Myths About Chatter: What's Really Causing Machining Vibrations?

Chatter, or self-caused machine vibrations, can often result in a significant drop in quality in regards to the final milled product. Vibrations during machining are expected, even invited, as the tool, tool holder, and the spindle should all vibrate at the same frequency in order to achieve the intended results.

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Myth #1: Imbalance Causes Chatter

Imbalances, unlike chattering, are caused by forced vibrations and are therefore not responsible for chattering, which is self-excited and recursive. Once you've measured the finish, you should be able to tell whether or not your imperfections are caused by machine imbalances or chatter. Harmonic frequencies work in tandem with multiple aspects of the milling process in order to provide a steady, even result.

Myth #2: Chatter is Caused by the Machine

Not necessarily. Many times, the chattering effect on a surface is caused by the part itself. Typically, the material setup, feed speed, and tooling play their own roles, but some common remedies like applying heavier chip loads won't offset the problems. Reconsidering the RPM and process dampening will ease your chatter concerns at the costs of higher stress on the machine and cutters.

Myth #3: Some Material is More Susceptible to Chattering Than Others

Controlling chattering doesn't have as much to do with materials as it does the RPM and knowing the material's frequency measurements will help offset the effects of chattering, but it varies from material to material. Aluminum, for instance, has a difference surface frequency during milling than steel or any other material. Compensating for chattering is ultimately the responsibility of the machinist and with the help of basic mathematics and computers, the effects of chattering can be avoided in the majority of instances.

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