

NATIONAL PHYSICAL LABORATORY

METROLOGY CENTRE

Ref: **MOY/SCMI/50** **SPECIFICATION OF ACCURACY**
(Issue 5)

for

A FLATNESS INTERFEROMETER

Type: An interferometer based on NPL design for testing flatness and parallelism of precision lapped surfaces. Illumination is by means of the green light of wavelength 546.1 nm obtained from a mercury discharge lamp used with a suitable filter.

LIMITING VALUE OR
MAXIMUM
PERMISSIBLE ERROR

1. GENERAL

- 1.1 The workmanship and finish shall be in keeping with a precision instrument of this class.
- 1.2 The instrument shall be marked:-
 - (i) With the maker's name or trade mark.
 - (ii) With identification numbers on the casting, work-table, optical head and optical flat.
 - (iii) "Based on NPL Design".

2. OPTICAL FLAT

- 2.1 The non-working (upper) surface of the optical flat shall be inclined to its working surface 7 minutes of arc
(minimum inclination).
- 2.2 The working surface shall be coated with a semi-reflecting film, preferably of titanium dioxide or bismuth oxide, to produce interference fringes of good contrast and symmetry when associated with the lapped surface of the work-table.
- 2.3 This coated working surface shall be flat 0.000 05 mm over a central
area 75 mm in diameter.

3. WORK TABLE

- 3.1 The upper surface shall be hard 800 HV minimum.
- 3.2 The upper surface shall have a lapped finish and a wringing property similar to that of high quality block gauges.
- 3.3 The upper surface shall be flat 0.000 08 mm over a central
area of diameter
75 mm.
- 3.4 The upper and lower surfaces shall be parallel 0.000 15 mm over 75 mm.

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4. PERFORMANCE

- 4.1 When the optical flat is inserted in its holder with the surface identified by the letters "A" and "B" uppermost, and the letter "A" adjacent to the column supporting the optical head, the resulting fringes shall be straight.
- 4.2 When examining a slip gauge 25 mm in size it shall be possible readily to observe the fringes produced over the surface of the work-table.

0.2 fringe over a central area of diameter 50 mm, 0.5 fringe overall.

(Signed)

for Director

L. W. Nichols

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JPP