

# Four Axis Conveyer Belt

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**Abstract:** This project is a working prototype model of advanced industrial crane. It is combination of crane and belt conveyor system. This project can work faster in industries through technology and so the production capacity of industries is greatly increased. The development of industries also provides employment opportunities to the people. The project is battery powered crane technology so that it does not harm the environment in any way. The project rotates left and right, and the load can be easily shifted back and forth and up and down.

**Keywords:** Belt conveyor, DC motors, MS material.

## 1. Introduction

To meet the ever-increasing demand for goods across the country and abroad, it is imperative to speed up and modernize the ancillary machinery of industries. Conventional cranes operate with hydraulic technology and such a complete mechanical crane also uses a large amount of petroleum fuel, causing a large amount of pollution and causing great damage to the environment. Also on other side belt conveyor system working in one direction. Due to that this types of material handling equipment can't flexible to work in more than one direction. Thus a project of four axis electromechanical crane has been prepared to upgrade the above complicated technology in advance.

## 2. Methodology

In order to develop this four axis conveyer belt, first of all the function of the project is decided and after determining the functions of the project, the load capacity of the project is determined. The activities of this project are determined as follows:

- The load can be shifted forward and backward by conveyer belt.
- The load can be shifted up and down by wire rob lifting.
- Gear mechanism is used to shift the load to the left as well as to the right.
- After determining the functions of the above project, the DC motor and its capacity are determined for use in the project, and finally the battery corresponding to the DC motor is selected.
- Thus the detailed analysis of all these factors are described with the diagram inside the following designing of four axis conveyer belt. After all the

technical factors of the project are decided and sketch drawing of the project is prepared. And accordingly all the materials of the project are procured from the local market.

## 3. Table

Table 1 Dimension off different parts of model

Part	Length	Width	Height
Foundation chasis	305mm	305mm	155mm
Vertical rotating chasis	305mm	305mm	35mm
Vertical roller lifting chasis	305mm	35mm	605mm
Conveyor belt chasis	30mm	203mm	610mm
Lifter roller	254mm	35mm(dia)	-
Conveyor belt roller	200mm	25mm(dia)	-
Conveyor belt rubber	608mm	200mm	2mm

During design of four axis conveyer belt, different fabrication processes are used

1. The joint are done with the electric arc welding process.
2. Cutting operations are done with hand cutter machine.
3. Grinding operations perform on the grinder machine.
4. The drilling operations perform on the radial drilling machine.

## 4. Figures



Fig. 1. Foundation chasis



Fig. 2. Vertical rotating chasis

In both chasis same mild steel angle material used with 25/5mm size L=305mm, W=305mm, H=155mm L=305mm, W=305mm, H=35mm Drilling size=6mm and 8mm Bushing ID size=25mm, Bushing OD size=35mm, Bushing H=40mm



Fig. 3. Attachment of both chasis

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Foundation chassis and vertical rotating chassis both are attached with 6505 number ball bearing. This part is made up of mild steel angle material with 25/5mm size.

Length=305mm

Width= 35mm

Height=607mm

Drilling size 8mm



Fig. 4. Roller lifting mechanism



Fig. 5. PVC

Length=30, Width=203mm, Height=610mm Bushing ID size=10mm, Bushing OD size=25mm Bushing H=30mm

In both lifting and belt drive mechanism, PVC plastic material rollers are used and rollers are worked on lathe machine for turning for OD processes.



Roller OD=35mm Shaft OD=10mm Roller length=254mm  
Total length=300mm



Roller OD=35mm Shaft OD=10mm Roller length=254mm  
Total length=300mm

Fig. 6. PVC rollers

For conveyor belt, we used synthetic rubber which is about 2mm thickness and 608mm length, 200mm width.



Fig. 7. Four axis conveyer belt

This is working model of four axis conveyer belt. This project operates according to the rules of electromechanical. This project works without any kind of petroleum fuel with only 15 volt battery power. In this project the movable power is done by 12volt DC non type motor. This project is controlled by wire remote control. The project is not done by electrical switches in the remote of this project; this remote has switches for the following functions:

1. Forward and reverse
2. Up and down
3. Clock and anti-clock.

## 5. Conclusion and Future Development

This project is to work faster in industries and create employment opportunities through the development of industries. Another important objective of this project is to help in industrial development free from pollution from electric battery power without consuming any kind of petroleum fuel. Some future works can be done on this project for development such as Servo motor can be used to increase the capacity of the project. Also Wireless remote control technology can be operated. Mobile control as well as GPRS technology can be applied. Battery can be charged from solar charging.

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