



ECS, Inc.

Environmental Control Solutions

March 20, 2017

Mr. Chris Castillon
Camerons Coffee Company
5700 12th Avenue East
Shakopee, MN 55379

RE: Catalytic Oxidizer Air Pollution Control System Emissions

Dear Chris:

Per your request I have summarized the typical emissions from Coffee Roasters with a Catalytic Oxidizer Air Pollution Control System.

The emission rates are shown as both uncontrolled and controlled and are based on emission rate per ton of coffee roasted.

Pollutant	Uncontrolled Emissions (Before Catalytic Oxidizer)	Controlled Emissions (Catalytic Oxidizer Stack)
Particulate Matter (PM)	1.3 lb/ton	0.12 lb/ton
Condensable PM	5.0 lb/ton	ND
Volatile Organic Compounds (VOC's)	0.86 lb/ton	0.047 lb/ton
Carbon Monoxide (CO)	1.5 lb/ton	0.098 lb/ton
ND – None Detected		

The above are considered by the US EPA and the MPCA to be the "Criteria Emission" pollutants.

The catalytic oxidizer is designed to oxidize organic emissions created in the coffee roasting process with a destruction efficiency of 95-97%. The precious metal catalyst is a Platinum Palladium mixture and it functions to reduce the oxidation temperature of the organics present from the 1200-1400 deg. F range to 700 deg. F. The catalyst construction consists of a ceramic honeycomb monolith bed about 18"Wx53"L with approximately 200 cells per square inch (cpsi). The depth of the bed (cells) is approx. 8.8". This design provides maximum contact of the polluted airstream with the catalyst surface. The ceramic monolith is coated, via a chemical process, with a precious metal Platinum Palladium mixture that continuously undergoes an oxidation/reduction reaction. The precious metal is oxidized by taking oxygen from the air stream with a comparative weak bond then that bond is broken as that oxygen is used to "burn" or oxidize the organic pollutants present in the air stream. Due to the continuous oxidation/reduction reaction, the precious metal catalyst remains un-changed. At the same time, the organic pollutants are oxidized to Carbon Dioxide (CO₂) and Water Vapor (H₂O). As mentioned above, the conversion (oxidation) efficiency is 95-97%.

Let me know if you have any questions or need additional information.

Sincerely,
Environmental Control Solutions, Inc.

Robert A. Laska