



### Welding Types & Their Specific Dangers

Welding isn't just another task on the jobsite — it's controlled chaos. You're harnessing electricity strong enough to stop your heart, flames hot enough to set a shop ablaze, and light so bright it can burn your eyes through your eyelids. Every strike of the arc is a battle against hazards waiting to pounce.

One wrong step and the villains of welding show themselves. A damp glove turns into a live wire. A single spark lands in your pocket and smolders into a fire. An oily rag under the bench waits for one stray ember to ignite hours after you've gone home. And the scariest part? Most of these accidents don't announce themselves — they happen fast, silent, and without warning.

Before you pick up a stinger, you need to understand what welding really is: a mix of heat, light, and chemistry that can build something strong — or leave scars that last a lifetime.

### Welding Types & Their Specific Dangers

#### **Shielded Metal Arc Welding (SMAW – “Stick”)**

- Flux-coated electrode melts into the weld pool.
- Dangers: Heavy fume generation, high arc flash risk, electrode stubs smoldering in pockets or trash.
- Screens/PPE: Shade 10–14 lens; FR welding curtains tall enough to shield others; FR clothing and gloves.

#### **Gas Metal Arc Welding (GMAW – “MIG”)**

- Wire electrode is fed continuously, shielded with gas.
- Dangers: Intense UV/IR light, sparks that travel 35 ft+, and gas displacement in enclosed spaces.
- Screens/PPE: Shade 10–13 lens; FR curtains to block arc rays and sparks; ventilation for shielding gases.

#### **Gas Tungsten Arc Welding (GTAW – “TIG”)**

- Non-consumable tungsten electrode with filler rod.
- Dangers: Extremely bright arc light, ozone generation, high localized heat to hands.
- Screens/PPE: Shade 8–13 lens; TIG-rated gloves; UV-filtering curtains.

### **Flux-Cored Arc Welding (FCAW)**

- Similar to MIG, but wire is flux-filled.
- Dangers: Heavy smoke and fume clouds; hot slag that traps molten metal; frequent sparks.
- Screens/PPE: Shade 10–14 lens; strong local exhaust ventilation; FR screens.

**Key Point:** Every type of welding has a villain lurking in it. SMAW and TIG invite Arc Nemesis with arc flash. MIG and FCAW give Spark Slinger his sparks. Oxy-fuel opens the door to Backdraft Banshee. Stainless TIG or MIG calls out Hex-Haze Harbinger with toxic fumes. Know the process — know the danger.

### Arc Nemesis – Electrical Shock, Arc Flash & Flash Burn



Arc Nemesis doesn't just shock your body — he blinds your vision. He hides in puddles, cracked insulation, and sweaty gloves, waiting for a path into your chest. A shock of just 50 volts across the heart can stop it cold. And when he strikes with an arc flash, the burst is hotter than the surface of the sun.

But his cruellest trick is **Welder's Eye** — also called *flash burn*. One unprotected glance at the arc, or even a reflection bouncing off a wall, and your cornea takes the hit. At first, you might shrug it off. A little irritation, maybe some redness. Hours later, it feels like punishment:

- “Like sandpaper grinding in your eyes every time you blink.”
- “Like hot grit you can't wash out.”
- “Like you can't close them, and you can't keep them open.”

Flash burn is essentially a sunburn on your eyeball. Treatment usually means patches, drops, and days of recovery in a dark room. Repeat exposures can blur vision permanently. Some welders never see the same way again.

#### **How to shut him down:**

- Stay dry — clothes, gloves, and floor.
- Inspect cables and leads every shift.
- Stand on a dry mat or wear rubber-soled boots.



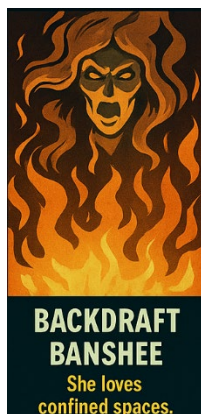
- Always wear a properly rated welding helmet (OSHA/ANSI Z87.1):
- Use welding screens/curtains to protect bystanders.

### Spark Slinger – Flying Sparks & Hot Metal

- **Where He Lurks:** Loose cuffs, open hoodie pockets, cluttered shops with rags and cardboard.
- **Why He's Dangerous:** Sparks hit 1,200°F and travel 35 feet; molten slag can ignite clothing or trash.
- **Defense:** FR sleeves and pants with cuffs closed; no synthetics; clear 35 ft or shield with blankets; close pockets.

### Backdraft Banshee – Fire & Explosion in Confined Spaces

- **Where She Lurks:** Inside drums, sealed tanks, and cabinets with vapors.
- **Why She's Dangerous:** Pulls in oxygen and ignites with a 3,000°F blast.
- **Defense:** Test air before hot work; ventilate continuously; stand hinge-side when opening containers; purge and clean before cutting/welding.



### Ember Wraith – After-Hours Fire Starter

- **Where She Lurks:** Slag piles, oily rags, dust under benches.
- **Why She's Dangerous:** Smolders quietly and ignites hours after you've gone home.
- **Defense:** Fire watch for 30–60 minutes; thermal checks for hot spots; clean up slag/dust; cool all hot metal before leaving.

### Key Hazards

- **Fire & Explosion:** Sparks ignite more than you think.
- **Electrical Shock:** Damp + damaged = deadly.
- **UV/IR Radiation:** Arc burns skin and eyes fast.
- **Physical Injuries:** Cuts, crushes, burns from mishandled materials.

### Before You Start:

1. Clear combustibles (or cover them).
2. Gear up — glasses, correct shade helmet, FR clothes, boots, gloves.

3. Stay dry — no puddles or damp gloves.
4. Inspect cables & clamps.
5. Locate extinguisher and confirm charge.

### While You Work:

- Keep head out of plume.
- Watch spark landing zones.
- Use screens to shield bystanders.
- Stay aware of hot/sharp materials.

### When You're Done:

- Fire watch 30–60 min.
- Check for smoldering.
- Store tools and cables properly.



### OSHA Case Study – “The Shirt That Burned”

**Date:** May 11, 2017

**Source:** OSHA Accident Report – Case #95648.015

It was supposed to be a routine job: MIG welding a set of oily A-frames. Sparks flew as usual until one ember landed on the worker's shirt. Normally it would smolder, but this shirt was soaked in oil. It didn't fizzle — it **erupted**.

Flames raced across the fabric. The worker tried to slap them out, but his gloves were also oily. Beneath, a synthetic T-shirt did the worst thing it could do — it melted into his skin, deepening the burns.

By the time co-workers put out the fire, the damage was catastrophic: severe burns to his stomach, shoulders, arms, face, and back. Weeks in the hospital. Skin grafts. Scars for life.

#### Why it happened:

- Oil residue + sparks = instant ignition.
- Synthetic underlayers melted into skin.
- PPE was only rated for radiant heat, not direct flame.

#### Lessons Learned:

- Keep clothing clean — oil, grease, and fuel feed Spark Slinger.
- Never wear synthetics under welding gear — only FR cotton or jackets.
- PPE has limits — make sure it matches the hazard.
- One spark is all it takes.