## RAS Continuous Weighing and Controlling: RAS (Recycled Asphalt Shingles) and RAP over the same Belt Scale; The biggest problem is that the control system has no idea what is coming out of either bin all the time. Bins do bridge, feed throats do get clogged, RAS Density changes constantly, therefore the bin output continuously changes when it should not be changing at all. RAS introduction affects oil content and voids.

After continuous weigh scales for RAS alone was installed, a test was conducted to monitor the consistency of bin output at a given speed. The Feeder Scale reported changes of flow of plus and minus 15% due to RAS density changes. That is a huge swing when comparing that with the plus and minus ½% accuracies some DOTs are requiring. This indicates that the assumption the industry is depending upon for the accuracy required for an ingredient as important as RAS is not a good assumption. Assuming weights when weighing volumetrically is not an adequately accurate method to control RAS.

Belt Scales are not accurate at low flow rates. Some belt scale manufacturers refuse to weigh light loaded products such as RAS for Belt Scale applications. The two different Ez-Flo Scales discussed can measure more accurately at low flows than the belt scales.

Clarence Richard Co. manufactures continuous weigh scales (EZ-Flo) for difficult materials that are being added to the mix process. Whether the Mix Producers realize it or not, they are having a problem accurately metering RAS into the process. This is a problem because the existing equipment today at the plant does not accurately measure the RAS Flow Rate. Adding I) Ez-Flo Weigh Loss Scale-Controller (Stationary plant .. wet or dry material) can enable your control system or II) an EZ-Flo Belt Feeder Scale (consistently dry material or portable plants) to perform as specified.
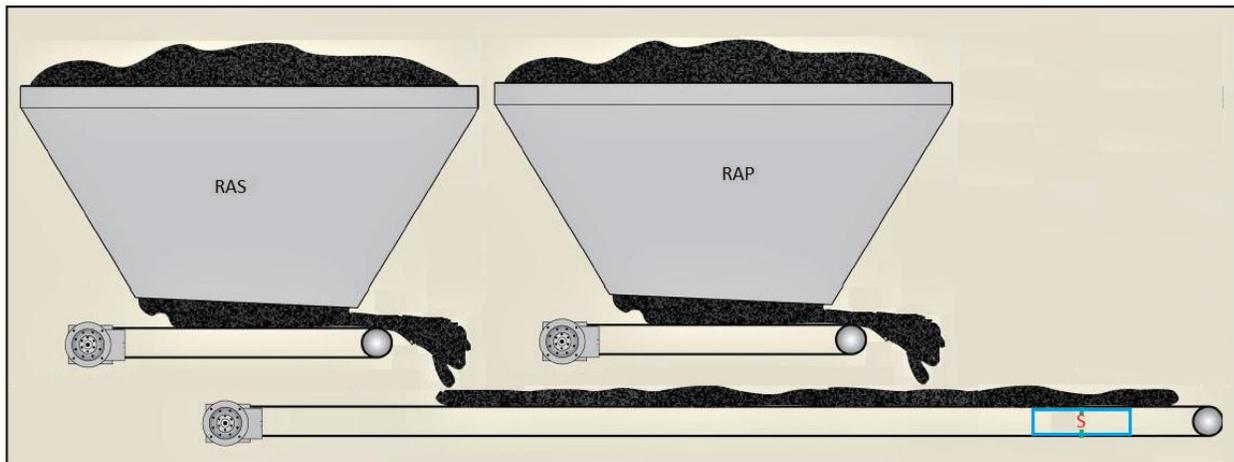
RAS is making 30% swings in proportions required because of density change. Imagine what that does to your end product.

Existing Volumetric System. These systems work relatively well with material that does not change much in Density.
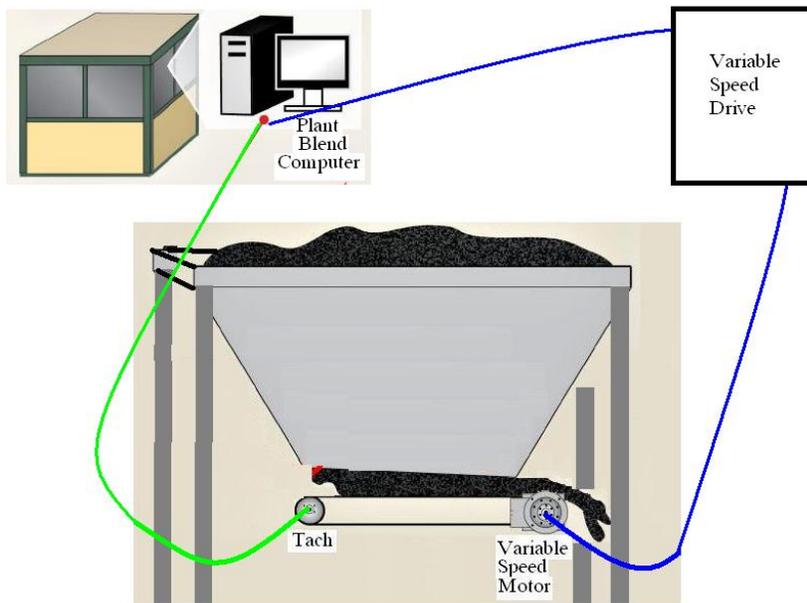

Problem: Materials, such as RAS Recycled Asphalt Shingles, can vary considerably in density which makes consistent, accurate RAS Control in a volumetric control situation impossible.

Solution I: **EZ-Flo Weigh Loss Scale-Controller** (Stationary Plant with Bin Legs on Load Cells) B that retrofits into any control system with no hardware/software changes.

EZ-Flo Weigh Loss Scale-Controller 1) not only weighs the RAS flow as the bin is depleting, 2) it controls the speed of the feeder and 3) alarms when the bin reaches a low level and 4) is smart enough to know when the bin is bridging or partially bridging is happening and it alarms for that as well.
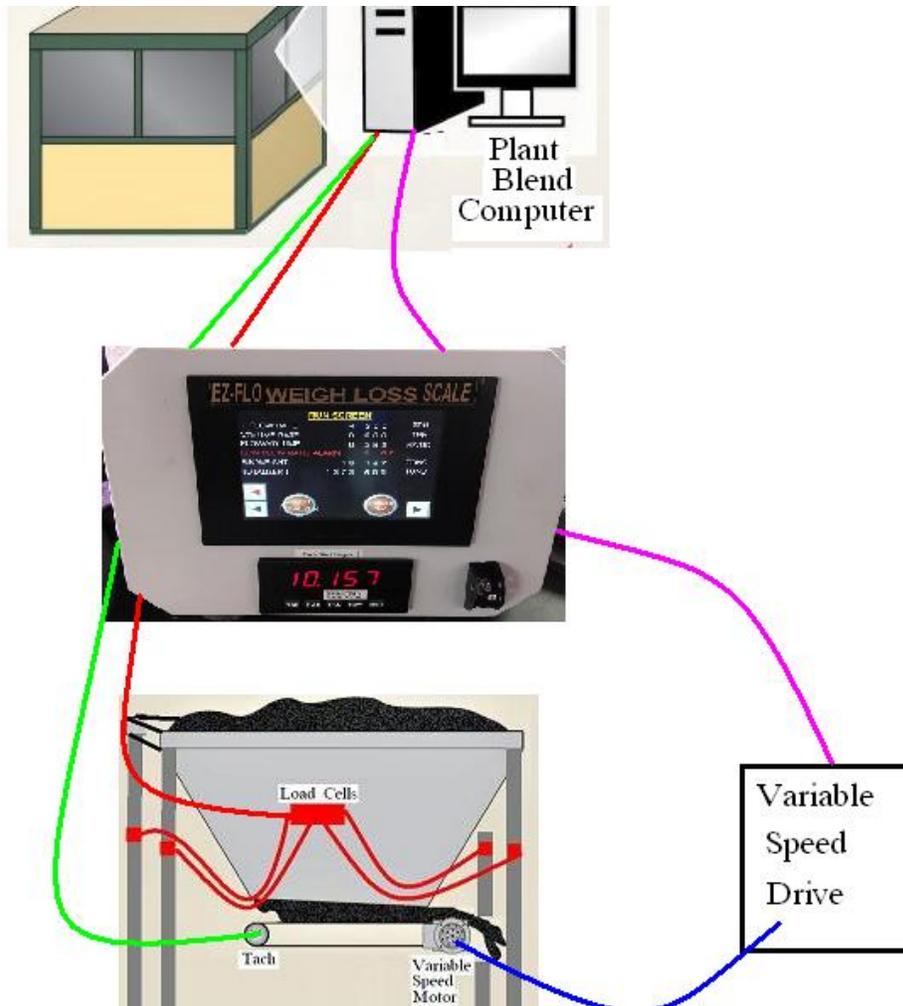
The EZ-Flo Weigh Loss Controller takes control of the Tach signal from the Plant Blend Control . This signal allows the EZ-Flo Weigh Loss Controller to calculate the volumetric flow and 1) for a short time, use this for startup and 2) allows the EZ-Flo Weigh Loss Controller   to compare the belt speed versus the flow rate which triggers a Low Flow Rate alarm when the belt speed increases abnormally during a bin bridge .

The Flow Scale Rate Signal replaces the existing Tach Signal normally wired to the blending computer. By doing so, blending computer hardware/software changes are not required. The existing blending computer RAS Bin Closed Loop Control can now control the RAS Feeder Speed from the accurate information as being delivered by either Ez-Flo Scales.
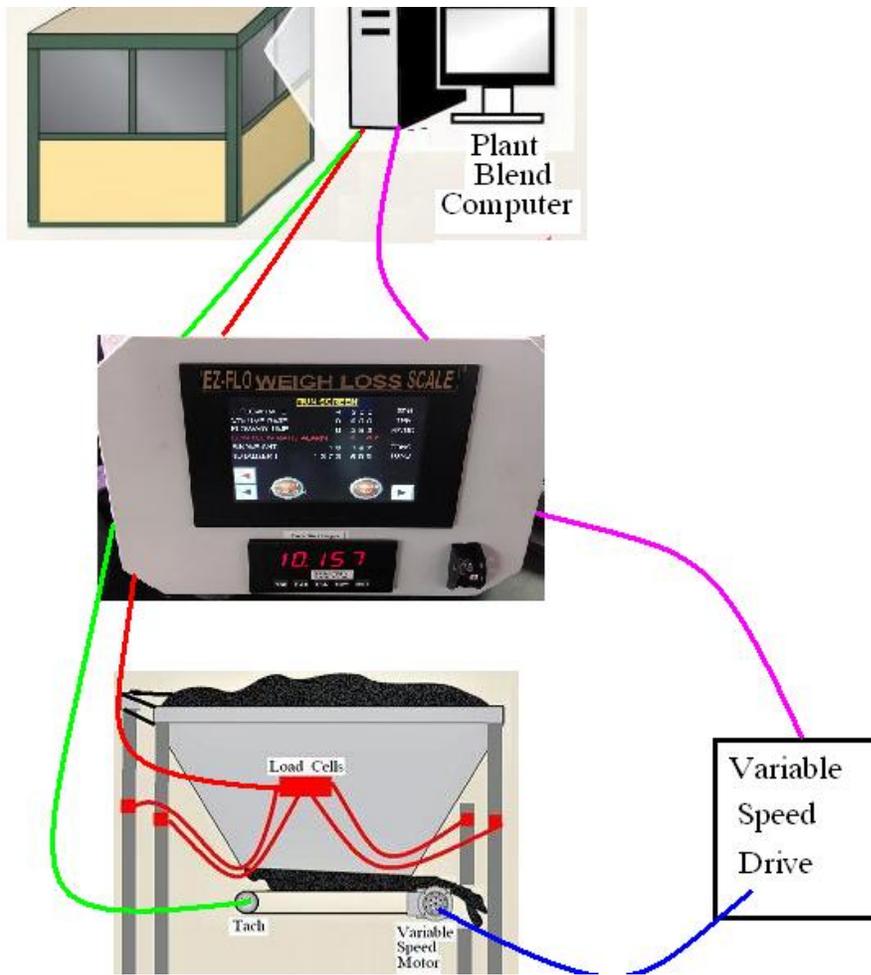
The EZ-Flo Weigh Loss Controller replaces the Volumetric Tach Frequency signal with a Gravimetric Scale Frequency signal. The Plant Blend Control does not know the difference and operates like it always does. The big difference is that the information the blend control is getting is now accurate gravimetric information and not the assumed volumetric information it had always been getting from the Tach Signal.

The weigh scale response time for changing gravimetric flow rates is considerably longer than volumetric instantaneous Tach Frequency changes. Therefore, the EZ-Flo Weigh Loss Controller startups up automatically on tach control for about a minute and then switches over to scale control when the scale has taken the time to calculate the weigh depletion. Since the scale response time is slower than the fast closed loop control system dynamics are set up for, the EZ-Flo Weigh Loss Controller can adjust for that easily by processing the reference speed signal from the Plant Blend Control through the EZ-Flo Weigh Loss Controller to the Variable Speed Drive.

 The bin is kept charged with a bucket loader every ½ hour or so. When the bin is being charge, the EZ-Flo Weigh Loss Controller senses the lack of weigh depletion and commands the bin feeder motor speed to freeze at that speed for a short time until the scale settles.

If the system is down for any reason, the scale can be switched out and the Tach switched back in and everything works like it did in Tach control. The retrofit process of applying the EZ-Flo Weigh Loss Controller did not change any parameters in the Plant Blend Computer therefore and the System allows the end user to use the Plant Blend Computer using the same bin volumetric calibrations the bin normally runs on.
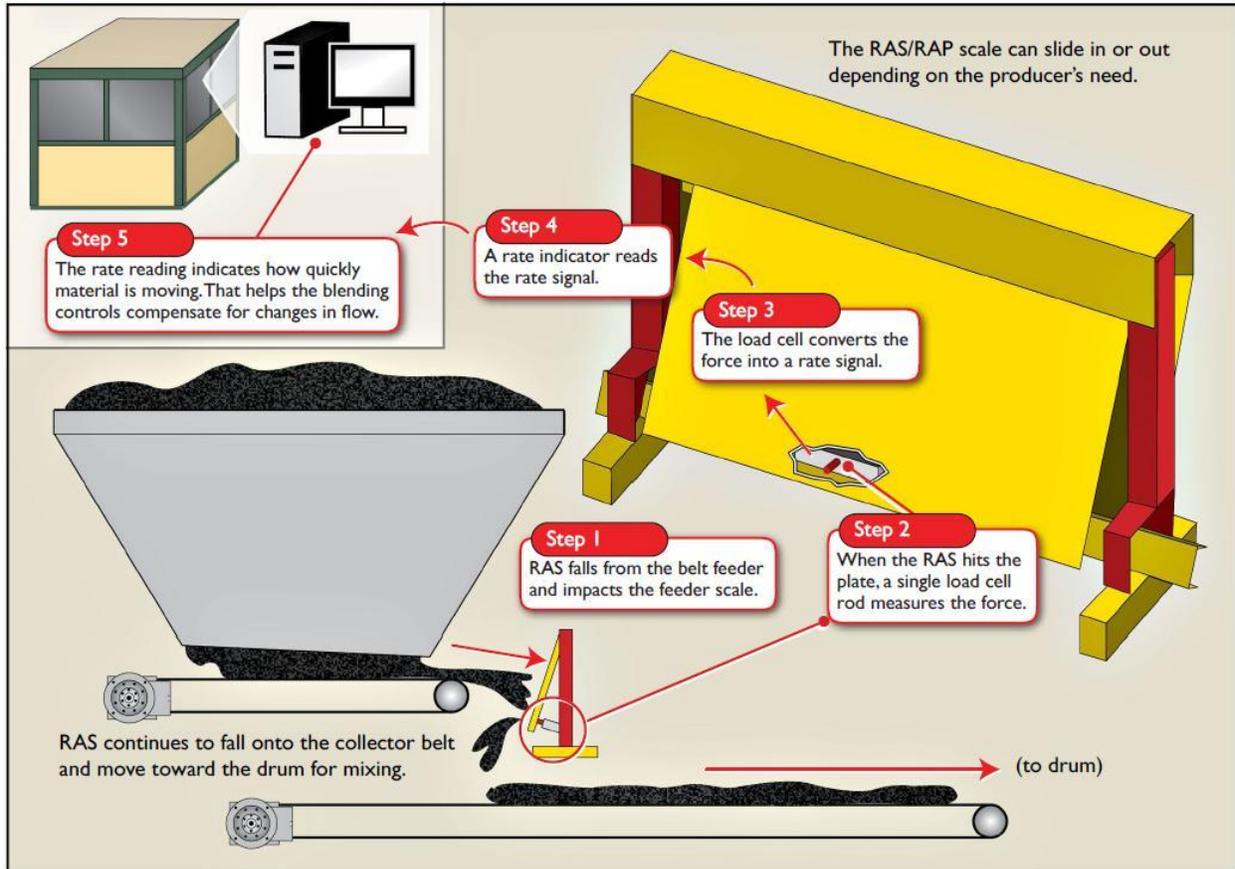
The price with the load cells, summing amp, Ez- Flo Weigh Loss Scale/Controller and phone-webinar support is $11,500. with free phone-webinar installation help. It will be relatively easily to install and it is most possible to install this without a service trip on our part .

Added Bonuses: Low Bin Level Alarm, Bin Bridging or Partially Bridging Alarm combined with Automatic Bin Vibrator-Blaster Enable Contacts.

Solution II: EZ-Flo Feeder Scale- Scale (consistently dry material or portable plants)

The RAS/RAP scale can slide in or out depending on the producer's need.

Step 5
The rate reading indicates how quickly material is moving. That helps the blending controls compensate for changes in flow.

Step 4
A rate indicator reads the rate signal.

Step 3
The load cell converts the force into a rate signal.

Step 1
RAS falls from the belt feeder and impacts the feeder scale.

Step 2
When the RAS hits the plate, a single load cell rod measures the force.

RAS continues to fall onto the collector belt and move toward the drum for mixing.

(to drum)

This solution is sometimes chosen a) when it becomes too difficult to retrofit an existing stationary bin set of legs to load cells or b) the weight being controlled is on portable bins. This system works best when the material is consistently dry. Excessively Wet Material; When (if) excessive material adheres to the plate, an alarm is activated allowing for the operator to clean the plate or switch to volumetric control until the plate is cleaned. The price with the load cells, summing amp, Ez- Flo Weigh Loss Scale/Controller and phone-webinar support is $11,500. with free phone-webinar installation help. It will be relatively easily to install and it is most possible to install this without a service trip on our part .

Graphics.. Courtesy Asphalt Pro Magazine