

5. **ALIGNMENT OF MEASURING CONTACTS**

- 5.1 It shall be possible, with the adjustments provided, to set the faces of the plane measuring contacts parallel. This parallelism shall be maintained throughout the 100 mm (4 in) travel of the measuring head plunger. 0.000 08 mm (0.000 03 in)
- 5.2 The faces of the measuring contacts shall be co-axial. This condition shall be maintained for all separations of the measuring contacts. 0.25 mm (0.01 in)

6. **FEELER POINTS**

- 6.1 The diameters of the “Best Size” feeler points for the measurement of the effective diameter of internal threads shall be within the limits laid down by NPL. NPL Sketch No. 672A attached.
- 6.2 All feeler points shall be well finished and hardened.
- 6.3 Each feeler point shall be identified by its appropriate tpi.

7. **WORK-TABLES**

- 7.1 All work-tables shall be interchangeable.
- 7.2 The upper surfaces of work tables shall be flat. 0.013 mm (0.000 5 in)

8. **ACCURACY OF SCALES IN MEASURING HEAD**

- 8.1 The main scale shall be accurate with respect to the zero graduation to within the tolerance given in the following table: -

RANGE		TOLERANCE	
mm	in	mm	in
0 up to 25	0 up to 1	±0.000 5	±0.000 02
Above 25 & up to 50	Above 1 & up to 2	±0.000 8	±0.000 03
“ 50 “ “ “ 75	“ 2 “ “ “ 3	±0.000 8	±0.000 03
“ 50 “ “ “ 100	“ 3 “ “ “ 4	±0.001 0	±0.000 04

- 8.2 The graticule and optical micrometer scales shall each be accurate with respect to their zero graduation to within ±0.0005 mm (±0.000 02 in)

NOTE: It is clearly not practicable to check the accuracy for every graduation on all three scales. It is considered that a fair assessment of accuracy will be obtained by testing the scales at the following intervals:

Description	SCALE	INTERVALS OF TEST
	GRADUATED	
Main Scale	0 to 100 mm by 1.0 mm (0 to 4 in by 0.05 in)	Every 5 mm (0.2 in)
Double line graticule	0 to 0.9 mm by 0.1 mm (0 to 0.04 in by 0.01 in)	Every interval
Optical micrometer scale	0 to 0.1 mm by 0.001 mm (0 to 0.01 in by 0.000 05 in)	Every 0.01 mm (0.001 in)

8.3 Without the application of any corrections, the functional accuracy of the measuring machine shall be within the tolerances given in the following table.

RANGE		TOLERANCE	
mm	in	mm	In
0 up to 25	0 up to 1	±0.000 8	±0.000 03
Above 25 & up to 50	Above 1 & up to 2	±0.001 0	±0.000 04
“ 50 “ “ “ 75	“ 2 “ “ “ 3	±0.001 0	±0.000 04
“ 75 “ “ “ 100	“ 3 “ “ “ 4	±0.001 3	±0.000 05

ACCESSORY EQUIPMENT

9. JAW BLADE HOLDER

9.1 The jaw blade holder shall stand on the upper surface of each work table without perceptible “rock”.

9.2 The fixed slip abutment face shall be square to the backing plate.

0.025 mm (0.001 in) over the length of abutment face.

10. PLANE PARALLEL JAW BLADES

10.1 The blades shall have a good lapped finish and be hardened.

800 HV minimum.

10.2 The working faces of the blades shall be flat.

0.000 3 mm (0.000 01 in)

10.3 The opposite working faces of each blade shall be parallel.

0.0025 mm (0.000 1 in) over their length.

11. GROOVED JAW BLADES

11.1 Each blade shall be marked with an identification number and the nominal included angle of the measuring vee.

11.2 All sharp edges are to be removed.

11.3 The “outside” and “inside” faces shall be

- (i) hard
- (ii) lapped flat
- (iii) parallel

800 HV minimum.
0.0003 mm (0.000 01 in)
0.001 mm (0.000 04 in)
over length of blade.

11.4 The rounded end shall be hard.

800 HV minimum.

11.5 The distance from the vee-axis to the rounded end of the blade shall be equal on each pair.

0.025 mm (0.001 in)

11.6 The width of the blade, i.e. the distance between the “outside” and “inside” faces shall be 11.11 mm (0.4375 in).

±0.13 mm (±0.005 in)

11.7 The depth of the blade shall be 9 mm (0.355 in).

+0 -0.1 mm (-0.004 in)

11.8 The minimum width of the measuring vee flanks shall be

2.5 mm (0.1 in)

11.9 The vee flanks shall be hard and lapped flat.

800 HV minimum.
0.001 mm (0.000 04 in)

11.10 The semi angle of the vee shall be 27° 30' for Whitworth threads and 30° for Metric and Unified threads.

±4 minutes

- 11.11 The vee axis shall be parallel transversely with the "inside" face. 0.0015 mm over 2.5 mm
(0.000 06 in over 0.1 in)
- 11.12 The vee axis shall be square with the side face. 0.005 mm over 2.5 mm
(0.0002 in over 0.1 in)
- 11.13 A Certificate or Test Report for this machine shall include values of E_0 for the jaw blades supplied. These values shall be given to the nearest 0.001 mm (0.000 05 in) and shall cover every pitch for which a stylus is provided.

12. **LENGTH BARS**

- 12.1 Each length bar provided shall conform to the requirements of the British Standard Specification for Length Bars, BS 1790. Inspection Grade.

13. **SLIP GAUGES**

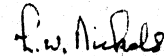
- 13.1 Each slip gauge provided shall conform to the requirements of the British Standard Specification for Slip Gauges, BS 888. Inspection Grade.

14. **ACCURACY OF PERFORMANCE**

- 14.1 The performance of the instrument shall be checked by using it to measure a series of gauges of known size. The inaccuracies of performance shall not exceed the following amounts:

External plain measurement	0.001 mm (0.000 04 in)
Internal plain measurement	0.001 mm (0.000 04 in)
External screw thread measurement	0.004 mm (0.000 16 in)
Internal screw thread measurement	0.008 mm (0.000 32 in)

(Signed)



for Director

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