

# ISO 9220:2022-02 (E)

## Metallic coatings - Measurement of coating thickness - Scanning electron microscope method

---

<b>Contents</b>	<b>Page</b>
<b>Foreword</b> .....	<b>iv</b>
<b>1 Scope</b> .....	<b>1</b>
<b>2 Normative references</b> .....	<b>1</b>
<b>3 Terms and definitions</b> .....	<b>1</b>
<b>4 Principle</b> .....	<b>1</b>
<b>5 Instrumentation</b> .....	<b>1</b>
5.1 Scanning electron microscope.....	1
5.2 Tools to calibrate the length measurement function of the SEM software.....	1
<b>6 Factors influencing the measurement results</b> .....	<b>2</b>
6.1 Surface roughness.....	2
6.2 Taper of cross-section.....	2
6.3 Specimen tilt.....	2
6.4 Coating deformation.....	2
6.5 Rounding of edges of the coating.....	2
6.6 Plating a protection layer.....	2
6.7 Etching.....	2
6.8 Smearing.....	3
6.9 Poor contrast.....	3
6.10 Magnification.....	3
6.11 SEM imaging parameters.....	3
<b>7 Preparation of cross-sections</b> .....	<b>3</b>
<b>8 Calibration of instruments</b> .....	<b>3</b>
8.1 General.....	3
8.2 Photography.....	4
8.3 Measurement.....	4
<b>9 Procedure</b> .....	<b>4</b>
<b>10 Precision</b> .....	<b>4</b>
10.1 General.....	4
10.2 Repeatability, $r$ .....	4
10.3 Reproducibility limit, $R$ .....	5
<b>11 Expression of results</b> .....	<b>5</b>
<b>12 Test report</b> .....	<b>5</b>
<b>Annex A (informative) General guidance on the preparation and measurement of cross-sections</b> .....	<b>7</b>
<b>Annex B (informative) Details on precision</b> .....	<b>10</b>
<b>Bibliography</b> .....	<b>12</b>