



LAB SHEARING AND BLENDING OF ASPHALT BINDERS AND ECR

In Asphalt Plus Technical Bulletin 1, Engineered Crumb Rubber (ECR) lab mix preparation discusses pre-blending of rubber and heated binder in a shearing mixer before the addition of the modified binder to heated aggregate in a bucket mixer.

Although use of a shearing mixer is recommended, there will be times when that equipment is not available. In those cases, lab technicians can use portable paint stirring or mixing equipment as an alternative to a shearing mixer.

If a portable or drill-mounted mixer is used, the technician must remember that they are stirring a heated liquid. As such, mixing should include all appropriate guards and personal protective devices as required under OSHA in order to avoid any injuries.

Under normal lab mixing/shearing of binder and ECR, the binder is heated to 325 F, ECR is added, and the ECR/binder is shear-mixed for 30 minutes before use in mix production. During mixing/shearing, the binder is held at the same 325 F temperature.

If a portable or hand-held mixer is used to blend ECR and heated binder, the binder will cool during mixing operations unless heat is added to the binder. If it is not possible to maintain binder heat while mixing/shearing is occurring, the following procedure is also acceptable:

1. Heat the binder to 325 F.
2. Add 1/3 of the required ECR to the binder and mix for one minute.
3. Add the second third of the ECR and mix for one minute.
4. Add the final third of the ECR and blend continuously for ten minutes or until the binder temperature falls below 310 F. Monitor the binder temperature with a heat gun or thermometer.
5. Place the blended binder in an oven and bring the rubber-binder temperature back to 325 F.
6. Blend continuously for ten minutes or until the

binder temperature reaches 310 F.

7. Repeat the re-warm-mix process until the total mixing time exceeds 40 minutes.

This will provide roughly the same rubber-binder blend that could be obtained from 30 minutes of mixing/shearing with a shearing mixer.

Please use care when inserting, operating, or removing the mixing device from the heated binder, please conform with all applicable safety standards, and please follow all binder handling procedures covered in TB 1. For further questions, please contact Asphalt Plus at the numbers provided below.



Figure 1: Hand drill attachment for mixing ECR and binder



Figure 2: Bench-scale binder-ECR mixing system