



## Team Results for Clean Snowmobile Challenge 2010

### 2010 Clean Snowmobile Competition - Lab Emission Event Emission Data Sheet

Team Name : Kettering Univ  
 Model : KU  
 Engine : KU  
 Displacement[cc] : 1049cc  
 100% Speed : 7987  
 100% Torque : 91.3  
 No of Strokes : 4  
 Fuel : Gasoline H/C: 1.85 O/C: 0.07

ModeNum	:	1	2	3	4	5
Weighting	:	0.12	0.27	0.25	0.31	0.05
Power kW	:	71.9	32.3	18.2	9.6	0.0
HC_m g/hr	:	172.24	7.94	3.55	1.03	0.27
CO_m g/hr	:	12252.38	2.88	1.13	0.05	0.00
NOx_m g/hr	:	14.12	629.37	97.34	51.72	2.43
N2O_m g/hr	:	0.00	0.00	0.00	0.00	0.00
Soot_m mg/hr	:	8.94	8.38	7.61	4.68	2.09
W_HC g/hr	:	20.67	2.15	0.89	0.32	0.01
W_CO g/hr	:	1470.29	0.78	0.28	0.02	0.00
W_NOx g/hr	:	1.69	169.93	24.33	16.03	0.12
W_HCNOx g/hr	:	22.36	172.07	25.22	16.35	0.13
W_Soot mg/hr	:	1.07	2.26	1.90	1.45	0.10

Total Weighted Power [kW] 24.894

#### Weighted Emissions

	HC	CO	NOx	HC+NOx
Total Mass [g/hr]	24.0	1471.4	212.1	236.1
Specific Mass [g/kW-hr]	1.0	59.1	8.5	9.5

Total Soot [mg/hr] 6.8 Specific Soot [mg/kW-hr] 0.3  
 BSFC [g/kW-hr] 342.8

#### Not Used for Competition

	CO2	N2O	CH4
Total Mass [g/hr]	54581	0.00	26.82
Specific Mass [g/kW-hr]	6550	0.00	3.22

#### EMISSION TESTS:

	Value	Limit	Result
Power	71.9	<96.94 kW	PASS
Soot	0.273	<100 mg/kW-hr	PASS
CO	59.11	<275 g/kW-hr	PASS
HC + NOX	9.49	<90 g/kW-hr	PASS
E-Score	188.9	>100	PASS
Valid Data for All 5 Modes			PASS

LAB EMISSION TEST PASS



## Team Results for Clean Snowmobile Challenge 2010

Modal Raw Data : Engine / Environmental

ModeNum		1	2	3	4	5
Total Points	points	313	1261	1197	1202	1186
PtsInMode	points	313	1261	1197	1202	1186
Speed	rpm	7986.41	6790.29	5953.27	5192.88	1671.86
Torque	Nm	85.95	45.48	29.18	17.72	0.00
Power	kW	71.88	32.34	18.19	9.64	0.00
BSFC	g/kw-hr	326.14	290.22	350.09	444.46	**
Fuel	g/hr	23443.94	9386.74	6368.60	4283.47	1643.25
T_int	degC	18.78	2.32	-7.40	0.36	10.30
RelHumid	%	31.17	19.57	19.47	19.73	18.71
Baro	in Hg	29.75	29.75	29.77	29.77	29.77
Baro	mmHg	755.65	755.58	756.06	756.22	756.16
Pvap_kPa	kPa	0.58	0.14	0.07	0.12	0.21
Pvap_inHg	inHg	0.17	0.04	0.02	0.04	0.06
AbsHumidity	grains/lb	25.16	5.99	3.18	5.34	9.27
SatPres	kPa	100.17	100.60	100.73	100.70	100.60
Hum Factor		0.81	0.76	0.75	0.75	0.76
F_fac		0.97	0.93	0.91	0.93	0.95
K_fac		0.99	0.96	0.94	0.96	0.97
Humidity	g/kg	3.59	0.86	0.45	0.76	1.32
H2		1.46	0.00	0.00	0.00	0.00
WetDry Factor		0.88	0.87	0.89	0.89	0.89



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### Modal Emissions Concentrations

ModeNum		1	2	3	4	5
THC	ppmC1	1113.45	112.96	62.95	28.01	19.30
CO	%	3.92	0.00	0.00	0.00	0.00
N2O	ppm	0.10	3.43	1.03	1.36	0.56
CH4	ppm	150.32	20.98	11.09	10.61	12.62
CO2	%	11.12	13.33	11.29	11.69	11.80
O2	%	0.31	0.47	3.56	2.93	2.76
CNOx	ppm	27.53	2698.19	520.45	425.72	52.55
AHC	ppm	76.71	3.73	1.21	0.14	0.00
C2H2	ppm	2.49	0.66	0.41	0.30	0.31
C2H4	ppm	37.36	2.78	2.70	0.66	0.18
C3H6	ppm	7.80	1.65	0.82	0.30	0.14
C4H6	ppm	18.28	0.18	0.11	0.06	0.06
ETOH	ppm	13.52	1.52	1.84	1.37	1.31
H2O	%	12.47	13.14	11.02	11.31	11.43
HCHO	ppm	1.07	3.79	2.92	0.60	0.13
HCN	ppm	2.50	0.52	0.28	0.14	0.19
HNCO	ppm	16.43	4.33	3.02	1.16	0.88
MECHO	ppm	3.31	0.02	0.01	0.00	0.00
NC5	ppm	0.00	0.00	0.00	0.00	0.00
NH3	ppm	574.08	0.46	0.03	0.02	0.00
NO	ppm	33.64	3566.91	682.23	548.71	58.72
SO2	ppm	1.28	1.94	1.32	1.25	1.22
Soot	mg/m3	0.036	0.074	0.082	0.078	0.092
ModalAFR_MO	-	11.799	13.525	16.420	15.760	15.592