

*Because every life has a purpose...*



# Welding 101



- Electric welding is the joining of metal using an electrical arc and a filler metal stick electrode or wire. Welding is done by creating an arc between the base metal (the metal being welded) and the filler metal. The arc melts the base metal and filler metal, combining them into one material to join the base metals. The filler metal is consumed in the process.

# Common Welding Terms

- **MIG Welding:** Metal Inert Gas Welding (also known as GMAW or Gas Metal Arc Welding). MIG welding joins metals by heating them with an arc between a continuously fed wire and the workpiece.
- **TIG Welding:** Tungsten Inert Gas welding (also known as GTAW or Gas Tungsten Arc welding). TIG welding joins metals by heating them with an arc formed between the tungsten electrode and the base metal.
- **Stick Welding:** (SMAW or Shielded Metal Arc Welding) manual arc welding process that uses a consumable electrode covered with a flux to lay the weld.

# Common Welding Terms

- **Tack Welding:** Short intermittent welds made to hold components in place before full welding is in begun
- **Welding Puddle:** The arc spot or “puddle” weld is started by striking an arc on the deck surface, causing a hole to form in the deck. The weld operation then continues by depositing electrode material on the beam or joist and allowing the molten “puddle” to engage the penetrated deck.
- **Amperages:** a unit of electric current equal to a flow of one coulomb per second
- **Filler metal:** filler metal is metal from a stick or fluxored wire that gives off a gas when it burns. This gas serves to shield the welding arc.

# What approvals are needed on a welding shield?

- Welding shields are covered under ANSI Z87.1-2015 as face protection.
  - Meets specifications
  - Impact testing
  - UV and IR protection 100% of time (on auto darkening)
  - Temperature requirements

*Beware of older approvals!*

# Selecting a Welding Shield

1. Lens Selection
2. Shade Lens
3. Switching Speed
4. Charging mechanism
5. Adjustable Sensitivity & Delay Controls

# Selecting a Welding Shield

## 1. Lens selection

- **Passive (standard):** dark tinted glass with a #10 shade and ultraviolet (UV) and infrared (IR) coatings. These lenses do not change color and remain dark at all times.
  - Advantage: basic protection, cost efficient
  - Disadvantages: Need to flip shield up and down continuously, difficult to maintain weld position after lowering shield
- **Auto-darkening (ADF):** A filter lens with special liquid crystal display (LCD) that typically is powered by a combination of battery and solar power. These lenses change color when activated. Typically darkens shade #8 to #13.
  - Advantage: Shield remains engaged and eyes are protected, easy to maintain weld position
  - Disadvantages: Higher price point

# Selecting a Welding Shield

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# Selecting a Welding Shield

## 2. Fixed or Variable Shade Lens

- **Fixed:** Recommended for welding with one material, consistent thickness, same process (stick, MIG, etc), same amperage.
- **Variable (adjustable):** Recommended for welding with different materials, different thicknesses, different processes and varying amperage
  - Shade #13 is darkest setting and used for high amperage and/or sensitive eyes

# Selecting a Welding Shield

1. Lens Selection
2. Shade Lens
3. **Switching Speed**
4. Charging mechanism
5. Adjustable Sensitivity & Delay Controls

# Selecting a Welding Shield

## 3. Switching Speed: Lens Reaction Time

- This number tells how fast the ADF will switch from its natural state to the selected darkened shade when welding begins
  - Faster is always better. Slower reaction time may result in arc flash
  - General rule: faster switching speed = more expensive shield and lens but increased comfort

# Selecting a Welding Shield

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## 4. Solar Power and Battery Life

- Some ADF shields have an internal, non-replaceable battery and solar assist panel
  - Disadvantage: Requires charging in direct sunlight & lens only works when charged
- Shields powered by replaceable battery and solar assist are preferred
- AAA battery vs. Lithium?
  - AAA is more economical and more readily available. Lithium gives longer life.

# Selecting a Welding Shield

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# Selecting a Welding Shield

## 5. Adjustable Sensitivity and Delay Controls

- Most helmets have the ability to adjust how much brightness will trigger the lens to darken known as sensitivity control
  - Useful for low amperages
- Delay control enables you to set how long the lens stays dark after the welding arc stops

# Why MSA & Miller?

- ANSI regulation change Z89.1-2014
  - Hard hat and welding shield must be certified together as a “system” to meet compliance



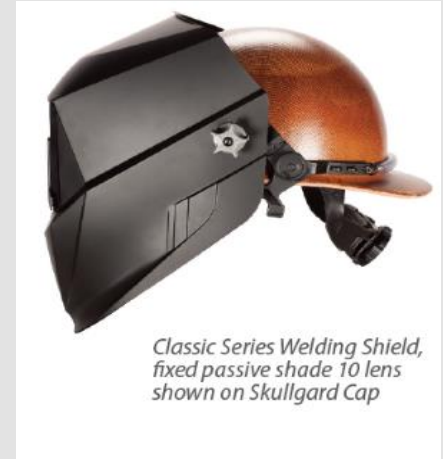


# JOINED FORCES



*Elite Series Welding Shield,  
shown on Thermalgard Cap*

Together we bring the best solutions from both industries to keep your workers protected and in compliance



*Classic Series Welding Shield,  
fixed passive shade 10 lens  
shown on Skullgard Cap*

## MSA Offering

- Century of experience in protecting industrial workers from hazards
- Global leader of PPE
  - Hard hat protection is a core product category
  - Broad portfolio of head protection models and styles

## Miller Offering

- 85 years of welding history
- World's largest manufacturer of welding equipment
- Industry leader of Welding Shields



■ **Elite Series**

- 3 shield options
  - Large-view variable ADF
    - ◆ X-Mode
  - Medium-view variable ADF
    - ◆ X-Mode
  - Passive shade #10



■ **Classic Series**

- 2 shield options
  - Fixed Shade #10 ADF
  - Passive Shade #10



■ **Adapters**

- 3 options
  - Universal
  - Slotted for Elite
    - ◆ 5 slots on rail
  - Slotted for Classic
    - ◆ 2 slots on rail

	Classic Series		Elite Series		
	Passive	Fixed Shade #10 ADF	Passive	5.9 in2 ADF	9.2 in2 ADF
Viewing Area	7.8 in <sup>2</sup>	5.2 in <sup>2</sup>	16 in <sup>2</sup>	5.9 in <sup>2</sup>	9.2 in <sup>2</sup>
Shades	10	10	10	8 to 13	5 to 8 & 8 to 13
Modes	N/A	Weld	N/A	Weld, X-Mode*	Weld, Cut, Grind, & X-Mode*
Switching Speed	N/A	1/3,600 sec	N/A	1/15,000 sec	1/20,000 sec
Cut Mode	No	No	No	No	Yes (Shades 5-8)
Sensors	N/A	2	N/A	3	4
Weight	10.8 oz. (307 g)	10.8 oz. (307 g)	13.5 oz. (384 g)	14.6 oz. (416 g)	16.6 oz. (472 g)
Replaceable Battery	No	No, solar powered	No	Yes, lithium battery with solar assist	Yes, lithium battery
Sensitivity & Delay controls	No	Yes	No	Yes, .1 - 1.0 second	Yes

Stage	Email	Subject	Call to Action
Awareness	1	Is your welding system safe and compliant with industry standards?	Download White Paper
Awareness	2	Joined Forces..... Presenting MSA/Miller Welding Shields and Adapters	"Explore Miller Shields & Adapters" (goes to web page)
Research	3	Watch how easy it is to pair industry leaders for the ultimate in protection and compliance	Watch Video
Research	4	Do you know about the advantages of the X-Mode welding shield technology?	Download white paper
Research	5	Eliminate the frustration in welding with X-mode technology	Watch Video

*Because every life has a purpose...*



**THANK YOU! Any Questions?**