

# Application Guidelines

## Introduction

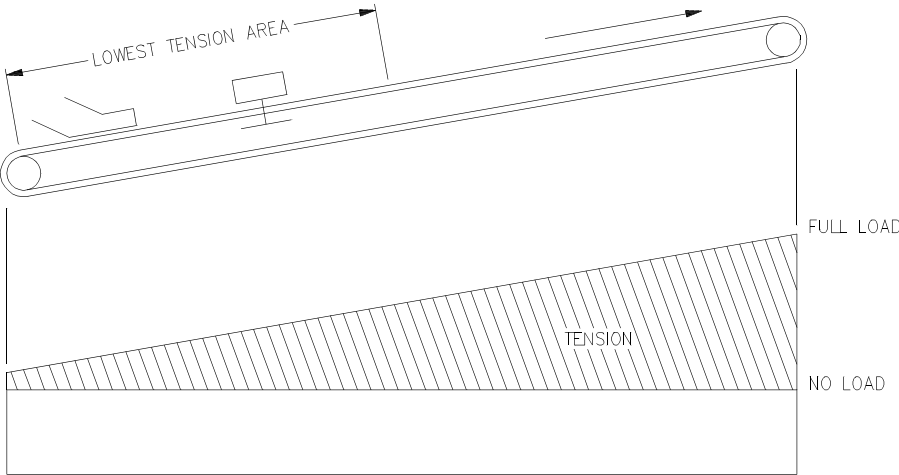
The most important consideration in the use and installation of belt conveyor scales is the application of the scale to the conveyor. The major cause for poor performance has been the misapplication of the scale to the conveyor.

The key to successfully applying the scale to the conveyor is to avoid locating the scale in any area of the conveyor where it is subjected to excessive belt tension or lifting of the conveyor belt. Always remember that the conveyor belt is an integral part of the scale and, as such, must remain in contact with the weigh bridge at all times.

**THE GUIDELINES ON THE FOLLOWING PAGES MUST BE CLOSELY ADHERED TO FOR APPLICATIONS REQUIRING A HIGH DEGREE OF ACCURACY AND REPEATABILITY. ON PROCESS INSTALLATIONS WHERE ACCURACY IS NOT OF PARAMOUNT IMPORTANCE, SOME OF THE REQUIREMENTS MAY BE RELAXED.**

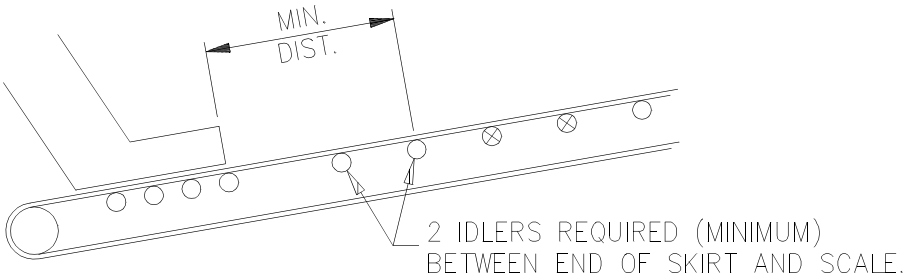
### 1. Least Tension Area:

The first general rule that applies is to locate the scale in the area of lowest tension on the conveyor. This location is normally near the tail pulley of the conveyor. High belt tension adversely affects the accuracy of the scale.



2. Material Transition:

The material to be weighed must settle on the belt before it is weighed. This requires allowing a specified length of conveyor for the material to accelerate up to the speed of the belt. The factors that influence this distance are:



- 1. Belt Speed
- 2. Conveyor Angle of Inclination
- 3. Material Lump Size
- 4. Type of Transition

Generally, the following guideline apply:

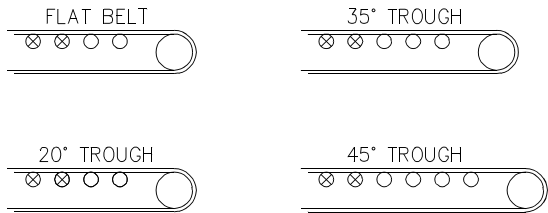
<b><u>BELT SPEED</u></b>	<b><u>MINIMUM DISTANCE</u></b>
100-300 FPM	3-4 feet
300-450 FPM	6-8 feet
450-600 FPM	9-12 feet
600-750 FPM	12-15 feet
750- OVER	20 feet

The distance is measured from the end of the infeed skirtboards to the idler adjacent to the weigh bridge.

Note: A minimum of two idlers must be installed between the end of the infeed skirtboards and the first scale idler.

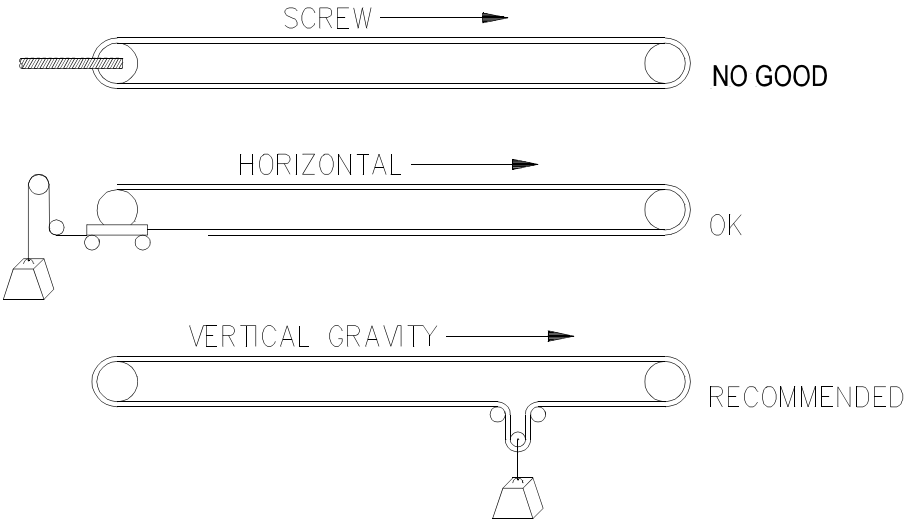
3. Belt Transition:

On short conveyors, where the scale may be located close to the head pulley, there must be a minimum number for fixed idlers between the scale weigh bridge and the head pulley to avoid the lifting effect created by transitioning from the troughing idlers to the flat or crowned head pulley. The higher the troughing angle, the greater the effect - and the more idlers needed between the scale and the head pulley.



4. Belt Take-up:

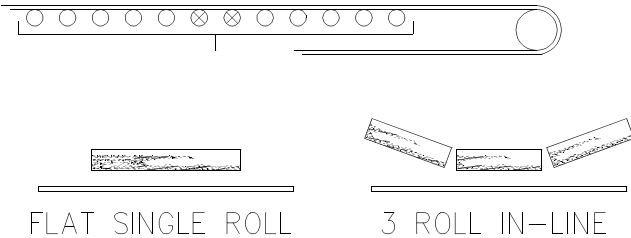
An automatic take-up is recommended to maintain a uniform belt tension. The take-up should not be so heavy as to introduce excessive belt tension, and should be designed to allow the addition or removal of weights. A vertical gravity take-up is recommended for higher accuracy installations. It is suggested a conveyor engineering handbook (such as Goodyear Handbook on Conveyor Belting) be consulted for the derivation of the correct weight. If handbook is not available, a general rule of thumb is: “the take-up weight should be no greater than the weight required to prevent slippage at the drive pulley when operating the conveyor fully loaded. If the sag between the carrying idlers is greater than 2% of the carrier idler spacing, the spacing between the carrying idlers should be decreased.”



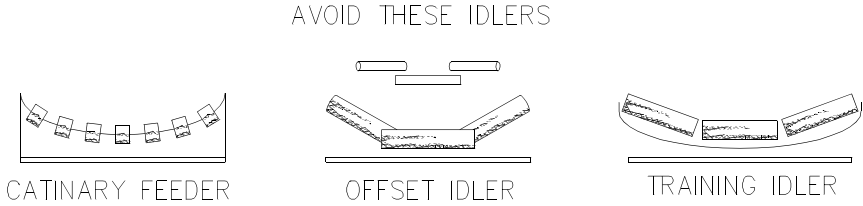
If the conveyor is equipped with a manual (screw) take-up, it is recommended the belt tension not be increased beyond the value that will produce less than 2% (of the idler spacing) sag between carrying idlers.

5. Idlers:

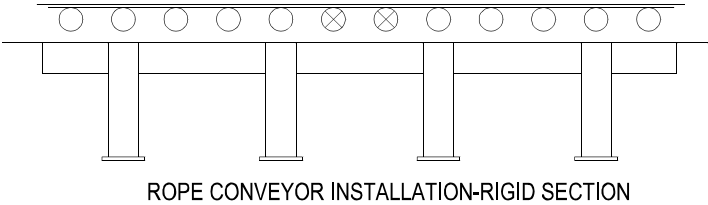
Flat single roll, or (3) roll in-line troughing idlers are required on the scale weigh bridge and (3) to (4) idlers on either side. The idler eccentricity tolerance should be 0.015" TIR for high accuracy installations.



Catenary or cable idlers must be avoided as well as off-set idlers. Training idlers must not be located within 40 feet either side of the scale.

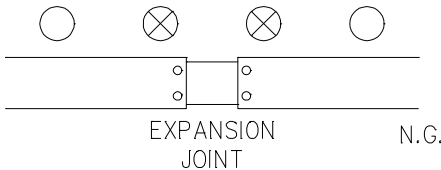


6. Construction:



The conveyor structure must be rigid and resist deflection under load. Rope conveyors require a rigid section with four fixed idlers either side of the scale weigh bridge.

Expansion joints must not be located in the area of the scale or 30 feet either side.

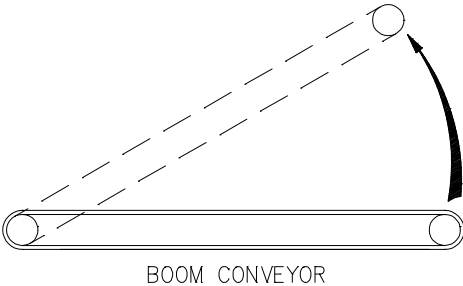


7. Conveyor Inclination:



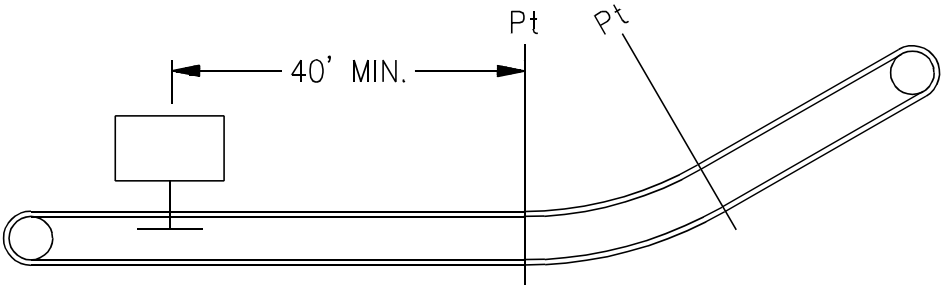
The conveyor inclination must not exceed the angle at which the material will slide backward and be re-weighed. Normally, most conveyor companies are aware of the critical angle.

The inclination of the conveyor should be fixed at one angle. Errors will result with changes in inclination.

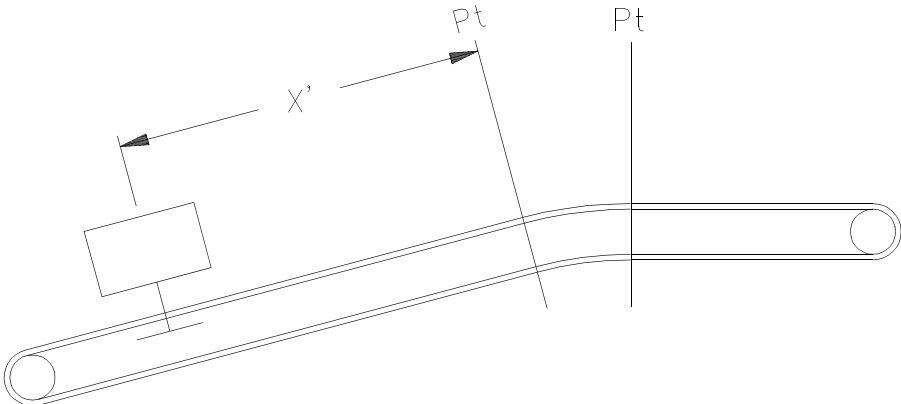


8. Curves - Concave:

If the conveyor has a concave curvature, the scale must be located at least 40 feet from the point of tangency . . . . . to avoid lifting effects of the belt.



9. Curves - Convex:

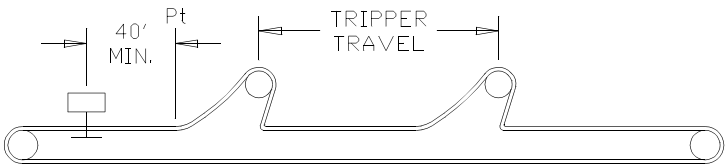


If the conveyor has a convex curve, the scale should be located:

- 20 degree Idlers      X = 8 feet or 2 idlers
- 35 degree Idlers     X = 12 feet or 3 idlers
- 45 degree Idlers     X = 16 feet or 4 idlers

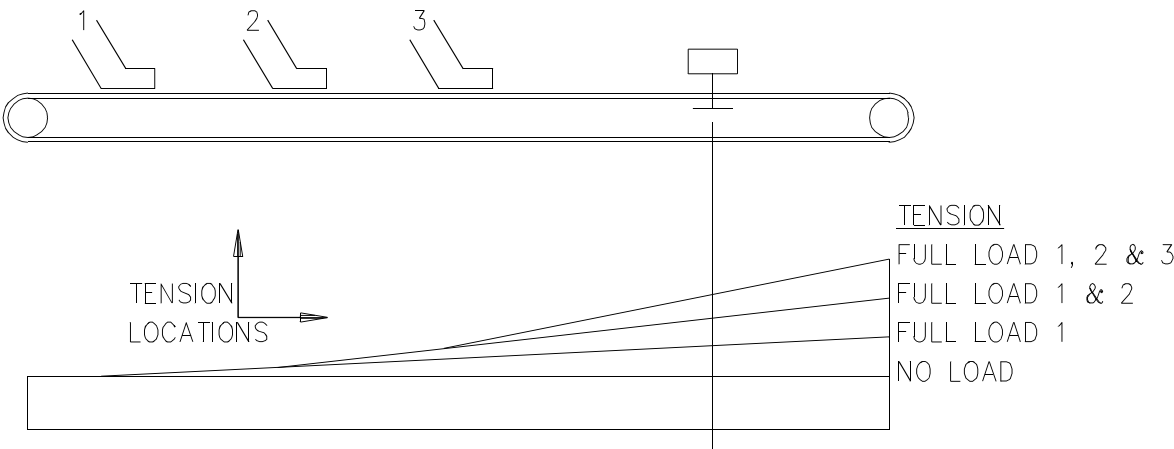
10. Trippers:

If the conveyor is provided with a tripper, the scale must not be located at a point 40 feet from the point of tangency of the belt - within the tripper fully retracted toward the tail pulley.

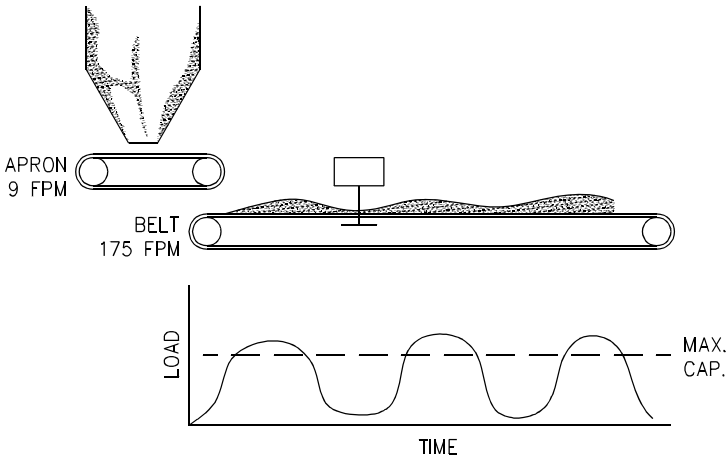


11. Multiple Feed Points:

Conveyors with multiple feed points should be avoided when high accuracy is required.

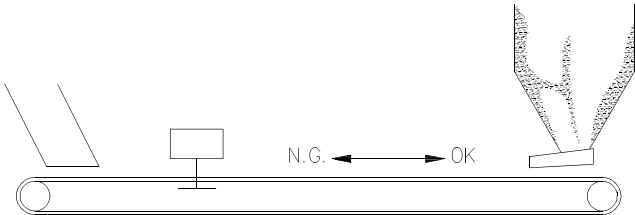


12. Non-Uniform Loading:



If the feed to the conveyor is not-uniform, plows and leveling plates should be installed to re-shape and smooth out the load. Apron feeders often create non-uniform loading. Ideally, actual loading should be between 50% and 90% of scale capacity, with less than a 5% variation in feed rate.

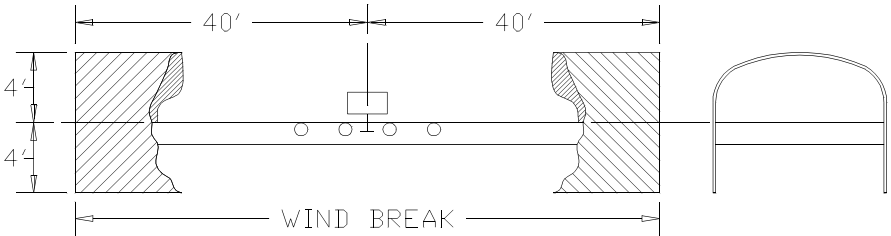
13. Reversible Conveyors:



The scale will not weigh accurately in both directions and any performance guarantee would be based on weighing in one direction. Two complete scales are required for accuracy in both directions.

14. Wind Breaks:

If the scale location will be subjected to wind velocities over 5 m.p.h., wind breaks should be installed. The wind break should extend 40 feet to either side of the scale, and 4 feet above and below the belt line. The wind breaks should be attached to the sides of the conveyor, and a section should be easily removable for inspection of the scale.



NOTE: For outside applications, the conveyor must be fitted with a protective cover.

15. Infeeds:

The infeed to the conveyor must be interruptable to allow for empty belt calibration. If a prefeed device is used, electrical circuitry should be provided to operate the scale conveyor independently of the prefeed device. If the conveyor “drags” the material from a storage bin, the bin should be fitted with a cut-off gate.

16. Scale Access:

The conveyor should be equipped with an adequate platform or catwalk to allow for inspection and servicing of the scale. It is recommended that the platform, or catwalk, be erected on both sides of the conveyor in the scale area.