



Introduction

Liquid hydrocarbon mixtures are often used when balance C3 to C5 alkane and alkene standards are needed. If analysis of liquid petroleum gas, natural gas liquids or liquefied hydrocarbon streams is necessary, Matheson Tri-Gas has package options including piston cylinders; cylinders with dual port valves; and cylinders with full length eductor tubes (FLET). Matheson Tri-Gas applies our own Research Grade C1 to C4 hydrocarbons where the highest purity standards are needed.

Typical Liquid Hydrocarbon Balance Gases:

- 1,3 Butadiene
- iso-Butane
- n-Butane
- 1-Butene
- 2-Butene
- iso-Pentane
- n-Pentane
- Propane
- Propylene

Reference the Pure Gas Section for typical impurities available.
Sulfur mixtures containing minor components are available as well.

Equipment Recommendations	Model No.	Page
Single Stage Reg. – Gas Phase	3537-510**	313
Manual Control Valve – Liquid	4351-510	417
Detector Tube	8014-125SA	392

Cylinder Sizes*	Contents
1A	**
1F	**
2A	**
1R	**
2R	**

5 & 10 gal. LPG cylinders
Piston Cylinders 500 cc and 1 liter
Valve Options CGA
Single Port + FLET
Dual Port + FLET (450 psig max)
Specify helium pressure pad, as necessary.

*Cylinder content varies by composition and liquid fill density. Weight contents will be calculated upon specification of mixture and cylinder size. FLET and helium pressure pad must be specified and have nominal cost.
**Regulators for Gaseous phase only.

LPG Reference Standards

ASTM D1263	Propane/Propylene Mixtures					Butane Mixtures	
	Mix 1 Propane with No Unsaturation	Mix 2 Propane/Low Propene	Mix 3 Propane/High Propene	Mix 4 Propene/Low Propane	Mix 5 Propene/High Propane	Mix 6 Butanes	Mix 7 Propene/Butane Mixture
Ethane	4	4	3	0.2	0.1	---	2
Propane	93	87	57	4.8	22.6	3	45
Propene	---	4	35	94.9	76.6	---	6
n-Butane	1	1	1	0.1	0.5	64	30
iso-Butane	1	3	3	---	---	25	15
Butene	---	---	---	---	0.2	6	---
iso-Pentane	1	1	1	---	---	2	2

Available Mixtures 1 - 7

Component	Grades	
	Primary	Certified
Ethane	•	•
Propane	•	•
Propene	•	•
n-Butane	•	•
iso-Butane	•	•
Butene	•	•
iso-Pentane	•	•



Constant Pressure Cylinder for Liquid Hydrocarbon Mixtures

The composition of multi-component hydrocarbon mixtures spanning a broad range of boiling points and vapor pressures changes with variance of temperature and pressure. Pressure control of the component mixture requires a special container.

Matheson Tri-Gas recommends floating piston cylinders, also known as constant pressure cylinders, in those cases where a high probability of fractionation may exist due to a wide range of component boiling points. The floating piston cylinder, illustrated below, is designed to allow application of constant pressure while the mixture is being depleted and for ease of mixing to ensure homogeneity. A constant working pressure of up to 1800 psig is applied to the gas side of the piston with an inert gas thus maintaining an equivalent pressure on the component blend. The mixture can be homogenized as needed to ensure reproducibility.

The floating piston cylinder is DOT approved in volumes ranging from 100 to 1000 cc. Cylinders are available from Matheson Tri-Gas for outright purchase in several sizes and can be returned for refill when necessary.

Complexity of liquid mixtures may vary depending on number of components and variation in boiling points. Natural Gas Liquid Blends and LPG Reference Standards are typical of the mixtures for which the piston cylinder is recommended.

Please contact your local Matheson Tri-Gas sales representative for pricing for mixtures, cylinders and accessories.

