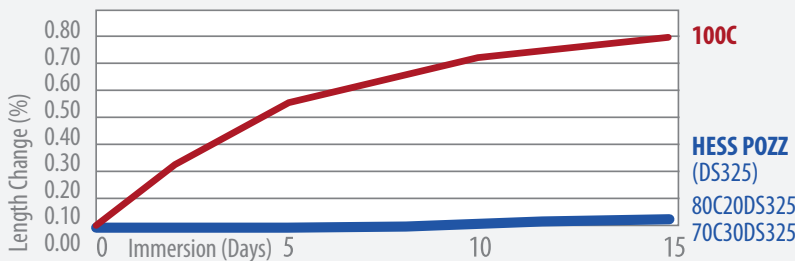


# Flatline Your ASR Problem for Pennies a Yard.

## MITIGATING ALKALI SILICA REACTION

Mortar mix designs tested according to a modified ASTM C1567 procedure using Type 1 cement and 25% replacement of fine aggregate with ground cullet glass. Hess Pozz (DS325) was used at 20 percent and 30 percent cement replacement. The percent length change for “acceptable expansion” is less than 0.10% at fourteen days with reactive aggregates. (University of Utah Study)

MIXTURE	ASR % LENGTH CHANGE	RATING
100Cement 25%Glass	0.699	Deleterious Expansion
80C 20DS325 Pozz; 25%Glass	0.029	Acceptable Expansion
70C 30DS325 Pozz; 25%Glass	0.011	Acceptable Expansion



THAT GRAPH TALKS BIG. But it’s backed up with ASTM standards-research providing definitive data that Hess Standard Pozz (a natural, carefully refined pumice pozzolan) mitigates or eliminates the Alkali Silica Reaction (ASR) in curing concrete in the presence of even the most reactive aggregate. And that “pennies a yard” statement? It’s calculated by combining the savings from using less Portland cement with the cost of the HessPozz replacement.

The science behind that amazing pozzolanic reaction is this: the aggregate-binding concrete glue—Calcium Silica Hydrate (CSH)—is the result of combining water and Portland cement. But that same hydration reaction also produces Calcium Hydroxide (CH) by-products (up to 25% of the hydrated Portland cement) that not only do nothing to contribute to concrete strength and density, but actively work against it,

introducing grief like the integrity-destroying alkali silica reaction as well as a swarm of other ills that result from CH-induced porosity.

Replacing some of the Portland cement with natural pumice pozzolan ignites a pozzolanic reaction within the hydrated concrete paste that *consumes* trouble-making CH and *converts it into additional CSH*. The pozz also reduces the alkali content of the concrete mix as well as the pH of the concrete pore solution. Think of it as molecular reclamation: concrete is densified and strengthened while trouble-making CH is consumed and repurposed. ASR is flat-lined. Also, a major reduction in concrete permeability (porosity) means sulfate attacks are mitigated. Reinforcing steel is protected without the need to thicken the cover concrete. The water-infiltration freeze-thaw cycle is impeded. Efflorescence is practically eliminated. Compressive strength gets a significant boost.

Pumice Pozz: Benefit after benefit. Structure after structure. Mile after mile.