Introduction

Matheson offers pure gases and stocked mixtures for many analytical instruments including Gas Chromatographs utilizing FIDs, TCDs and ECDs, as well as process gas analyzers.

Carrier and Fuel Gases

Matheson carrier and fuel gases are screened for the presence of companion gases, hydrocarbons, halocarbons and moisture. The key to success is to match the gas with the detector, carrier and fuel gas grade, and the desired method detection limit.

Maintaining the purity of carrier gases and calibration mixtures demands the use of proper gas regulators and flow control equipment. Additional purification can be employed with the use of various filters and purifiers within the gas transfer system. And always remember, using gases under high pressure requires that proper safety precautions be employed.

Table I: Gas Chromatograph Carrier Gas Selection Chart

			Recommended Matheson Grade for Method Detection Limit					
Method/Detector	Selectivity	Recommended Carrier Gas	0 to 100 ppt	100 ppt to 100 ppb	100 ppb to 10 ppm	10 ppm to 0.1%	0.1% to 10%	10% to 100%
AED *Atomic Emission Detector*	Universal	Helium	N/A	Research	Research	Research	Matheson	N/A
DID *Discharge Ionization Detector*	Universal	Helium	N/A	Research	Research	Matheson	N/A	N/A
		Helium Purge	N/A	High Purity	High Purity	High Purity	N/A	N/A
ECD *Electron Capture Detector*	Poly-Halogen Organic Compounds	Nitrogen	VOC FREE	VOC FREE	VOC FREE	Matheson	N/A	N/A
		5% Methane 95% Argon	ULTRA P-5	ULTRA P-5	P-5	P-5	N/A	N/A
FID *Flame Ionization Detector*	Organic Compounds	Air	N/A	ULTRA 1065	CEM	Ultra Zero	Dry Air	Dry Air
		Helium	N/A	Research	Research	Matheson	Zero	High Purity
		Hydrogen	N/A	Research	Research	Matheson	Zero	Prepurified
		Nitrogen	N/A	Research	Research	Matheson	Zero	Prepurified
FPD/PFPD *Flame Photometric Detector and Pulsed FPD*	Sulfur and Phosphorus Compounds	Air	N/A	CEM	CEM	VEM ZERO	N/A	N/A
		Helium	N/A	Research	Matheson	UHP	N/A	N/A
		Hydrogen	N/A	Research	Matheson	UHP	N/A	N/A
		Nitrogen	N/A	Matheson	Matheson	UHP	N/A	N/A
FTIR *Fourier Transform Infrared Detector*	Universal	Nitrogen	N/A	N/A	N/A	Matheson	UHP	High Purity
GC/MS *Gas Chromatograph/ Mass Spectrometer*	Universal	Argon	Research	Research	Matheson	Matheson	Zero	N/A
		Helium	Research	Research	Matheson	Matheson	Zero	N/A
		Hydrogen	Research	Research	Matheson	UHP	Zero	N/A
		Nitrogen	Research	Research	Matheson	Matheson	Zero	N/A
HALL ELCD *Hall Electro Conductivity Detector*	Sulfur, Nitrogen and Phosphorus Compounds	Helium	UHP	UHP	UHP	N/A	N/A	N/A
		Hydrogen	UHP	UHP	UHP	N/A	N/A	N/A
PHID/HID *Helium Ionization Detector / Pulsed HID*	Universal	Helium	N/A	Research	Research	Matheson	N/A	N/A
		Helium Purge	N/A	High Purity	High Purity	High Purity	N/A	N/A
PID *Photo Ionization Detector*	Aromatic and Inorganic Compounds	Helium	N/A	Matheson	Matheson	UHP	N/A	N/A
		Nitrogen	N/A	Matheson	Matheson	UHP	N/A	N/A
TCD *Thermal Conductivity Detector*	Universal	Argon	N/A	N/A	Research	Matheson	UHP	High Purity
		Helium	N/A	N/A	Research	Matheson	UHP	High Purity
		Hydrogen	N/A	N/A	Research	Matheson	UHP	Prepurified
		Nitrogen	N/A	N/A	Matheson	Matheson	UHP	Prepurified
USD *Ultra Sonic Detector*	Universal	Argon	N/A	N/A	Research	Matheson	UHP	High Purity
		Helium	N/A	N/A	Research	Matheson	UHP	High Purity
		Hydrogen	N/A	N/A	Research	Matheson	UHP	Prepurified
		Nitrogen	N/A	N/A	Matheson	Matheson	UHP	Prepurified

Introduction *(continued)*

Table II: Pure and Support Gas Grades for Process Gas Analyzers

Gas Analyzer	Selectivity	Gases Used	Recommended Matheson Grade for Detection Limits: 10 ppb to 1 ppm	1 ppm to 100 ppm	100 ppm to 1%	1% to 100%
Chemiluminescent	NO, NO_2	Air	Acid Rain CEM	Acid Rain CEM	Zero Gas	N/A
		Nitrogen	Acid Rain CEM	Acid Rain CEM	Zero Gas	N/A
Electrochemical	H_2S, NO,	Air	Acid Rain CEM	Acid Rain CEM	Zero Gas	N/A
Detectors	NO_2, SO_2	Nitrogen	Acid Rain CEM	Acid Rain CEM	Zero Gas	N/A
NDIR	CO, CO_2, SO_2	Air	Acid Rain CEM	Acid Rain CEM	Zero Gas	Air, CO_2 Free
		Nitrogen	Acid Rain CEM	Acid Rain CEM	Zero Gas	Zero Gas
NIR	Universal	Nitrogen	N/A	Matheson	UHP	HP
Paramagnetic	O_2	Nitrogen	N/A	Oxygen Free	Matheson	UHP
Semiconductor	Flam-Ox	Air	N/A	N/A	Zero Gas	Dry
Sensors		Nitrogen	N/A	N/A	Prepurified	UHP
Total	Hydrocarbons	Air	VOC Free	Ultra Zero	Vehicle Emission	N/A
Hydrocarbon/FID		Nitrogen	VOC Free	Matheson	UHP	N/A
		Hydrogen	Research	Research	Zero	N/A
		FID Fuel	Ultra	Ultra	Zero	N/A

Gas Fill Volume Practices

Gas Compressibility Factors at 70°F and at stated gauge pressures, and from recognized industry sources, are used to verify cylinder contents. Ideal gas calculations may not apply.

In the calculation of Kpa pressure units, gauge pressure in psig is used. Where Kpa units are used, it is interpreted as Kpa (gauge).