

## Test Class

## DownwashCalculator

**Builder**

**calculateZDistanceZeroLift()**

**calculateDownwashGradientConstantDelft(distVortexPlane)**

It calculates all the necessary variables useful for the calculation of the downwash gradient and the distances.

Using the parameters calculated before, this method calculates the distance between the aerodynamic center of the horizontal tail and the zero lift line of the wing.

This method evaluates the downwash gradient using formula.

$$\epsilon = \frac{d\epsilon}{d\alpha_w}(\alpha_w - \alpha_{0_w})$$

```
○ DownwashCalculator theDownwashCalculator = new DownwashCalculator(aircraft);  
○ double distanceZeroLiftLine = theDownwashCalculator.calculateZDistanceZeroLift();  
○ double downwashGradientLinear = theDownwashCalculator  
.calculateDownwashGradientConstantDelft(distanceZeroLiftLine);  
○ double downwashAngle = downwashGradientLinear * alphaAbsolute;
```