

General Emissions from INOV8 Products

1. CO (carbon monoxide) – INOV8 uses an Allen Combustion Emission Analyzer using a calibrated sensor for basis. CO is typically measured at less than 100 PPM (parts per million).
2. NO_x (Oxides of Nitrogen) are generated at combustion temperatures above 2500^oF (1371^oC). The INOV8 flame temperatures are 1800^oF to 2000^oF to thus avoid generation of NO_x compounds.
3. SO₂ (Sulfur dioxide) waste automotive oils do not generally contain sulfur thus does not generate sulfur dioxide. Some diesel engines might have traces of sulfur in the fuel and thus in the oil but his would be very small.
4. CO₂ (Carbon Dioxide) INOV8 adjusts the combustion air so to provide 9 – 11% Carbon Dioxide. This number assures that some excess air is available to provide for complete combustion.
5. O₂ (Oxygen) the INOV8 burner is generally set to provide approximately 2 - 3 % excess oxygen.
6. Dust – In the United States, we identify the unburned residual as ash. There are 3½ pints of unburnable residue in one 55-gallon drum of waste oil. For this reason, the furnace must be cleaned frequently. Five hundred hours is a typical running time between cleanings for the furnace and about 300 for the boilers.
7. Soot – We identify soot as improperly burned fuel or free carbon. The INOV8 burner is to be set to give no visible soot. The Underwriters Laboratory Standard 296A allows a Spot Test of #4 for waste oil burning. Test results on the INOV8 Furnace when burning waste crankcase oil are #2.
8. Volatile Toxic Metals – Please review the attached Oil Analysis to identify the metals encountered in various waste oils. Lead is essentially non-existent since it has been removed from gasoline and engine bearings. Other metals encountered are: aluminum, chrome, copper, lead, tin, cadmium, Silver, nickel, and titanium. The metals contained in waste oil are oxidized as they pass through the combustion process.
9. PCDD/PCDF (Dioxins and Furans) - The only source of these chemicals to occur in combustion gasses is IF certain pre-cursors occurred in the fuel source. These would be compounds of Chlorine or Fluorine. In the United States, we are not allowed to burn fuels that contain halogens or various other pre-cursors of PCDD/PCDF.
10. Barometric Pressure (Static and dynamic) – The velocities throughout the furnace or boiler are not very small so dynamic pressures are the same as the static pressure. Our Instruction Manual calls for combustion chamber pressure of 0.04 inch of water column. The Manual also specifies proper chimney height and avoidance of elbows to achieve this level of static pressure.
11. The flue temperature of the furnace will vary around 500^oF depending on ash removal. The flue temperature of the boiler will be around 400^oF.
12. Moisture – For each gallon of fuel burned, the products of combustion contain one gallon of water in vapor form. Moisture will not be a problem for flue temperatures of 400 to 500 degrees.
13. Volumetric Flow – The ratio of air to fuel burned is 1350 Ft³ of 60^o F air for each gallon of fuel burned. Each gallon of fuel oil provides 140,000 BTU's.