

BLADE OR VANE - DIMENSIONING OF TURBINE ENGINE AIRFOIL

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Revised

PURPOSE

This Aeronautical Recommended Practice has been prepared to provide a standard method for the dimensioning of parts containing airfoil shapes.

INTRODUCTION

This method will apply to parts with or without a base. The methods of fastening these parts are quite varied, therefore the blade base shown is for illustration only. All dimensions and notes shown pertaining to the common functional point, line, or plane are considered to apply to some similar point on any type of fastener.

Sections (except reference sections) should be located entirely within the airfoil portion of the blade or vane. Reference sections deemed necessary may be tabulated.

The "TYPICAL AIRFOIL SECTION" should delineate the correct relation of the concave and convex sides. The Station Numbers as required should progress in a clockwise direction from the leading edge. The specific terminology shown should be followed where applicable to insure drawing consistency. Negative linear or angular dimensions are not recommended.

It is recommended that metal, glass, or equivalent layout masters of airfoil sections be supplied to manufacturers of these parts.

DEFINITIONS

BASE -- A portion of the blade or vane which is used as a fastener.

BASE ϕ OR ANGLE REF LINE -- A datum plane to be used for controlling the angular relation of the various sections. BASE ϕ shall be designated when it coincides with the ANGLE REF LINE.

STACKING POINT -- A common working point for each airfoil section which may or may not coincide with the center of gravity of the section and about which the sections rotate.

AXIS OF TWIST -- A straight line or axis containing the nominal or average of stacking points and about which angle "W" applies.

MAX THK -- The dimension at the point of maximum thickness of the airfoil section.

ANGLE "W" -- The angle between the "BASE ϕ " or "ANGLE REF LINE" and the datum line for each section. (This datum line is generally parallel to the chord line of the airfoil section.)

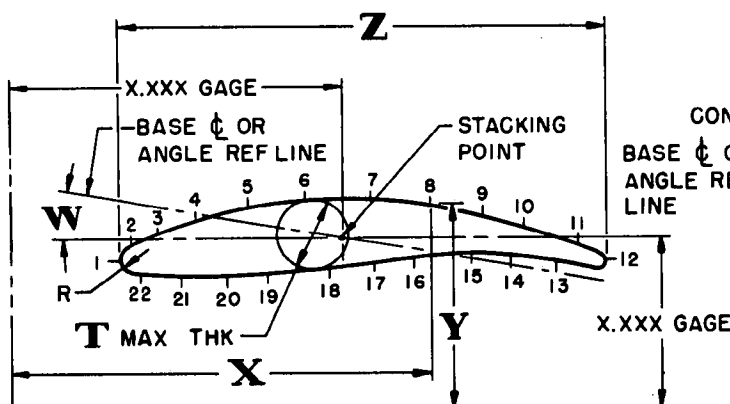
DIMENSION "V" -- The dimension from the common functional point, line, or plane to the plane of the respective airfoil section.

AIRFOIL SECTION DATA

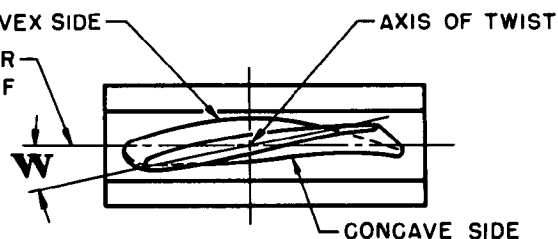
SECTION	A-A	B-B	C-C	D-D	E-E
Z	.XXX-.XXX				
W ± X°	X°X'				
V	.XXX				
U	.XXX-.XXX				
T	.XXX-.XXX				
S	.XXX				
STATION	X Y	X Y	X Y	X Y	X Y
1	.XXX .XXX				
2					
3					
4					
5					
6					

GENERAL DRAWING NOTES:

1. TABULATED DIMENSIONS DEFINE THE NOMINAL AIRFOIL SECTION CONTOURS.
2. BLEND SMOOTHLY BETWEEN STATIONS AND SECTIONS.
3. CONTOUR OF CONCAVE AND CONVEX SIDES OF AIRFOIL SECTIONS MUST BE MAINTAINED WITHIN AN .XXX BAND PARALLEL TO NOMINAL.
4. AIRFOIL SECTION STACKING POINTS MAY BE DISPLACED A MAX OF .XXX RELATIVE TO ANY OTHER SECTION IN ANY DIRECTION WHEN VIEWED FROM THE END. THE NOMINAL OR AN AVERAGE OF STACKING POINTS ESTABLISHES A STRAIGHT LINE THAT IS DEFINED AS THE AXIS OF TWIST.
5. THE ANGULAR RELATION OF THE AXIS OF TWIST MAY VARY .XXX PER INCH OF LENGTH IN ANY DIRECTION IN RELATION TO A PLANE CONTAINING (THE COMMON FUNCTIONAL POINT, LINE, OR PLANE OF THE PART).

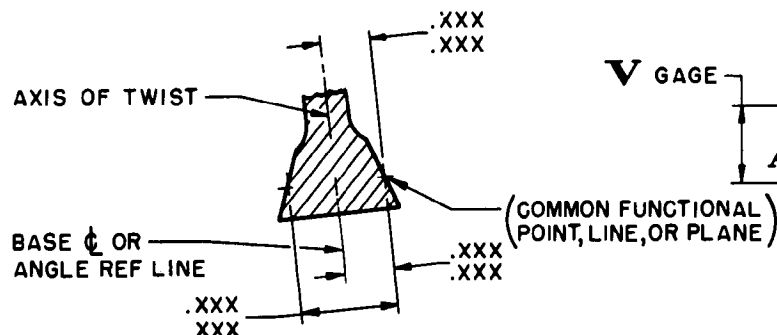
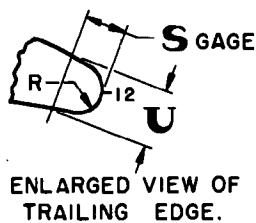


TYPICAL AIRFOIL SECTION



NOTE: BLADE BASE AS SHOWN FOR ILLUSTRATIVE PURPOSES ONLY.

NOTE: THE BASE OF THE BLADE SHALL BE DIMENSIONED FROM THE COMMON FUNCTIONAL POINT, LINE, OR PLANE OF THE PART.



SECTION F-F

