

ARC-ZONE COOLANT MASTER GUIDE



Liquid-Cooled
Welding &
Industrial
Cooling
Systems

What This Guide Covers

If you're running a liquid-cooled TIG torch, laser welder, or industrial chiller—this guide will help you:

- Pick the right coolant
- Avoid pump failure and torch damage
- Understand propylene vs ethylene glycol
- Set the correct mix ratio
- Keep your system running cool, clean, and reliable

Why Coolant Matters

Liquid-cooled systems don't fail all at once—they cook themselves over time. Inferior, or dirty coolant leads to:

- Overheating torches
- Burned up pumps
- Scale buildup in lines
- Reduced arc stability
- Algae growth in the system

Bottom line:

Coolant isn't maintenance... it's performance.

Propylene Glycol vs Ethylene Glycol (The Truth)

Selecting the right coolant starts with understanding the difference between propylene glycol and ethylene glycol. While both are used for heat transfer and freeze protection, they differ in toxicity, performance, and application. Choosing the correct type is critical for system safety, cooling efficiency, and long-term equipment reliability.



Propylene Glycol (PG)

- Low toxicity (safer around people)
- FDA-recognized safe (used in food/pharma)
- Safer for open or exposed systems
- Environmentally safer if spilled
- Higher viscosity (slightly more pump load)
- Slightly lower heat transfer vs ethylene

Best for: TIG welding - Laser welding - Shop environments - Open systems

Ethylene Glycol (EG)

- Maximum cooling performance
- Superior heat transfer efficiency
- Lower viscosity (better flow/pump efficiency)
- Strong freeze protection at lower concentrations
- Industry standard for automotive/industrial systems
- Highly toxic — requires careful handling and disposal

Best for: Sealed systems - Heavy industrial - Automotive - High heat-load applications

Quick Comparison

Feature	Propylene Glycol	Ethylene glycol
Safety	Low Toxicity	Higher Toxicity
Cooling Power	Very Good	Excellent
Shop Use	Ideal	Limited
Industrial Use	Good	Best
Arc-Zone Pick	Most Applications	Niche Use

Arc-Zone Recommendation

For 90% of welding applications:

Run Propylene Glycol

You get:

- Safe handling
- Reliable cooling
- Longer equipment life

Use Ethylene Glycol only when:

- You need max cooling performance
- System is sealed
- Exposure risk is controlled

Coolant Mix Ratio Chart

Temperature Protection	Glycol %	Water %
32°F (0°C)	0%	100%
20°F (-6°C)	25%	75%
0°F (-18°C)	35%	65%
-20°F (-29°C)	45%	55%

Arc-Zone sweet spot: 25%–40% glycol

Distilled vs Deionized Water (Don't Skip This)

- Distilled Water - Best all-around choice
- Deionized Water - Ultra-clean, but can be aggressive over time

Never use:

- Tap water
- Hose water
- "Looks clean" water

Minerals = scale = clogged lines = dead pump

Top 5 Coolant Mistakes (We See This Every Day)

1. Running straight water
2. Using automotive coolant in TIG systems
3. Mixing with tap water
4. Never changing coolant
5. Letting debris contaminate the system

These kill more torches than amperage ever will.

Maintenance Schedule (Simple & Effective)

Task	Frequency
Check Coolant Level	Weekly
Inspect Clarity	Monthly
Flush System	Every 6-12 Months
Replace Coolant	Annually

Failure Signs (Catch It Early)

- Torch getting hot in your hand
- Pump getting loud or inconsistent
- Discolored or cloudy coolant
- Reduced cooling performance

If you see this—don't wait. Flush it.

System Protection Best Practices

- Use high-quality glycol coolant
- Mix with distilled water only
- Keep system sealed and clean
- Use inline filtration when possible
- Store coolant properly

Final Words from Joe Welder: You can run the best torch, best machine, best setup...
...but if you're using the wrong coolant, and your cooling system is dirty,
or neglected— you're burning up your system from the inside out.

Run it clean. Run it right.
That's how pros keep welding.