

# Supplementary Materials: Characterization of Enhanced ITZ in Engineered Polypropylene Fibers for Bond Improvement

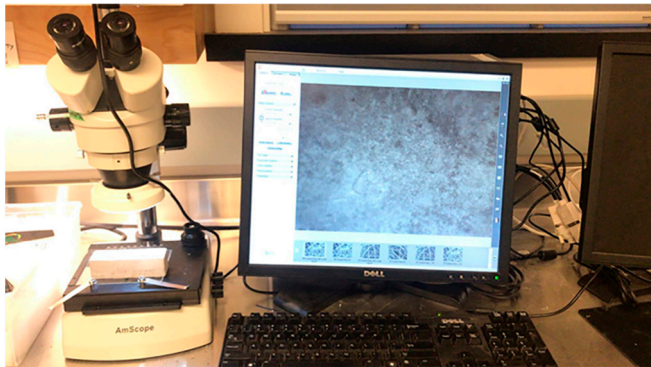
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(a)



(b)

**Figure S1.** (a) Amscope © Trinocular stereo zoom microscope setup; (b) Hitachi S-4800 FESEM.

**Table S1.** Polypropylene fiber properties.

Mechanical Property	Unit	Value
Length of the fiber	mm	12
Diameter of the fiber	micron	30
Specific Gravity	-	0.9
Elastic Modulus	GPa	7
Tensile Strength	MPa	300–450
Water Absorption	%	0
Melting Point	°C	162
Thermal Conductivity	W/mK	N/A
Density	kg/m <sup>3</sup>	900

**Table S2.** Chemical Composition of Mix M.

<b>Chemical Component</b>	<b>Quantity</b>
Crystalline Silica	15–25%
Portland cement	5–10%
Aluminum oxide	1–5%
Iron oxide	0–3%
Calcium oxide	0.3-3%

**Table S3.** Chemical Composition of Mix P.

<b>Chemical Component</b>	<b>Quantity</b>
Silica sand	25–50%
Portland cement	5–10%
Flue dust (zinc refining)	0.1–0.25%
Lithium carbonate	0.1–0.25%

**Table S4.** Physical Properties of Metakaolin.

<b>Property</b>	<b>Description/Value</b>
Visual Color	Cream White
Particle Structure	Amorphous
325 Mesh Residue %	5 to 6
Average Particle Size (Sedigraph)	0.09
Free Moisture %	1.4 $\mu$
Specific Gravity	Max 0.5
pH (20% Solids)	2.2
	4.0

**Table S5.** Physical Properties of Silica Fume.

<b>Property</b>	<b>Description/Value</b>
Appearance	Light Grey Powder
Specific Gravity	2.2
Bulk Density	600–650 kg/m <sup>3</sup>
Fineness, (45 $\mu$ m retained)	1–3 wt% retained
Soundness, (autoclave)	0.01–0.05 % Expansion
Tendency to entrap air	No
7-day Pozzolanic Strength Activity Index	120–127 % of control
BET Fineness (specific surface)	18–21 m <sup>2</sup> /g

**Table S6.** Chemical composition of the adhesive.

<b>Name</b>	<b>Percentage by Weight (Indicative)</b>
Acetone	20–30
Propane	20–30
Cyclohexane	10–20
Petroleum distillates	10–20
Hexane	<0.5