

Elemix[®] Concrete Additive

Product Definition

Elemix concrete additive is composed of innovative polymeric spheres that have been specially formulated for use in concrete. This additive distributes uniformly in concrete, providing lighter weight for durable concrete in structural and non-structural concrete applications.

Elemix concrete additive is added during the batching process and distributes uniformly with regular mixing. Manufactured to exact tolerances, Elemix additive ultimately reduces the variability in concrete mixtures, delivering a more consistent batch.



Potential Applications

Elemix concrete additive has been successfully used in numerous commercial applications. Example markets include: ready mix in grouts and fills, poured in place, elevated decks and toppings, and manufactured concrete products, including block and precast building components.

Elemix concrete additive is a global, sustainable solution that offers:

- Reduced weight by delivering targeted unit weights while achieving structural compressive strengths
- Improved concrete performance through enhanced thermal properties and resistance to cracking
- Increased efficiencies with easy placement, pumping and finishing while reducing building and transportation costs

Typical Mix Designs

A variety of mix designs have been studied yielding a range of densities and strengths. The following table depicts typical ranges of ingredients:

Typical Ranges of Ingredients for Structural Mixes

Ingredient	lb/yd ³	kg/m ³
Cement*	525–800	311–475
Fly ash*	0–225	0–133
Fine aggregate	950–1,700	564–1,008
Coarse aggregate	225–1,000	133–593
Water	250–420	148–249
Elemix concrete additive	1–13	0.6–7.7
Admixtures	As directed by manufacturer	

*Recommended minimum total cementitious level 640 lb/yd³

Ranges of Density (Structural and Non-Structural)

Wet Density 150-75 pcf (2400-1200 kg/m³)

Corresponding Elemix additive dosage 1-28 lb/yd³ (1-17 kg/m³)

*Dosage is approximate and will depend on mix designs and the specific gravity of the raw materials.





Durability

The use of Elemix concrete additive has been found to provide durable concrete in freeze-thaw degradation. Mixtures using Elemix additive and no traditional air-entraining admixtures have produced durable concrete.

ASTM C666 >80%
relative dynamic modulus

ASTM C672 ~2
rating without use of sealer

*Performance is mix design specific.

Placing and Finishing

Concrete made with Elemix concrete additive can be placed and finished by traditional methods.



TECHNICAL CHARACTERISTICS

Concrete made with Elemix additive meets applicable requirements for many concrete applications.

ASTM C39 Compressive Strength

Elemix additive combined
with normal weight aggregates

120 pcf (1920 kg/m³)
2500–4500 psi (17–31 MPa)

130 pcf (2080 kg/m³)
2500–5900 psi (17–41 MPa)

135 pcf (2160 kg/m³)
2500–7000 psi (17–48 MPa)

Elemix additive combined
with lightweight aggregates

100 pcf (1600 kg/m³)
2500–5400 psi (17–37 MPa)

120 pcf (1920 kg/m³)
2500–7000 psi (17–48 MPa)

ASTM C78 Flexural Strength

(Properties are density dependent)

120 pcf (1920 kg/m³)
500–600 psi (3–4 MPa)

130 pcf (2080 kg/m³)
700–800 psi (5–6 MPa)

ASTM C143/ASTM C1611 Consistency

Slump 0–8 inches (0–203 mm)
Slump Flow <26 inches (<660 mm)

ASTM C666 Freeze–Thaw Resistance (Procedure A & B)

Structural mixes greater than 80% RDM

ASTM C672 Scaling–Deicing

Visual Rating of Surface ~2
(slight to moderate scaling)

ASTM E119 Fire Rating

(ANSI/UL 263 — CAN/ULC S101)
Fire Testing of Building Construction and Materials
UL Design No. D974
ULC Design No. F915

ASTM C469 Modulus of Elasticity and Poisson's Ratio

Modulus of Elasticity

$e_c = 3000\text{--}4000$ ksi (20700–27600 MPa)

Poisson's Ratio

.18–.25

*Results are affected by coarse aggregate type and loading.

**Strength results are based on 28 days.

For details on specific projects, visit www.elemix.com.

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This product is Classified by Underwriters Laboratories Inc. as a concrete additive in UL Fire Resistance Directory, 40UC (Design D974), and is UL Listed to Canadian safety standards (ULC S-101 Design F915).



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