

***Desain and Development of a Horizontal Rotary Dryer Cylinder  
with the Addition of Internal Flight to Produce a Cataracting  
Motion Pattern***

Nur Faizin, S.Si., M.Si (*Undergraduated Thesis*)

Novita Safitri

*Renewable Energy Engineering Study Program  
Department of Engineering*

**ABSTRACT**

*Rice and corn are Indonesia's primary food commodities, harvested at moisture contents of 24–26% and up to 28% (wb), well above the safe storage threshold of 14%. A horizontal rotary drum dryer with internal flights efficiently generates cataracting motion, forming a free-falling particle curtain that maximizes contact with hot drying air. This study experimentally investigated a single straight-flight rotary drum dryer prototype fitted with a transparent cover, using filling degree variations of 5%, 10%, 15%, and 20%, and drum speeds of 6, 7, 9, and 11 rpm, on paddy and corn. The results show that the dominant cataracting movement pattern is formed at a filling degree of 5%-15%, while a filling degree of 20% results in a transition to cascading. The transparent cover proved effective for direct visual identification of particle motion patterns and shower frequency during operation.*

**Keywords:** *cataracting, filling degree, internal flights, rotary dryer, shower frequency*