

# SECTION 1 – SAFETY PRECAUTIONS – READ BEFORE USING

 Protect yourself and others from injury—read, follow, and save these important safety precautions and operating instructions.

## 1-1. Symbol Usage

 **DANGER!** – Indicates a hazardous situation which, if not avoided, will result in death or serious injury. The possible hazards are shown in the adjoining symbols or explained in the text.

 Indicates a hazardous situation which, if not avoided, could result in death or serious injury. The possible hazards are shown in the adjoining symbols or explained in the text.

**NOTICE** – Indicates statements not related to personal injury.

 Indicates special instructions.



This group of symbols means Warning! Watch Out! ELECTRIC SHOCK, MOVING PARTS, and HOT PARTS hazards. Consult symbols and related instructions below for necessary actions to avoid these hazards.

## 1-2. Breathing Air Hazards

 The symbols shown below are used throughout this manual to call attention to and identify possible hazards. When you see the symbol, watch out, and follow the related instructions to avoid the hazard. The safety information given below is only a summary of the more complete safety information found in the Principal Safety Standards. Read and follow all Safety Standards.

 Only qualified persons should install, operate, maintain, and repair this equipment. A qualified person is defined as one who, by possession of a recognized degree, certificate, or professional standing, or who by extensive knowledge, training and experience, has successfully demonstrated the ability to solve or resolve problems relating to the subject matter, the work, or the project and has received safety training to recognize and avoid the hazards involved.

 During operation, keep everybody, especially children, away.



### BREATHING UNFILTERED AIR can be hazardous.

Welding produces fumes and gases. Misuse of the supplied air respirator (SAR) may expose you to fumes and gases hazardous to your health.

- Read and follow these instructions and the safety labels carefully. The supplied air respirator is intended only for welding applications. The supplied air respirator helps protect the user from specific airborne contaminants but must be used correctly to be fully effective. Have an industrial hygienist test the air in your facility to ensure the supplied air respirator provides adequate protection from contaminants in your environment. If you have questions about the supplied air respirator, see equipment NIOSH label and consult your Safety Director and a certified Industrial Hygienist. For occupational use applications, employers must implement a written respiratory protection program meeting the requirements of OSHA 29 CFR 1910.134 (USA) or CSA Z94.4 (Canada), and other substance specific requirements as applicable.
- Do not use the supplied air respirator until you have been trained in its proper operation by a qualified person.
- Follow all applicable ANSI, OSHA, CSA, CGA, and other regulatory guidelines pertaining to the use of supplied air respirators.
- Do not use the supplied air respirator where there is danger of fire or explosion.
- Do not use the supplied air respirator in applications immediately dangerous to life or health (IDLH).
- Do not use the supplied air respirator in windy conditions, or negative pressure inside the hood can draw in contaminants from the outside air.
- Use the supplied air respirator only in NIOSH-approved atmospheres. Do not use the supplied air respirator in confined spaces, where oxygen levels are 19.5% or lower, where contaminant levels are unknown or are immediately dangerous to life or health,

where contaminant levels exceed supplied air respirator specifications, in areas that are poorly ventilated, or where escape is not possible without using the supplied air respirator.

- Do not enter a hazardous area until you are sure the supplied air respirator is assembled correctly, working properly, and worn properly.
- Before each use, inspect the supplied air respirator for damage and verify it operates properly. Before using the supplied air respirator, test the air flow to verify the supplied air respirator is receiving an adequate volume of air. Clean and maintain the supplied air respirator according to the manufacturer's instructions.
- Do not use the supplied air respirator without all components or with the air supply turned off because hazardous levels of oxygen and carbon dioxide can accumulate in the helmet.
- Always wear the supplied air respirator when entering a contaminated area. Do not remove the supplied air respirator until outside the contaminated area.
- Dangerous contaminants may not smell or be visible. Leave the area immediately if you notice any of the following:
  - Breathing becomes difficult.
  - You experience dizziness, impaired vision, or eye, nose, or mouth irritation.
  - The air supply equipment alarm sounds.
  - The air supply smells or tastes unusual.
  - The equipment is damaged.
  - Air flow decreases or stops.
  - If you think the equipment is not supplying adequate protection.

Do not remove the equipment until you are in a safe area.

- Do not repair, modify, or disassemble the supplied air respirator or use with parts or accessories not supplied by the manufacturer. Use only those components that are part of the NIOSH-approved assembly.
- The supplied air respirator must be used with the helmet, hood, hoses, connectors, filters, and other components recommended by the manufacturer to provide a NIOSH-approved respirator system. See the NIOSH label for information on the required equipment.
- Do not use the supplied air respirator belt and shoulder straps as a safety harness.
- The supplied air respirator does not clean or filter contaminants from the air. Breathable air must be supplied to the supplied air respirator and meet the requirements of Grade D breathing air as described in Compressed Gas Association Commodity Specification G.7.1 (United States) or CSA Standard Z180.1 (Canada). Use appropriate filters and carbon monoxide alarms to ensure breathable air is supplied.

- Have a qualified person test the breathing air to ensure it meets Grade D requirements. Breathing air testing shall be done in accordance with a written respirator protection program (prepared by a qualified person) specific to the workplace.
- Locate the compressed air source in a clean environment that is free from toxic fumes and gases and away from other sources of contamination, such as building exhaust vents and engine-powered vehicles and equipment (including generators). Be sure inlet on compressed air source is properly filtered to remove contaminants.
- Use only air line couplings designed for the supplied air respirator; air couplings must be incompatible with outlets for other gas systems.
- Do not connect the supplied air respirator to unbreathable (non-Grade D) air sources.
- To ensure adequate cooling of supply air, follow air compressor manufacturer's recommendations when selecting air hose length. Do not use an air compressor that supplies air warmer than 160°F (71°C); supply air exceeding this temperature will degrade the air hose, which could adversely affect the supplied air respirator's performance.
- Operate supplied air respirator within specified air pressures and air hose lengths. The air supply system (air supply lines, fittings, filters, couplings, air pump/tanks) must be able to deliver sufficient air volume within safe limits, 125 psig (862 kPa) maximum. If correct air pressure is not maintained, negative air pressure can develop in the helmet and create a risk of contaminants being inhaled. Also, unless removed by filters, oil, water, and other contaminants could flow downstream from the compressed air source and adversely affect the supplied air respirator's performance. While air is flowing, use a reliable pressure gauge to continually monitor air pressure at the air source connection point.

### 1-3. Arc Welding Hazards



#### ARC RAYS can burn eyes and skin.

Arc rays from the welding process produce intense visible and invisible (ultraviolet and infrared) rays that can burn eyes and skin. Sparks fly off from the weld.

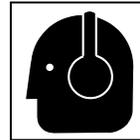
- Wear a welding helmet fitted with a proper shade of filter to protect your face and eyes when welding or watching (see ANSI Z49.1 and Z87.1 listed in Safety Standards). Refer to Lens Shade Selection table in Section 1-4.
- Wear approved safety glasses with side shields under your helmet.
- Use protective screens or barriers to protect others from flash, glare, and sparks; warn others not to watch the arc.
- Wear body protection made from leather or flame-resistant clothing (FRC). Body protection includes oil-free clothing such as leather gloves, heavy shirt, cuffless trousers, high shoes, and a cap.
- Before welding, adjust the auto-darkening lens sensitivity setting to meet the application.
- Stop welding immediately if the auto-darkening lens does not darken when the arc is struck.



#### WELDING HELMETS do not provide unlimited eye, ear, and face protection.

Arc rays from the welding process produce intense visible and invisible (ultraviolet and infrared) rays that can burn eyes and skin. Sparks fly off from the weld.

- Use helmet for welding/cutting applications only. Do not use helmet for laser welding/cutting.
- Use impact resistant safety spectacles or goggles and ear protection at all times when using this welding helmet.
- Do not use this helmet while working with or around explosives or corrosive liquids.
- This helmet is not rated for overhead welding. Do not weld in the direct overhead position while using this helmet unless additional precautions are taken to protect yourself from arc rays, spatter, and other hazards.
- Inspect the auto-lens frequently. Immediately replace any scratched, cracked, or pitted cover lenses or auto-lenses.
- Lens and retention components must be installed as instructed in this manual to ensure compliance with ANSI Z87.1 protection standards.
- This helmet provides protection from projectiles associated with grinding, chipping, and related activities; it is not a hard hat and does not provide protection from falling objects.



#### NOISE can damage hearing.

Noise from some processes or equipment can damage hearing.

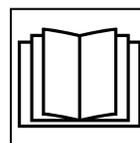
- Wear approved ear protection if noise level is high.



#### FUMES AND GASES can be hazardous.

Welding produces fumes and gases. Breathing these fumes and gases can be hazardous to your health.

- Keep your head out of the fumes. Do not breathe the fumes.
- Ventilate the work area and/or use local forced ventilation at the arc to remove welding fumes and gases. The recommended way to determine adequate ventilation is to sample for the composition and quantity of fumes and gases to which personnel are exposed.
- Read and understand the Safety Data Sheets (SDSs) and the manufacturer's instructions for adhesives, coatings, cleaners, consumables, coolants, degreasers, fluxes, and metals.
- If ventilation is poor, wear an approved supplied air respirator.
- Work in a confined space only if it is well ventilated, or while wearing a supplied air respirator. Always have a trained watchperson nearby. Welding fumes and gases can displace air and lower the oxygen level causing injury or death. Be sure the breathing air is safe.
- Do not weld in locations near degreasing, cleaning, or spraying operations. The heat and rays of the arc can react with vapors to form highly toxic and irritating gases.
- Do not weld on coated metals, such as galvanized, lead, or cadmium plated steel, unless the coating is removed from the weld area, the area is well ventilated, and while wearing a supplied air respirator. The coatings and any metals containing these elements can give off toxic fumes if welded.



#### READ INSTRUCTIONS.

- Read and follow all labels and the Owner's Manual carefully before installing, operating, or servicing unit. Read the safety information at the beginning of the manual and in each section.
- Use only genuine replacement parts from the manufacturer.
- Perform installation, maintenance, and service according to the Owner's Manuals, industry standards, and national, state, and local codes.



### HOT PARTS can burn.

- Do not touch hot parts bare handed.
- Allow cooling period before working on equipment.

- To handle hot parts, use proper tools and/or wear heavy, insulated welding gloves and clothing to prevent burns.

## 1-4. Lens Shade Selection Table

Process	Electrode Size in. (mm)	Arc Current in Amperes	Minimum Protective Shade No.	Suggested Shade No. (Comfort)*
Shielded Metal Arc Welding (SMAW)	Less than 3/32 (2.4)	Less than 60	7	--
	3/32-5/32 (2.4-4.0)	60-160	8	10
	5/32-1/4 (4.0-6.4)	160-250	10	12
	More than 1/4 (6.4)	250-550	11	14
Gas Metal Arc Welding (GMAW) Flux Cored Arc Welding (FCAW)		Less than 60	7	--
		60-160	10	11
		160-250	10	12
Gas Tungsten Arc Welding (TIG)		250-500	10	14
		Less than 50	8	10
		50-150	8	12
Air Carbon Arc Cutting (CAC-A)	Light Heavy	150-500	10	14
		Less than 500	10	12
Plasma Arc Cutting (PAC)		500-1000	11	14
		Less than 20	4	4
		20-40	5	5
		40-60	6	6
		60-80	8	8
		80-300	8	9
		300-400	9	12
400-800	10	14		
Plasma Arc Welding (PAW)		Less than 20	6	6-8
		20-100	8	10
		100-400	10	12
		400-800	11	14

Reference: ANSI Z49.1:2021

\*Start with a shade that is too dark to see the weld zone. Then, go to a lighter shade which gives a sufficient view of the weld zone without going below the minimum.

## 1-5. California Proposition 65 Warnings

**⚠ WARNING – Cancer and Reproductive Harm — [www.P65Warnings.ca.gov](http://www.P65Warnings.ca.gov).**

## 1-6. Principal Safety Standards

*Safety in Welding, Cutting, and Allied Processes*, American Welding Society standard ANSI Standard Z49.1. Website: <http://www.aws.org>.

*Safety in Welding, Cutting, and Allied Processes*, CSA Standard W117.2 from Canadian Standards Association. Website: [www.csagroup.org](http://www.csagroup.org).

*Safe Practice For Occupational And Educational Eye And Face Protection*, ANSI Standard Z87.1, from American National Standards Institute. Website: [www.ansi.org](http://www.ansi.org).

*NIOSH Approval of Respiratory Devices*, CFR Title 42 - Public Health, Part 84 from the Centers for Disease Control. Website: [www.cdc.gov/niosh](http://www.cdc.gov/niosh).

OSHA, Occupational Safety and Health Standards for General Industry, Title 29, Code of Federal Regulations (CFR), Part 1910.177 Subpart N, Part 1910 Subpart Q, and Part 1926, Subpart J. Website: [www.osha.gov](http://www.osha.gov).

*OSHA Important Note Regarding the ACGIH TLV, Policy Statement on the Uses of TLVs and BEIs*. Website: [www.osha.gov](http://www.osha.gov).

*American National Standard for Respiratory Protection*, ANSI /ASSE Standard Z88.2-2015 from American National Standards Institute. Website: [www.ansi.org](http://www.ansi.org).

*Selection, Use, and Care of Respirators*, CAN/CSA Standard Z94.4 from Canadian Standards Association. Website: [www.csagroup.org](http://www.csagroup.org).

*Commodity Specification for Air*, CGA Pamphlet G-7.1 from Compressed Gas Association. Website: [www.cganet.com](http://www.cganet.com).

*Compressed Breathing Air and Systems*, CSA Standard Z180.1 from Canadian Standards Association. Website: [www.csagroup.org](http://www.csagroup.org)

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