# Questions and Answers
# from Tech Tuesday Webinar on
# *Admixtures for Modern Paving Concrete*
# Sep 16, 2025

1. What steps would you take to begin identifying potential issues that you believe could be related to admixtures and not the concrete mix itself? (Agency- Kansas)
   ANSWER: Conduct uniformity testing on the admixture and compare the results with the manufacturer's published values. Perform mortar or concrete testing by swapping the sample of the admixture in question with a different sample or a similar admixture to evaluate potential issues (not all problems are easily measured or evaluated). Lab testing is beneficial because variables such as raw materials, environmental conditions, and equipment are much easier to control and keep constant. Field testing is advantageous if the problem is related to specific field conditions (e.g., mixing in a concrete mixer truck, placement through a paving machine, hand placement, environmental conditions).

2. What are some things to look for in determining whether the issue is with the concrete mix itself or the admixture? (Agency - Kansas)

   ANSWER: When changing the admixture dosage (whether increasing or removing it), admixture samples, and/or sources of admixtures, are changes in concrete performance expected? For example, does the slump change when the water reducer is removed?

3. I think of Viscosity Modifiers as thickeners, how do they promote more bleeding? (Industry – Colorado)

   ANSWER: At low dosages, certain VMAs will 'release' the water, decreasing viscosity and increasing bleeding. The thickening and bleed reduction typically associated with VMAs occur at higher dosages (as used in tremie concrete, SCC, etc.).

4. What impact does air temperature have on water reducers? (Association - Michigan)
   ANSWER: I don't have direct information on the effectiveness of water reducers at different temperatures on slump response. However, it is known that slump increases with a decrease in concrete temperature, which is not necessarily due to an increase in the effectiveness of the water reducer.

   Generally speaking, the retardation effectiveness of water reducers and retarders (hours of retardation per ounce of water retarder impact) increases as the temperature rises.

This response is ideal in most cases since, as the temperature increases, the concrete setting will be faster, and more retardation will be needed to maintain the setting time for placement.

5. Please discuss top-down set vs bottom-up setting (Association - Michigan)
   ANSWER: In my opinion, top-down set and bottom-up setting are influenced by two parameters: the water content in the concrete and the temperature of the concrete. For instance, top-down setting can occur when the top of the slab is exposed to evaporation (hot, windy, direct sun, low humidity) and high temperatures (during the daytime), while the bottom of the slab is exposed to a moistened and cool subgrade (when concrete is placed early in the morning while the subgrade is the coolest). Bottom-up setting can occur when the subgrade is significantly warmer (accelerating the setting at the bottom of the slab) than the cooler ambient air temperature (slowing the setting at the top of the slab).

6. Great presentations! I learned a lot about water reducers. I didn't realize that some WRs can slow/retard the set time. Do you know of any studies that compare set times of mixtures using Type IL cement with various classes of water reducers (e.g. Normal, mid-range, and high range)? (Consultant – Florida)
   ANSWER: I don't know of any particular published studies, but my experience is that the slump with PLCs can be lower than with Portland cement produced at the same plant (0 to 1 gal/cy). This results in a greater demand for the water reducer to reach the target slump, and since retardation is dependent on water reducer dosage, this can also lead to more retardation. Note that this is the same situation when switching from one source of Portland cement to another or switching from one PLC source to another. Whenever there is a change in cement source, irrespective of the type of cement, there is the potential for changes in water demand and slump.

7. Which chemical admixture or mineral additive would you recommend to control water separation from the mix due to the lack of fine sand particles? We tried VMAs, but after an hour they lost their effectiveness and the water still separated from the mix. Thank you. (Academia – Lithuania)
   ANSWER: I recommend trying different VMAs made with significantly different raw materials (e.g., diutan gums, synthetic polymers, welan gums, xanthan gums). A different VMA raw material may be more robust in your system. Additionally, using water reducers with higher viscosity rather than lower viscosity may also help.

8. Some people claim that using mid-range water reducers at higher dosages is equivalent to using a HRWR. What is your opinion on this approach? (Academia – Indiana)

ANSWER: It depends on which specific mid-range water reducer (MRWR) and which specific high-range water reducer (HRWR) and the level of retardation that is acceptable. In most cases with conventional concrete, many MRWRs can be used at higher dosages to achieve similar slumps as conventional HRWRs. However, in mixtures with relatively high HRWR dosages, as is typical with SCC or very low w/cm mixes, it is more difficult for MRWR to match performance of the HRWR.

9. For newer blended cements that are water hungry, what do you recommend for admixtures to prevent pre-mature cracking and shrinkage cracking. (Consultant - Nebraska)

   ANSWER: One strategy is to use water reducers with a higher water reduction to retardation ratio. This may involve switching from a normal-range water reducer to a mid-range water reducer or simply selecting a different water reducer within the same range. Some internal curing and integrally mixed evaporation-retarding technologies, such as super absorbent polymers, have also shown promise in this area.

Answers prepared by Mark Niemuth on 9/26/25