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**NATIONAL STANDARD OF THE
PEOPLE'S REPUBLIC OF CHINA**

GB/T 36594-2018

Method of ultrasonic inspection for cemented carbide

硬质合金超声检测方法

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Foreword

This standard was drafted in accordance with the rules given in GB/T 1.1-2009. This standard was proposed by the China Nonferrous Metals Industry Association. This standard is under the jurisdiction of the National Nonferrous Metals Standardization Technical Committee (SAC/TC243). This standard is drafted by: Zhuzhou Cemented Carbide Group Co., Ltd., Nanchang Cemented Carbide Co., Ltd., Shenzhen City Co., Ltd., Zhejiang Hengcheng Cemented Carbide Co., Ltd. The main drafters of this standard. Lu Shaowu, Liang Hong, Deng Tao, Yang Jun, Huang Shuai, Zhang Yue, Jin Yimin. Cemented carbide ultrasonic testing method

1 Scope

China's national method for inspecting cemented carbide by A-scan ultrasonic pulse-echo contact testing. Cemented carbide is tungsten carbide particles held in a cobalt binder, made by pressing and sintering, and it is the material of cutting tools, mining picks, wear parts and rolls. Its defects come from how it is made: porosity where the liquid binder did not fill, cobalt lakes where it pooled, cracks from the shrinkage of sintering, and inclusions. All of them are internal and none is visible from outside. That matters because the material is used in components that are expensive and that fail catastrophically - a roll ring bursting on a rolling mill, a mining pick shattering - and because the finished part is far too hard to machine, so a defective blank has already absorbed all the grinding cost before anyone finds out. Ultrasound sees inside it well: carbide is dense, fine-grained and acoustically quiet, so a small reflector stands out clearly against the background.

This standard specifies the method for ultrasonic longitudinal wave detection of cemented carbide by the A-type ultrasonic pulse reflection contact method. This standard is applicable to cemented carbide products with a height of 10.0mm~380.0mm and a detection area of not less than 113mm², or a diameter that is not small. Ultrasonic testing of solid carbide rods at

6.0 mm and lengths from

40.0 mm to 380.0 mm.

2 Normative references

The following documents are indispensable for the application of this document. For dated references, only dated versions apply to this article. Pieces. For undated references, the latest edition (including all amendments) applies to this document.

GB/T 3488.1-2014 Metallographic determination of microstructures - Part 1 . Metallographic photographs and descriptions

GB/T 3500-2008 Powder metallurgy terminology

GB/T 9445 Non-destructive testing personnel qualification and certification

GB/T 12604.1-2005 Non-destructive testing terminology ultrasonic testing

GB/T 18694 Nondestructive Testing Ultrasonic Testing Probe and Characterization of Its Sound Field

GB/T 18852 Non-destructive testing Ultrasonic testing Reference test blocks and methods for measuring the characteristics of contact probes General technical conditions for

JB/T 10061 A pulse reflection ultrasonic flaw detector

3 Terms and definitions

GB/T 12604.1-2005, GB/T 3488.1-2014, GB/T 3500-2008 and the following terms and definitions apply to This document.

3.1 Hole Pores having a size greater than or equal to 25 μm present in the metallographic surface.

3.2 Mixing mixedmaterial The mixture is mixed with another grade or mixture of other grades with a large difference in particle size.

3.3 Cobalt aggregation cobaltconcentration A cobalt-rich zone that differs from normal tissue in metallographic grinding.

3.4 Tungsten carbide aggregate tungstencarbideagglomeration Coarse tungsten carbide is gathered together.

3.5 Clutter clutter A reflected waveform shaped like a grass.