

IMIMTECHNOLOGY IN 3D PRINTING DARTS

Author: Chen Dong

Principle

Due to uneven allowances in the blank of these parts, manual marking and gauging are required to determine the machining datum and positional deviation of the workpiece, which affects the continuous operation time of the machine tool and can easily lead to excessive machining results.

Jingdiao CAM Software SurfMill

Examples

Die Casting Parts Quickly and Accurately

brands are not supported.

Production boundaries and limits

1. The NC code can only be programmed in Jingdiao CAD/CAM software-

2. It is possible that the systems and operational modes of these grinding

machines may not align seamlessly with those of other production

equipment, necessitating organizational training for users by the

3. This solution is typically applied in small and medium-sized batch

stage, and cannot be used in large-scale production.

ensure the accuracy of measurement, a periodic

5. For some parts with complex structures, the IM

technology is unable to conduct inspection.

calibration process is necessary.

processing or during the initial research and development verification

4. The measurement accuracy depends on the precision of machine. To

SurfMill and run in Jingdiao CNC system. CNC systems from other

To achieve five-axis adaptive machining for these parts, the parts are positioned using ordinary fixtures, and the "in-machine inspection" function of Jingdiao is used to detect the distribution of blank allowances, calculate distribution deviations, automatically establish a precise machining coordinate system, and perform compensatory machining. The entire process requires no manual intervention.

Advantages

- 1. The use of this solution has improved the efficiency of establishing the workpiece coordinate system. Jingdiao's grinding machining solution eliminates the need for manual measurement of hole precision,
- allowing automatic in-machine measurement of hole precision.

 2. The use of this solution has improved the accuracy of establishing the workpiece coordinate system. The equipment integrates a CMM function to ensure that the product is qualified when it leaves the
- 3. The use of this solution has reduced the production cycle time of
- 4. During the processing, ordinary clamping fixtures can be used, eliminating the need for expensive customized fixtures. This reduces the waiting time for customized fixtures and greatly shortens the research and development cycle.

Disadvantages

- 1. Occupy some cycle time. In-machine Measurement time is required, while CMM time will be saved.
- 2. The tiny structures in 3D printed parts cannot be detected, and some rough surfaces created by 3D printing may result in large errors during inspection.
- 3. Some 3D printed parts may have defects such as internal cavities and cracks, and IMIM technology may have difficulty detecting these internal issues
- 4.3D printed parts often require the use of support structures, which may interfere with the measurement process and need to be appropriately handled before measurement.

Cost: The cost includes the following two parts:

One is the hardware cost, such as probe, receiver, standard ring or standard ball. The cost is related to the desired precision.
 The other is the software cost, only Jingdiao CAM software and CNC systems with measuring function and authority can use this technology, additional cost may apply for professional measurement function.

www.**KSC**Conference.nl

Automatically Defines the Coordinate System of 3D Print Parts Quickly and Accurately



eu.jingdiao.com

Beijing Jingdiao Group

Beijing Jingdiao Group is a global company focusing on the R&D, production and sales of precision CNC machine tools as well as the "machining digitization" engineering services. The main service industries include: precision mold, precision parts, 3C structural parts, medical equipment, automotive electronics, etc.

The group's main products are Jingdiao high-speed machining center, its CNC system, precision spindle, CAM software and other core technology products and key functional components are independent research and development and scale production, with complete independent intellectual property rights, independent research and development of CAM software SurfMill9.5 has been certified by the German PTB authority.

Upon the unremitting efforts for nearly thirty years, the flagship product of Beijing Jingdiao – Jingdiao high-speed machining center, has been advanced internationally in its technical performance, with an international leading application ability and an precision machining capability of 0.1µm feeding, 1µm cutting and nanoscale surface roughness.



Advantages

1. Jingdiao's grinding machining solution eliminates the need for manual calibration of the grinding head, enabling automatic detection of the

grinding head size.

2. Jingdiao's grinding machining solution eliminates the need for manual measurement of hole precision, allowing automatic in-machine measurement of hole precision.

3. Through automatic detection of grinding head size and hole precision, the production process becomes more continuous, with longer effective running time for the machine tool, higher efficiency in processing parts, and faster cycle time for single-piece processing.4. The equipment integrates a CMM function to ensure that the product is

qualified when it leaves the machine.

5. Prior to measuring workpieces, the machine tool is programmed to automatically execute a cleaning routine, ensuring that the workpiece being inspected is clean and free from contaminants that could potentially affect the accuracy and validity of the measurement results.

Disadvantages

1. At present, the Jingdiao solution can only stably achieve an accuracy of 2µm, and higher precision still requires the use of other external

2. The solution requires the configuration of grinding wheel measuring instrument, grinding wheel dresser, etc., which increases certain costs, complicates the programming process, and raises the requirement for cleanliness during the machining process.





Hole grinding processing

Production boundaries and limits

1. The Jingdiao 5-axis high-speed grinding machining center is sensitive to environmental conditions such as temperature and humidity. These factors can affect both the processing accuracy and the equipment performance.

2. The NC code can only be programmed in Jingdiao CAD/CAM software–SurfMill and run in Jingdiao CNC system. CNC systems from other brands are not supported.

3. It is possible that the systems and operational modes of these grinding machines may not align seamlessly with those of other production equipment, necessitating organizational training for users by the

4. The measurement accuracy depends on the precision of machine. To ensure the accuracy of measurement, a periodic calibration process is

Cost: The cost includes the following two parts:

1.One is the hardware cost, such as probe, receiver, standard ring or standard ball. The cost is related to the desired precision.2.The other is the software cost, only Jingdiao CAM software and CNC systems with measuring function and authority can use this technology, additional cost may apply for professional measurement function.

www.KSCConference.nl

