

Pantheon™ Reduces ASR Expansion

Alkali-Silica Reaction (ASR) is a primary consideration when designing a concrete mix. ASR normally occurs when silica-rich aggregates react with alkalis in cement, forming a gel that absorbs water and expands, causing cracking in the concrete.

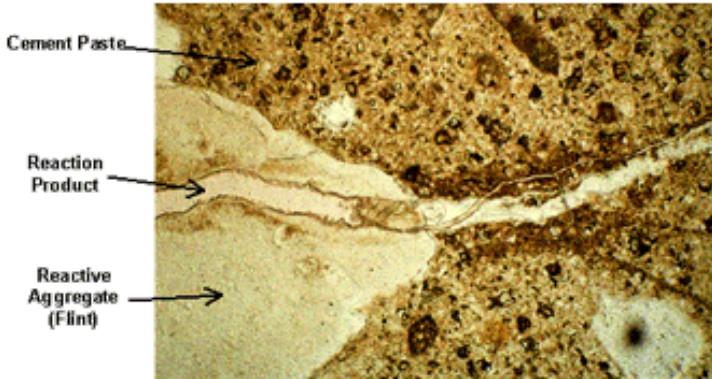


Figure 1: A close look at ASR gel



Figure 2: Cracking due to ASR

Pantheon™ reduces ASR because the silica dense powder quickly reacts with Calcium Hydroxide (CH) to form Calcium Silicate Hydrate (C-S-H). By creating C-S-H Pantheon™ contributes to the strength of concrete and reduces permeability by filling in voids. Decreasing permeability limits the mobility of water, starving the ASR gel and preventing expansion.

As a result, high replacement rates of Pantheon™ offer increased protection against ASR. This can be seen in 3rd party testing in accordance with ASTM-C441.

ASR Expansion Reduction vs. Cement Replacement with Pantheon

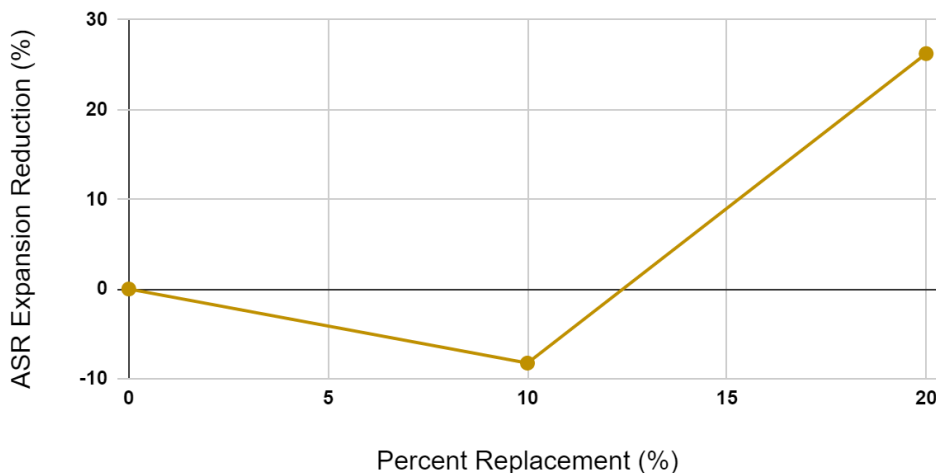


Figure 3: ASTM-C441 test data done by the CTL Group. Note that a critical amount (15%+) of Pantheon™ is needed in the mixture to see the ASR reduction effects.