



Designation: **B665 – 08 (Reapproved 2012) B665 – 19**

Standard Guide for Metallographic Sample Preparation of Cemented Tungsten Carbides¹

This standard is issued under the fixed designation B665; the number immediately following the designation indicates the year of original adoption or, in the case of revision, the year of last revision. A number in parentheses indicates the year of last reapproval. A superscript epsilon (ϵ) indicates an editorial change since the last revision or reapproval.

1. Scope*

1.1 This guide prescribes a method for preparing cemented carbides for metallographic examination.

1.2 *This standard does not purport to address all of the safety concerns, if any, associated with its use. It is the responsibility of the user of this standard to establish appropriate ~~safety~~ safety, health, and ~~health~~ environmental practices and determine the applicability of regulatory limitations prior to use.*

1.3 *This international standard was developed in accordance with internationally recognized principles on standardization established in the Decision on Principles for the Development of International Standards, Guides and Recommendations issued by the World Trade Organization Technical Barriers to Trade (TBT) Committee.*

2. Referenced Documents

2.1 *ASTM Standards:*²

~~B390 Practice for Evaluating Apparent Grain Size and Distribution of Cemented Tungsten Carbides (Withdrawn 2010)~~³

~~B657 Guide for Metallographic Identification of Microstructure in Cemented Carbides~~

3. Significance and Use

3.1 This sample preparation procedure may be used to prepare metallographic samples for ~~Test Method Guide B657 and Practice B390~~. It does not include all variations of sample preparation.

4. Selection of Specimen

4.1 Cemented tungsten carbides are very often in the form of relatively small pieces; it is possible to select and mount the entire piece in such manner as to permit examination of the entire cross section. When pieces are too large for this, however, they should be sectioned, using a diamond cutoff ~~wheel~~, wheel or electrical discharge machining (EDM), to allow viewing of as much of a representative cross section as possible. For micrographs, the area selected should represent, as nearly as possible, the entire cross section.

5. Procedure

5.1 There are several acceptable methods for preparing cemented tungsten carbide surfaces for microscopical examination. Basically, they all use diamond wheels for grinding and diamond powders for lapping. The grinding practices differ, to a minor degree, with respect to grit size of diamond. In all practices, however, the final polish is produced by extremely fine diamond powder lapping, and in all practices care must be exercised to retain the microstructure in its true form and to avoid pull-out of the softer matrix material (usually cobalt). While it is accepted that other procedures may be used successfully, this procedure has proved satisfactory in many laboratories.

5.1.1 *Mounting*—Where possible, specimens should be mounted in a plastic material such as phenol-formaldehyde or poly(methyl methacrylate) to facilitate polishing without rounding the edges. Larger specimens may be polished without mounting.

¹ This guide is under the jurisdiction of ASTM Committee B09 on Metal Powders and Metal Powder Products and is the direct responsibility of Subcommittee B09.06 on Cemented Carbides.

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² For referenced ASTM standards, visit the ASTM website, www.astm.org, or contact ASTM Customer Service at service@astm.org. For *Annual Book of ASTM Standards* volume information, refer to the standard's Document Summary page on the ASTM website.

*A Summary of Changes section appears at the end of this standard