

**EPA Protocol Gas Audit Results**  
**Tri-Blend NO/SO2/CO2 Gases - Certified According to EPA Traceability Protocol**  
**EPA Cylinder Gas Assays: April 2003 - February 2004**

Gas Vendor	Gas Conc. Level	NO					SO2					CO2				
		Tag Value (ppm NO)	Audit Result		Vendor Analytical Technique	Reference Standard	Tag Value (ppm SO2)	Audit Result		Vendor Analytical Technique	Reference Standard	Tag Value (% CO2)	Audit Result		Vendor Analytical Technique	Reference Standard
			Original Tag Value	Reanalyzed Value				Original Tag Value	Reanalyzed Value				Original Tag Value	Reanalyzed Value		
Air Liquide	Low	54.0	Pass		FTIR	GMIS	47.5	Pass		FTIR	GMIS	5.0	Pass		FTIR	GMIS
	Mid	401	Pass		FTIR	GMIS	499	Pass		FTIR	GMIS	12	Pass		FTIR	GMIS
	High	911	Pass		FTIR	GMIS	981	Pass		FTIR	GMIS	18	Fail	Pass	FTIR	NTRM
Airgas Southwest Specialty Gases	Low	48.90	Fail	Pass	Chem	NTRM	47.73	Pass		NDIR	NTRM	5.01	Pass		NDIR	NTRM
	Mid	406.0	Pass		Chem	NTRM	496.8	Pass		NDIR	NTRM	12.0	Pass		NDIR	NTRM
	High	900.0	Fail	Pass	Chem	NTRM	994.6	Pass		NDIR	NTRM	18.0	Pass		NDIR	NTRM
Airgas NCN Specialty Gases	Low	51.4	Pass		NDIR	NTRM	50.4	Pass		NDIR	GMIS	5.0	Pass		NDIR	NTRM
	Mid	388	Pass		NDIR	NTRM	500	Pass		NDIR	NTRM	12	Pass		NDIR	NTRM
	High	845	Fail	Pass	NDIR	NTRM	1000	Pass		NDIR	NTRM	18	Pass		NDIR	NTRM
Airgas South Specialty Gases	Low	50.05	Fail	Pass	Chem	GMIS	50.23	Pass		NDIR	NTRM	5.04	Pass		NDIR	NTRM
	Mid	397.5	Pass		Chem	NTRM	502.8	Pass		NDIR	NTRM	12.0	Pass		NDIR	NTRM
	High	900.0	Pass		Chem	NTRM	998.8	Pass		NDIR	NTRM	18.1	Pass		NDIR	NTRM
BOC Gases	Low	49.8	Pass		FTIR	SRM	50.9	Pass		FTIR	SRM	5.0	Pass		FTIR	NTRM
	Mid	407.8	Fail	Pass	FTIR	SRM	500.4	Pass		FTIR	NTRM	12.0	Pass		FTIR	NTRM
	High	900	Fail	Pass	FTIR	SRM	1000	Pass		FTIR	NTRM	18	Pass		FTIR	NTRM
AGA / Linde Gas Group	Low	50.4	Pass		Chem	GMIS	48.7	Pass		NDIR	GMIS	5.2	Pass		NDIR	NTRM/GMIS
	Mid	396	Pass		Chem	GMIS	466	Pass		NDIR	GMIS	13	Pass		NDIR	NTRM/GMIS
	High	904	Pass		Chem	GMIS	956	Pass		NDIR	GMIS	18	Pass		NDIR	NTRM/GMIS
Matheson Tri-Gas	Low	48.9	Fail	Pass	FTIR	SRM	49.5	Pass		FTIR	SRM	5.2	Fail	Pass	FTIR	SRM
	Mid	410	Fail	Pass	FTIR	SRM	504	Pass		FTIR	SRM	12	Pass		FTIR	SRM
	High	904	Pass		FTIR	SRM	988	Pass		FTIR	SRM	18	Pass		FTIR	SRM
Messer MG Industries	Low	50.0	Pass		Chem	GMIS	50.1	Pass		NDIR	GMIS	5.1	Pass		NDIR	GMIS
	Mid	398	Pass		Chem	GMIS	501	Pass		NDIR	GMIS	12	Pass		NDIR	GMIS
	High	888	Pass		Chem	GMIS	1004	Pass		NDIR	GMIS	18	Pass		NDIR	GMIS
Messer MG Industries (Spec Air Specialty Gas)	Low	50.0	Pass		Chem	GMIS	49.3	Pass		NDIR	GMIS	5.1	Pass		NDIR	GMIS
	Mid	403	Pass		Chem	GMIS	496	Pass		NDIR	GMIS	12	Pass		NDIR	GMIS
	High	894	Pass		Chem	GMIS	1004	Pass		NDIR	GMIS	18	Pass		NDIR	GMIS
National Specialty Gases	Low	46.2	Fail	Pass	FTIR	GMIS	51.8	Fail	Pass	FTIR	GMIS	4.9	Pass		FTIR	GMIS
	Mid	398	Pass		FTIR	GMIS	500	Pass		FTIR	GMIS	12	Pass		FTIR	GMIS
	High	930	Pass		FTIR	GMIS	991	Pass		FTIR	GMIS	18	Fail	Pass	FTIR	GMIS
Praxair	Low	51.2	Pass		Chem	GMIS	50.0	Pass		UV	GMIS	5.0	Pass		NDIR	GMIS
	Mid	406	Pass		NDIR	GMIS	509	Pass		NDIR	GMIS	12	Pass		NDIR	GMIS
	High	914	Pass		NDIR	GMIS	999	Pass		NDIR	GMIS	18	Pass		NDIR	GMIS
Scott Specialty Gases	Low	50.0	Pass		FTIR	NTRM	50.4	Pass		FTIR	NTRM	5.0	Pass		FTIR	NTRM
	Mid	402	Pass		FTIR	NTRM	503	Pass		FTIR	NTRM	12	Pass		FTIR	NTRM
	High	911	Pass		FTIR	NTRM	1011	Pass		FTIR	NTRM	18	Pass		FTIR	NTRM
Scott-Marrin In.	Low	50.8	Pass		Chem	GMIS	50.9	Pass		UV	GMIS	5.1	Pass		GC	GMIS
	Mid	397	Pass		Chem	GMIS	504	Pass		UV	GMIS	12	Pass		GC	GMIS
	High	886	Pass		Chem	GMIS	997	Pass		UV	GMIS	18	Pass		GC	GMIS
Spectra Gases Inc.	Low	50.1	Pass		Chem	NTRM	50.2	Pass		NDIR	NTRM	5.0	Pass		NDIR	GMIS
	Mid	405	Pass		FTIR	NTRM	495	Pass		NDIR	GMIS	12	Pass		NDIR	NTRM
	High	923	Pass		FTIR	NTRM	988	Pass		NDIR	GMIS	18	Pass		NDIR	NTRM

A gaseous component was said to fail only if all available analytical techniques used in the audit indicated a greater than a 2.0% difference from the cylinder tag value. Any accuracy assessment is an instantaneous snapshot of the process being measured. These results should not be regarded as a final statement concerning the accuracy of EPA Protocol Gases. They can be used as an indicator of the current status of the accuracy of EPA Protocol Gases as a whole. However, individual results should not be taken as definitive indicators of the analytical capabilities of individual producers. EPA presents this information without assigning a rating to the gas vendors, for example, who is the best, who is approved, or is not approved.