

Eclipse Blast Tips



No Blow Blast Tips

Blast Tip is the name given to any small burner to handle combustible mixtures of gas and air under sufficient pressure to cause a blast-like flame. In general, Blast Tips are built to burn without the use of any refractory tunnel and are either self-piloting or built to prevent the flame from blowing away under normal conditions of operation.

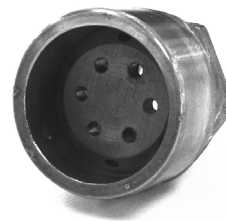
Due to the marked differences in combustion characteristics of various combustible gases, it is not always possible to use the same tip on all gases. A tip that may have good flame retention when burning coke oven gas may not hold a natural gas flame at all.

Blast Tips are suitable for variety of applications. They can be used in groups to heat a wide area such as the bottom of a kettle, or mounted down a length of pipe as in a core oven.

Operation

All capacities in this bulletin are based on a stoichiometric air/gas mixture. If the ratio of air to gas is less than stoichiometric, the gas capacity will be correspondingly increased, but the air necessary to complete combustion will have to be available in the oven.

If Blast Tips get hot during operation, they will heat the mixture before it is burned, increasing its volume and thus reducing capacity. In addition, heating of the tips will



Standard Steel Tips

cause pre-ignition and backfiring which may damage the tips through excessive heating. If there is a danger of over-heating, alloy steel tips may be used.

Piloting

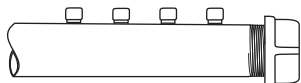
Unless tips are very close together and a fast burning gas is being used, each tip must be lit individually. This may be done by a manual torch.

CAUTION: It is dangerous to use any fuel burning equipment unless it is equipped with suitable flame sensing device(s) and automatic fuel shut-off valve(s). Thermocouple flame monitoring must not be used on burners with capacities greater than 150,000 BTU/hr (44 kW). Eclipse can supply flame monitoring systems or information on alternate sources.

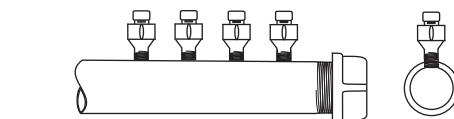
Installation

The illustrations below show various ways of installing blast tips in pipes. For gas-mixture capacity of standard pipe see Gas-Mixture Capacity of Standard Pipe. Long manifolds may be made of extra-heavy pipe, although this will reduce pipe capacity. Eclipse can fabricate any burner length or configuration desired. Contact your Eclipse representative for details.

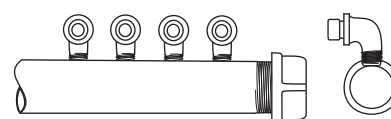
Typical Pipe Burner Applications



Pipe burner showing tips screwed directly into pipe. Suitable for small capacities and short lengths.



Pipe burner showing tips mounted in extension fittings. Reducing fittings may also be used where large tips of small capacity are used.



Pipe burner showing tips mounted at a 90 degree angle.

No-Blow Blast Tips Series "K"



No-Blow Tips were specially designed to meet the need for a tip that would operate satisfactorily on any kind of gas. The flame will not blow off from these tips when used with the slow burning natural or bottle gases nor will they back-fire when used with the fast burning coke oven or water gas. They answer the need for a universal tip that would not have to be changed when the gas supply was changed. They operate best when used with correct mixtures of air and gas but will handle even widely incorrect and varied mixtures. They may be used in completely enclosed chambers without secondary air provided they are not allowed to over-heat. If ample secondary air is available, capacities may be as much as doubled. The standard tips are steel but heat resisting alloy tips can be supplied for higher operating temperatures.

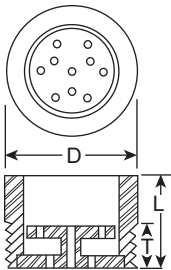
Applications

No-Blow Tips have been successfully used for fire-polishing, core ovens, baking ovens, various types of kettles, cookers, small boilers, low temperature annealing ovens, meat smokehouses, air heaters, and in many other installations where a large number of small flames were desirable.

No-Blow Tips may be used in clusters in special castings or arranged along pipes either straight or shaped. They may be screwed into the pipe directly or mounted in standard fittings such as ells or couplings. If mounted directly in the pipe, there is greater danger of pre-ignition as the gas burning in the tip tends to heat the mixture in the pipe directly. If in doubt as to the suitability of No-Blow Tips for your application, send us a print or sketch giving all information on temperatures, kind of gas and cycles of operation, and we will gladly advise.

Limitations

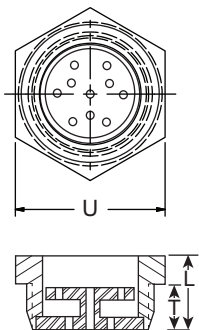
No-Blow Tips should not be used where they will be subjected to radiant heat or any temperature above 750°F (400°C) unless alloy tips are used. With alloy, the temperature limit is around 1200°F (650°C) although care must be taken to avoid pre-ignition.



Part Number	Material	Size of Pipe Thread "NPT"	Port Area in ² (mm ²)	Capacities BTU/hr (kW)*	Dimensions in (mm)			Weight of Each oz. (kg.)
					L	D	T	
102901	Steel	3/8	.014 (9.0)	2,900 (0.85)	0.70 (18)	0.66 (17)	0.41 (10)	0.5 (0.014)
102907	Stainless Steel							
102902	Steel	1/2	.022 (14.2)	5,000 (1.47)	0.56 (14)	0.81 (21)	0.34 (9)	0.75 (0.021)
102908	Stainless Steel							
102903	Steel	3/4	.045 (29.0)	9,000 (2.64)	0.72 (18)	1.02 (26)	0.44 (11)	1.5 (0.043)
102909	Stainless Steel							
102904	Steel	1	.056 (36.1)	10,800 (3.17)	0.75 (19)	1.31 (33)	0.56 (14)	2.25 (0.064)
102910	Stainless Steel							

*Based on full gas/air ratios at 5" w.c. mixture pressure. For other mixture pressures, reference correction table below.

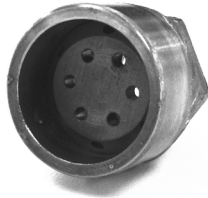
If burning in the open, increase capacities 20%.



Part Number	Material	Size of Pipe Thread "NPT"	Port Area in ² (mm ²)	Capacities BTU/hr (kW)*	Dimensions in (mm)			Weight of Each oz. (kg.)
					L	T	U	
103047	Steel	3/8	.014 (9.0)	2,900 (0.85)	0.59 (15)	0.41 (10)	1.25 (32)	0.5 (0.014)
102969	Stainless Steel							
103048	Steel	1/2	.022 (14.2)	5,000 (1.47)	0.72 (18)	0.53 (14)	0.875 (22)	0.75 (0.021)
102997	Stainless Steel							

*Based on full gas/air ratios at 5" w.c. mixture pressure. For other mixture pressures, reference correction table below.

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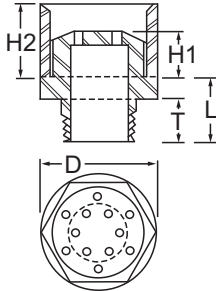
In both the commercial and industrial field, there is a large demand for various types of small blast burners. Most of these needs can be handled by a number of tips arranged in groups or combinations.

The Standard Steel Blast Tip consists of two pieces, a hexagonally shaped head with drilled ports and a protective steel ring. These tips are accurately machined and drilled and furnished only with 3/8" pipe thread.

The Standard Steel Tips are recommended for use in combustion chambers where they are not exposed to high

radiant heat and the ambient temperature does not exceed 600°F (315°C). Where tips are being used in combustion work at higher temperatures and the chamber is not supplied with ample secondary air, alloy rings are recommended.

Being small, Standard Steel Tips enable the engineer to make any shape of burner required to fit the job. They are used on pipe burners giving high capacity with exceptionally good turn-down range. The cupped feature prevents the flame from blowing off and enables them to be used in close combustion chambers where other types of tips would soon go out. The best applications of these tips will be found on low temperature operations such as candy furnaces, smokehouses, tank heaters, and core ovens.



Part Number	Size of Pipe Thread "NPT"	Burner Area in ² (mm ²)	Capacities BTU/hr (kW)*	Dimensions in (mm)					Weight of Each oz. (kg.)
				H1	H2	L	D	T	
16104-1	3/8	.059 (37.9)	12,000 (3.52)	0.36 (9)	-	0.55 (14)	0.88 (22)	0.34 (9)	0.75 (0.021)
102502	3/8	.059 (37.9)	12,000 (3.52)	0.36 (9)	0.47 (12)	0.55 (14)	0.88 (22)	0.34 (9)	1.75 (0.05)

*Based on full gas/air ratios at 5" w.c. mixture pressure. For other mixture pressures, reference correction table below.

Capacity Multipliers

Pressure in "w.c. (mbar)																				
Mixture Pressure	1/2"	1"	2"	3"	4"	5"	6"	7"	8"	9"	10"	11"	12"	13"	14"	15"	16"	20"	25"	30"
Multiplier	.316	.447	.631	.775	.893	1.00	1.11	1.18	1.26	1.34	1.41	1.48	1.55	1.61	1.67	1.73	1.79	2.00	2.24	2.45

Gas-Mixture Capacity of Standard Pipe

The most common application for tips in ovens of various sorts where long pipe burners are used to secure proper heat distribution over long lengths. To secure uniform length of flame throughout the entire burner length, it is important that certain factors of pipe size and capacity be

observed. The table below shows the amount of total mixture that can be handled by various pipe sizes based on velocity pressure of .3" to .5" which is usually satisfactory.

Pipe size, Inches	1	1-1/4	1-1/2	2	2-1/2	3	4	5	6
Mixture in CFH	800	1500	2200	3500	5500	8000	13000	30000	50000

