

Due in part to carbon emissions, the Earth is getting hotter. Common sense, and government mandates demand that we do something about it. Something big. Something smart. Something that makes a difference. Duracoat™ provides an efficient, cost-effective way to revitalize aging underground infrastructure. Doing so protects water quality while reducing energy costs, decreasing carbon emissions and improving air quality.

According to the Environmental Protection Agency (EPA), wastewater treatment plants use 3 percent of the electric load in the United States. In short, that's a lot of carbon dioxide released into the atmosphere. We can do something about it.

Cleaner water. Reduced emissions. Better air. Duracoat™ is a great start.

High Performance Concrete.

# Duracoat™

Water Tight. Corrosion Proof.



## ■ Aging infrastructure adds to Global Warming

Few existing wastewater and stormwater systems were designed to be truly watertight. These leaky, sometimes degrading collection systems can cause wastewater to leak



into groundwater supplies and surface water systems. Or, valuable and limited drinking water supplies can be lost. The loss of pipe capacity from the leaks requires additional energy to move flows through the system and to process these flows at the treatment plant.

Because it is hard to know where the system is broken or leaking, repairs to these systems can be so costly and unpredictable. And, every water manager knows that infrastructure maintenance and replacement is a huge expense. As demand and need for system capacity grows, there are three choices: repair and replacement of the collection system; create holding areas (storage) or build

additional treatment plants. But new plants create additional financial demand, increase energy costs and spew carbon emissions into the air. Even though a new treatment plant may handle the increased flow, it does nothing to solve the problem at the source or protect our watersheds from old, leaking systems.

Duracoat™ offers an efficient, cost-effective solution that extends the life and improves the performance of existing systems. And in the process, helps protect water and air quality...all for less money.



(800) 915-9160

[www.CleanWaterResources.com](http://www.CleanWaterResources.com)

# Water Tight. Corrosion Proof. Duracoat™

The US Department of Transportation and DOT's are promoting infrastructure made from High Performance Concrete to extend service life. Duracoat™ is the strongest and most durable concrete liner on the market today. It is an Ultra-High Performance Concrete (UHPC) that is fiber-reinforced pre-blended concrete mix. It's composed of highly specific cement, silica fume, silica flour and silica sand.

- Duracoat™ is sprayable and pumpable and forms to each structure.
- Duracoat™ is designed to adhere to any vertical substrate that is clean, dry and free of loose materials.
- Duracoat™ is available in a 3-component premix: pre-blended 50 lb bags, liquid admixture and bagged fiber. Use of a pre-mix simplifies the batching sequence and length of mixing time. It can be mixed in a normal industrial, high shear, high torque concrete mixer, tuned for fine-sized materials.

And because Duracoat™ contains less water than other cements, it is less susceptible to freeze/thaw action and corrosion. Also its fiber matrices make Duracoat™ seismically stable and self-healing.

The key performance characteristics of Duracoat™ include:

- Single-step application process
- Compressive strengths in the 15,000-20,000 psi range
- Flexural strength in the 1,000-3,000 psi range
- High resistance to corrosion (approx. 300 Coulombs)
- Self healing
- Seismic performance and dimensional stability

## Product Specs

**Placing:** Duracoat™ is adaptable to most placing techniques, including spray-on, cast-in-place, pumping, injection, extrusion, etc.

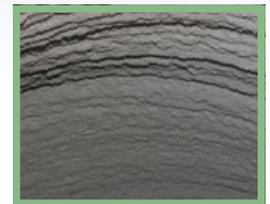
**Curing:** Normal curing at 45-75 degrees Fahrenheit (with a fine water mist surface treatment for 24 to 72 hours or anti dehydrate in precast or cast-in-place applications).

**Thermal treatment:** 140 degrees Fahrenheit with 100 percent relative humidity for 72 hours.

**Textures/molding:** Duracoat™ has the ability to replicate the microtexture of the form surface or special mold textures. Spray-on surface textures are of high quality uniform appearance

**Density:** 2.2 to 2.4 SG

**Rheology:** Plastic to high slump flow:  
Flow (Abrams cone) 8–28 in.  
Flow (ASTM shock table) 6–9 in.



**Colors:** Typically sold in white or light gray, but available in a variety of solid or blended colors upon request.

**Storage:** Take precautions to protect this product from water. Duracoat™ is reactive with water and it is not recommended to store Duracoat™ in direct contact with the ground. Exposure to water or high humidity environments will reduce material performance.

## Selected Performance Characteristics for HPC

Performance Characteristic	Standard Test Method	Duracoat™	FHWA HPC Performance Grade <sup>A</sup>		
			1	2	3
<b>Freeze-Thaw Durability</b> <small>(x=relative dynamic modulus of elasticity after 300 cycles)</small>	AASHTO T 161 ASTM C 666 Proc. A	x = 100%	60% ≤ x ≤ 80%	80% ≤ x	
<b>Chloride Permeability</b> <small>(x=coulombs)</small>	AASHTO T 277 ASTM C 1202	x < 330	2000 < x ≤ 3000	800 < x ≤ 2000	x ≤ 800
<b>Strength <sup>B</sup></b> <small>(x=compressive strength, ksi)</small>	AASHTO T 22 ASTM C 39	x > 15 ksi	6 ≤ x < 8 ksi	8 ≤ x < 10 ksi	10 ≤ x < 14 ksi
<b>Elasticity <sup>B</sup></b> <small>(x=modulus of elasticity, GPa)</small>	ASTM C 469	24 ≤ x < 40 GPa	24 ≤ x < 40 GPa	40 ≤ x < 50 GPa	x ≥ 50 GPa
<b>Shrinkage</b> <small>(x=microstrain)</small>	AASHTO T 160 ASTM C 157	800 > x > 600	800 > x ≥ 600	600 > x ≥ 400	400 > x

**Source:** CWR for Duracoat; U.S. Federal Highway Administration (FHWA) for Grades 1, 2 and 3

**Notes:** A – Per FHWA, a given HPC mix design is specified by a grade for each desired performance characteristic. For example, a concrete may perform at Grade 3 in strength and elasticity, Grade 2 in shrinkage and scaling resistance, and Grade 2 in all other categories.

B – Per FHWA report, specimens to be moist cured for 56 days. Duracoat tests C39 and C469 were completed after 28 days of curing, so the 56-day values would be higher than reported here

MADE IN THE USA

