



Nitrogen Pipeline Services: Where and When You Need It

From gas supply to integrity management to cleaning – along with service design and modeling – Linde Services Canada Inc. has the experience and track record you can rely on to support your new pipeline construction and ongoing maintenance needs.



Expertise You Can Count On

Linde offers production, delivery, and pumping of nitrogen – and can deliver a continuous supply of high-purity nitrogen to you via a dedicated fleet of mobile pumping units.

Dry, inert nitrogen is a versatile industrial tool, and Linde's precisely controlled mobile nitrogen pumping services (NPS) puts nitrogen to work in a wide range of applications using a variety of mobile nitrogen equipment.

We match the type of equipment to each application for optimum economy and performance. Linde can deliver nitrogen to you based on any combination of the following conditions:

- Flow rates to 23,786 m³/h (840,000 scfh) per unit
- Pressures to 68,950 kPa (10,000 psi)
- Temperatures from - 195° to 315°C (-320° to 600°F)
- Volumes: unlimited

Linde equipment mobility provides nitrogen where you need it, whether that is on site or in locations where nitrogen is typically unavailable, such as pipeline right-of-ways and remote valve stations and terminals.

At-A-Glance: Linde Applications

Drying and Purging prevents product contamination, corrosion, and risk of explosions by removing air and residual moisture. Blanketing protects interior pipeline walls from corrosion during extended out-of-service periods; ideal for removing water after hydro-testing and protecting moisture-sensitive products.

Pipeline Displacement is a one-step displacement, drying, and inerting process. Linde can support multi-leg displacements over hundreds of miles.

Tool Propellant is used for pigging with pressurized nitrogen gas as the propellant. Inline inspection tools can also be pushed through pipelines.

Pneumatic Pressure Testing of equipment is undertaken by safely using air or nitrogen.



Cleaning Service That Cuts Downtime

The SANDJET™ service is Linde's in-place economical pipeline cleaning method that cleans to a white-metal blasted finish while drying and inerting. The SANDJET service uses dry, inert nitrogen gas to propel cleaning particles through the line at high velocity to quickly remove corrosion, scale and heavy deposits. The service is also effective for removing contaminants prior to abandonment. The best part: the entire service takes only a few hours.

Complete Engineering Modeling

Linde is your one-stop technical resource – providing detailed engineering estimates for your pipeline displacement needs. By assessing pipeline diameter, requested pig speed, and elevation data, Linde can provide hour-by-hour injection flow rate and pressure requirements. See sample report below:

					We monitor the inlet and outlet pressure for safety			
Time Hours	Milepost km	Elevation meters	N ₂ Flow m ³ /min	N ₂ Used m ³	Inlet Pressure psig	Outlet Pressure psig	Pig Speed km/h	Discharge Rate m ³ /hr
Pre-start	0.00	1480	0	0	526	410	0.0	0
0:00	0.00	1480	283	0	1300	220	2.6	190
0:30	1.30	1488	286	8.5k	1300	217	2.6	191
1:00	2.62	1494	288	17.1k	1300	214	2.6	193
1:30	3.96	1503	291	25.8k	1300	210	2.7	195
.
.
.
52:30	160.08	1346	350	1045.0k	1300	220	3.2	235
53:00	161.69	1333	350	1055.5k	1291	211	3.2	235
53:30	163.30	1320	0	1058.4k	1278	193	3.2	235
54:00	164.91	1311	0	1058.4k	1265	180	3.2	235
.
.
.
117:30	369.30	1579	0	1058.4k	563	527	3.2	235
118:00	370.91	1573	0	1058.4k	560	524	3.2	235
118:22	372.11	1579	0	1058.4k	558	533	3.2	235
Stopped	372.11	1579	0	1058.4k	558	558	0.0	235

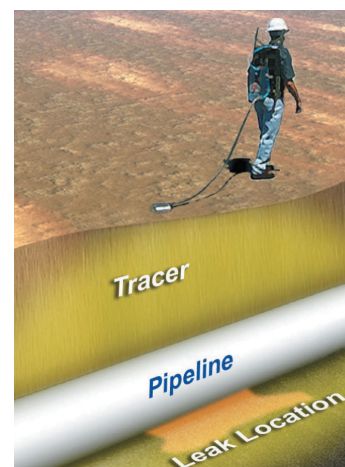
Design nitrogen flow and pressure at mile posts for a safe (below MOP) and efficient displacement

Integrity Management That Keeps You Online

Helium Leak Detection: HELITEC® is Linde's helium leak detection service, which quickly locates leaks in buried pipelines by using a helium tracer in a gas (usually with nitrogen as a carrier gas) along with a sensitive helium detector. By removing the process fluid from the line and pressurizing it with the test gas, the helium detector can sense the presence of helium in the air above the line. A problem detected quickly is a problem solved with a reduced impact on productivity.

Linde has the innovative applications and expertise to help you optimize your operations and reduce downtime with extensive service offerings for refineries, chemical plants, terminals and pipelines. Our offerings include:

- | | |
|--------------------------|------------------------------|
| → Purging and Inerting | → Drying and Purging |
| → Accelerated Cool-down | → Blanketing |
| → Inert Entry Support | → Pneumatic Pressure Testing |
| → Hot Nitrogen | → HELITEC Leak Detection |
| → Backup Hydrogen Supply | → Specialty Services |
| → SANDJET Cleaning | → Temporary Gas Supply |
| → Product Displacement | → IN2ERT™ Chemical Cleaning |
| → Tool Propellant | → IN2ERT Purging |



Contact Linde Today:

To contact Linde and learn more about our services, please visit us at www.lindecana.ca/services, email us at LSCI@linde.com, call in western Canada **866.443.3491** or call in eastern Canada **888.332.4066**.

Linde Services Canada Inc.

1 City Centre Drive, Suite 1200, Mississauga, Ontario, L5B 1M2
Phone 1-800-225-8247, www.lindecana.ca