



**PRODUCT DESCRIPTION**

EcoCem®PLUS was developed by Lehigh Cement to reduce the embodied carbon of cement and concrete. It is a blended, portland limestone cement (PLC) manufactured by Lehigh Cement to comply with all applicable requirements of CSA A3001 Cementitious Materials for Use in Concrete. EcoCem®PLUS is a hydraulic, interground portland cement containing clinker, gypsum, between 5% and 15% limestone and 20% (+/- 2.5%) Type F fly ash, by mass. It meets the CSA designations GULb-20F and HSLb-20F.

EcoCem®PLUS produces less greenhouse gases during its manufacture than conventional portland cement. It provides superior sustainability benefits by reducing the amount of energy and emission intensive clinker consumed during manufacturing.

EcoCem®PLUS exhibits high sulphate resistance that meets or exceeds the performance of Lehigh Cement’s HS cement. Concrete with EcoCem®PLUS meets or exceeds the concrete compressive strength development typically achieved with an 80/20 concrete plant blend of Type GU cement and fly ash, by mass. For additional information, please request a current mill certificate from a Lehigh representative.

Concrete testing comparison where 0.50 w/cm and 300kg/m<sup>3</sup> cementitious were held constant. Results indicate that EcoCem®PLUS strength performance exceeds an 80/20 concrete plant blend of cement and fly ash.

EcoCem®PLUS performance under CSA A3004-C8 sulphate solution exposure equals or exceeds the performance of Lehigh Cement’s HS cement.

**KEY FEATURES/BENEFITS**

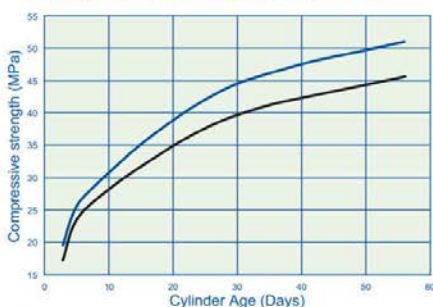
- Industry leading embodied carbon reduction
- High sulphate resistance. Eliminates the need for HS or HSe
- Concrete compressive strength development comparable or superior to traditional fly ash mixes
- Reduced slab bleeding
- Reduces silo requirements at concrete plants



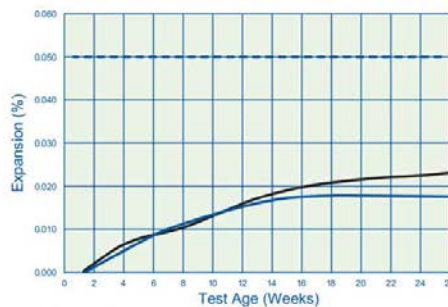
EcoCem®PLUS EPD



**Compressive strength comparison**



**Sulphate resistance**



— EcoCemPLUS®  
 — GU Cement with 20% fly ash

— EcoCemPLUS®  
 — HS Cement  
 - - - CSA Specification Limit - High Resistance to Sulphate Expansion at 6 Months

## APPLICATIONS

Using EcoCem®PLUS is an environmentally responsible choice. Production of this earth-friendly cement generates at least 22% less CO<sub>2</sub> than other portland cements, while still delivering the consistency, versatility and performance Lehigh customers expect.

EcoCem®PLUS cement is a cost-effective, high quality building material that is suitable for use in a wide range of applications including:

- cast-in-place and precast concrete,
- oil well cementing
- soil stabilization.

EcoCem®PLUS is suitable for use with a wide range of additives and admixtures to extend the properties and uses of concrete. Chemical admixtures (ASTM C494 & C260) behave similarly in use and dosage as with GU cements and 20% fly ash, by mass. Setting characteristics of EcoCem®PLUS are also comparable to typical portland cements with 20% fly ash, by mass. EcoCem®PLUS is compatible with additional supplementary cementitious materials and blended supplementary cementitious materials as per CSA A3001. Studies have shown that concrete containing portland limestone cement with the appropriate mix design and proportions of fly ash, slag cement, silica fume or natural pozzolans will produce denser concrete with more desirable concrete ability to resist sulphate expansion and chloride ion penetration. Using a Blended High Sulphate Resistant cement (HSLb) is only one ingredient in producing durable concrete. End users must ensure their specific mix designs meet all requirements of Tables 1 to 4 of CSA A23.1 for a given class of exposure.

## DELIVERY/STORAGE

Portland cement is a moisture sensitive material that must be kept dry in order to retain its quality. Product is available in bulk.

## HISTORY

Portland limestone cements are not new products and have been around for decades in Europe. Lehigh's parent company, HeidelbergCement, developed cement with 20% limestone content for special applications in 1965. Today, in Europe, the standards allow up to 35% limestone and portland limestone cement is used regularly. As a result of the work of standards groups in Canada and the United States, cement with up to 15% limestone and equivalent performance to ordinary or general use cement is being used throughout North America. Fly ash blended cements have also been used extensively in North America for decades.

Property		CSA A3001-18	EcoCem®PLUS (Reported Values)
Chemical Requirements	Sulphur Trioxide (SO <sub>3</sub> ), %	3.0 Max	2.7
	LOI, %	13.0 Max	4.0
	Supplementary Cementing Materials Content, %	50.0 Max	20.0*
Physical Requirements	Fineness, % Retained	24 Max	5
	Blaine	N/A	5400
	Autoclave Expansion, %	0.8 Max	-0.01
	Sulphate Resistance, % Expansion 6 months	0.05 Max	0.02
	Time of Set, Minutes	45 Min, 480 Max	125
	ASR Expansion, % (CSA A23.2-25A)	0.10	0.04
	Comprehensive Strength, MPa		
	3 - Day	14.5 Min	20
	7 - Day	20.0 Min	25
28 - Day	26.5 Min	40	

\* EcoCem®PLUS contains 20% (+/- 2.5%) interground Type F fly ash meeting the requirements of Table 9 of CSA A3001-18



## CAUTION

When dry, portland and slag cements are non-hazardous. When in contact with water (such as in eyes or skin) or when mixed with water to make concrete, mortar or grout it becomes highly alkaline and can irritate or burn the skin and injure the eyes when not properly handled. Direct contact should be avoided. If contact occurs, wash the affected area with water immediately. If fresh portland cement concrete or portland cement gets into the eyes, rinse them thoroughly with water and seek medical attention. Inhalation of dry portland cement can irritate the upper respiratory system. For additional safety information reference our Safety Data Sheets online at [www.lehighhanson.com](http://www.lehighhanson.com).

## WARRANTY

The information and statements herein are believed to be reliable, but are not to be construed as the warranty or representation for which we assume legal responsibility. Lehigh portland and slag cements shall conform to the current standard specification for portland cement, ASTM C150, ASTM C595, CSA A3001, or ASTM C989 and no other warranty, representation or condition of any kind, expressed or implied, or (including no warranty of merchantability or fitness for a particular purpose) shall trust earned daily apply. Having no control over the use of cement, seller will not guarantee finished work, nor shall seller be liable for consequential damages.