

Non-stationary heat transfer from spherical vessels under free convection. Investigation of liquid petroleum products storage

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Abstract. A study of the non-stationary heat transfer from spherical vessels under free convection was performed in the laboratory. From this study, a set of mathematical correlations between *Nusselt* and *Grashof* numbers resulted, with the practical goal of calculating the heat transfer coefficient in industrial applications of petroleum products storage, for the estimation of insulation necessities. It was found that the linearity of *Nusselt* (Nu) correlated with *Grashof* (Gr) is valid for values of $Nu < 30$. Over this value, the Gr depends strongly on the size of the body, Gr being proportional to the diameters ratio raised at power 2.5.

Keywords: heat transfer, free convection, petroleum storage
