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Stylus ball cleaning

A clean stylus ball on a co-ordinate measuring machine (CMM) or Equator™ gauging system is key to achieving repeatable metrology results. Contaminant build-up on the stylus ball from general use (especially when scanning) can lead to poor metrology results. Frequent inspection and cleaning of the stylus ball will ensure that results are as accurate as possible.

Dirt, pick-up and wear

Dirt can be a combination of contaminants and debris from a number of sources such as remnants of grease from handling, dust, oxides, protective oil or the remnant of coolant lifted from the part under inspection. Dirt should be cleaned from a stylus ball as often as possible to reduce the risk of metrology being affected.

Pick-up is a mechanical phenomenon where a permanent transfer of material from the part being inspected to the stylus ball occurs, typically during scanning. This is also known as adhesive wear.

Abrasive wear is a mechanical phenomenon where a permanent transfer of material from the stylus ball to the part occurs, potentially leaving a flat spot on the ball.

Adhesive wear and abrasive wear are permanent changes in a stylus ball's composition which cannot be removed; Renishaw recommends that styli are replaced immediately if pick-up or wear is noted. If either phenomenon reoccurs frequently, discuss your application with your nearest Renishaw office to understand whether any other ball materials or alternative methods of inspection may be more suitable.

Recommendations

- All Renishaw styli should be frequently inspected and cleaned to reduce the risk of poor metrology.
- If pick-up or wear is detected and cannot be cleaned, the stylus must be replaced.
- Styli should be cleaned prior to installing on the probe to ensure no packaging dust is present on the ball.
- Care should be taken when cleaning styli.
- Do not use abrasive or corrosive cleaner on the stylus as this could potentially damage the adhesive joint, rendering the stylus unusable.
- Contact your local Renishaw office for help or advice regarding the cleaning and care of your stylus.

Recommended cleaning equipment

When inspecting for dirt, pick-up or wear the following are recommended:

For ball diameters of < 1 mm

A microscope with 40× to 80× of magnification is recommended.

For ball diameters of 2 mm – 8 mm

A microscope with 10× to 40× level of magnification is recommended.

A light source of at least 1000 lumen will enable clearer identification of contaminant type.

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Suggested methods for styli cleaning

For ball diameters of < 1 mm

Due to the fragility of these styli, Renishaw recommends that they are inspected under microscope, using only canned air to remove contamination.For ball diameters of 2 mm – 8 mm.

For ball diameters of 1 mm – 3 mm

Use small lint-free buds.

For ball diameters > 3 mm

Use large lint-free buds.

1. Soak the lint-free bud in IPA.
2. Ensure any excess IPA is wiped off on the pump pot.
3. Under the microscope, sweep around the equator of the ball in one direction and wipe the top surface, taking care to apply minimum pressure.
4. Dry the stylus with canned air before reattaching it to the probe.

CAUTION: Care must be taken when reattaching the stylus to prevent contamination of stylus ball.

If the stylus is attached to the probe head during cleaning, apply light pressure and ensure that caution is exercised; excessive force during cleaning can result in the probe head requiring recalibration.

Datum balls

Use a soft lint-free cloth to sweep around the entire datum ball.

CAUTION: Care must be taken to not contaminate the datum ball.

IPA can be used in addition to the lint-free cloth. Ensure all IPA has evaporated before using the datum ball.

Cleaning procedure (video)

The following video demonstrates examples of both small ball and large ball stylus cleaning:

http://resources.renishaw.com/en/details/--86746

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Part no.: H-1000-2136-01-A