

Effect of Flutter in aircraft design

- Original mass distribution is affected.
- Lifting surface flat form is changed because twisting and bending.
- Control surface design is highly affected.

Type of Flutter:

- classical Flutter.
- Non-classical Flutter.

Difference between classical and non-classical Flutter.

classical Flutter.

1. Combined bending and torsional mode.

2. It is purely experimental

3. It is approximated result

non classical Flutter.

1. Any one mode either bending or torsion

2. It is purely theoretical

3. It give property of separated flow stalling condition, time lag effect

$$M_0 + \rho c = \rho M$$

where ρc is the dipole of the aerodynamic

center of the flexural couple expressed in

form of the wing chord c and ρ is the slope

of the wing from the aerodynamic beam.

$$M_0 = \frac{1}{2} \rho V^2 c$$

$$M = \frac{1}{2} \rho V^2 c$$