

Job Grading Standard for Precision Measurement Equipment Calibrating, 3378

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INTRODUCTION

This standard provides the occupation definition, titling instructions, and grading criteria for nonsupervisory jobs in the Precision Measurement Equipment Calibrating, 3378, for Federal Wage System (FWS) and other trades, craft, and labor pay plans.

This standard is divided into three parts. Part I contains occupational information applicable to Federal work covered by this standard without regard to pay plan or job grading system. Part II provides the criteria for jobs graded in accordance with FWS Key Ranking Jobs used to create the grade framework for FWS jobs. Part III will include explanatory material about the development of this standard, and will be added after this draft is finalized.

The term “Federal Wage System” or “FWS” denotes the major job grading system and pay structure for trades, craft, and labor work in the Federal Government. Some agencies have replaced the FWS pay plan indicators with agency-unique pay plan indicators. References to Federal Wage System and Wage Grade (WG) have been omitted from much of this job grading standard (JGS).

Coverage

This JGS covers nonsupervisory jobs involved in the calibration and certification of electrical, electronic and physical/dimensional test, measurement, and reference equipment.

PART I – OCCUPATIONAL INFORMATION

Part I is intended for use by all agencies in evaluating trades, craft, and labor work in the Precision Measurement Equipment Calibrating, 3378. It provides the definition, titling instructions, and detailed information for this occupation.

General Occupation Determination Guidelines

For a variety of reasons, selection of the correct occupation for a job is essential to the human resources management process. For example, qualification requirements used in recruiting and organizational structure are often designed with consideration of the occupation.

Determining the correct occupation is usually apparent by reviewing the assigned duties and responsibilities and then comparing them to the general occupational information and definition provided by the standard. Generally, the occupation determination is based on the primary work of the job, the highest level of work performed, and the paramount skill and knowledge required to do the work. Normally, it is fairly easy to make this decision. However, in other instances, determining the correct occupation may not be as obvious.

When a job requires the performance of regular and recurring work in two or more occupations (mixed jobs), select the occupation involving the highest skill and qualification requirements for the job.

Use the following guidelines to determine the appropriate occupation when the work matches more than one job. It is sometimes difficult to determine which particular occupation predominates. In such situations, apply the guidelines below in the order listed to determine the correct job.

- **Paramount skill and knowledge required.** Although there may be several different kinds of work in the job, most will have a paramount skill and knowledge requirement. The paramount skill and knowledge is the most important type of knowledge or experience required to do the work.
- **Reason for the job's existence.** The primary purpose of the job or management's intent in establishing the job is an indication of the appropriate occupation.
- **Organizational mission and/or function.** Jobs generally align with the mission and function of the organization to which they are assigned.
- **Recruitment source.** Supervisors and managers can help by identifying the occupation that provides the best qualified applicants to do the work. This is closely related to the paramount skill and knowledge required.

Although the work of some jobs may require applying related skill and knowledge in calibrating test, measurement, and reference equipment, Precision Measurement Equipment Calibrating, 3378, may not be the appropriate occupation. The [Additional Occupational Considerations](#) section of this standard provides examples where the work may involve applying related skill and knowledge, but not to the extent it warrants placement in this occupation.

Additional information may be found in the U.S. Office of Personnel Management (OPM) publication [Introduction to the Federal Wage System Job Grading System](#).

DISTINGUISHING BETWEEN TECHNICAL AND TRADE, CRAFT, OR LABOR WORK

Determining the appropriate occupational category is one of the first decisions to make when classifying a position. This decision is based on the position description or other official record of duties and responsibilities assigned to a position or group of positions. To fully understand the position it is important to consider such factors as the position's primary duty or responsibility, its primary purpose or reason for existence, relationship to other positions, the mission and responsibility of the organization in which it is located, and the essential, requisite qualifications required to do the work.

Technical Work Involves:

- developing and designing test and repair equipment, analyzing repair practices, or developing procedural instructions on methods and steps of equipment repairs;
- developing maintenance standards and procedures, testing and evaluating new or modified systems, or analyzing the compatibility of interlocking components and systems;
- planning and directing the installation of complex systems and associated facilities, particularly where there are problems of site selection and construction;
- designing and analyzing circuits, determining feasibility of these designs, evaluating equipment performance under varying environmental conditions, collecting data, or designing or modifying designs to achieve performance and cost objectives; and
- developing or evaluating new or modified systems or monitoring frequency emissions by licensed stations.

Trade, Craft, or Labor Work Involves:

- repairing systems and equipment to include detecting and diagnosing malfunctions, tearing down equipment, repairing or replacing parts or components, or aligning, calibrating and testing the modified or repaired equipment;
- performing preventive and corrective maintenance to keep equipment and systems in reliable condition;
- installing equipment in accordance with plans, specifications, and detailed instructions, or reinstalling repaired or modified systems;
- fabricating electronic equipment in accordance with plans, specifications, and instructions including constructing, assembling, arranging, mounting, or wiring electronic parts and components; and
- making measurements to diagnose malfunctions to ensure equipment operates within prescribed standards.

Additional information on distinguishing between technical and trade, craft, or labor work can be found in the [**Introduction to the Electronic Equipment Installation and Maintenance Family, 2600.**](#)

Occupational Information

PRECISION MEASUREMENT EQUIPMENT CALIBRATING, 3378 Qualification Standard	
Occupation Definition	<p>This occupation covers nonsupervisory jobs for which the primary purpose is the calibration and certification of electrical, electronic, and physical/dimensional test, measurement, and diagnostic equipment (TMDE) and reference standards. Equipment and reference standards are used to ensure the functional accuracy and operational precision of electronic systems and equipment and must be calibrated to extreme precisions.</p> <p>Precision measurement equipment calibration work requires skill and knowledge to perform and certify calibrations that can be related to stated references, usually national or international standards, through an unbroken chain of comparisons. The work requires:</p> <ul style="list-style-type: none"> • knowledge of the electrical, electronic, physical, and mechanical laws governing precision measurements; • skill in mathematics to determine the effect of environmental variables on equipment and on calibration standards; and • delicate mechanical and visual skills to achieve required precise fits, tolerances, and calibrations. <p>Precision measurement equipment calibration work also requires skill and knowledge in:</p> <ul style="list-style-type: none"> • operating a variety of precision test equipment, instruments, and standards; • using tools of the trade to perform repair or maintenance incidental to the calibration; and • using computer systems and software to operate automated testing and calibration systems and to document results.
Titling	<p>Title 5, United States Code, requires OPM to establish authorized official job titles within occupations. These include a basic title (e.g., Precision Measurement Equipment Calibrator) that may be appended with one or more prefixes and/or suffixes. Agencies must use the official job titles for human resources management, budget, and fiscal purposes.</p> <p>The official basic title for jobs in this occupation is <i>Precision Measurement Equipment Calibrator</i>.</p> <p>Helper and Intermediate</p> <ul style="list-style-type: none"> • If the work involves assisting journey level precision measurement equipment calibrators, refer to the Federal Wage System Job Grading Standard for Trades Helper Jobs. • If the work involves training or development of skills associated with precision measurement equipment calibration, refer to the Federal Wage System Job Grading Standard for Intermediate Jobs. Grade 11 in this JGS is to be used as the “journey level” in applying the Intermediate Job Grading Table.

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PRECISION MEASUREMENT EQUIPMENT CALIBRATING, 3378 (continued)	
Titling (continued)	<p>Supervisors and Leaders</p> <ul style="list-style-type: none"> • Add the suffix “Supervisor” to the basic title when the agency determines the job is supervisory. If the job is covered by the Federal Wage System refer to the Federal Wage System Job Grading Standard for Supervisors for additional titling and grading information. • Add the suffix “Leader” to the basic title when the agency determines the job is a leader. If the job is covered by the Federal Wage System refer to the Federal Wage System Job Grading Standard for Leader WL/NL for additional titling and grading information.
Occupational Information	<p>General Occupational Information</p> <p>Calibration is comparing a measuring device against a standard instrument of higher accuracy to detect, adjust, rectify, and document the accuracy of the measuring device. Calibrators test precision measurement equipment and reference standards to determine conformity with a known standard of measurement that is traceable to the National Institute of Standards and Technology (NIST).</p> <p>Using secondary reference standards, i.e., standards calibrated relative to a primary standard, calibrators calibrate and certify TMDE at the reference level and at the transfer level, i.e., maintenance shop level, when maintenance activities lack that capacity. They certify standards used to evaluate electrical, electronic, physical/dimensional, flow, pressure, temperature, wind speed, sound, microwave, time and frequency, nucleonic, laser, and/or optical parameters, and provide accuracy specification and uncertainty statements traceable to NIST. They make adjustments and minor repairs incidental to the calibration using precision measurement and diagnostic equipment along with other tools.</p> <p>Calibrators must isolate the work performed from influences such as temperature, humidity, vibration, electrical power supply, and radiated energy that might affect the calibration.</p> <p>Calibrators use computer databases and programs to prepare certification paperwork and other documentation, including calibration time interval information and “as found” or “out-of-tolerance” notifications. They must be precise, thorough, exacting, and meticulous regarding their calibration work, including numerical determinations and record preparation.</p> <p>⇐BACK TO TABLE OF CONTENTS</p>

Impact of Automation

Automation and computer technology affect the way work is accomplished. Precision measurement equipment calibrators use computers and operate automated test equipment to perform a wide variety of calibrations. They also use computers to research and obtain up-to-date manufacturers' manuals and documentation to assist in calibrating the equipment and in troubleshooting malfunctions. They enter, store, and retrieve testing data in multiple formats.

Although employees in this occupation use computers to perform basic work processes, knowledge of the rules and processes to perform the work remains the paramount subject matter knowledge required. The automation tools involved and the skill required to use them generally replace or supplement work methods and techniques previously performed through manual or machine-enhanced processes. Jobs in this occupation may require knowledge of the applications of information technology (IT) to the assignment area and skill in the use of IT software and hardware systems, but they are not directly involved in developing, delivering, or supporting IT systems, applications, and services. Although computers are used to facilitate work within this occupation, the use of automation does not change the primary purpose of the work. Proper placement of jobs within this and other trade, craft, and labor occupations is based on the relevant knowledge and skills required to perform the primary duties of the job, i.e., calibrating and certifying precision measurement equipment.

Additional Occupational Considerations

Some jobs may include work requiring skill and knowledge typically associated with the Precision Measurement Equipment Calibrating, 3378, occupation. In some cases, a closer look at the work may reveal placement in this occupation may not always be appropriate. The [General Occupation Determination Guidelines](#) section of this standard offers guidance on selecting the most appropriate occupation.

The following table provides examples of work similar to that performed by precision measurement equipment calibrators, but not to the extent the paramount skill and knowledge required would warrant placement in the Precision Measurement Equipment Calibrating, 3378, occupation.

If Work Involves...	See This Standard:
Developing and designing precision measurement equipment and instruments, analyzing calibration practices, or developing procedural instructions on methods and steps of equipment calibrations.	Electronics Technical, 0856
Testing, maintenance, repair, calibration, and installation of electronic measurement equipment, instruments, and test stations.	Electronic Measurement Equipment Mechanic, 2602
Fabricating, installing, repairing, and maintaining ground, airborne, and marine electronic equipment.	Electronics Mechanic, 2604
Installing, maintaining, repairing, and calibrating electronic controls and indicating and recording systems.	Electronic Industrial Controls Mechanic, 2606
Repairing, troubleshooting, calibrating, and testing electronic digital computer systems and their components and peripheral devices used for scientific engineering or administrative computation and recordkeeping.	Electronic Digital Computer Mechanic, 2608

(continued)

Additional Occupational Considerations (continued)	
If Work Involves...	See This Standard:
Installing, repairing, modifying, calibrating, and maintaining integrated electronic systems, such as fire control, flight/landing control, automatic test equipment, flight simulators, bombing navigation, and electronic warfare.	<u>Electronic Integrated Systems Mechanic, 2610</u>
Planning and fabricating complex research and prototype instruments made from a variety of materials and used to detect, measure, record, and regulate heat, pressure, speed, vibration, and other areas of interest.	<u>Instrument Making, 3314</u>
Installing, repairing, testing, and calibrating a variety of instruments containing electric, mechanical, pneumatic, hydraulic, and/or electronic components, assemblies, and controls, and/or maintaining, repairing, and calibrating precision instruments such as dial indicators, concentricity gauges, sine bars, micrometers, and plug and ring gauges.	<u>Instrument Mechanic, 3359</u>
Examining services, materials, and products that are processed, manufactured, or repaired by workers performing trade or craft work to determine if they are within acceptable standards, specifications, or contractual requirements.	<u>Job Grading Standard for Inspectors</u>

Crosswalk to the Standard Occupational Classification					
<p>The U.S. Office of Management and Budget requires all Federal agencies to use the Standard Occupational Classification (SOC) system for statistical data reporting purposes when collecting occupational data. The Bureau of Labor Statistics uses SOC codes for the National Compensation Survey and other statistical reporting. The U.S. Office of Personnel Management (OPM) and other Federal agencies maintain a “crosswalk” between OPM authorized occupational series and the SOC codes to serve this need. This requirement and these SOC codes have no effect on the administration of any Federal human resources management system. The information in this table is for informational purposes only and has no direct impact on grading jobs covered by this JGS. The SOC codes shown here generally apply only to nonsupervisory jobs in these occupations. As changes occur to the SOC codes, OPM will update this table. More information about the SOC is available at http://stats.bls.gov/soc.</p>					
Federal Occupational Series and Position Titles and Their Related Standard Occupational Classification System Codes					
Federal Occupational Series	Standard Occupational Classification Code Based on Occupational Series		Job Title	Standard Occupational Classification Code Based on Job Title	
Precision Measurement Equipment Calibrating, 3378	51-9199	Production Workers, All Other	Precision Measurement Equipment Calibrator	51-9199	Production Workers, All Other

PART II – GRADING INFORMATION

Part II provides grading information for use in determining the appropriate grade of nonsupervisory jobs in Precision Measurement Equipment Calibrating, 3378. These grading criteria are applicable to Federal Wage System jobs. You will find more complete instructions for evaluating jobs in the following OPM publications: [Introduction to the Federal Wage System Job Grading System](#) and the [Operating Manual for the Federal Wage System](#).

General Job Grading Guidelines

Jobs are graded by a method requiring consideration of the total job including:

- its purpose and relationship to other jobs;
- analysis of the work done and its requirements; and
- determination of the correct grade by comparison with the grade definitions in an appropriate JGS.

For trades, craft, and labor work, four factors are considered in grading jobs:

- **Skill and Knowledge** – Covers the nature and level of skill, knowledge, and mental application required in performing assigned work. Jobs vary in such ways as the kind, amount, and depth of skill and knowledge needed, as well as in the manner, frequency, and extent to which they are used.
- **Responsibility** – Covers the nature and degree of responsibility involved in performing work. Jobs vary in responsibility in such ways as the complexity and scope of work assigned, the difficulty and frequency of judgments and decisions made, the kind of supervisory controls, and the nature of work instructions and technical guides used.
- **Physical Effort** – Covers the physical effort exerted in performing assigned work. Jobs vary in such ways as the nature, degree, frequency, and duration of muscular effort or physical strain experienced in work performance.
- **Working Conditions** – Covers the hazards, physical hardships, and working conditions to which workers are exposed in performing assigned work.

Determining Grade Levels

This standard describes work at grades 11 and 12. It does not describe all possible levels at which jobs might be established. You may grade jobs differing substantially from the level of skill, knowledge, and other work requirements described in this standard above or below these grade levels by applying sound job grading principles.

Helper and Intermediate Jobs

Use the U.S. Office of Personnel Management's [Federal Wage System Job Grading Standard for Trades Helper Jobs](#) and [Federal Wage System Job Grading Standard for Intermediate Jobs](#) to grade helper and intermediate jobs in Precision Measurement Equipment Calibrating, 3378.

Supervisor and Leader Jobs

Use the U.S. Office of Personnel Management's [Federal Wage System Job Grading Standard for Supervisors](#) and [Federal Wage System Job Grading Standard for Leader WL/NL](#) to grade supervisor and leader jobs in Precision Measurement Equipment Calibrating, 3378.

Grade Level Descriptions

PRECISION MEASUREMENT EQUIPMENT CALIBRATOR, GRADE 11	
Grade 11 Level Description	<p>General: Grade 11 calibrators apply knowledge of measurement science, mathematics, physics, and electronics to calibrate and certify a variety of electrical, electronic, and/or physical/dimensional test, measurement, and diagnostic equipment (TMDE). They provide secondary reference level TMDE support, generally within an assigned geographic area. Grade 11 calibrators ensure the measurement accuracy of equipment such as oscilloscopes; spectrum and network analyzers; signal, synthesizer, and humidity generators; thermometers; pressure gages; attenuators; adapters; digital voltmeters; multimeters; radio frequency power meters; phase meters; frequency counters; flow meters; gage blocks; inductance capacitance resistance analyzers; and other specialized equipment. The items calibrated may contain circuits and assemblies which perform multiple functions such as reception and simulation, amplification and integration, digital and analog conversion, or a variety of other functions required to evaluate parameters of interest in major electrical, electronic, or electromechanical systems. The units calibrated at this level are usually self-contained and functionally independent.</p> <p>Grade 11 calibrators set up their own work stations, and use automated procedures, technical orders, technical bulletins, and technical manuals to perform much of their work. They identify and utilize appropriate measurement procedures; perform corrective actions to address identified calibration problems; and adapt equipment, standards, and procedures to accomplish unique measurements and maintain calibration standards with a minimum of guidance or procedures. If calibration procedures do not exist for the equipment, grade 11 calibrators contact the submitting activity or manufacturer to obtain documentation to assist in calibrating the equipment. They sometimes develop new or modified calibration procedures for use on specific equipment. They do not deviate from published calibration procedures without approval.</p> <p>Grade 11 calibrators work without detailed procedures or instructions and apply comprehensive trade knowledge of electrical, electronic, and/or mechanical principles to calibrate and certify equipment. They must use sound judgment in achieving specified assurances, sensitivities, and precise tolerances.</p> <p>Grade 11 calibrators document the calibration process, prepare and affix calibration labels, and note any out of tolerances and extent of deviations encountered during the calibration process. They maintain data for all calibrated equipment, instruments, and standards.</p> <p>Skill and Knowledge: Precision measurement equipment calibrators at this level exercise skill in:</p> <ul style="list-style-type: none"> • using various precision measurement instruments and standards such as pulse generators, frequency counters, voltmeters, and oscilloscopes;

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PRECISION MEASUREMENT EQUIPMENT CALIBRATOR, GRADE 11 (continued)

- setting up and operating a variety of equipment and standards under actual or simulated operating conditions;
- utilizing electronic circuits to measure electronic or electrical quantities to determine the performance characteristics and accuracy of other instruments and equipment;
- reading, interpreting, and applying a variety of technical electronic data such as schematic symbols, wiring diagrams, tables and charts, mathematical expressions and formulae, calibration procedures, and color codes used in the trade;
- determining appropriate measurement tolerances based on equipment specifications;
- modifying or developing new calibration procedures for use on specific equipment;
- systematically identifying and defining calibration problems and evaluating alternatives;
- mathematically determining the effect of temperature, humidity, and other variables on the equipment undergoing calibration and the calibration standard used;
- using computer systems and software to maintain records and control documents; and
- using a variety of hand and power tools to make incidental repairs.

Precision measurement equipment calibrators at this level apply a comprehensive practical knowledge of:

- electrical, mechanical, pneumatic, and/or hydraulic principles;
- operating electronic principles related to equipment which is:
 - integrated with other devices; and
 - complicated by a variety of multicomponent assemblies and devices with intricate functional relationships;
- methods and techniques of precise measurement of electrical and electronic quantities and relationships, such as standing wave ratio, power, impedance, reactance, and attenuation;
- established techniques and methods to test, calibrate, and certify a variety of test equipment;
- production and utilization of oscillations over a broad range of frequencies;
- signal and wave form behavior, distortion, and amplification;
- pulse, trigger, and synchronization techniques;
- digital/analog processing and data conversion techniques;
- a variety of display and indication methods; and
- methods of signal modulation and electromagnetic radiation.

Responsibility: Calibrators at this level work in accordance with available drawings, specifications, technical orders, technical bulletins, and automated procedures. They calibrate and certify a variety of specialty equipment for conformance to established standards using complex methods with exacting tolerances. Grade 11 calibrators often develop diagrams and sketches for equipment where specifications are vague and incomplete. They exercise judgment and independence in determining solutions to calibration and certification problems.

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Grade 11 Level Description (continued)

PRECISION MEASUREMENT EQUIPMENT CALIBRATOR, GRADE 11 (continued)

Grade 11 calibrators may be responsible for providing technical guidance and assistance to lower-graded workers. They often coordinate with technical and professional personnel on matters affecting operating specifications and changes in procedures. Completed work is subject to spot check by the supervisor to ensure compliance with accepted trade practices. Work is also subject to periodic audit by inspectors and/or quality assurance staff to ensure conformance with prescribed accuracy and sensitivity requirements.

Physical Effort: The work assignments require light to moderate physical effort. The calibrators frequently lift, carry, or otherwise handle items weighing up to 50 pounds (23 kilograms) independently, and occasionally in excess of 50 pounds with the help of weight handling equipment or with assistance from other workers. They work in a sitting position for extended periods of time, and frequent standing, walking, bending, reaching, and stooping is required. The work requires manual dexterity and visual acuity to handle very small parts and make delicate adjustments.

Working Conditions: The calibrators normally work in clean, well-lighted, heated, and ventilated areas, but may work at remote user locations under variable conditions. They are exposed to the possibility of electric shock, burns from electrical or radio frequency energy or hot solder, and cuts and bruises. Workers may be required to wear appropriate safety gear such as protective eyewear, and often work within clean room environments where special garments, including head coverings, shoe coverings, and gloves are required.

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Grade 11 Level Description (continued)

PRECISION MEASUREMENT EQUIPMENT CALIBRATOR, GRADE 12

General: At this level, the work involves the electrical, electronic, physical, and dimensional standards and measurements applicable to the calibration and certification of unusually complex, multifunctional, and/or interrelated precision measurement equipment, instruments, and instrumentation systems. Grade 12 calibrators apply greater judgment and higher level skills and knowledge than grade 11 calibrators in calibrating equipment and standards with very critical tolerances, accuracies, or uncertainties, such as those used in avionics test equipment, missile launching systems, radar, communication, fiber optic, countermeasures, and other systems and devices. Grade 12 calibrators serve as technical experts and solve the most complex calibration problems. They use advanced test methods and calibration procedures. They interpret detailed technical orders and schematics and adapt them to diverse and complex precise measurements. Grade 12 calibrators may devise new ways to improve efficiency, e.g., automation, without affecting accuracy.

The items calibrated at this level are more difficult to calibrate than those described at the grade 11 level because they are often of unique design or system configuration, or are combined and interrelated with other electronic equipment. Grade 12 calibrators must understand and predict the progressive effects of uncertainties throughout the interrelated units, trace the effect of a change in one subsystem on other subsystems, and determine which controls and devices must be adjusted to compensate.

Grade 12 calibrators analyze schematic drawings, compare design specifications with measurement requirements, and recommend modifications and procedures to meet measurement objectives. They work with specifications and procedures which are often vague and incomplete as a result of the unique equipment applications at this level. If standards required for the calibration are not available, the grade 12 calibrator identifies an adequate substitute. If no substitute is available, the grade 12 calibrator recommends and prepares new and/or modified calibration procedures for approval at higher levels.

Similar to grade 11 calibrators, grade 12 calibrators document the calibration process, prepare test and certification reports, and provide specific information such as assigned values, corrections, and measurement uncertainties for calibrated instruments. They make determinations as to the instability and/or unreliability of the equipment or standard and recommend if it should be taken out of service.

Skill and Knowledge: In addition to the skills used at grade 11, precision measurement equipment calibrators at grade 12 exercise skill in:

- using the full complement of precision electronic reference standards and complex special test panels complicated by a variety of critical absolute or percentage tolerance values and relationships of factors such as:
 - bandwidth;
 - frequency response;

(continued)

Grade 12 Level Description

PRECISION MEASUREMENT EQUIPMENT CALIBRATOR, GRADE 12 (continued)

Grade 12 Level Description (continued)

- gain;
- sensitivity;
- attenuation;
- noise level;
- time delay;
- power;
- linearity; and
- modulation;
- analyzing circuits and preparing or interpreting detailed diagrams and schematics to effectively calibrate and certify a variety of complex electronic precision measurement equipment, instruments, and standards;
- using computer programming routines to set and adjust equipment operating parameters;
- recommending substitution of standards or precision measurement test equipment or instruments;
- understanding and applying the results of uncertainty analysis concepts and calculations and documenting the uncertainty parameters in accordance with national or international standards;
- applying tolerance accuracy ratio calculations to determine suitability of calibration standards; and
- using tools similar to those described at [grade 11](#).

In addition to the knowledge applied at grade 11, precision measurement equipment calibrators at grade 12 apply a thorough knowledge and understanding of:

- the design, construction, function, and end-use application of a variety of highly complex, unconventional, or custom-built precision measurement equipment used in connection with research, experimental, or testing activities; and
- mathematical concepts such as probability and statistical inference, fractions, percentages, ratio, and proportions.

Responsibility: Grade 12 calibrators exercise significantly more judgment and independence in determining the methods and techniques required to solve unusually complex calibration and certification problems than grade 11 calibrators. They independently judge the impact modified test equipment or procedures may have on ensuring proper calibration of the highly complex reference standards and equipment certified at this level.

Grade 12 calibrators are responsible for applying significantly greater judgments and decisions than grade 11 calibrators. They must keep abreast of technological changes in the occupation and provide technical guidance and assistance to lower-graded workers. For example, they develop detailed schematics and drawings for use by lower-graded workers in the calibration of one-of-a-kind equipment. Grade 12 calibrators coordinate their work with technical and professional personnel. Completed calibrations and certifications are often accepted without further review.

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PRECISION MEASUREMENT EQUIPMENT CALIBRATOR, GRADE 12 (continued)

Grade 12 Level Description (continued)

Physical Effort: The physical effort is the same as that described at [grade 11](#).

Working Conditions: Working conditions are the same as those described at [grade 11](#).

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