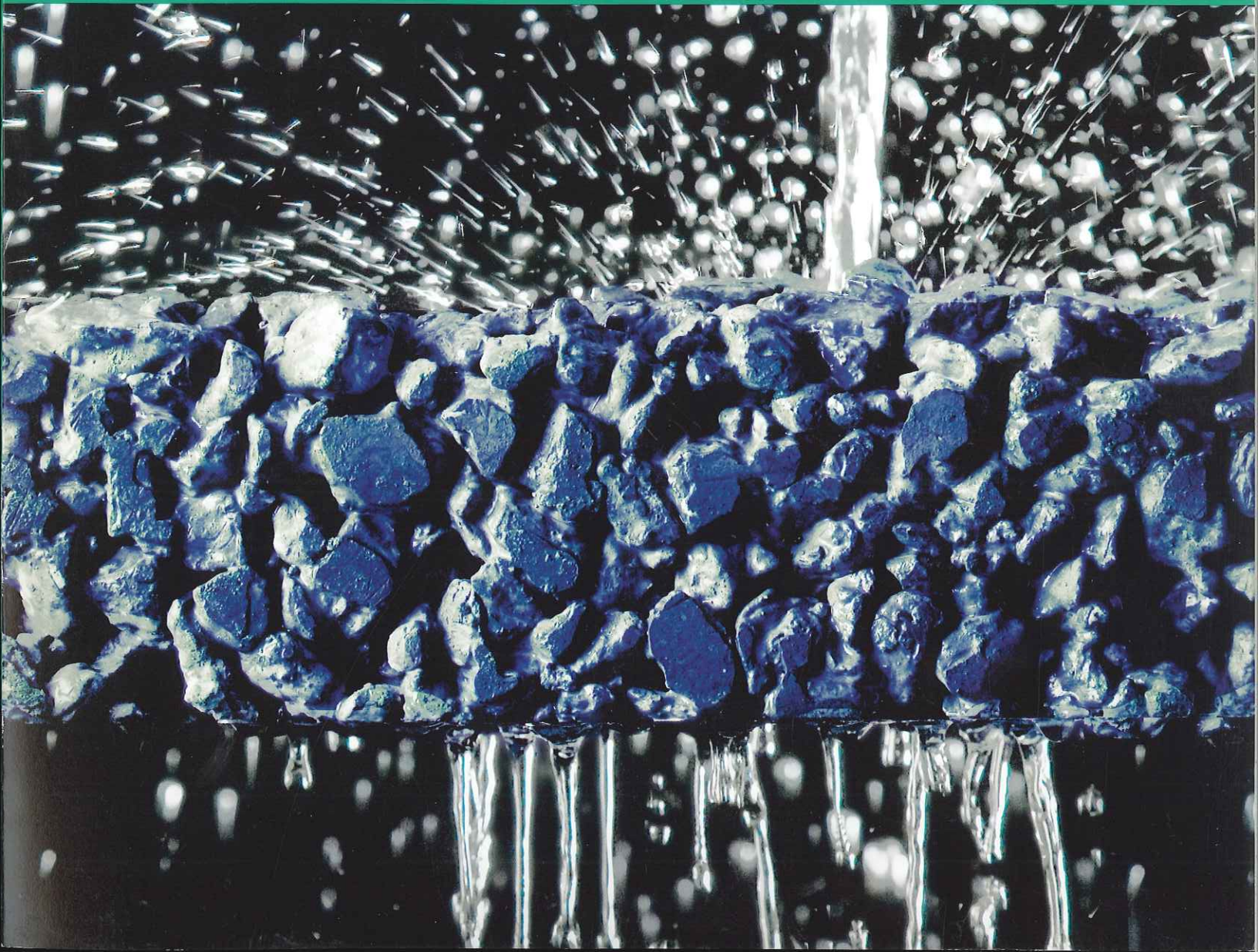


# Emerald<sup>TM</sup> SERIES

Pervious Concrete







# PERVIOUS CONCRETE

## INTRODUCTION TO PERVIOUS CONCRETE

Pervious concrete, sometimes referred to as "no-fines concrete," is a mixture of hydraulic cement, coarse aggregate of smaller size, admixtures and water. Pervious concrete allows the water to percolate through the concrete into the sub-base and recharge the underground water level.

**Emerald Series™** is a new generation of concrete designed to reduce the carbon footprint using post industrial waste, post consumer waste, recycled concrete, locally harvested raw materials, and pervious concrete designed for storm water management.

Emerald Series™ Products	Environmental Attributes	LEED Category	LEED Credits Product Contributes To
Pervious Concrete	<ul style="list-style-type: none"> <li>Improved run-off water quality</li> <li>Reduced water retention requirement</li> <li>Increased site sustainability</li> </ul>	<ul style="list-style-type: none"> <li>Sustainable Sites</li> </ul>	<ul style="list-style-type: none"> <li><b>SS 6.1 Stormwater Design - Quantity Control (1 Point)</b></li> <li><b>SS 6.2 Stormwater Design - Quality Control (1 Point)</b></li> </ul>

SS: Sustainable Sites

**Emerald Series™** can also contribute toward **Regional Priority Credits**. Regional Priority Credits incentivizes the achievement of credits that address geographically specific environmental priorities. If a Regional Priority Credit is earned, then a bonus point is awarded to the project's total points. Check with your local USGBC chapter to see what Regional Priority Credits are available in your area.

## HOW PERVIOUS CONCRETE BENEFITS YOUR PROJECTS

Among other benefits, Pervious Concrete can significantly benefit in three major areas:

### Environmental Benefits

- Reduces the size and sometimes the need for storm water runoffs
- Recharges the ground water level
- Allows for the natural treatment of polluted water by soil filtration
- Reduces risk of flooding and top soil wash away

### Safety Benefits

- Reduces tire noise – Due to open interconnected air void structure, it act as an effective acoustic absorbent
- Prevents glare – Pervious concrete allows the water to flow freely through the surface which reduces glare
- Reduces hydroplaning and flooding

### Economic Benefits

- Reduces or eliminates the need for storm sewers or retention ponds
- Increases facilities for parking by reducing water retention areas

**PERVIOUS CONCRETE APPLICATIONS**

- Low-volume traffic pavements
- Sidewalks and pathways
- Parking areas
- Driveways
- Patios
- Slope stabilization
- Noise barriers
- Sub-base for conventional concrete pavements

**PERVIOUS CONCRETE MIX DESIGN**

Pervious concrete contains large amounts of interconnected air voids, which allow water to pass through rapidly. The typical air void content of pervious concrete is between 15 - 30% allowing a flow rate of 3 - 8 gal/min/ft<sup>2</sup>. A minimum of 15% air void content is necessary to provide sufficient permeability.

Pervious concrete describes a zero inch slump concrete made of "gap graded" coarse aggregate, portland cement, little or no fine aggregate, admixtures and water. Pervious concrete is not specified by w/c ratio or workability like other types of concrete. The quality of pervious concrete is measured by air void content, water permeability rate, and specific gravity.

**DETERMINING THE CHARACTERISTICS OF PERVIOUS CONCRETE****Permeability**

Permeability is a measure of the ability of a material (typically unconsolidated material) to transmit fluids. The permeability can be determined by percolation rate. Percolation rate is expressed by gallons/ft<sup>2</sup>/minute or liter/m<sup>2</sup>/minute. Percolation rate can be determined experimentally by using a simple device called a permeameter.

**Density and Void Content**

Density and void content of pervious concrete may be determined by ASTM C1688. This test method is applicable to pervious concrete mixtures containing coarse aggregate with a nominal maximum size of 25 mm [1 in.] or smaller. For the test, pervious concrete is placed in a standard measure and consolidated using a proctor hammer. The density and void content of the pervious concrete are calculated based on the measured mass of the consolidated concrete specimen, the volume of the measure, and the total mass of materials mixed.

**Compressive and Flexural Strength**

Compressive strength will vary with mix design. Typical values are between 2000 psi to 3000 psi. If a small amount of sand is used then compressive strengths over 4000 psi can be achieved. Flexural strengths are critical factors in the quality of pervious concrete. The flexural strength of pervious concrete ranges between 150 psi up to 550 psi.



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