designs and secondary protective barriers are not required for many industrial applications. KEMROK installations continue to save customers substantial capital investment dollars and accelerate rapid return to service of critical facilities.

Specify CERATECH's high performance, KEMROK cement concrete for your next project and realize reduced operational downtime, lower maintenance costs and extended infrastructure service life!



Applications include:

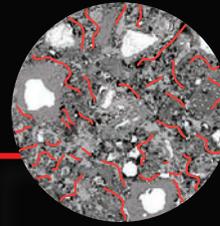
- Sump Pits
- Chemical Trenches
- Utility Vaults
- Tank Bases
- Pickling Tanks
- Storage Tanks
- Warehouse Floors
- Loading Areas
- Poultry Facility Slabs
- Cooling Tower Bases
- Flumes
- Milking Areas
- Sludge Pits
- Pump Pads
- Pulp & Paper Plants
- Food Processing Areas



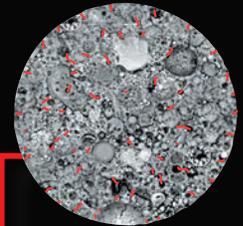
CERATECH's cement concrete is batched, delivered, placed and finished using standard industry practices and protocols.

4.00 inch diameter x 8.00 inch high
concrete specimens were partially submerged
in a 15% sulfuric acid solution for
28 days per ASTM-C-267 guidelines

Continuous capillary
network within
portland cement
concrete



Discontinuous
capillary network
within KEMROK™
cement concrete



portland cement
concrete



KEMROK™
CHEMICAL RESISTANT CONCRETE

**Outperforms
portland cement concrete in
chemical environments**



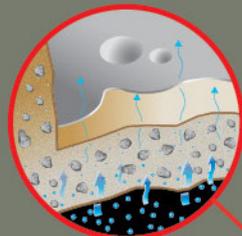


Durability Technology

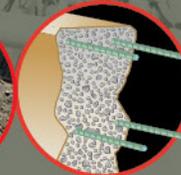
CERATECH's KEMROK™ cement paste is comprised of acid resistant crystalline hydrates. The calcium content of KEMROK cement paste is very low and does not contain calcium hydroxide nor calcium silicate hydrates, (those components that are the site of acid attack in portland cement paste.) **Combined, these attributes produce an exceptionally durable, chemically resistant concrete.**

In many cases, the use of KEMROK™ eliminates the need for a protective epoxy coating. However, where an epoxy coating is required, use of KEMROK™ will provide enhanced containment integrity (as the epoxy coating deteriorates) and shortens shutdown periods by accepting coatings within 3 days after placement.

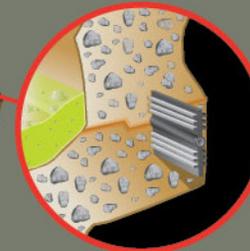
Typical Secondary Containment Structure



Very low water to cement ratio (0.18 - 0.22) and hydration mechanism facilitates successful coating applications within 3 days without blisters or bond failure.

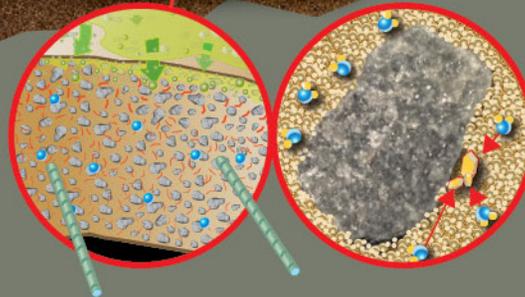


Very similar specific gravity characteristics between cement and aggregates minimizes susceptibility for segregation, facilitates efficient placement and ensures a homogeneous, durable concrete.



KEMROK™ cement exhibits exceptional bond strengths to itself, enabling low permeability joints & enhanced performance of installed waterstops.

Very low water to cement ratio (0.18 - 0.22) contributes to an extremely dense crystalline matrix, with a discontinuous capillary network that prevents the deteriorating ingress of caustic and corrosive chemicals, protecting the integrity of the concrete and reinforcing steel.



KEMROK™ does not possess free calcium hydroxide which often forms expansive gypsum in voids around aggregates when exposed to acids and water that have penetrated portland cement concrete. This lack of $\text{Ca}(\text{OH})_2$ also provides inherent prevention of ASR, allowing for a broad choice of regional aggregates and increasing durability.



For additional information, visit our website at www.ceratechusa.com or call us at 800-581-8397



Sustainability

CERATECH's unique, carbon neutral cement technology sets the standard for sustainable construction materials.

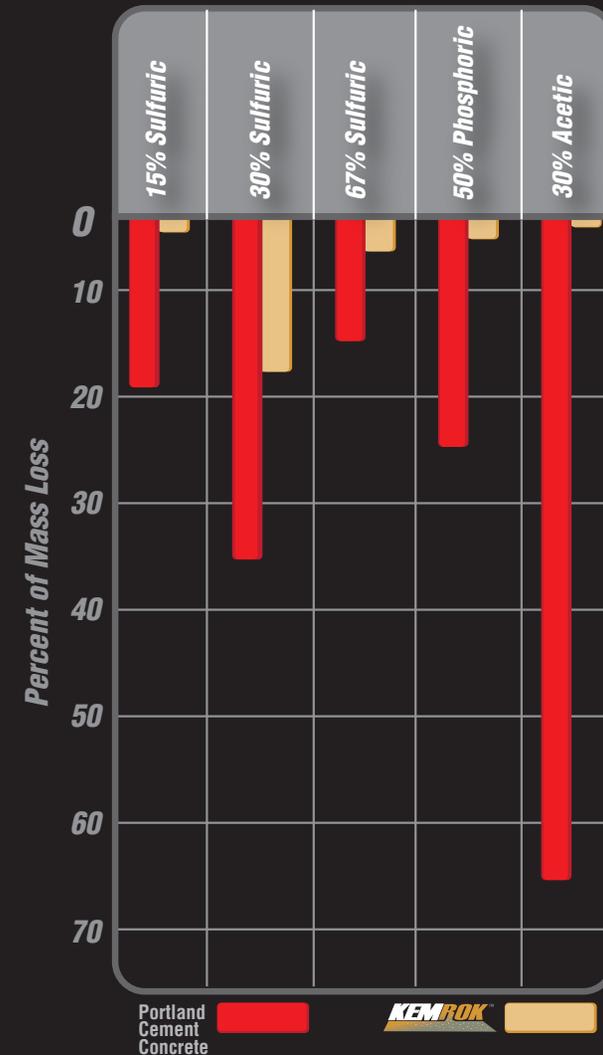
A typical 10 yd³ placement of carbon neutral KEMROK provides the following environmental benefits:

- **Eliminates 3.5 tons of CO₂**
- **Preserves 5.25 tons of virgin mineral resources**
- **Saves 190 Gallons of water**
- **Diverts 3.5 tons of coal ash from landfills**
- **Liquid activators produced from rapidly renewable resources**

Chemical Resistance

**84 Day Mass Loss
Performance Comparison
Vs. Portland
Cement Concrete**

(Per ASTM-C-267 Test Protocols)





Previous deteriorated trenches constructed with Type II/V micro-silica enhanced portland cement concrete

A Case Study:

A chemical processing facility utilized **KEMROK™** concrete for construction of a 705 foot long trench designed to carry molten sulfur for processing. Normally, these trenches would be constructed with high silica fume portland cement concrete to resist the corrosive effects of molten sulfur and sulfuric acid. (Sulfur temperatures reach 300°F.)

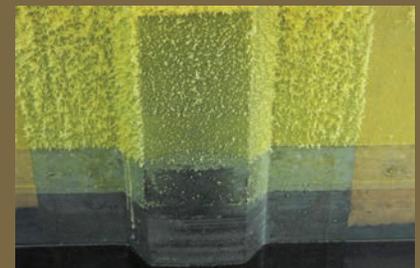
CERATECH's durable **KEMROK™** concrete was chosen for its chemical & thermal resistance characteristics, high early strengths and rapid curing enabling faster return to service.

Specifications called for a concrete with a slump of approximately 5 to 7 inches to facilitate pumping and rebar encapsulation with strengths of 4,000 psi in 7 days.

After several years of service, the **KEMROK™** concrete trench shows zero degradation. **This customer plans to replace all of their portland cement concrete trenches with KEMROK™ concrete thereby eliminating the recurrent costs associated with production downtime, maintenance and rebuilding of corroded trenches.**



New trenches constructed with CERATECH's **KEMROK™** pozzolanic, corrosion resistant cement concrete.



CERATECH's **KEMROK™** cement concrete trenches after 24 months of continuous service shows no deterioration