# What is “Specialty Gas”?

Gases or gas mixtures which are produced to rigid, application-dependent specifications, ensuring the supply of a consistent and reliable product appropriate of a specific need and/or requirement.

Presented by Richard Turner

517-861-1330

# The Nines Mirage

## Contaminant Specifications – PPM

### Supplier

| | A | B | C |
|---|---|---|---|
| **Oxygen** | **<2** | **<4** | **<1** |
| **Water** | **<1** | **<3.5** | **<2** |
| **CO2** | **N/A** | **<1** | **<1** |
| **CO** | **N/A** | **N/A** | **<1** |
| **THC** | **<0.5** | **<0.5** | **<0.5** |
| **Nitrogen** | **N/A** | **<5** | **<5** |
| **Hydrogen** | **N/A** | **N/A** | **<1** |
| | 99.999% | 99.999% | 99.999% |

Total 99.999%

N/A = Not Analyzed

TPD Method = 100% Minus maximum level of measured impurities

# Common Applications and Uses

Nitrogen

- GC Carrier Gas – GC/MS
- Inerting
- Liquid Nitrogen coolant for NMR
- Purge gas
- Food packaging
- Wide variety of analytical applications
- Biological storage freezers (liquid)

# Common Applications and Uses

- Air
  - Oxidizer in flame detectors (FID, FPD, & AA)
  - Purge gas
  - Pneumatic Operation
  - Zero gas

# Common Applications and Uses

Argon

- ICP, AA, GC
- Ar/CH4 mixtures for Nuclear Counters/ECD
  (P-5 & P-10)
- Semiconductor Process
- Specialized lamps
- Wide variety of analytical applications
- Purge Gas

# Common Applications and Uses

## Helium

- GC Carrier Gas (MS, ECD, FID, TCD, FPD, PID, HID)
- Inert atmosphere
- Leak detection
- Liquid Helium in research - NMR
- Coolant in Nuclear reactions
- In mixtures for Neon lights
- Crystal Growth – Semiconductor Process

# Market Segments

- Stationary Source Monitoring
  - Continuous Emissions monitoring (CEM)
  - EPA Protocol Grade Mixtures
- Mobile Source Emissions Monitoring
  - Trains, Planes and Automobiles
  - Primary Master Grade Mixtures

# EPA Protocol Production Timing

# EPA Protocol Gases

- Non-Reactive Gases:

  Carbon Dioxide, Methane, Oxygen, Propane

- Reactive Gases:

  Carbon monoxide, Hydrogen Sulfide, Nitric Oxide, Nitrogen Dioxide.

- Highly Reactive Gases: (Less than or = to 25 ppm)

  Hydrogen Sulfide, Nitric Oxide, Nitrogen Dioxide

- Balance Gas: Air or Nitrogen

  Except Nitric Oxide and Oxygen

# Certification Periods

- EPA Protocols are assigned certification periods

  based upon the minor component, balance gas and/or concentration.
- Range from 56 months to 36 months.
- EPA mandates certification period.
- Complete listing of current certification periods available upon request.