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OSHA Regulations and Nuclear Static Eliminators

OSHA has adopted regulations (29 CFR 1910.1096) that cover the use of ionizing radiation in general industry. These are based on the US Nuclear Regulatory Commission regulations covering the use of radioactive material. Section 29 CFR 1910.1096 (p) specifies that an employer who uses radioactive material under the terms of a valid NRC or Agreement State license “shall be deemed to be in compliance with the requirements of this section with respect to such possession and use.”

Since you become a General Licensee by receiving our devices, you shall be deemed to be in compliance with the OSHA requirements with regard to the use of our nuclear static eliminator, provided that you use them in accordance with the instruction sheets provided to you with these devices.

Hazard Communication / Material Safety Data Sheet (MSDS) Exclusion

Ionizing devices manufactured by NRD LLC are excluded from the OSHA Hazard Communication and Material Safety Data sheet requirements. This exclusion is stated under 29 CFR 1910.1200 (b) (6) (xi).

NRD LLC will not issue an MSDS for this reason. All required instructions are included with each product shipped.

Tech Tips – 3

Clearing the Air About Alpha Energy Ionizers

Alpha-energy or nuclear ionizers have had great success in a wide range of applications over the past quarter century. Despite this, there are still some misconceptions regarding their use. The following information is intended to clarify some of these issues.

Regulations

According to federal regulations, NRD alpha energy devices must be tested after 13 months of use. That's one of the reasons NRD makes ionizers available on an annual lease basis; when your one-year lease expires, we ship you a new ionizer and you return the old one to us.

Relocating Equipment

You're free to relocate alpha energy equipment within a facility as desired. And if you want to transfer your ionizer to a different facility, you need only return it to NRD. We can then forward it to the new location for you – at no charge.

Exporting

NRD has shipped alpha energy ionizers internationally for more than 20 years. We are not aware of any countries that prohibit importing or using these devices, although certain governments do have different requirements than the U.S. Malaysia, for example, requests certification to ISO 2919. NRD is accustomed to providing the necessary documentation to meet such requests, and we're always happy to work with customers to address special needs.

Safety

Nuclear ionizers are safe to use just about anywhere static is a problem. NRD ionizers have an excellent track record of performance in even the most demanding applications, like microelectronics, medical devices and explosive environments. Some of the largest manufacturers in the world – with names like Motorola, Texas Instruments, Baxter and Thiokol – use our ionizers with great success in a variety of applications and environments.

A few more facts

Here are a few other facts about nuclear ionizers that might interest you:

- They require no outside power source.
- They require no calibration, because they provide constantly balanced ionization.
- They are safe to use even in volatile or solvent-laden environments.
- There is no risk of electrical shock.

Some of NRD's newer products, like the Ionmaster™ mini blower, contain ion cells which are exempt from the foregoing conditions in the U.S. Our Staticmaster™ products are also exempt from restrictions, and have been used for many years to eliminate static in such applications as photography, radiography, and scientific laboratories. In fact, they're available to the general public from specialty stores and camera shops.



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Tech Tips – 3

Clearing the Air About Alpha Energy Ionizers

General Licensing Requirements in the United States

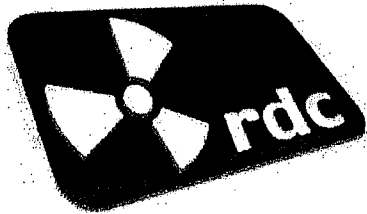
The Nuclear Regulatory Commission requires that those who possess nuclear devices be licensed. When NRD, LLC ships a static control device to you, you automatically become a general licensee upon receipt of the equipment. As a licensee, there are certain requirements you must follow:

1. You must maintain the device label in legible condition, securely attached to the device and visible.
2. The device should not be transferred to another location, person or company. However, transfer to another company location can be accomplished by sending the ionizer to NRD, LLC. We will then ship the device to the new location, per your instructions.
3. Should a device become damaged, lost or stolen, you should immediately contact NRD, LLC at (716) 773-7634. You will be advised of reporting requirements, if any.
4. You must retain accurate records of the receipt, transfer and disposal of each device in your possession.
5. The device must be tested every 13 months. To meet this requirement, simply return the device to NRD, LLC within 15 days of your lease expiration date. Do not use your own packaging or corrugation; we will provide an original (Type A) shipping container upon request. Call us at 1-800-525-8076, during business hours, Monday through Friday.
6. The device should not be abandoned or disposed of except by return to: NRD, LLC, 2937 Alt Blvd., Grand Island, NY 14072
7. Some states require that the initial receipt of a device be reported by the general licensee to the appropriate agency in that state. For example, New York State requires filing a "registration of a generally licensed radiation device" (Form: DOSH-240.4) upon receipt. If you have any questions about specific requirements in your state, contact NRD, LLC for assistance.

A complete set of relevant information on regulations is supplied with each ionizer shipment. We also have information available to explain safety issues and address concerns that you or your employees might have. It's worth noting that in more than 25 years of product distribution and usage, not one incident of personal harm has ever been documented.



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Safety Facts of **Alpha Ionizer**

By Rupinder Kaur, Health Physicist

Alpha Ionizer

The Alpha Ionizer is a device used to neutralize static charge on any material. It uses a radioactive source called Polonium (Po-210) to produce ions (positive or negative charged particles) in the surrounding air. These ions attract their counterparts in order to neutralize the charge on the material. Essentially, the exposure and health risk from the Alpha Ionizer is not measurable.

Radiation

Radiation is everywhere and is as old as the universe itself. Two types of radiation are: ionizing and non-ionizing. Non-ionizing radiation damages tissue through heating effects. Sun light and heat are non-ionizing radiation also described as ultraviolet (UV) and infrared (IR) radiation. Ionizing radiation (alpha and beta particles, neutrons, and x and gamma rays) causes damage by ionizing, i.e., stripping electrons off atoms. Ionizing radiation can be found in smoke detectors and sometimes emitted from color televisions. A radioactive source has an unstable nucleus. In order to achieve a stable state, it will emit radiation via the radioactive decay process. A radioactive atom gives off ionizing radiation in all directions in the form of fast flying particles or rays.

Radiation Dose

Radiation is essentially movement of energetic particles or waves in space. These traveling particles interact with and deposit energy in any medium through which they pass. The amount of energy absorbed is called dose. Dose is usually measured in units of Roentgen (R), rad, or rem (when the dose is deposited in human tissue). The occupation dose limit for a radiation worker in United States of America is 5000 mrem*per year. To have a better perspective, it should be noted that the average background radiation from natural sources is about 300 mrem/yr (~35 microrem*/hr). Following is the exposure received during various activities in U.S.:

Chest X-ray	20 mrem
Dental X-ray	200-700 mrem
Cross-country jet flight	5-10 mrem
Smoking cigarettes (1.5 packs/day)	8,000 mrem/yr
Pacemaker	700 mrem/yr

* millirem is 1000th of rem

* micro rem is 1000th of mrem

Health Risks

To estimate the health risk from radiation, it is very important to understand the nature of radiation. Knowledge of the *type*, *energy*, and amount of the *exposure* is required in order to determine the effect of radiation to the body. For example, *alpha particles* of the same energy and exposure do not have same effect on the body as *gamma rays*. Alpha particles cannot penetrate even the outer layer of skin, but gamma rays penetrate human tissue *and* shielding. *High-energy* gammas are more penetrating than low energy. *Exposure* can be external or internal. External exposure is from any radioactive source external to body. Internal exposure is the exposure caused by ingested or inhaled radioisotopes. The greater the exposure greater is the risk of biological effects. High levels of exposure to ionizing radiation will damage or kill the cells which makeup our bodies. Cancer can result from cells that are damaged but survive.

Radiation Protection

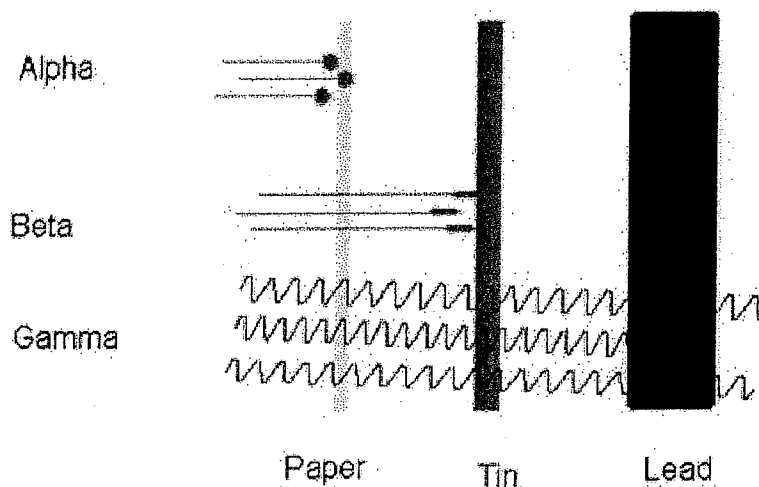
The exposure from any type of radiation can be limited by controlling the following factors: Time, Distance, and Shielding.

Time: The greater the time one is exposed to the radiation source, the greater the exposure (dose).

Distance: Doubling the distance from radiation source reduces the exposure four times.

Shielding: Any material placed in between the source of radiation and the occupied area will absorb some of the radiation and thus reduce the exposure. The more material used, and greater its density, the more radiation will be reduced.

Following is a profile of penetration levels of various radiation types:



Radiation in Alpha Ionizer

Polonium-210 is a naturally occurring radioisotope. It can be found throughout earth's crust. Polonium decays to stable form of lead (Pb-206) by emitting alpha particles. A very small percentage of the time (0.0012%), 803 keV gamma rays are also generated in this decay.

Alpha particles travel only an inch or so in air and have little penetrating power. Alpha particles are not considered an external radiation hazard because the dead layer of skin easily stops them. The only way alphas can be harmful is by ingestion or inhalation of an alpha emitter (internal exposure). Internally, the source of alpha radiation can be in close contact with unprotected body tissue and can deposit a large amount of energy in small volume of body tissue.

Gamma rays are very penetrating. Their range in air is very long compared to alpha and beta radiation. Range also depends upon the energy associated with the gamma radiation. Gamma radiation is best shielded by dense materials such as lead or steel. Gamma rays are very similar to X-rays in nature.

The only difference is in their origin. Gamma radiation is emitted from nucleus of an atom, whereas X-rays are produced by the rearrangement of electrons outside the nucleus.

The radioactive source (Po-210) in the Alpha Ionizer is encapsulated inside a solid metallic foil. It has been shown¹ that there is no chance of ingesting particles from such encapsulated ionizing sources. Therefore, the Alpha Ionizer used under normal mounting and operating conditions (as specified in instructional manual) creates no hazard from alpha radiation.

The small amount of 803 keV gamma radiation produced in the decay process will be further attenuated with the metallic foil structure and the steel frame of the ionizer. Under normal mounting conditions, the Ionizer is about two (2) feet away from the workspace. If a person were to work 8 hrs-a-day for a whole year, the annual occupation dose would still be less than 2 mrem. Such a low amount of exposure is hard to measure against background radiation. The number cited here is the calculated number. The exposure from a single dental X-ray is at least 100 times higher than the dose from the Alpha Ionizer in a year.

¹ "Registry of Radioactive Sealed Sources and Devices - Safety Evaluation of Devices" No. NY 0502D110G, 12/31/97