SWIFT SKILLS ACADEMY

2026 SOUTH AFRICAN WELDING RESOURCE

OXY-ACETYLENE GAS WELDING FLAME, SAFETY & SETUP GUIDE

CAPE TOWN | SOUTH AFRICA

A practical learner and workshop guide for pre-use inspection, flame identification, weld setup, pool control, defect checks and training decisions.

01 **SETUP**

Pre-use equipment & area check

02 **FLAME**

Neutral, carburising & oxidising

03 **CONTROL**

Torch, pool, filler & travel

04 **QUALITY**

Defect diagnosis & next action

THE PRACTICAL CONTROL CHAIN

INSPECT > SET UP > ADJUST FLAME > FORM POOL > ADD FILLER > CHECK QUALITY > SHUT DOWN

READ SOURCE BLOG | EXPLORE WELDING COURSES | BOOK GAS WELDING TRAINING

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Pre-Use Safety & Equipment Inspection

Print this page and use it as a preparation checklist before practical oxy-acetylene welding. It is a training aid, not a substitute for site procedures or manufacturer instructions.

CYLINDERS & REGULATORS

- [ ] Cylinders secured upright and protected from impact
- [ ] Cylinder labels / gas identity confirmed
- [ ] Regulators suitable for the correct gas service
- [ ] Gauges, valves and threads show no obvious damage
- [ ] Oxygen equipment free from oil and grease

HOSES & TORCH

- [ ] Hoses checked for cuts, burns, cracks and makeshift repairs
- [ ] Connections secure and correctly matched
- [ ] Flashback / reverse-flow protection fitted as required
- [ ] Torch body, mixer and tip visually sound
- [ ] Leak check completed using an approved method

WORK AREA

- [ ] Combustibles removed or controlled
- [ ] Suitable ventilation available
- [ ] Hot-work / fire controls confirmed where applicable
- [ ] Safe cylinder location and hose routing established
- [ ] Hot metal can be placed without creating a hazard

PERSONAL PROTECTION

- [ ] Eye / face protection suited to the task
- [ ] Protective clothing and gloves in serviceable condition
- [ ] Closed footwear suitable for hot-metal work
- [ ] Loose clothing / ignition hazards controlled
- [ ] Supervisor / learner responsibilities understood

CONTROL NOTE

If a gas leak, damaged hose, suspect regulator, missing protection device, unsafe work area or other abnormal condition is found, stop and resolve it before lighting the torch.

2 Neutral, Carburising & Oxidising Flames

Learn to identify the three principal oxy-acetylene flame conditions. The correct setting depends on the material, procedure and training task.

FLAME	VISUAL / SOUND CUE	GENERAL EFFECT	TRAINING NOTE
NEUTRAL	Clear inner cone; stable flame; no pronounced acetylene feather	Balanced flame condition commonly used for general gas welding	Use as the baseline setting when the procedure calls for a neutral flame
CARBURISING / REDUCING	Visible acetylene feather; softer carbon-rich appearance	Reducing / carbon-rich atmosphere	Do not assume 'softer' means safer or more suitable; match the procedure
OXIDISING	Shorter sharp cone; more intense sound; excess oxygen	More oxidising effect on the work	Incorrect use can change surface condition and weld behaviour

BEFORE YOU START THE WELD

- [ ] Flame is stable and matches the required procedure
- [ ] Tip size and pressure settings match the equipment guidance
- [ ] Material identity, thickness and joint preparation are confirmed
- [ ] Filler rod / flux requirement is confirmed before heating

3

Gas Welding Setup & Control Worksheet

Use this page to record the planned setup and then check technique during supervised practice.

JOB SETUP

MATERIAL _____ THICKNESS _____

JOINT TYPE _____ FILLER ROD _____

TIP / NOZZLE _____ FLAME TYPE _____

1

POSITION

Set stable stance, torch angle and a clear travel path.

2

PREHEAT

Bring the joint area up to temperature without overheating one edge.

3

FORM POOL

Establish a controlled molten pool at the joint.

4

ADD FILLER

Introduce filler deliberately; avoid flooding the pool.

5

TRAVEL

Coordinate torch, pool and filler at a consistent pace.

6

FINISH

Control the end of the weld, then shut down safely.

SUPERVISOR / SELF-CHECK

Torch angle: _____ **Travel speed:** _____ **Filler control:** _____

4

Defect Diagnosis Matrix

Use this matrix after welding to identify what to investigate next. It is a troubleshooting aid, not a substitute for an approved welding procedure or formal inspection.

VISIBLE PROBLEM	POSSIBLE CONTRIBUTORS	CHECK FIRST
Lack of fusion	Insufficient heat, poor torch position, fast travel, poor preparation	Pool formation, torch angle, travel speed
Burn-through	Excessive heat, slow travel, thin material, large tip / poor control	Heat input, tip selection, travel speed
Porosity	Contamination, poor surface condition, unsuitable flame / handling	Cleanliness, setup, gas system condition
Undercut	Heat concentrated at edge, poor angle, travel / filler imbalance	Torch angle, edge heating, filler timing
Excess reinforcement	Too much filler, slow travel, oversized pool	Filler quantity, pool size, travel
Underfill	Insufficient filler, fast travel, poor joint control	Filler timing and volume
Oxidised surface	Incorrect flame condition, prolonged exposure, contamination	Flame setting, surface condition, heat exposure
Distortion	Excess heat, poor restraint, poor sequence	Heat input, clamping, sequence

QUALITY NOTE

A visually neat weld is not automatically a sound weld. Acceptance depends on the applicable drawing, procedure, inspection criteria and job requirements.

5

Choose the Right Training Scope

Use this page before requesting a quotation so the training route matches the work that learners or employees actually need to perform.

INDIVIDUAL LEARNER PLANNER

CURRENT EXPERIENCE _____

MAIN MATERIAL / THICKNESS _____

WORK OR CAREER GOAL _____

NEED WELDING ONLY / WELDING + BRAZING / WIDER PATHWAY _____

I need help with:

- ☐ BOOKING
- ☐ CURRENT FEES
- ☐ CALLBACK
- ☐ WELDING PATHWAY

EMPLOYER / ON-SITE PLANNER

NUMBER OF EMPLOYEES _____

SITE / WORKSHOP _____

EQUIPMENT AVAILABLE _____

MATERIALS / TYPICAL WORK _____

REQUIRED OUTCOME _____

PREFERRED TIMING _____

BOOK GAS WELDING | CURRENT FEES | REQUEST CALLBACK | EMPLOYER TRAINING

6 Continue Learning or Take Action

Use the live links below to return to the source article, explore the wider welding pathway or speak to Swift Skills Academy.

SWIFT SKILLS ACADEMY

Cape Town, South Africa

WEBSITE	www.swiftskillsacademy.com	CALL	021 828 0772
EMAIL	info@swiftskillsacademy.co.za	WHATSAPP	+27 60 998 7412

CONTINUE LEARNING

Source Blog: Gas Welding Course Cape Town

Brazing Course Cape Town

Gas Cutting Course Cape Town

COMMERCIAL NEXT STEP

Compare the wider welding pathway, then use the correct route for booking, fees or guidance.

WELDING COURSES | HELP ME CHOOSE

EMPLOYER QUOTE | CALLBACK

WHATSAPP US ABOUT GAS WELDING ->

FINAL TAKEAWAY

Control the equipment. Control the flame. Control the pool.

The value of gas-welding training is not simply learning to light a torch. It is learning a disciplined sequence of inspection, setup, heat control, filler control, quality checking and safe shutdown.

USE NOTE

This is a practical training aid. Adapt it to the actual workplace, equipment, materials, manufacturer instructions, approved procedures and site safety requirements. A completed checklist does not by itself prove competence, authorisation or legal compliance.