

## Asphalt Testing Solutions & Engineering, LLC

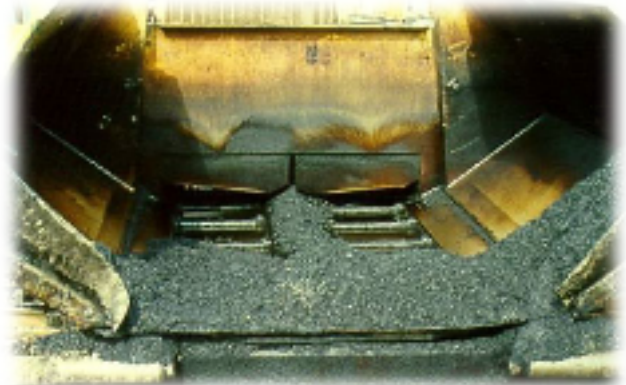
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### Trouble-Shooting Segregation Problems

The easiest way to find the source of your segregation problems is to “chase the problem backwards” in the operation. If you encounter segregation in the final mat, start looking backwards until the segregation stops – the cause of your problem will exist in the transition between where it is occurring and where it is not. As simple as this sounds, it works. Below is a list of some common causes of segregation at various stages of the operation – listed in a backwards direction. They can serve as a simple “punch list” for locating your problem.

#### At the Paver:

- **Failure to “fold the hopper wings” infrequently during the paving operation** – this can cause both gradation problems and “temperature segregation”
- **Failure to keep the ends of the cross screws full during paving** – this causes large rock to roll to the longitudinal edges of the mat
- **Failure to keep the depth of material high enough in the cross screw** – maintain the level of mix +/- 1” from the center of the shaft on the cross screw
- **Allowing the hopper to run empty between truck loads** – keep the paver hopper or paver insert between 1/3 and 2/3 full at all times.



#### During Truck Loading:

- **Load in multiple drops** – do not load in one continuous drop – load against the bulk head, tail gate, then “socket load” the middle in three drops
- **Do not allow the truck to creep forward during loading** – which can cause “running segregation” in the truck bed
- **Loading below the cone line should be avoided** – always keep a cone of material in the silo – emptying the cone typically results in coarse mix
- **“Lose the cone” on startup and shutdown** – evaluate wasting the first and last load from the silo – the first load when the silo fills and last load as the silo empties are often coarse and segregated



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### At the Batcher:

- **Holes in the batcher gates or batcher walls** – allow mix to trickle feed into the silo
- **Make sure batcher gates close all the way** – so mix is not allowed to trickle feed into the silo
- **Make sure each batch is as large as possible** – timed batchers should be adjusted so that the batcher fills up completely regardless of production rate – volumetric batchers should have paddles adjusted to collect as large of a mass of material as possible
- **Make sure batchers are fed in the middle** – too fast of feed from a slat is sometimes a problem with this – AND split batchers (batchers with a middle splitter and two gates) should be fed in-line with the splitter so material collects evenly on both sides



### At the Slat Conveyors:

- **Make sure feed is at 90 degrees at transfer points** – sometimes “oblique feed” causes large material to “roll to the outside” at transfer points
- **Make sure slats are tall enough and moving fast enough for the production rate** – material should not roll over the top of the slat
- **Slats that run too fast** – can cause segregation by “flipping” the large stone to the outside of the transfer point at discharge



### In the Drum-Mixer or Mixing Drum:

- **Mixing flights with buildup on them** – can create dams in the drum, causing segregation behind the dam
- **Missing mixing flights or mixing tips** – can also create dams and spots where segregation can occur
- **Buildup on mixing flights** – can eliminate the “tumbling action” in the mixing area, which can cause large stone to constantly roll to one side in the mixing chamber
- **Feed from the drum to the slat should be at 90 degrees** – “in line” feed can cause the mix to be coarser or finer on the left or right depending on the effectiveness of the mixing chamber – see above – 90 degree feed from drum to slat mostly eliminates this problem by remixing the material





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### At the Feed Bins:

- **Consider “blending or mixing the face” before filling the loader bucket** – any minor amount of stockpile segregation is usually eliminated with this approach
- **Care should be taken to make sure the right material is fed into the right bin** – with a repetitive movement like this it is easy to accidentally put the wrong material in the bin



### In the Stockpiles:

- **Outside edges can be coarser and inside finer with “stacker built” material** – it is imperative to “blend the outside edges with the inside middles” prior to filling the loader bucket
- **Stacking material too high with the loader** – can cause the outside edges to become coarser as material constantly rolls down the outside edges – re-mix the outside edges
- **Building ramps** – can cause material to “ribbon segregate” as it is pushed off the end of the ramp and tumbles down to the ground – extreme outside edges become coarser



### At the Quarry:

- **Outside edges can be coarser and inside finer with “stacker built” material** – it is imperative to “blend the outside edges with the inside middles” prior to loading trucks
- **Stacking material too high with the loader** – can cause the outside edges to become coarser as material constantly rolls down the outside edges – re-mix before loading
- **Building ramps** – can cause material to “ribbon segregate” as it is pushed off the end of the ramp and tumbles down to the ground – extreme outside edges become coarser
- **Storage silos can segregate** – depending on the silo diameter or width – outside edges can become coarser as the silo is filled like a hot mix silo - when the silo is then emptied gradations become coarser



## NOTES

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Asphalt Testing Solutions & Engineering, LLC (ATS) is an independent asphalt testing company with multiple laboratories in Jacksonville, Florida. In addition to providing quality control and quality assurance services for asphalt contractors in the lab and on the roadway, ATS also operates a performance testing lab and asphalt binder lab.

The ATS staffed and managed quality control labs are CMEC accredited and the performance lab is AASHTO accredited for hot mix asphalt, aggregate and asphalt binder testing. A licensed professional engineer heads the consulting and legal assistance services for ATS.

ATS offers services encompassing quality control testing, quality assurance, performance testing, asphalt binder testing, mix design, engineering consulting, product development and expert witness services. ATS team members maintain a pulse on the industry, including innovative technologies and specifications around the world through involvement in national and international committees and organizations. Staying on the forefront and providing input to the changes in the industry allows ATS to service its clientele with a higher-level knowledge.

ATS is housed on the property of an asphalt contractor with the ability to schedule and run research mixes through the asphalt plant. Resources are also available to lay material in the field for real world scenario testing and analysis.