



SURFACE VEHICLE STANDARD

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Surface Texture

RATIONALE

Several images were of poor quality and needed to be replaced.

1. SCOPE

This SAE Standard is concerned with the geometrical irregularities of surfaces of solid materials. It established definite classifications for various degrees of roughness and waviness and for several varieties of lay. It also provides a set of symbols for use on drawings and in specifications, reports, and the like. The ranges for roughness and waviness are divided into a number of steps, and the general types of lay are established by type characteristics.

This standard does not define what degrees of surface roughness and waviness or what type of lay are suitable for any specific purpose. It does not specify the means by which any degree of such irregularities may be obtained or produced. Neither is it concerned with the other surface qualities such as luster, appearance, color, corrosion resistance, wear resistance, hardness, microstructure, and absorption characteristics, any of which may be governing considerations in specific applications.

Surfaces, in general, are very complex in character. Although the height, width, length, shape, and direction of surface irregularities may all be of practical importance in specific applications, this standard deals only with their height, width, and direction.

2. REFERENCES

2.1 Applicable Documents

The following publications form a part of the specification to the extent specified herein. Unless otherwise indicated, the latest revision of SAE publications shall apply.

2.1.1 SAE Publications

Available from SAE International, 400 Commonwealth Drive, Warrendale, PA 15096-0001, Tel: 877-606-7323 (inside USA and Canada) or +1 724-776-4970 (outside USA), www.sae.org.

AS291 Surface Texture, Roughness, Waviness, and Lay

SAE J449 Surface Texture Control

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Documents

Document Sharing Hub

2.1.2 Other Publications

ASA B46.1-1962

3. DEFINITIONS

See Figure 1.

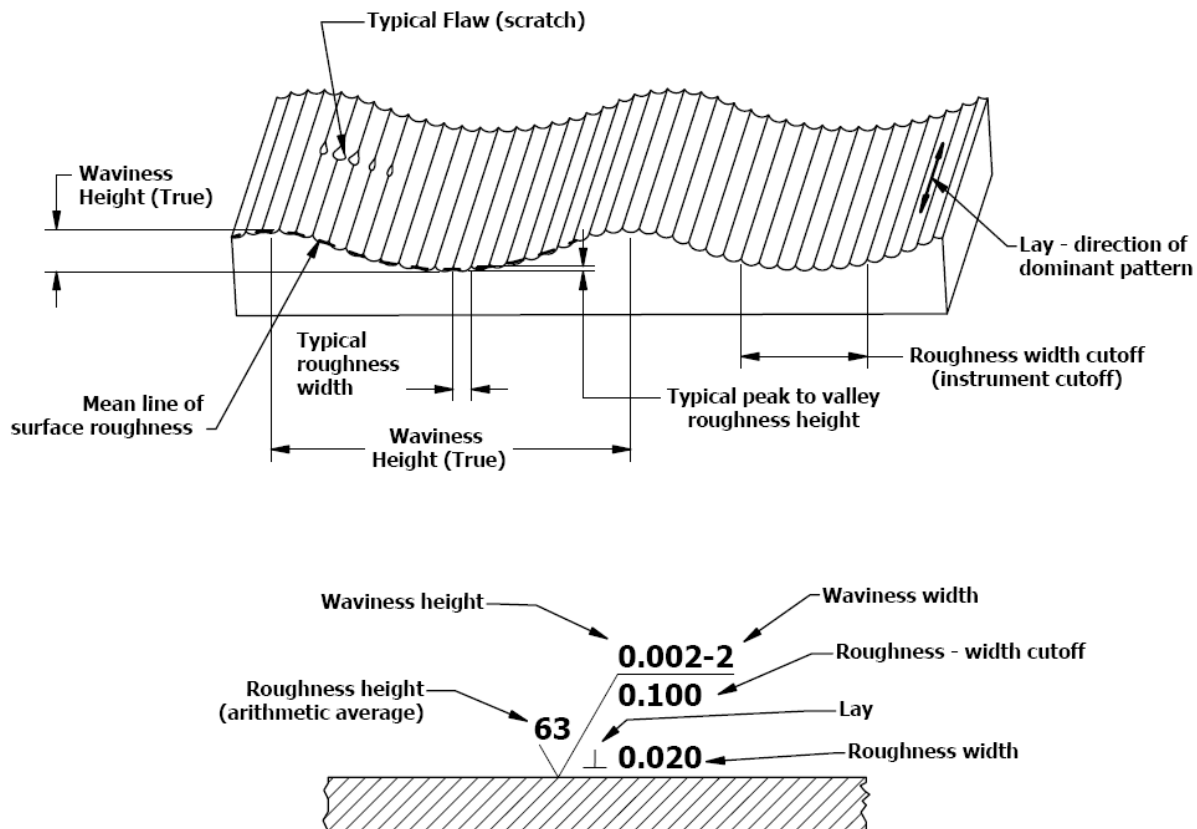


Figure 1 - Meaning of each part of symbol defined

3.1 SURFACE TEXTURE

Repetitive or random deviations from the nominal surface which form the pattern of the surface. Surface texture includes roughness, waviness, lay, and flaws.

3.2 SURFACE

The surface of an object is the boundary which separates that object from another object, substance, or space. Surfaces with which this standard is concerned shall be those requiring control of roughness or other surface characteristics.

3.2.1 NOMINAL SURFACE

Nominal surface is the intended surface contour, the shape and extent of which is usually shown and dimensioned on a drawing or descriptive specification.

3.2.2 MEASURED SURFACE

The measured surface is a representation of the surface obtained by instrumentation or other means.

3.3 PROFILE

The profile is the contour of a surface in a plane perpendicular to the surface, unless some other angle is specified.

3.3.1 NOMINAL PROFILE

The nominal profile is the profile disregarding surface texture.

3.3.2 MEASURED PROFILE

The measured profile is a representation of the profile obtained by instrumental or other means. (See Figure 2.)

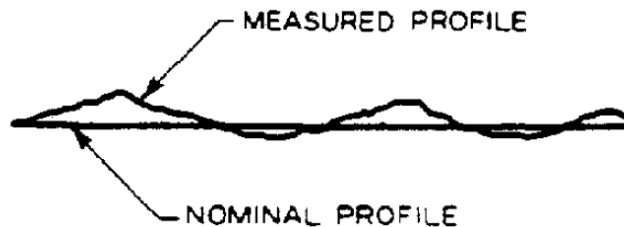


Figure 2 - Measured profile

3.4 CENTERLINE (ROUGHNESS)

The centerline is the line about which roughness is measured and is a line parallel to the general direction of the profile within the limits of the roughness-width cutoff, such that the sums of the areas contained between it and those parts of the profile which lie on the either side of it are equal.¹

3.5 MICROINCH

One millionth of a linear inch (0.000001 inch). This is the unit of height for roughness. Microinches may be abbreviated as μin .

3.6 ROUGHNESS

Roughness consists of the finer irregularities in the surface texture, usually including those irregularities which result from the inherent action of the production process. These are considered to include traverse feed marks and other irregularities within the limits of the roughness-width cutoff. (See Figure 1.)

3.7 WAVINESS

Waviness is the usually widely spaced component of surface texture and is generally of wider spacing than the roughness-width cutoff. Waviness may result from such factors as machine or work reflections, vibration, chatter, heat treatment, or warping strains. Roughness may be considered as superposed on a wavy surface. Their directions are not necessarily related.

3.8 LAY

The direction of the predominant surface pattern, ordinarily determined by the production method used.

3.9 FLAWS

Flaws are irregularities which occur at one place or at relatively infrequent or widely varying intervals in a surface. Flaws include such defects as cracks, blow holes, checks, ridges, and scratches. Unless otherwise specified, the effect of flaws shall not be included in the roughness-height measurements.

¹ Centerline, as defined above, is also known mathematically as the median line.