

White Paper

## **A Guide to the Types of Belt Edge used in Rubber Conveyor Belts**

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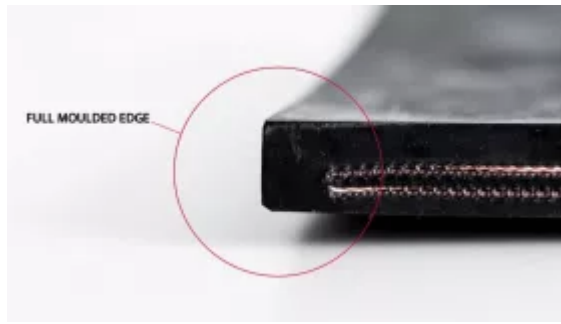
Considering the huge amounts of money spent on conveyors and conveyor belting and the numerous challenges they can present, deciding on exactly what type of edge a conveyor belt should have does not really sound particularly important. But strange as it may seem, selecting the right type of belt edge can have an enormous impact, especially in terms of cost. Here, Dunlop Conveyor Belting's Les Williams throws some surprising light on the subject and provides some useful hints on how to potentially save quite a lot of money.

### **Living in the Past**

For many years now there have been continual advances in the technology and the types of materials used to manufacture rubber multi-ply conveyor belts. Gradually, over time, misconceptions and myths are being put to rest. However, a great many conveyor technicians and conveyor belt buyers seem to retain outdated beliefs when it comes to which type of belt edge to choose.

There are only three basic types of belt edge. The importance of which type to use is vastly underrated. Choosing the wrong type continues to cost many conveyor operators a great deal of wasted money, both in terms of belt costs and also in repairs, maintenance and lost production.

### **Moulded Edges**



Full moulded edge

Many years ago, moulded edges were the standard because cotton was used as the reinforcing fabric in multi-ply belts. A moulded edge was therefore essential in order to prevent moisture penetrating the cotton fabric and causing it to rot. However, since the inception of synthetic belt carcasses using polyester and polyamide, this problem effectively no longer exists. Although belts without moulded edges are now the most commonly used, moulded edges continue to be needlessly specified within many requests for quotations.

Moulded edges can only be created when a belt is manufactured (assembled and vulcanised) to an exact width. This is a vitally important factor which I will come back to later. During the calendaring of the belt, a small strip of un-reinforced rubber is attached to the side of the carcass. The strip is formed as an integral part of the belt during the actual vulcanizing process. This typically creates between 5 to 15 mm of unreinforced rubber on the belt edge.

Moulded edges do not provide any structural advantage. In fact they can be susceptible to damage because they can very easily be torn off if the belt wanders off-track for any reason.

## **Sealed Edges**



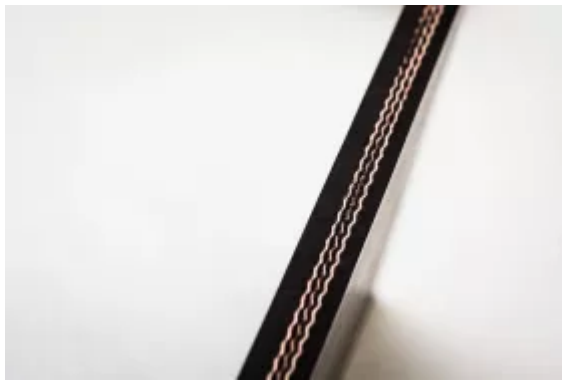
Sealed edge

The alternative and most commonly used belt edge type is the 'cut & sealed edge' or simply 'sealed edge'. The majority of fabric multi-ply belting is held in

stock in a range of the most commonly used standard widths by the manufacturers, distributors and traders. To maximise efficiency of production and minimise cost, these standard width stock belts are usually made as wide as the manufacturing machinery will allow. These are known as 'slabs' which are then cut to narrower widths. For example. 400 m of 2200 mm wide belt would be produced that could then be slit (cut) to produce 400 m of 1000 mm wide belt and 400 m of 1200 mm wide. The belt edges are then sealed.

At Dunlop we automatically create belts with sealed edges in a single process using special cutting knives that rotate at an extremely high speed. The heat created by the friction of the rotating knives melts the carcass fibres and a small amount of the rubber on the edge of the belt, effectively creating a seal. Technically speaking, this is a 'cut and sealed edge' but is more commonly referred to as a 'sealed edge'.

## **Cut Edge**



Unsealed (raw) cut belt edge

Belts with cut edges that are not sealed in any way are produced in the same way but are slit using conventional cutting knives. At Dunlop we do not recommend the use of unsealed (raw) cut belt edges.

Apart from a better visual aspect, having a sealed edge means that moisture is prevented from being drawn into the carcass from the edge by capillary forces. Although the synthetic carcass fibres are hardly affected, moisture can ultimately cause vulcanising problems when making splice joints so it is better to be safe than sorry. Having a sealed edge enables a belt to be safely used in wet conditions and makes it better suited to long term storage outdoors.

## **Steelcord Construction Belts**

In the case of steelcord and steel reinforced fabric ply belting it is necessary to use moulded edges in order to prevent moisture penetration into the carcass which, over time, would cause the steel to corrode. In Dunlop, all of our steelcord belts are manufactured to a specific set of specifications that fully embed the steel cords so for these reasons they are always supplied with moulded edges.

## **‘Made to Order’**

Many conveyor belts are ‘made to order’ for the end-user. These belts are mostly either the more specialised cover grades (such as fire resistant for example), hi-performance carcass constructions (such as steel reinforced fabric ply) or simply a non-standard width requested by the customer. Custom-made belts will naturally have moulded edges.

## **Avoiding unnecessary Cost**

If the manufacturer is prevented from making a belt at the widest, most cost-efficient production width then that will have a negative impact on the selling price to the end-user. For example, to produce 600 m of 800 mm wide belt, it is far more efficient to manufacture 300 m of 1600 mm wide belt and then cut and seal into 2 × 300 m rolls of 800 mm wide. Demanding a moulded edge rather than a sealed edge prevents this from happening because 600 m of 800 mm wide belt with moulded edges would have to be made to order and would take virtually twice the time to produce.

Unnecessarily prolonging the production time has to be reflected in the price. Causing a belt to be made to order rather than being taken from stock also has a major impact on the delivery lead time. Taking a roll of pre-cut belt from the warehouse will invariably be a whole lot faster than scheduling a special production run.

The logical conclusion in all of this is that insisting on having a belt supplied with moulded edges even when there is no practical or technical benefit can be a huge waste of money.