

ce200PF-w™ is a polymer fiber enhanced Ultra-High Performance Concrete (UHPC) developed at ceEntek Pte Ltd, Singapore, containing white cement, finely graded sand, polymer fiber and other carefully selected components.

MIX COMPONENTS

1. ce200PF-w™ premix
2. cePP-fiber
3. cePBA1-385 (Admixture paste)
4. Potable water

MIX COMPONENTS QUANTITIES

Table 1 outlines the weight of each mix component used in the mixing of ce200PF-w™, for a typical batch sized in an IMER Mortarman 120 planetary mixer or equivalent planetary mixer.

The values below have been determined in order to simplify the weighing of components, as much as possible. In order to ensure the batch is mixed properly, a single batch requires a given weight of ce200PF-w™, based on the mixing capacity of the high-shear mixer used and the desired plastic properties of ce200PF-w™. When mixing a different volume than the volume in Table 1, each substituent weight is to be adjusted and verified by a ceEntek Technical Representative.

Table 1: Material quantities per 151L batch of ce200PF-w™

Mix Component	kg/m ³	lbs/yd ³	kg	Lbs
ce200PF-w™ premix	1985.75	3347.09	300	661.39
cePP-fiber	10.99	18.52	1.66	3.66
cePBA1-385S	38.59	65.05	5.83	12.85
Potable water	214.66	361.82	32.43	71.5

STORAGE AND SHELF LIFE

ce200PF-w™ Premix: Premix bags must be protected from moisture, freezing, and kept dry at all times. Unopened bags of ce200PF-w™ Premix have a shelf life of 6 months.

cePP-fiber: Fiber bags must be stored in a dry place.

cePBA1-385: cePBA1-385 must be stored in a dry place and be protected from sun and freezing. Unopened pail of cePBA1-385 has a shelf life of 6 months.

PROCEDURES

Mixing: Mixing ce200PF-w™ requires a high shear mixer and qualified personal on-site. The number of mixers should be adjusted to reduce the waiting time between batches, depending on the volume of material to be placed. Since a wheelbarrow or buggy will be used to transport the fresh material to the pouring location, the mixers must be raised high enough to ensure that it discharges properly. A platform can also be used next to the mixer to allow workers to batch properly and safely. The mixer should be kept as clean as possible between batches in order to guarantee the performance of subsequent batches.

Mixing Sequence: The following mixing procedure has been developed and tested thoroughly at an ambient temperature of 25 ± 1 °C when using an IMER Mortarman 750 planetary mixer or equivalent planetary mixer. The mixing procedure may be adjusted to better suit the temperature conditions, based on the recommendations of a ceEntek Technical Representative. Prior to the batching operation, the mixer must be inspected and cleaned so that no foreign material impacts the fresh ce200PF-w™ mixing.

Different models of high-shear mixer have successfully been used to batch ce200PF-w™. Refer to ceEntek Technical Representative to use a different high-shear mixer.

Table 2: Mixing procedure for ce200PF-w™

Step	Component to Introduce	Action	Mixer Speed	Start (mm:ss)	End (mm:ss)
1	ce200PF-w™ premix	Introduce ce200PF-w™ premix the mixer			
2	cePBA1-385S and potable water	Dilute cePBA1-385S with potable water to form paste suspension			
3	cePP-fiber	Introduce by scattering the fiber across the blend surface	Medium	00:00	00:30
4	paste suspension	Slowly introduce the paste suspension into the mixer during mixing	Medium	00:30	01:30
5	-	Mix	Medium	01:30	07:00

Table 3: Precautionary measures

Cautions	
<p>1. All personnel involved in mixing operations are required to adhere to the PPE requirements as below.</p>	 <p>Hard Hat</p>  <p>Safety Glasses</p>  <p>Hand Protection</p>  <p>Foot Protection</p>  <p>Dust Mask</p>
<p>2. Make sure that the inside of the mixer has been pre-dampened slightly (remove any excess water) prior to the preparation of every batch on each batching day.</p>	
<p>3. The time to complete steps 1 to 5 outlined in the mixing sequence of Table 2 above may vary and must be validated by a ceEntek Technical Representative.</p>	
<p>4. Cover the mixer with plastic during mixing to help control dust emissions or alternately, use a dust collector mounted over the mixer.</p>	
<p>5. Clean and dry the mixer as best as possible between batches in order to help ensure consistency between batches. Remove any build up excess material on the mixer or mixing blades.</p>	

CURING

The curing of ce200PF-w™ is essential in obtaining the necessary mechanical and physical material properties. In order to properly cure the material, the contractor must cover the fresh material with formwork plywood, or plywood wrapped in a plastic film, immediately after pouring. Covering the material quickly after pouring prevents the top surface of the material from drying out. The ce200PF-w™ is demolded after 24 hours of casting and water-cured at approximately 23 °C (73 °F) in a humidity-controlled chamber.

MECHANICAL, DURABILITY AND TIME DEPENDENT PROPERTIES OF ce200PF-w™

The following data is representative of typical values achievable under laboratory conditions. Results in the field may vary.

Table 4: Mechanical properties of ce200PF-w™

Mechanical properties	Curing ages (day)	Parameter	Mean values	
			SI Unit	US Unit
Compressive Strength ¹	1	$f_{c,1}$	>85 MPa	>12.3 kpsi
	7	$f_{c,7}$	>110 MPa	>15.9 kpsi
	28	$f_{c,28}$	>140 MPa	>20.3 kpsi
Flexural Strength ²	7	$f_{r,7}$	>20 Mpa	>2.9 kpsi
	28	$f_{r,28}$	>23 MPa	>3.2 kpsi
Tensile Strength ³	28	$f_{t,28}$	>9 Mpa	>1.3 kpsi
Water Absorption ⁴	28	$f_{a,28}$	<5%	<5%
Chloride Permeability ⁵	28	$f_{p,28}$	<75 C	<75 C
Dry Shrinkage ⁶	28	$f_{s,28}$	<0.04%	<0.04%

1	Compressive Strength tests in accordance to ASTM C39
2	Flexural Strength tests in accordance to ASTM C348
3	Tensile Strength tests in accordance to ASTM C307
4	Water Absorption tests in accordance to ASTM C642
5	Chloride Permeability tests in accordance to ASTM C1202
6	Dry Shrinkage tests in accordance to ASTM C157



Compression.pdf



Water Absorption.pdf



RCPT.pdf



Flexural Tensile.pdf



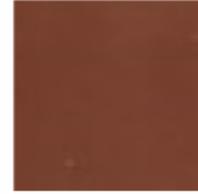
E-Modulus.pdf



Black



Charcoal Black



Maroon



Gray



Smoke White



Whisper White

Ultra High Performance Fiber Reinforced Concrete



Steel Fiber



Polymer Fiber

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