

FUEL ADDITIVE MIXTURES AND FUELS CONTAINING THEM

ABSTRACT

A fuel additive concentrate for gasoline, a gasoline fuel containing an additive mixture, a method for reducing wear in an engine and in a fuel delivery system of a gasoline engine, and a method for improving injector performance. The additive concentrate includes an aromatic solvent and a mixture that contains (i) N,N-bis(2-hydroxyethyl)alkylamide, (ii) 2-((2-(bis(2-hydroxyethyl)amino)ethyl)amino)ethyl alkanoate and N-(2-(bis(2-hydroxyethyl)amino)ethyl)-N-(2-hydroxyethyl)alkylamide, and (iii) fatty acid ester(s) and amide(s) derived from a self-condensation product of diethanolamine (DEA) containing at least 3 amino groups. A weight ratio of (i) to (ii) to (iii) in the concentrate ranges from about 8:2:0 to about 2:5:3. The fuel additive mixture is substantially devoid of glycerin and remains fluid at a temperature down to about -20 °C.

[No Figure]