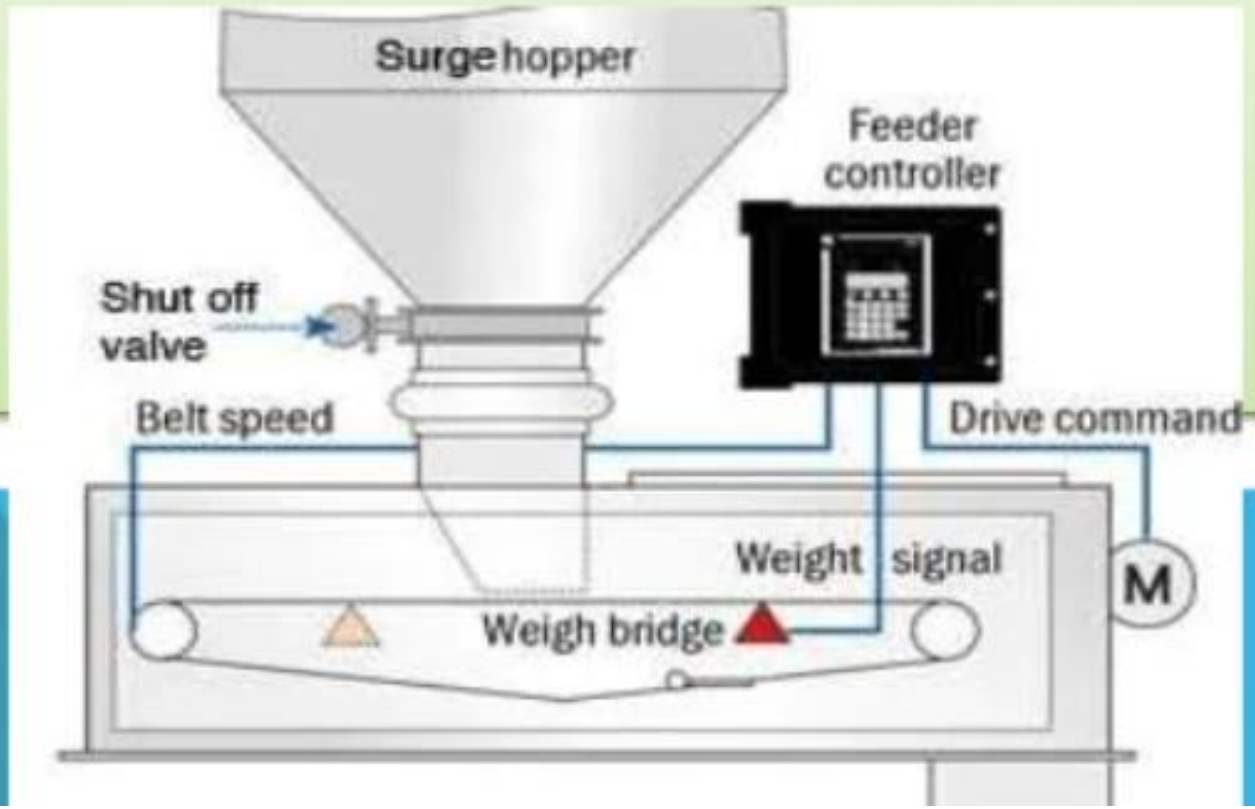
18ECO134T – Sensors and Transducers

Unit IV : Session 9 : SLO 2

ABOUT WEIGH FEEDER-

The Weigh Belt Feeder is a relatively simple, extremely reliable gravimetric feeder providing high feeding precision and efficient process monitoring.



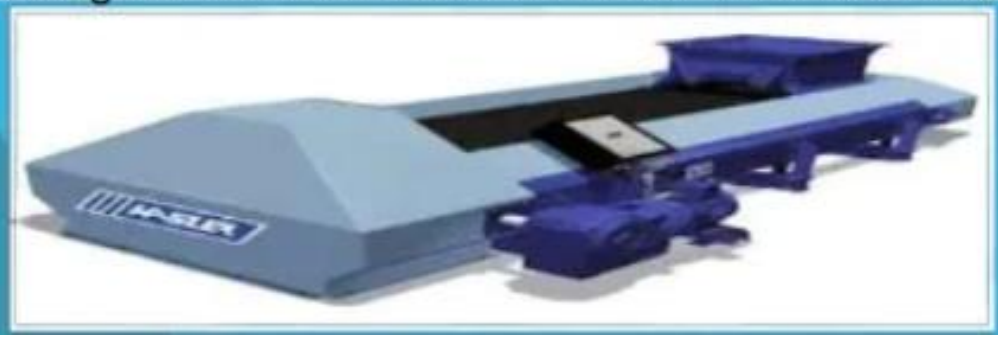
Weigh Belt Feeder Principle of Operation–

In a weigh belt feeder, product is feed as a continuous band onto a conveyor belt, through an inlet slide gate or automatic pre-feeder. A load sensor under the belt continuously measures the weight of the product over a defined length of belt.

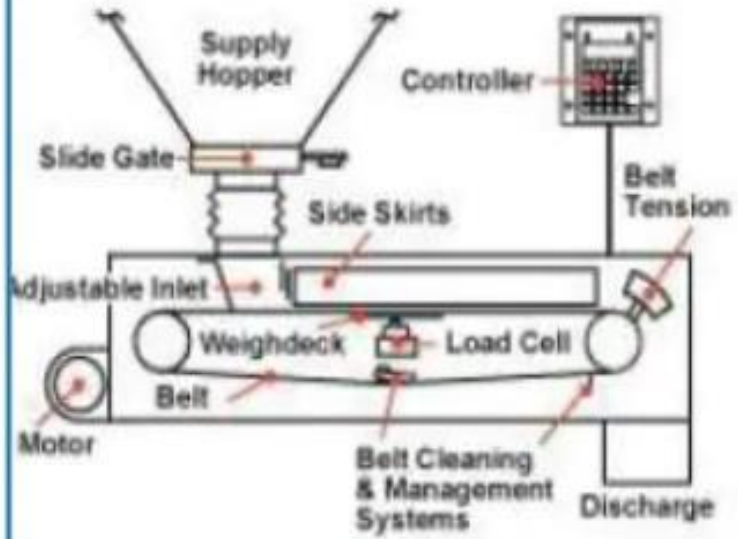
The controller continuously compares the actual weight with the set point weight, and automatically adjusts the motor speed to either increase or decrease belt speed, in order to maintain a constant federate. Any variation in the density of the material is reflected as a change in belt loading, which is compensated for by adjusting the belt speed.

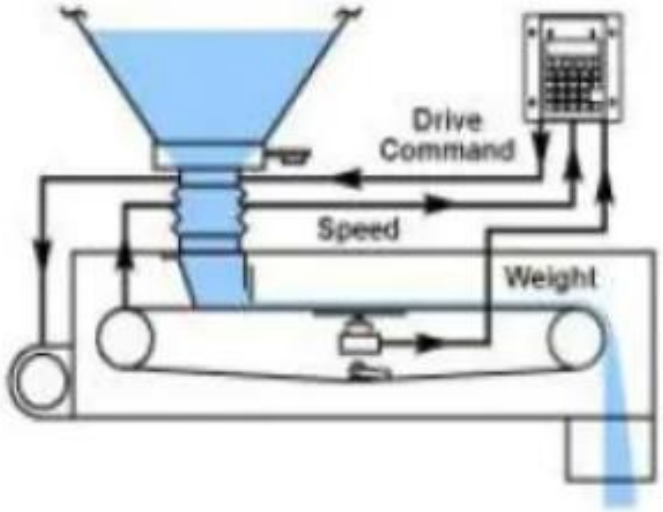
Weigh-belt feeders can be positioned directly beneath a silo, making them suitable extraction devices for foodstuffs, animal feed, detergents and plastic pellets. The ideal inlet gate has an adjustable width, so that the profile (and thus the volume) of the material being discharged can be varied to meet the needs of the application.

For inventory control or metering, the Smart Weigh Belt can be placed into a constant speed configuration to measure or totalize the amount fed into a process.



Weigh Belt Feeder Elements and Principle of Operation





THERE ARE FOUR ESSENTIAL COMPONENTS TO ANY CONVEYOR BELT SCALE.

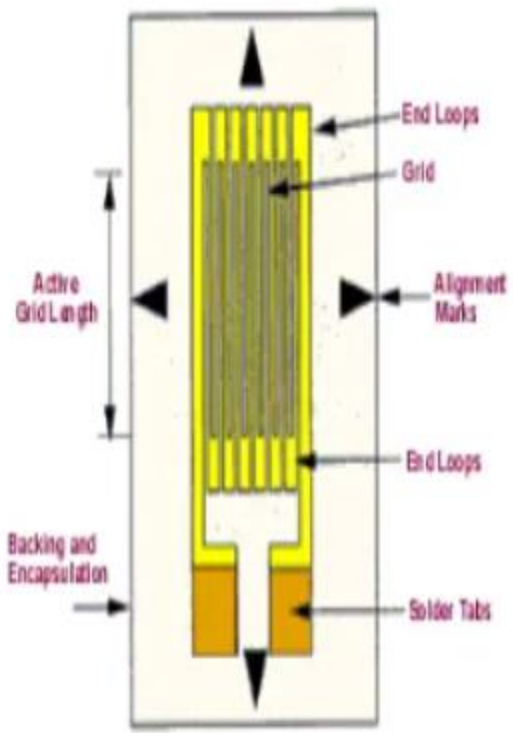
1-Weigh Bridge

2-Speed Sensor

3-Integrator

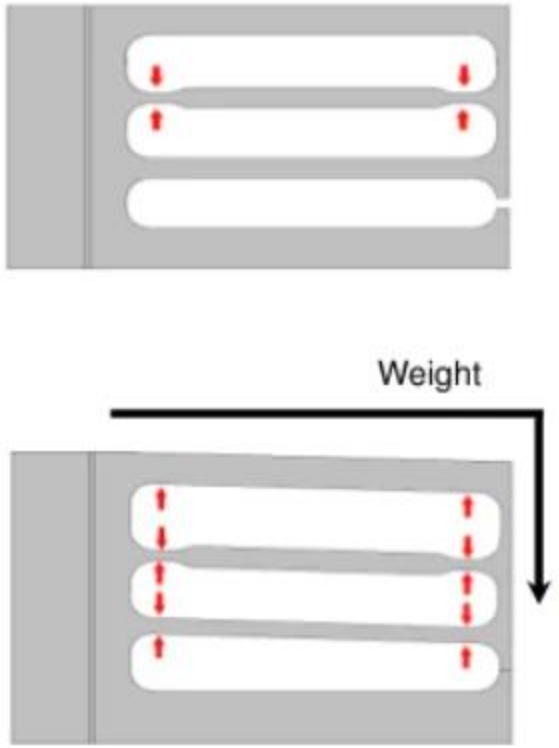
4-Conveyor

6/10/2016



Weigh bridge operation

- Strain gauge theory
  - A thin wire is coiled so that as the metal it is attached to is stretched the wire is made longer and thinner
  - The electrical resistance of the wire is related to the cross-sectional area of the wire
  - The change in resistance is proportional to the amount the load cell metal is flexed



Weigh bridge operation

- Load cell theory
  - Load cells are steel frames with strain gauges mounted at points where the load cell is designed to flex
  - The parallelogram load cell is designed for parallel sides to stay parallel and only vertical forces are measured