EcoCem®PLUS

EcoCem®PLUS was developed by Heidelberg Materials to reduce the carbon footprint of cement and concrete. EcoCem®PLUS is a blended portland limestone cement (PLC) capable of producing strong and durable concrete with high sulphate resistance. EcoCem®PLUS is produced at the cement plant by intergrinding clinker, Type F fly ash, limestone and gypsum.

Quality control at the cement plant provides accurate raw-material dosage, reducing proportioning demands at the concrete plant. The final result is a highly consistent product that is sustainable and durable, and also reduces storage requirements on site.

ENVIRONMENTAL IMPACTS

Lehigh Edmonton Plant: Product-Specific Type III EPD

Declared Cement Products (five):
GULb/HSLb; GU/Type 10; HE/Type 30; HS/Type 50; OWG

Declared Unit: One metric tonne of cement

	CEMENT PRODUCTS				
	GULb HSLb	GU Type 10	HE TYPE 30	HS TYPE 50	OWG
Global Warming Potential (kg CO_2-eq)	632	816	886	836	842

EPD created under the 2020 Cement PCR

EcoCem®PLUS is an innovative blended portland limestone cement (PLC) designed to provide strength and durability while significantly reducing carbon footprint in concrete.

EcoCem®PLUS Qualities:

Superior sustainability

- Third-party-verified product/plant-specific Type III Environmental Product Declaration (EPD) available
- Reduced carbon footprint by more than 22% compared to GU & HS cements

Superior durability & strength

- Type F fly ash content provides increased workability and added protection against AAR and High Sulphate environments
- Can be used in most applications above or below ground
- Eliminates need for HS or HSe
- Intergrinding at the cement plant allows improved particle packing, providing enhanced particle-size distribution
- Reduces porosity through formation of carboaluminates
- Nucleation creates more surface area for increased precipitation of cement crystals

Certified product provides assurance and peace of mind

- CSA designation as GULb-20F & HSLb-20F with mill certification available
- Reduced silo requirements at concrete plants

Heidelberg Materials

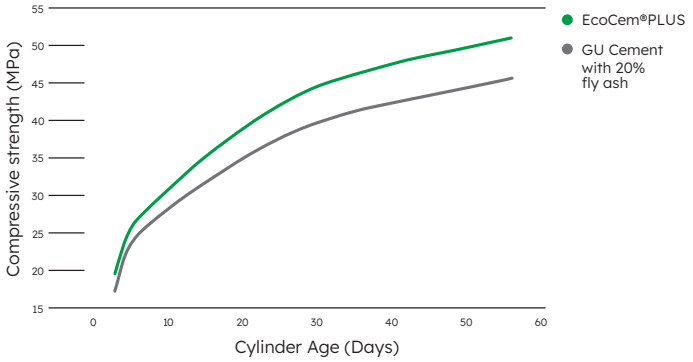
Material to build our future

Performance made simple

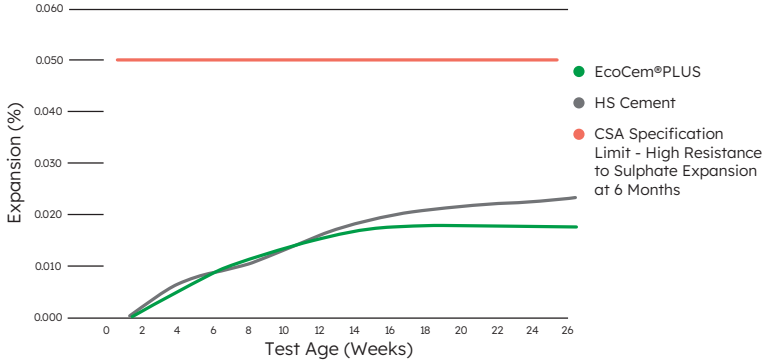
Concrete testing comparison where 0.50 w/cm and 300kg/m3 cementitious were held constant. Results indicate that EcoCem®PLUS strength performance exceeds an 80/20 concrete plant blend of cement and fly ash.

EcoCem®PLUS performance under CSA A3004-C8 sulphate solution exposure equals or exceeds the performance of Heidelberg Materials' HS cement.

Compressive strength comparison



Sulphate resistance



Requirements and properties

	Property	CSA A3001-18	EcoCem®PLUS (Reported values)
Chemical Requirements	Sulphur Trioxide (SO_3), %	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	NA	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

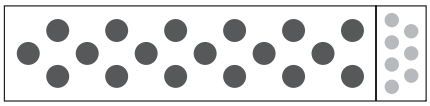
*EcoCem®PLUS contains 20% (+/- 2.5%) interground Type F fly ash meeting the requirements of Table 9 of CSA A3001-18

Improved Particle Packing

Traditional portland cement

95% Ground Clinker

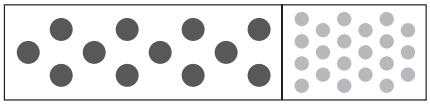
Less than 5% Limestone

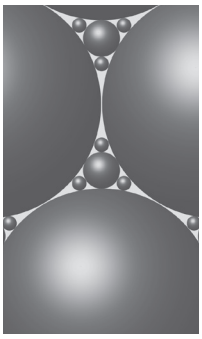


EcoCem®PLUS

Ground Clinker

Fly Ash & Limestone





- Enhanced particle-size distribution
- Reduced porosity through formulation of carboaluminates
- Nucleation creates more surface area for increased precipitation of cement crystals

For more information, visit

heidelbergmaterials.ca

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 A23.1-19 for a given class of exposure. EcoCem® is a registered trademark in Canada.