Strzelecka, K., Jezowiecka-Kabsch, K. Real Values of Resistance Coefficient in Water Flow Through Pipe Sudden Contraction. ***Ochrona Srodowiska*** **2010, Vol. 32, No. 1, pp. 33–37.**

Abstract: The complexity of flow in the vicinity of the pipe sudden contraction is linked with the velocity field structure, *i.e.* with the Coriolis coefficient value $\alpha \neq 1$. That necessitates the determination of the resistance coefficient (ζ) value by experiments and the assessment of its dependence on the Reynolds number. The experiments reported on in the present paper enabled the real values of the resistance coefficient ζ to be determined (taking into account the relation $\alpha=\alpha(Re)$ established in our own researches) for 9 pipe sudden contractions within the range of $d/D \in (0.35, 0.82)$. The real values obtained by experiments were compared with the values calculated in terms of a formula commonly used in engineering. Without exception, the resistance coefficient values determined by experiments were found to be by 20% to 70% lower depending on sudden contraction (d/D). The formula $\zeta=-0.5658(d/D)^2+0.0002604(d/D)+0.4094$ (as well as the relevant table) was proposed for the description of the turbulent flow ($Re_d>10^4$) through the pipe sudden contraction, and thus enabled the value of the coefficient ζ to be determined for the sudden contraction chosen from the range of $d/D \in (0.35, 0.82)$.

Keywords: Pipe flow, resistance coefficient, pipe sudden contraction.