

# ISO 17541:2014-09 (E)

## Plastics - Quantitative evaluation of scratch-induced damage and scratch visibility

---

| <b>Contents</b>                                                                                                    |                                                            | <b>Page</b> |
|--------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------|-------------|
| Foreword .....                                                                                                     |                                                            | iv          |
| <b>1</b>                                                                                                           | <b>Scope .....</b>                                         | <b>1</b>    |
| <b>2</b>                                                                                                           | <b>Normative references .....</b>                          | <b>1</b>    |
| <b>3</b>                                                                                                           | <b>Terms and definitions .....</b>                         | <b>1</b>    |
| <b>4</b>                                                                                                           | <b>Principle .....</b>                                     | <b>3</b>    |
| <b>5</b>                                                                                                           | <b>Apparatus .....</b>                                     | <b>3</b>    |
| <b>5.1</b>                                                                                                         | <b>General description .....</b>                           | <b>3</b>    |
| <b>5.2</b>                                                                                                         | <b>Scratch tip .....</b>                                   | <b>3</b>    |
| <b>5.3</b>                                                                                                         | <b>Load and position sensors .....</b>                     | <b>4</b>    |
| <b>5.4</b>                                                                                                         | <b>Test load .....</b>                                     | <b>4</b>    |
| <b>5.5</b>                                                                                                         | <b>Test speed .....</b>                                    | <b>4</b>    |
| <b>5.6</b>                                                                                                         | <b>Specimen stage .....</b>                                | <b>4</b>    |
| <b>6</b>                                                                                                           | <b>Test specimens .....</b>                                | <b>5</b>    |
| <b>6.1</b>                                                                                                         | <b>General .....</b>                                       | <b>5</b>    |
| <b>6.2</b>                                                                                                         | <b>Shape and dimensions .....</b>                          | <b>5</b>    |
| <b>6.3</b>                                                                                                         | <b>Preparation .....</b>                                   | <b>5</b>    |
| <b>6.4</b>                                                                                                         | <b>Conditioning .....</b>                                  | <b>5</b>    |
| <b>6.5</b>                                                                                                         | <b>Number of test specimens .....</b>                      | <b>5</b>    |
| <b>7</b>                                                                                                           | <b>Procedure .....</b>                                     | <b>5</b>    |
| <b>7.1</b>                                                                                                         | <b>Test atmosphere .....</b>                               | <b>5</b>    |
| <b>7.2</b>                                                                                                         | <b>Scratch tip .....</b>                                   | <b>5</b>    |
| <b>7.3</b>                                                                                                         | <b>Method A (constant load condition) .....</b>            | <b>5</b>    |
| <b>7.4</b>                                                                                                         | <b>Method B (linearly increasing load condition) .....</b> | <b>6</b>    |
| <b>7.5</b>                                                                                                         | <b>Scratch testing .....</b>                               | <b>6</b>    |
| <b>8</b>                                                                                                           | <b>Interpretation of result .....</b>                      | <b>7</b>    |
| <b>8.1</b>                                                                                                         | <b>General .....</b>                                       | <b>7</b>    |
| <b>8.2</b>                                                                                                         | <b>Scratch strength and scratch resistance .....</b>       | <b>7</b>    |
| <b>8.3</b>                                                                                                         | <b>Single-damage (SD) .....</b>                            | <b>7</b>    |
| <b>8.4</b>                                                                                                         | <b>Multiple-damage (MD) .....</b>                          | <b>8</b>    |
| <b>9</b>                                                                                                           | <b>Test report .....</b>                                   | <b>10</b>   |
| <b>Annex A (informative) 3-D colour model .....</b>                                                                |                                                            | <b>12</b>   |
| <b>Annex B (informative) Example for quantitative determination of scratch damage and scratch visibility .....</b> |                                                            | <b>13</b>   |
| <b>Bibliography .....</b>                                                                                          |                                                            | <b>17</b>   |