



## Team Results for Clean Snowmobile Challenge 2010

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

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Team Name       : Univ of Idaho
Model           : UI
Engine          : UI
Displacement[cc] : 593cc
100% Speed     : 7957
100% Torque    : 91.1
No of Strokes  : 2
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	:	75.5	33.2	19.2	10.8	0.0
HC_m g/hr	:	5040.93	584.55	421.00	682.72	170.02
CO_m g/hr	:	26503.23	3178.33	3076.62	2216.82	59.15
NOx_m g/hr	:	340.93	362.66	42.81	8.13	0.40
N2O_m g/hr	:	0.00	0.00	0.00	0.00	0.00
Soot_m mg/hr	:	4415.27	187.11	242.57	54.72	818.24
W_HC g/hr	:	604.91	157.83	105.25	211.64	8.50
W_CO g/hr	:	3180.39	858.15	769.16	687.21	2.96
W_NOx g/hr	:	40.91	97.92	10.70	2.52	0.02
W_HCNOx g/hr	:	645.82	255.75	115.95	214.16	8.52
W_Soot mg/hr	:	529.83	50.52	60.64	16.96	40.91

Total Weighted Power [kW] 26.188

Weighted Emissions

	HC	CO	NOx	HC+NOx
Total Mass [g/hr]	1088.1	5497.9	152.1	1240.2
Specific Mass [g/kW-hr]	41.6	209.9	5.8	47.4

Total Soot [mg/hr] 698.9      Specific Soot [mg/kW-hr] 26.7  
 BSFC [g/kW-hr] 372.6

Not Used for Competition

	CO2	N2O	CH4
Total Mass [g/hr]	47828	0.00	254.65
Specific Mass [g/kW-hr]	5739	0.00	30.56

EMISSION TESTS:

	Value	Limit	Result
Power	75.5	<96.94 kW	PASS
Soot	26.687	<100 mg/kW-hr	PASS
CO	209.94	<275 g/kW-hr	PASS
HC + NOX	47.36	<90 g/kW-hr	PASS
E-Score	125.9	>100	PASS
Valid Data for All 5 Modes			PASS

LAB EMISSION TEST      PASS



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### Modal Raw Data : Engine / Environmental

ModeNum		1	2	3	4	5
Total Points	points	315	1195	1181	1197	1207
PtsInMode	points	315	1195	1181	1197	1207
Speed	rpm	7998.13	6760.27	5972.23	5179.79	1203.16
Torque	Nm	90.17	46.93	30.71	19.94	0.00
Power	kW	75.52	33.22	19.21	10.82	0.00
BSFC	g/kw-hr	440.18	332.35	364.40	448.34	**
Fuel	g/hr	33241.69	11042.27	6998.47	4850.25	568.92
T_int	degC	23.90	25.39	23.64	21.86	21.17
RelHumid	%	66.07	50.54	25.15	23.19	24.24
Baro	in Hg	29.76	29.76	29.76	29.76	29.76
Baro	mmHg	755.92	755.97	755.90	755.90	755.78
Pvap_kPa	kPa	1.62	1.34	0.61	0.51	0.51
Pvap_inHg	inHg	0.48	0.40	0.18	0.15	0.15
AbsHumidity	grains/lb	71.18	58.77	26.44	22.14	22.30
SatPres	kPa	99.16	99.44	100.17	100.27	100.25
Hum Factor		1.00	1.00	1.00	1.00	1.00
F_fac		1.00	1.00	0.99	0.98	0.98
K_fac		1.00	1.00	1.00	0.99	0.99
Humidity	g/kg	10.17	8.40	3.78	3.16	3.19
H2		2.51	0.60	0.99	1.11	0.11
WetDry Factor		0.90	0.89	0.89	0.90	0.95



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### Modal Emissions Concentrations

ModeNum		1	2	3	4	5
THC	ppmC1	21574.67	6548.58	7540.55	18413.60	19304.53
CO	%	5.62	1.76	2.73	2.96	0.33
N2O	ppm	0.06	0.43	0.17	0.45	0.44
CH4	ppm	944.92	215.06	209.43	310.06	148.68
CO2	%	6.45	9.95	9.05	8.28	4.20
O2	%	4.49	3.09	3.64	4.55	13.68
CNOx	ppm	439.97	1225.06	231.19	66.13	13.64
AHC	ppm	1320.03	321.97	485.50	1181.19	1438.47
C2H2	ppm	211.53	103.18	89.46	229.06	81.65
C2H4	ppm	1277.01	807.41	370.46	192.66	127.26
C3H6	ppm	502.76	126.24	170.22	82.01	53.82
C4H6	ppm	32.75	8.99	6.73	7.05	7.30
ETOH	ppm	515.39	38.39	134.46	869.56	737.03
H2O	%	10.21	11.37	10.89	10.46	4.90
HCHO	ppm	1156.37	572.12	471.42	148.76	114.53
HCN	ppm	20.42	41.92	9.97	5.42	0.91
HNCO	ppm	152.79	122.11	77.65	12.72	2.65
MECHO	ppm	488.96	142.92	146.97	179.16	146.22
NC5	ppm	42.18	0.00	7.21	484.38	555.15
NH3	ppm	12.41	10.49	5.29	3.09	0.09
NO	ppm	384.27	1152.40	188.34	54.41	6.90
SO2	ppm	66.14	33.30	14.85	1.15	0.06
Soot	mg/m3	10.598	1.271	2.609	0.810	40.178
ModalAFR_MO	-	14.064	15.028	14.967	15.742	42.028