CNC Turning Automated high-precision machining of complex parts

Specifications :

Price	Contact us
Brand Name	ETCN
Place of Origin	Shanghai
Min.Order Quantity	100
Payment Terms	T/T,L/C,D/P
Supply Ability	3 days
Delivery Detail	3days--7days
Packaging Details	Wooden case or wooden pellets depended on clients' require

Detail Introduction :

CNC Turning--Automated high-precision machining of complex parts

Turning is a method of cutting the workpiece on the lathe by rotating the workpiece relative to the tool. The cutting performance of the turning tool depends firstly on the tool's material and secondly on the geometrical parameters and structure of the tool. Turning is suitable for machining revolving surfaces. Most workpieces with revolving surfaces can be processed by turning methods, such as inner and outer cylindrical surfaces, inner and outer conical surfaces, end faces, grooves, threads, and revolving forming surfaces. The tools used are mainly turning tools.

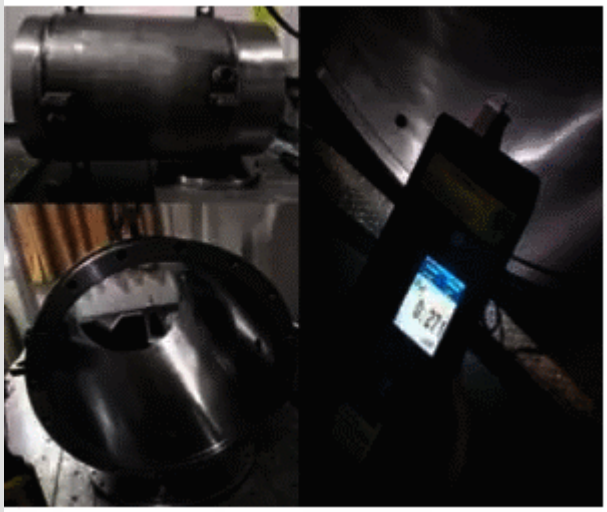
Numerical control turning refers to the technological method of digitally controlled lathe processing. A numerical control system and a drive system are added to form a numerical control lathe based on traditional lathes. To provide you with a high standard of CNC Machining Services.

CNC machining case

An advanced CNC turning-milling compound lathe processes the stainless steel motor spindle, and all processing procedures can be completed in one clamping. The size tolerance range is ±0.02mm, and the surface is passivated and cleaned.	
Equipment	Turning and milling compound lathe
Process	Precision turning/drilling/milling keyway/deburring

Material	Stainless steel	
Stainless steel motor shaft processed by CNC lathe	Surface	Passivation cleaning

The stainless steel end joints of medical gastroscope fittings are processed by an advanced CNC centering machine, with a wall thickness of 0.1mm and threaded threads on both sides to ensure flow and stop gauges. The roundness is ±0.005mm, the size tolerance range is ±0.01mm, and the surface is passivated and cleaned.		
	Equipment	CNC walking machine
	Process	Precision turning/drilling/threading/deburring
	Material	Stainless steel
Stainless steel end joints for medical useprocessed by CNC core walking machine	Surface	Passivation cleaning



Large-scale motor cylinder, with an inner diameter of 450mm, welding the outer plate and pressure test after processing the cooling groove. The inner-circle runout is 0.05mm, the size tolerance is ±0.04mm, and the inner diameter surface roughness is above Ra0.8.		
	Equipment	CNC walking machine
	Process	Precision turning/drilling/threading/deburring
	Material	Stainless steel
Motor cylinder processed by CNC lathe	Surface	Passivation cleaning

	Large-scale roller, the blank is made by the hot drying sleeve process, after welding, it is turned into a whole by a CNC lathe, the surface is polished, and the tolerance of the bearing gear is +0.005	
	Equipment	CNC lathe
	Process	Hot baking/welding/precision turning/external grinding
	Material	Carbon steel
Roller processed by CNC lathe	Surface	Polished

Turning tool and its selection method

1. Cutting performance of tool materials

Tool material mainly refers to the material of the cutting part of the tool, which is the basic factor that affects the quality of the processed surface, cutting efficiency, and tool life. High-performance tool materials are the basic conditions to ensure the efficient work of the tool.

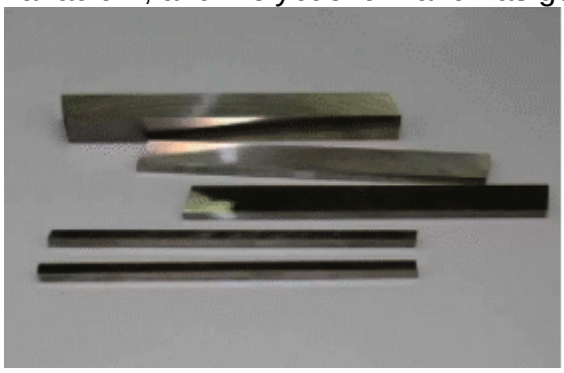
(1) High hardness and high wear resistance.
(2) Strength and impact toughness.
(3) Heat resistance.
(4) Manufacturability and economy.

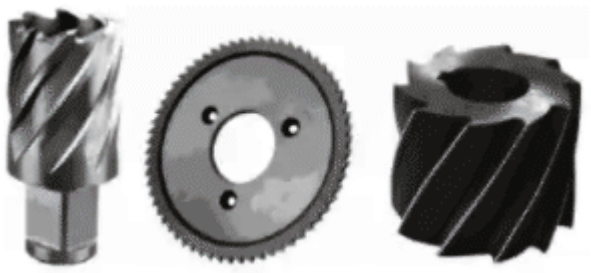
2. Commonly used tool materials

Commonly used tool materials include tool steel, high-speed steel, cemented carbide, ceramics, and super-hard tool materials. At present, high-speed steel and cemented carbide are the most commonly used.

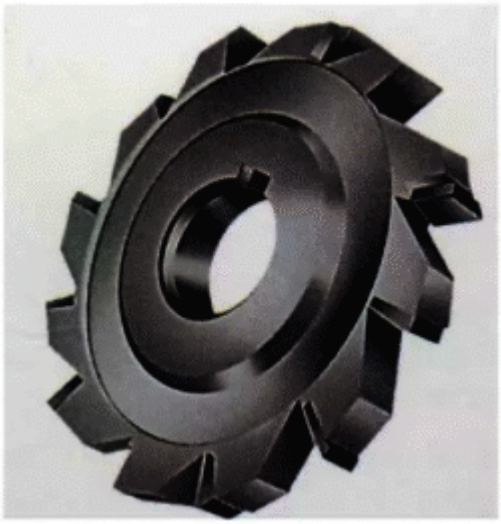
(1) High-speed steel.

High-speed steel is a high-alloy tool steel with more alloying elements such as tungsten, chromium, vanadium, and molybdenum and has good comprehensive properties.





(2) Cemented carbide.
Cemented carbide is usually made by powder metallurgy. It is made by high-pressure and high-temperature sintering of fine powders of metal carbides (such as WC or TiC, etc.) with high hardness and melting point and a binder. Cemented carbide has high hardness, good wear resistance, high-temperature resistance, and good chemical and thermal stability.



3. Types of turning tools

There are many types of turning tools. The type and purpose of turning can be divided into external turning tools, face turning tools, inner hole turning tools, turning tools, grooving tools, thread turning tools, etc.

From the structural point of view, turning tools can be divided into integral turning tools, welded turning tools, machine clamp turning tools, indexable turning tools, and forming turning tools. Among them, the cutting performance of indexable turning tools is stable, and there is no need to sharpen the tools, and the proportion of turning tools is gradually increasing.

(1) Integral turning tool.
The cutting part of the integral turning tool and the tool holder are integrated. Necessary turning tools consume a lot of valuable tool materials, so generally, only ordinary turning tools and high-speed steel turning tools adopt an integrated structure.

(2) Welding turning tools.
Welding turning tool is a turning tool that is used after opening a groove on a carbon steel shank according to the geometric angle of the tool, welding the carbide blade in the groove with solder, and sharpening it according to the selected geometric parameters.

(3) Machine clamp turning tool.
A machine-clamped turning tool is a turning tool that uses ordinary blades and clamps the blades on the toolbar by mechanical clamping. According to the clamping method, common machine clamping tools can be divided into three types: S-type clamping, P-type clamping, and M-type clamping.

(4) Turning tools can be indexed.
The indexable turning tool is a machine clamp turning tool that uses indexable inserts. After a cutting edge is dull, it can be quickly indexed and replaced with an adjacent new cutting edge to continue working. Until all the cutting edges on the blade are blunt, the blade is scrapped and recycled. After

replacing the new blade, the turning tool can continue to work.

(5) Forming turning tool.
A forming turning tool is a special tool for processing the forming surface of the revolving body. Its blade shape is designed according to the profile of the workpiece and can be used on various lathes to process the forming surface of the inner and outer revolving bodies. It is mainly used to process large batches of small and medium-sized parts with forming surfaces.

4. Reasonable selection of knives

(1) When rough turning, choose high-strength and durable tools to meet the requirements of large back-grabbing and large feed.
(2) When finishing turning, choose tools with high precision and good durability to ensure machining accuracy requirements.
(3) To reduce the time for tool change and facilitate tool setting, machine-clamped knives, and machine-clamped blades should be used as much as possible.
(4) Try to use general-purpose fixtures to clamp the workpiece and prevent the use of special fixtures;
(5) The part positioning datum coincides with reducing positioning errors.

FAQ

Q. Compared with ordinary turning processing, what are the advantages of CNC turning?

A: 1. Concentration of working procedures reduces processing equipment and improves efficiency.
2. One person can be optimistic about several machine tools, reducing labor costs.
3. Lower threshold requirements for operators.
4. The precision of CNC machine tools is high.

Q. What is the role of cutting fluid? What are the two types of commonly used cutting fluid? What is the main function of each type?

A: The role is to cool, lubricate, clean, and prevent rust;
Commonly used are emulsion and cutting oil.
Emulsion emulsified oil is diluted with 15-20 times of water, and it is mainly used for cooling;
The main component of cutting oil is mineral oil, which mainly plays a role in lubrication;

Q. What are the requirements for the material of the cutting part of the turning tool?

A: (1) High hardness
(2) Good wear resistance
(3) Good heat resistance
(4) Sufficient strength and toughness (to withstand greater impact)
(5) Good process performance.

Q. What are the two major types of commonly used turning tool materials? What are the characteristics of each type of material?

A: The materials of commonly used turning tools are mainly high-speed and cemented carbide.

The characteristics of high-speed steel turning tools are simple manufacturing, convenient sharpening, sharp cutting edges, good toughness, and the ability to withstand greater impact, but high-speed steel turning tools have poor heat resistance and are not suitable for high-speed turning.

Cemented carbide is divided into tungsten drill type, tungsten titanium cobalt type, tungsten titanium but drill type, and so on.

Q. What is the dullness standard of turning tools and the life of turning tools?

A: (1) The amount of wear on the flank surface of the tool from the beginning of cutting to the point where it can no longer be used is called the blunt standard.

(2) Tool life: the total cutting time of the tool from the beginning of cutting until it reaches the blunt standard.

Q. How are chips produced? What are the common types of chips?

A: Chips are formed by deformation and slippage caused by the blade's cutting and the rake face's pushing.

Common chips are band chips, squeezed chips, unit chips, and cracked chips.

Q. How is cutting heat generated? What are the factors that affect cutting heat?

A: It is caused by the elasticity and plastic deformation of the workpiece and the friction between the chips and the workpiece.

The resulting factors are workpiece material, geometric tool angle, cutting amount, and so on.

Q. Which two factors are related to the cutting temperature? What are the ways of cutting heat transfer?

A: It is related to two factors: the generation of cutting heat and the dissipation of cutting heat.

Pass out through chips, workpieces, tools, and surrounding media.