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## **Quality Assessment of Low-Freezing Fluids on Ukrainian Market**

The rapid development of the automotive industry has led to heavy loads and high temperatures in the car. The work of modern engine is impossible without the use of coolant. Historically, the first cooling liquid was water. However, the properties of water do not meet the requirements that are sought in today's coolants. Therefore, the world's leading manufacturers of consumables are constantly developing new higher-quality coolants.

In Ukraine, the market offers not only quality coolants and fluids but also fluids of questionable quality, as well as outdated brands of liquids. In addition, quality control of fluids should be conducted according to standards. On the one hand, domestic Ukrainian standards for coolants are outdated, and, on the other hand, there are many foreign standards. This situation with the standards leads to difficulties in selecting and evaluating the quality of coolants.

Assessment of the coolants quality is conducted by the following parameters: the liquid composition, color, density, chilling temperature, boiling temperature, corrosive effect on metal.

An important requirement to coolants is impact on the environment. Ethylene glycol, which is part of a coolant, is a strong poison, so it was replaced with propylene glycol. Fluids based on propylene glycol are more environmentally friendly, less toxic and higher heat dissipation. Unfortunately, no propylene glycol coolants are found in the Ukrainian market.

The results of an independent study of the Ukrainian market coolants held by German company PIP-Privates Institute Produktbegutachtung that addressed the following brands of coolants: NORDIKA, GROM-EX (both - the production of PE "Lubin"). A-40M production PE "Naumenko" (B.Cerkov). "Snowstorm" (PE "PROMSTROY"), "TYPHOON-40" (TD "IFC"), "Standard-40" (PE Lubin) and COOL EX-40 (PE "Kozlov") showed the comparison of temperature properties of fluids and their pH value.

To sum up, high quality of fluids ensures reliable operation of the engine over a predetermined operating life.