

Nitrogen Applications:

	Description	Flow (scfm)	Pressure (psig)
OIL & GAS			
Underbalanced Drilling	Drilling operation where the pressure in the wellbore and bottomhole is less than the formation, allowing for production during drilling as well as protection of the formation. Nitrogen is commonly used because of combustion issues, and to far lesser extent, corrosion issues.	1500-3000	1500-3000
UBD Surface Equipment Inerting	During UBD operations, potentially explosive reservoir fluids are collected and processed in special four phase separator vessels and collections tanks on the surface. These tanks are inerted with N2 to prevent an explosive environment	300	4000
Coiled Tubing Operations	Coiled tubing is a flexible coil of piping that is run down a well and used in workovers, drilling operations, and fracturing. Nitrogen is sent down the hole to stimulate production, clean out debris, etc. Can also be used for shallow drilling and UBD horizontal drilling.	350-3000	1000-10000
Pipeline Purging and Drying	Dry nitrogen is used to displace hydrocarbons in a pipeline or push a "pig" down a pipeline during cleaning operations. N2 is also used to dry chemical pipelines to very low dew points, or for general inerting during plant turnarounds.	100-3000	300-3000
Cementing	Adding nitrogen to a cement slurry will reduce the cement hydrostatic pressure column but still maintain compressive strength. This is done when the formation pressure is too low to hold the hydrostatic pressure column of cement to cover and separate zones.	200-1500	1000-3000
Well Completions and Workovers	Wells are sometimes capped off after drilling operations are concluded, and perforating the production string and displacement of the hydrostatic fluid head must be done to get the well to flow on primary pressure. Workovers are subsequent cleanouts performed on a regular basis to remove hydrostatic fluids	350-3000	1000-5000
Gas Lifts	Introducing N2 in the produced oil product lightens the fluid, and the gas helps carry the lighter fluid to the surface. This is a secondary or enhanced oil recovery technique	300-3000+	1000-5000
Nitrogen Flooding	Injection of nitrogen is used to push a miscible front through a reservoir which pushes banks of displaced oil to production wells.	1000-3000+	1000-5000
Reservoir Pressure Maintenance	When the primary pressure of the reservoir is gradually depleted over time, additional energy must be added to the reservoir to drive the reservoir products to the surface. N2 or natural gas is used to provide this additional pressure.	1000-3000+	1000-5000