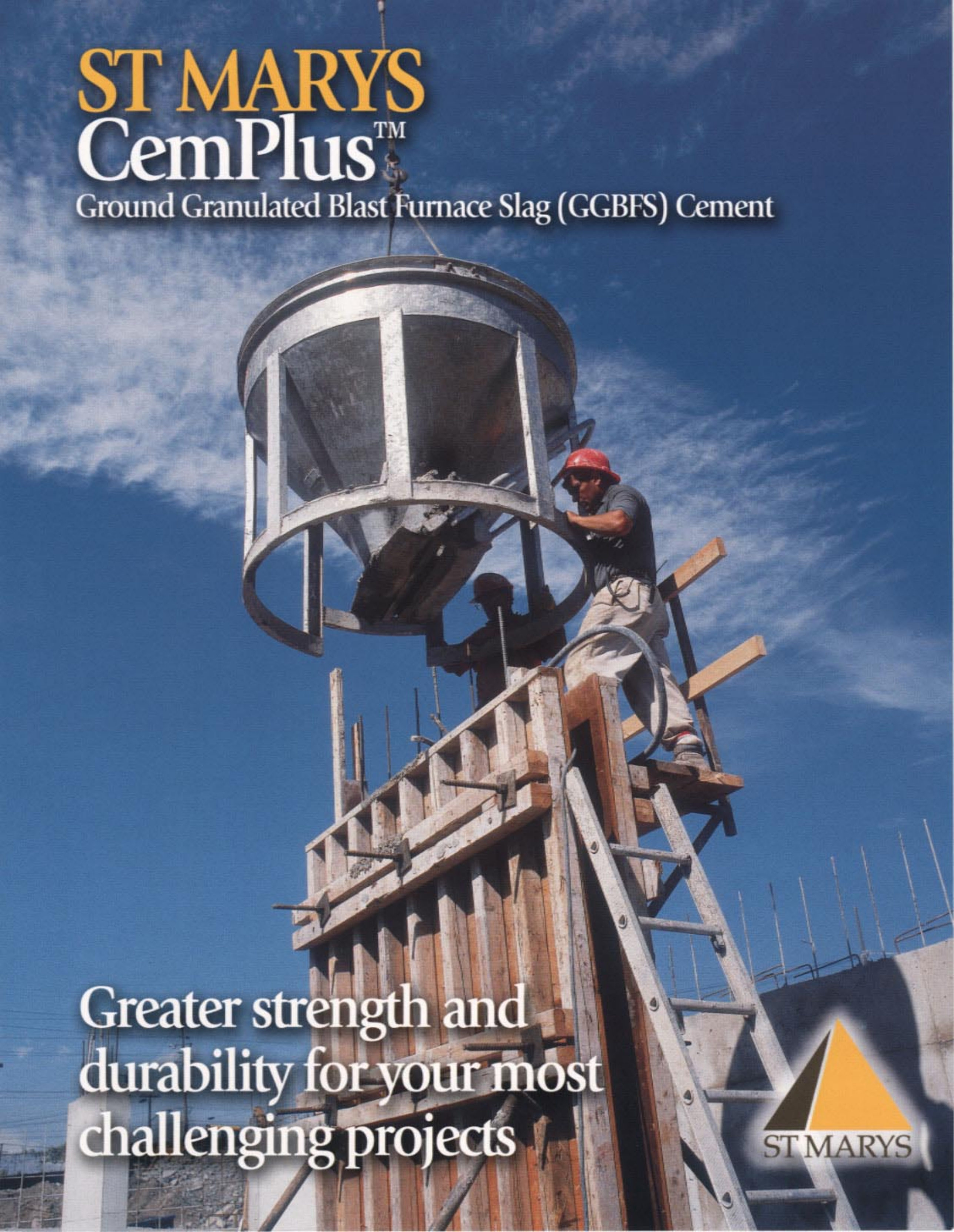
ST MARYS CemPlus™

Ground Granulated Blast Furnace Slag (GGBFS) Cement



Greater strength and durability for your most challenging projects

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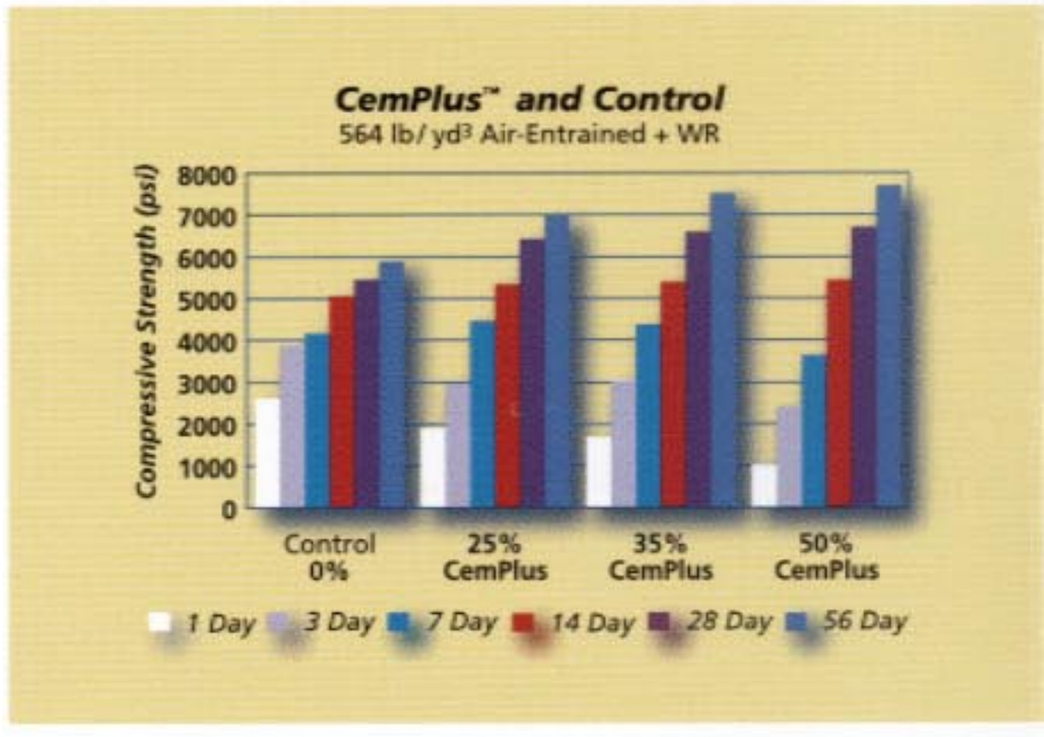
St Marys CemPlus™ slag cement in concrete improves performance in 7 important ways.

St Marys CemPlus™ is produced by finely grinding granulated blast furnace slag, a glassy by-product of iron production that has cementitious properties similar to Portland cement. The result is a product that, when blended with Portland cement in various combinations, offers seven significant advantages over mixes containing 100% Portland cement.

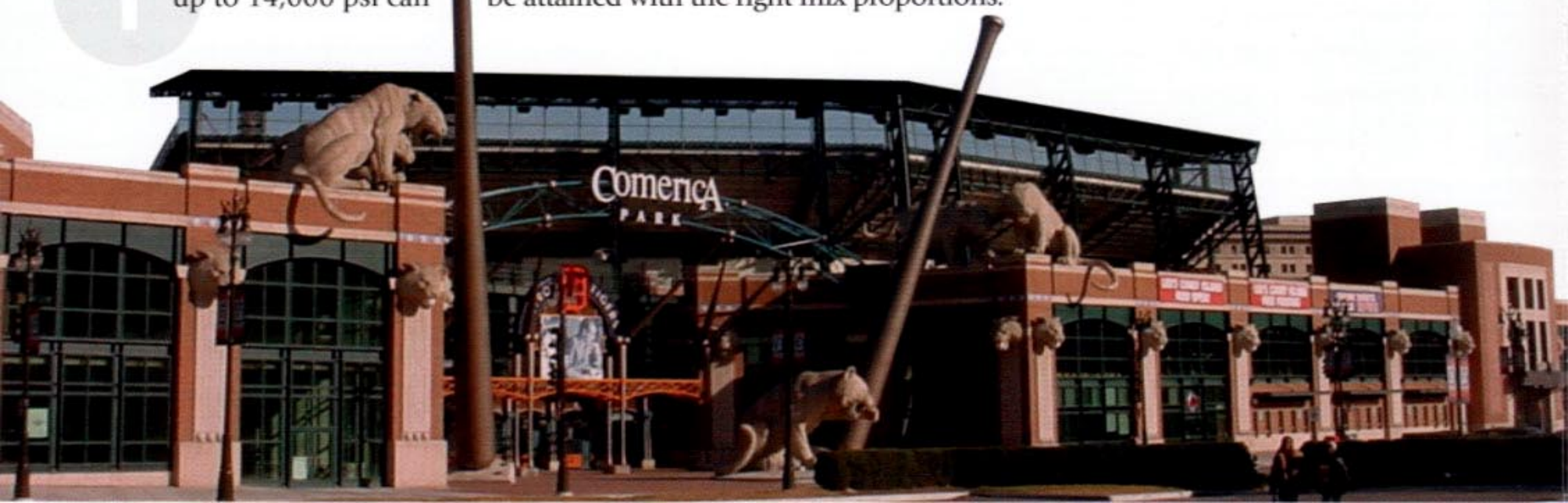
These advantages are:

- Higher 28 day compressive and flexural strengths
- Reduced permeability and increased resistance to chlorides and other aggressive chemicals
- Improved workability/finishability/pumpability
- Increased resistance to alkali-silica reactions (ASR)
- Increased resistance to sulfate attack
- Reduced heat of hydration
- A whiter, brighter finished appearance



1 Higher 28-day compressive and flexural strengths

St Marys CemPlus in concrete increases the compressive and flexural strengths at 28 days. The benefit of enhanced strengths can be realized as early as 7 days. Compressive strengths of up to 14,000 psi can be attained with the right mix proportions.



2 Reduced permeability and increased resistance to chlorides and other aggressive chemicals

CemPlus in concrete produces a denser structure with reduced porosity. 25% to 50% CemPlus replacement levels in concrete have been shown to dramatically reduce permeability. This characteristic leads to more durable concrete and helps to protect reinforcing steel from chlorides, increasing the service life of structures exposed to severe environments.

3 Improved workability/finishability/pumpability

St Marys CemPlus improves the workability of concrete. This is due to the smooth, dense surface characteristics of the slag cement particles which are ground slightly finer than Type I Portland cement. Pastes containing CemPlus are more fluid than those made from Portland cement alone, resulting in better workability and easier pumping and placing.

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4 Increased resistance to alkali-silica reactions (ASR)

The use of CemPlus in concrete containing reactive aggregates improves the resistance to ASR by reducing the available alkalis in the concrete. ASTM C1260 testing has shown that CemPlus replacement levels of 25% to 50% (required levels will depend on the aggregate) will reduce the 14 day expansion to below 0.10%.

5 Increased resistance to sulfate attack

The use of CemPlus in concrete exposed to sulfates (in ground water, soil, waste water or animal waste) improves the resistance to sulfate attack by reducing the reactive elements in the concrete. ASTM C1157 testing has shown St Marys CemPlus replacement levels of 35-50% provide equivalent sulfate resistance to Type V Portland cement .

6 Reduced heat of hydration

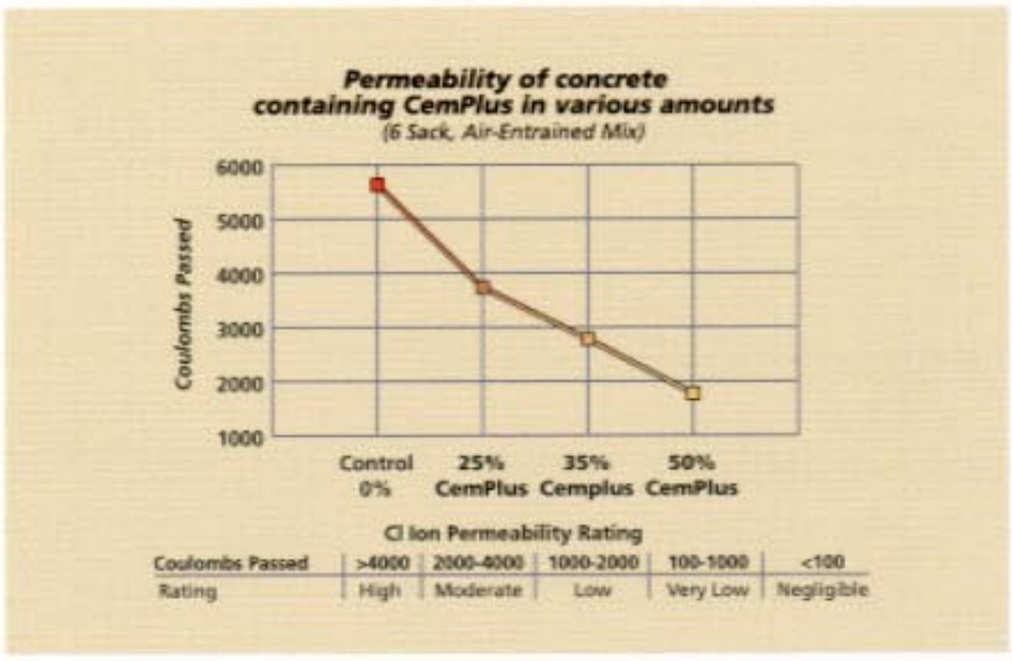
St Marys CemPlus replacement levels of 65% to 75% reduces the heat of hydration significantly. This is beneficial in concrete used for mass applications such as dams, mat foundations and large bridge piers, where the generation of heat and the resultant stresses are major concerns.

7 A whiter, brighter finished appearance

The use of St Marys CemPlus has advantages in architectural concrete. Concrete that contains CemPlus cures to a very light grey or white surface that will enhance the appearance of any structure.

The fine print

- St Marys CemPlus™ conforms to ASTM C989 Grade 100.
- At temperatures above 73°F, concrete containing St Marys CemPlus has moderately longer time of set compared to concrete containing 100% Portland cement which is advantageous during the peak construction season. At placement temperatures between 32° F and 55° F, setting times can be considerably longer when compared to 100% Portland cement concrete and standard cold-weather practices should be followed.
- To provide the concrete producer with the greatest flexibility to meet various job requirements, St Marys CemPlus is produced as a separate material to be blended with regular Portland cement at the batch plant. It is delivered, stored and handled in the same manner as Portland cement.
- St Marys CemPlus is a recycled material. Utilization of CemPlus as a replacement for Portland cement is environmentally friendly.
- St Marys CemPlus hydration consumes calcium hydroxide present in concrete. By reducing the amount of calcium hydroxide remaining in the concrete and by impeding the infiltration of moisture, St Marys CemPlus reduces the occurrence of efflorescence.
- The reduced permeability of concrete containing St Marys CemPlus is shown in these ASTM C1202 "Chloride Ion Penetration" test results. A decrease in the coulomb reading as the replacement level of St Marys CemPlus increases is typical. (Tested in accordance with ASTM C1202 at an age of 28 days.)



St Marys Cement Inc. (U.S.) has an experienced technical services department ready to provide assistance on any cement problem. Contact your field representative or the nearest St Marys location.

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St Marys Cement Inc. (U.S.)

CemPlus Production and Sales:
9333 Dearborn, Detroit, MI 48209
Telephone **800-462-9157**

640 E. South Street, Schoolcraft, MI 49087-9715
Telephone **616-679-5253**

1331 Pannel Rd. NW, Grand Rapids, MI, 49504
Telephone **616-363-3856**

389 Ganson Street, Buffalo, NY 14203
Telephone **716-854-1222**

400 Seahorse Drive, Waukegan, IL 60085
Telephone **847-662-0006**

250 Jefferson Avenue, Cleveland, OH 44113
Telephone **216-579-1911** or **800-622-7707**

712 West Canal Street, Milwaukee, WI 53233
Telephone **414-276-4408** or **800-783-1319**

924 McDonald Street, Green Bay, WI 54303
Telephone **920-435-8590**

Corporate Office:
55 Industrial Street, Toronto, Ontario, Canada M4G 3W9
Telephone **416-696-4411** Order # **1-800-665-5001**