

Welding with Arc-Welding Equipment

Self-Inspection Checklist




Optional Information

Name of School:
Date of Inspection:
Career-Technical program/course/room:
Signature of inspector:

Guidelines:

This checklist covers regulations issued by the U.S. Department of Labor, Occupational Safety and Health Administration (OSHA) under the general industry standards 29 CFR 1910.254 and 1910.306, and the construction standards 1926.351 and 1926.353. It applies to the use of arc-welding and cutting equipment. This checklist must be used with the Welding, Cutting, and Brazing–General Requirements checklist. The regulations cited apply only to private employers and their employees, unless adopted by a State agency and applied to other groups such as public employees. A yes answer to a question indicates that this portion of the inspection complies with the OSHA or U.S. Environmental Protection Agency (EPA) standard, or with a nonregulatory recommendation.

 Questions marked with this symbol may require the help of an outside expert.

General

1	Are employees and students properly instructed and qualified to operate arc-welding equipment? [29 CFR 1910.254(a)(3) and 1926.351(d)]
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Application of Arc-Welding Equipment

2	Does arc-welding equipment comply with the Requirements for Electric Arc-Welding Apparatus (NEMA EW-1-1962, National Electric Manufacturers Association), or the Safety Standard for Transformer-Type Arc-Welding Machines (ANSI C33-2-1956, Underwriters Laboratories)? [29 CFR 1910.254(b)(1)]
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U.S. Centers for Disease
Control and Prevention
National Institute for
Occupational Safety and Health

Safety Checklist Program for Schools
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Application of Arc-Welding Equipment

3	Are arc-welding machines designed and constructed to operate under their anticipated environmental conditions including unusual altitude, temperature, corrosive chemicals, steam, humidity, oil vapors, flammable liquids, vibration/shock, dust, or weather? [29 CFR 1910.254(b)(2)]
4	Are alternating-current manual arc-welding and cutting machines limited to 80 volts? [29 CFR 1910.254(b)(3)(i)(A)]
5	Are alternating-current automatic arc-welding and cutting machines limited to 100 volts? [29 CFR 1910.254(b)(3)(i)(B)]
6	Are manual or automatic direct-current (DC) arc-welding and cutting machines limited to 100 volts? [29 CFR 1910.254(b)(3)(ii)(A)]
7	Are terminals for welding leads protected from contact? [29 CFR 1910.254(b)(4)(iv)]
8	When manual electrode holders are used, are they designed specifically for arc welding and cutting? [29 CFR 1926.351(a)(1)]
9	Are manual electrode holders of a capacity capable of safely handling the maximum rated current required by the electrodes? [29 CFR 1926.351(a)(1)]
10	Are the outer surfaces of the jaws of the holder and all current-carrying parts passing through the portion of the holder that the arc welder or cutter grips fully insulated against the maximum voltage to ground? [29 CFR 1926.351(a)(2)]
11	Are arc-welding and cutting cables completely insulated, flexible, and capable of handling the maximum current requirement of the work in progress? [29 CFR 1926.351(b)(1)]

Installation of Arc-Welding Equipment

12	Are arc-welding machine frames or cases electrically grounded? [29 CFR 1910.254(c)(2)(i)]
13	Does the circuit between the ground and the grounded power conductor have resistance low enough to permit sufficient current to flow to cause the fuse or circuit breaker to interrupt the current? [29 CFR 1926.351(c)(5)]
14	Do ground return cables have a safe current-carrying capacity equal to or greater than the maximum output capacity of the arc-welding or cutting unit that it services? [29 CFR 1926.351(c)(1)]
15	Are chains, wire ropes, cranes, hoists, elevators, and conduits containing electrical conductors prohibited from being used to complete work-lead circuits? [29 CFR 1910.254(c)(2)(ii) and (iii) and 1926.351(c)(2)]
16	If pipelines are temporarily used to complete work-lead circuits, are they free from threaded joints, flange-bolted joints, or caulked joints? [29 CFR 1910.254(c)(2)(ii)] <i>Note: Special precautions must also be used to avoid sparking at connection of the work-lead current.</i>
17	If a structure or pipeline is used as a ground-return circuit, are periodic inspections performed to determine that the required electrical contact exists at all joints? [29 CFR 1926.351(c)(3)] <i>Note: The generation of an arc, sparks, or heat at any point shall cause rejection of the structures as a ground circuit. If the structure or pipelines are used continuously, all joints should be bonded and periodic inspections conducted to ensure that no condition of electrolysis or fire hazard exists because of such use.</i>
18	Are all grounding connections checked to determine that they are mechanically strong and electrically adequate for the required current? [29 CFR 1910.254(c)(2)(v) and 1926.351(c)(6)]
19	Is a disconnecting switch with overcurrent protection located at or near each arc-welding machine that does not have such a switch? [29 CFR 1910.254(c)(3)(i) and 29 CFR 1910.306(d)(1)]
20	Is a disconnecting switch with overcurrent protection provided for each outlet intended for connection to a portable welding machine? [29 CFR 1910.254(c)(3)(i)]
21	For individual welding machines, is the rated current-carrying capacity of the supply conductors not less than the rated primary current of the welding machine? [29 CFR 1910.254(c)(3)(ii)]
22 	Are all DC arc-welding machines connected with the same polarity? [29 CFR 1910.254(c)(3)(iv)(A)]
23 	Are all AC arc-welding machines connected to the same phase of the supply circuit and with the same instantaneous polarity? [29 CFR 1910.254(c)(3)(iv)(B)]

Operation and Maintenance

24	Are employees and students assigned to operate or maintain arc-welding equipment acquainted with the requirements of 29 CFR 1910.252 and 1910.254? [29 CFR 1910.254(d)(1)]
25	Are employees and students engaged in gas-shielded arc-welding acquainted with Recommended Safe Practices for Gas-Shielded Arc-Welding (A6.1-1966, American Welding Society)? [29 CFR 1910.254(d)(1)]
26	Are arc-welding machine hookups checked before starting operations? [29 CFR 1910.254(d)(2)]
27	Is coiled welding cable spread out before use to avoid serious overheating and damage to insulation? [29 CFR 1910.254(d)(2)]
28	Is the grounding of the welding machine frame checked before operations are started? [29 CFR 1910.254(d)(3)]
29	Are arc-welding machines checked for leaks of cooling water, shielding gas, or engine fuel before operations are started? [29 CFR 1910.254(d)(4)]
30	Is proper switching equipment provided for shutting down the machine? [29 CFR 1910.254(d)(5)]
31	Are the manufacturer's printed rules and instructions covering operation of the equipment supplied strictly followed? [29 CFR 1910.254(d)(6)]
32	When not in use for any substantial period of time (such as during lunch hour or overnight) are (a) electrodes removed from the holders; (b) the holders safely placed so they cannot make contact with people, conductive objects, fuel or compressed gas tanks; and (c) the machines disconnected from the power source? [29 CFR 1910.254(d)(7) and 1926.351(d)(1) and (d)(3)]
33	Are electrode cables free from splices within 10 feet from holders? [29 CFR 1910.254(d)(8) and 1926.351(b)(1)] <i>Note: The general industry standard 1910.254(d)(9)(iii) and the construction standard 1926.351(b)(1) permit joining lengths of cable by standard insulated connectors specifically designed for that purpose. The construction standard, however, also permits splices that are insulated as well as the original cable.</i>
34	Is the operator required to report any equipment defects or safety hazards and to discontinue use until safety has been assured? [29 CFR 1910.254(d)(9)(i) and 1926.351(d)(4)]
35	Are arc-welding machines repaired only by qualified personnel? [29 CFR 1910.254(d)(9)(i)]
36	If arc-welding machines become wet, are they thoroughly dried and tested before use? [29 CFR 1910.254(d)(9)(ii)]
37	Is dipping hot electrode holders into water prohibited? [29 CFR 1926.351(d)(2)]
38	Are cables with damaged insulation or exposed bare conductors replaced? [29 CFR 1910.254(d)(9)(iii)] <i>Note: The construction standard 1926.351(b)(4) permits repair of cables with rubber and friction tape or other equivalent means as long as the areas are protected by sufficient insulation.</i>
39	When metal-arc welding with inert gas, are special precautions taken for hazards associated with chlorinated solvents? [29 CFR 1926.353(d)(1)(i)] <i>Note: Inert-gas metal-arc welding produces 5 to 30 times more ultraviolet radiation than shielded metal-arc welding. The ultraviolet rays cause the decomposition of chlorinated solvents, liberating toxic fumes and gases. When in use, chlorinated solvents must be kept at least 200 feet away from the exposed arc (unless shielded) and surfaces prepared with chlorinated solvents must be thoroughly dry before welding is permitted. In addition, the shading density for filter lenses must be increased. All skin must be covered to protect against flashes and radiant energy.</i>