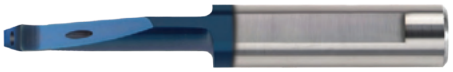
Technical Section

Carbide Grades:

BXC (P30 - P50, K25 - K40)
PVD TiN coated grade for low cutting speed.
Works well with a wide range of stainless steels.



BMK (K10 - K20)
Sub-micron grade with advanced PVD triple coating. Extremely high heat resistant and smooth cutting operation, for high performance, and normal machining conditions. General purpose for all materials.

K20 (K10 - K30)
Uncoated Carbide grade for non ferrous metals, aluminum and cast iron.

TNX
New advanced carbide grade TN***X*** for higher feeds and high performance, at medium to high cutting speed. Extra fine grain size with high hardness and toughness combined with triple layer reddish coating, provides high edge stability and better chip flow.

Cutting speed for Tiny Tools

ISO Standard	Material		Condition	Cutting Speed ft/min BXC	BMK	K20	TNX
P	Non-Alloy steel and cast steel, free cutting steel	<0.25%C	Annealed	82-230	98-262		118-262
		≥0.25%C	Annealed				
		< 0.55%C	Quenched and tempered				
		≥0.55%C	Annealed				
			Quenched and tempered				
	Low alloy steel and cast steel (less than 5% alloying elements)		Annealed	66-131	82-164		98-164
			Quenched and tempered				
	High alloy steel, cast steel, and tool steel		Annealed	66-131	82-164		98-164
			Quenched and tempered				
M	Stainless steel and cast steel		Ferritic/martensitic	82-131	98-197		118-197
			Martensitic				
			Austenitic				
K	Cast iron nodular (GGG)		Ferritic/pearlitic	82-197	98-262		118-262
			Pearlitic				
	Grey cast iron (GG)		Ferritic	98-230	98-262		118-262
			Pearlitic				
	Malleable cast iron		Ferritic	66-131	66-164		79-164
			Pearlitic				
N	Aluminum-wrought alloy		Not cureable	164-328	197-394	98-164	236-394
			Cured				
	Aluminum-cast, alloyed	<=12% Si	Not cureable	131-262	164-295	66-131	197-295
			Cured				
		>12% Si	High temperature				
	Copper alloys	>1% Pb	Free cutting	98-197	98-230	66-131	118-230
			Brass				
			Electrolytic copper				
	Non metalic		Duroplastics, fiber plastics	131-262		66-131	
			Hard rubber				
S	High temp. alloys, Super alloys	Fe based	Annealed	49-98	49-131		59-131
			Cured				
		Ni or Co based	Annealed				
			Cured				
			Cast				
	Titanium alloys		Alpha+beta alloys cured	33-98	33-98		39-98
H	Hardened steel		Hardened 45-50 HRc	33-98	49-131		59-131
			Hardened 51-55 HRc				
			Hardened 56-62 HRc				
	Chilled cast iron		Cast	33-98	33-98		39-98
	Cast iron		Hardened	33-66	33-66		39-66

Recommended Feed Rate: .0005 - .001 inch/rev

Threading Passes

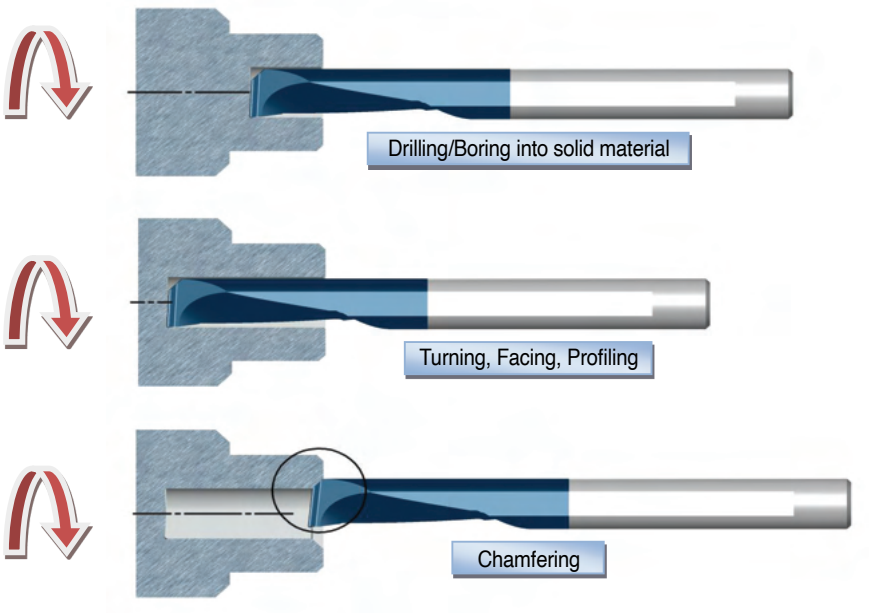
Pitch:	mm TPI	0.5 48	0.7 36	0.8 32	1.0 24	1.25 20	1.5 16	2-5 14-5
Number of Passes		6 - 12	7 - 14	7 - 16	8 - 18	8 - 20	10 - 22	20 - 38

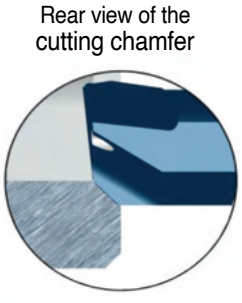
CMR Carmex Multi-Task Tiny Tools

- Carmex is introducing a new and innovative Multi-Task Tiny Tool **CMR** for Boring, Turning, Facing and Chamfering with a single tool.
- The unique design enables machining of the material without the need for a pilot hole.
- The new tool shortens the machining cycle time and the number of tools required - providing **High Productivity**.
- Effective through coolant hole with a spiral flute, evacuates the chips out of the hole uninterruptedly.
- Unique chip breaker and flute design.
- To use with standard SIM toolholders on Swiss Type or CNC lathe machines.
- Available in **BMK** Grade only.

Working Method

- The tool penetrates the work piece and produces the hole compliant with the minimum diameter the tool allows.
- The tool can penetrate the material in one pass or several passes depending on the work piece material, coolant pressure, machine power etc.
- The hole can be enlarged by multi radial passes.





The tool is equipped with an additional cutting edge, which is located across the main front edge. This allows production of an additional 45° chamfer on the work piece without the need to stop the spindle or processing operation.

CMR General Recommendations

Coolant fluid

Dry machining should not be performed under any circumstances.
It is necessary to use an internal coolant in all applications.
Oil or Emulsion lubricants are recommended for best performance.
In the event of low coolant pressure, adding an external coolant can improve the tool operation.

The cooling stream is designed to provide three benefits:
1. Cooling the cutting edge of the tool, and the contact area.
2. Pushing the chip away from the tool quickly, thereby reducing wear of the edge.
3. Helping to break the chip into smaller pieces and evacuating them from the cutting area.

Cutting Data

ISO Standard	Material	Cutting Speed ft/min
P	Low and Medium Carbon Steels <0.55%C	65-245
	High Carbon Steels ≥0.55%C	65-245
	Alloy Steels, Treated Steels	65-200
M	Stainless Steels - Free Cutting	65-200
	Stainless Steels - Austenitic	65-230
	Cast Steels	65-230
K	Cast Iron	65-330
N	Aluminum ≤12%Si, Copper	130-490
	Aluminum >12% Si	65-330
	Synthetics, Duroplastics, Thermoplastics	130-490
S	Nickel Alloys, Titanium Alloys	50-200
H	Hardened Steels	-

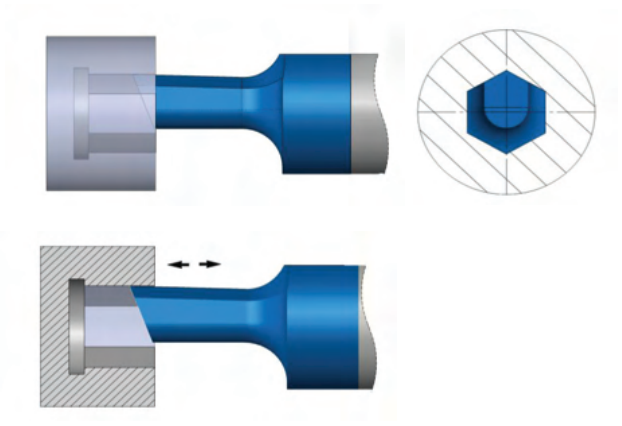
Recommended Feed Rate: .0005 - .001 inch/rev

HK Broaching Tools for Hexagon Keys

The HK broaching system have been developed to machine internal keyways inside blind or through holes, using CNC machines.

- To use with Carmex standard SIM Bar Holders
- The holder can be located directly in the turret or the machine spindle
- Holder with rear clamping screw for full support during operation
- Available in **BMK** Grade only.

Working Demo



Cutting Data

Material Tensile Strength (lbs/in²)	Feed rate (in/min)	In-feed per stroke (inch)
58.000-94.000	276-354	.0024-.0035
101.000-123.000	197-256	.0016-.0028
130.500-145.000	157-217	.0012-.0022
160.500-174.000	118-177	.0008-.0016

The cutting data above is an initial recommendation and depends on the machine condition, workpiece profile and the application clamping

- A relief groove is highly recommended, if not possible a gradual volume decrease should be made at the end of the broaching groove
- The HK tool must be positioned outside of the hole/groove before each stroke
- After setup and first stroke, we recommend to observe the tool and the application to make sure no collision occurred