

Selecting The Ideal Vibrator Speed For Material Flow Issues

By Rob Beiersdorfer

There are three (3) critical considerations when choosing the ideal RPM for a Rotary Electric Vibrator to solve your material flow issue:

1. The viscosity of the material. A sticky or wet material will require a higher “stroke” to break surface tension of the stored material's particles to both themselves and the wall, slope or bed to which they are attracted. Breaking the surface tension allows the particles to move freely. In simple terms, “stroke” is the amplitude that will break the attachment of the material/particle to the wall, table, or bed to which it has been attached. The slower the RPM of a Rotary Electric Vibrator, the higher the stroke. Typically, high RPM is considered to be 1800-RPM to 3600-RPM, which, in general, will not create high stroke. Lower RPM (900-RPM to 1200-RPM Vibrators) are speeds that will produce higher stroke.

2. The moisture content of the material. A damp material (moisture $\geq 7\%$) is much harder to move compared to a relatively dry material. As a guideline, the wetter the material, the slower the RPM (for greater stroke) needs to be. Depending on the type of material, the movement of moist materials is best suited to a Vibrator running at 1800-RPM or slower.

3. The bulk density of the material. A heavy material (density ≥ 70 -lbs/ft) requires more stroke for movement, and therefore a slower Vibrator RPM is required. Typically, heavy materials require a Vibrator running at 900-RPM or 1200-RPM to efficiently move the material.

In general, the following guidelines should be followed:

- Use 3600-RPM Vibrators to move fine, dry powders, such as flour and carbon black
- Use 1800-RPM Vibrators to move materials that are damp and have a bulk density below 70-lbs/ft such as damp coal and sugar granules
- Use 900-RPM or 1200-RPM Vibrators to move heavy (≥ 70 -lbs/ft) materials, or excessively wet materials, such as aggregates and sands



PLANT MATTERS

Final Thoughts

There are no absolute rules when it comes to choosing the ideal RPM for a Rotary Electric Vibrator for any specific particular material flow problem. Experience shows the guidelines presented will apply to most – but not all – material flow issues. It is important to look at each material flow issue independently and choose the RPM that history has shown will provide the greatest likelihood of success.

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Thanks for reading this post. If you'd like to know more about the subject or have any questions about Linear Industrial Vibrators, or Vibratory Motors and Equipment for any of our experts, **please drop us a line.**