



# Team Results for Clean Snowmobile Challenge 2014 Team 8 ECO



## 2014 Clean Snowmobile Competition - Lab Emission Event Emission Data Sheet

Test Date : 2014/03/07 16:47:17  
Team Name : Buffalo  
Team Number : 8  
Model : Polaris 600IQ  
Engine : Briggs and Stratton  
Displacement[cc] : 952.00  
100% Speed : 3314  
100% Torque : 111.9  
No of Strokes : 4  
Fuel : diesel H/C: 1.80 O/C: 0.00

ModeNum	:	1	2	3	4	5
Weighting	:	0.12	0.27	0.25	0.31	0.05
Power kW	:	35.8	16.9	12.0	4.8	0.0
HC_m g/hr	:	0.00	0.00	0.00	0.00	0.00
CO_m g/hr	:	0.01	0.14	0.01	0.06	0.00
NOx_m g/hr	:	133.32	78.53	55.70	23.56	9.62
Soot_m mg/hr	:	5646.68	719.67	642.97	341.34	71.31
N2O_m mg/hr	:	0.03	0.02	0.01	0.01	0.00
CO2_m g/hr	:	32512.96	14053.43	10334.98	4931.37	1282.55
CH4_m g/hr	:	0.01	0.02	0.04	0.03	0.01
W_HC g/hr	:	0.00	0.00	0.00	0.00	0.00
W_CO g/hr	:	0.00	0.04	0.00	0.02	0.00
W_NOx g/hr	:	16.00	21.20	13.92	7.30	0.48
W_HCNOx g/hr	:	16.00	21.20	13.92	7.30	0.48
W_Soot mg/hr	:	677.60	194.31	160.74	105.82	3.57
W_N2O g/hr	:	0.00	0.00	0.00	0.00	0.00
W_CO2 g/hr	:	3901.56	3794.43	2583.74	1528.73	64.13
W_CH4 g/hr	:	0.00	0.01	0.01	0.01	0.00

Total Weighted Power [kW] 13.348

### Weighted Emissions

	HC	CO	NOx	HC+NOx
Total Mass [g/hr]	0.00	0.06	58.91	58.91
Specific Mass [g/kW-hr]	0.00	0.00	4.41	4.41
BSFC [g/kW-hr]	272.6			

Total Soot [mg/hr] 1142.04 Specific Soot [mg/kW-hr] 85.56

### Not Used for Competition

Total N2O [mg/hr]	0.01	Specific N2O [mg/kW-hr]	0.00
Total CO2 [g/hr]	11872.58	Specific CO2 [g/kW-hr]	889.48
Total CH4 [g/hr]	0.03	Specific CH4 [g/kW-hr]	0.00
RMC BSFC [g/kW-hr]			

### EMISSION TESTS:

	Value	Limit	Result
Power	38.85	<96.94 kW	PASS
Soot	85.56	<100 mg/kW-hr	PASS
CO	0.00	<275 g/kW-hr	PASS
HC + NOX	4.41	<90 g/kW-hr	PASS
E-Score	207.06	>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	182	1200	1200	2083	1200
PtsInMode	points	184	3050	1500	3470	1800
Speed	rpm	3312.28	2817.44	2489.64	2154.79	871.62
Torque	Nm	103.31	57.16	46.19	21.22	0.00
Power	kW	35.83	16.86	12.04	4.79	0.00
BSFC	g/kw-hr	284.99	261.76	269.57	323.56	**
Fuel	g/hr	10212.21	4414.20	3246.19	1548.96	402.84
T_int	degC	16.61	16.98	16.72	16.43	13.35
RelHumid	%	24.35	25.59	24.74	25.86	25.16
Baro	in Hg	28.75	28.73	28.74	28.73	28.74
Baro	mmHg	730.18	729.85	730.01	729.66	730.04
Pvap_kPa	kPa	0.40	0.43	0.41	0.42	0.34
Pvap_inHg	inHg	0.12	0.13	0.12	0.12	0.10
AbsHumidity	grains/lb	17.99	19.32	18.41	18.94	15.44
SatPres	kPa	96.95	96.88	96.92	96.86	96.99
Hum Factor		0.79	0.79	0.79	0.79	0.78
F_fac		1.00	1.00	1.00	1.00	0.99
K_fac		1.02	1.02	1.02	1.02	1.01
Humidity	g/kg	2.57	2.76	2.63	2.71	2.21
H2		0.00	0.00	0.00	0.00	0.00
WetDry Factor		0.89	0.92	0.93	0.95	0.97



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## Modal Emissions Concentrations

ModeNum		1	2	3	4	5
THC	ppmC1	0.00	0.00	0.00	0.00	0.00
CO	%	0.00	0.00	0.00	0.00	0.00
N2O	ppm	0.92	0.88	0.89	1.17	0.96
CH4	ppm	0.14	0.39	0.68	0.99	0.86
CO2	%	11.54	8.09	7.03	5.27	3.51
O2	%	2.97	8.31	9.96	12.71	15.42
CNOx	ppm	452.51	432.65	362.68	240.78	251.53
AHC	ppm	0.00	0.00	0.00	0.00	0.00
C2H2	ppm	1.46	1.16	1.03	0.93	0.83
C2H4	ppm	0.06	0.05	0.08	0.12	0.08
C3H6	ppm	0.01	0.02	0.02	0.03	0.05
C4H6	ppm	0.09	0.11	0.05	0.05	0.03
ETOH	ppm	0.01	0.18	0.32	0.08	0.13
H2O	%	10.73	7.66	6.60	4.88	3.38
HCHO	ppm	0.57	0.28	0.21	0.45	0.16
HCN	ppm	0.89	0.54	0.52	0.47	0.37
HNCO	ppm	1.21	2.57	1.76	1.76	1.34
MECHO	ppm	0.00	0.00	0.00	0.00	0.00
NC5	ppm	0.02	0.02	0.02	0.39	0.03
NH3	ppm	0.11	0.05	0.03	0.04	0.02
NO	ppm	469.58	291.58	107.61	81.46	43.87
NO2	ppm	104.17	254.39	351.52	222.77	278.07
Soot	mg/m3	36.82	7.61	8.04	6.69	3.58
AFR	:1	17.09	24.80	28.68	38.64	58.53



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Measurement Accuracy (SAE paper 961804)

ModeNum	H2_XLS %	ModalHC_Dry %	ModalFTIR_H2O %	N2 %	Ar %	AFR :1	Tr_Eff -
1	0.000	0.000	10.731	80.535	0.931	17.059	0.850
2	0.000	0.000	7.663	80.466	0.930	24.749	0.588
3	0.000	0.000	6.603	80.067	0.926	28.626	0.509
4	0.000	0.000	4.884	79.453	0.918	38.561	0.379
5	0.000	0.000	3.378	79.212	0.916	58.405	0.253

ModeNum	ModalWHC %	ModalC1 %	ModalC8 %	ModalSUM_HC %	ModalT_Emiss %	ModalError %
1	0.000	**	**	**	**	**
2	0.000	**	**	**	**	**
3	0.000	**	**	**	**	**
4	0.000	**	**	**	**	**
5	0.000	**	**	**	**	**

# Power Run

## Team 8 ECO

TeamNumber	8
TeamName	Buffalo
Model	Polaris 600IQ
Engine	Briggs and Stratton

Displacement cc	952.00
RatedSpeed	3314
RatedTorque	111.9

