

## **Abstract**

The habilitation thesis in mechanical engineering domain of candidate (assoc.prof. Florin Emil MARIAȘIU, PhD) titled: RESEARCHES ON POSSIBILITIES TO IMPROVE BIOFUEL'S USE IN INTERNAL COMBUSTION ENGINES FUELLING, represents the synthesis of educational and research activities conducted at the Technical University of Cluj-Napoca, Department of Automotive and Transportation.

Research directions addressed by the candidate are refers to investigate the possibility of increasing the efficient use of biofuels in internal combustion engines fuelling. As a result of research conducted, were identified contemporary issues which this topic facing and using original and unconventional methods, were able to manage the issuance of applicative and relevant solutions and conclusions presented through scientific articles and books published.

The context in which candidate's need to follow habilitation process is analyzed and justified is found in the thesis' first chapter (CONTEXT OF HABILITATION).

In the second chapter of habilitation thesis "RESEARCH DIRECTIONS AND COMPETENCES", are presented the research directions followed by the candidate and skills held by it, as a direct results of professional and academic development.

Chapter 3 entitled "RESEARCH ACTIVITIES AND RESULTS" reviews the scientific results obtained through research activities. Are presented scientific articles, published books in the field of biofuels and internal combustion engines, the experience in managing and conducting research projects, awards and distinctions, patent applications, national and international collaborations with academia.

The widely development and detailing of research activity in biofuels is being conducted under Chapter 4 "CONTEXT OF RESEARCH WORK". Based on the summary of the main articles published in important scientific journals, are presented research directions and results. Were discussed issues related to the investigation of possibilities: to increase the efficiency of biofuels use in internal combustion engines fuelling, to optimize engine cold start process and to reduce engine friction losses. Solutions presented have an original and unconventional approach on investigated topics (subjects), and also a applicative character by issuing two patent applications based on the results of this research.

Opinion issued on this basis is found in a succinct (summary) form in the fifth chapter of the habilitation thesis "CONCLUSIONS". It presents new research directions opened by the results already obtained.

In the last chapter (Chapter 6 "CAREER DEVELOPMENT PLAN") are highlighted current and future directions (on short- and long-term) in academic and research career and directions to be followed by the candidate.