Maximizing the Efficiency of Robotic Welding Cells

Hardware, Accessories, & Best Practices

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Evaluating MIG Guns

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Downtime

In a robotic welding application, downtime is the enemy of efficiency- and of your bottom line.

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Robotic Welding Torches – the Right Torch for the Job

- Duty Cycle
- Air-cooled vs. Water-cooled

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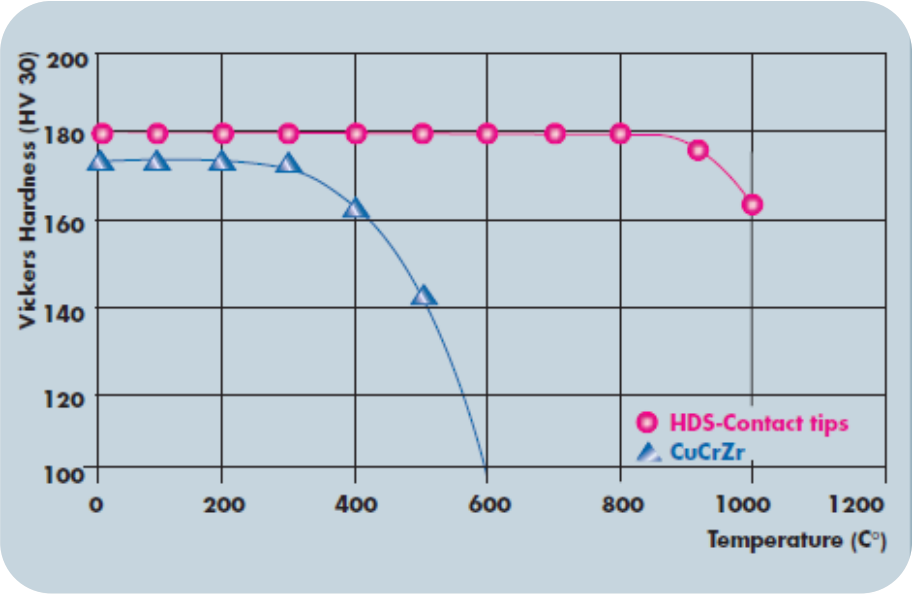
Robotic Welding Torches – the Right Torch for the Job



- Choose a quality torch from a quality manufacturer
- Machined aluminum-armored swannecks over crimped tube construction
- Repeatability & TCP
- Heavy duty cable
- Durable/Long-lasting consumables
- Neck changing station compatibility

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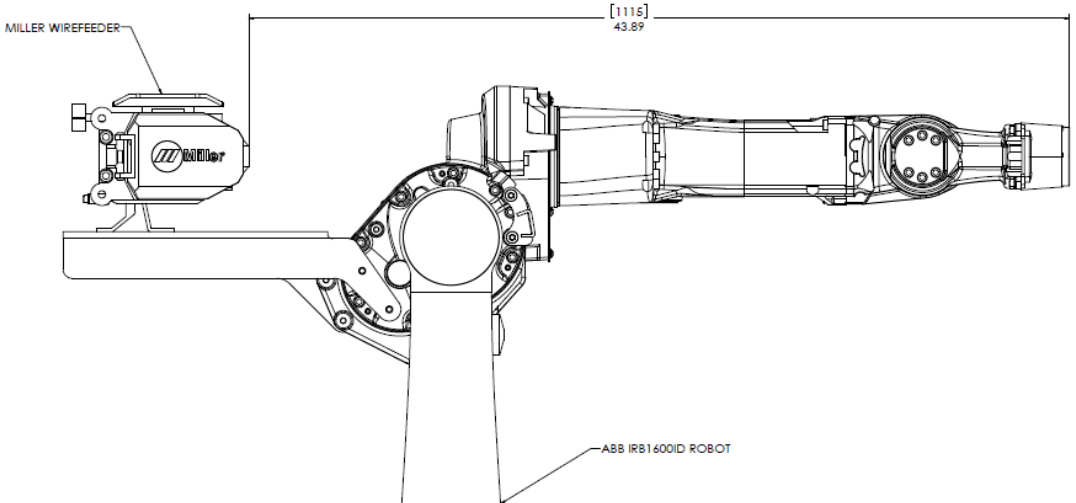
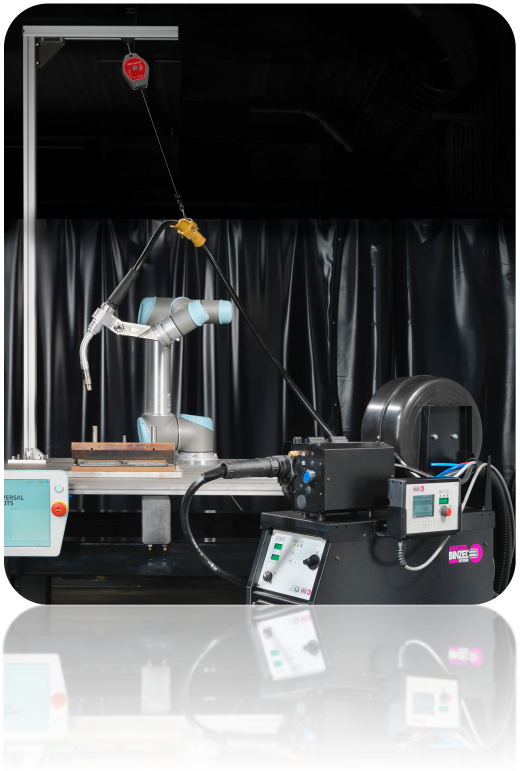
Robotic Welding Torches – Cable Management

With proper cable management, you can extend the life of your cable.

- Correct Length:
  - Too long – cable moves excessively
  - Too short – cable can be pulled apart





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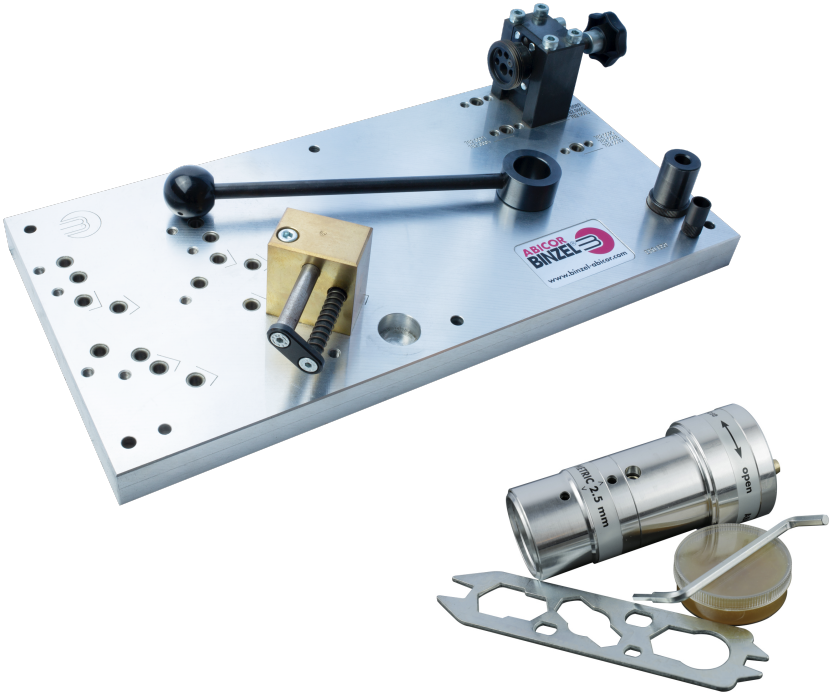
Robotic Welding Torches – Preventative Maintenance



Perform regular maintenance on your robotic torches.

- Check all connections to ensure they’re tight
- Make sure consumables are properly installed
- Wire feeding
- Manage spatter buildup on front end consumables
- Use alignment Jigs regularly to verify TCP

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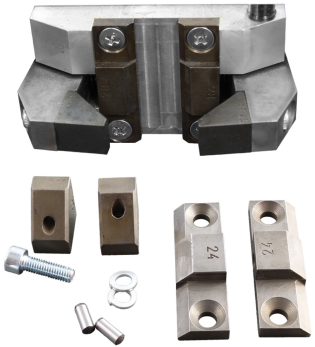
Robotic Peripherals – Torch Cleaning Stations – Reamers

Allowing spatter to build up on your front end consumables could lead to gas delivery issues & porosity.

- Fully automated
- Reamers keep consumables free of spatter build up
- Match the reamer blade and clamp set to the consumables you are using



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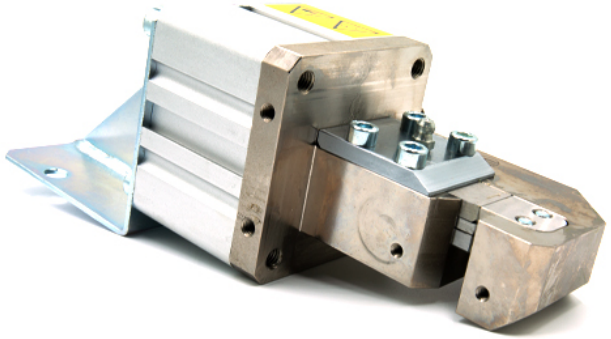
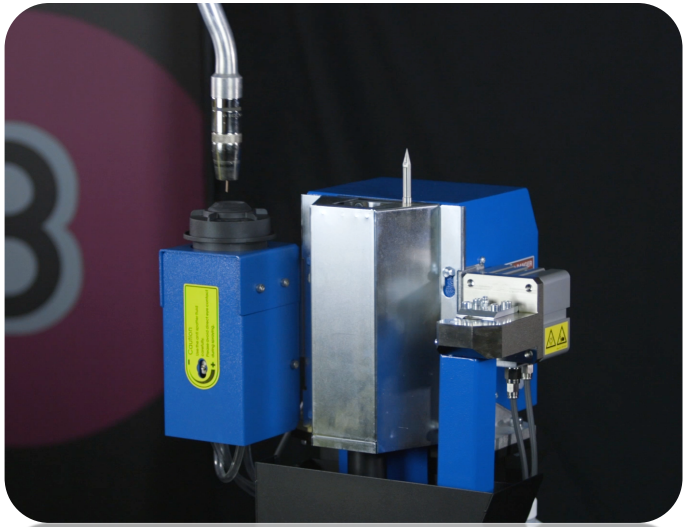
Robotic Peripherals – Torch Cleaning Stations – Wire Cutting Stations

Consistent wire stick-out for proper arc starts, every time.

- Fully automated
- Look for wire cutting stations that use the ‘clamp & shear’ method
- Clamping before cutting prevents the wire from bending





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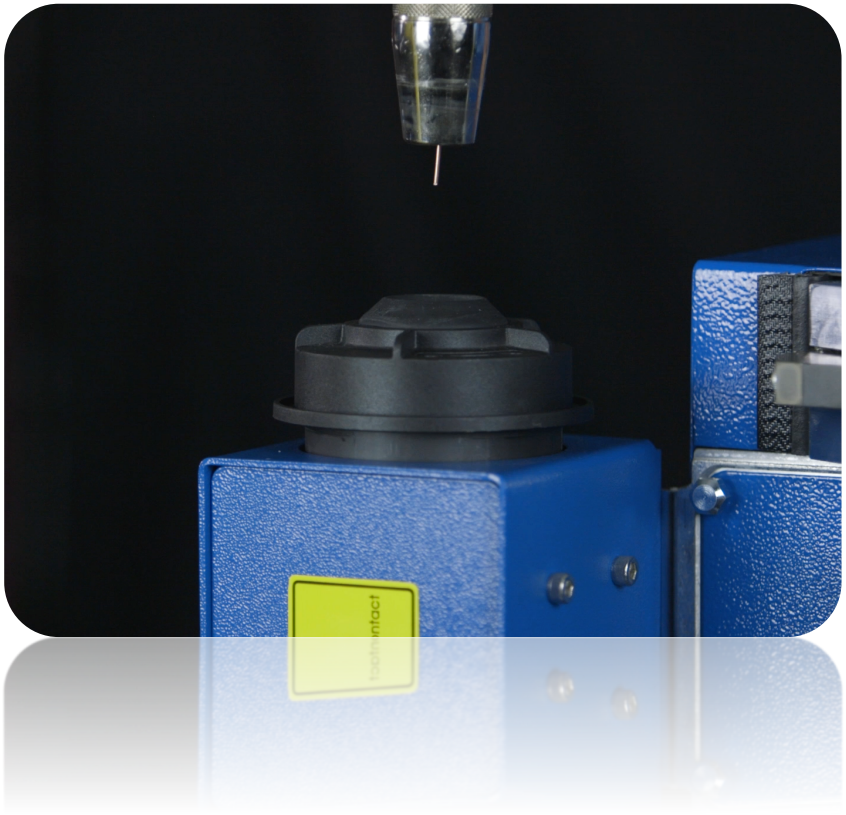
Robotic Peripherals – Torch Cleaning Stations – Anti-Spatter Applicator



Spatter build up can also shorten the life of your consumables

- Recommended, but not always necessary
- Prevents spatter from sticking to front-end consumables
- An applicator prevents wasting anti-spatter and keeps it from spreading throughout the cell
- Makes the job of the reamer much easier

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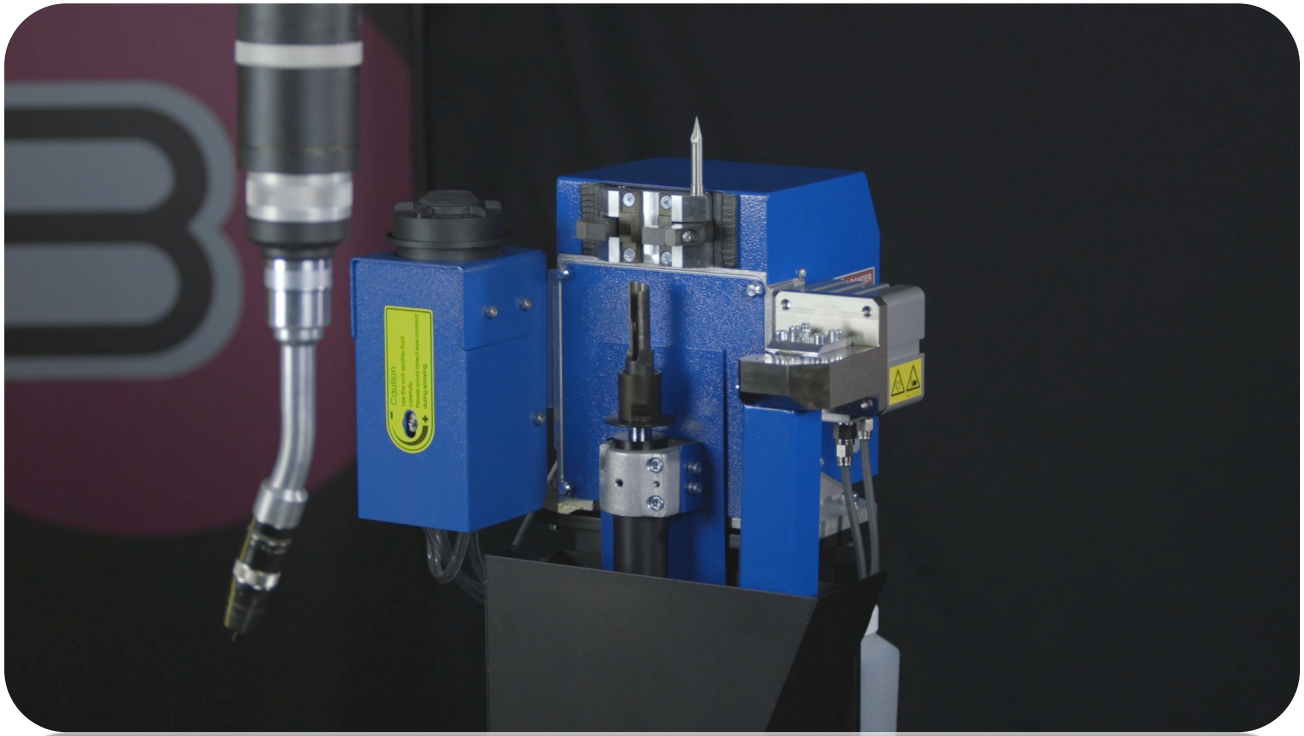
Robotic Peripherals – Torch Cleaning Stations – TCS-FP



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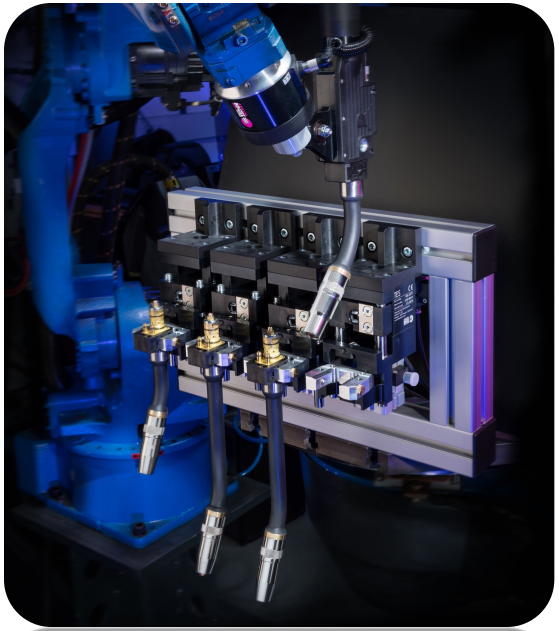
Robotic Peripherals – Automatic Neck Changing Stations

Reduce the downtime from torch neck changes.

- Programmable into robot's weld cycle
- Neck/jump liners required
- Used necks can be maintained offline without interrupting the weld cycle



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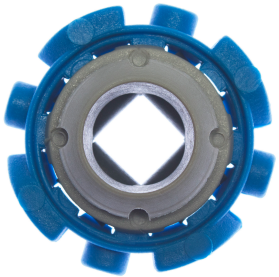
Robotic Peripherals – Wire Feeding Conduits

Friction and lack of flexibility within the wire feeding system can cause a host of problems.

- **MasterLiner Conduit:**
  - Rollers reduce friction
  - Highly durable outer sheath
  - Only one feeder needed
  - Increased flexibility



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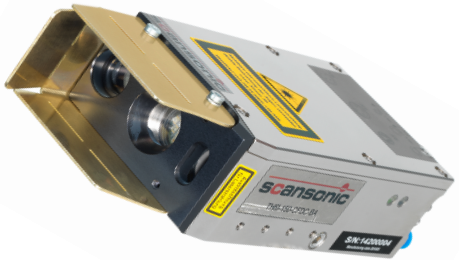
Robotic Peripherals – Optical Seam Tracking

Repeatability is important to keeping a robotic welding cell running smoothly.

- Real-time tracking of the weld joint using laser triangulation
- Tracks on reflective surfaces
- Reduces scrap, and programming time



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Maintenance & Tooling – Intro

Poorly maintained equipment is neither efficient nor cost effective.

- Using a worn out part can shorten the lifespan of other components

- Adopt a maintenance checklist (daily, weekly, and monthly)

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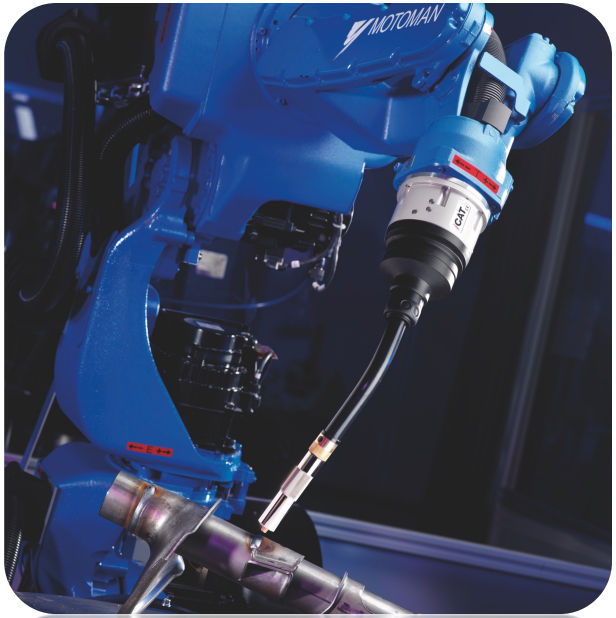
Maintenance & Tooling – Torch Maintenance



- Check the condition of your cable
- Inspect the wire brake
- Check the condition of your consumables
- Ensure that all parts are tight and there are no leaks

Tip: With water-cooled torches, flow switches within the cooler are recommended

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Maintenance & Tooling – Wire Delivery & Peripheral Liners

There are a lot of variables to consider when discussing wire delivery.

- Ensure the inlet and outlet of the liner is clear of debris
- Liners should be as straight and short as possible
- Check to make sure the liner is cut properly
- If using a roller liner (MasterLiner), do not blow compressed air into the liner.

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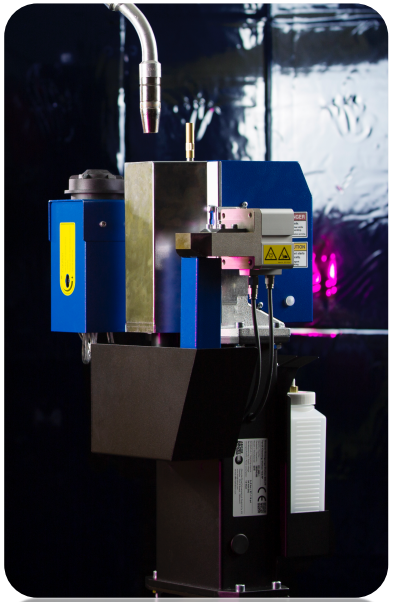
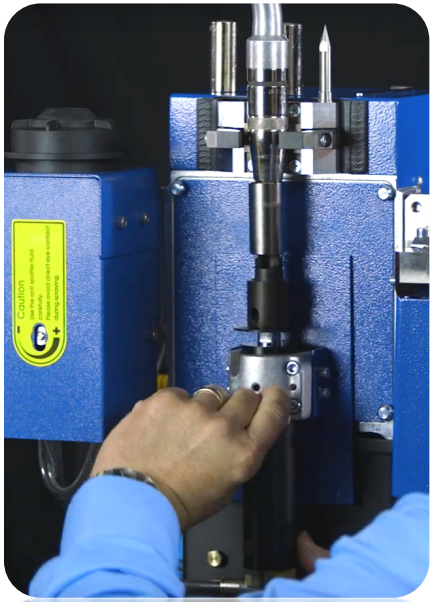
Maintenance & Tooling – Torch Cleaning Stations





Torch cleaning stations are great IF properly maintained.

- Check the reamer blade/clamp set for wear
- Inspect wire cutting blade
- Ensure there is a proper amount of anti-spatter fluid
- Check hoses/fittings for leaks

Tip: Tools are available to verify reamer depth

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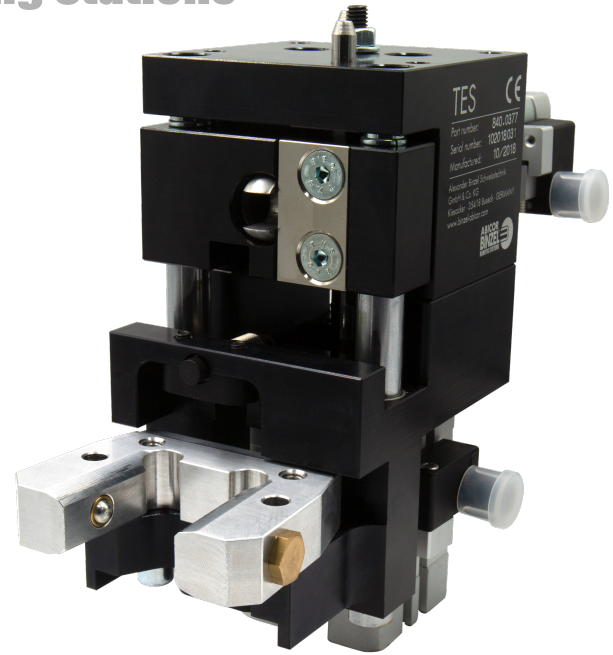
Maintenance & Tooling – Automatic Neck Changing Stations

- Can be controlled pneumatically, electrically, or both. Either way, check all necessary connections
- Keep the moving parts and sensors properly lubricated, clean, and free of debris
- Replace parts that become worn over time if necessary, such as the clamps



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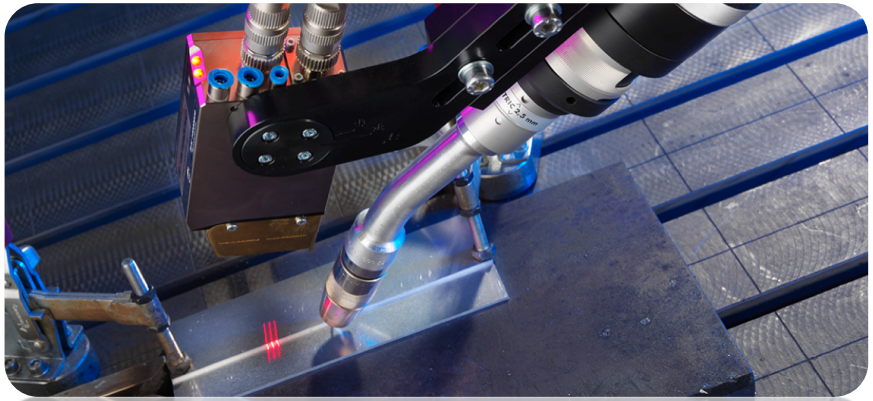
Maintenance & Tooling – External Sensors

- Consult the sensor's manufacturer for proper maintenance guidelines and schedules
- Ensure you are using clean, dry air for sensors equipped with an "air-knife"
- Check the condition of your collision sensor(s) and their internal components
- Regularly test any sensors to ensure they are functioning properly



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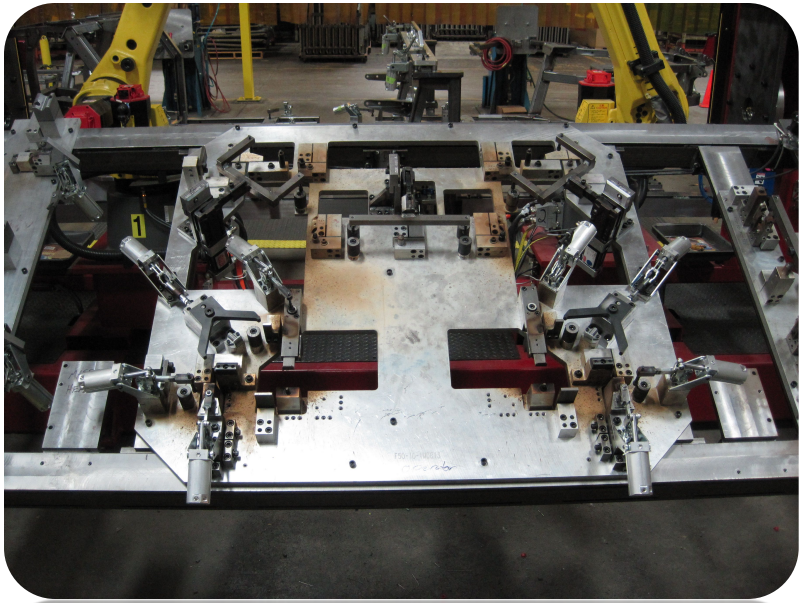
Maintenance & Tooling – Fixtures

Pay attention to all aspects of your weld process.

- All fixtures need to be grounded to the welding power source. All surfaces of the fixture should be clean to transfer the grounded fixture to the part to be welded

- If your fixturing has incorporated sensors, keep these sensors free of dust and debris. Test regularly



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Maintenance & Tooling – Maintenance Intervals

Many manufacturers have recommended maintenance intervals, check with them for specific guidelines and schedules.

Preventative Maintenance Schedule	Daily	Weekly	Monthly
Visually inspect tip orifice	x		
Check tightness of tip	x		
Check tightness of nozzle	x		
Check tightness of tip holder/diffuser	x		
Check tightness of torch necks		x	
Check tightness of rear power pin		x	
Check cable for abrasions/cuts	x		
Check wire liner for wear		x	
Lube o-rings on power pin			x
Lube o-rings on water-cooled neck			x

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Additional Solutions to Consider – Gas Management

- Gas management systems can significantly reduce gas consumption

- Set parameters, control gas flow settings, and collect data on gas usage and performance
  - EWR2 & EWR2 Net

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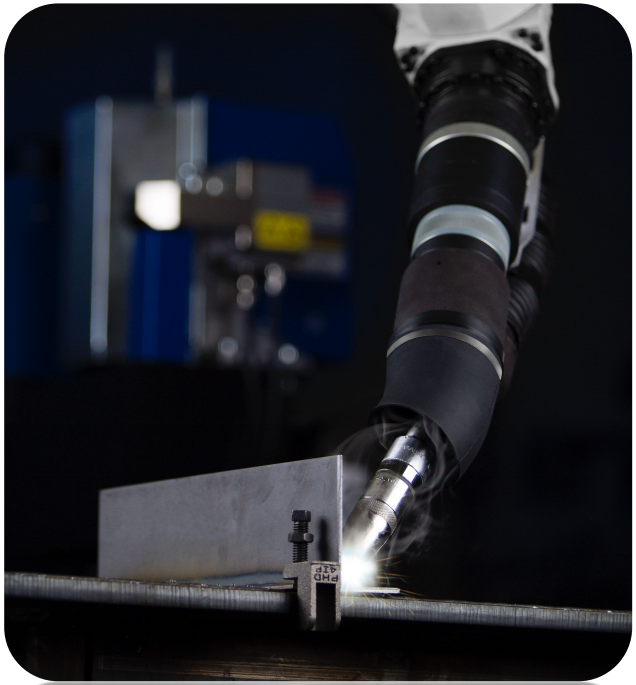
Additional Solutions to Consider – Fume Extraction



- At the source fume extraction is less expensive than an integrated, hooded system
- Keeps the cell free of welding fumes and dust, keeping everything within the cell clean
- Low-profile, easy to integrate into your current setup
  - xFUME™ ROBO

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