

Removing material from an operating conveyor belt

Thomas Greaves from DYNA Engineering explains the reasons to consider installing a diverter plough.

IF YOU’VE EVER WISHED you could remove all the material from your operating conveyor without having to waste time and money by shutting it down first, a diverter plough (DP) may be just what you’re looking for.

You might be wanting to start using your crushing plant to manufacture road base, or perhaps you have a need to remove contaminated or low-quality material from the belt before it reaches the storage bins, or possibly for removal of material in case of a breakdown, or a requirement to divert a certain amount into a ground bin.

There are many reasons to consider installing a DP, not the least of which is its relatively low cost and short production lead time.

How it works

Designed to fit onto an existing conveyor structure, DYNA Engineering’s DYNA-Trac diverter plough can be raised and lowered as required, allowing the normal operation of the conveyor to continue even when the DP is not in use. It can remain raised to allow material to travel under it when not in use.

When activated, the DP blade will start to lower onto the belt while the belt support underneath lifts the belt from a trough shape to a flat shape. This enables the blade to lightly contact the belt across the entire width, ready to divert material off the belt surface.

Material then impacts the blade in a steady stream, and it will begin to push the material to one or both sides of the conveyor, into discharge chutes.

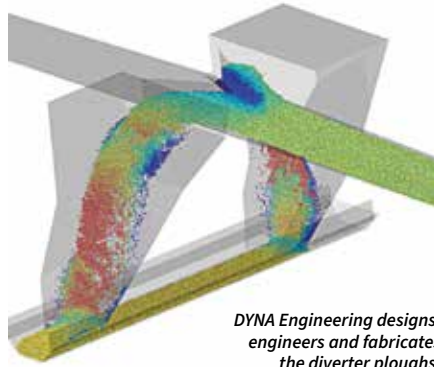
Design considerations

Blades are commonly made of hardened steel, engineered plastics or polyurethane. The composition of the blade is an important consideration as it needs to be wear-resistant enough

to withstand the application, but, at the same time, be subtle enough not to damage the conveyor belt.

The choice of blade is dictated by three factors:

- How fast the conveyor belt is running.
- How much material is being conveyed.
- Where the material is being moved to.



DYNA Engineering designs, engineers and fabricates the diverter ploughs.

Double-sided blades can handle a higher material flow rate compared to a single-sided blade. However, they will usually incur added costs for additional chutes and structures.

Part of the DP design and engineering project incorporates a belt support system. This mechanism is constructed in a series of transition and flat idler rollers that shape the belt from a trough profile to a flat profile when engaged. A mechanical energy source is connected to the belt support mechanism to lift the belt. This can be a pneumatic or hydraulic cylinder or and electric motor.

Discharge chutes

Discharge chutes are designed and installed to catch the material diverted by the blade over the sides of the flattened belt. They guide the material

A diverter plough is an apparatus that can redirect or discharge the material being conveyed.





down to a suitable discharge location below the conveyor structure. Typical discharge locations include loading points on another conveyor, storage bins, stockpiles or a dump truck parked below the discharge chute.

Recent case study

DYNA Engineering installed a DYNA-Trac DP on an overland-conveyor system

in one of Western Australia's largest iron ore mine sites in the Pilbara. The complete assembly was locally designed, engineered and fabricated in the company's Bayswater (WA) workshop, requiring over 15 tonnes of locally sourced steel work to be utilised.

The DP was being used to divert material from the conveyor before it reached the head pulley, creating a

stockpile while the stacker conveyor was still under construction. This gave the operators the ability to commission the processing plant which was further upstream in the system.

To realise the project DYNA Engineering team worked closely with the client's engineering team, designing and producing a detailed and customised solution able to meet all the customer's needs, specifications and requirements.

Designed, engineered and fabricated in under 12 weeks, the double-sided V blade is able to push up to 4,500 tonnes per hour of iron ore fines from the 2000mm width belt into purpose designed chutes. **B**

Typical DP applications

- Material flow alteration
- Material separation
- Bin maintenance and emptying of storage bins
- De-watering