

DACUM Research Chart for Welder

Produced for



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DUTIES	TASKS			
A. Complete Welding Certification & Training Requirements	A.1 Complete pre-employment physical	A.2 Obtain security clearance	A.3 Participate in HR training (e.g., ethics, sexual harassment)	A.4 Participate in safety training (e.g., OSHA, maritime)
	A.10 Complete quarterly updates for welding certifications			
B. Obtain Welding Certifications	B.1 Identify certification process (e.g., SMAW, GTAW)	B.2 Identify weldment type (e.g., pipe, plate)	B.3 Identify welding position (e.g., 6G, overhead, vertical, horizontal)	B.4 Weld test assemblies for inspection
C. Perform Shielded Metal Arc Welding (SMAW) Process (Stick)	C.1 Verify SMAW certification	C.2 Participate in SMAW pre-job briefing	C.3 Select SMAW data sheet	C.4 Perform SMAW job site inspection
	C.10 Verify SMAW hot work area is safe for departure	C.11 Remove SMAW equipment from job site		
D. Perform Gas Tungsten Arc Welding (GTAW) Process (TIG)	D.1 Verify GTAW certification	D.2 Participate in GTAW pre-job briefing	D.3 Select GTAW data sheet	D.4 Perform GTAW job site inspection
	D.10 Verify GTAW hot work area is safe for departure	D.11 Remove GTAW equipment from job site		
E. Perform Gas Metal Arc Welding (GMAW) Process (MIG)	E.1 Verify GMAW certification	E.2 Participate in GMAW pre-job briefing	E.3 Select GMAW data sheet	E.4 Perform GMAW job site inspection
	E.10 Verify GMAW hot work area is safe for departure	E.11 Remove GMAW equipment from job site		

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A.5 Participate in hot work training (e.g. fire watch, filler material control)	A.6 Complete welding workmanship training	A.7 Complete annual welder eye exam	A.8 Qualify to welding industry standards (e.g., AWS, NAVSEA)	A.9 Complete respirator training
C.5 Set up job site for SMAW process	C.6 Set up SMAW equipment (e.g., welding machine, ground clamp)	C.7 Perform covered electrode inspections	C.8 Perform SMAW weldments (e.g., butt, fillet)	C.9 Perform visual inspection of SMAW weldments
D.5 Set up job site for GTAW process	D.6 Set up GTAW equipment (e.g., gas bottle, torch)	D.7 Perform GTAW filler material inspections	D.8 Perform GTAW weldments (e.g., butt, sockets)	D.9 Perform visual inspection of GTAW weldments
E.5 Set up job site for GMAW process	E.6 Set up GMAW equipment (e.g., wire feeder, gas bottle)	E.7 Perform GMAW filler material inspections	E.8 Perform GMAW weldments (e.g., butt, fillet)	E.9 Perform visual inspection of GMAW weldments

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DUTIES

TASKS

F. Perform Flux Cored Arc Welding (FCAW) Process	F.1 Verify FCAW certification	F.2 Participate in FCAW pre-job briefing	F.3 Select FCAW data sheet	F.4 Perform FCAW job site inspection
	F.10 Verify FCAW hot work area is safe for departure	F.11 Remove FCAW equipment from job site		
G. Perform Oxygen Fuel Cutting (OFC)	G.1 Participate in OFC training	G.2 Participate in OFC pre-job briefing	G.3 Perform OFC job site inspection	G.4 Set up job site for OFC
H. Perform Plasma Arc Cutting (PAC)	H.1 Participate in PAC training	H.2 Participate in PAC pre-job briefing	H.3 Perform PAC job site inspection	H.4 Set up job site for PAC
I. Perform Air Carbon Arc Gouging (ACAG)	I.1 Participate in ACAG training	I.2 Participate in ACAG pre-job briefing	I.3 Perform ACAG job site inspection	I.4 Set up job site for ACAG

General Knowledge and Skills

Knowledge

Workmanship inspections
Welding positions (vertical, horizontal, overhead)
Equipment set up
Filler materials
Base metals
Job set up
Joint design:
 butt joint weld
 T-joint weld
 lap joint weld
 cross joint weld
Welding symbols
Pre-heat and interpass temperatures
Welding procedures and processes
Safety requirements
Basic metallurgy
Basic math
Welding techniques (bead placement and sequencing)
Welder qualifications
Welding terminology

Skills

Eye-hand coordination
Leadership
Decision making
Multitasking
Time management
Communication
Job planning
Blueprint/schematic reading
Interpersonal
Problem solving
Weld contour (grinding)
Reading comprehension

Acronyms

OSHA	Occupational Safety & Health Administration
AWS	American Welding Society
SMAW	Shielded Metal Arc Welding
GTAW	Gas Tungsten Arc Welding
GMAW	Gas Metal Arc Welding
FCAW	Flux Cored Arc Welding
OFC	Oxygen Fuel Cutting
PAC	Plasma Arc Cutting
ACAG	Air Carbon Arc Gouging
NAVSEA	Naval Sea Command
TIG	Tungsten Inert Gas
HR	Human Resources
PPE	Personal Protective Equipment

Behaviors

Honest
Team player
Dependable
Creative
Flexible
Trustworthy
Safety conscious
Professional
Motivated
Trainable
Process oriented
Accurate
Ethical
Knowledgeable
Reliable
Compliant
Consistent
Driven
Mechanically inclined
Adaptive
Able to work under pressure
Ambidextrous
Energetic/stamina

Tools, Equipment, Supplies and Materials

Welding shield
Hoses (gas, air)
Fire extinguisher
PPE
 Face shield
 Hard hat
 Knee pads
 Leather gloves
 Steel-toed shoes
 Safety glasses
 Ear plugs
 Long sleeves
 Head covering
 Respirator
 Fire retardant clothing
Oxy fuel cutting torch
Wire cutters
Bottle wrench
Plasma arc machine
Wire feeder
Power cables
Drop lights
Fall protection harness
Left-vest (over water welding)
Magnetic mirror holder
Wire brush
Slag hammer
Needle gun
Grinder
Electrode holder
Weld machine
Weld gauges
Flow meters
TIG torch
Welding lead
Welding ground clamp
Tungsten
Filler material (rods, wire)
Temperature sticks
Pyrometer
Machinist files
Basic hand tools (wrenches, screwdrivers)
Allen wrench
Burr motors
Tool bag
Carbon arc rig
Flashlight

Future Trends and Concerns

Competitive pay
Trend toward automation/use of robotics
Job security (sequestration)
Insurance cost to employees
Shortage of skilled labor
Growing difficulty obtaining security clearances
New technology changes (drives skill requirements)
Trend toward advanced education
Welder proficiency levels
Retention of welders