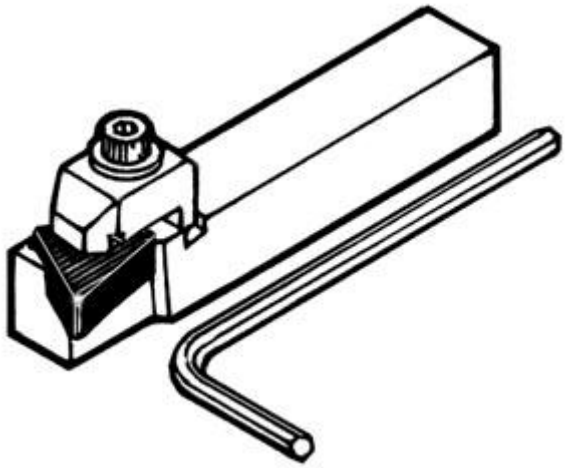
SHERLINE Inserted Tip Ceramic Tool Holders

P/N 2265



Use of the Sherline negative rake ceramic insert tool holder

The 3/8" IC Negative Rake Ceramic Indexable Holder will bring a lot of enjoyment to your machining, particularly if you choose to turn hard or abrasive materials such as tool steel and hardened steel pins or cast iron. The indexable ceramic insert sits on the tool holder at a 5° negative angle. This gives the sides of the cutter clearance even though the insert has square sides. By having square sides, both the top and bottom of the insert can be used as cutting edges. This gives you a total of six cutting edges on each insert. Though not inexpensive, when you consider the alternative to ceramic is diamond or PCBN, which cost $70.00 to $90.00 for one insert with one cutting edge, and here you are getting six cutting tools in one, it is really a pretty good deal.

Remember that ceramic cutting tools are very hard and brittle. To ensure longer insert life and better results we have a few recommendations.

1) Good ceramic performance depends on using a good holder. It must be rigid and held with the least amount of overhang. The insert pocket must be clean and free of any damage.

2) The material you are cutting must be held as rigid as possible. Any vibration in the part will lead to a bad finish and premature insert wear. Try not to extend the part out past the chuck or collet by more than 1-½ times the diameter of the part. For example, if you were to turn a ¼" hard pin to a smaller diameter, 1.5 x .250 = .375. Therefore the ¼" pin should not extend beyond the chuck by more than .375".

3) Ceramic inserts will NOT do interrupted cuts! Don’t even try. If you try to turn a shaft that has a keyway or spline, as soon as the insert gets to the relieved part of the shaft it will start to chip.

4) Coolants (oil or water) are not are not recommended. They tend to cause thermal cracking in the insert.

5) Because you will be turning hardened material at a high rate of speed without coolant, the chips will come off red hot and can ignite other chips that are allowed to collect or "bird nest" around the tool. Use a chip brush to remove chips from the work area often so they don't build up into a combustible pile.

6) Because this is a negative rake tool, it is important to have your tool on center. Above center will result in a poor or impossible cut and poor finish. Below center will cause the part to try and climb up on top of the insert.

7) Because this is a negative rake tool and you are cutting hard material, the smaller the diameter that you are turning, the more the part will flex away from the tool. We recommend that you cut into and out of the part. This is what is meant by "turning in and out." Turn your part feeding towards the headstock, then stop and feed back out with the crosslide at the same setting. You will notice that the insert will take a skim cut on the way out because there is less pressure on the part. This will also alleviate some of your taper problems.

Feeds and Speeds:

The SFM (Surface Feet per Minute) factor which is used to calculate your spindle speed will range from 300 to 1200 depending on the type and hardness of the material that you are cutting. What you will find is that your maximum spindle speed will be dictated more by the rigidity of your setup than by the material or rpm range of your machine. There are charts available that list the SFM value for most metals.

Example:

Material: ¼" hardened steel pin is 30–50 Rockwell.

Roughing SFM: is 500–800.

Spindle Speed Calculation: SS = (SFM x 3.82) divided by the diameter or 500 x 3.82 ÷ .25 = 7640

With the given SFM the spindle speed could range from 7640 rpm to 12,224 rpm. (NOTE: Spindle speeds higher than 2800 rpm will require the use of the optional P/N 4335 10,000 RPM pulley set on a Sherline machine.)

You will most likely get chatter at the higher rpms and be forced to lower your spindle speed.

Below is the application data for your insert. We recommend that you start near the upper third of the speed range, and near the lower third of the feed range.

Karl Rohlin, Shop Foreman
Sherline Products Inc.

Application Data

Material	Application	Speed/SFM[1]	Feed/IPR[2]	DOC[3]/Inches
High Temp Alloys	Rough	300 – 500	.003 - .006	.050
"	Finish	400 – 600	.003 - .006	<.050
Carbon Alloy Steels, 20 – 30 Rockwell C	Rough	800 – 1500	.005 - .010	.050
"	Finish	1000 – 1600	.003 - .012	<.050
Hardened Steels, 30 – 50 Rockwell C	Rough	500 – 800	.004 - .008	.050
"	Finish	600 – 1000	.003 - .010	<.050
Hardened Steel and Chilled Iron, 50 – 60 Rockwell C	Rough	200 – 400	.002 - .006	.050
"	Finish	300 – 600	.002 - .006	<.050
Grey Cast Iron, 140-260 BHN	Rough	500 – 1200	.005 - .012	.050
"	Finish	500 – 1600	.005 - .012	<.050
Nodular Cast iron, 150 – 300 BHN	Rough	500- 1000	.004 - .012	.050
"	Finish	500 – 1400	.004 - .012	<.050.

[1]SFM = Surface Feet per Minute
[2]IPR = Inches Per Revolution
[3]DOC = Depth of Cut

The holder is manufactured from 12L14 Steel which is case hardened and black oxide coated.

PARTS LISTING, P/N 2265 CERAMIC HOLDER

P/N	DESCRIPTION
22655	3/8" Ceramic Insert Tool holder
22656	Ceramic Insert Clamp
22657	5-40 x 1/2 SHCS
22658	#5 Washer
40570	3/32" Hex Driver
2266	Replacement Ceramic Insert (TNG222 T00325 [Q32 grade])