

## Outstanding Lubricant Using Fluorographene as an Extreme Pressure Additive

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**Abstract :** Currently, there has been a great interest, during the last years, on graphene due to its lubricant properties on friction and antiwear processes. Likewise, fluorographene has also been gaining renown due to its excellent chemical and physical properties which have been mostly applied in the electronics industry. Nevertheless, its tribological properties haven't been analyzed thoroughly. In this paper, fluorographene was examined as an extreme pressure additive and the nano lubricant made with a cutting fluid and fluorographene in the range of 0.01-0.5% wt, which proved to withstand 53.78% more pounds than the conventional product and 7.12% more than the nano lubricant with graphene in a range between 0.01-0.5% wt. Said extreme pressure test was carried out with a Pin and Vee Block Tribometer following an ASTM D3233A test. The fluorographene used has a low C/F ratio, which reflects a greater presence of atomic fluorine and its low oxygen percentage, supports the substitution of oxygen-containing groups by fluorine. XPS Spectra shows high atomic fluorine content of 56.12%, and SEM analysis details the formation of long and clear crystalline structures, in the fluorographene used.

**Keywords :** extreme pressure additive, fluorographene, nanofluids, nanolubricant

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