

QWISE-HJ-HHLJDZDS-2019

Company Standard

Hunan WISE New Material Technology Co., Ltd.

Steel Bonded Carbide sub-factory

Pressed molding powder quality identification process

Operating instructions

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Steel Bonded Carbide sub-factory Operating instructions

Pressed molding powder quality identification

1 main raw and auxiliary materials

1.1 Main raw materials: mixed materials of various grades.

1.2 Main auxiliary materials: None.

2 major equipment and tools

2.1 Main equipment: 100T hydraulic press, bottom (40 ×) microscope, magnetic saturation meter.

2.2 Main tools: calipers, balances, electronic scales, stainless steel trays, stainless steel shovel, copper screens, sampling drills.

3 job quality requirements

3.1 The operation must strictly comply with the equipment safety technical regulations.

3.2 Specimens shall not have delamination, cracks, falling edges, falling corners, unpressed, over-fired, under-burned, carburized, decarburized, etc.

3.3 Timely and accurate identification of the chemical composition, physical and mechanical properties of each grade mixture, whether the organization meets the internal control standards or the provisions of the interim standards.

4 steps and essentials

4.1 sampling and sample delivery

4.1.1 After the slurry sample taken from the wet grinding group is dried, sieve it with a 250 μm (60 mesh) sieve, fill in the sample bag according to the batch number on the slurry sample bag (specify whether it contains wax), The sieved batches were bagged for chemical analysis.

4.1.2 The sample of the remaining slurry after the sample is sent is stored in the desiccator for the purpose of identification.

Management focus: the batch number must be written on the sample bag; the desiccant must be replaced frequently to keep the dryer dry and the material is not oxidized.

4.1.3 Sampling the upper, middle and lower points of the 1/2 radius of the drum with a clean sampling drill (or shovel), the sampling amount is 0.5~1.0kg.

Management focus: sampling drill or shovel must be cleaned, operation should be accurate, and the grade and batch number should be separated. Prevent mixing.

4.2 Sample preparation

4.2.1 Before pressing, first clean the tool, correct the balance and caliper, check the mold model and limiter.

4.2.2 Weigh the mixture according to the weight of each grade for pressing.

Identify the batch number of the material, prepare the sample number, and engrave it on the sample. The long sample is engraved on the side and the three samples are engraved on both ends.

4.2.3 Strictly inspect the sample, and there shall be no unqualified phenomena such as delamination, cracking, falling edge, corner drop, uncompressed, large burr.

4.2.4 Return the remaining mixture after pressing to the mixing stock and pour into the mixing tank of the same batch.

4.3 Sintering

4.3.1 Handle with ease when loading the boat. The high-cobalt alloy pad has two to four layers of coated paper and one to two layers of graphite paper boat. There is a gap between the products.

4.3.2 Put the filled “Production Identification Sintering Instruction Card” into the boat with the sample and place the boat in the designated position.

4.3.3 General requirements The sintering process of the identification pattern is consistent with a large number of products, and can be sintered with the furnace without the same system. The identification sintering process and heat number of each grade are filled in by the sintering group.

Management focus: See the sintering process notice for details.

4.4 Sample processing and inspection

4.4.1 The sintered form is first sandblasted and then ground by a surface grinder.

Management focus: Long strip samples should be sized before refining to ensure that the size after finishing is up to the inspection requirements.

4.4.2 Fill in the sample bag; ask for the batch number, number, test item, and sample delivery date on the sample bag.

4.4.3 According to the requirements, 5 pieces of strength samples, 2 pieces of three samples, and 2 pieces of metallographic samples are respectively placed in the corresponding sample bags for inspection.

4.5 Section inspection

Five pieces of each batch of samples were knocked open along a large plane with a cross-sectional area of not less than 1 cm². Observed under a microscope magnified 32 times. Check for the phenomenon of carburization, decarburization, mixing, dirty, under-burning, uncompressed, coarse grain accumulation, etc., the percentage of soiling is 20%; the carburizing and decarburization need to explain the parts; The material needs to be stated as serious.

4.6 Magnetic saturation measurement

4.6.1 From the sample of the cross-section, select 2 pieces per batch and weigh the weight on the electronic scale.

Management focus: weighing accuracy of 0.001g.

4.6.2 Turn on the magnetic saturation meter for calibration. The test can be carried out according to the requirements, and the test results are filled in the original record of the

magnetic saturation measurement of cemented carbide.

Management focus: Each sample is tested twice, and the error of the two results does not exceed 0.2. Otherwise, recalibrate the instrument and retest.

4.7 Judgment

4.7.1 Collect the results of each inspection project in the “mixture identification record” and carefully check the results according to internal control standards or interim standards. To meet the standard, you can fill out the “mixed mixed suppression notice” to cut the material.

4.7.2 The material that was judged to be unqualified for the first time was re-identified, and only one re-identification was allowed under the same system. The system of re-qualification is as follows

1) Chemical analysis is unqualified: only unqualified items are re-delivered, usually re-delivered once, and special circumstances may be increased as appropriate.

2) Physical and mechanical properties are unqualified: any one of the unqualified products should be fully qualified.

3) Fracture or metallographic failure: If any of the two fails, the fracture and metallography should be re-identified. For the diversification, the identification can be made twice, and the seepage and decarburization should be cautious, allowing the number of identifications to be relaxed.

4.7.3 Treatment of non-conforming materials

If the unqualified materials are verified, the appraisers shall promptly fill out the “Notice of Disqualified Products Evaluation and Disposal” to feed back the information to the assessor. The reviewer shall fill in the disposition measures, and after the signature of the reviewing person, notify the processing class.

4.7.3.1 Treatment of unqualified chemical components

1) The binder content is unqualified;

2) The total carbon content is unqualified: if the total carbon content exceeds the standard, the other performances are normal, and the reviewer reviews the blank. If there is a performance non-conformity associated with it, then it will be modified or spiked.

3) Unqualified oxygen content: If the oxygen content exceeds the standard, the other properties are normal, and the reviewer reviews the blank. If there is a performance non-conformity associated with it, then it will be modified or spiked.

4) Unqualified iron content: If the iron content exceeds the standard, the other properties are normal, and the reviewer will review the blanking. If there is a performance failure related to it, the next is added.

4.7.3.2 Treatment of unqualified physical and mechanical properties

1) Unqualified magnetic force: If other performances are normal, the judges will decide whether to review the blanking according to the qualification conditions, the furnace conditions, the actual batch sintering conditions, the identification of the grain condition, etc., and notify the adjustment of the batch sintering system when necessary.

2) Unqualified density: When the binder content is normal, the high density is generally related to decarburization. If this phenomenon still occurs after re-identification, it should be modified or blended. If the density is low, we should start with the analysis of possible causes and take corresponding measures;

i. Under-burning: Improve the sintering temperature or prolong the high-temperature holding time.

li, wet grinding process is not performed properly: lower regrind.

lii, alloy carburizing: the next modification or admixing or reviewing the blanking, while adjusting the bulk sintering process.

lv, severe decarburization: under the modified or blended.

v, not pressed well: re-sample identification.

3) Unsatisfactory hardness: In the case of normal chemical composition and acceptable density, the possible causes and disposal methods of low hardness of the alloy are as follows:

I. Identify excessive sintering temperature or high temperature holding time: reduce the sintering temperature or shorten the high temperature holding time.

li, wet grinding process is not performed properly: lower regrind.

lii, high binder content: under the modified or spiked.

The lv and hardness identification samples are cobalt-rich on the surface due to the outward movement of the cobalt liquid: the hardness sample is properly ground.

v, seepage: under the modified or mixed.

4) Unsatisfactory bending strength: When the chemical composition is normal, the density and hardness are qualified, the possible reasons for the unqualified bending strength of the identified material and the corresponding disposal methods are as follows:

I. More microscopic pores in the alloy: lower regrind.

li, high impurity content or improper additives, uneven mixing: under the admixture.

4.7.3.3 Disposal of defective materials

1) Dirty: Re-grinding.

2) Leaching or decarburization: sub-mixing or admixing.

3) Mixing: Re-grinding or admixing.

4) Mixed crystal: In the case of normal sintering temperature and high temperature holding time, if the metal phase is qualified, the magnetic force and hardness are normal, and the slight mixed crystal can be judged. When the sintering is normal, the severe mixed crystals must be mixed underneath.

5) Coarse grain aggregation: under regrind.

4.7.3.4 Treatment of metallographic unqualified materials

1) The porosity is too high: the next regrind.

2) The graphite phase η phase is unqualified: the next modification or admixture or review is also notified to adjust the batch sintering process.

3) Unqualified grain size: too coarse, under regrind: too fine, under the admixture.

Management focus: The cross-section observation should be careful, accurate, and the inspection results should be clearly and unambiguously registered, and the implementation standards should be strict.

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