

Table 1. Parameters of Ceramicrete Binders

Compositional and Setting Parameters	Observed Data	Remarks
Types of phosphate binders	Phosphates of magnesium and iron are well developed. Processes are known for phosphate binders of several other oxides.	Ceramicrete is $MgKPO_4$ based. $Fe_2(HPO_4)_2$ based binder is ferrocement.
Types of aggregates	Any inorganic mineral and industrial waste.	Any combination with ash enhances the strength and quality of Ceramicrete products.
Binder and aggregate proportions	20-50 wt% binder and the rest as aggregates.	Calcium based aggregates reduce the quality of the product. Calcium silicates are an exception.
Water demand	Generally half by weight of the binder.	Sensitive to particle size of the aggregate and the binder.
Setting time	From a few minutes to several hours.	Controlled by a small amount of additive.
Slurry before setting	Thin to thick liquid; viscosity ranges are 200 to 1000 centipoise.	Pumpable; the viscosity can be adjusted with additives.
Heat generation	Exothermic process. Sets even in cold temperatures.	Controlled by suitable pretreatment of binder additives.
pH range of setting slurry	Changes from highly acidic to neutral during setting reaction.	Set into slightly alkaline (pH=8) due to excess oxides
Forming process	Casting in molds, dye-casting, extrusions, spraying.	Chemical formulation is adjusted to suit each process
Surface texture	Matte glaze to rough surface.	Takes the texture of the mold
Color	Ceramicrete binder is	A wide range of colored

	white; ferrocement is red iron oxide color or pitch black.	Ceramic products can be formed by adding ceramic colors.
Dimensional stability during setting	Slight expansion.	Captures intricate features of the mold.
Production equipment	Conventional cement equipment with plastic liners.	Bonds to almost everything except plastics.
Cost	Ceramic binder with 70% loading is approximately 10-12 cents per pound. The same for ferrocement is 3-4 cents per pound.	Ceramic is more expensive than portland cement but has superior properties.