fts Technologies

ATmaP™ Surface Treatment Technology

CO_2 Research Study

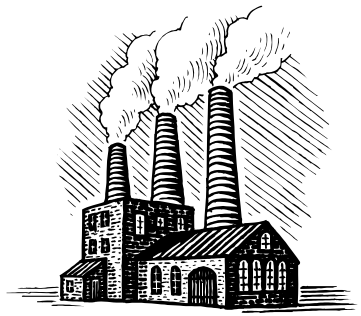
Comparing and Contrasting ATmaP™ To Adpro

Carbon Foot Print

Carbon Foot-print: *The amount of CO_2 emitted in to the atmosphere to generate the energy input required to run your operating process on a daily kWh basis.*

When one ton of carbon is combusted in the presence of oxygen it forms approximately 3.7 tons of CO_2.

For every 1 kWh required, 0.19 kg of CO_2 is produced through a natural gas energy plant, or 0.32 kg of CO_2 is produced through a coal energy plant.



CO_2 Emissions Due to Energy Consumption

- The graph below represents the amount of CO_2 each process will produce:
- For every gallon of gasoline burned, 8.70 Kg of CO_2 is produced
  - 3.40 metric tons/day = the equivalent of 390.80 gallons of gasoline a day *[AdPro]*
  - 0.28 metric tons/day = the equivalent of 32.49 gallons of gasoline a day [*ATmaP*]

	Based on a 16 hour day, 240 days per year - Natural Gas		
	Metric Tons / Day	**Metric Tons / Year**	**U.S.A. Tons / Year**
ATmaP	**0.28**	**67.85**	**74.79**
AdPro	**3.40**	**816.54**	**900.08**

The numbers included in the graph account for the amount of CO_2 released in to the atmosphere due to the operating of all ATmaP components from start to finish, and all AdPro components up to and including the RTO, with an operating booth of 12'x12'x25', RTO temperature of 1400°F, and 4,000 CFM, and efficiency rating of 60%.

EPA.gov provided the translation of gasoline to Kg of CO_2

How to Calculate The Amount of Natural Gas needed in CF, per year:

$$\{[SCFM*(60)*(16)*(240)]*[1.8*(\Delta T/100)]\}/1000$$

SCFM	: Standard Cubic Feet per Minute
60	: The Number of Minutes per Hour
16	: The Number of Hours in a Single Work Day
240	: The Number of Work Days in a Year
1.8	: The Number of BTU's Needed to Raise 1 SCFH of Air 100°F.
ΔT	: Change in Temperature, °F
100	: The Amount Calculated for SCFH, for the BTU's to Raise Temperature
1000	: Number of BTU's per Cubic Foot per Hour (CFH)

Total CF of Natural Gas Needed For The Process

Previously Calculated CF annually +

$$(((((480\text{volts})*(60\text{amps}))/1000_a)*3412)/1000_b)*16)*240)$$

Volts * Amps = Watts

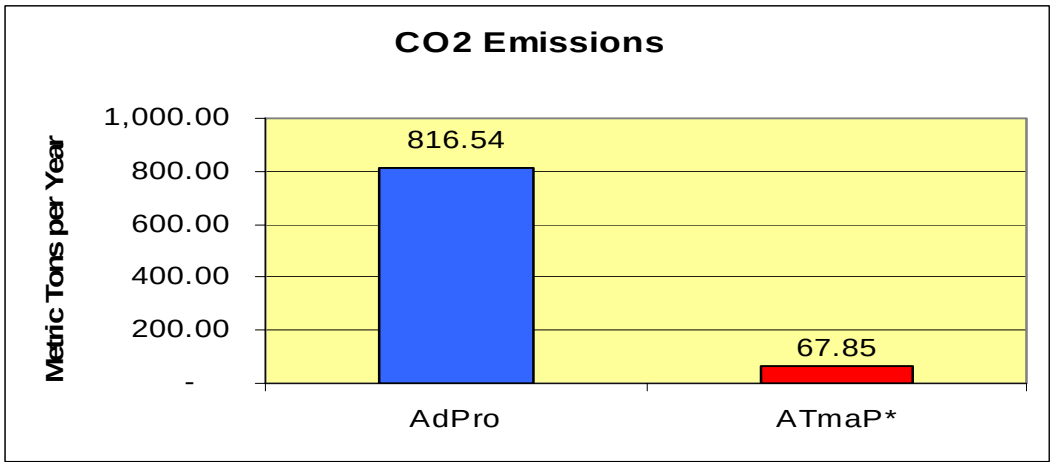
1000_a	: The Number of Watts in a kW
3412	: The Number of BTU's per kW
1000_b	: The Number of BTU's in a CFH
16	: Number of Hours per Work Day
240	: Number of Work Days per Year

Δ Temperature of Recuperative Thermal Oxidizer (RTO), and its Efficiency Rating

- The efficiency rating of the Recuperative Thermal Oxidizer (RTO) corresponds to its effectiveness at recirculating the energy generated by the combustion of the solvents. If your RTO is able to capture and re-use 60% of the energy created during the combustion process, then you in turn only have to use the equivalent amount of energy required to raise the temperature inside the RTO by 40% of the operating temperature. If the Operating temperature is 1400°F minus room temperature, then you're raising the temperature by 528°F with an outside power source, such as a coal or natural gas power plant.

- The temperature of the RTO (1400°F) minus room temperature (80°F), multiplied by 1 minus the efficiency rating of the RTO.

Comparing Adpro's Annual Carbon Foot Print to ATmaP's

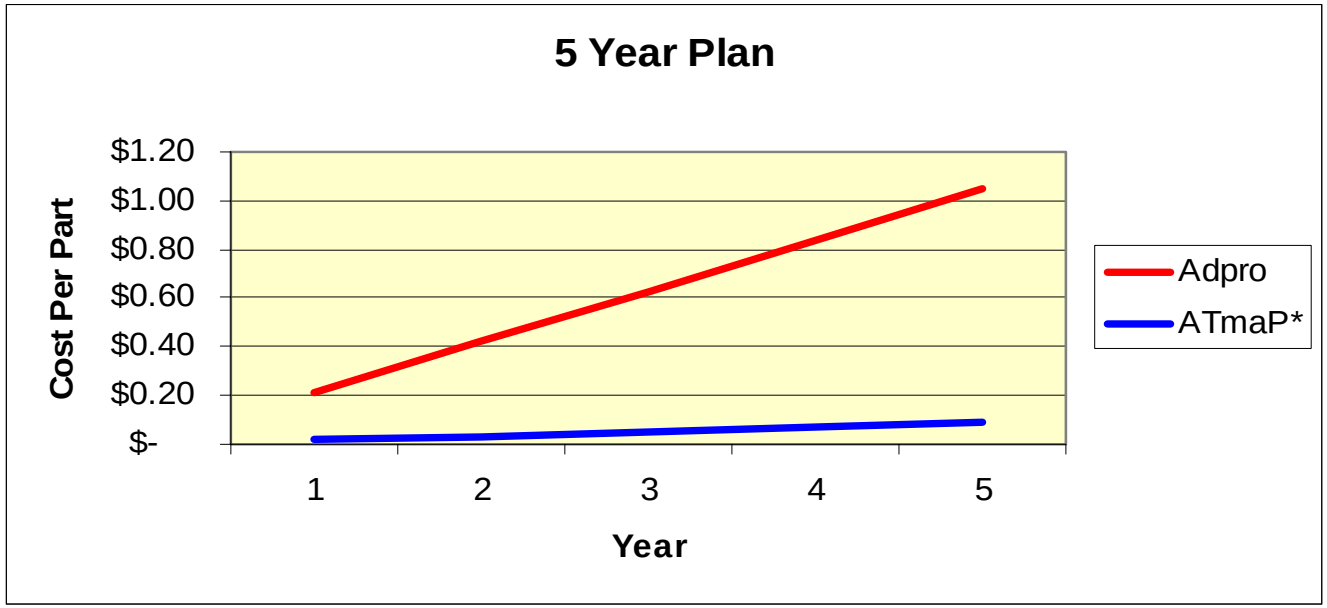


$$((\text{CF per year}/240_a)/16)*(1000_a)/3412)*(0.19)/(1000_b)*(1.5)*(16)*(240_b)$$

- 240_a : Number of work days in a year
- 16 : Number of hours in a single work day
- 1000_a : Number of BTU's per Cubic Foot per Hour (CFH)
- 3412 : Number of BTU's per KW of Electricity
- 0.19 : Number of Kg of CO_2 produced to generate 1 kWh
- 1000_b : Converting Kg to Metric Tons
- 1.5 : The constant density of CO_2
- 16 : The number of hours in a work day
- 240_b : The number of days in a work year

Figures used to generate the above graph were SCFM = 4000 ; Efficiency of RTO = 60% ; Number of fascias produced annually = 700,000 ; number of ATmaP units required = 1.92.

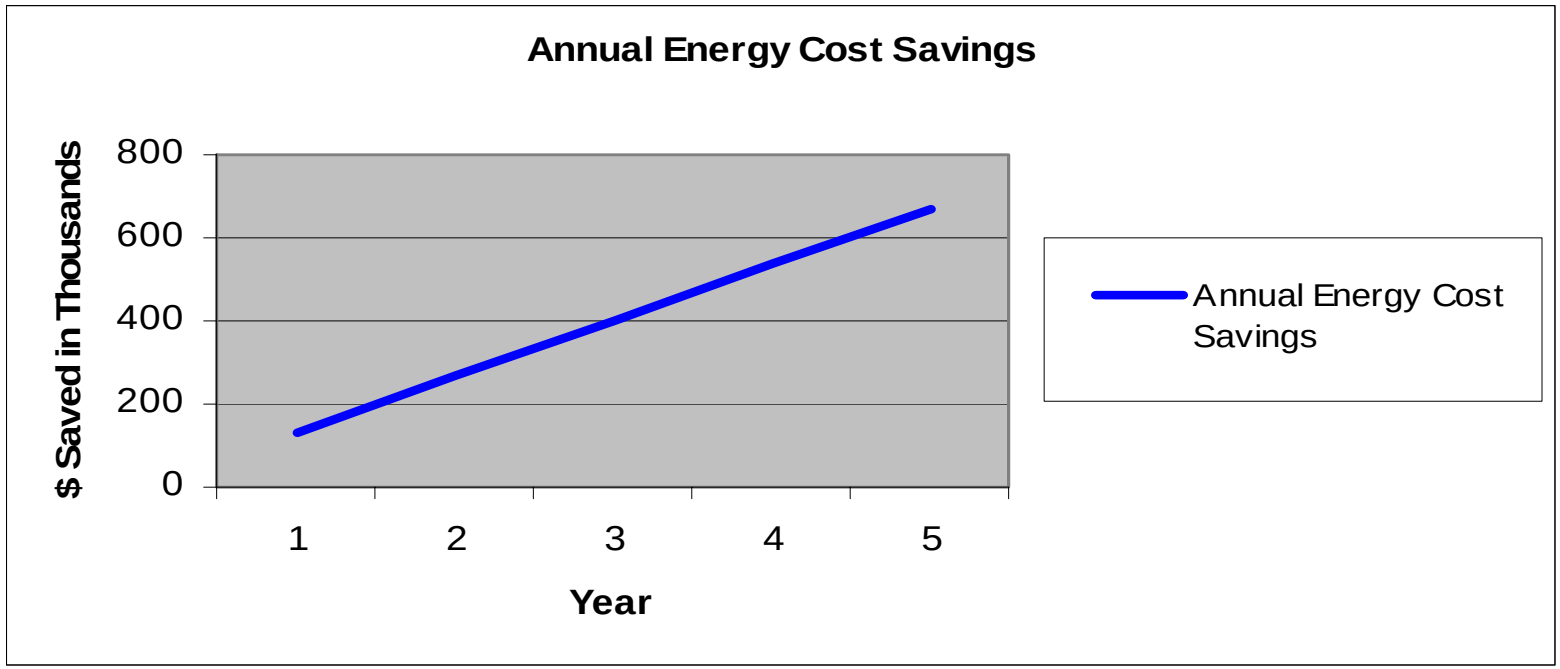
Energy Costs per Part:



Over the next 5 years you can see that using ATmaP™, rather than Adpro, can save you on average $0.96 per every part treated in energy costs.

Figures used to generate the above graph were SCFM = 4000 ; Efficiency of RTO = 60% ; Number of fascias produced annually = 700,000 ; number of ATmaP units required = 1.92.

Energy Cost Savings:



Implementing ATmaP* instead of Adpro, can save you $670,000 over the next 5 years in energy costs

Figures used to generate the above graph were SCFM = 4000 ; Efficiency of RTO = 60% ; Number of fascias produced annually = 700,000 ; number of ATmaP units required = 1.92.

What This Means…

- By using ATmaP™ instead of Adpro, in 1 year you can:
  - lower your carbon foot-print of the treatment process by 91.7%
  - Save over $134,000 in energy costs
  - Eliminate all VOC's and HAP's from the treatment process

Figures used to generate the above numbers were SCFM = 4000 ; Efficiency of RTO = 60% ; Number of fascias produced annually = 700,000 ; number of ATmaP units required = 1.92.

Contact

If there are any questions about the calculator, or what it is representing, please contact;

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