Oxy-Fuel Gas Cutting

Correct Conditions

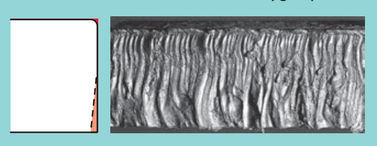
The very light dragline should be almost vertical for profile cutting. For straight cutting a drag of up to 10% would be permissible.

Sharp top edges, smooth surface, draglines barely visible. A very light scale of oxide easily removed. Square face. Sharp bottom removed.

Common Faults

Speed too slow

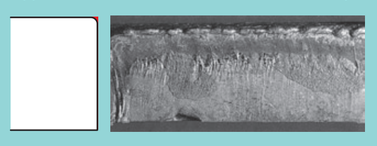
Bad gouging in the lower half of the cut is caused by molten steel scouring the cut surface, and the hot metal and slag that congeals on the underside is always difficult to remove. Secondary cause of this condition is too low oxygen pressure.



Melted and rounded top edge. Lower part of cut face fluted or gouged very irregularly. Bottom edge rough. Heavy scale on cut face that is difficult to remove.

Nozzle too low

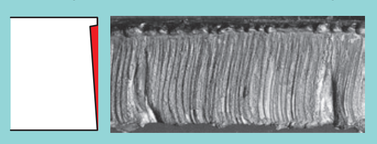
Having the nozzle too low does not usually spoil the cut surface badly, but it does of course badly burn the top corner. Very often it retards the oxidation reaction and makes it appear that the cut has been done too slowly.



Top edge slightly rounded and heavily beaded. Cut face usually square with fairly sharp bottom corner.

Preheat Flame too large

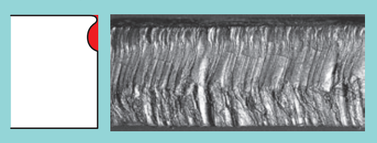
This is the easiest and most obvious condition to correct, which provided other conditions are correct usually gives a fairly clean, although excessively oxidised cut face, but with a heavy rounding at the top edge.



Rounded top edge with metal falling into kerf. Cut face generally smooth, but tapered from top to bottom. Excessive tightly adhering slag.

Nozzle too high above work

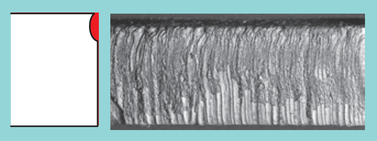
The melting of the top edge is due to heat spread each side of the cut and the undercutting is caused by the oxygen stream being above the work, so that it spreads and tends to "bell-out" as it transverses down the kerf.



Excessive melting and rounding of the top edge. Undercut at top of cut face with lower part square and sharp bottom corner.

Pressure of cutting oxygen too high

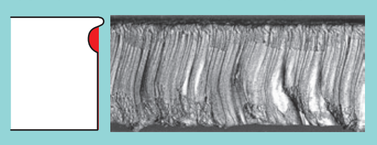
This is probably the most common fault in cutting that causes the rounding of the top part of the cut face it is caused by the turbulence of the oxygen stream due to the high pressure at which it leaves the nozzle. On thinner material it may cause a taper cut that sometimes leads to the incorrect supposition that the cutter is incorrectly mounted in relation to the plate.



Regular bead along the top edge. Kerf wider at top edge with undercutting of face just below.

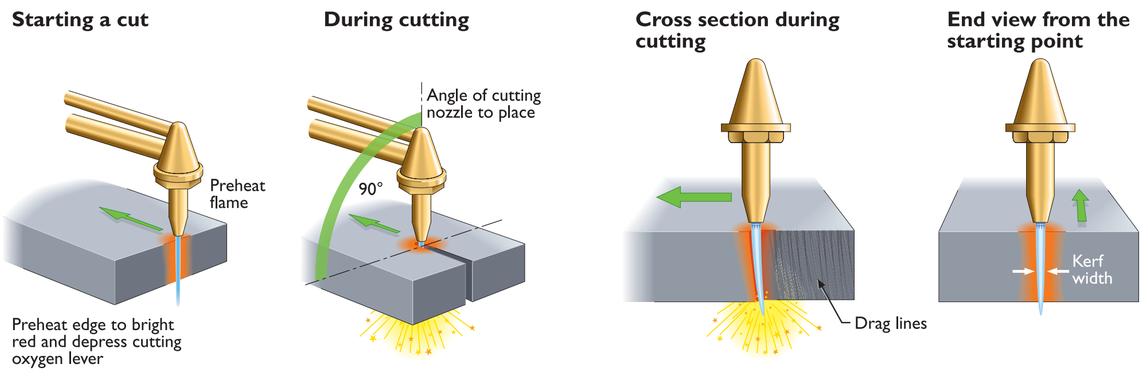
Speed too fast

The excessive backward drag of the cut line would result in the cut not being completely severed at the end. The occasional gouging or fluting along the cut indicates that the oxygen pressure is too low for a normal speed. In other words, if the speed was dropped and the oxygen pressure maintained, a perfectly good cut would result.

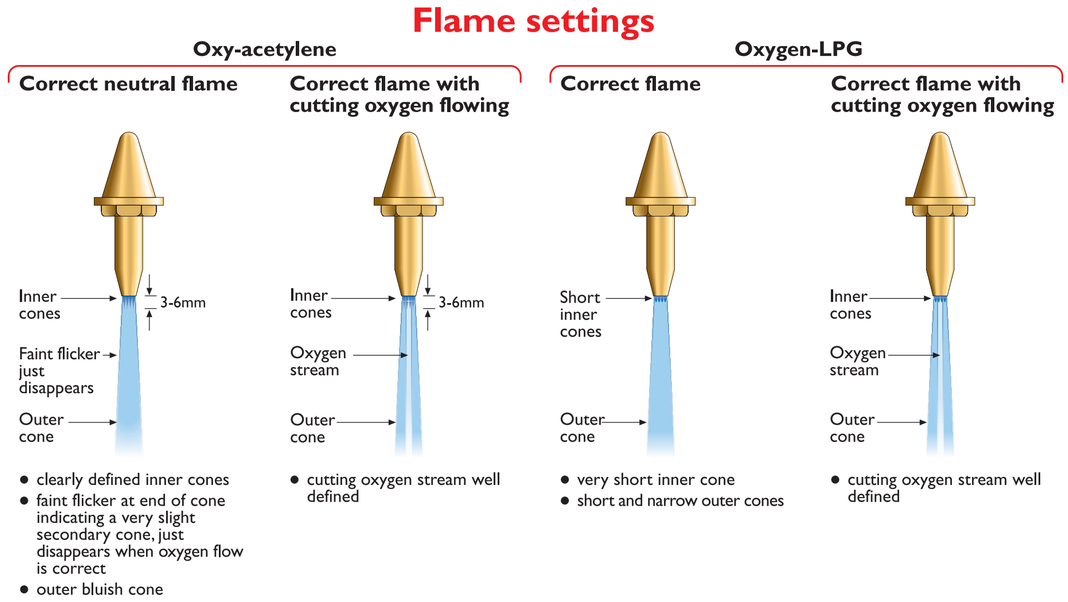


Top edge not too sharp and may be bearded. Undercutting at top of the cut face. Draglines have excessive backward drag. Slightly rounded bottom edge.

Cutting techniques



Flame settings



- clearly defined inner cones
- faint flicker at end of cone indicating a very slight secondary cone, just disappears when oxygen flow is correct
- outer bluish cone

- cutting oxygen stream well defined

- very short inner cone
- short and narrow outer cones

- cutting oxygen stream well defined

ACETYLENE and HANDIGAS (LPG) are the most commonly used fuel gases for the cutting of mild steel. Prior to attempting to cut, the material should be cleaned with a stiff wire brush to remove dirt and scale. With correct gas pressures, nozzle size, cutting torch angle and speed, the quality of freehand cutting depends upon the steadiness of the operator.

Cutting Nozzles

Cutting Nozzle Data

The nozzle is the "Business End" of Gas Cutting: Using low quality, or damaged nozzles can be compared to cutting cloth with blunt scissors. Magnificent, expensive cutting machines cannot perform if poor quality cutting nozzles are used.

BOC strives continually to improve nozzle design to increase efficiency, to lengthen working life, to affect gas cost savings and increase cutting speed etc.

These nozzles are designed for use with the BOC cutting attachment, the UNIVERSAL cutting torch and the LT torch.

BOC 2 Seat Acetylene Cutting Nozzles

Part No.		Descrip-tion	Plate (mm)	DA (kPa)	Oxy (kPa)	Speed (mm/min)	DA (L/min)	Oxy (L/min)
Single	20 Pack							
105520	105420	6C-A	1–5	100	180	450	2	11
105521	105421	8C-A	6–10	100	200	400	3	20
105522	105422	12C-A	12–20	100	220	350	4	40
105523	105423	15C-A	25–40	100	250	300	6	60
105523	105423	15C-A	50–80	100	350	220	7	80
105524	105424	20C-A	100–125	100	400	150	10	150
105525	105425	24C-A	150–200	100	500	120	13	260
105526	105426	32C-A	200–300	100	600	100	45*	420

BOC 2 Seat LPG Cutting Nozzles

Part No.	Descrip-tion	Plate (mm)	LPG (kPa)	Oxy (kPa)	LPG (L/min)	Oxy (L/min)
106626	6C-P	3–6	100	200	2	18
106627	8C-P	6–10	100	200	3.5	30
106628	12C-P	10–20	100	250	4.5	58
106629	15C-P	20–40	100	400	5.5	100
106629	15C-P	40–80	100	400	6	120
106630	20C-P	80–125	100	400	6.5	171
106631	24C-P	125–200	100	500	9	256
106632	32C-P	200–300	100	600	14	450

BOC 3 Seat Oxy-Acetylene Cutting Nozzles for use with Universal Cutter

Part No.	Descrip-tion	Plate (mm)	DA (kPa)	Oxy (kPa)	DA (L/min)	Oxy (L/min)
105560	ANM 8	4–6	15	150	8	8
105561	ANM 12	6–12	15	200	9	10
105562	ANM 16	12–25	15	250	10	13
105562	ANM 16	25–50	20	300	11	13
105562	ANM 16	50–75	20	350	11	14
105563	ANM 20	75–100	30	300	13	20
105564	ANM 24	100–150	30	300	16	25
105565	ANM 32	150–250	35	450	20	26
105565	ANM 32	250–300	45	550	23	28

BOC 3 Seat Oxy-LPG Cutting Nozzles for use with Universal Cutter

Part No.	Descrip-tion	Plate (mm)	DA (kPa)	Oxy (kPa)	DA (L/min)	Oxy (L/min)
105566	PNM 8	4–6	20	150	5	22
105567	PNM 12	6–12	20	200	5	24
105568	PNM 16	12–25	20	300	10	41
105568	PNM 16	25–50	30	300	12	43
105568	PNM 16	50–75	35	350	15	50
105569	PNM 20	75–100	40	350	17	59
105570	PNM 24	100–150	40	400	17	60
105571	PNM 32	150–250	50	560	18	66
105571	PNM 32	250–300	60	560	19	72

BOC LT Cutting Nozzles–for use with LT Torch

Part No.	Descrip-tion	Plate (mm)	DA (kPa)	Oxy (kPa)	DA (L/min)	Oxy (L/min)
105590	LT 8C-A	3–6	15	200	3	10
105591	LT 12C-A	6–20	15	200	3	11
105592	LT 16C-A	20–25	15	200	3	23
105592	LT 16C-A	25–35	15	400	4	56
105592	LT 16C-A	35–50	20	500	4	70

AUSTRALIA

131 262

Fax: **132 427**
Email: **contact@boc.com**
Website: **www.boc.com.au**

BOC Limited
ABN 95 000 029 729
Riverside Corporate Park
10 Julius Avenue
North Ryde, NSW 2113
AUSTRALIA

NEW ZEALAND

0800 111 333

Fax: **0800 229 923**
Email: **customer-service-nz@boc.com**
Website: **www.boc.co.nz**

BOC Limited
970–992 Great South Road
Penrose, Auckland
NEW ZEALAND

IP 21874 | FDAUS | 0106 | 10K