

FENG WATERPROOF CONCRETE MIX 2 MIX DESIGN

A) Typical Basic Mix Design

FENG WATERPROOF CONCRETE (READY MIX) (per m³)

Total dry weight: 2400 kg

Cement: Sand: Aggregate = 1:1.5:2.5, 1:2:2.5, 1:2:3 are several ratios that are suitable for the mix design. They should give us the amount of the materials as:

CEMENT		360-470	kg
FINE AGGREGATE		650-850	kg
COARSE AGGREGATE		910-1150	kg
TOTAL		2400	kg
W/C		0.33-0.36	

FENG WATERPROOF CONCRETE (READY MIX) (per yd³)

Strength: 30MPa

Total dry weight: 3915 lbs

Cement: Sand: Aggregate = 1:1.5:2.5, 1:2:2.5, 1:2:3 are several ratios that are suitable for the mix design. They should give us the amount of the materials as

CEMENT		607-792	lbs
FINE AGGREGATE		1096-1433	lbs
COARSE AGGREGATE		1534-1938	lbs
TOTAL		3915	lbs
W/C		0.33-0.36	

Notes:

- Standard size for sand which is also called fine aggregate: 0.1 to 1 mm
- Standard size for coarse aggregate or stones: 20 mm +/- 20%
- (Preferable stone types: limestone, pea stone or standard crushed stone)

B) Admix Component Summary

- Admixture components include:
 1. A magnesium oxide material.
 2. A magnesium aluminosilicate material.
 3. A colloidal silica material; a powdered nano-graphene oxide material.
 4. A powdered titanium dioxide material.
- A total amount of water is added to the cement, fine aggregate, coarse aggregate and magnesium oxide material, and wherein 20% of the total water is added in the form of the following slurries:
 1. The first slurry contains the magnesium aluminosilicate material, and comprises 10% of the total water.
 2. A second slurry contains the colloidal silica material, and comprises 5% of the total water.

C) Admix Components (Refer table below for dosage range)

1. Magnesium Aluminosilicate – Palygorskite/Attapulgit ore

- Self-dispersing hydrated magnesium aluminosilicate acts as a binder, thixotrope, reinforcement additive, anti-settling agent and rheology modifier.
- Can be introduced at any point in the process with similar performance.

2. Magnesium oxide blend

- Expansion agent that counteracts the tensile forces across the concrete body during the initial setting state.
- Always added in the dry state to concrete mix.
- There is naturally occurring CaO present in the MgO blend which comprises about 2 to 6% of the composition.

3. Colloidal silica solution

- This is a colloidal solution comprised of 15-30% wt. amorphous silica in 85 wt % water.
- The silica particles should conform to the size 1-100 nm, preferably in the 1-50 nm range.
- The particle surface area should be in the range of 300-900 m²/g, preferably in the 500-600 m²/g range.
- Enables internal hydration and curing, early strength acceleration, increased workability by binding to the cement particles.

D) Optional Components depending on specific use and conditions

Basaltic Fibers

Use of basaltic fibers is to avoid all forms of internal cracking and limit the width of cracks when our invention is to be used in extreme weather conditions.

ADMIXTURE DOSAGE RECOMMENDATIONS (per M³)

Constituents (dry)	Dosage Range	Low Range	High Range	Units
Cement	-	360	470	kg
Fine Aggregate	-	650	850	kg
Coarse Aggregate	-	910	1150	kg
MagOx Blend	3% of Cement Weight	10.8	23.5	kg
Basaltic Fibers	-	0.45	0.85	kg
Constituents (wet)				
Water	-	120	170	L
Standard Water	80% of total water weight	96	136	L
Non-standard water slurry	20% of total water weight	24	34	L
Acti-gel	10% of non-standard water weight	2.4	3.4	kg
Nano-Graphene	2.5% of non-standard water weight	2	4	kg
Colloidal Silica	5% of non-standard water weight	1.2	1.7	kg
Nano-Titanium Dioxide	2.5% of non-standard water weight	2	4	kg