NOTAM

NOTICE TO AIR MANAGERS

*"**Intellectuals are not born, but are made.** I believe the aim of education is the knowledge not of facts but of values. I strongly believe in the capabilities of student's community and ensure everything best to reach them for their promising growth.*

- Sri Ch. Malla Reddy (Chairman, MRGI)

Dr. V.S.K. Reddy
Principal, MRCET

A thought beyond horizons of success committed for educational excellence. "Wishing all the aeronautical Engineering students all the success in future endeavors".

SwetaBala M.N.V.S

HOD, Dept. of AE

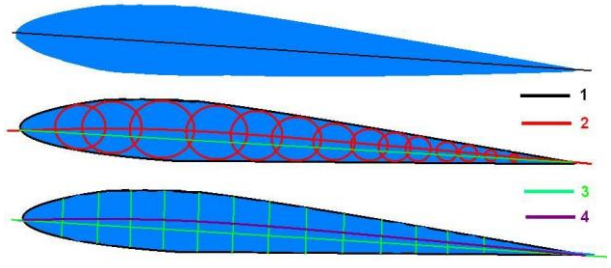
It is a very happy moment to start a Newsletter especially for Aeronautical Engineering Students. I whole heartedly wish the students a grand success in carrying out this Herculian task. I express my deep sense of gratitude to all the faculty members and students for helping me in bringing out this newsletter. I personally wish that this Newsletter in the long run will and should cater all the career oriented needs of an Aeronautical student and help them in a better way.

Prof. T.B.S. Rao
(Wg. Cdr.) (Director, AE)

A creative and innovative thought given by the aeronautical engineering students which will propel future generation towards their goals as an aeronautical engineer. This News letter helps all the aero students in research /project works during their final year semester and career prospection and future planning after completion of assigned coursework succesfully
I convey my best regards to all the students who participated in making this bulletin and the deep concern

What's Inside:

The **NACA airfoils** are airfoil shapes for aircraft wings developed by the National Advisory Committee for Aeronautics (NACA). The shape of the NACA airfoils is described using a series of digits following the word "NACA". The parameters in the numerical code can be entered into equations to precisely generate the cross-section of the airfoil and calculate its properties.



Profile lines – 1: Chord, 2: Camber, 3: Length, 4: Midline

Four-digit series

The NACA four-digit wing sections define the profile by:

For example, the NACA 2412 airfoil has a maximum camber of 2% located 40% (0.4 chords) from the leading edge with a maximum thickness of 12% of the chord. Four-digit series airfoils by default have maximum thickness at 30% of the chord (0.3 chords) from the leading edge.

The NACA 0015 airfoil is symmetrical, the 00 indicating that it has no camber. The 15 indicates that the airfoil has a 15% thickness to chord length ratio: it is 15% as thick as it is long.

Five-digit series

The NACA five-digit series describes more complex airfoil shapes:

For example, the NACA 23112 profile describes an airfoil with design lift coefficient of 0.3 (0.15*2), the point of maximum camber located at 15% chord (5*3), reflex camber (1), and maximum thickness of 12% of chord length (12).

Camber line profiles

3 digit camber lines

3 digit camber lines provide a very far forward location for the maximum camber.

The first digit is 2/3 of the design lift coefficient (in 10ths).

The second digit is twice the longitudinal location of the maximum camber location (in 10ths).

The third digit indicates a non-reflexed (0) or reflexed (1) trailing edge.

Modifications

Four- and five-digit series airfoils can be modified with a two-digit code preceded by a hyphen in the following sequence:

One digit describing the roundness of the leading edge with 0 being sharp, 6 being the same as the original airfoil, and larger values indicating a more rounded leading edge.

One digit describing the distance of maximum thickness from the leading edge in tens of percent of the chord.

For example, the NACA 1234-05 is a NACA 1234 airfoil with a sharp leading edge and maximum thickness 50% of the chord (0.5 chords) from the leading edge.

In addition, for a more precise description of the airfoil all numbers can be presented as decimals.

1-series

A new approach to airfoil design pioneered in the 1930s in which the airfoil shape was mathematically derived from the desired lift characteristics. Prior to this, airfoil shapes were first created and then had their characteristics measured in a wind tunnel. The 1-series airfoils are described by five digits in the following sequence:

1. The number "1" indicating the series
2. One digit describing the distance of the minimum pressure area in tens of percent of chord.
3. A hyphen.
4. One digit describing the lift coefficient in tenths.
5. Two digits describing the maximum thickness in percent of chord.

For example, the NACA 16-123 airfoil has minimum pressure 60% of the chord back with a lift coefficient of 0.1 and maximum thickness of 23% of the chord.

6-series

An improvement over 1-series airfoils with emphasis on maximizing laminar flow. The airfoil is described using six digits in the following sequence:

For example, the NACA 61_2-315 a=0.5 has the area of minimum pressure 10% of the chord back, maintains low drag 0.2 above and below the lift coefficient of 0.3, has a maximum thickness of 15% of the chord, and maintains laminar flow over 50% of the chord.

7-series

Further advancement in maximizing laminar flow achieved by separately identifying the low pressure zones on upper and lower surfaces of the airfoil. The airfoil is described by seven digits in the following sequence:

1. The number "7" indicating the series.
2. One digit describing the distance of the minimum pressure area on the upper surface in tens of percent of chord.
3. One digit describing the distance of the minimum pressure area on the lower surface in tens of percent of chord.
4. One letter referring to a standard profile from the earlier NACA series.
5. One digit describing the lift coefficient in tenths.
6. Two digits describing the maximum thickness as percent of chord.
7. "a=" followed by a decimal number describing the fraction of chord over which laminar flow is maintained. a=1 is the default if no value is given.

8-series

Supercritical airfoils designed to independently maximize airflow above and below the wing. The numbering is identical to the 7-series airfoils except that the sequence begins with an "8" to identify the series.