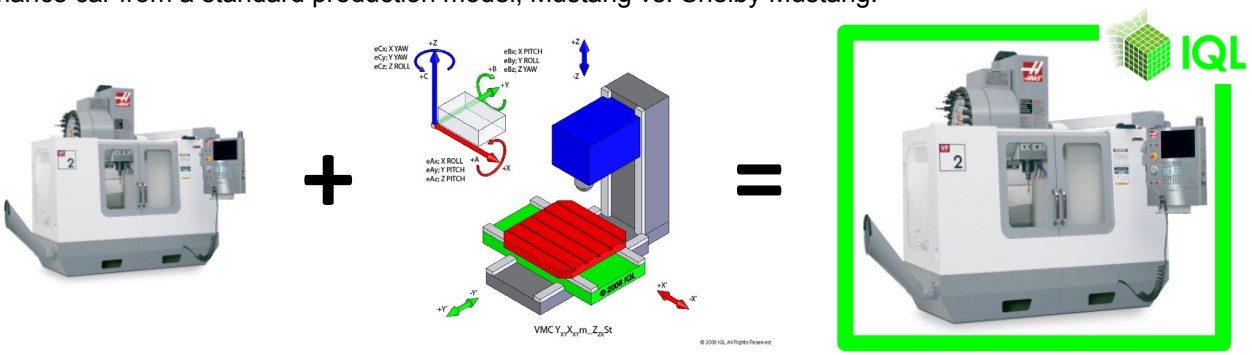
IQL SuperTune™ Service

For Haas Machining Centers

Double Machine Capability

Increased machine positioning accuracy means lower operating costs and increased revenue. Tighter tolerance applications previously limited to higher priced Japanese and European machining centers now can be executed with low cost user friendly Haas systems.

The IQL SuperTuning process optimizes the performance of standard Haas systems. Similar to creating a high performance car from a standard production model; Mustang vs. Shelby Mustang.

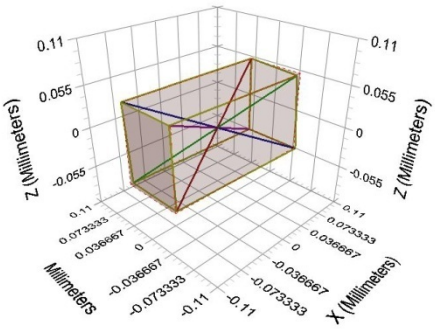


Applying a low impact anchoring system and proprietary precision alignment & adjustment Locus® Methods provides machine positioning performance equal to higher accuracy / higher cost machines. The IQL SuperTuning process is achieved on-site in less than a week or as part of a new machine installation.

One Big Sweet Spot: Volumetric Performance

At the micron level, machines axes often look like a potato chip, twisted and misaligned creating inconsistent results throughout the workzone. Finding those specific areas where tight tolerance features can successfully be machined is often trial and error. IQL SuperTuning focuses on optimizing key angular errors based upon each machine's specific structural design resulting in consistent positioning performance throughout the entire work zone.

- High Performance Volumetric Positioning
- Part Location & Fixturing Flexibility
- Increased Machine Stiffness
- Higher Repeatability
- Reduced Backlash



Haas VF2 Volumetric Performance 0.020mm

Reduced Operating Costs

"First Part Correct"

Machine more parts to Nominal Feature locations, reducing the effort to create and change Feature Offsets. Increased machine capability simplifies first part set-up and verification, significantly increasing productivity.

- Shorten operation set-up & eliminate related scrap
- Eliminate secondary operations required to achieve
- difficult feature tolerances
- Eliminate scrap & rework due to machine positioning limitations
- Reduce "Tight Tolerance" production issues

40% Lower Capital Investment

Lower cost capability always creates Competitive Advantage. It also allows for more common systems, eliminating many support and servicing issues related to supporting multiple systems.

- Lower Production Overhead Rates
- Higher Return on Assets (ROA)
- Common Machines, Common Controls, Repair Parts, Staff Training, etc.
- Easier to Operate Machines
- Staffing Flexibility
- Simplified CAM Programming - Execution and Support

IQL SuperTune™

Performance Specifications

Haas Model	Travels (in)			Standard Performance				SuperTune Performance					
				Average Linear Positioning Accuracy*		Average Linear Repeatability		Average Linear Positioning Accuracy*†		Average Linear Repeatability		Volumetric Positioning Performance*†	
	X	Y	Z	in	mm	in	mm	in	mm	in	mm	in	mm
Vertical Machining Centers (VMC)													
VF2	30	16	20	±0.0002	±0.005	±0.0001	±0.003	±0.00010	±0.0025	±0.00004	±0.001	0.0008	0.020
VF2YT	30	20	20	±0.0002	±0.005	±0.0001	±0.003	±0.00010	±0.0025	±0.00004	±0.001	0.0008	0.020
VF3	40	20	25	±0.0002	±0.005	±0.0001	±0.003	±0.00012	±0.003	±0.00004	±0.001	0.0010	0.026
VF3YT	40	26	25	±0.0002	±0.005	±0.0001	±0.003	±0.00012	±0.003	±0.00004	±0.001	0.0010	0.026
VF4	50	20	25	±0.0002	±0.005	±0.0001	±0.003	±0.00015	±0.004	±0.00004	±0.001	0.0011	0.028
VF5	50	26	25	±0.0002	±0.005	±0.0001	±0.003	±0.00015	±0.004	±0.00004	±0.001	0.0011	0.028
VF5XT	60	26	25	±0.0002	±0.005	±0.0001	±0.003	±0.00015	±0.004	±0.00004	±0.001	0.0012	0.030
VF6	64	32	30	±0.0003	±0.008	±0.0002	±0.005	±0.00015	±0.004	±0.0001	±0.0025	0.0013	0.032
VF7	84	32	30	±0.0003	±0.008	±0.0002	±0.005	±0.00023	±0.006	±0.0001	±0.0025	0.0014	0.036
VF8	64	40	30	±0.0003	±0.008	±0.0002	±0.005	±0.00023	±0.006	±0.0001	±0.0025	0.0013	0.032
VF9	84	40	30	±0.0003	±0.008	±0.0002	±0.005	±0.00023	±0.006	±0.0001	±0.0025	0.0014	0.036
VF10	120	32	30	±0.0003	±0.008	±0.0002	±0.005	±0.00023	±0.006	±0.0001	±0.0025	0.0020	0.050
VF11	120	40	30	±0.0003	±0.008	±0.0002	±0.005	±0.00023	±0.006	±0.0001	±0.0025	0.0020	0.052
VM-2	30	20	20	±0.0002	±0.005	±0.0001	±0.003	±0.0001	±0.0025	±0.00004	±0.001	0.0008	0.020
VM-3	40	26	25	±0.0002	±0.005	±0.0001	±0.003	±0.00012	±0.003	±0.00004	±0.001	0.0008	0.020
VM-6	64	32	30	±0.0002	±0.005	±0.0001	±0.003	±0.00015	±0.004	±0.00004	±0.001	0.0008	0.020
Horizontal Machining Centers (HMC)													
EC-400	20	20	20	±0.0002	±0.005	±0.0001	±0.003	±0.0001	±0.0025	±0.00004	±0.001	0.0008	0.020
EC-500	32	20	28	±0.0002	±0.005	±0.0001	±0.003	±0.0001	±0.0025	±0.00004	±0.001	0.0008	0.020
EC-1600	64	40	32	±0.0003	±0.008	±0.0002	±0.005	±0.00017	±0.0045	±0.0001	±0.0025	0.0013	0.034
EC-2000	84	40	32	±0.0003	±0.008	±0.0002	±0.005	±0.00023	±0.006	±0.0001	±0.0025	0.0015	0.038
EC-3000	120	40	32	±0.0003	±0.008	±0.0002	±0.005	±0.00023	±0.006	±0.0001	±0.0025	0.0020	0.052

* Linear Scales required to achieve listed accuracy for Models VF6-VF11 & EC1600-EC3000

† Performance tested in accordance with ISO 230 & ASME B5.54 - 2005

Requirements:

Temperature Gradients:

Per Day:	7°F/4°C
Per Hour:	4°F/2°C
Per Meter:	2°F/1°C

Avoid direct sunlight and large thermal shocks (open external doors, etc.)

Performance is contingent upon machine operation and site meeting Haas recommended operating requirements.

Note: Overall machine height is increased 2.5” (64mm)

Printed 3/13

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