

Development of Micro-CMM and Error Compensation

*^{1, 1, 1, 1, 2, 2, 2, 2}
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Key words : Micro-CMM, Abbe offset, Laser interferometer

1. (3 D coordinate measuring machine) 가 (probe) (stage) 가 가 micro-CMM 가 (too) micro-CMM [1-3] micro-CMM 300 x 300 x 50 mm³ Abbe offset X, Y Z cross roller 3 X, Y 0.015 μm μm mm (E1) (E3) 0.3 0.3 (granite plate) X, Y

2. metrology frame Abbe zerodur 가 metrology frame Abbe offset 6 가

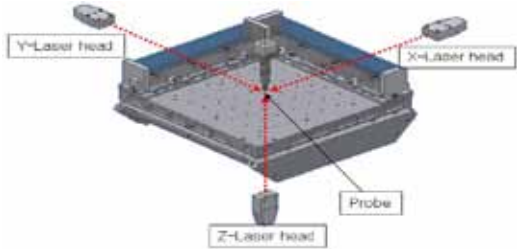


Fig. 1 Metrology frame with 3 reference plane mirrors and laser interferometer.

Z
Z
cross roller
Z
DC
3
touch probe

가
Fig. 3

0.883 μm
0.267 μm

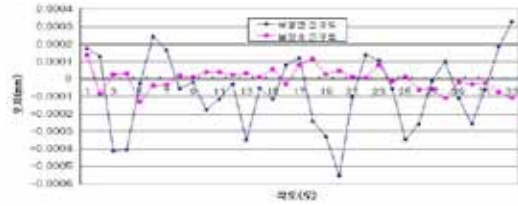


Fig. 3 Compensation of touch probe.

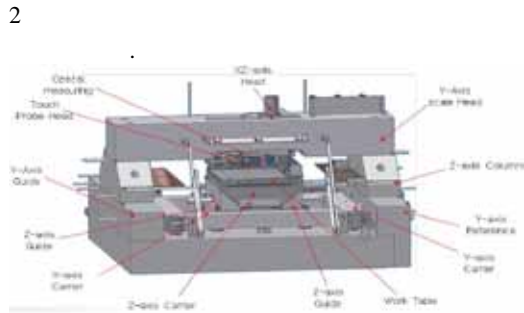


Fig. 2 Overview of micro-CMM.

4. 가

가
15, 50, 125, 200,
250 mm
X, Y

250 mm
가 1
300 x 300 x 50 mm³

가

3.

3

가

Table 1 Measurement of 15 mm gauge block

x=15mm 선형	15mm 기준 길이(보정값 계수10.0)	편차
15.00003	15.00002	0.000010
y=15mm 선형		
15.000019	15.00002	-0.000001
xy대각선 a방향-15mm		
14.999961	15.00002	-0.000059
xy대각선 b방향-15mm		
15.000106	15.00002	0.000086

가

500 x 500 mm² Z

4 μm
0.152 μm

3 3

가

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