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FEDERAL WAGE SYSTEM JOB GRADING STANDARD FOR ELECTROPLATING, 3711

Workforce Compensation and Performance Service

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ELECTROPLATING, 3711

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WORK COVERED

This standard covers nonsupervisory work involving the use of electrolytic and chemical processes to plate, coat, and treat surfaces of metals and metal alloys for purposes of protection, repair, maintenance, and fabrication of parts and equipment. The work requires a knowledge of the preparation, testing, and maintenance of various electrolytic and chemical solutions; and skill in controlling and using them in performing the processes required to prepare, plate, coat, or otherwise treat various types of surfaces.

WORK NOT COVERED

The following kinds of work are not covered by this standard:

-- Spraying molten metal onto metal objects, or dipping metal objects into molten metals such as zinc, tin, copper, or other molten metal composition. (See 3707, Metalizing.)

-- Vacuum depositing silver and copper on optical element surfaces. (See 4005, Optical Element Working.)

-- Making intaglio printing plates in chrome by electroforming and chemical process. (See 4449, Electrolytic Intaglio Platemaking.)

TITLES

Jobs graded by this standard at grade 9 and above are to be titled *Electroplater.*

Jobs graded by this standard below grade 9, other than helper and intermediate jobs, are to be titled *Electroplating Worker*.

GRADE LEVELS

This standard does not describe all possible grade levels for this occupation. If jobs differ substantially from the skill, knowledge, and other work requirements described in the grade levels of the standard, they may be graded above or below these grades on the application of sound job grading methods.

HELPER AND INTERMEDIATE JOBS

Helper and intermediate electroplater jobs are graded and titled by reference to the U.S. Office of Personnel Management Job Grading Standards for Trades Helper and Intermediate Jobs. Grade 9 is to be used as the “journey level”in applying the Intermediate Job Grading Table.

3711-7 ELECTROPLATING WORKER, GRADE 7 3711-7

General: Grade 7 electroplating workers use established processes to plate, coat, and treat metal items by immersion in a series of chemical or electrolytic solutions. These processes include protective and decorative plating of metal surfaces with metallic finishes such as cadmium, tin, copper, nickel, or silver. Other processes used include cleaning, decreasing, acid pickling, phosphating, oxide coating, black oxide coating, and anodizing. Work at this level includes adjusting solution levels, checking solution temperatures, and making routine settings and adjustments to electrolytic and chemical equipment to insure a satisfactory deposit or finish on metal surfaces. The supervisor assigns work and checks it during progress and upon completion for quality and workmanship.

Skill and Knowledge: Grade 7 electroplating workers apply skill in adjusting solution levels by adding distilled water and assisting higher level workers to add chemicals to treating and plating solutions; preparing parts by standard cleaning methods; and placing parts on holding devices or racks for anodizing, or routine plating with cadmium, chrome, copper, nickel, tin, or silver. They have a practical knowledge of the reaction between commonly used chemicals and metals and metal alloys, and are skilled at using this knowledge to set up and provide proper treatments and processes for the metal parts to be plated. For example, these treatments and processes may include acid stripping of aluminum alloys, the acid and cyanide pickling of steel alloys, or the oxide coating, phosphating, black oxide coating, chromating, and similar treatments for other metals and metal alloys.

Grade 7 electroplating workers use a knowledge of the electrical circuit between the power source and the part to be plated to apply proper controls such as plating time, amperage, and current density as stated in processing procedures. They position the part in the jig or wiring harness to establish proper electrical continuity. They calculate surface dimensions and apply the results in making routine amperage and voltage adjustments or settings to the electrolytic equipment.

They are skilled in the use of electrolytic and chemical equipment, and standard holding devices and accessories to plate, coat, and treat parts such as bolts, nuts, tools, equipment parts, or other similar metal parts, typically on production line basis. They may use micrometers, calipers and gages to determine the amount of plating deposited.

Responsibility: Grade electroplating workers receive work assignments from the supervisor in the form of specific oral or written instructions and accomplish their work in accordance with manufacturers' publications, technical orders, and established show policies, procedures, and practices. They follow instructions which clearly indicate the plating, coating, or treatment procedures to be followed in preparing surfaces to be plated; setting up the parts in appropriate holding devices; positioning work in the electrolytic or chemical solution; making settings and adjustments to controls; and performing necessary postplating treatments. They notify the supervisor when they encounter any problem such as poor plating results, equipment breakdown, or solution inefficiency.

They keep the supervisor advised of the work progress and completion. The supervisor checks work during progress to insure use of proper work methods, and the completed assignment for quality.

Physical Effort: Work performed by Grade 7 electroplating workers is often repetitious and requires continued use of both hands, and frequent standing, stooping, bending, reaching, and lifting at shoulder level. They frequently handle objects weighing up to 5 kilograms (10 pounds), and occasionally objects weighing as much as 18 kilograms (40 pounds).

Working Conditions: The electroplating workers work inside in shop areas having adequate light, ventilation, and safety control. They are frequently exposed to acid solutions, solvents, hot waxes, noxious fumes, excessive humidity, and a variety of caustic chemicals. Protection from exposure to burns, scalds, and skin irritations often requires the workers to wear uncomfortable safety equipment such as rubber gloves, rubber aprons, goggles, face shields, or respirators.

3711-9 ELECTROPLATER, GRADE 9 3711-9

General: In comparison with the established types of plating and coating operations performed at the grade 7 level, the types of work operations performed by the grade 9 electroplaters are more diverse and include depositions, coatings, and treatments that are not covered by established processes or involve the use of rare or precious metals. These operations are more exacting in that they require plating or treatment of limited or precisely defined areas on a part; require special treatment and processing in order to insure adherence of the metallic deposit or coating; or require extensive or precise controls of the electrolytic or chemical process.

The grade 9 electroplaters receive assignments from the supervisor and complete the work with more independence than the grade 7 electroplating workers. They receive little or no detailed instructions and completed work is checked to see that it meets overall job requirements.

Skill and Knowledge: The grade 9 electroplaters are skilled at using a variety of electrolytic and chemical processes to accomplish precision, protective, and decorative metallic or nonmetallic finishes on a wide array of metal and metal alloy objects. In comparison with the established or repetitive types of plating, coating, and treating processes performed at the grade 7 level, the grade 9 electroplaters restore worn metal surfaces to original dimensions with successive precision buildups of zincate, copper and chrome; build up seal or bearing grooves with precision layers of silver or chrome; use immersion processes to chemically mill structural parts; hard anodize aluminum alloys; multicolor anodized aluminum parts; and touch up surfaces that require precision finishes with the selective brush plater. They apply skill in adapting auxiliary anodes, holding devices, jigs, fixtures, and thieving materials to fit intricate contours of internal metal surfaces. They apply more skill than the grade 7 in controlling current density and plating range, masking metal objects having unusual shapes and dimensions, selecting and correctly positioning of anodes in the solution, and determining and using appropriate preplating, plating, and postplating processes for the work.

The grade 9 electroplaters perform such plating processes as high speed silverplating on seal or bearing surfaces that are subject to lubrication and require skill in masking with wax or electroplating tape to avoid chemical damage to surface areas that are not to be plated and to prevent loss of valuable silver. They may also use processes involving precious metals, such as gold, platinum, or rhodium, where special procedures for conserving or reclaiming the metal is required. They apply an extensive knowledge of preplating treatments such as sulfuric or nitric acid baths, cyanide copper strike, or other special treatments necessary to prepare aluminum or similar alloys for plating and to insure a sound plating bond. They prepare anodized aluminum surfaces for special color patterns and multicolor effects by skillfully positioning the metal objects in the solution and adapting or devising racks to hold them in the proper position.

The grade 9 electroplaters use an extensive knowledge of plating processes to identify basic problems such as inefficient cleaning, spotty stripping, low cathode efficiency, pitting, poor throwing power, faulty adhesion, rough plate, nonuniform plating, or corrosion failure that may occur in any plating process;

locate the probable causes, and make necessary corrections and adjustments. The electroplaters at this grade adapt standard plating and coating methods to perform new or unusual work such as one-of-a-kind jobs that require special or complex setups, very close thickness tolerances, or especially smooth surface finishes. They use shop mathematics and dimensions of parts to calculate the extent of intricate surface areas to be plated and, based on these calculations, determines the sizes of anodes or holding devices.

They use their knowledge of plating and treating solutions to neutralize chemical wastes before their disposal. They replenish solutions by adding various agents such as brighteners, wetting agents, and other compounds in order to produce desired characteristics of deposited metal, crystal size, brittleness, or ductility. The grade 9 electroplaters work from blueprints, technical orders, engineering specifications, sketches, manufacturers' manuals, and laboratory analysis reports. They apply skill in using precision measuring instruments, such as magnetic thickness gages, electronic thickness testers, dial bore gages, micrometers, and calipers, to insure required plating thickness before removing parts from holding devices. They use pH meters, hydrometers, and scales for checking the proper mix and efficiency of chemical and electrolytic solutions. They use rheostats, voltmeters, and ammeters to make adjustments to control the amount and flow of current through the solution.

Responsibility: The supervisor assigns work through technical job orders that normally include blueprints or sketches, or through oral or written general instructions. In addition to the types of plating, coating, and treatment operations found at the grade 7 level, the grade 9 electroplaters must plan their own work and, based on the requirements of the job, determine the equipment, procedures, and processes to be used. They determine the type of plating process to be used, the type, size, and shape of anodes, the appropriate holding devices; and the type of preplating and postplating treatment required to meet job specifications. They frequently organize their work so as to handle several jobs or processes simultaneously. They are responsible for determining the cause of equipment or process failure and for making corrections or adjustments. They also determine the need for special adaptation or modification of standard operating methods, procedures, and techniques to insure quality workmanship on new or unusual jobs.

The electroplaters at this grade work with greater independence than the grade 7 electroplating worker in that work at this level is normally checked only after completion for conformance with job specifications and acceptable trade practices.

Physical Effort: As at the grade 7 level, work at the grade 9 level requires continual use of both hands, and frequent standing, stooping, bending, reaching, and lifting; however, physical exertion is greater because the parts and equipment handled vary in shape, size, and intricacy and require more extensive handling in preplating and postplating treatment processes. Greater and more frequent effort is also required in preparing and installing a wider variety of handling and holding devices. The grade 9 electroplaters frequently handle objects weighing up to 9 kilograms (20 pounds) and occasionally as much as 36 kilograms (80 pounds).

Working Conditions: Working conditions at this level are essentially the same as those described for the grade 7 level.