

Suppliers' Tips

My weighbelt feeder isn't producing an accurate feedrate, what can I do?

Many, if not most, errors related to feedrate accuracy occur because of design errors or improperly sizing the feeder for the application. However, to simplify this discussion, we'll assume that the weighbelt was properly designed for the application and was accurate at one time, that calibration results using the correct simulated test load can still be routinely performed well within the accuracy requirements, and that the appropriate design parameters have been properly programmed and remain in the instrument.

If we begin with these assumptions, we'll need to address the narrower question of what goes wrong when actual material is being handled.

1. *Belt speed (velocity) reading fluctuations.* Weighbelts convert belt speed (fpm) and material loading (pounds per foot) into a rate (pounds per minute) signal for the controller. If the belt slips or the pulley increases in size due to material buildup, a belt speed error will be produced. A 1 percent error in speed output will produce a 1 percent error in the scale output.

2. *Improper belt tension.* Excessive belt tension can result in feedrate inaccuracies attributable to variations in the belt and pulley eccentricity. In addition, an overly tensioned belt will be registered as either additional weight on the weight sensor or insufficient weight on the weigh sensor, depending on how well aligned the weigh idler is to the adjacent (nonweigh) idlers. Follow the manufacturer's belt tension recommendations to avoid inaccurate weighing.

3. *Material accumulation.* Material buildup on any of the system's weighing parts will change the system tare, resulting in feedrate inaccuracy. Follow recommended calibration intervals and clean the weigh section as required. However, manufacturers suggest that this material buildup not be disturbed in cases where accumulation remains constant in the process. Instead, the system should be rebalanced for the additional tare. When accumulation is variable, some material accumulation prevention is required to maintain feedrate accuracy.

4. *Feed material issues.* Check that the material being fed meets the design specifications for particle size, moisture content, density, and flowability as variations in these parameters will affect feedrate accuracy. In addition, erratic material flow to the weighbelt because of surging, ratholing, bridging, or flooding can directly affect feed accuracy.

Following the manufacturer's recommended maintenance procedures goes a long way toward keeping a weighbelt accurate and reliable.

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There are several reasons why a weighbelt feeder may not provide an accurate feedrate. The weighbelt uses both the weight on the weighbridge and the belt speed to determine the feedrate. One possible reason for an inaccurate feedrate could be a buildup of material on the feeder's head or tail pulley. This can increase the belt tension and change the weight registered on the weighbridge. If the buildup continues, it could actually stretch the belt to a breaking point. Make sure that the head and tail pulleys are cleaned and that the cause of the material buildup is fixed. This includes adjusting the feeder's side skirts between the side walls and the belt.

Feedrate errors can also be caused by belt slippage. If the belt is slipping, the feeder's rotation transmitter won't provide accurate information for the belt speed. Adjust the belt tension based on the manufacturer's recommendations and check the tension periodically. Make sure that the belt is tracking properly to keep it from rubbing on the side rails.

Another possible reason for a feedrate error would be a bad load cell or a bad linkage between the weighbridge that the belt rides on and the load cell below. You can diagnose these issues by placing a test weight on the weighbridge. Put the weight on and take it off several times to make sure that the load cells are within the manufacturer's specification and that the reading is repeatable. After all the possible mechanical issues are addressed, then perform a weighbelt recalibration based on the manufacturer's recommended procedure. If the results of catch tests — which is when an operator compares the material weight registered by the weighbelt and the actual material weight from a scale — still show a discrepancy, then the actual electronics that integrate the material weight and belt speed in the feeder may be the problem.

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Equipment suppliers are a valuable source of information about equipment and processes. In light of this, each month we ask suppliers a question of concern to our readers. Answers reflect the suppliers' general expertise and don't promote the suppliers' equipment. If you have a question you'd like suppliers to answer, send it to Kayla Carrigan, Associate Editor, Powder and Bulk Engineering, 1155 Northland Drive, St. Paul, MN 55120; fax 651-287-5650 (kcarrigan@escpub.com).