Haas Technical Documentation

Mill Tips to Prevent Chatter

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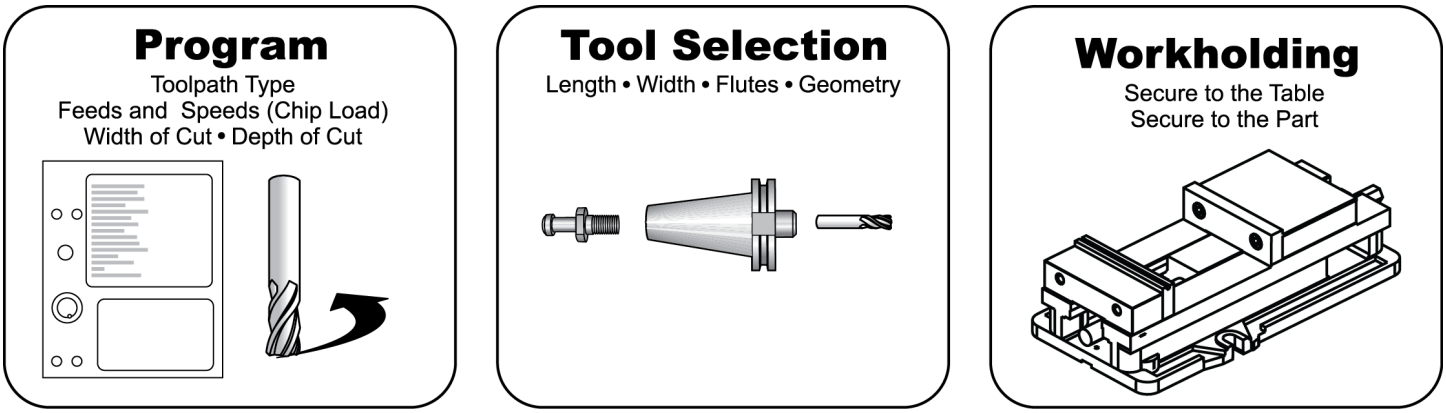
Translation Available

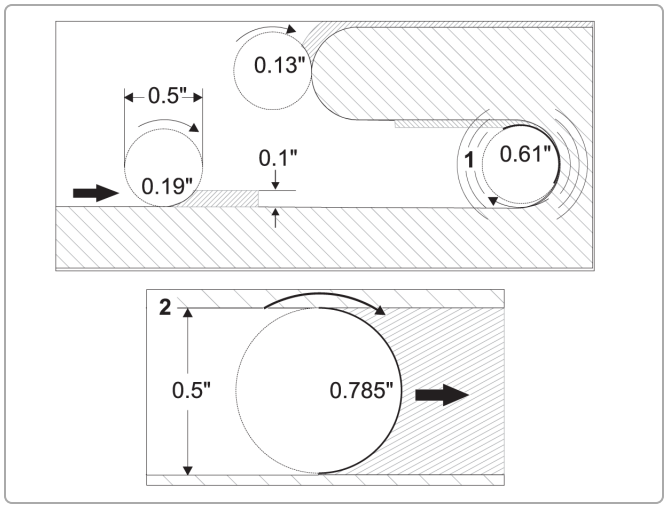
INTRODUCTION

Consider the overall job when you have a problem with chatter. Chatter always comes down to these aspects of the application:



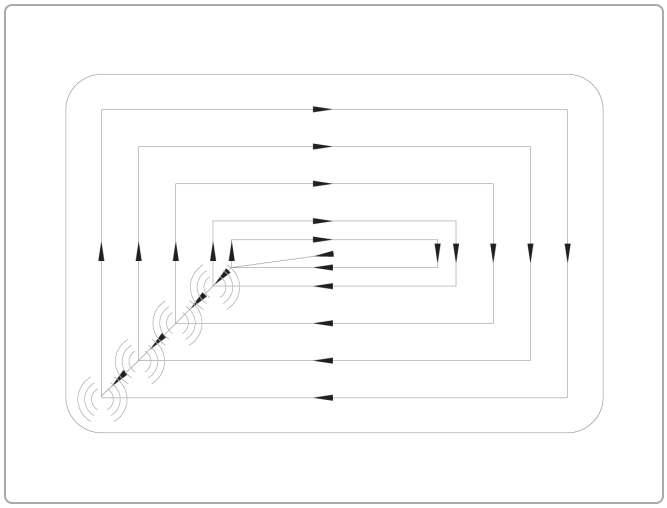
Compromises required in one aspect of the job will require adjustments to the other aspects of the job.

Program



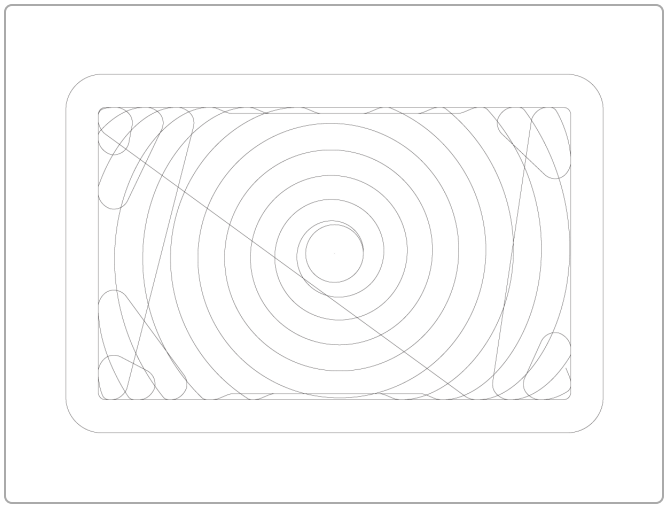
Example:

Toolpaths with slotting and large corner engagement can cause chatter at a given speed/feed combination. Note how tool engagement increases through the internal corner [1] and in a slot cut [2].



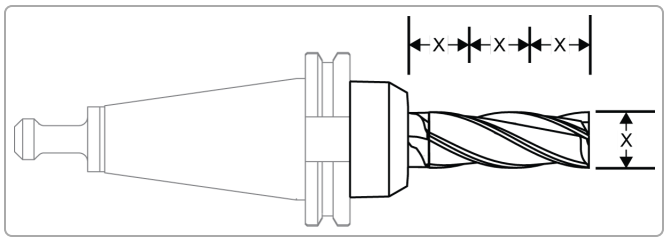
Toolpath Types

With a conventional toolpath, cutting forces increase as tool engagement increases with the direction changes.



Constant engagement toolpaths do not require adjustments to speeds and feeds through direction changes.

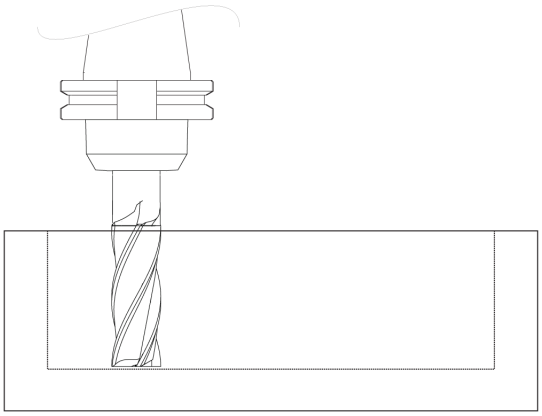
Tool Selection



Tool Selection - Tool Length

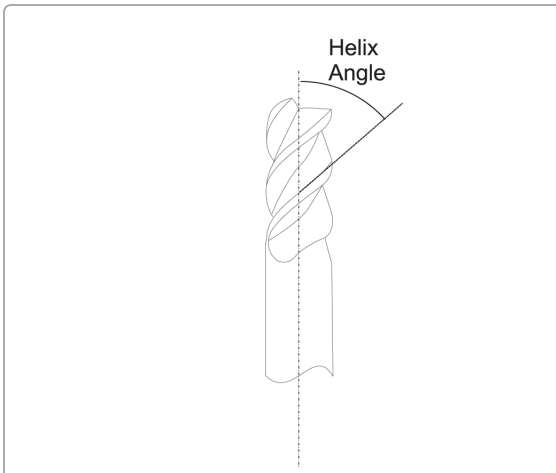
If the cut chatters and reducing the tool length is practical, reduce the tool length. A 10% reduction in the length-to-diameter ratio results in a 25% increase in tool stiffness.

Unless absolutely necessary, the tool should not be more than 3 times longer than it is wide.



Tool Length and Deep Pockets

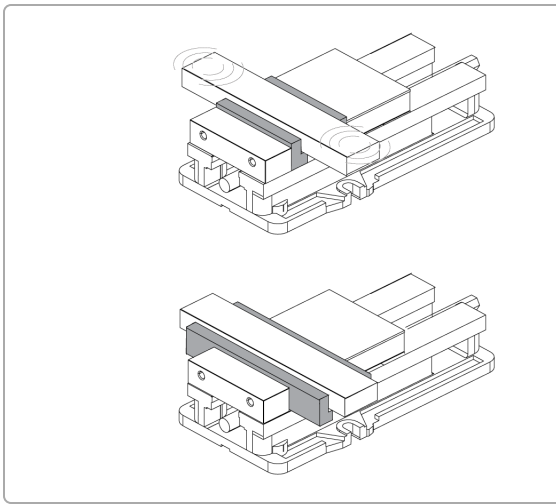
Deep pockets require deviation from the normal length-to-diameter ratio for tools. Lower the cutting load with program adjustments: reduce the depth-of-cut, the width-of-cut, feed, or change to a constant-engagement toolpath.



Tool Types

Use the highest-performance tool possible, ideally with variable helix and cutting angles. High-performance tooling uses tool geometry designed to dampen the vibrations that cause chatter.

Workholding



Workholding Example:

Fragile workholding, a long, skinny part, overhangs, etc.—Lower the cutting load through adjustments to the tool selection or program. Stiffen the workholding with supports if possible.