

Fluidized Bed Concentrator (FBC) with Bead Activated Carbon

Description and Applications Summary:

Captis Aire partner, Environmental C&C, designs and manufactures a complete line of Fluidized Bed Concentrators (FBC). Our modular design allows for independent adsorber and desorber sizing tailored to each application. Concentration ratios up to 5,000 to 1 are available for maximum energy efficiency and absolute minimum carbon footprint. Proprietary BAC (Bead Activated Carbon) media is a custom engineered product with unique physical properties utilizing nano-scale pore geometry for capture of organic gasses in process exhaust streams at the molecular level. VOC (solvent) recovery as well as energy efficient thermal treatment of the concentrated stream from desorber are available. With over 30 years in business, EC&C has 62 installations in the US and 5 foreign countries utilizing 5 fabrication vendors. 45 of 62 units are Recovery. We are pleased to contribute to projects with larger companies who design and install complete environmental and process control systems. The perfect solution to achieving energy efficiency, environmental compliance, reducing carbon footprint, possibly earning carbon credits all at the same time, with one system.

Operational Parameters - Comparative Example:

Regenerative Thermal Oxidizer (RTO) vs Fluidized Bed Concentrator (FBC) – 300,000 CFM

Parameters:	RTO	FBC	Advantages of FBC
Energy Usage, MJ	Up to 10x	1x	<ul style="list-style-type: none"> Lower operating costs due to reduced energy usage. Less Greenhouse Gas (GHG) emissions generated due to reduction in energy Case Study: 280,000 mmBTUs/year reduction
Greenhouse Gas (GHG) Emissions	Up to 5x	1x	<ul style="list-style-type: none"> Reduced energy usage and elimination of oxidation of emissions means reduced GHG emissions. Case Study: 14,000 tons/year CO₂e reduction
Emissions Treatment Temperature	>1400°F	175°F	<ul style="list-style-type: none"> Adsorption. No natural gas required to heat media to treat emissions
Media Desorption Temperature	>1400°F	400°F	<ul style="list-style-type: none"> Less energy for carbon media desorption.
Media depth, feet (ft)	16 ft	1 ft	<ul style="list-style-type: none"> Less Electricity (fan HP) required to move process air through less media depth.
Media Configuration	Packed (Static)	Fluidized (Moving)	<ul style="list-style-type: none"> Less Electricity (fan HP) required to move process air through fluidized media. Less susceptible to plugging from particulate
Fan Size, Horsepower (HP)	2400 HP	600 HP	<ul style="list-style-type: none"> Less HP due to less media Less HP due to fluidized vs packed media
Emissions Treatment	Oxidation to CO ₂	Adsorption (Capture) for sale	<ul style="list-style-type: none"> Emissions are NOT oxidized to CO₂, so no GHG are formed when treating air. Emissions, that would have been pollutants, could be collected and sold as valuable byproducts.
Footprint, feet (ft)	40 x 210 ft	40 x 100 ft	<ul style="list-style-type: none"> Less steel & weight due to small size
Media Reuse	Media Discarded	Media Reused	<ul style="list-style-type: none"> Continuous media desorption with 'in unit' regeneration capability & reuse.
Safety (Reliability)		Inherently Safer	<ul style="list-style-type: none"> Lower operating temperatures. No large heavy moving parts required by RTO's 30 Flow Reversals per Hour. No thermal cycling, easier maintenance.