

# DIN EN ISO 25178-2:2023-09 (E)

## Geometrical product specifications (GPS) - Surface texture: Areal - Part 2: Terms, definitions and surface texture parameters (ISO 25178-2:2021)

---

<b>Contents</b>		<b>Page</b>
<b>European foreword</b> .....		<b>4</b>
<b>Foreword</b> .....		<b>5</b>
<b>Introduction</b> .....		<b>6</b>
<b>1 Scope</b> .....		<b>7</b>
<b>2 Normative references</b> .....		<b>7</b>
<b>3 Terms and definitions</b> .....		<b>7</b>
3.1 General terms .....		7
3.2 Geometrical parameter terms .....		11
3.3 Geometrical feature terms .....		17
<b>4 Field parameters</b> .....		<b>21</b>
4.1 General .....		21
4.2 Height parameters .....		21
4.2.1 General .....		21
4.2.2 Root mean square height .....		21
4.2.3 Skewness .....		21
4.2.4 Kurtosis .....		21
4.2.5 Maximum peak height .....		22
4.2.6 Maximum pit depth .....		22
4.2.7 Maximum height .....		22
4.2.8 Arithmetic mean height .....		22
4.3 Spatial parameters .....		22
4.3.1 General .....		22
4.3.2 Autocorrelation length .....		22
4.3.3 Texture aspect ratio .....		23
4.3.4 Texture direction .....		24
4.3.5 Dominant spatial wavelength .....		24
4.4 Hybrid parameters .....		24
4.4.1 General .....		24
4.4.2 Root mean square gradient .....		24
4.4.3 Developed interfacial area ratio .....		24
4.5 Material ratio functions and related parameters .....		25
4.5.1 Areal material ratio .....		25
4.5.2 Inverse areal material ratio .....		25
4.5.3 Material ratio height difference .....		26
4.5.4 Areal parameter for stratified surfaces .....		27
4.5.5 Areal material probability parameters .....		29
4.5.6 Void volume .....		30
4.5.7 Material volume .....		31
4.6 Gradient distribution .....		32
4.7 Multiscale geometric (fractal) methods .....		34
4.7.1 Morphological volume-scale function .....		34
4.7.2 Relative area .....		35
4.7.3 Relative length .....		35
4.7.4 Scale of observation .....		35
4.7.5 Volume-scale fractal complexity .....		35
4.7.6 Area-scale fractal complexity .....		35

4.7.7	Length-scale fractal complexity.....	36
4.7.8	Crossover scale.....	36
<b>5</b>	<b>Feature parameters.....</b>	<b>37</b>
5.1	General.....	37
5.2	Type of texture feature.....	38
5.3	Segmentation.....	38
5.4	Determining significant features.....	38
5.5	Section of feature attributes.....	40
5.6	Attribute statistics.....	41
5.7	Feature characterization convention.....	41
5.8	Named feature parameters.....	41
5.8.1	General.....	41
5.8.2	Density of peaks.....	42
5.8.3	Density of pits.....	42
5.8.4	Arithmetic mean peak curvature.....	42
5.8.5	Arithmetic mean pit curvature.....	42
5.8.6	Five-point peak height.....	42
5.8.7	Five-point pit depth.....	43
5.8.8	Ten-point height.....	43
5.9	Additional feature parameters.....	43
5.9.1	General.....	43
5.9.2	Shape parameters.....	44
<b>Annex A (informative) Multiscale geometric (fractal) methods.....</b>		<b>46</b>
<b>Annex B (informative) Determination of areal parameters for stratified functional surfaces.....</b>		<b>53</b>
<b>Annex C (informative) Basis for areal surface texture standards — Timetable of events.....</b>		<b>56</b>
<b>Annex D (informative) Implementation details.....</b>		<b>57</b>
<b>Annex E (informative) Changes made to the 2012 edition of this document.....</b>		<b>61</b>
<b>Annex F (informative) Summary of areal surface texture parameters.....</b>		<b>63</b>
<b>Annex G (informative) Specification analysis workflow.....</b>		<b>65</b>
<b>Annex H (informative) Overview of profile and areal standards in the GPS matrix model.....</b>		<b>66</b>
<b>Annex I (informative) Relation with the GPS matrix.....</b>		<b>67</b>
<b>Bibliography.....</b>		<b>68</b>