

# **Development of Low-Cost, High-Efficiency Powder Transfer System for Food Industry**

## **Abstract**

Powder Transfer System (PTS) has been widely used in various industries to transport powder from one workstation to another. It speeds up the loading process while decreasing operator fatigue and manual handling. Majority of food industry in Small and Medium Enterprise (SME), Perlis, is still using the manual handling methods to transfer the powder from mixer to filling funnel station which requires higher needs of manpower. Hence, PTS is introduced to overcome the problems in the industry with the aim of development of low cost (affordable by SME industries) yet high efficiency system. Development of this system started from selecting the most suitable transfer system for food grade powder with the consideration of the working principle and safety for food and environment. Pneumatic Vacuum Conveying System (PVCS) is selected as the most suitable system in this project through the system selection process. This project also includes the system design which involves the designation of system function and design based on requirements by using the functional decomposition and engineering CAD drawing software—SolidWorks, material selections for the system components which suitable for food grade conditions, and cost estimation. Lastly, validation of the system design structure stability, transfer rate analysis, and development of the prototype are carried out at company M, one of the SME companies in Perlis, Malaysia.

## **Keywords**

Pneumatic vacuum conveying system; Powder transfer system