

NATIONAL PHYSICAL LABORATORY

METROLOGY CENTRE

Ref: MOY/SCMI/13 SPECIFICATION OF ACCURACY
(Issue 4)

for

AN OPTICAL VERTICAL COMPARATOR

Type: Optical Vertical Comparator (“Vertical Omtimeter”) fitted with a projector attachment.
Magnification approximately X1000.

Made by: Optical Measuring Tools Ltd.

LIMITING VALUE OR
MAXIMUM
PERMISSIBLE ERROR

1. GENERAL

- 1.1 The general workmanship and finish shall be in keeping with a precision measuring instrument of this class.
- 1.2 Each instrument shall be marked with the maker’s name or trade mark and with an identification number. This identification number shall appear on the main base and on the measuring head.
- 1.3 The illumination and definition of the scale shall be reasonably uniform over its whole range.
- 1.4 The focusing motion of the eyepiece shall be smooth. It shall be possible to focus the scale and index line simultaneously.
- 1.5 The focus of the scale shall be comfortable within the range of the eyepiece adjustment both with and without the projector attachment.
- 1.6 The graduation lines of the scale shall be clear cut and the scale shall be free from blemishes over its whole range.

2. MEASURING CONTACT

- | | | |
|-----|--|---|
| 2.1 | The force to be applied to the measuring contact to obtain the zero reading shall lie between | Approximately 2 and 5N.
(8 and 16 ozf) |
| | Note: The face of the measuring contact shall normally be rounded. | |
| 2.2 | The rounded measuring contact shall be well finished and hardened. | Minimum 850 HV |
| | Note: If a flat contact face is supplied: - | |
| 2.3 | Provision shall be made to ensure parallelism between this contact face and the surface of the work table. | |
| 2.4 | The contact shall be hardened. | Minimum 850 HV |
| 2.5 | It shall be flat. | 0.0005 mm (0.000 02 in) |

LIMITING VALUE OR
MAXIMUM
PERMISSIBLE ERROR

3. MEASURING HEAD TUBE

- | | | |
|-----|---|----------------------|
| 3.1 | The measuring head tube shall be straight and uniform in diameter. | 0.012 mm (0.0005 in) |
| 3.2 | The tube shall be a good sliding fit in its bracket. | |
| 3.3 | It shall be possible to clamp the measuring tube effectively in its bracket at any position along the tube. | |

4. WORK-TABLE

- | | | |
|-----|--|--|
| 4.1 | The working surface of the work-table shall be lapped and well finished. | |
| 4.2 | The working surface shall be hardened. | Minimum 800 HV |
| 4.3 | The working surface shall be flat. | 0.001mm (0.000 04 in)
over the area of a central
portion of 75mm (3in)
diameter. Any departure
from true flatness shall be
in the nature of a
convexity. |
| 4.4 | The fine adjustment of the work-table shall be smooth in action and the table shall be provided with an adequate clamp. On clamping the table, no appreciable change in setting shall be observed. | |

5. ACCURACY OF PERFORMANCE

- | | | |
|-----|--|-------------------------|
| 5.1 | It shall be possible to obtain repetition of readings within | 0,0005 mm (0.000 02 in) |
| 5.2 | Scale readings shall be the same whether the measuring contact takes up its position after travelling in either an upward or downward direction. | 0.0005 mm (0.000 02 in) |
| 5.3 | When a cylinder is rolled under the measuring contact in different directions the readings shall not differ by more than | 0.0005 mm (0.000 02 in) |

LIMITING VALUE OR
MAXIMUM
PERMISSIBLE ERROR

Accuracy of Scale

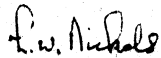
5.4 The scale shall be accurate with respect to the zero graduation to within

Metric

Up to and including 0.05 mm	±0.0005 mm
Above 0.05 mm and up to 0.08 mm	±0.0008 mm
“ 0.08 mm “ “ “ 0.10 mm	±0.0010 mm
“ 0.10 mm	±0.0013 mm

Inch

Up to and including 0.002 in	±0.000 02 in
Above 0.002 in and up to 0.003 mm	±0.000 03 in
“ 0.003 in “ “ “ 0.004 mm	±0.000 04 in
“ 0.004 in	±0.000 05 in

 (Signed)

for Director

October 1969
MOY/SCMI/13
Issue 4

