

“Study on screw conveyor using different coating materials”

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Abstract— Screw conveying systems might be used in various types of industries where the goods and products are moved with rotational effect of screw. The primary purpose of the model is to calculate the power,

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torque and axial force required for the scroll to transport the solid. The model is presented in a non-dimensional form and the procedure for implementing the model is included. The model is compared to test data from an existing publication; there was good agreement between the model and data. Results are presented in the form of graphs to illustrate the influence of key parameters. The 3D model is created in CATIA software and this model is imported for simulation in ANSYS. There are four types of material used SS440, Tin, Zinc and ZrN. Comparative analysis study is done for all the four materials for total deformation directional deformation and equivalent stress.

Keywords- Conveyor system; Screw conveying, ANSYS, CATIA, SS440, Tin, Zinc, Zrn.

I. INTRODUCTION

Conveyors are defines as a mechanical devices which can transfer material or goods from one plane to another place without any effort allying to it. The construction of the conveyors are mostly based on frame, supporting roller or conveying roller or belt and the driven motor with gearbox as per the rpm of the roller required. The conveyors are also used for conveying the bulk materials which gravel material and other aggregate during the building construction work. In industries it is mainly used to convey the coal, fly ash and the output product to the final destination of the plant. There are various types of conveyor utilize as the area and the type of work such as belt conveyor, roller conveyor, vibratory conveyor, bucket conveyor etc. The all basic types of conveyors are described below:

The basic principle of material along the trough is similar to the sliding motion of a nut along a rotating screw when the nut is not allowed to rotate. The weight of material and the friction of the material against the wall present the load from rotating with the screw.

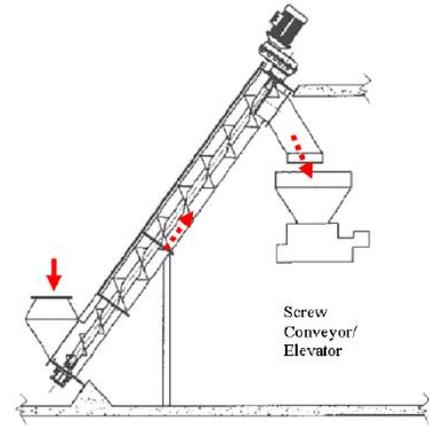


Fig.1-Screw conveyor

A. Components of screw conveyor

1) Screw:

Based on rotation- Left and Right Hand Screws

A transport screw is either right hand or left hand contingent upon the type of the helix. The hand of the screw is effortlessly dictated by taking a gander toward the finish of the screw. The screw imagined to one side has the flight helix folded over the pipe in a counter-clockwise bearing, or to one side. Same as left hand strings on a jolt. This is subjectively named a LEFT hand screw. The screw envisioned to the privilege has the flight helix folded over the pipe a clockwise way, or on your right side. Same as right hand strings on a jolt. This is named a RIGHT hand screw. A transport screw saw from either end will demonstrate a similar design. In the event that the finish of the transport screw isn't promptly unmistakable, at that point by simply envisioning that the fighting has been cut, with the cut end uncovered, the hand of the screw might be effectively decided.

2) Mass Flow

It is the combination of both variable diameter of the centre pipe and the pitch of the flight such that as the pitch increase volume of the material also increase. It is mainly utilizes in screw feeders for uniform flow of bulk material from the silos hoppers etc.