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# NUMERICAL ANALYSIS OF OIL DISTRIBUTION IN PANEL-TYPE RADIATORS.

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**Abstract.** Panel-type radiators play a crucial role in the cooling process of power transformers, exchanging the heat generated by power losses with the surrounding environment through convection and radiation processes. This numerical study analyzes the effects of inlet/outlet boundary conditions on oil distribution within panel-type radiators. To reduce computational complexity, costs, and time, the radiators are isolated from the transformer's tank, thus opening the thermosiphon circuit, which is the driving force that moves the oil through the coil (heat source) and the radiator panels (heat sink). With the circuit opened, appropriate inlet and outlet boundary conditions need to be defined in the radiator collectors.Traditionally, numerical analyses impose mass or volumetric flow rates with specific inlet temperatures at the top collector and define outlet boundary conditions at the bottom collector, resulting in the outlet temperature. However, such conditions tend to replace buoyancy-induced flow with a flow rate more related to pumping, departing from the underlying physical phenomena. This study investigates oil distribution using close circuit for different panel configurations to assess the validity of assumptions regarding inlet flow rates.

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