

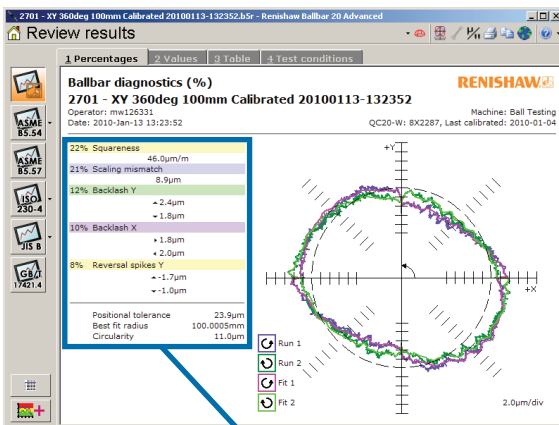
Comparison of partial arc and 360° tests

Overview

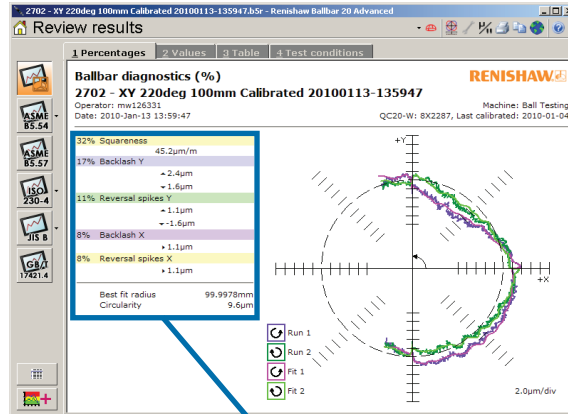
Partial arc testing can be performed to save both test time and axis travel. So how do the results compare between a partial arc test and a full 360° test performed in the same part of the machine volume?

During the development of the partial arc test numerous tests were carried out comparing results from 360° and partial arc results. Since there is a portion of the arc 'missing' in a partial arc test there are some errors that cannot be diagnosed, for example scaling mismatch (see support article H-8014-1639 for full details). However, for the errors that are diagnosed the difference between a partial arc result and that of a 360° is less than the repeatability of any given test.

Below is a typical example of a comparison test between partial arc and 360° tests.



22% Squareness	46.0µm/m
21% Scaling mismatch	8.9µm
12% Backlash Y	±2.4µm ±1.8µm
10% Backlash X	±1.8µm ±2.0µm
8% Reversal spikes Y	±1.7µm ±1.0µm
Positional tolerance	23.9µm
Best fit radius	100.0005mm
Circularity	11.0µm



32% Squareness	45.2µm/m
17% Backlash Y	±2.4µm ±1.6µm
11% Reversal spikes Y	±1.1µm ±1.6µm
8% Backlash X	±1.1µm
8% Reversal spikes X	±1.1µm
Best fit radius	99.9978mm
Circularity	9.6µm

Renishaw plc
New Mills, Wotton-under-Edge,
Gloucestershire GL12 8JR
United Kingdom

T +44 (0) 1453 524524
F +44 (0) 1453 524901
E uk@renishaw.com
www.renishaw.com

RENISHAW 
apply innovation™

About Renishaw

Renishaw is an established world leader in engineering technologies, with a strong history of innovation in product development and manufacturing. Since its formation in 1973, the company has supplied leading-edge products that increase process productivity, improve product quality and deliver cost-effective automation solutions.

A worldwide network of subsidiary companies and distributors provides exceptional service and support for its customers.

Products include:

- **Dental CAD/CAM scanning and milling systems.**
- **Encoder systems for high accuracy linear, angle and rotary position feedback.**
- **Laser and ballbar systems for performance measurement and calibration of machines.**
- **Medical devices for neurosurgical applications.**
- **Probe systems and software for job set-up, tool setting and inspection on CNC machine tools.**
- **Raman spectroscopy systems for non-destructive material analysis.**
- **Sensor systems and software for measurement on CMMs (co-ordinate measuring machines).**
- **Styli for CMM and machine tool probe applications.**

Renishaw worldwide

Australia

T +61 3 9521 0922
E australia@renishaw.com

Austria

T +43 2236 379790
E austria@renishaw.com

Brazil

T +55 11 4195 2866
E brazil@renishaw.com

Canada

T +1 905 828 0104
E canada@renishaw.com

The People's Republic of China

T +86 21 6180 6416
E china@renishaw.com

Czech Republic

T +420 548 216 553
E czech@renishaw.com

France

T +33 1 64 61 84 84
E france@renishaw.com

Germany

T +49 7127 9810
E germany@renishaw.com

Hong Kong

T +852 2753 0638
E hongkong@renishaw.com

Hungary

T +36 23 502 183
E hungary@renishaw.com

India

T +91 80 6623 6000
E india@renishaw.com

Indonesia

T +62 21 2550 2467
E indonesia@renishaw.com

Israel

T +972 4 953 6595
E israel@renishaw.com

Italy

T +39 011 966 10 52
E italy@renishaw.com

Japan

T +81 3 5366 5316
E japan@renishaw.com

Malaysia

T +60 3 5631 4420
E malaysia@renishaw.com

The Netherlands

T +31 76 543 11 00
E benelux@renishaw.com

Poland

T +48 22 577 11 80
E poland@renishaw.com

Russia

T +7 495 231 16 77
E russia@renishaw.com

Singapore

T +65 6897 5466
E singapore@renishaw.com

Slovenia

T +386 1 527 2100
E mail@rls.si

South Korea

T +82 2 2108 2830
E southkorea@renishaw.com

Spain

T +34 93 663 34 20
E spain@renishaw.com

Sweden

T +46 8 584 90 880
E sweden@renishaw.com

Switzerland

T +41 55 415 50 60
E switzerland@renishaw.com

Taiwan

T +886 4 2473 3177
E taiwan@renishaw.com

Thailand

T +66 2 746 9811
E thailand@renishaw.com

Turkey

T +90 216 380 92 40
E turkiye@renishaw.com

UK (Head Office)

T +44 1453 524524
E uk@renishaw.com

USA

T +1 847 286 9953
E usa@renishaw.com

For all other countries

T +44 1453 524524
E international@renishaw.com

RENISHAW HAS MADE CONSIDERABLE EFFORTS TO ENSURE THE CONTENT OF THIS DOCUMENT IS CORRECT AT THE DATE OF PUBLICATION BUT MAKES NO WARRANTIES OR REPRESENTATIONS REGARDING THE CONTENT. RENISHAW EXCLUDES LIABILITY, HOWSOEVER ARISING, FOR ANY INACCURACIES IN THIS DOCUMENT.

©2011 Renishaw plc. All rights reserved.

Renishaw reserves the right to change specifications without notice

RENISHAW® and the probe emblem used in the RENISHAW logo are registered trademarks of Renishaw plc in the UK and other countries. apply innovation, Productive Process Pyramid, Productive Process Patterns, Productivity+, AxiSet, Rengage, Trigger Logic, ToolWise, Sprint, MicroHole, PassiveSeal, SwarfStop, Equator and Versatile gauging are trademarks of Renishaw plc.

All other brand names and product names used in this document are trade names, service marks, trademarks or registered trademarks of their respective owners.



H - 8 0 1 4 - 1 6 4 1 - 0 1

Issued 0411 Part no. H-8014-1641-01-A