

Alternative methods of aluminum alloys recycling in solid and semisolid state

Jure Krolo, and Branimir Lela

Faculty of Electrical Engineering, Mechanical Engineering, and Naval Architecture, Split, Croatia

jkrolo@fesb.hr, blela@fesb.hr

Corresponding author: J. Krolo (jkrolo@fesb.hr), Faculty of Electrical Engineering, Mechanical Engineering, and Naval Architecture, University of Split, Croatia

ABSTRACT

This lecture deals with alternative methods of aluminum alloys recycling in solid and semisolid state. Recycling of aluminium as the second most commonly used metal is of extreme importance both for environment protection and the circular economy in the aluminium industry. There is a growing need for development of new recycling technologies and strategies with the aim of increasing the recovery rate for recycling of produced waste, as well as reduction of emissions of harmful pollutants into the atmosphere and mitigation of adverse environmental impact. Predictions show that the demand for aluminium at the global level will double by 2050. Problematic aluminium type of waste are machining chips due to the increased loss during conventional recycling by remelting. Part of our project is to propose alternative methods for aluminum chips recycling in solid and semisolid state in order to reduce material loss and energy consumption. First part of the lecture will explain aluminum recycling in solid state to produce quality recycled samples. Main used methods were compaction, hot extrusion and equal channel angular pressing. In second part, method based on aluminum metal foams production directly from machining chips, without comminution step of the aluminum into powder, will be presented. Finally, last method will be for thixo feedstock material production directly from machining chips.

BIOGRAPHY

Dr. Jure Krolo, mag. ing. mech. was born on June 6, 1991 in Split. In October 2015 he enrolled Ph.D. study of Mechanical Engineering at the Faculty of Electrical Engineering, Mechanical Engineering and Naval Architecture in Split under the mentorship of Assoc. Prof. dr. sc. Branimir Lela. From October 2015 he works as teaching and research assistant also at FESB. He obtained Ph.D. degree in February 2021. Until now he published 23 science papers in journals and international science conferences. In addition to scientific research work, he has so far assisted in teaching at the following courses: Technology 2, Metalworking Technology, Fundamentals of Technology, Forming, Tools and Equipment, Materials 1, Materials 2. A narrower area of interest and research are forming technologies and materials. Dr. Jure Krolo has his expertise in metal forming technology and alternative methods for aluminum recycling. His main hobby at free time is spearfishing in the Adriatic sea and family life.



- LinkedIn: www.linkedin.com/in/jure-krolo-173221a6/
- Research Interest: metal forming, materials, aluminum