

# DO-160 Compliance for COREInsight Tags

## Background.

COREInsight tags have not been subjected to formal DO-160 testing because they are attached to ULDs and **not connected electrically or physically to an airframe.**

The operation or failure to operate of a tag under conditions specified in DO-160 has no impact on the safety or operation of an aircraft.

Tags do not transmit on aircraft: they are in “airplane mode”. Tags if they were to transmit use Bluetooth Low Energy (2.4Ghz) which is acceptable to most airlines

The majority of the testing involved in DO-160 relates to the ability of connected equipment to **remain operational** under the specified environmental conditions and are therefore not applicable to tags powered by batteries and with no external connection. Exceptions are noted in the table below.

## DO-160 Test Table

Section	Name	Description	
	<b>Standard conditions</b>		
4.0	<b>Temperature</b>	This checks the effects of temperature on the system. Condensation also can be a factor coming from cold temperatures.	Not applicable. Tags are hermetically sealed and not required to operate on aircraft.
	<b>Altitude</b>	These tests check the effects (in terms of performance) of altitude, including loss of cabin pressure on the device/system/equipment. Factors tested include dielectric strength, cooling under low pressure, and resilience to rapid change in air pressure. The norm defines the different temperature profiles under which the equipment must be tested. Due to the variety of aircraft, the equipment is classified in categories.	Not applicable. Tags are hermetically sealed and not required to operate on aircraft.
5.0	<b>Temperature Variation</b>	These tests exercise the assemblies capability of surviving extreme temperature changes and the effects of differing coefficients of thermal	Not applicable. Tags are not required to

		expansion.	operate on aircraft.
<b>6.0</b>	<b>Humidity</b>	These tests under humidity check the effects of high concentrations of humidity and the articles ability to withstand moisture effects. Typically moisture sensitive devices have issues with this test and require conformal coat or other types of protection.	Not applicable. Tags are hermetically sealed and not required to operate on aircraft.
<b>7.0</b>	<b>Shock &amp; Crash safety</b>	This aircraft type dependent test checks the effects of mechanical shock. Crash safety test insures the item does not become a projectile in a crash. The norm describes the test procedure for airborne equipment.	Tags are attached to Unit Load Devices. In the case of structural units (“containers”) they are riveted on the inside of the front panel. In the case of pallet tags they are bolted to the seat track.  Tags weigh less than 10 grams and carried in the cargo hold. If individually dislodged they do not constitute a potential projectile threat
<b>8.0</b>	<b>Vibration</b>	Aircraft type dependent test checks the effects of vibration and the equipment's ability to operate during all vibration scenarios.	Not applicable. Tags are not required to operate on aircraft.
<b>9.0</b>	<b>Explosion proofness</b>	These tests subject the test article to an environment under vacuum, with a gaseous mixture of combustibles. The unit must operate and be subjected to any actuation including knob turns and button pushes and not ignite the environment.	Tags are hermetically sealed (specifically excluded from testing requirement) and not required to operate on aircraft.  Tags contain Lithium non-rechargeable batteries and comply with FAA limits on lithium content of encapsulated devices.
<b>10.0</b>	<b>Water proofness</b>	These tests subject the test article to various scenarios of dripping water or pooled water to verify the unit will fully operate in the given condition.	Not applicable. Tags are hermetically sealed and not required to operate on aircraft.

11.0	<b>Fluids susceptibility</b>	Aviation related fluids susceptibility including a variety of fluids ranging from carbonated sugared beverage to various cleaners and solvents.	Not applicable. Tags are hermetically sealed, not required to operate on aircraft and not installed in areas subject to such exposures.
12.0	<b>Sand &amp; Dust</b>	These tests subject the unit to an environment of blowing sand and dust of specific particle sizes in which the unit must operate at the end of exposures.	Not applicable. Tags are hermetically sealed and not required to operate on aircraft.
13.0	<b>Fungus Resistance</b>	These tests determine whether equipment material is adversely affected by fungi under conditions favorable for their development, namely, high humidity, warm atmosphere and presence of inorganic salts.	Not applicable. Tags are hermetically sealed and not required to operate on aircraft.
14.0	<b>Salt &amp; Fog</b>	This test verifies the test articles ability to survive multiple exposures of salt fog and drying and the environment's ability to cause accelerated corrosion.	Not applicable. Tags are hermetically sealed and not required to operate on aircraft.
15.0	<b>Magnetic effect</b>	This ensures that the aircraft's compass is not affected.	Tags are located in the cargo hold more than 3 meters from aircraft navigation systems.
16.0	<b>Power input</b>	Input power conducted emissions and susceptibility, transients, drop-outs and hold-up. The power input tests simulate conditions of aircraft power from before engine start to after landing including emergencies.	Not applicable. Tags are not connected to external power and not required to operate in aircraft.
17.0	<b>Voltage spike</b>	This test determines whether equipment can withstand the effects of voltage spikes arriving at the equipment on its power leads, either AC or DC.	Not applicable. Tags are not connected to external power and not required to operate in aircraft.
18.0	<b>Audio Frequency Conducted</b>	This test determines whether the equipment will accept frequency components of a magnitude normally	Not applicable. Tags are not required to

	<b>Susceptibility</b>	expected when the equipment is installed in the A/C. These frequency components are normally harmonically related to the power source fundamental frequency.	operate in aircraft.
19.0	<b>Induced Signal Susceptibility</b>	This test determines whether the equipment interconnect circuit configuration will accept a level of induced voltages caused by the installation environment. This section relates specifically to interfering signals related to the power frequency and its harmonics, audio frequency signals, and electrical transients that are generated by other on-board equipment or systems and coupled to sensitive circuits within the EUT through its interconnecting wiring.	Not applicable.  Tags are not connected to external power and are not required to operate in aircraft.
20.0 and 21.0	<b>RF emission and susceptibility</b>	Radio frequency energy: -- radiated emissions and radiated susceptibility (HIRF) via an (Electromagnetic reverberation chamber).	Tags do not transmit on aircraft. They only act as a receiver and will only transmit when in the presence of a COREInsight reader which is not installed on aircraft.  In the unlikely event that a tag went into transmit mode it is operating on Bluetooth frequencies and is considered by the FAA as the equivalent of a PED (personal electronic device).  The total radiated emissions of a transmitting tag is +6dbm.
22.0 and 23.0	<b>Lightning susceptibility</b>	Direct and indirect effects depending on mounting location; includes induced transients into the airframe or wire bundle.	Not applicable.  Tags are not connected to the aircraft and not required for the operation of the aircraft.
24.0	<b>Icing</b>	This test determines performance characteristics for equipment that must operate when exposed to icing conditions that would be encountered under conditions of rapid changes in temperature, altitude and humidity.	Not applicable.  Tags are not required to operate in aircraft.

25.0	<b>ESD</b>	This checks for resilience vs ESD in handling and operation.	<p>Not applicable.</p> <p>Tags are not required to operate in aircraft.</p> <p>Tags have no external connections through which ESD could be transmitted.</p>
26.0	<b>Flammability</b>	This analysis and test verifies the assembly will not provide a source to fire.	<p>Tags contain lithium non-rechargeable batteries and comply with FAA limits on lithium content of encapsulated devices.</p> <p>Tags on ULDs are hermetically sealed and are separated by a significant distance so that they can't interact with each other to transfer heat.</p>