

Static Removal Capability of the A&D AD-1683 Ionizer in a Nitrogen Atmosphere

Accurate weighing with an electronic balance is difficult if the target sample is statically charged. This is especially true when a very small amount of sample is to be weighed using an analytical balance with a readability of 0.1 mg or finer. For such weighing, it is essential to minimize the effects of static by using an ionizer (static eliminator).

Analytical balances are often used in a glove box, and static should to be removed even if the air inside is displaced with a gas such as nitrogen. Accordingly, A&D tested whether our AD-1683 ionizer would work in such environments.

Model tested: AD-1683

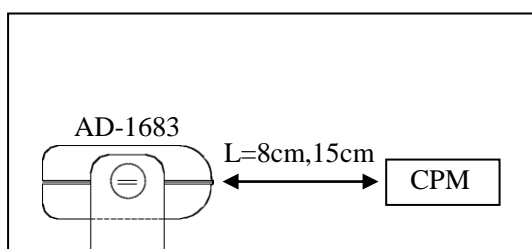
Devices used: Electrostatic measuring device (charge plate monitor, or CPM, of Kasuga Denki, Inc.)

Vacuum glove box (G-10N-MV-AV-1H-VA of Takasugi MFG. Co. Ltd.)

Procedure

1. Depressurize the inside of the glove box to a medium vacuum (10^2 to 10^{-1} Pa) and then displace it with N₂ (purity of 99.99% or higher). *1 atmosphere is approx. 100 kPa.
2. Install the electrostatic measuring device 8 cm or 15 cm in front of the AD-1683.
3. Charge the electrostatic measuring device to +1 kV (or -1 kV).
4. Activate the AD-1683 to start static removal.
5. Measure the time elapsed until the electrostatic voltage drops to an insignificant level of ± 0.1 kV or less.

[Setup image]



Results

Time required for static removal

Initial electrostatic voltage		+1 kV	-1 kV
Distance between the AD-1683 and the electrostatic measuring device	8 cm	Within 1 sec.	Within 1 sec.
	15 cm	Approx. 2 sec.	Approx. 5 sec.

Observations and remarks

- It can be inferred that the medium vacuum and 99.99% purity resulted in the nitrogen atmosphere still containing a minute amount of air (including oxygen), whose molecules were ionized for static removal.
- The AD-1683 is capable of removing static in a nitrogen atmosphere (with the conditions mentioned above).
- For safety reasons, it is recommended to unplug the AD-1683 once static is removed. An ionizer should not be operated for a long period of time.