

**XII Triennial International
Scientific Conference
Engineering TODAY**

2026

BOOK OF ABSTRACTS

25 - 27 JUNE 2026, VRNJAČKA BANJA, SERBIA

**FACULTY OF MECHANICAL AND CIVIL ENGINEERING IN KRALJEVO
UNIVERSITY OF KRAGUJEVAC**

Design solution of a cyclone for the separation of PM10 and PM2.5 particulate matter

Nenad Stojić¹, Nebojša Bogojević¹, Miljan Marašević¹, Stefan Pajović¹

¹ University of Kragujevac, Faculty of Mechanical and Civil Engineering in Kraljevo, Kraljevo, Serbia

ABSTRACT: Despite all efforts toward energy transition and the replacement of fossil fuels with renewable energy sources, the use of fossil fuels (coal, oil, and natural gas) continues to be the foundation of modern energy infrastructure, while simultaneously serving as the primary cause of environmental degradation. The combustion of fossil fuels releases energy, but also byproducts that directly alter the chemical and physical composition of the air. Anthropogenic activities lead to atmospheric pollution and climate change, primarily due to the increased concentration of greenhouse gases and particulate matter (PM), which mostly originates from fossil fuel combustion processes. Air pollution caused by particulate matter is one of the greatest environmental challenges of our time. These particles are not gases, but microscopic solids suspended in the air. To reduce the concentration of PM particles in the air to permissible limit values, various systems and devices are used for their separation. Cyclone separators represent one of the oldest and most economical technologies for cleaning gases from suspended particles. Although they are mainly used for and have a high separation efficiency for particles larger than PM10, the goal of this paper is to propose a design for a cyclone that enables the separation of all particles, including PM10 and PM2.5. Also, the goal is to keep the overall dimensions unchanged while achieving the highest possible efficiency for the separation of suspended particles.

KEYWORDS: Cyclone, Design, Flow analysis, Particulate matter.