

C. Moulding and Millwork

Technical Bulletin C-4

Keys to Successful Moulding or Milling of Cellular PVC

RPM's of Spindles

Varies with moulder. We recommend spindle speeds of 8,000 RPM's or greater. We have found that the higher the spindle RPM the smoother the surface of the milled VERSATEX board. We use equipment with an RPM of 6,000 which is satisfactory but not optimum.

Feed Rate

Weinig specifies a feed rate of approximately 45 FPM (15m/min). We recommend feed rates between 40 and 60 FPM depending on material thickness, profile being cut and tooling wear. Too fast a feed rate will lead to surface chatter.

Hold Down

It is important the board be held in place during the milling or moulding to prevent or minimize material vibration. Vibration will lead to chatter lines across the face of the moulding profile produced.

Tooling Wear

It is important to maintain sharp tooling. Worn tooling or tooling with chips in the insert will create a ripping or chatter look in the core of the cellular PVC board. This can also lead to softening or gumming of the core due to heat build-up.

Tooling Insert Steel

Most mill shops use high speed tool steel inserts. However, carbide steel can also be used for tooling inserts.

Dust Extraction

Probably one of the most critical components associated with the proper milling and moulding of VERSATEX. It is very important that all milling and moulding equipment have an optimum dust extraction and collection system. If you allow the dust and small PVC chips to build up around the tooling inserts, they will generate excessive heat thus creating gumming or softening of the PVC core.

Tooling Angle

The rake angle that other OEM's have told me works best with VERSATEX is 25 degrees. One long time VERSATEX OEM sets his rake angle on his Weing grinder to 25 degrees when grinding inserts. He has tried steeper angles in the range of 10 to 15 degree but the surface finish becomes a little coarser. This OEM feels that using a steep rake angle on the insert is much like using a dull blade when placed in contact with the product being milled. This is because the sharpest part of the tool is not in contact with the PVC piece being milled. As a result, if the angle is too steep you are basically cutting with a dull knife which can lead to tearing and ripping at the core of the product. This tearing and ripping created through the use of a dull knife will also generate excessive frictional heat which can cause a gumming or softening of the PVC core.

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Milling Bit

Use a single edge upcut spiral bit which is ideal for plastic when milling VERSATEX. Use a bit that pulls the shaving out rather than down. This removes the shavings from the cut, reduces heat build up at the point of the cut which reduces or eliminates pull out in the core. Vortex Tool Company recommends a 5600 series with a single edge upcut spiral. Good results will be achieved at a chip load of 0.016 to 0.018". Run your tools at 14,000 rpm's and feed speeds between 5700 and 6500 mm/min or 19 to 21 feet per minute.