



Main Office
 Post Office Box 1448
 Saint Albans, WV 25177
 Tel 304 722-4237
 Fax 304 722-4230
 WV License #WV000007

Virginia Office
 605 Lithia Road
 Wytheville, VA 24382
 Tel 276 227-0378
 Fax 276 223-0134
 VA License #2701032711

CONSTRUCTION COMPANY

www.ordersconstruction.com

January 6, 2016

Dennis Lawyer
 Health Physicist
 Licensing Assistance Team
 Division of Nuclear Materials Safety
 U. S. Nuclear Regulatory Commission, Region I
 2100 Renaissance Boulevard, Suite 100
 King of Prussia, PA 19406-2713

Re: Mail Control No. 589657
 Renewal of License Number 47-19344-01

Mr. Lawyer:

Below is references to where the additional information you requested for our application dated December 13, 2015, requesting renewal to Nuclear Regulatory Commission License No. 47-19344-01, Docket No. 03017470:

1. Your application had many of the elements as stated in NUREG-1556, Volume 1, "Consolidated Guidance About Materials Licenses: Program-Specific Guidance About Portable Gauge Licenses," (<http://www.nrc.gov/reading-rm/doc-collections/nuregs/staff/sr1556/v1/r1/>) but may not be as clear as needed for the license. You stated that you would obtain a radiation survey meter as needed, but the guidance also says that the meter meets a certain criteria. Please state, "We will either possess and use, or have access to and use, a radiation survey meter that meets the Criteria in the section entitled "Radiation Safety Program – Instruments" in NUREG-1556, Vol. 1, Rev. 1, dated November 2001.

On Page 2, #16 of the Radiation Safety Program, it states: Orders Construction will possess and use a radiation survey meter that meets the Criteria in the section entitled "Radiation Safety Program – Instruments" in NUREG – 1556, Vol. 1, Rev. 1, dated November 2001.

On Page 7, the Radiation Safety Program states: A survey will be conducted by the RSO (or another knowledgeable person such as a consultant if the RSO is unavailable) using appropriate radiation detection instrumentation. Orders Construction possesses and has access to use a radiation survey meter that meets the Criteria in the section entitled "Radiation Safety Program – Instruments" in NUREG – 1556, Vol. 1, Rev. 1, dated November 2001.

589657

NUREG/RGN MATERIALS-002



REC'D 1010716AM1024

2. Your application did not discuss performing periodic physical inventories. As stated in NUREG, Vol. 1, Rev 1, please state, "Physical inventories will be conducted at intervals not to exceed 6 months, to account for all sealed sources and devices received and possessed under the license.

On Page 5 - #1 Gauge Inventory, the Radiation Safety Program

states: Physical inventories will be conducted at intervals not to exceed 6 months. This will be done to account for all sealed sources and devices received and possessed under this license.

3. Your application states that you will use monitoring as required. This is not clear and does not state that the monitoring would require NAVLAP accreditation. As stated in NUREG-1556, Vol.1, Rev. 1, please state, "Either we will maintain, for inspection by NRC, documentation demonstrating that unmonitored individuals are not likely to receive a radiation dose in excess of 10 percent of the allowable limits in 10 CFR Part 20, or we will provide dosimetry processed and evaluated by an NVLAP-approved processor that is exchanged at a frequency recommended by the processor."

On Page 1 - #3 RSO, the Radiation Safety Program states: Personnel monitoring devices are used as required and reports of personnel exposure are reviewed in a timely manner. Orders Construction will maintain, for inspection by the NRC, documentation demonstrating that unmonitored individuals are not likely to receive a radiation dose in excess of 10 percent of the allowable limits in 10 CFR Part 20.

On Page 5 – Personal Monitoring, the Radiation Safety Program

states: Personnel monitoring devices are used as required and reports of personnel exposure are reviewed in a timely manner. Orders Construction will maintain, for inspection by the NRC, documentation demonstrating that unmonitored individuals are not likely to receive a radiation dose in excess of 10 percent of the allowable limits in 10 CFR Part 20.

4. Your application did not specifically state that the leak test kits would be from an organization authorized by the NRC or Agreement State to provide leak test kits to others. As stated in NUREG-1556, Vol. 1, Rev. 1, please state, "Leak tests will be performed by using a leak test kit supplied by an organization authorized by NRC or an Agreement State to provide leak test kits to other licensees."

On Page 4 – #4 Maintenance, the Radiation Safety Program states: A leak test will be performed every six months as stated on the license, using an approved leak test kit and in accordance with the gauge

manufacturer's instructions. The operator will have received proper instruction on how to leak test the gauge and will wear his/her assigned monitoring device. Leak tests will be performed by using a leak test kit supplied by an organization authorized by the NRC or an Agreement State to provide leak test kits to other licensees.

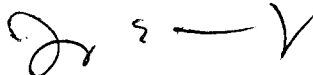
On Page 5 – Leak Tests, the Radiation Safety Program states: A leak test will be performed every six months as stated on the license, using an approved leak test kit and in accordance with the gauge manufacturer's instructions. The operator will have received proper instruction on how to leak test the gauge and will wear his/her assigned monitoring device. Leak tests will be performed by using a leak test kit supplied by an organization authorized by the NRC or an Agreement State to provide leak test kits to other licensees.

5. Additional security requirements have been added since NUREG-1556, Vol. 1, Rev 1. was published. Please state, "We will develop, implement and maintain security procedures using information in the NUREG-1556, Volume 1, Rev. 1, Errata: Appendix H, "Operating, Emergency, and Security Procedures (<http://pbadupws.nrc.gov/docs/ML0521/ML052130055.pdf>)"

On Page 6 – Security, the Radiation Safety Program states: Orders Construction will develop, implement and maintain security procedures using information in the NUREG-1556, Volume 1, Rev. 1, Errata: Appendix H, "Operating, Emergency and Security Procedures.

Upon your review please accept and renew Orders Construction Company, Inc.'s application for renewal of Radioactive Materials License Number 47-19344-01. If you have any questions or concerns feel free to contact me at my contact information below.

Sincerely,



Jeffrey E. Dixon Jr., RSO, CSP
Orders Construction Company, Inc.
Director of Safety and Workforce Development
(304) 722-4237 : Office
(304) 389-6912 : Mobile
(304) 201-2405 : Fax
jeffd@ordersconstruction.com

Enclosure



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January 6, 2016

Licensing Assistance Team
Division of Nuclear Materials Safety
U. S. Nuclear Regulatory Commission, Region I
2100 Renaissance Boulevard, Suite 100
King of Prussia, PA 19406-2713

Re: Mail Control No. 589657
Renewal of License Number 47-19344-01

Mr. Dennis Lawyer:

Attached is an application for renewal of Orders Construction Company, Inc.'s Radioactive Materials License Number 47-19344-01. Below is a description of required items for submittal of this application:

5. Radioactive Material:

a. Element and Mass Number

1. Cesium 137
2. Americium 241

b. Chemical and/or Physical Form

1. Sealed Sources (QSA Global Model No. CDCW556, or Isotope Product Labs. Model HEG-137)
2. Sealed Neutron Sources (QSA Global Model AMNV.997 or Isotope Product Labs. Models 3021, 3027 and Am1.N02)

c. Maximum Amount which will be possessed at one time

1. Not to exceed 9 millicuries per source and 27 millicuries in total.
2. Not to exceed 44 millicuries per source and 132 millicuries in total.

6. Purpose for which Licensed Material will be used:

Both sources of Cesium 137 and Americium 241 are used in Troxler Model 3400 and 3411 Series portable gauging devices for measuring physical properties of materials. Orders Construction Company has three gauges in total and all three are used to measure the physical properties of earth. The physical properties measured are the density and moisture of earth for compaction purposes when building roads and other structures for construction purposes.



7. Individual responsible for Radiation Safety Program and their training experience:

Jeffrey E. Dixon Jr. is Orders Construction Company's Radiation Safety Officer. Mr. Dixon has received the RSO Certification from Humboldt Scientific, Inc. Mr. Dixon is a graduate of Marshall University in December of 2012 in which he received a Bachelor of Science in Safety Technology. Mr. Dixon also graduated from West Virginia State College in May of 2003 and received an Associate in Applied Science in Environmental Safety and Health Management. Mr. Dixon recently received the Designation of Certified Safety Professional on September 11, 2015, Certificate # CSP-30354.

8. Training for Individuals Working in or Frequently Restricted Areas.

Operators of Troxler Model 3400 and 3411 Series portable gauging devices for measuring physical properties of materials are required to attend Nuclear Safety for Gauge Operator training. An operating employee must also attend U. S. Department of Transportation training on the general awareness/familiarization function specific, safety and security awareness training as related to the transportation of nuclear gauges. Our only current compaction gauge operator is Brian D. Kelvington and his training is attached to this application.

9. Facilities

Licensed material is used or stored at the Orders Construction Company shop facility located at 230 Stewart Lane, Winfield, WV 25213 and may be used at temporary jobsites of Orders Construction Company anywhere in the United States where the U. S. Regulatory Commission maintains jurisdiction for regulating the use of licensed material, including areas of exclusive Federal jurisdiction within Agreement States.

9. Equipment

Equipment owned and stored at the Orders Construction Company shop facility located at 230 Stewart Lane, Winfield, WV 25213 includes:

- a. Troxler Model 3411 Series Portable Gauging Device, Serial Number 14796
- b. Troxler Model 3411 Series Portable Gauging Device, Serial Number 13067
- c. Troxler Model 3430 Series Portable Gauging Device, Serial Number 23866

The latest leak test results are attached to this application.

10. Radiation Safety Program

Orders Construction Company, Inc.'s Radiation Safety Program is attached to this application.

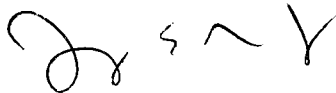
11. Waste Management

Leak Tests are performed every six months on each gauge. The latest leak test results have been included with this application. Annual Calibration of each gauge occurs in the first quarter of each year. The latest Calibration results have also been included with this application. The Radiation Safety Program outlines Emergency Telephone Numbers (Page 6-7) to call if damage to a gauge were to occur which

could result in contamination. This is outlined throughout the Radiation Safety Program, but specifically in the Physical Damage area on Page 6. On Page 6 it outlines that in the event that there is damage to a source or a gauge, an authorized cleanup contractor will remove the damaged equipment after verifying that the source is not leaking and is safe to remove. A survey will be conducted by the RSO (or another knowledgeable person such as a consultant if the RSO is unavailable) using appropriate radiation detection instrumentation. Orders Construction possesses and has access to use a radiation survey meter that meets the Criteria in the section entitled "Radiation Safety Program – Instruments" in NUREG – 1556, Vol. 1, Rev. 1, dated November 2001. Orders Construction Company owns this equipment and it is calibrated annually. Necessary notifications to local authorities as well as the NRC will be required.

Upon review please accept and renew Orders Construction Company, Inc.'s application for renewal of Radioactive Materials License Number 47-19344-01. If you have any questions or concerns feel free to contact me at my contact information below.

Sincerely,



Jeffrey E. Dixon Jr., RSO, CSP
Orders Construction Company, Inc.
Director of Safety and Workforce Development
(304) 722-4237 : Office
(304) 389-6912 : Mobile
(304) 201-2405 : Fax
jeffd@ordersconstruction.com

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RADIATION SAFETY PROGRAM

General:

The Radiation Safety Program covers the procedures for the safe and proper use and possession of radioactive material as contained in portable moisture/density gauges used to measure soil and other materials. When handled in accordance with this plan, the radioactive materials present no hazard to the licensee's employees, customers, or the general public.

Radiation Safety Officer:

All use and possession is under the direction and supervision of the Radiation Safety Officer (RSO). The RSO is a single point of accountability and responsibility between the Regulatory Agency and the Licensee. The RSO is responsible for all aspects of the Radiation Safety Plan, including the following specific duties.

1. Licensed material possessed by the licensee is limited to the type and quantities of byproduct material listed on the license.
2. Individuals using gauges are properly trained, have read and understand the Radiation Safety Program, receive refresher training at least annually to include review of operating and emergency procedures (per 10 CFR Part 20), Department of Transportation (DOT) requirements, all changes in regulatory requirements, deficiencies identified during annual audits and users are authorized by the RSO.
3. Personnel monitoring devices are used as required and reports of personnel exposure are reviewed in a timely manner. Orders Construction will maintain, for inspection by the NRC, documentation demonstrating that unmonitored individuals are not likely to receive a radiation dose in excess of 10 percent of the allowable limits in 10 CFR Part 20.
4. Gauges are properly secured against unauthorized removal at all times when gauges are not in use.
5. Proper authorities are notified in case of accident, damage to gauges, fire or theft.
6. Audits are performed at least annually to ensure that (a) the licensee is abiding by NRC and DOT regulations and the terms and conditions of the license (e.g., periodic leak tests, inventories, use limited to trained, approved user's), (b) the licensee's radiation protection program content and implementation achieve



occupational doses and doses to members of the public that are ALARA (see 10 CFR 20.1101), and (c) the licensee maintains required records with all required information (e.g., records of personnel exposure; receipt, transfer, and disposal of licensed material; gauge user training) sufficient to comply with NRC requirements.

7. Results of audits, identification of deficiencies, and recommendations for change are documented (and maintained for at least 3 years), provided to management for review, and prompt action is taken to correct deficiencies.
8. Audit results and corrective actions are communicated to all personnel who use licensed material (regardless of their location or the license under which they normally work.)
9. To serve as a point of contact and give assistance in case of emergency. All incidents, accidents, and personnel exposure to radiation in excess of ALARA or Part 20 limits are investigated and reported to NRC and other authorities, as appropriate, within required time limits.
10. Licensed material is transported in accordance with all applicable DOT Requirements.
11. The Radiation Safety Officer has up-to-date copies of NRC's regulations, reviews new or amended NRC Regulations, and revises licensee procedures, as needed, to comply with NRC regulations.
12. Licensed material is disposed of properly.
13. To ensure that the equipment is leak tested at the required intervals.
14. The license is amended whenever there are changes in: licensed activities, responsible individuals, or information or commitments provided to NRC in the licensing process.
15. To post all required signs and notices at gauge storage location.
 - Post document RH-2364, Notice to Employees
 - Label storage cabinet with "Caution, Radioactive Material" and international symbol.
 - Post notice of where a copy of the organization's license, safety plan, and copy of regulations are located.
16. Orders Construction will possess and use a radiation survey meter that meets the Criteria in the section entitled "Radiation Safety Program – Instruments" in NUREG – 1556, Vol. 1, Rev. 1, dated November 2001.

Operation:

1. Before removing the gauge from its place of storage, check to make sure that the

gauge source rod is in the shielded, locked position, and the transport case is locked.

2. Sign the gauge out on the sign out sheet including the date(s) of use, name(s) of the authorized users who will be responsible for the gauge, and the temporary jobsite(s) where the gauge will be used.
3. Follow all applicable Department of Transportation (DOT) requirements when transporting the gauge.
4. The operator will exercise suitable control over the gauge at all times and maintain constant surveillance. At no time is it to be left unattended or in the possession of an unauthorized person. Always keep unauthorized persons away from the area where the gauge is to be used.
5. Never look under the gauge when the source rod is being lowered into the ground.
6. Do not touch the source rod with your fingers, hands, or any part of your body and always make sure the source rod is in the shielded position after each measurement is made.
7. After each measurement, always return the source to the shielded position and lock it there.
8. When not being used for field measurements, the gauge will be locked and returned to its storage/transportation case in a secured storage location.
9. When testing is complete, the gauge will be returned to its permanent place of storage as soon as possible and logged back in on the sign out sheet.
10. When required, the operator will wear the personnel-monitoring device assigned. Never wear another person's film badge. Never store your film badge near the gauge. When the operator is not using the equipment, the monitoring device will be kept in a radiation free, low heat area.
11. At all times operators will observe ALARA principles to minimize any dose received: As Low As Reasonable Achievable
12. While the equipment is in the operators possession, the operator will have:
 - a. Copy of the License.
 - b. Copy of this Radiation Safety Plan with Emergency Procedures and Telephone/Call - Down List.
 - c. Copy of Letter of Authorized Users from RSO.
 - d. Copy of the Gauge Operating Manual.
 - e. Copy of the Current Leak Test Certificate.

Transportation:

1. During transportation, the equipment shall be fully secured in the transporting vehicle and located away from personnel. When transported in a closed vehicle (car or van), the case will be locked and vehicle will be locked when the operator is not with the vehicle. When transported in an open bed vehicle (pick-up truck), the case will be locked and the case securely fastened and locked to the truck bed when the operator is not with the vehicle.
2. The equipment will only be transported in an approved DOT shipping container with all the required labels and markings.
3. During transportation the operator will have Shipping Papers on the seat adjacent to the driver or in a holder which is mounted to the inside of the door on the driver's side of the vehicle describing the radioactive material with the proper nomenclature. The gauge will be properly blocked and braced in the vehicle so as not to allow it to move around in the vehicle.
4. When shipping by common carrier, the package shall be in compliance with 49 CFR 170-179.

Maintenance:

1. Periodic maintenance will include checking of the shutter closure prior to use and cleaning of the gauge. The operator will have received proper instruction on how to clean the gauge and will wear his/her assigned monitoring device.
2. When finished measuring the gauge should be cleaned and lubricated. Make sure that all the pieces are with the gauge and in the case. The user manual and shipping papers are back inside the case and not in the vehicle.
3. No maintenance will be performed in which the radioactive source is removed from the gauge. The gauge will be returned to the manufacture or an approved service center for this type of service.
4. A leak test will be performed every six months as stated on the license, using an approved leak test kit and in accordance with the gauge manufacturer's instructions. The operator will have received proper instruction on how to leak test the gauge and will wear his/her assigned monitoring device. Leak tests will be performed by using a leak test kit supplied by an organization authorized by the NRC or an Agreement State to provide leak test kits to other licensees.
5. The shipping case will be periodically checked for integrity, and to verify that all labels are present and readable.

Protection from the Elements:

1. Rain/snow - Make every effort to keep the gauge dry. Once the gauge becomes wet or has built up moisture on the electronics it takes several days for the gauge to completely dry out. If a wet gauge is used, then the results will be erratic.
2. Extreme heat - Make every effect to keep the gauge out of direct sun light during times of extreme heat. Direct exposure to sun on extremely hot days can damage the electronics of the gauge.
3. The storage case for the gauge is not weather proof and the same precautions will need to be exercised if the gauge is inside the case. If the case does get wet you will need to pull out the packing foam and allow it to dry, otherwise it will begin to mildew and allow moisture to build up on the electronics.

Personal Monitoring:

1. Personnel monitoring devices are used as required and reports of personnel exposure are reviewed in a timely manner. Orders Construction will maintain, for inspection by the NRC, documentation demonstrating that unmonitored individuals are not likely to receive a radiation dose in excess of 10 percent of the allowable limits in 10 CFR Part 20.

Leak Test:

1. A leak test will be performed every six months as stated on the license, using an approved leak test kit and in accordance with the gauge manufacturer's instructions. The operator will have received proper instruction on how to leak test the gauge and will wear his/her assigned monitoring device. Leak tests will be performed by using a leak test kit supplied by an organization authorized by the NRC or an Agreement State to provide leak test kits to other licensees.

Gauge Inventory:

1. Physical inventories will be conducted at intervals not to exceed 6 months. This will be done to account for all sealed sources and devices received and possessed under this license.
2. A checkout log will be attached to the wall within the storage room for gauges. Information on the log will include serial number of gauge, operator checking out gauge, date checked out, destination, estimated return date, and actual date of return.

Training:

1. All operators will complete a manufacturer's Operator's Training Course or other approved user safety course. Operators will be given special training as required for

their individual work assignments.

Physical Damage:

1. If any moving equipment is involved, stop its movement, until the extent of contamination, if any can be established.
2. Cordon off the area around the incident. An area with a radius of fifteen (15) feet will be sufficient. In some incidents it may be necessary to cordon off a larger area depending on the existing circumstances.
3. The RSO or approved facility will visually inspect the gauge to determine the extent of the damage to the source(s), source housing(s) and shielding.
4. At the earliest possible time, when the situation is under control, contact the RSO. In the event that the RSO is not available, contact one of the other company personnel or agencies listed below. Describe the conditions and follow the instructions of the individual contacted. The RSO or other appropriate individual will immediately notify the appropriate regulatory agency.

Security Requirements:

1. Orders Construction will develop, implement and maintain security procedures using information in the NUREG-1556, Volume 1, Rev. 1, Errata: Appendix H, "Operating, Emergency and Security Procedures.

Emergency Telephone Numbers:

Jeffrey E. Dixon Jr. - RSO	Work: (304) 722-4237
Director of Safety and	Cell: (304) 389-6912
Workforce Development	Home: [REDACTED]

Jamie Dorsey – Asst. RSO	Work: (304) 722-4237
Project Manager	Cell: (304) 549-7389
	Home: [REDACTED]

Robert Orders Jr.	Work: (304) 722-4237
CEO	Cell: (304) 541-1641
	Home: [REDACTED]

Police or Fire:	911
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NRC Emergency Operations Center (24 Hr.)	(301) 816-5100
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NRC Region II	(301) 415-5575
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Troxler Electronic Laboratories, Inc.
3008 Cornwallis Road
P. O. Box 12057
Research Triangle Park, NC 27709

(919) 839-2676

REMINDER TO LICENSEE MANAGEMENT AND RSO:

1. In the event that there is damage to a source or a gauge, an authorized cleanup contractor will remove the damaged equipment after verifying that the source is not leaking and safe to remove.
2. A survey will be conducted by the RSO (or another knowledgeable person such as a consultant if the RSO is unavailable) using appropriate radiation detection instrumentation. Orders Construction possesses and has access to use a radiation survey meter that meets the Criteria in the section entitled "Radiation Safety Program – Instruments" in NUREG – 1556, Vol. 1, Rev. 1, dated November 2001.
3. Make necessary notifications to local authorities as well as the NRC as required. (Even if not required to do so, you may report ANY incident to NRC by calling NRC's Emergency Operations Center at (301) 816-5100, which is staffed 24 hours a day and accepts collect calls. NRC notification is required when gauges containing licensed material are lost and stolen, when gauges are damaged or involved in incidents that result in doses in excess of 10 CFR 20.2203 limits.
4. Timeliness of reports to the NRC needs to be considered.
5. Reporting requirements are found in 10 CFR 20.2201-2203 and IOCFR 30.50.

Theft or Loss

Immediately notify the RSO. The RSO will immediately notify the appropriate regulatory agency and the police.

Fire

1. Call the Fire Department.
2. Notify the RSO.
3. Stand by to advise the fire fighters as to the nature, locations, and potential hazards of the radioactive materials. Supply them with an information packet consisting of the facility layout and a data sheet of the equipment. Be sure to include any other important information. e.g. explosives, guard dogs, etc.

4. Take action appropriate with a fire to protect personnel.

<u>Melting Points:</u>	⁰ F	⁰ C
Stainless Steel	2550	1400
Carbide	2000	1090
Aluminum	1005	540
Lead	620	327
Polyethylene	257	125

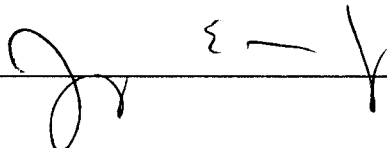
Temperatures in an industrial fire will normally range from 500⁰F at floor level to a high at the ceiling of 400⁰F to 800⁰F. The polyethylene and lead would melt in most fires, the aluminum only in a severe fire. The stainless steel capsule would not reach its melting point.

Disposal/Decommissioning

1. Disposal will only be performed by transferring to a properly licensed organization.
8. The regulatory agency will be notified 30 or more days in advance of any relocation of the storage area. Formal decommissioning will not be required, provided leak tests are current.

RADIATION SAFETY PLAN

This radiation safety plan will be implemented at all times. A copy of these procedures shall be maintained in the licensee's radioactive materials license file, and another copy in the shipping case of the nuclear gauge at all times.

Signed:  _____ Date: 1/6/2016



**APPLICATION FOR MATERIALS
LICENSE**

Estimated burden per response to comply with this mandatory collection request: 4.3 hours. Submittal of the application is necessary to determine that the applicant is qualified and that adequate procedures exist to protect the public health and safety. Send comments regarding burden estimate to the FOIA, Privacy, and Information Collections Branch (T-5 F53), U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001, or by internet e-mail to Infocollects.Resource@nrc.gov, and to the Desk Officer, Office of Information and Regulatory Affairs, NEOF-10202, (3150-0120), Office of Management and Budget, Washington, DC 20503. If a means used to impose an information collection does not display a currently valid OMB control number, the NRC may not conduct or sponsor, and a person is not required to respond to, the information collection.

INSTRUCTIONS: SEE THE APPROPRIATE LICENSE APPLICATION GUIDE FOR DETAILED INSTRUCTIONS FOR COMPLETING APPLICATION. SEND TWO COPIES OF THE ENTIRE COMPLETED APPLICATION TO THE NRC OFFICE SPECIFIED BELOW. *AMENDMENTS/RENEWALS THAT INCREASE THE SCOPE OF THE EXISTING LICENSE TO A NEW OR HIGHER FEE CATEGORY WILL REQUIRE A FEE.

APPLICATION FOR DISTRIBUTION OF EXEMPT PRODUCTS FILE APPLICATIONS WITH:

MATERIALS SAFETY LICENSING BRANCH
DIVISION OF MATERIAL SAFETY, STATE, TRIBAL AND RULEMAKING PROGRAMS
OFFICE OF NUCLEAR MATERIALS SAFETY AND SAFEGUARDS
U.S. NUCLEAR REGULATORY COMMISSION
WASHINGTON, DC 20555-0001

ALL OTHER PERSONS FILE APPLICATIONS AS FOLLOWS:

IF YOU ARE LOCATED IN:

ALABAMA, CONNECTICUT, DELAWARE, DISTRICT OF COLUMBIA, FLORIDA, GEORGIA, KENTUCKY, MAINE, MARYLAND, MASSACHUSETTS, NEW HAMPSHIRE, NEW JERSEY, NEW YORK, NORTH CAROLINA, PENNSYLVANIA, PUERTO RICO, RHODE ISLAND, SOUTH CAROLINA, TENNESSEE, VERMONT, VIRGINIA, VIRGIN ISLANDS, OR WEST VIRGINIA,

SEND APPLICATIONS TO:

LICENSING ASSISTANCE TEAM
DIVISION OF NUCLEAR MATERIALS SAFETY
U.S. NUCLEAR REGULATORY COMMISSION, REGION I
2100 RENAISSANCE BOULEVARD, SUITE 100
KING OF PRUSSIA, PA 19406-2713

IF YOU ARE LOCATED IN:

ILLINOIS, INDIANA, IOWA, MICHIGAN, MINNESOTA, MISSOURI, OHIO, OR WISCONSIN,
SEND APPLICATIONS TO:

MATERIALS LICENSING BRANCH
U.S. NUCLEAR REGULATORY COMMISSION, REGION III
2443 WARRENVILLE ROAD, SUITE 210
LISLE, IL 60532-4352

ALASKA, ARIZONA, ARKANSAS, CALIFORNIA, COLORADO, HAWAII, IDAHO, KANSAS, LOUISIANA, MISSISSIPPI, MONTANA, NEBRASKA, NEVADA, NEW MEXICO, NORTH DAKOTA, OKLAHOMA, OREGON, PACIFIC TRUST TERRITORIES, SOUTH DAKOTA, TEXAS, UTAH, WASHINGTON, OR WYOMING,

SEND APPLICATIONS TO:

NUCLEAR MATERIALS LICENSING BRANCH
U.S. NUCLEAR REGULATORY COMMISSION, REGION IV
1600 E. LAMAR BOULEVARD
ARLINGTON, TX 76011-4511

PERSONS LOCATED IN AGREEMENT STATES SEND APPLICATIONS TO THE U.S. NUCLEAR REGULATORY COMMISSION ONLY IF THEY WISH TO POSSESS AND USE LICENSED MATERIAL IN STATES SUBJECT TO U.S. NUCLEAR REGULATORY COMMISSION JURISDICTIONS.

1. THIS IS AN APPLICATION FOR (Check appropriate item)

- A. NEW LICENSE
 B. AMENDMENT TO LICENSE NUMBER
 C. RENEWAL OF LICENSE NUMBER

47-19344-01

2. NAME AND MAILING ADDRESS OF APPLICANT (Include ZIP code)

ORDERS CONSTRUCTION COMPANY, INC.
POST OFFICE BOX 1448
SAINT ALBANS, WV 25177

3. ADDRESS WHERE LICENSED MATERIAL WILL BE USED OR POSSESSED

ORDERS CONSTRUCTION COMPANY, INC.
230 STEWART LANE
WINFIELD, WV 25213

4. NAME OF PERSON TO BE CONTACTED ABOUT THIS APPLICATION

JEFFREY E. DIXON JR.

BUSINESS TELEPHONE NUMBER

(304) 722-4237

BUSINESS CELLULAR TELEPHONE NUMBER

(304) 389-6912

BUSINESS EMAIL ADDRESS

JEFFD@ORDERSCONSTRUCTION.COM

SUBMIT ITEMS 5 THROUGH 11 ON 6-1/2 X 11" PAPER. THE TYPE AND SCOPE OF INFORMATION TO BE PROVIDED IS DESCRIBED IN THE LICENSE APPLICATION GUIDE.

5. RADIOACTIVE MATERIAL

a. Element and mass number, b. chemical and/or physical form, and c. maximum amount which will be possessed at any one time.

6. PURPOSE(S) FOR WHICH LICENSED MATERIAL WILL BE USED.

7. INDIVIDUAL(S) RESPONSIBLE FOR RADIATION SAFETY PROGRAM AND THEIR TRAINING EXPERIENCE.

8. TRAINING FOR INDIVIDUALS WORKING IN OR FREQUENTING RESTRICTED AREAS.

9. FACILITIES AND EQUIPMENT.

10. RADIATION SAFETY PROGRAM.

11. WASTE MANAGEMENT.

12. LICENSE FEES (Fees required only for new applications, with few exceptions*)
(See 10 CFR 170 and Section 170.31)

FEE CATEGORY

RENEWAL

AMOUNT ENCLOSED \$

0.00

13. CERTIFICATION. (Must be completed by applicant) THE APPLICANT UNDERSTANDS THAT ALL STATEMENTS AND REPRESENTATIONS MADE IN THIS APPLICATION ARE BINDING UPON THE APPLICANT.

THE APPLICANT AND ANY OFFICIAL EXECUTING THIS CERTIFICATION ON BEHALF OF THE APPLICANT, NAMED IN ITEM 2, CERTIFY THAT THIS APPLICATION IS PREPARED IN CONFORMITY WITH TITLE 10, CODE OF FEDERAL REGULATIONS, PARTS 30, 32, 33, 34, 35, 36, 37, 39, AND 40, AND THAT ALL INFORMATION CONTAINED HEREIN IS TRUE AND CORRECT TO THE BEST OF THEIR KNOWLEDGE AND BELIEF.

WARNING: 18 U.S.C. SECTION 1001 ACT OF JUNE 25, 1948 62 STAT. 749 MAKES IT A CRIMINAL OFFENSE TO MAKE A WILLFULLY FALSE STATEMENT OR REPRESENTATION TO ANY DEPARTMENT OR AGENCY OF THE UNITED STATES AS TO ANY MATTER WITHIN ITS JURISDICTION.

CERTIFYING OFFICER -- TYPED/PRINTED NAME AND TITLE

JEFFREY E. DIXON JR, CSP
RADIATION SAFETY OFFICER

SIGNATURE

Jeffrey E. Dixon Jr

DATE

12/13/2015

FOR NRC USE ONLY

TYPE OF FEE	FEE LOG	FEE CATEGORY	AMOUNT RECEIVED \$	CHECK NUMBER	COMMENTS
APPROVED BY				DATE	

BCSP | BOARD OF CERTIFIED SAFETY PROFESSIONALS

2301 W. Bradley Avenue, Champaign, IL 61821 | P: +1 217-359-9263

To verify current status, visit bcsp.org/certification_directory.

Having met the applicable requirements defined by its bylaws,
BCSP hereby authorizes the use of

Certified Safety Professional (CSP)

to

Jeffrey Eugene Dixon, Jr.

**Expires on
12/31/2016**

**Certificate #
CSP-30354**

**Recertify by
12/31/2020**



SECRETARY

PERSONAL INFORMATION WAS REMOVED
BY NRC. NO COPY OF THIS INFORMATION
WAS RETAINED BY THE NRC.

Marshall University

The Marshall University Board of Governors

upon the recommendation of the faculty of

College of Information Technology and Engineering

has conferred upon

Jeffrey Eugene Dixon, Jr.

the degree of

Bachelor of Science

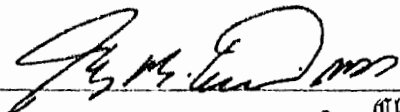
Safety Technology


Cum Laude

In Testimony Whereof, the signatures of the duly authorized officers of the Board of Governors and the Faculty of the University and the seal of the University have been affixed.

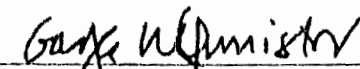
Given at Huntington, West Virginia, this [REDACTED]

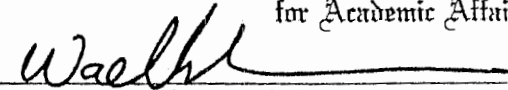
Marshall University Board of Governors


Chairman


President of the University




Provost and Senior Vice President
for Academic Affairs


Dean, College of Information

West Virginia State College



Know all persons by these presents
That the West Virginia State College Board of Governors
upon the recommendation of the Faculty has conferred upon

Jeffrey Eugene Dixon, Jr.

the degree of
Associate in Applied Science
in
Management

With all the rights, honors, and privileges thereunto appertaining. Witness the seal
of the college and the signatures of its duly authorized officers hereunto
affixed this [REDACTED].

Hayo W. Carter, Jr.

President

Patricia G. McClure

Chair, Faculty Board



Arnold Cooper

Vice President, Academic Affairs

Robert L. Lull



HUMBOLDT SCIENTIFIC, INC.
RSO Certification

Jeffrey E. Dixon, Jr.

**HAS SUCCESSFULLY COMPLETED A CERTIFIED
RADIATION SAFETY OFFICER COURSE**

Subjects included were:

RSO Duties and Responsibilities

Radiation Safety Practices

Regulatory Requirements

Dose/Shielding Requirements

Accidents/Storage

Regulatory Guidance (NUREG-1556, Vol. 1)

Transportation/HAZMAT Requirements

Risk

ALARA

Radiation Measurement

Operating and Emergency Procedures

Calibration and Maintenance

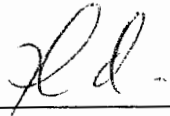
Record Keeping

Date of Training: **January 23, 2007**

Location: **Charleston, WV**

Certificate Number: **6797**

HAZMAT Expiration Date: **January 23, 2010**



Instructor: Keith Earnshaw

Humboldt Scientific, Inc.

551-D Pylon Drive

Raleigh, NC 27606

Nuclear Gauge Operator Recertification

This certifies that

Brian David Kelvington

has successfully completed the *Nuclear Safety for Gauge Operators Refresher Course* online course on the date shown below.

February 16, 2015



Troxler Electronic Laboratories, Inc.
P.O. Box 12057 - 3008 E. Cornwallis Road - Research Triangle Park, NC 27709
Phone: (919) 549-8661 - Fax: (919) 549-0761 - www.troxlerlabs.com

HAZMAT CERTIFICATION

as required by U.S. DOT and IATA

This certifies that

Brian David Kelvington

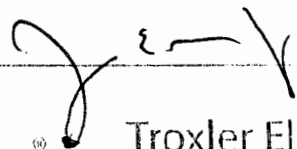
has been trained and tested in accordance with the U.S. Department of Transportation and International Air Transport Association (IATA) hazardous material requirements for general awareness/familiarization, function specific, safety, and security awareness training as related to the transportation of nuclear gauges. A description of the training course materials is available from Troxler Electronic Laboratories, Inc. This certificate expires three years from the training date shown below.

February 16, 2015

EMPLOYER CERTIFICATION

I certify that the hazmat employee identified on this certificate has been trained and tested as required by U.S. DOT Hazardous Material Regulations (49 CFR 172 Subpart H).

Signature



Title

2/16/2015



The Leader in Construction Testing Equipment

Troxler Electronic Laboratories, Inc.

PO Box 12057-3008 Cornwallis Road - Research Triangle Park, NC 27709

Phone: (919) 549-8661 - Fax (919) 549-0761 - www.troxlerlabs.com

Course: Hazmat

Tracking Code: E8698A8A75H7B3D_69844



Troxler Electronic Laboratories, Inc.

3008 Cornwallis Rd., P.O. Box 12057

Research Triangle Park, NC 27709

Tel: (877) 876-9537 Fax: (866) 391-2759

License: NC 032-0182-1

JEFFREY E. DIXON, JR.
ORDERS CONSTRUCTION COMPANY
501 SIXTH AVENUE
PO BOX 1448
ST ALBANS, WV 25177

Cust ID: 1315

LEAK TEST CERTIFICATE

DEVICE:

Model: 3411 Serial No: 14796

SEALED SOURCES:

Serial No.	Measure Date	Nuclide	GBq	mCi
50-3531	07/15/1987	Cs-137	0.296	8
47-10153	06/22/1987	Am-241:Be	1.48	40

LEAK TEST ANALYSIS:

Sample collected on: 09/16/2015
Sample analyzed on: 09/21/2015 10:33:15 A Position: 31
Analyzed by: EM

	ALPHA	BETA-GAMMA
Conversion factor (cpm/Bq)	1.25E+01	1.97E+01
Background measurement (cpm)	0	24
Sample measurement (cpm)	1	16
Activity (Bq)	< MDA	< MDA
Min. Detectable Activity (Bq)	3.8E-01	1.3E-00

This certifies that the leak test results are:

- Less than 185 Bq (0.005 uCi)
- Greater than 185 Bq (0.005 uCi)



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ORDERS CONSTRUCTION COMPANY
501 SIXTH AVENUE
PO BOX 1448
ST ALBANS, WV 25177

Cust ID: 1315

LEAK TEST CERTIFICATE

DEVICE:

Model: 3411 **Serial No:** 13067

SEALED SOURCES:

Serial No.	Measure Date	Nuclide	GBq	mCi
75-9424	04/29/1996	Cs-137	0.296	8
47-8377	09/12/1985	Am-241:Be	1.48	40

LEAK TEST ANALYSIS:

Sample collected on: 09/16/2015
Sample analyzed on: 09/21/2015 10:34:27 A **Position:** 32
Analyzed by: EM

	ALPHA	BETA-GAMMA
Conversion factor (cpm/Bq)	1.25E+01	1.97E+01
Background measurement (cpm)	0	24
Sample measurement (cpm)	2	32
Activity (Bq)	< MDA	< MDA
Min. Detectable Activity (Bq)	3.8E-01	1.3E+00

This certifies that the leak test results are:

- Less than 185 Bq (0.005 uCi)
- Greater than 185 Bq (0.005 uCi)



Troxler Electronic Laboratories, Inc.

3008 Cornwallis Rd., P.O. Box 12057

Research Triangle Park, NC 27709

Tel: (877) 876-9537 Fax: (866) 391-2759

License: NC 032-0182-1

JEFFREY E. DIXON, JR.
ORDERS CONSTRUCTION COMPANY
501 SIXTH AVENUE
PO BOX 1448
ST ALBANS, WV 25177

Cust ID: 1315

LEAK TEST CERTIFICATE

DEVICE:

Model: 3430 Serial No: 23866

SEALED SOURCES:

Serial No.	Measure Date	Nuclide	GBq	mCi
75-5834	05/19/1994	Cs-137	0.296	8
47-19729	07/05/1994	Am-241:Be	1.48	40

LEAK TEST ANALYSIS:

Sample collected on: 09/16/2015
Sample analyzed on: 09/21/2015 10:35:40 A Position: 33
Analyzed by: EM

	ALPHA	BETA-GAMMA
Conversion factor (cpm/Bq)	1.25E+01	1.97E+01
Background measurement (cpm)	0	24
Sample measurement (cpm)	0	31
Activity (Bq)	< MDA	< MDA
Min. Detectable Activity (Bq)	3.8E-01	1.3E+00

This certifies that the leak test results are:

Less than 185 Bq (0.005 uCi)

Greater than 185 Bq (0.005 uCi)

InstroTek, Inc. Gauge Calibration Report

Gauge Model: 3411
 Serial Number: 14796
 Calib. Date: 01/23/2015

Expires: 01/23/2016

Density Std. Cnt: 1675
 Moisture Std. Cnt: 604
 Bay Number: 413

Block Type	Low	Med	High
Density	110.6	139.7	170.2
S/N	4001	4002	3005
Depth	Density	Calibration	Counts
BS	753	507	349
2	2582	1662	1021
4	2664	1621	904
6	2164	1225	635
8	1500	786	383
10	959	460	218
12	566	249	126

Gauge Constants:

Depth	A	Bx1000	C	@125 pcf Repeatability
BS	2.66394	1.09822	-0.05988	0.70
2	8.34645	0.91241	0.14863	0.34
4	9.71921	0.94308	0.27480	0.30
6	10.72246	1.14836	0.14471	0.30
8	10.82514	1.39339	0.04903	0.32
10	11.87995	1.74030	-0.00772	0.37
12	15.67354	2.25088	-0.03303	0.44

Moisture Parameters:

Block Type	Low	MagPoly	E	Fx1000	@15 pcf Repeatability
Density	0	36.1			
S/N	4001	3006			
	Moisture	Cal Counts	Gauge Constants		
	13	382	0.02152	1.05587	0.32

All measurements are in pcf unless otherwise stated. B & F are in Kg/m3
 Service Center: InstroTek, Inc. 5908 Triangle Drive Raleigh, NC 27617



InstroTek, Inc. Expected Std. Count

Gauge Model: 3411
 Serial Number: 14796
 Calib. Date: 01/23/2015

Expires: 01/23/2016

Density Std. Cnt: 1675
 Moisture Std. Cnt: 604
 Bay Number: 413

Date	From	To
-----	-----	-----
Jan 15	1658	1692
Feb 15	1655	1688
Mar 15	1652	1685
Apr 15	1649	1682
May 15	1646	1679
Jun 15	1642	1676
Jul 15	1639	1672
Aug 15	1636	1669
Sep 15	1633	1666
Oct 15	1630	1663
Nov 15	1627	1659
Dec 15	1624	1656
Jan 16	1620	1653
Feb 16	1617	1650
Mar 16	1614	1647
Apr 16	1611	1644
May 16	1608	1640
Jun 16	1605	1637
Jul 16	1602	1634
Aug 16	1599	1631

NOTE: The expected density standard counts are based on decay of the Cesium 137 source used for density measurements. The results listed on this calibration report relate only to the gauge listed on this report. This calibration is only intended to be used for construction materials density and moisture measurements for any use outside of this limitation consult the manufacturer.

The blocks used for the calibration of the gauge listed above have density values that are traceable to SI through NIST. These blocks were traced to SI through NIST by using certified by NIST load cell (Sentran 2B1-1K-000, SN 931050) and calipers (SPI 40" Calipers, SN 000184); with an uncertainty of 0.3% for density and 2.2% for moisture. Block types: 3001 & 4001-Magnesium; 3002 & 4002-Magnesium/Aluminum Laminate; 3003-Aluminum; 3004-Limestone; 3005-Granite; 3006-Magnesium/Polyethylene.

The calibration performed was according to the ASTM D7759, the manufacturer's recommended procedures, and InstroTek's ISO 17025 Quality System. Maximum uncertainty for the density of 164 pcf (2628.0 kg/m3) at Backscatter (BS) is +/- 0.5 pcf (8.0 kg/m3), depths 2-11 are +/- 0.25 pcf (4.0 kg/m3), and depth 12 is +/- 0.35 pcf (6 kg/m3). Maximum uncertainty for the moisture at 15 pcf (240.3 kg/m3) at Backscatter (BS) is +/- 0.33 pcf (5.3 kg/m3).

The metallic block density values stated on this calibration report are the true gravimetric densities. During the calculation of A, B, and C constants, the metal densities are normalized by correction factors to account for chemical composition effects. The normalization correction factors for each block are dependent on the Gauge Manufacturer, Gauge Model, and Gauge Calibration Method; contact InstroTek for the specific Normalization Factors used in the calibration.

InstroTek, Inc.


 Calibration Technician

01/23/2015
 Date

InstroTek, Inc.
As Found / As Left Report

Gauge Model: 3411
Serial Number: 14796
Calib. Date: 01/23/2015

Density Std. Cnt: 1675
Moisture Std. Cnt: 604
Bay Number: 413

As Found Condition:

Depth	Low	Error	Med	Error	High	Error
	109.2		136.1		164.1	
BS	110.2	1.0	136.8	0.7	162.0	2.1
2	109.8	0.6	137.2	1.1	162.5	1.6
4	109.8	0.6	136.5	0.4	163.4	0.7
6	109.8	0.6	136.6	0.5	163.0	1.1
8	110.1	0.9	136.7	0.6	162.3	1.8
10	109.4	0.2	136.2	0.1	161.5	2.6
12	109.9	0.7	137.6	1.5	159.5	4.6

Actual Moisture Density: 36.1 Measured: 36.5 Error: 0.4

As Left Condition:

Depth	Low	Error	Med	Error	High	Error
	109.2		136.1		164.1	
BS	109.2	0.0	136.1	0.0	164.1	0.0
2	109.2	0.0	136.1	0.0	164.1	0.0
4	109.2	0.0	136.1	0.0	164.1	0.0
6	109.2	0.0	136.1	0.0	164.1	0.0
8	109.2	0.0	136.1	0.0	164.1	0.0
10	109.2	0.0	136.1	0.0	164.1	0.0
12	109.2	0.0	136.1	0.0	164.1	0.0

Actual Moisture Density: 36.1 Measured: 36.1 Error: 0.0

Uncertainty of the Calibration blocks were measured at k=2. Actual block densities and repeatability of the measurements is on page 1 of the calibration report.

InstroTek, Inc. Gauge Calibration Report

Gauge Model: 3411
Serial Number: 13067
Calib. Date: 01/23/2015

Expires: 01/23/2016

Density Std. Cnt: 2191
Moisture Std. Cnt: 627
Bay Number: 413

Block Type	Low	Med	High
Density	110.6	139.7	170.2
S/N	4001	4002	3005
Depth	Density	Calibration	Counts
-----	-----	-----	-----
BS	1009	682	466
2	3504	2274	1400
4	3579	2198	1239
6	2881	1650	857
8	1991	1044	505
10	1243	600	279
12	729	328	159

Gauge Constants:

Depth	A	Bx1000	C	@125 pcf Repeatability
-----	-----	-----	-----	-----
BS	2.53736	1.03417	-0.04510	0.61
2	8.21975	0.86756	0.20115	0.30
4	9.64089	0.92001	0.29296	0.26
6	10.11958	1.09142	0.18304	0.26
8	10.72300	1.37428	0.05875	0.28
10	10.69911	1.67405	0.00389	0.32
12	11.47847	2.06159	-0.02174	0.40

Moisture Parameters:

Block Type	Low	MagPoly	E	Fx1000	@15 pcf Repeatability
-----	-----	-----	-----	-----	-----
Density	0	36.1			
S/N	4001	3006			
	Moisture	Cal Counts	Gauge Constants		
	-----	-----	-----	-----	-----
	14	389	0.02233	1.03368	0.31

InstroTek, Inc.
As Found / As Left Report

Gauge Model: 3411
Serial Number: 13067
Calib. Date: 01/23/2015

Density Std. Cnt: 2191
Moisture Std. Cnt: 627
Bay Number: 413

As Found Condition:

Depth	Low	Error	Med	Error	High	Error
	109.2		136.1		164.1	
BS	108.8	0.4	136.1	0.0	160.5	3.6
2	108.5	0.7	136.1	0.0	162.1	2.0
4	108.5	0.7	135.1	1.0	162.1	2.0
6	108.6	0.6	135.7	0.4	162.1	2.0
8	108.9	0.3	135.7	0.4	161.9	2.2
10	109.1	0.1	135.5	0.6	160.9	3.2
12	109.0	0.2	136.2	0.1	159.0	5.1

Actual Moisture Density: 36.1 Measured: 35.9 Error: 0.2

As Left Condition:

Depth	Low	Error	Med	Error	High	Error
	109.2		136.1		164.1	
BS	109.2	0.0	136.1	0.0	164.1	0.0
2	109.2	0.0	136.1	0.0	164.1	0.0
4	109.2	0.0	136.1	0.0	164.1	0.0
6	109.2	0.0	136.1	0.0	164.1	0.0
8	109.2	0.0	136.1	0.0	164.1	0.0
10	109.2	0.0	136.1	0.0	164.1	0.0
12	109.2	0.0	136.1	0.0	164.1	0.0

Actual Moisture Density: 36.1 Measured: 36.1 Error: 0.0

Uncertainty of the Calibration blocks were measured at k=2. Actual block densities and repeatability of the measurements is on page 1 of the calibration report.

InstroTek, Inc.

Expected Std. Count

Gauge Model: 3411
 Serial Number: 13067
 Calib. Date: 01/23/2015

Expires: 01/23/2016

Density Std. Cnt: 2191
 Moisture Std. Cnt: 627
 Bay Number: 413

Date	From	To
-----	-----	-----
Jan 15	2169	2213
Feb 15	2165	2209
Mar 15	2161	2204
Apr 15	2157	2200
May 15	2152	2196
Jun 15	2148	2192
Jul 15	2144	2187
Aug 15	2140	2183
Sep 15	2136	2179
Oct 15	2132	2175
Nov 15	2128	2171
Dec 15	2124	2167
Jan 16	2120	2162
Feb 16	2115	2158
Mar 16	2111	2154
Apr 16	2107	2150
May 16	2103	2146
Jun 16	2099	2142
Jul 16	2095	2138
Aug 16	2091	2133


NOTE: The expected density standard counts are based on decay of the Cesium 137 source used for density measurements. The results listed on this calibration report relate only to the gauge listed on this report. This calibration is only intended to be used for construction materials density and moisture measurements for any use outside of this limitation consult the manufacturer.

The blocks used for the calibration of the gauge listed above have density values that are traceable to SI through NIST. These blocks were traced to SI through NIST by using certified by NIST load cell (Sentran ZB1-1K-000, SN 931050) and calipers (SPI 40" Calipers, SN 000184); with an uncertainty of 0.3% for density and 2.2% for moisture. Block types: 3001 & 4001-Magnesium; 3002 & 4002-Magnesium/Aluminum Laminate; 3003-Aluminum; 3004-Limestone; 3005-Granite; 3006-Magnesium/Polyethylene.

The calibration performed was according to the ASTM D7759, the manufacturer's recommended procedures, and InstroTek's ISO 17025 Quality System. Maximum uncertainty for the density of 164 pcf (2628.0 kg/m³) at Backscatter (BS) is +/- 0.5 pcf (8.0 kg/m³), depths 2-11 are +/- 0.25 pcf (4.0 kg/m³), and depth 12 is +/- 0.35 pcf (6 kg/m³). Maximum uncertainty for the moisture at 15 pcf (240.3 kg/m³) at Backscatter (BS) is +/- 0.33 pcf (5.3 kg/m³).

The metallic block density values stated on this calibration report are the true gravimetric densities. During the calculation of A, B, and C constants, the metal densities are normalized by correction factors to account for chemical composition effects. The normalization correction factors for each block are dependent on the Gauge Manufacturer, Gauge Model, and Gauge Calibration Method; contact InstroTek for the specific Normalization Factors used in the calibration.

InstroTek, Inc.


 Calibration Technician

01/23/2015
 Date

InstroTek, Inc.

Gauge Calibration Report

Gauge Model: 3430
 Serial Number: 23866
 Calib. Date: 02/11/2015

Expires: 02/11/2016

Density Std. Cnt: 1856
 Moisture Std. Cnt: 646
 Bay Number: 413

Block Type	Low	Med	High
Density	110.6	139.7	170.2
S/N	4001	4002	3005
Depth	Density	Calibration	Counts
BS	793	534	364
2	2745	1784	1070
4	2814	1723	965
6	2265	1274	673
8	1550	819	397
10	969	467	216
12	572	258	121

Gauge Constants:

Depth	A	Bx1000	C	@125 pcf Repeatability
BS	2.40737	1.04866	-0.04333	0.68
2	7.04252	0.76580	0.36391	0.33
4	8.98456	0.91885	0.28237	0.30
6	11.17172	1.22928	0.07848	0.29
8	9.39863	1.34189	0.06210	0.32
10	9.81628	1.67049	0.00513	0.37
12	9.46751	1.98227	-0.01357	0.45

Moisture Parameters:

Block Type	Low	MagPoly	E	Fx1000	@15 pcf Repeatability
Density	0	36.1			
S/N	4001	3006			
	Moisture	Cal Counts	Gauge Constants		
	14	403	0.02167	1.04073	0.31

InstroTek, Inc.

Expected Std. Count

Gauge Model: 3430
 Serial Number: 23866
 Calib. Date: 02/11/2015

Expires: 02/11/2016

Density Std. Cnt: 1856
 Moisture Std. Cnt: 646
 Bay Number: 413

Date	From	To
Feb 15	1837	1874
Mar 15	1833	1870
Apr 15	1830	1867
May 15	1826	1863
Jun 15	1823	1860
Jul 15	1819	1856
Aug 15	1816	1853
Sep 15	1812	1849
Oct 15	1809	1845
Nov 15	1805	1842
Dec 15	1802	1838
Jan 16	1798	1835
Feb 16	1795	1831
Mar 16	1792	1828
Apr 16	1788	1824
May 16	1785	1821
Jun 16	1781	1817
Jul 16	1778	1814
Aug 16	1774	1810
Sep 16	1771	1807

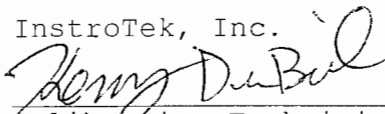
NOTE: The expected density standard counts are based on decay of the Cesium 137 source used for density measurements. The results listed on this calibration report relate only to the gauge listed on this report. This calibration is only intended to be used for construction materials density and moisture measurements for any use outside of this limitation consult the manufacturer.

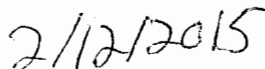
The blocks used for the calibration of the gauge listed above have density values that are traceable to SI through NIST. These blocks were traced to SI through NIST by using certified by NIST load cell (Sentran 2B1-1K-000, SN 931050) and calipers (SPI 40" Calipers, SN 000184); with an uncertainty of 0.3% for density and 2.2% for moisture. Block types: 3001 & 4001-Magnesium; 3002 & 4002-Magnesium/Aluminum Laminate; 3003-Aluminum; 3004-Limestone; 3005-Granite; 3006-Magnesium/Polyethylene.

The calibration performed was according to the ASTM D7759, the manufacturer's recommended procedures, and InstroTek's ISO 17025 Quality System. Maximum uncertainty for the density of 164 pcf (2628.0 kg/m³) at Backscatter (BS) is +/- 0.5 pcf (8.0 kg/m³), depths 2-11 are +/- 0.25 pcf (4.0 kg/m³), and depth 12 is +/- 0.35 pcf (6 kg/m³). Maximum uncertainty for the moisture at 15 pcf (240.3 kg/m³) at Backscatter (BS) is +/- 0.33 pcf (5.3 kg/m³).

The metallic block density values stated on this calibration report are the true gravimetric densities. During the calculation of A, B, and C constants, the metal densities are normalized by correction factors to account for chemical composition effects. The normalization correction factors for each block are dependent on the Gauge Manufacturer, Gauge Model, and Gauge Calibration Method; contact InstroTek for the specific Normalization Factors used in the calibration.

InstroTek, Inc.


 Calibration Technician


 Date

InstroTek, Inc.
As Found / As Left Report

Gauge Model: 3430
Serial Number: 23866
Calib. Date: 02/11/2015

Density Std. Cnt: 1856
Moisture Std. Cnt: 646
Bay Number: 413

As Found Condition:

Depth	Low	Error	Med	Error	High	Error
	109.2		136.1		164.1	
-----	-----	-----	-----	-----	-----	-----
BS	108.8	0.4	135.7	0.4	160.5	3.6
2	108.8	0.4	135.3	0.8	162.6	1.5
4	108.4	0.8	135.1	1.0	162.0	2.1
6	108.3	0.9	136.0	0.1	161.6	2.5
8	108.8	0.4	135.1	1.0	161.3	2.8
10	108.9	0.3	135.5	0.6	161.3	2.8
12	108.8	0.4	135.7	0.4	159.9	4.2

Actual Moisture Density: 36.1 Measured: 36.5 Error: 0.4

As Left Condition:

Depth	Low	Error	Med	Error	High	Error
	109.2		136.1		164.1	
-----	-----	-----	-----	-----	-----	-----
BS	109.2	0.0	136.1	0.0	164.1	0.0
2	109.2	0.0	136.1	0.0	164.1	0.0
4	109.2	0.0	136.1	0.0	164.1	0.0
6	109.2	0.0	136.1	0.0	164.1	0.0
8	109.2	0.0	136.1	0.0	164.1	0.0
10	109.2	0.0	136.1	0.0	164.1	0.0
12	109.2	0.0	136.1	0.0	164.1	0.0

Actual Moisture Density: 36.1 Measured: 36.1 Error: 0.0

Uncertainty of the Calibration blocks were measured at k=2. Actual block densities and repeatability of the measurements is on page 1 of the calibration report.