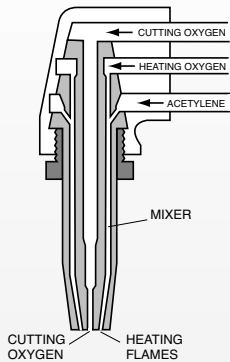


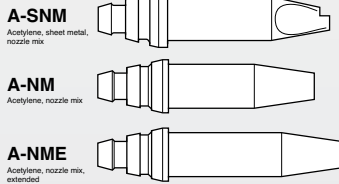
Cutting with Acetylene



ANM - Cutting nozzles

The Saffire ANM Series cutting nozzles are manufactured from Tellurium Copper and are of solid, one piece drawn construction. This technology provides the best conditions for a high velocity gas such as acetylene and enhances stability and cutting efficiency.

The seats of ANM nozzles are diamond turned to guarantee "metal to metal" seal with the blowpipe head is secure. Essential to ensure no head seat leaks, thereby reducing backfire risks.

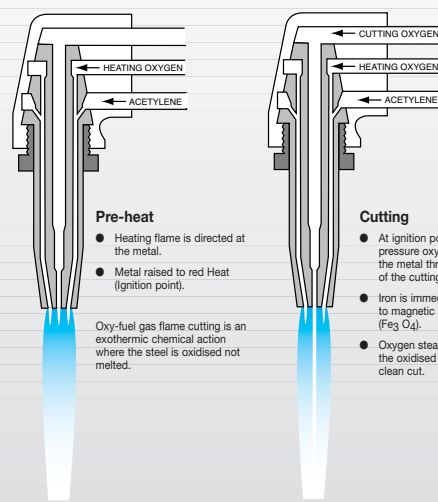


Type	Length	Sizes available
A-SNM	87mm	Sheet metal
A-NM	76mm	1/32 3/64 1/16 5/64 3/32 1/8 in
A-NME	87mm	1/32 3/64 1/16 5/64 3/32 1/8 in

Saffire acetylene nozzles - Ref No prefixes are: 143 for A-NM, 116 for A-NME.

Material thickness	Nozzle size	Ref No.	Gas pressure		Gas consumption		Fuel					
			Cutting oxygen	Fuel	Cutting oxygen	Preheat oxygen						
mm	in		bar	lb/ft ²	m ³ /h	ft ³ /h	l/h	ft ³ /h	l/h	ft ³ /h		
6	1/2	3-6	1.5	20	0.15	2	0.85	30	310	11	290	10
		0700143016	0700116322						520	18.5	480	17
12	1/2	5-12	2.0	30	0.15	2	1.85	65	370	13	340	12
		0700143017	0700116323						620	22	570	20
25	1	10-75	2.5	35	0.15	2	4.05	143	425	15	400	14
		0700143018	0700116324						800	28	700	25
50	2	10-75	3.0	45	0.15	2	4.7	166	450	16	425	15
		0700143018	0700116324						800	28	700	25
75	3	10-75	3.5	50	0.15	2	5.3	188	510	18	450	16
		0700143018	0700116324						800	28	700	25
100	4	10-75	3.0	45	0.15	2	7.2	256	570	20	510	18
		0700143019	0700116325						860	31	800	28
150	6	90-150	3.0	45	0.2	3	10.5	370	860	31	800	28
		0700143020	0700116326						1220	43	1100	39
250	10	190-300	4.5	65	0.2	3	22.5	795	1245	44	1130	40*
		0700143022	0700116328						1555	55	1415	50*
300	12	190-300	5.5	80	0.2	3	26.0	920	1415	50	1275	45*
		0700143022	0700116328						1555	55	1415	50*
Sheet		ASNM	1.5	20	0.25	2	0.85	30	85	3	85	3

Process Description



Pre-heat

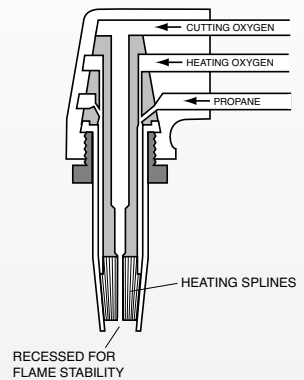
- Heating flame is directed at the metal.
- Metal raised to red Heat (Ignition point).

Oxy-fuel gas flame cutting is an exothermic chemical action where the steel is oxidised not melted.

Cutting

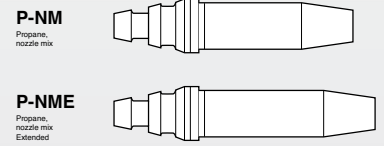
- At ignition point, high pressure oxygen directed at the metal through activation of the cutting oxygen lever.
- Iron is immediately oxidised to magnetic oxide of iron (Fe₃O₄).
- Oxygen steam blows away the oxidised area leaving a clean cut.

Cutting with Propane



PNM - Cutting nozzles

Saffire PNM Series cutting nozzles are of two piece design made up of a brass inner nozzle with splines and a hollow drawn copper outer sheath. The reason that PNM's differ from ANM is that different gas mixing criteria apply. Oxy-propane has a lower burning velocity than oxy-acetylene and this requires two things to develop good flame conditions. First, turbulence must be created between the inner and outer parts of the nozzle to obtain adequate mixing of the propane and oxygen. Secondly, the volume of mixed oxy-propane needs to be more than double that of oxy-acetylene for the same usable heat. This is achieved by having very large channels (the splines) to conduct the greater gas volumes.



Type	Length	Sizes available
P-NM	76mm	1/32 3/64 1/16 5/64 3/32 1/8 in
P-NME	87mm	1/32 3/64 1/16 5/64 3/32 1/8 in

Saffire propane nozzles - Ref No prefixes are: 143 for P-NM, 116 for P-NME.

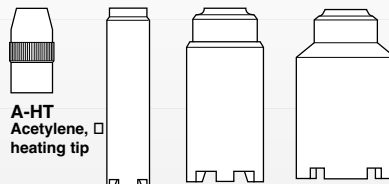
Material thickness	Nozzle size	Ref No.	Gas pressure		Gas consumption		Fuel					
			Cutting oxygen	Fuel	Cutting oxygen	Preheat oxygen						
mm	in		bar	lb/ft ²	m ³ /h	ft ³ /h	l/h	ft ³ /h	l/h	ft ³ /h		
6	1/4	3-6	1.5	20	0.2	3	0.85	30	680	24	170	6
		0700124890	0700143780						1360	48	340	12
12	1/2	5-12	2.0	30	0.2	3	1.75	62	905	32	225	8
		0700124891	0700143781						1360	48	340	12
25	1	10-75	2.5	35	0.3	4	4.3	152	1130	40	280	10
		0700124892	0700143782						2490	88	620	22
50	2	10-75	3.0	45	0.3	4	4.8	171	1360	48	340	12
		0700124892	0700116324						2490	88	620	22
75	3	10-75	3.5	50	0.3	4	5.6	156	1585	56	400	14
		0700124892	0700143782						2490	88	620	22
100	4	78-100	3.0	45	0.3	4	6.7	266	1810	64	450	16
		0700124893	0700143783						2490	88	620	22
150	6	90-150	3.0	45	0.4	6	9.5	335	2490	88	620	22
		0700124894	0700143784						3825	128	905	32
250	10	190-300	4.5	65	0.5	7	20.9	740	3965	140	990	35
		0700124896	0700143786									
300	12	190-300	5.5	80	2.6	9	25.5	900	4305	152	1075	38
		0700124896	0700143786									

These figures are intended as a guide and may vary according to local conditions, material and flame setting.

* Acetylene cylinders must be manufactured when consumption rates of acetylene exceed 35 cu. ft. per hour (1 cu. metre per hour) for periods over 10 minutes.

Special Cutting Processes

Heating



Propane superheating nozzles

Heating with Acetylene

Nozzle data for acetylene fuel gas

Nozzle	A-HT 25 (ref 126134)	A-HT 50 (ref 126135)	A-HT 100 (ref 126136)	
Fuel gas pressure	bar (lb/ft ²)	0.3 (4)	0.4 (6)	0.5 (7)
Oxygen pressure	bar (lb/ft ²)	0.3 (4)	0.4 (6)	0.7 (10)
Fuel gas consumption	l/h (ft ³ /h)	1100 (36)*	1800 (63)*	3000 (86)*
Oxygen consumption	l/h (ft ³ /h)	1100 (40)	2000 (70)	3000 (106)
Heat output (approx.)	J/S (Btu/h)	15,240 (62,000)	26,600 (91,000)	40,730 (139,000)

Superheating with Propane

The flame size and heat output of these nozzles varies considerably with the pressure settings used. Two typical alternatives are given for each size of nozzle.

Nozzle	1H (ref 157557)	2H (ref 157558)	3H (ref 157559)	4H (ref 157560)	5H (ref 157561)						
Propane pressure	bar	0.15	0.5	0.2	0.57	0.3	1.1	0.35	1.3	0.85	2.0
Propane pressure	lb/ft ²	2	7	3	8	4	15	5	18	12	30
Oxygen pressure	bar	0.7	2.0	1.1	2.5	1.8	5.0	2.5	5.7	3.5	8.7
Oxygen pressure	lb/ft ²	10	30	15	35	25	70	35	80	50	125
Propane consumption	l/h	830	1900	1200	2100	2100	4100	4600	3200	7000	7000
Propane consumption	ft ³ /h	29	65	41	75	73	144	94	162	112	245
Oxygen consumption	l/h	3500	7300	4800	8700	8300	16500	19600	12700	28000	28000
Oxygen consumption	ft ³ /h	121	255	168	304	290	575	370	650	444	985
Heat output (approx.)	J/S	21100	47760	29890	55080	53620	105770	69150	118960	82330	181070
Heat output (approx.)	Btu/h	72,000	163,000	102,000	188,000	183,000	361,000	236,000	406,000	281,000	618,000

Gouging



Saffire acetylene gouging

Ref	Groove		Pressure		Consumption									
	Width mm	Depth mm	Acetylene bar	Oxygen bar	Acetylene ft ³ /h	Oxygen ft ³ /h	Preheat ft ³ /h							
A-GNM-13 0700126809	1/4-5/16	6-8	1/4-3/8	2-8	0.5	7	4.0	60	32	905	35	990	130	3690
A-GNM-19 0700126810	5/16-7/8	8-11	1/2-7/8	6-11	0.5	7	5.0	75	60*	1700	66	1870	330	9340
A-GNM-25 0700126811	3/4-1 1/2	9-12	3/4-1 1/2	9-12	0.55	8	5.5	85	74*	2100	81	2290	575	16270