

SOP No: SOP-MILL-004	SOP Description: Separation of Broken/Head Rice Using a Shaker Table
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### **SOP-MILL-004: Separation of Broken/Head Rice Using a Shaker Table**

Scope:

Head rice is defined as kernels that are at least three-fourths of the original kernel length after milling (USDA, 2005). Head Rice Yield (HRY), the mass percentage of rough rice that remains as head rice after milling, is a primary indicator of milling quality. In order to determine HRY, broken kernels must be separated from the head rice fraction of milled rice.

Principle:

Broken kernels are separated from head rice using a series of vibrating inclined screens that are sized according to the type of rice (short, medium, or long). The screens, set on an incline, vibrate gently, which causes the higher-mass head rice to be conveyed into a collection pan before the lower-mass broken or underdeveloped kernels. A final visual check of the broken fraction is done to sort out any head rice that may have been caught in the screens.

Equipment:

Grainman Model 61-117-01, Grainman Machinery Manufacturing Corp., Miami, Florida

Materials:

Milled rice  
Collection pan for head rice fraction  
Vessel for collecting broken kernel fraction  
Scale

Procedure:

1. Select the proper screens to place on the table according to the rice being tested. The screens are marked either medium grain (10/64" screens) or long grain (12/64" screens).
2. Tighten the screens in place with the screws located on the back left-hand side of the frame, making sure that the screens are level.
3. Place the sample at the front of the top screen, at the top of the incline (closest to you).
4. Turn the shaker table on, set at approximately 80 rpm, and set a pan at the base of the bottom screen for collection of head rice.
5. Since the rice has a tendency to pool along the left side of the screen, use a wooden stick to gently even it out as it vibrates down the screens.
6. Observe the rice as it moves down the screens into the collection pan. If there is a lot of head rice left on the screens, increase the speed. If there are a lot of broken kernels coming down with the head rice, decrease the speed.
7. Let the shaker table vibrate until the majority of the head rice is collected.
8. When the rate of falling rice has slowed considerably, switch off the shaker table. Carefully remove the top screen from the frame and empty the contents into the large, flat stainless steel

tray that accompanies the table. Knock the back side of the screen with a wooden stick to dislodge all of the kernels.

9. Rerun this portion of the milled rice to ensure further separation of brokens from head rice.
10. Once all of the head rice is collected in the pan, remove the screens and empty the remaining kernels into the stainless steel tray.
11. For the most accurate head rice yield, it is necessary to hand sort any head rice that remains in the tray and add it to the head rice fraction.
12. Weigh the head rice and record as head rice weight. It may be necessary to weigh the broken fraction of the sample, as well.
13. Calculate Head Rice Yield (Reference SOP-MILL-005).
14. Store both fractions of the sample in ziplock bags for further analysis.
15. Clean the shaker table and screens with a vacuum cleaner after each use.