

1.1 Tool Steel

1.1.1 Defined of Tool steel

(1) Carbon tool steel

The first part, in accordance with the GB/T13304 "classification of steel" classified by chemical composition of steel," Carbon tool steel belongs to non alloy steel. According to the standard part 2 "steel according to the grades of main quality classification and the main performance", carbon tool steel belongs to the special quality of alloy steel.

Carbon tool steel, alloy tool steel) is a high carbon hypereutectoid, eutectoid or hypoeutectoid steel, the carbon content range of 0.7% ~ 1.3%. Its performance in addition to related to industrial smelting, thermoplastic deformation, mainly depends on the carbon content, carbon is the main strengthening elements carbon tool steel. This kind of steel has high hardness and wear resistance after heat treatment, red hardness, low hardenability. In order to improve the hardenability of steel, some brands add 0.40% ~ 0.60% of manganese in steel. Carbon tool steel, usually in annealing state delivery, generally should be inspection hardness, high power, low power and fractograph, and surface decarburization layer depth, etc. This kind of steel is mainly used in the manufacture of general cutting speed, and the processing is not too high hardness and strength of materials, tools, and the shape is simple, low accuracy of the measuring tool, mould, etc.

(2) alloy tool steel

According to GB / 13304 "classification of steel in the first part of the" classified by chemical composition of steel, alloy tool steel belongs to alloy steel. According to the standard part 2 "steel according to the grades of main quality classification and the main performance" alloy tool steel belongs to the special quality of alloy steel.

Alloy tool steel for medium and high carbon alloy steel, used in the manufacture of section, shape, special, larger and more complex measuring tools and cutters, shock resistant and heat and cold mould and some special purpose tools. This kind of steel carbon content is higher, and contain a variety of strengthen the alloy elements, such as chromium, molybdenum, tungsten, vanadium, etc., has the high hardness, toughness, good wear resistance, red hardness, impact resistance, and has a good hardenability, the stability of the organization, such as smaller heat treatment deformation performance. Steel is usually annealing state delivery. Due to the complexity of alloy tool steel chemical composition, the working conditions, so the surface quality and internal quality and strict, general high power, low power shall be checked and microstructure, such as fracture, acid leaching at low, pearlite organization decarburization layer depth, carbon round steel mesh and uneven eutectic carbide, etc.

(3) high-speed tool steel

According to GB / 13304 "classification of steel in the first part of the" classified by chemical composition of steel, high-speed tool steel belongs to alloy steel. According to the standard part 2 "steel according to the grades of main quality classification and the main performance", high-speed tool steel special steel alloy quality

Is a high carbon alloy steel, high-speed tool steel main alloy elements tungsten, chromium, vanadium, molybdenum, cobalt, aluminum, etc., belongs to the steel grade of leydig shape, contains a lot of alloy carbides. These carbide has high speed tool steel with high red hardness, hardness and wear resistance. The as-cast high speed tool steel ledeburite organization is bulky, so it is difficult to thermoplastic deformation. Steel annealing state usually in the delivery of the goods, or again after annealing by other machining methods (peeling, grinding, etc.) after the delivery of the goods. For high speed tool steel shall generally be inspection hardness, eutectic carbide is not uniformity, low power and fracture, large granular carbide, etc. High-speed tool steel and high temperature (600 °C) is not more than you can keep a good cutting performance, cutting tool used in the manufacture of high efficiency, such as milling cutter, reamer, broach, gear shaper cutter, and drill bit, etc., also used as a cold work mould, high temperature bearing, etc