

S U R F A C E F I N I S H

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I. SCOPE: This Standard provides a method for the application of surface finish control to aircraft engine parts. Recommendations for a Surface Roughness Standard are contained in A.S.A. publication B46 and this S.A.E. Aeronautical Standard contains a summary of information therein plus other information which has been compiled from current manufacturing practice.

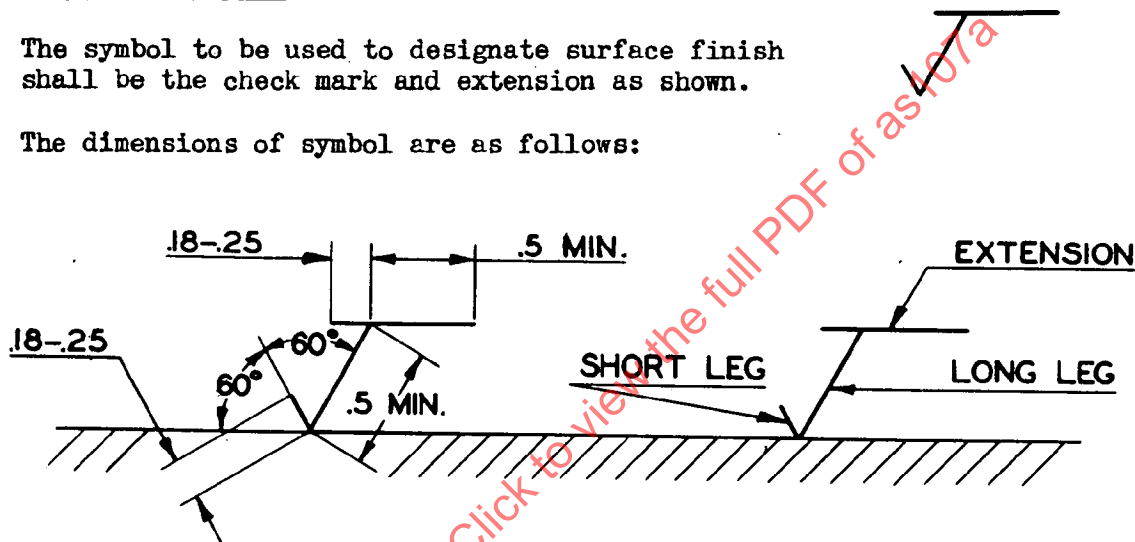
II. DEFINITIONS:

- A. Surface: The surface of an object is the boundary which separates that object from another substance or object.
- B. Nominal Surface: A two-dimensional boundary of separation which is absolutely true and smooth and whose shape and extent is defined by a drawing or descriptive specification.
- C. Surface Qualities: The physical characteristics of a surface, such as roughness, waviness and flaws.
- D. Roughness: That deviation from nominal surface evidenced by minute contiguous irregularities occurring on the nominal surface. Roughness in itself does not alter the trueness of a surface.
- E. Waviness: That deviation from nominal surface evidenced by recurrent irregularities having the form of waves. These deviations are usually of greater magnitude than surface roughness which may be superimposed on waviness.
- F. Flaws: Irregularities of any sort which occur at only one place or at relatively infrequent and widely varying random intervals in a surface. A flaw may be a scratch, a ridge, a hole, a peak, a crack or a check, etc.
- G. Microinch (Mu In.): One millionth (.000001) part of the U.S. Standard linear inch.
- H. RMS: The square root of the mean of the sum of the squares of the height (in microinches) of the irregularities. RMS may be calculated but is usually taken from a meter of an instrument made for measuring surface roughness.
- I. Roughness Scale: A series of index numbers of varying magnitude from zero upward as indicated in this Standard.
- J. Roughness Number: A physical measurement in RMS microinches which represents the maximum permissible degree of roughness of the surface to which it is applied except that, where two numbers are used, the larger shall be the maximum and the smaller the minimum permissible degree of roughness. The physical measurement shall be the maximum sustained reading of a series of readings, taken normal to the surface and in the direction giving the greater value (usually across the lay).

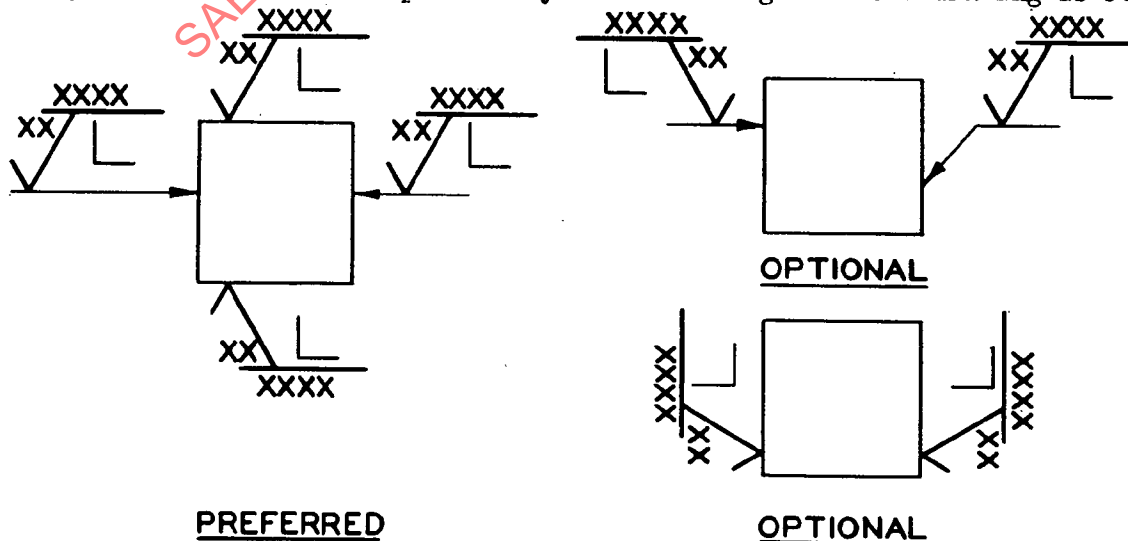
- K. Waviness Scale: A series of numerical values from zero upward as indicated in this Standard.
- L. Waviness Number: A physical measurement in inches which represents the maximum permissible departure from a nominal surface.
- M. Lay: The direction of tool marks, or grain, of surface roughness.
- N. Lay Designation: A series of characters inscribed in a half square with approximately .250 sides as indicated in this Standard.

III. SURFACE FINISH SYMBOL:

- A. The symbol to be used to designate surface finish shall be the check mark and extension as shown.
- B. The dimensions of symbol are as follows:



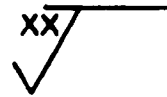
- C. On drawings, or in specifications, this symbol shall be referred only to the profile of a surface.
- D. The point of $\checkmark$ shall be either on the line depicting the surface, on the witness line, or on an arrow pointing to the surface as shown. The long leg and extension shall preferably be to the right as the drawing is read.



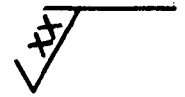
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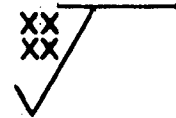
- E. The roughness number shall be placed adjacent to and on the inside of the long leg, as shown.



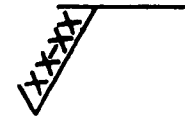
OR

OPTIONAL

1. The maximum and minimum roughness number shall be placed as shown. The maximum shall be placed either above or after the minimum.



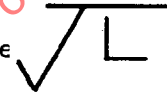
OR

OPTIONAL

- F. The waviness designation when used shall be placed outside the extension line.



- G. The lay designation when used shall be placed inside the extension line adjacent to and on the outside of the long leg.



IV. SCALES:

A. Roughness Scale (Microinches - RMS):

1*	6	20*	60	200*
2	8*	25	80*	250
3*	10	32*	100	320*
4	13*	40	130*	400
5*	16	50*	160	500*

*Preferred numbers

B. Waviness Scale:

.00002
.00005
.0001
.0002
.0005
.0010
.0020
.0050
.0100

Note: To control contact area when required, the above scale may be supplemented with a percentage bluing note (90% - 75% - 50% preferred); thus, .00005 - 90% blue which indicates that deviation shall be .00005 inches or less and that the surface shall show 90% contact with a mating bluing gage.