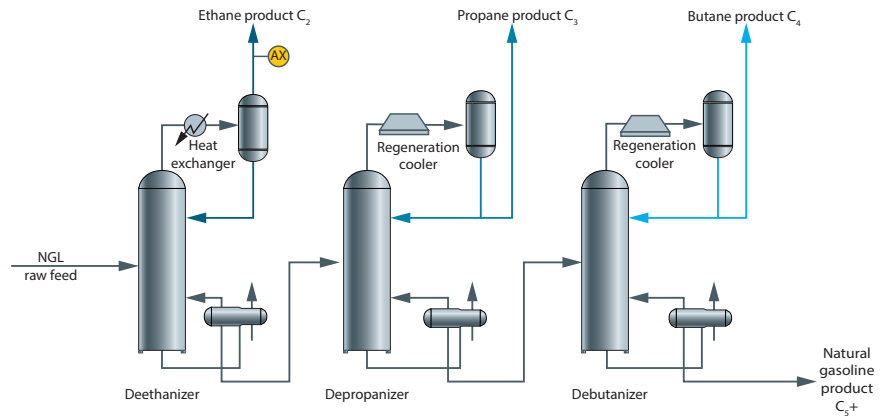


Natural gas processing: CO₂ in ethane NGL fractionation

Benefits at a glance

- Fast response to CO₂ concentration changes
- Laser-based measurement is highly selective and accurate for CO₂ in ethane
- Non-contact laser measurement avoids fouling and corrosion for reliable long-term operation
- Low maintenance and OPEX costs – no carrier gases or consumable items



NGL fractionation process

Fractionation and recovery of NGLs

Natural gas from some geological formations contains natural gas liquids (NGLs); ethane, propane, butane and a mix of C₅+ liquid condensates. These NGL compounds are commercially valuable as feedstocks for production of petrochemicals, octane-boosting gasoline additives, and for use as fuels. Cryogenic processing is used to separate and recover NGLs from natural gas using a series of fractionation columns.

Measurement of CO₂ to meet purity specifications

The purity specifications for ethane and other NGL fractionation products are based on their intended use and downstream processing. Contaminants including H₂O, CO₂, and H₂S are measured in NGL fractionation products to ensure purity specifications are met and documented as required in tariff and

sales agreements between suppliers, carriers and end users.

Endress+Hauser's solution

Tunable diode laser absorption spectroscopy (TDLAS) is a SpectraSensors technology proven highly effective for this important measurement. TDLAS analyzers have an exceptionally fast response to changes in CO₂ concentration, an important performance characteristic for monitoring CO₂ in the outlet of a deethanizer and at downstream custody transfer points. Laser and detector components are isolated and protected from process gas and contaminants avoiding fouling and corrosion and ensuring stable long-term operation and accurate measurements in the field.

Application data

Target component (Analyte)	CO ₂ in ethane
Typical measurement range	0-100 ppmv*
Typical repeatability	±2 ppmv
Measurement response time	1 to ~60 seconds
Principle of measurement	Tunable diode laser absorption spectroscopy (TDLAS)
Validation	Certified blend of CO ₂ in nitrogen

*Consult factory for alternate ranges.

Typical background stream composition

Component	Minimum (%)	Typical (%)	Maximum (%)
Methane (C1)	0	1	5
Ethane (C2)	95	98	100
Propane (C3)	0	1	3
Butanes and heavier (C4+)	0	0	1
Water (H ₂ O)	0	20 ppmv	250 ppmv
Hydrogen sulfide (H ₂ S)	0	10 ppmv	1

The background stream composition must be specified for proper calibration and measurement performance. Specify the typical composition, along with the minimum and maximum expected values for each component, and the measured component. Other stream compositions may be allowable with approval from Endress+Hauser.