gr. HI – 17 –

2021

Calculation task № 21

Determine the overall flow rate coefficient of complex gas pipeline which consists of two parallel connection sections of the same length of 11.6 km, Diameters of the sections are 150 and 200 mm. Coefficients of hydraulic resistance of sections are 0.025 and 0.02 respectively. Standard section is section number 1 (the reference diameter of the pipeline is 150 mm).

$L = 11.6$ km

$d_1 = 150$ mm ; $d_2 = 200$ mm ;

$\lambda_1 = 0.025$; $\lambda_2 = 0.02$;

$d_{st.s.} = 150$ mm ; $\lambda_{st.s.} = 0.025$

Determine : $K_{fl.ov.p.}$ – ?

Solution

The overall flow rate coefficient of the complex gas pipeline which consists of two parallel connection sections of the same length L :

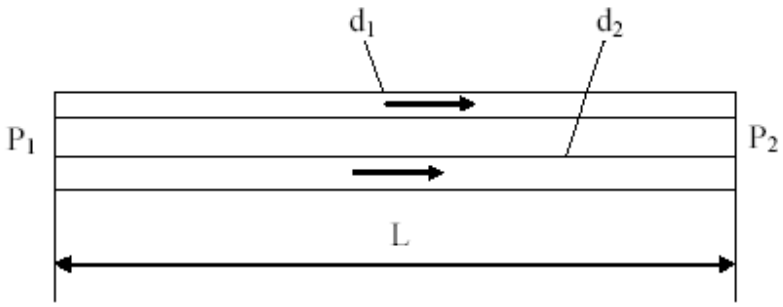
$$K_{fl.ov.p.} = K_{fl.1} + K_{fl.2}$$

According to the formulation of the calculation task the standard section is section number 1.

$$K_{fl.1} = K_{fl.st.s.} = 1 \quad .$$

$d_{st.s.} = 150$ mm ; $\lambda_{st.s.} = 0.025$

Figure



$$K_{fl.2} = \sqrt{\frac{d_2^{\,5}}{d_{st.s.}^{\,5}} \cdot \frac{\lambda_{st.s.}}{\lambda_2}} = \_\_\_\_\_ = \_\_\_\_\_$$

$$K_{fl.ov.p.} = 1 + \_\_\_\_\_ = \_\_\_\_\_$$

Answer : $K_{fl.ov.p.} = \_\_\_\_\_$