

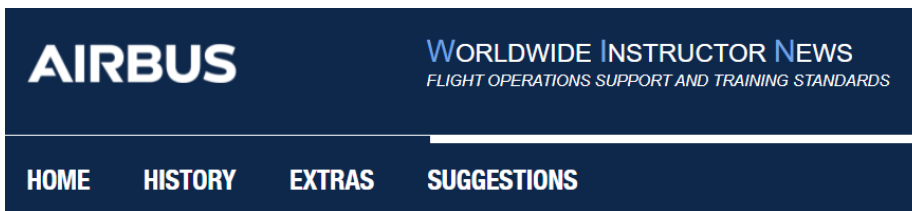
# Airbus Flight Tests Videos

## 26<sup>th</sup> Flight Safety Conference

### Dubai 28-31 March 2022



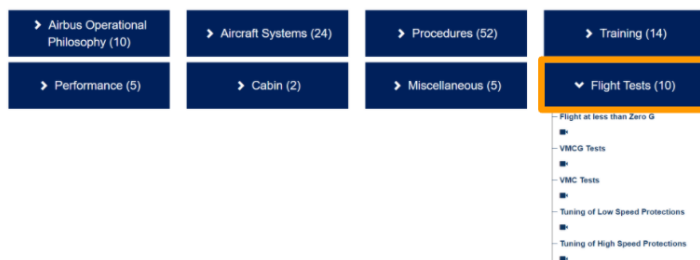
Flight Tests Videos for the 26th Flight Safety Conference are available on the **Airbus WIN** Platform.  
(<https://www.airbus-win.com/> & Application on IOS/Android)



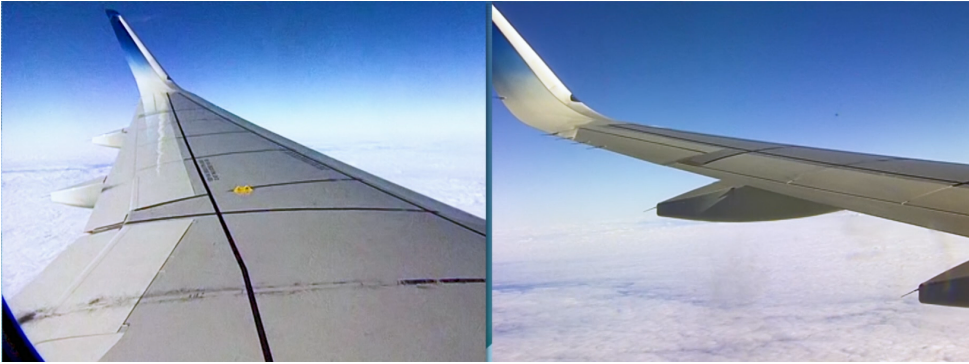
This serie is made of 10 videos:

1. Flutter Tests
2. Max Energy Braking
3. Stall Tests
4. Flight Tests with Ice Shapes
5. Tuning of AOA Protections at High Mach Number
6. Tuning of Hi Speed Protections
7. Tuning of Low Speed Protections
8. VMC Tests
9. VMCG Tests
10. Flight at less than Zero G

To access all these Airbus Flight Tests videos, go to the Airbus WIN Flight Tests section :



# FLUTTER TESTS



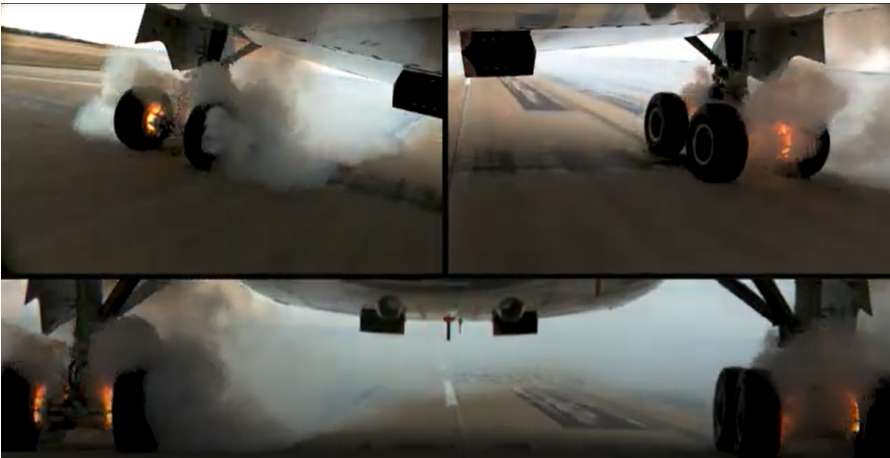
**Title:**

Flight Test - Flutter Tests

**Summary:**

This video describes the flutter phenomenon and how we test aircraft to ensure they are free from flutter, with sufficient margin, up to the design limit speeds (or design dive speeds  $VD/MD$ ).

# MAXIMUM ENERGY BRAKING



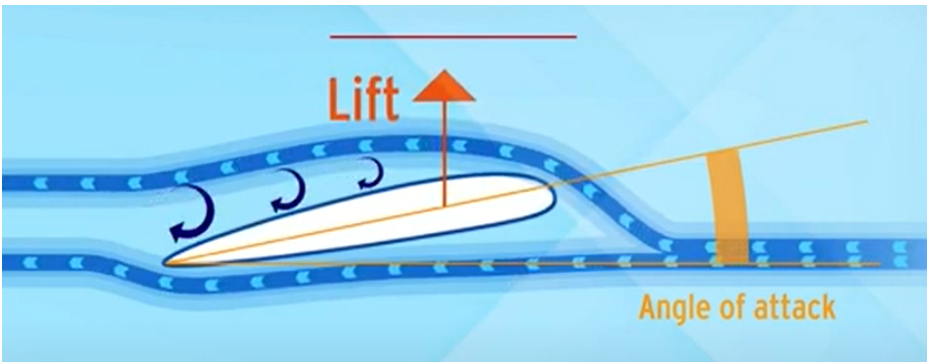
**Title:**

Maximum Energy Braking

**Summary:**

On a new airplane, the braking performance of an acceleration-stop with maximum energy is demonstrated by a full scale test. This video shows how this test is conducted to ensure that the aircraft at maximum certified energy can be safely brought to a stop using only its brakes and that there is enough time for firefighters to intervene.

# STALL TESTS



**Title:**  
Stall Tests

**Summary:**

During the flight tests campaign of a new aircraft, hundreds of stalls are performed. One of the main objectives of stall tests is the measurement of the stall speed. The stall speed is essential in order to maintain sufficient margin to the stall in operations while ensuring optimal performance at takeoff and landing. This video shows how the stall tests are performed and the procedure followed to recover from the stall.

# FLIGHT TESTS WITH ICE SHAPES



**Title:**

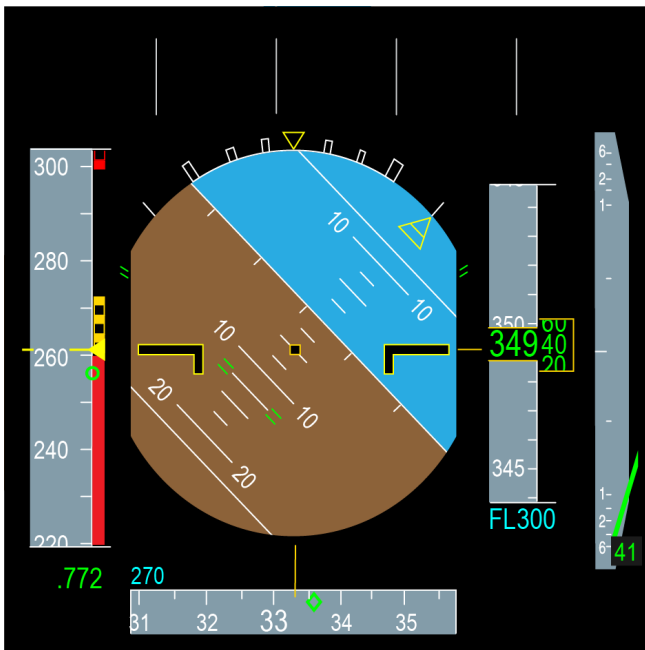
Flight Tests with Ice Shapes

**Summary:**

The certification requires safe operation in maximum ice accretion conditions. Since those conditions might be difficult to encounter during flight tests, artificial ice shapes are installed on all leading edge surfaces that do not have anti-ice protection systems fitted.

This video shows how flight tests are performed with ice shapes to validate performances and operational flight conditions, especially the stall protections because ice accretions can affect the stall conditions.

# TUNING OF ANGLE OF ATTACK PROTECTIONS AT HIGH MACH NUMBER



## Title:

Tuning of Angle of Attack Protections at High Mach Number

## Summary:

On large aircraft, in clean configuration and high altitude, when the angle of attack increases some buffeting appears and intensifies up to a point it becomes a deterrent for the flight crew. This defines the limit angle of attack of the flight domain, which decreases when the Mach number increases. This video shows how the flight tests allow tuning the angle of attack protections in normal law to ensure maximum maneuverability while still being protected.

# TUNING OF HIGH SPEED PROTECTIONS



**Title:**

Tuning of High Speed Protections

**Summary:**

This video shows how high speed protections are tuned on fly-by-wire aircraft in order to limit any VMO/MMO exceedance and avoid reaching the maximum design limit speeds (or design dive speeds - VD/MD), which ensures no loss of control and no structural damage even above VMO/MMO.

# TUNING OF LOW SPEED PROTECTIONS



**Title:**

Tuning of Low Speed Protections

**Summary:**

Fly-by-wire technology provides the possibility to protect aircraft from entering a stall condition. This video shows how the stall protection at low speed is tuned during several flight tests with different maneuvers performed. This allows for certain parameters to be tuned such as the maximum angle of attack.

# VMC

Minimum control speed in flight

# TESTS



**Title:**

VMC Tests - Minimum Control Speed in Flight

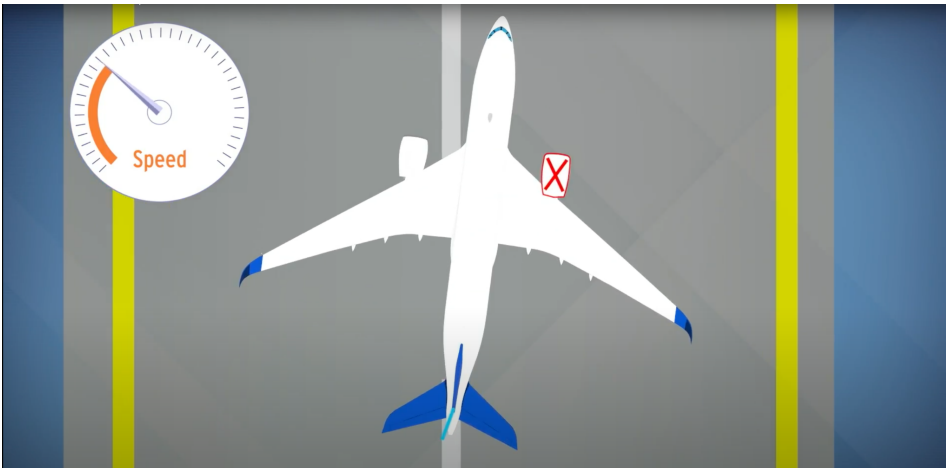
**Summary:**

This video shows how the minimum control speeds, VMCA (for Airborne) and VMCL (for Landing), are measured during flight tests and checks that lateral maneuverability at these speeds is sufficient to ensure no loss of control in the case of an engine failure.

# VMCG

Minimum Control Speed on Ground

# TESTS



**Title:**

VMCG Tests - Minimum Control Speed on Ground

**Summary:**

When an engine fails during a take-off roll, there is a speed below which the take-off cannot be continued safely because of a lack of lateral controllability. This speed is known as the VMCG. This video shows how the tests are performed to determine the VMCG value.

# FLIGHT AT LESS THAN ZERO G



**Title:**

Flight at Less Than Zero G

**Summary:**

An aircraft may be subjected to negative G for a very short period when flying in strong turbulence or during an avoidance maneuver. This video shows how the proper operation of the various systems during negative G regime are demonstrated in flight.