



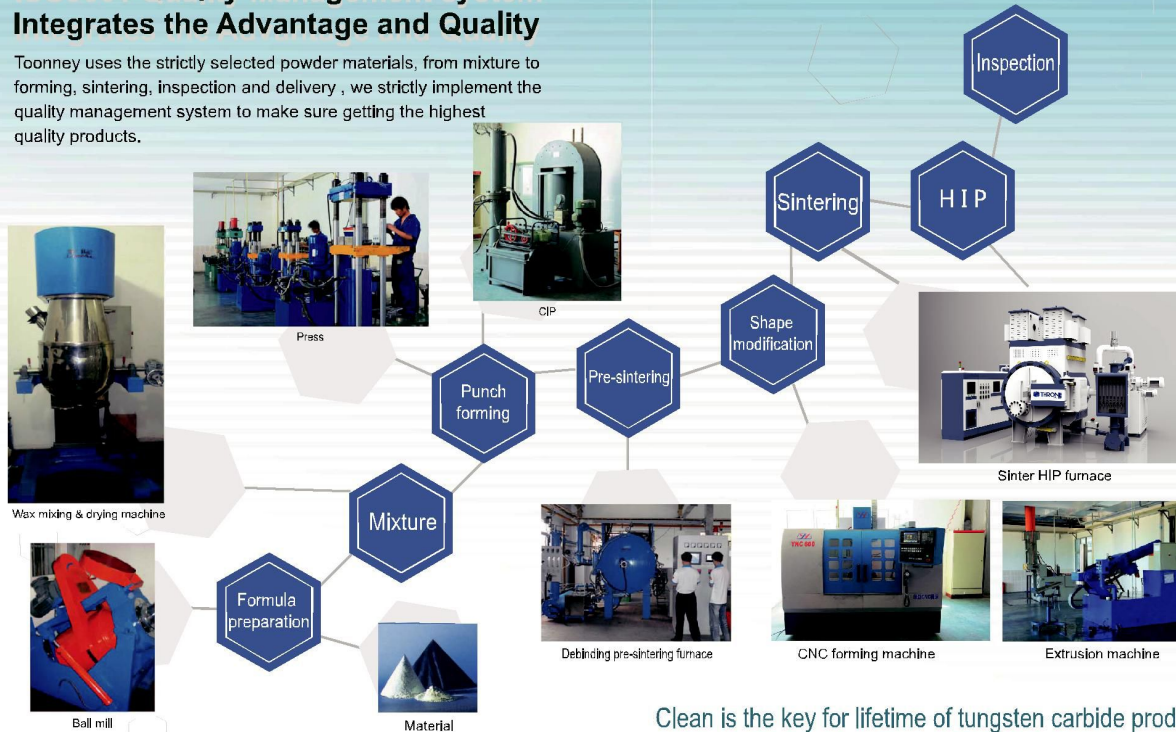
Toonney Alloy(Xiamen) Co.,Ltd.



TOONNEY ALLOY

ISO9001 Quality Management system Integrates the Advantage and Quality

Toonney uses the strictly selected powder materials, from mixture to forming, sintering, inspection and delivery , we strictly implement the quality management system to make sure getting the highest quality products.



Clean is the key for lifetime of tungsten carbide products

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Toonney Alloy(Xiamen) Co.,Ltd.



TOONNEY ALLOY

Advanced
inspection
equipments



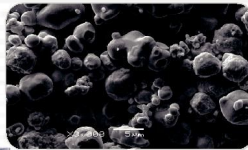
High magnification metallographic microscope



HV



HRA



Scanning electronic microscope



SEM



Carbon analyzer



T-RS

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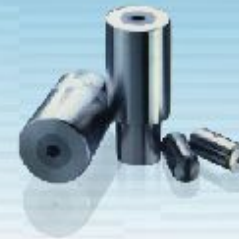
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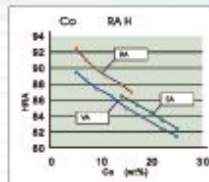
TOONNEY tungsten carbide material Micro technology creates the high quality products

To ensure the stable quality, Toonney precisely inspects the hardness, strength and fracture toughness in each necessary process, and strictly control the quality in each manufacturing step with best efforts.



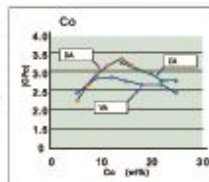
■ Hardness

The index of hardness usually is HRA or HV, HRA is more common. Wc-Co alloy material has the characters that, the hardness will be lower along with the increasing of Co, and higher when grain size decreases. When temperature increases, the hardness will be decreased.



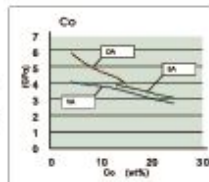
■ Bending strength

There is a simple and widely used method in hard metal area to testing the material properties. In this method, testing is done to 3 points' bending strength according to CIS026, at the beginning strength increases along with the increase of Cobalt content, when Co content reach about 15% the bending strength reach the peak, then decrease along with the increase of Co content. As right side chart shows.



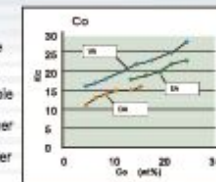
■ Compression strength

Cemented carbide material has very good compression resistant, the two factors cobalt content and size of tungsten carbide grain effect the compression strength, right side chart shows how they effect, when cobalt content is between 4-5% the compression strength is more than 6Gpa, then decreases with the increase of cobalt content or grain size.



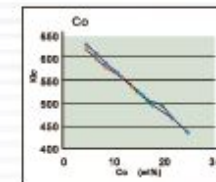
■ Fracture toughness

Fracture toughness is a index still in use to test the must have energy and impact load to break the hard metal material. It is also called intensity pressure saturation coefficient, become more important in recent years. The testing method is to make the sample crack and fracture, and the needed energy enlarging the crack to fracture is fracture toughness, which presents toughness, the higher the value, the harder for crack to be enlarged. As the chart shows, the higher cobalt content, the higher fracture toughness, the smaller tungsten carbide grain size, the smaller fracture toughness.



■ Yang's modulus (Vertical coefficient of elasticity)

The Yang's modulus value of hard metal is 2-3 times of steel commonly, it is a very important property of the structural material. Yang's modulus will decrease along with the increase of cobalt.



■ Thermal expansion coefficient

This index should be very important when hard metal is applied in different temperature. We can often see the example that crack is easily to arise when the hard metal welded with copper, it is because of the different thermal expansion coefficient. The TEC value of hard metal is 1/2 to 1/3 than of steel. As the chart shows, TEC will increase along with the increase of cobalt content.

