EFFECTS OF CONE INCLINATION AND HEIGHT ON CYCLONE PRESSURE DROP AND POWER REQUIREMENT

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ABSTRACT:

This work investigated the influence of cone inclination and cyclone height on pressure drop and energy requirement of cylindrical-conical tangential entry cyclone. The pressure drop across the cyclone was measured with a manometer connected across the inlet and exit of the cyclone. Minimum pressure drop of 3.55 cm of kerosene was observed at 2^o cone inclination and 0.6 m overall cyclone height while maximum pressure was 5.05 cm of kerosene at 2^o and 0.3 m overall height. Pressure drop and power requirements were found to increase with cone inclination and decrease with cyclone height. The statistical model developed was found to mimic experimental data at all heights and cone inclination studied.

Keywords: Pressure drop, Tangential entry cyclone, Manometer, Power requirement, Pitot tube

1. INTRODUCTION

Cyclones are among the oldest types of industrial particulate control equipment and are still one of the most widely used of all industrial gas cleaning equipment (Wang *et al*., 2004). Cyclones are preferred above other gas cleaning device because of their simplicity, easiness and low costs in terms of construction, operation, maintenance and energy consumption (Jianyi and Mingxian, 2003).

The search for ways to improve cyclone performances while retaining the basic features and simplicity of operation is ever continuing. Apart from collection efficiency, cyclone pressure drop is another important concern from the point of view of energy consumption (Lee *et al*., 2001). Historically, considerable pressure drop studies have featured in many publications which include: flow pattern and

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