



# Team Results for Clean Snowmobile Challenge 2014 Team 8



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

Test Date : 2014/03/07 17:37:03  
 Team Name : Buffalo  
 Team Number : 8  
 Model : Polaris 600IQ  
 Engine : Briggs and Stratton  
 Displacement[cc] : 952.00  
 100% Speed : 3304  
 100% Torque : 101.5  
 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	:	33.8	17.8	6.9	3.7	0.0
HC_m g/hr	:	0.00	0.00	0.00	0.00	0.00
CO_m g/hr	:	0.49	0.01	0.01	0.00	0.00
NOx_m g/hr	:	189.77	95.72	37.33	22.30	9.64
Soot_m mg/hr	:	2583.75	958.97	545.14	440.55	393.97
N2O_m mg/hr	:	0.03	0.02	0.01	0.01	0.01
CO2_m g/hr	:	31480.27	15387.44	7147.30	4565.61	1754.97
CH4_m g/hr	:	0.03	0.02	0.02	0.03	0.04
W_HC g/hr	:	0.00	0.00	0.00	0.00	0.00
W_CO g/hr	:	0.06	0.00	0.00	0.00	0.00
W_NOx g/hr	:	22.77	25.84	9.33	6.91	0.48
W_HCN0x g/hr	:	22.77	25.84	9.33	6.91	0.48
W_Soot mg/hr	:	310.05	258.92	136.28	136.57	19.70
W_N2O g/hr	:	0.00	0.01	0.00	0.00	0.00
W_CO2 g/hr	:	3777.63	4154.61	1786.82	1415.34	87.75
W_CH4 g/hr	:	0.00	0.00	0.01	0.01	0.00

Total Weighted Power [kW] 11.739

### Weighted Emissions

	HC	CO	NOx	HC+NOx
Total Mass [g/hr]	0.00	0.06	65.34	65.34
Specific Mass [g/kW-hr]	0.00	0.01	5.57	5.57
BSFC [g/kW-hr]	310.8			

Total Soot [mg/hr] 861.53 Specific Soot [mg/kW-hr] 73.39

### Not Used for Competition

Total N2O [mg/hr]	0.02	Specific N2O [mg/kW-hr]	0.00
Total CO2 [g/hr]	11222.15	Specific CO2 [g/kW-hr]	955.96
Total CH4 [g/hr]	0.02	Specific CH4 [g/kW-hr]	0.00
RMC BSFC [g/kW-hr]			

### EMISSION TESTS:

	Value	Limit	Result
Power	35.14	<96.94 kW	PASS
Soot	73.39	<100 mg/kW-hr	PASS
CO	0.01	<275 g/kW-hr	PASS
HC + NOX	5.57	<90 g/kW-hr	PASS
E-Score	206.29	>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	601	1200	1200	1200	1200
PtsInMode	points	1201	1500	1499	1500	1800
Speed	rpm	3306.16	2806.67	2479.39	2144.83	1258.08
Torque	Nm	97.69	60.71	26.61	16.31	0.00
Power	kW	33.82	17.84	6.91	3.66	0.00
BSFC	g/kw-hr	292.34	270.88	324.88	391.57	**
Fuel	g/hr	9888.08	4833.14	2244.94	1434.04	551.23
T_int	degC	14.75	14.91	16.32	16.94	13.12
RelHumid	%	25.13	24.44	24.56	24.92	24.57
Baro	in Hg	28.76	28.76	28.77	28.76	28.77
Baro	mmHg	730.43	730.58	730.68	730.46	730.83
Pvap_kPa	kPa	0.37	0.36	0.40	0.42	0.33
Pvap_inHg	inHg	0.11	0.11	0.12	0.12	0.10
AbsHumidity	grains/lb	16.71	16.39	17.84	18.75	14.87
SatPres	kPa	97.01	97.04	97.02	96.97	97.10
Hum Factor		0.78	0.78	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	2.39	2.34	2.55	2.68	2.12
H2		0.00	0.00	0.00	0.00	0.00
WetDry Factor		0.92	0.93	0.95	0.96	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	0.88	0.91	1.03	1.11	2.06
CH4	ppm	0.22	0.22	0.46	0.72	2.23
CO2	%	8.58	7.49	5.50	4.79	3.22
O2	%	7.61	9.20	12.30	13.41	15.83
CNOx	ppm	494.92	445.91	274.81	223.68	169.32
AHC	ppm	0.00	0.00	0.00	0.00	0.00
C2H2	ppm	1.22	1.00	0.87	1.03	0.90
C2H4	ppm	0.08	0.11	0.11	0.09	0.19
C3H6	ppm	0.02	0.05	0.03	0.05	0.06
C4H6	ppm	0.14	0.07	0.04	0.05	0.14
ETOH	ppm	0.47	0.65	0.58	0.52	0.75
H2O	%	7.89	7.05	5.08	4.47	3.09
HCHO	ppm	0.20	0.11	0.10	0.11	0.06
HCN	ppm	0.59	0.48	0.45	0.40	0.29
HNCO	ppm	2.34	1.93	1.15	0.92	0.89
MECHO	ppm	0.00	0.00	0.00	0.00	0.00
NC5	ppm	0.00	0.01	0.01	0.01	0.01
NH3	ppm	0.01	0.01	0.01	0.02	0.01
NO	ppm	436.66	179.00	74.29	39.04	20.10
NO2	ppm	193.71	389.74	274.32	243.75	197.08
Soot	mg/m3	12.91	8.60	7.72	8.50	13.31
AFR	:1	23.39	26.80	36.89	42.54	63.68



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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	7.894	80.190	0.927	23.343	0.622
2	0.000	0.000	7.050	80.030	0.925	26.750	0.546
3	0.000	0.000	5.077	79.256	0.916	36.807	0.399
4	0.000	0.000	4.473	79.233	0.916	42.450	0.346
5	0.000	0.000	3.091	78.936	0.912	63.537	0.234

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

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

Displacement cc	952.00
RatedSpeed	3304
RatedTorque	101.5

