EXPERIMENTAL STUDY OF FLUID FLOW
CHARACTERISTIC AROUND A CIRCULAR AND D-TYPE CYLINDER NEAR A FLAT PLATE IN A LAMINAR AND TURBULENT BOUNDARY LAYER

“Case Study For The Effect of Gap Ratio Between Cylinder and Flat Plate 0,2; 0,267; 0,333”

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ABSTRAK

The external fluid flow characteristic around a bluff body is being developing at the moment. There are a lot of applications in industry sector that use the fluid mechanics methods. One of the application from external fluid flow is off-shore pipe near the sea floor. According to the explanation, the experimental experimental study of wall effect against fluid flow characteristics passing through a circular and D-type cylinder will be examinated.

In this experiment, there are two cylinders (circular and D-type 65° cylinder) that will be arranged transversal in the wind tunnel. The variation of this experiment such as the gap ratio variation (G/D), drag coefficient (C_D) and lift coefficient (C_L) will be measured with moment scale in the wind tunnel, and pressure distribution (C_p) will be measured with the pressure tap that mounted around the cylinder. The wake region can be measured after we have gotten the velocity profile behind the cylinder. The
boundary layer thickness has been influenced by the addition of wire with 4 mm in diameter on upstream of the cylinder, so we can get the transitional boundary layer from laminar to turbulent boundary layer with Reynolds Number \( \text{Re} = 5.3 \times 10^4 \), and the variation of gap ratio between cylinder and flat plate are 0.2; 0.267; and 0.333.

This experiment will be focused to calculated the drag coefficient \( C_D \), lift coefficient \( C_L \), pressure distribution \( C_P \) and the width of wake region.

Keywords: circular cylinder, drag coefficient \( C_D \), lift coefficient \( C_L \), pressure distribution \( C_P \), width of wake region.