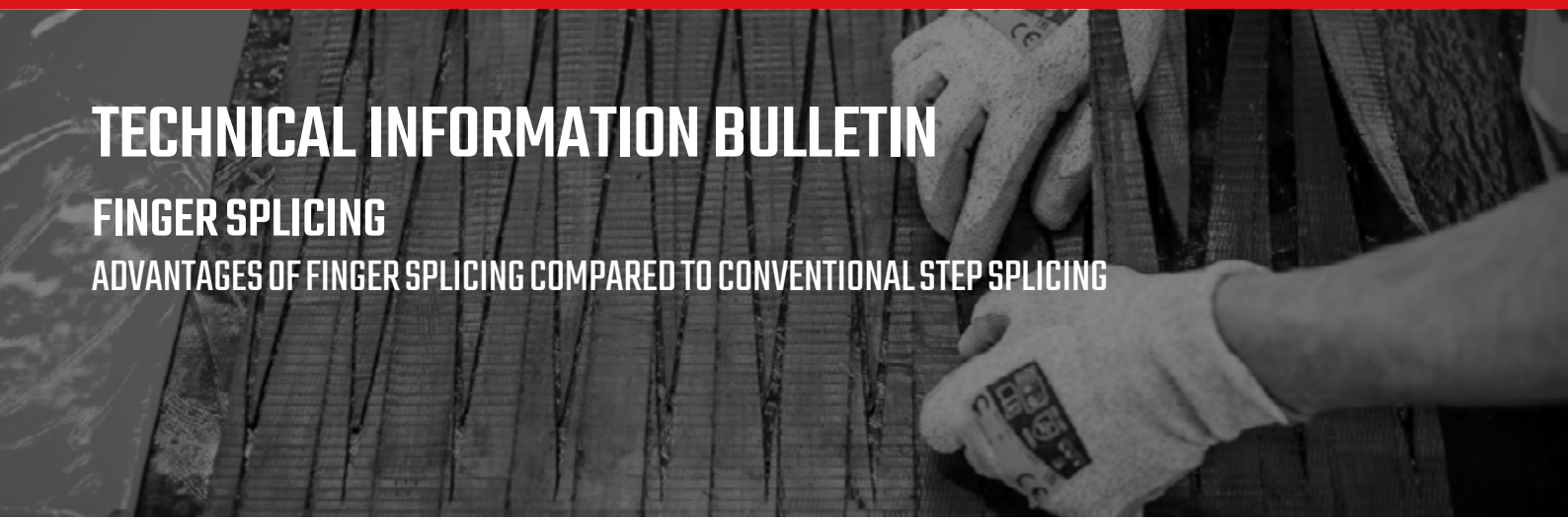


TECHNICAL INFORMATION BULLETIN

FINGER SPLICING

ADVANTAGES OF FINGER SPLICING COMPARED TO CONVENTIONAL STEP SPLICING

THE WEAKEST POINT

The area where the open ends of a conveyor belt are joined together to create one continuous loop (better known as the splice joint) is, almost without exception, the weakest point of any conveyor belt. Because of the safety implications and the potential loss of output caused by splice joint failure, it is critically important to maximize the strength and long-term durability of the joint.

The splice must withstand a wide range of changes in tension as well as other factors such as short transitions, “S” drive arrangements and impact from heavy materials falling from height on to the joint. Added to that is the dynamic stress caused by the continual flexing over drums and pulleys. Even though a great deal of time and care may have been taken in calculating the correct belt specification and buying a good quality conveyor belt, it can all be easily wasted if the splice joint proves to be unreliable.

THE ADVANTAGES OF FINGER SPLICING

The most popular method of making a splice joint is the use of vulcanized splicing, which can be either a hot or cold splice. Within this, the two most common techniques used to create a vulcanized splice joint is the step splice and the finger splice. In all cases, it is not physically possible to join a belt without some loss of longitudinal tensile strength. With this in mind, especially on more critical conveyors, it is important to optimize the strength of the splice joint.

No. of plies	Maximum % tensile strength
1	90%
2	50%
3	67%
4	75%
5	80%

The main disadvantage of a standard step splice is that it will always create a proportional loss of tensile strength that is the equivalent of one ply. As can be seen in table 1, a 2-ply step splice only retains a maximum of 50% of the belts longitudinal tensile strength, a 3-ply step joint can only achieve a maximum tensile strength of 67%. By contrast, the primary advantage of the finger splice method is that it retains up to 90% of the belt's tensile strength.

These numbers are based on 'static' tensile strength. Very importantly, in dynamically stressed conditions (when the belt is working and under load) the resistance to dynamic fatigue for a finger splice is vastly superior to a stepped splice.

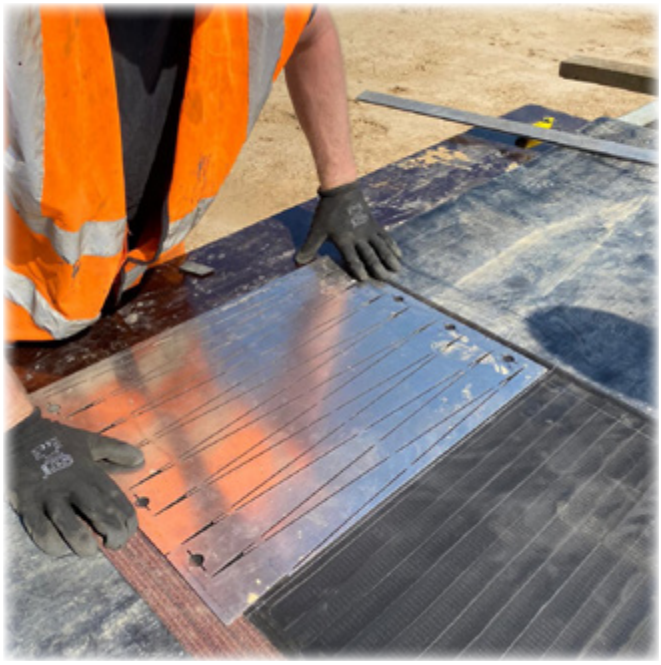
MAXIMISING SPEED AND ACCURACY

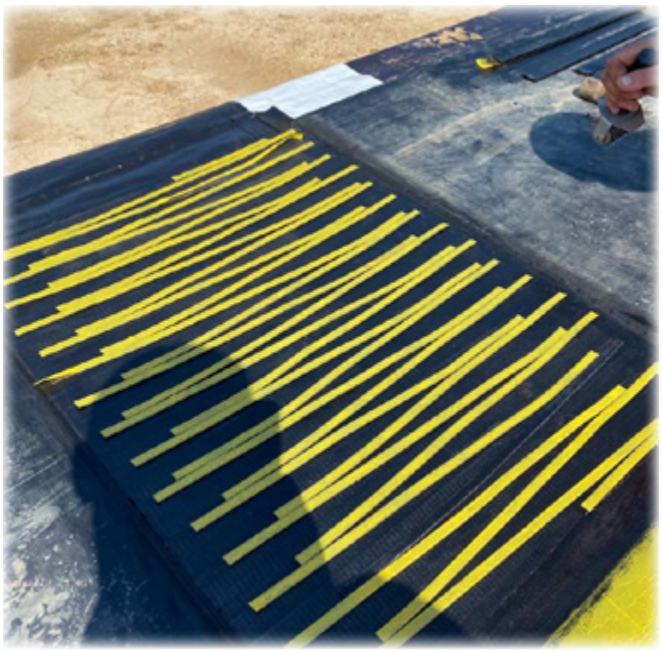
When preparing to make a finger splice it is a good practice to make use of dedicated templates with the finger shape predefined and ready to trace onto the belt. This helps to speed up the process and greatly improve accuracy.

By comparison, templates are not available for stepped splices so the accuracy depends much more on the skill and attention of the splicer who is measuring and cutting. The use of a template allows very accurate preparation and enables perfect alignment and matching and therefore the perfect splice between of both belt ends. The end result is the achievement of maximum strength and durability.

POTENTIAL COST SAVINGS

Although step splice joints are generally easier and quicker to make compared to finger splices, the loss of longitudinal tensile strength must be taken into consideration when trying to establish the correct specification of belt for a specific conveyor. Therefore, the calculation should always include the safety in the splice at the given efficiency. The much higher retention of tensile strength provided by a finger splice means that it can often be possible to install a lower and therefore less expensive specification. For example, it could mean that a 630/3 belt can be fitted rather than a 630/4-ply that would otherwise be necessary if a step splice was being used. The superior strength and durability of finger splices also reduces the frequency to repair and re-splice, which lowers both direct (actual repair) and indirect (lost output) costs.





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