

**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**

Change of the heat transfer coefficient in the tube-to-tube exchanger in the ground coffee cooling plant

Miljan Marašević¹, Nenad Stojić¹, Nebojša Bogojević¹, Dragan Cvetković², Aleksandar Nešović³

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

² University of Kragujevac, Institute of Information Technologies, Kragujevac, Serbia

³ University of Kragujevac, Faculty of Engineering, Kragujevac, Serbia

ABSTRACT: In coffee production facilities, one of the important elements for quality is the cooling of the coffee after leaving the mills. Most often, heat exchangers of the tube-in-tube type, with water as the cooling medium, are used. The mixture of ground coffee and air is considered as a heterogeneous system, with very low movement speeds. The paper analyzed the change in the heat transfer coefficient for the tube-to-tube type exchanger, for four characteristic cases. The first case is the movement of ground coffee without additional elements only by pneumatic transport, the second case is the movement of ground coffee using a chain, the third case is the movement of ground coffee using a chain with buckets and the fourth case is the movement of ground coffee in the exchanger using a chain with circular cross-section boards. The obtained results show that the heat transfer coefficient is the highest in the fourth case, slightly lower in the second case, while the first case is the most unfavorable. The ratio in the heat transfer coefficient of the mentioned exchanger between the most unfavorable and the most favorable case is approximately 3.6 times.

KEYWORDS: Heat transfer coefficient, Tube-to-tube exchanger, Ground coffee.