

Wildfire suppressant rheology. Impact of water quality on water-enhancer viscosity

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Abstract: An important characteristic of the majority of the water-enhancing products on the wildfire suppression market is their ability to increase the viscosity of water. This increase in viscosity is linked to their performance. While performance of these products is key, there are several external variables that can influence how these suppressants physically behave. One such external variable is water quality, which is anecdotally known to impact water-enhancing products. This study aimed to understand how water quality—in particular, hardness—affects the viscosity of various water-enhancing products at different mix ratios. Understanding how water quality affects the viscosity of these products can offer insight into (1) which products are highly sensitive to water quality changes, and (2) how the target viscosity of a mixed product can be affected by water quality.

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Wildfire suppressant rheology. Mapping viscosity as a function of product mix ratios

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Abstract: The USDA Forest Service's Qualified Product List (QPL) provides guidance on the range of permissible mix ratios for water-enhancer products. Due to the proprietary nature of water-enhancer products, there are several unknowns about the rheology of the permissible mix ratios. This study focused on mapping the viscosity of various suppressant products as a function of their mix ratios. The results revealed a wide range of viscosities across products, with each product showing a different non-linear relationship with different mix ratios. The results from this study can help understand the optimum viscosity range to achieve desired drop characteristics during aerial operations.

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