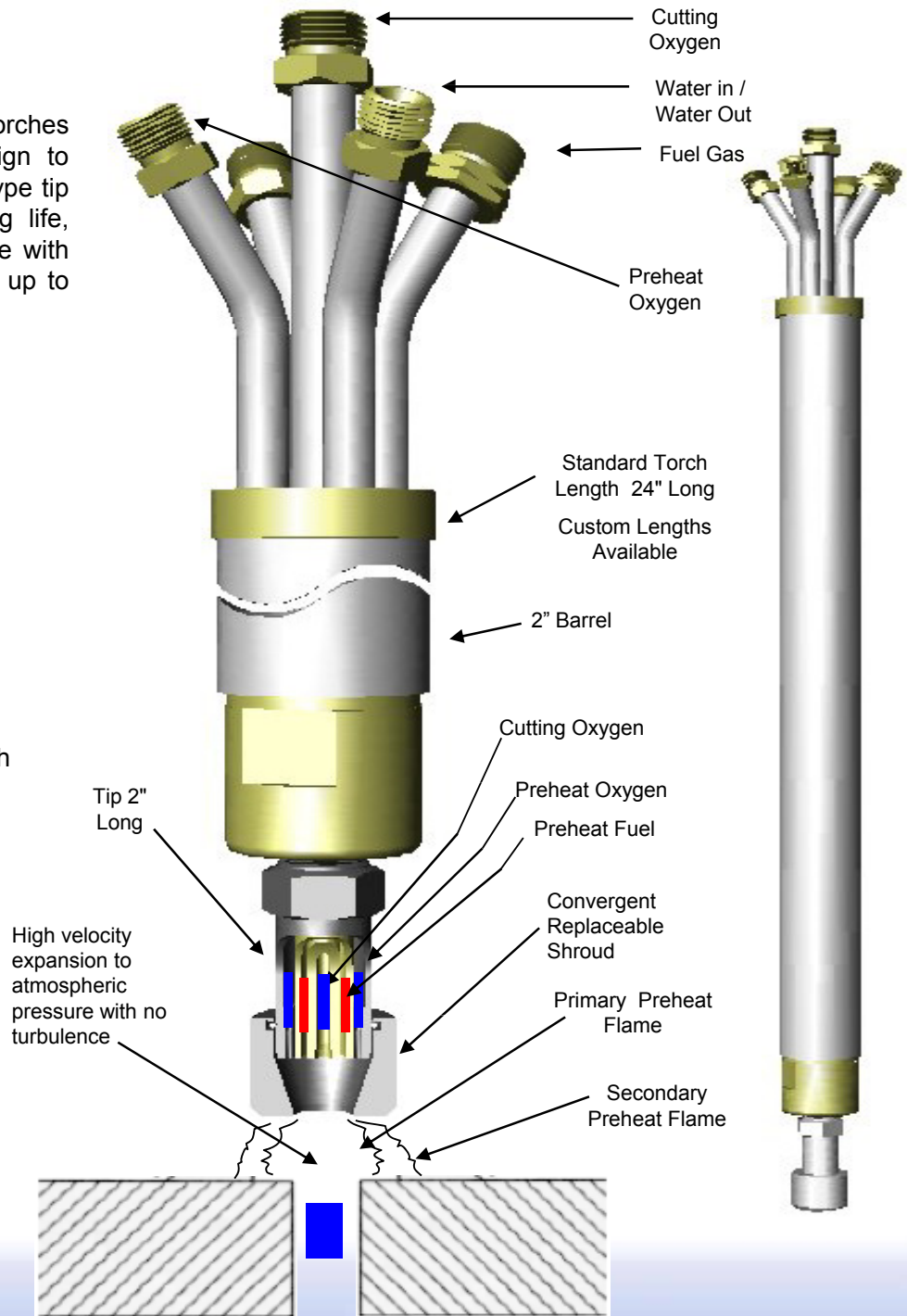


EM 2600 (EXTERNAL MIX) TORCHES & NOZZLES HIGH VOLUME, WATER COOLED, CASTER MACHINE TORCH

The **FLAME TECH® EM (External Mix)** torches and tips are of a completely new design to increase productivity. The **External Mix** type tip assures safety, high quality cutting, long life, ease of operation and economy. For use with propane or natural gas, cutting materials up to 22+ inches thick

OUTSTANDING FEATURES

- **Safe – No Flash Back**
External mixing eliminates any possibility of flash-back
- **Cool Running – No Overheating**
External mixing is engineered to run cool when cutting.
- **Extra Stand-Off Distance**
Conventional stand-off is less than 2" With EM (External Mix). 3" to 6" is common.
- **High Quality Cutting Surface**
Minimal slag – straight cut – square top.
- **Highly Energy Efficient**
Oxygen shielding of the fuel gas reduces consumption
- **Available With Protective Replaceable Nozzle Shroud**
Protective shroud for cooler, enhanced operation
- **Available In Air-Cooled and Water-Cooled Models**

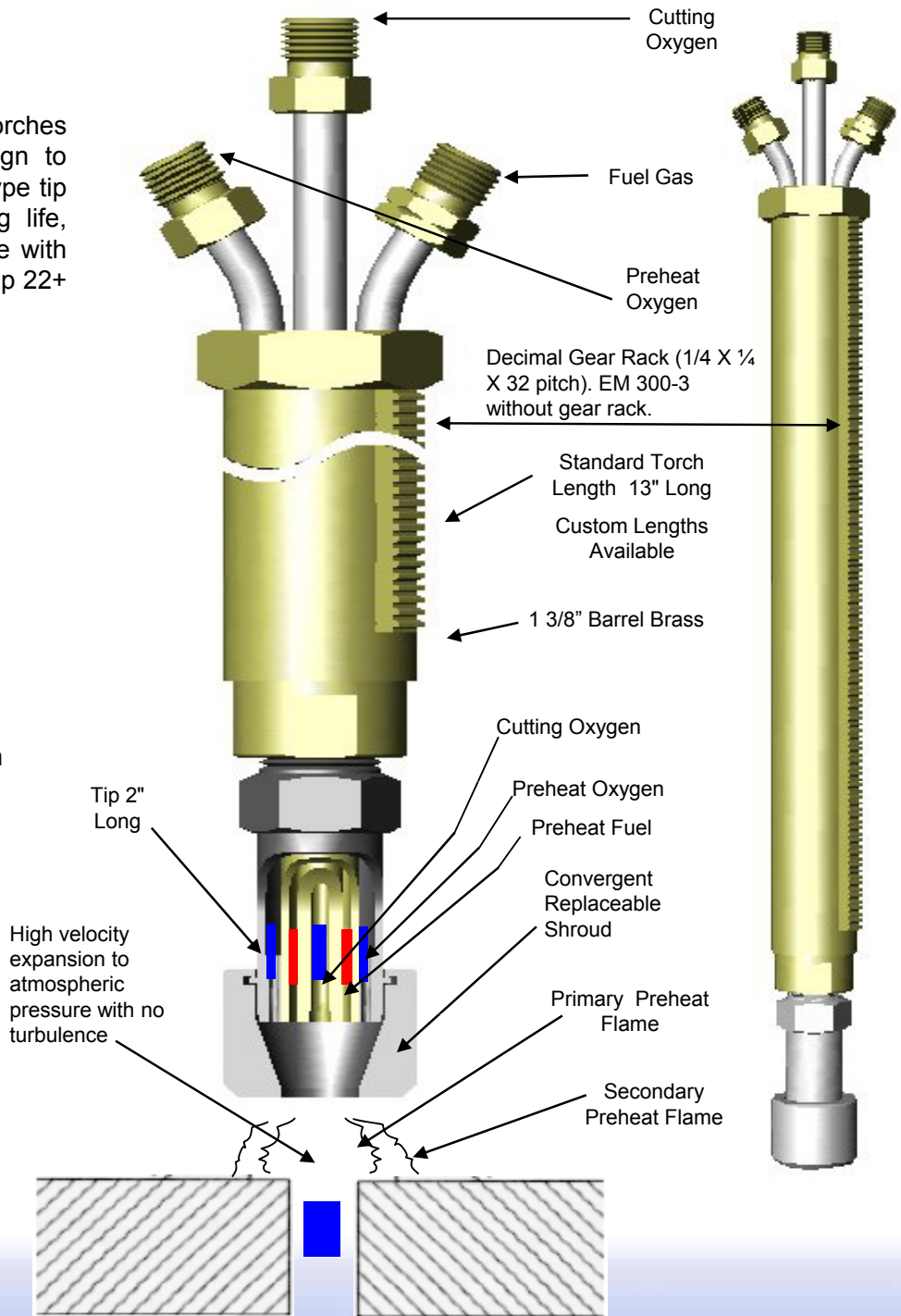


EM 300-2 (EXTERNAL MIX) TORCHES & NOZZLES HIGH VOLUME, AIR COOLED, CASTER MACHINE TORCH

The **FLAME TECH EM (External Mix)** torches and tips are of a completely new design to increase productivity. The **External Mix** type tip assures safety, high quality cutting, long life, ease of operation and economy. For use with propane or natural gas, cutting materials up to 22+ inches thick

OUTSTANDING FEATURES

- **Safe – No Flash Back**
External mixing eliminates any possibility of flash-back
- **Cool Running – No Overheating**
External mixing is engineered to run cool when cutting.
- **Extra Stand-Off Distance**
Conventional stand-off is less than 2" With EM (External Mix). 3" to 6" is common.
- **High Quality Cutting Surface**
Minimal slag – straight cut – square top.
- **Highly Energy Efficient**
Oxygen shielding of the fuel gas reduces consumption
- **Available With Protective Replaceable Nozzle Shroud**
Protective shroud for cooler, enhanced operation
- **Available in Air-Cooled and Water-Cooled Models**



FLAME TECH®

STEEL INDUSTRY PRODUCTS



EM-300-4C (EXTERNAL MIX) TORCHES & NOZZLES HIGH VOLUME, AIR COOLED TORCH, STRAIGHT & BEVEL CUTTING

The **FLAME TECH EM®** (External Mix) torches and tips are of a completely new design to increase productivity. The **External Mix** type tip assures safety, high quality cutting, long life, ease of operation and economy. For use with propane, propylene or natural gas, cutting materials up 22+ inches thick

OUTSTANDING FEATURES

▪ Safe – No Flash Back

External mixing eliminates any possibility of flash-back

▪ Cool Running – No Overheating

External mixing is engineered to run cool when cutting.

▪ Extra Stand-Off Distance

Conventional stand-off is less than 2" With EM (External Mix). 5" to 6" is common.

▪ High Quality Cutting Surface

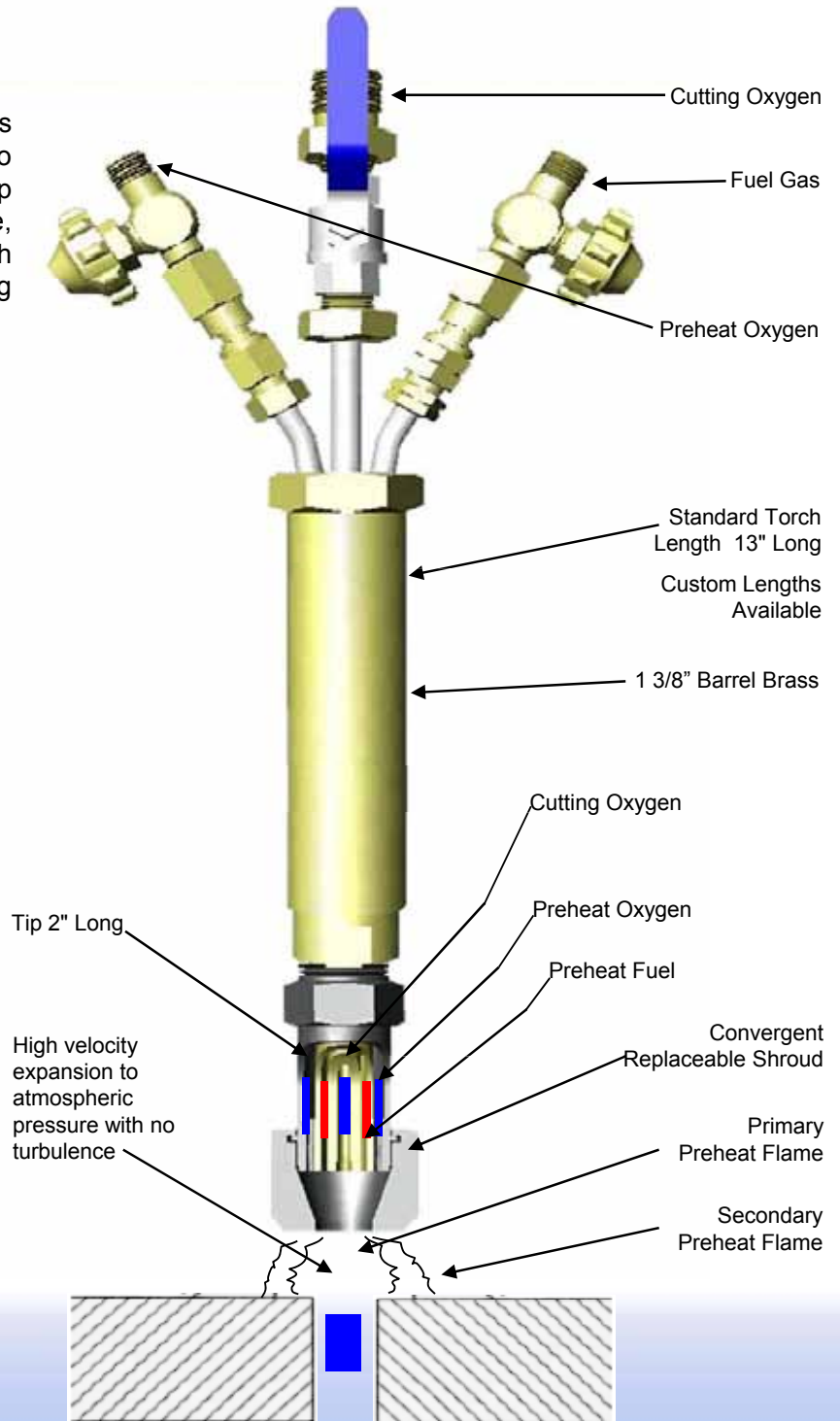
Minimal slag – straight cut – square top.

▪ Highly Energy Efficient

Oxygen shielding of the fuel gas reduces consumption

▪ Available With Protective Replaceable Nozzle Shroud

Protective shroud for cooler, enhanced operation



FLAME TECH®

FLAME TECH® EM (External Mix) MACHINE TORCHES

- EM 300-1** High volume, air-cooled, machine torch for use with the **EM** tips - with metric gear rack.
- EM 300-2** Same as **EM 300-1**, but with a decimal gear rack (1/4 x 1/4 x 32 pitch), for use with most domestic torch holders.
- EM 300-3** Same as **EM 300-1**, but without gear rack - for most steel mill, hot billet, cutting, applications.
- EM 600-3** Water cooled, without gear rack.

Standard Torch Length 13" - Custom Lengths Available

- EM 2600** High volume, water-cooled, machine torch 2" (50mm) Barrel for use with the **EM** tips.

Standard Torch Length 24" - Custom Lengths Available

FLAME TECH® EM (External Mix) TIPS

- EM-XXX** Two (2) piece natural gas - propane tip with **External Mixing** design for thick plate and hot billet Cutting sizes 100, 200, 300, 600, and 800.
- ES-2** Snap-on Shroud for EM nozzles

EXTERNAL MIX OPERATIONAL DATA AND INSTRUCTIONS FOR USE

The **EM** cutting torch is a external mixing design permitting the fuel gas and oxygen to be mixed externally at the exit end of the torch and tip. No internal mixing of fuel gas or oxygen occurs in the torch or tip. External mixing occurs due to the distribution of preheat gases and shielding gases around the cutting oxygen stream. Thus the **cutting oxygen stream must be turned on for the proper mixing of gases and preheating to occur**. This type of process produces an extremely long preheating zone, allowing high standoff of torch and tip to steel. The **EM** torch was designed for automatic cut-off operations, such as hot and cold sitting, continuous casting, billets, slab cuts, and end cropping.

The following are general instructions for use on typical conditions for cutting steel at temperatures of 1400 degrees Fahrenheit. Cold steel and non-typical conditions will require some adjustment to the procedures. Cut quality can vary depending on temperature and carbon content of steel, casting speed, steel quality, pressures, cutting speed, purity of oxygen, etc. Specific information for any cutting application should be obtained directly from **Flame Technologies, Inc.®**

1. After connecting torch to machine and securing fuel and oxygen lines, screw the **EM** nozzle and shroud into torch and adjust to a height of 5-6 inches from steel. Open all valves and check the tip and all connections for fuel and oxygen leaks.
2. Adjust the automatic torch holder and travel mechanism to allow for a slight pause (2-5 seconds) at the billet edge and travel time in accordance with the chart above.
3. Set preheat oxygen and fuel gas with the chart above. Open preheat oxygen and fuel gas valves and light the gas at about 2 inches below the tip end. The preheat flame should be blue in color by the tip end, and yellow in color as it gets further away. The whole preheat flame will be large, very soft and lazy when compared to the harsh, sharp cone preheats of conventional cutting torches. Adjust pressure at the regulator if necessary. The pressures given in the EM performance chart may be used as a starting point. Depending on conditions, small adjustments may be necessary for best performance.
4. Set cutting oxygen pressure with the EM performance chart. Set the timer to allow the cutting oxygen to come on 2 seconds before the pause at the edge of the billet. The cutting oxygen will cause the preheat flame to sharpen and is vital to successful performance. Adjust cutting oxygen to the pressure which will yield the most slag free cut.

External Mix Nozzle Operational and Performance Data

Metal Thickness (Inches) Cold Steel	Metal Thickness (Inches) Hot Steel	Nozzle Size	Cutting Oxygen		Pre-Heat Oxygen		Natural Gas		Speed (in/min)		Kerf Width *
			PSI	CFH	PSI	CFH	PSI	CFH	COLD	HOT	
2 - 4		100	90	750	10	700	20	600	14		.190
4 - 6		100	140	900	15	800	25	700	10		.190
4 - 6		200	130	1200	15	800	25	700	12		.220
	4 - 6	100	120	850	15	800	25	700		12	.200
	4 - 6	200	110	1000	15	800	25	700		16	.220
6 - 8		200	130	1200	20	900	30	800	10		.225
	6 - 8	200	110	1000	20	900	30	800		12	.235
	6 - 8	300	100	1400	20	900	30	800		14	.275
8 - 10		200	130	1200	20	900	30	800	8		.250
8 - 10		300	120	1700	20	900	30	800	10		.295
	8 - 10	200	140	1300	20	900	30	800		10	.260
	8 - 10	300	110	1600	20	900	30	800		12	.310
10 - 14		300	130	1900	25	1100	35	950	6		.325
	10 - 14	300	120	1700	20	900	35	950		8	.325
14 - 18+		600	130	2600	25	1100	35	950	4		.375
	14 - 22+	600	130	2600	25	1100	35	950		6	.375

Updated 1/1/08

* - NOTES: Kerf width measured when used with ES-2 converging shroud

Bottom surface of ES-2 Shroud should be 5 - 6 inches above top surface of billet