NATIONAL PHYSICAL LABORATORY

**STANDARDS DIVISION**

**Ref: MOY/SCMI/86 (Issue 2)**

# SPECIFICATION OF ACCURACY

**for**

# A "MATRIX" 12-INCH CIRCULAR TABLE

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Type: A 12-inch circular rotatable table which can be read directly to 5 seconds of arc by use of a vernier.

Made by: The Coventry Gauge & Tool Co. Ltd.

| | | LIMITING VALUE OR MAXIMUM PERMISSIBLE ERROR |
|---|---|---|
| 1. **GENERAL** | | |
| 1.1 | The general workmanship and finish shall be in keeping with a precision measuring tool of this class. | |
| 1.2 | The table shall be marked with an identification number and with the maker's name or trade mark. | |
| 2. **BASE** | | |
| 2.1 | The under surface of the base casting shall be free from blow holes and the bearing area shall be adequate | 20% minimum. |
| 2.2 | The under surface shall be flat so that the table is entirely free from rock when supported on a truly flat surface. | |
| 3. **TABLE** | | |
| 3.1 | The upper surface of the table shall be flat whether the table be clamped or unclamped | 0.0003 in. (0.008 mm). |
| 3.2 | The upper surface of the table shall be square to the axis of rotation | 0.0002 in. (0.005 mm) over the table diameter. |
| 3.3 | The upper surface of the table and the under surface of the base shall be parallel for all relative positions. | 0.0003 in. (0.008 mm) over the table diameter. |
| 4. **CLAMPING** | | |
| 4.1 | The action of clamping the table shall not: - | |
| (i) | cause a change in the table height relative to the under surface of the base | 0.0001 in. (0.0025 mm). |
| (ii) | cause any change in rotation | 1 vernier division (5 sec of arc). |
| 5. **CENTRE PLUG** | | |
| 5.1 | The centre plug shall bear the same identification number as the table with which it is associated. | |

| | | LIMITING VALUE OR MAXIMUM PERMISSIBLE ERROR |
|---|---|---|
| 5.2 | The parallel and tapered surfaces of the plug shall be hard and well finished | 800 HV minimum. |
| 5.3 | The parallel and tapered portions shall be straight | 0.000 05 in. (0.0013 mm) over their respective lengths. |
| 5.4 | The parallel portion shall be cylindrical | 0.000 05 in. (0.0013 mm). |
| 5.5 | The parallel and tapered portions shall be concentric | 0.000 05 in. (0.0013 mm) i.e. 0.0001 in. (0.0025 mm) FIM. |

## 6. TAPERED SOCKET IN TABLE

| | | |
|---|---|---|
| 6.1 | The centre plug shall be a good fit in the tapered socket as revealed by a "blueing" test. | |
| 6.2 | When the centre plug is fitted in the taper socket, in any rotational position, its axis shall coincide with the axis of rotation of the table | 0.0001 in. (0.0025 mm) i.e. 0.0002 in. (0.005 mm) FIM. |

## 7. SCALE

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|---|---|---|
| 7.1 | The graduation lines on the handwheel and the vernier shall be cleanly cut and free from blemishes | |

## 8. ACCURACY

| | | |
|---|---|---|
| 8.1 | The maximum error between any two settings shall not exceed | 1/3 minute of arc. |

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