

Breaking Down the Complexities of Coolant Technology - PEAK's Joe Long Explores the Science Behind Antifreeze and Coolant for Modern Engines

In a recent EPARTRADE-hosted webinar, industry expert Joe Long, Senior Field Technical Trainer at Old World Industries, took an audience through the complexities of antifreeze and coolant technologies. Addressing the prevalent question, "Aren't all coolants the same?" Long's answer was a clear "no," underscoring the wide variance in coolant formulations based on vehicle requirements, usage scenarios, and technological advancements.

The presentation delved into the evolution of coolant technologies, beginning with traditional green coolants to extended-life formulations like GM's Dexcool. Long highlighted that while older vehicles typically used basic green coolant, modern vehicles often require advanced organic acid technology (OAT) coolants, which offer longer life and enhanced corrosion protection.

Long explained, "Each coolant is formulated with unique additives tailored to meet specific vehicle needs. For example, Dexcool's orange coolant was specifically designed to meet GM's 1995 specifications and is optimized for engines factory-filled with OAT technology. Ford, on the other hand, uses a yellow coolant that is nitrite-free, supporting hybrid and electric vehicle applications."

Coolant Color and Compatibility

A critical insight shared by Long centered on the misconception that color indicates compatibility. "Color is simply a dye; it does not reflect the chemical properties or intended use of the coolant. Vehicle owners and fleet managers should ensure they select coolants aligned with their engine's design and original equipment (OE) specifications to avoid corrosion, clogging, and other performance issues," Long noted.

Electric Vehicles and Emerging Technologies

The discussion extended into the future of coolants, especially in light of growing electric and hydrogen-powered vehicle markets. According to Long, electric vehicles (EVs) require multiple cooling systems to manage the temperature of batteries, power electronics, and motors. The industry is working to develop specialized fluids with low conductivity to prevent electric arcing in these high-voltage environments. "Battery electric and hydrogen fuel cell technologies are pushing the boundaries of what's required from coolants," Long explained, adding that ASTM and the Technology and Maintenance Council (TMC) are actively working on formalized standards for EV coolants.

Practical Advice for Engine Coolant Management

Joe Long offered practical advice for users, discussing the importance of using distilled water when diluting concentrated coolants and the dangers of mixing incompatible coolants. He stressed, “When it comes to testing and replacing coolant, following a disciplined approach is key. From testing pH levels to visual inspection, there are simple ways to maintain coolant quality and ensure engine longevity.”

Long also addressed the environmental impact of coolant disposal, advocating for proper disposal through recycling facilities to prevent environmental harm. He cautioned against the use of recycled coolants in high-performance engines, as they may lack the precise chemical balance required for optimal performance.

Conclusion

With the automotive world advancing towards more sophisticated and eco-friendly technology, Joe Long emphasized that understanding the nuances of coolant formulation is more important than ever. “Coolants are no longer a one-size-fits-all product. Modern vehicles demand specific formulations, and understanding these differences can be the deciding factor between smooth performance and costly repairs.”

For more information, [watch the full webinar here.](#)