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## **AERO-ENGINE EMISSION TESTING UNDER REAL OPERATING CONDITIONS OF A SMALL AIRCRAFT**

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*ABSTRACT* – Due to a rapid development of air transportation there is a need for the assessment of real environmental risk related to the aircraft operation. The emission of carbon monoxide and particulate matter is still a serious threat– constituting an obstacle in the development of combustion engines. The applicable regulations related to the influence of the air transportation on the environment introduced by EPA (Environmental Protection Agency), ICAO (International Civil Aviation Organization) contained in JAR 34 (JAA, Joint Aviation Requirements, JAR 34, Aircraft Engine Emissions), FAR 34 (FAA, Federal Aviation Regulations, Part 34, Fuel Venting and Exhaust Emission Requirements for Turbine Engine Powered Airplanes), mostly pertain to the emission of noise and exhaust gas compounds, NO<sub>x</sub> in particular. They refer to jet engines and have stationary test procedures depending on the engine operating conditions. The actual standards for the aircraft with the turbine engine emissions assessment are the procedures included in ICAO, FAR 34 regulations. These procedures are stationary and they are provided in the airport area. The said standards do not include aviation piston engines.

Due to the differences in the combustion processes between piston and jet engines it should be assumed that the toxic emissions of a piston combustion engine will be higher than those of a jet engine. A considerable growth in the number of general aviation class aircraft may contribute to an increase in the emissions from piston aviation engines, which may pose a threat to the natural environment. The emission of NO<sub>x</sub> in the upper parts of the atmosphere is particularly disadvantageous as it fosters the greenhouse effect.

The article presents the results of the exhaust gas emissions research of the small aircraft engine under real operating conditions.