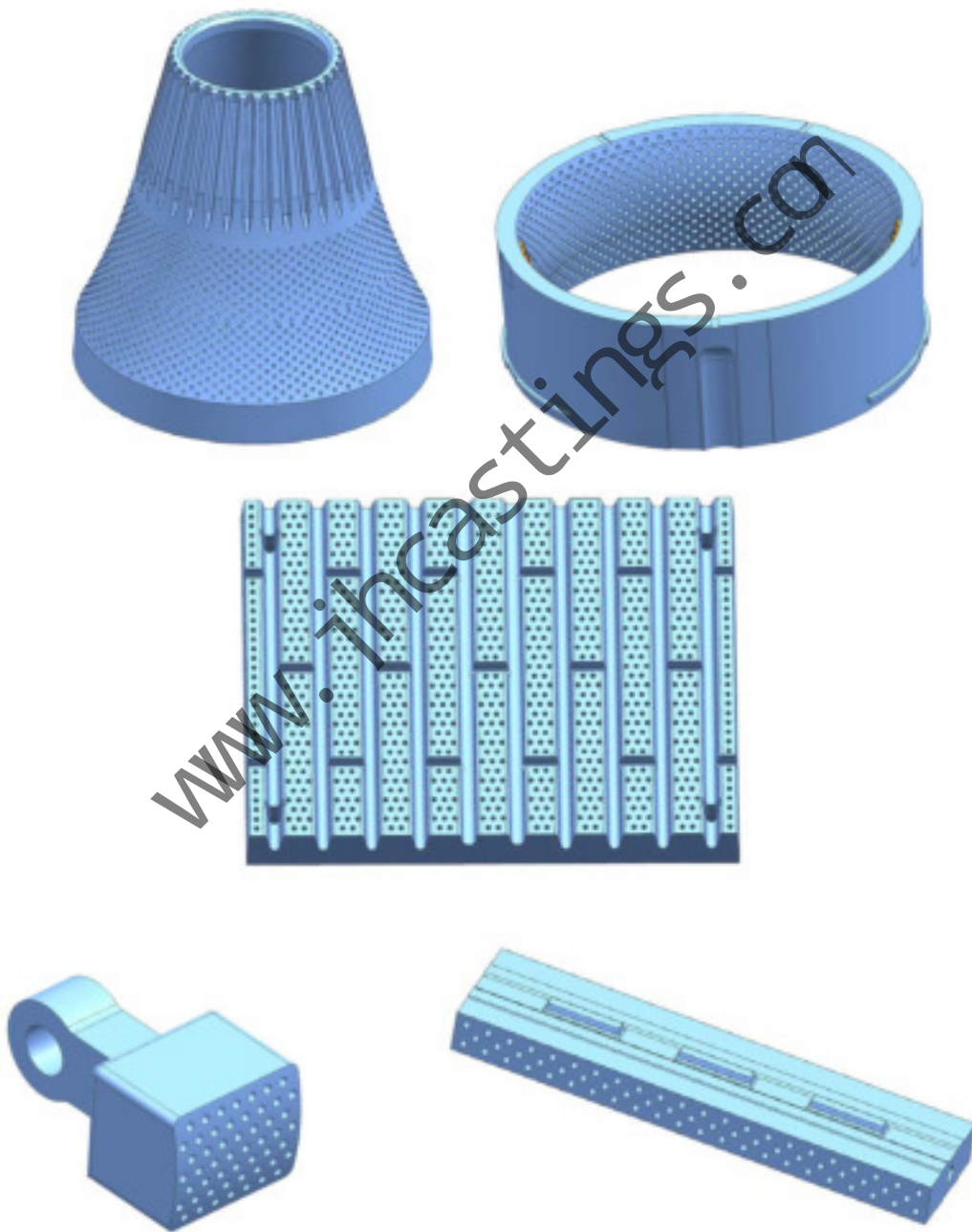




Wear parts with alloy insert introduction





1. Introduction

TiC alloy insert have good performance and wear resistance. Through special process design and production technology, TiC alloy insert are applied as insert to the wear surface of high manganese steel castings and high chromium iron castings, such as **cones, jaw plates, blow bars, hammers and other products**. By this method, the insert can significantly enhance the plasticity and impact strength of the reinforced surface, effectively reduce the wear of the high manganese steel casting or high chromium casting matrix, and increase the service life of the wear-resistant parts to about **1.5 to 2 times**.

1.1 Physical properties of TiC insert : (manganese steel hardness after heat treatment is 180-220HB, after harden, hardness is 550-600HB)

Hardness/HRC	Density/cm ³	Bending strength/mm ²	Grain size/ μ m
60 \pm 2	6.0 \pm 0.2	1600 \pm 200N	1.5+0.5

1.2 Chemical component of TiC insert

Chemical component	TiC	Fe	Others
Percentage%	47	37	16

1.3 Typical size

Diameter/mm	Length/mm
12	20/30/40/50/60/70/80
14	20/30/40/50/60/70/80
16	40/50/60/70/80/100
20	40/60/80/100

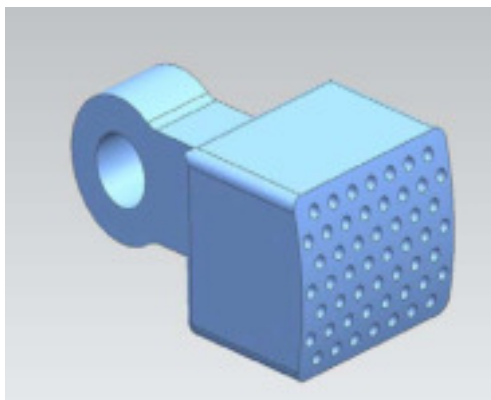
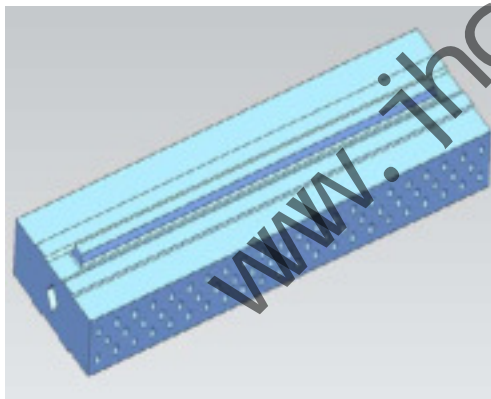
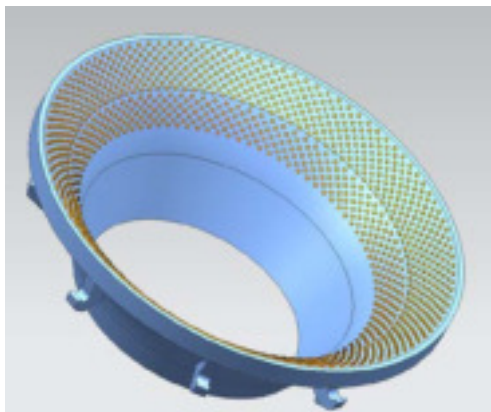
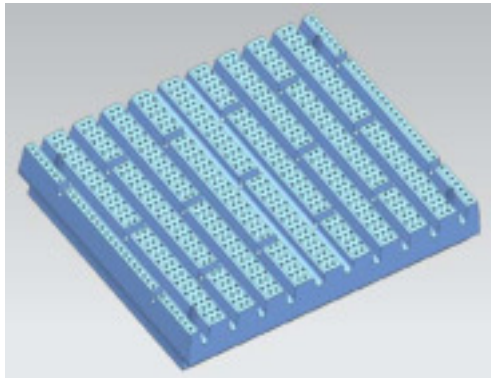
1.4 Production process of TiC insert

2. Application

TiC alloy insert are widely used in high manganese steel castings and high chromium cast iron castings, but now they are most commonly used in high manganese steel castings. They are found in various types of cones, jaw plates, blow bars, and hammers. use. In production, it is important to select alloy insert size according to the working conditions of the product, the discharge size, etc., and design a reasonable layout plan to ensure that the best results can be achieved and at the same time can facilitate production. There are two points in the design that require special attention: the first is that the volume ratio of insert to the bulk material should not be greater than 1:10, to avoid poor metallurgical fusion, and the phenomenon of inserts falling during use; the second is that the distance between inserts can not too close to prevent the phenomenon of pouring failure, and reasonably control the spacing.



2.1 Successful cases





2.2 Important factors for qualified products

The first important factor is the quality of inserts. We have to use the best raw materials to make the inserts, combined with strict production process control, to make the inserts have best mechanical properties with best wear resistant performance.

The layout design of insert is another important aspect to be sure products have good wear performance. We cooperate with our customers to study the wear shape after old parts failure, and we make specific design for each customer, each model to be sure the insert layout, size, quantity are all in best option.

In the production of castings composite with insert, the metallurgical fusion of insert and substrates material is very important, so controlling the pouring temperature is the key factor to produce successful castings. If pouring temperature is too low, the metallurgical fusion will bad and may cause inserts fall down during suing, causing machine damaged. If pouring temperature is too high, it will cost many problems such as more impurities, the product is prone to defects, and product metallography does not meet the standard. Sometimes higher temperature may also cause inserts fall down or floating to casting surface. Generally, the pouring temperature is about 30°C higher than normal products.

According to specific design, Jianheng Metal will be able to control the right pouring temperature to get the best parameters for production.

2.3 Advantages

2.3.1 Increase wear life

Most successful customer have got twice wear life than normal material products;

2.3.2 Few changes and more out put



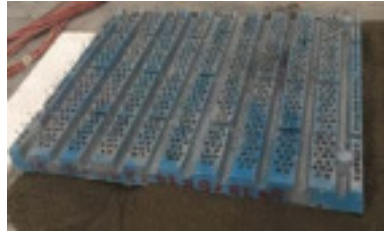



By longer wear life, it is possible for customers to reduce the frequency of replacement parts, which can help customer reduce cost on replacing part, and reduce cost because of machine stop work. So the average out put for per set of spare parts also higher.

2.3.3 High cost performance choice




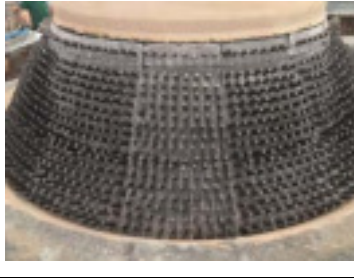


The successful wear parts composite with inserts give customer a high cost performance choice on the products. Compared with traditional products, it has obvious advantages and more and more customers attracted to accept it.

2.4 Production cases

2.4.1 Jaw plate production







		
(1) Pattern preparation	(2) Insert preparation (3) Surface cleaning	(4) Molding: put insert on pattern;
		
(5) Stripping	(6) Pouring	(7) Shake out and cleaning

2.4.2 Cones production

		
(1) Pattern preparation	(2) Insert preparation	(3) Core making
		
(4) Molding: put cores with insert in the molds;	(5) Pouring	(6) Shake out and cleaning



2.4.3 Hammers production

		
(1) Pattern preparation	(2) Insert preparation – square shape	(3) Insert preparation – circle shape
		
(4) Put insert into mold	(5) Put insert into mold	(7) Shake out and cleaning

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