

# Nitrogen Services: Liquid N<sub>2</sub>

Reduce plant and pipeline downtime,  
optimize crucial shutdown periods

Nitrogen (N<sub>2</sub>) at high flow rates, pressures and temperatures can substantially reduce plant and pipeline downtime by providing efficient purging/blanketing, drying, pressure testing and product displacement solutions in a safe, inert manner.

The Baker Hughes Process & Pipeline Services (PPS) N<sub>2</sub> services fleet is fully mobile and independent of client-support facilities. PPS provides N<sub>2</sub> where plant supplies may be insufficient for applications such as purging, displacing large-diameter pipelines, high-velocity cleaning and pigging runs, accelerated cooldowns, and pressure testing.

PPS provides high-flow N<sub>2</sub> at a wide range of pressures and temperatures to ensure the safe start-up or shutdown of all systems.

PPS personnel remain on call 24 hours a day, seven days a week. Also available around the clock is a diversified fleet of self-contained, nitrogen-pumping equipment used to provide the most efficient N<sub>2</sub> solutions, custom engineered for your needs.

## N<sub>2</sub> services whenever and wherever needed

PPS has extensive experience

using N<sub>2</sub> for all applications. Vast technical knowledge facilitates the best service technique for each application. In addition, PPS ensures optimal scheduling, connection arrangements, and site services required for the job.

PPS' innovation and customization makes it far more than a commodity supplier. N<sub>2</sub> projects are engineered start-to-finish, typically completing operations faster while using less N<sub>2</sub>. We're committed to providing the right portable N<sub>2</sub> supply and engineered services at the customer's chosen location. As N<sub>2</sub> services are often required on an urgent basis, operations are organized to respond quickly with support from an unmatched array of service locations worldwide.

### Hot N<sub>2</sub>

Injected at controlled high temperatures, it provides a safe, inert, and controllable medium for catalyst regeneration, furnace bake-outs, and hydrocarbon and solvent stripping.

### Drying

Provides an efficient, safe and inert medium to extremely low dewpoints, providing a much higher capacity to carry moisture than alternative gases.

## Applications

- Hot N<sub>2</sub>
- Drying
- Purging and blanketing
- Leak testing
- Accelerated cooldowns
- Pipeline product displacements
- Foam inerting
- Freeze plug isolations

## Features and benefits

- High flow rates – N<sub>2</sub> pump units that can deliver up to 16,000 scf/min (460 m<sup>3</sup>/min) with a single unit.
- High pressures – N<sub>2</sub> pump units that can deliver pressures of up to 10,000 psi (690 Barg).
- High temperatures – Direct fired N<sub>2</sub> pump units and steam vaporizer units that can deliver nitrogen gas at temperatures up to 572°F (300°C).
- Supply options – Ability to source liquid N<sub>2</sub> from suppliers across the country, minimizing costs and ensuring nearby delivery points.
- Storage options – Large fleet of N<sub>2</sub> storage equipment, including standard capacity and body load transports, as well as King storage units that hold up to 23,000 gal of liquid N<sub>2</sub>.



## Purging & Blanketing

Replaces hydrocarbon vapor, flammable and toxic gas, or air with an environmentally safe and inert medium during turnarounds, shutdowns, service changes, inspections and maintenance.

## Leak Testing

N<sub>2</sub> (with a trace of helium), used for final commissioning, verifies the safety and environmental integrity of new and existing facilities, accurately detecting leaks as small as 0.10 scf/year.

## Accelerated Cooldowns

A controlled cooling agent can greatly reduce the time required before remedial work begins, reduce the risk of fire and provide a safe, inert atmosphere.

## Pipeline Product Displacements

Product transfer for pipeline rerouting, modifications,

revalidation testing, pigging and decommissioning are accomplished quickly using , high flow rates and pressures.

## Foam Inerting

Eliminates explosive atmospheres in systems where it is not feasible to remove all hydrocarbons or flammable products, allowing hot cutting on systems still containing flammable liquids.

## Freeze Plug Isolations

Used as a temporary isolation tool to freeze water, gel, and some hydrocarbon products in various sized pipes. It provides isolation anywhere in the system, particularly where valves are not available.

The PPS turnkey approach maximizes the effectiveness of N<sub>2</sub> applications and frees customers to focus on other issues during crucial shutdown periods.

**Baker Hughes** 