

Gaseous and Liquid Nitrogen Specifications & DOT Shipping Information



CHARACTERISTIC	PROCURED/ DELIVERED	DELIVERED	PROCURED/ DELIVERED
SPECIFICATION:	MIL-PRF-27401D , Type I and II	SE-S-0073, Table 6.3-5	MIL-PRF-27401D , Type I and II
	Grade B		Grade C (see NOTE)
Purity	99.99% by vol. (min.) Indirect method	99.99% by vol. (min.) Indirect method -or- 95.00% by vol. (min.) Direct method	99.995% by vol. (min.) Indirect method
Total impurities	100 ppm by vol. (max.)	100 ppm by vol. (max.)	50 ppm by vol. (max.)
O ₂	50 ppm by vol. (max.)	50 ppm by vol. (max.)	20 ppm by vol. (max.)
Total hydrocarbon content (as methane)	5.0 ppm by vol. (max.)	5.0 ppm by vol. (max.)	5.0 ppm by vol. (max.)
Moisture content	11.5 ppm by vol. (max.)	11.5 ppm by vol. (max.)	5.7 ppm by vol. (max.)
Hydrogen	N/A	N/A	0.5 ppm by vol. (max.)
" Particulate*	1.0 mg/liter	N/A	1.0 mg/liter

* Applies to Type II (liquid) only

Note: Filtration is provided as follows (all ratings absolute): GN2 [pipeline](#) has 10-micron filters at plant and meter stations. LN2 tankers have 40-micon on outlet. [Rechargers](#) have 10-micron on outlet. Compressed gas trailers, [MSUs](#), k-bottle manifolds, and small dewars are not normally equipped with filters but liquid/gas used to refill them passes through a 40-(liquid) or 10-(gas) micron filter.
Grade C LN2 and GN2 are usually re-certified Grade B product which meets Grade C purity requirements.

Usage & Other Data: Nitrogen is an inert atmospheric gas (~78% of what you breathe is GN2). It is used primarily as a pressurant to operate pneumatic actuators (i.e. open/close valves), to pressure transfer a fluid from one vessel to another, or to maintain a clean, dry, non-flammable atmosphere in and/or around some component or vessel. Liquid nitrogen is often used testing components at cryogenic temperatures. The pipeline supplies 7000 psig GN2 to the KSC Industrial Area, CX39 Area (Shuttle), CX36 (Atlas II), CX37 (Delta IV), CX40 (Titan) and CX41(AtlasV).

Note: The following is required for deliveries for manned test and flight use only.

CHARACTERISTIC	PROCURED/DELIVERED
SE-S-0073, Table 6.3-5 (MIL-PRF-27401D , Grade B plus)	
CO	5 ppm by vol. (max.)
CO ₂	5 ppm by vol. (max.)
Aromatic hydrocarbons (as benzene)	0.5 ppm by vol. (max.)
Halogenated hydrocarbons	1 ppm by vol. (max.)
Chlorinated hydrocarbons	0.1 ppm by vol. (max.)
Nitrous oxide	1 ppm by vol. (max.)
Odor	None detectable
Other impurities	Analysis procedures for impurities shall be per MIL-STD-1564. For ECLSS ground test only, total hydrocarbons as methane - 50 ppm (max.)

Proper Shipping Name and Container Markings:

49 CFR 172.101 Hazardous Materials Table

Sym-bols	Hazardous material descriptions & proper shipping names	Hazard Class or Division	Identifi-cation numbers	PG	Label Codes	Special Provision	Packaging (173.***)			Quantity Limitations		Vessel Stowage	
							Excep-tions	Non Bulk	Bulk	Passenger aircraft/ rail	Cargo aircraft only	Loca-tion	Other

DOT Hazardous Material Codes and Regulations will explain the letters and numbers.

Sample Table for Gaseous Nitrogen

	Nitrogen, compressed	2.2	UN1066	2.2		Packaging (173.***)			Quantity Limitations		Vessel Stowage	
						306	302	314, 315	75 kg	150 kg	A	



Sample Table for Liquid Nitrogen

	Nitrogen, refrigerated liquid (cryogenic liquid)	2.2	UN1977	2.2		Packaging (173.***)			Quantity Limitations		Vessel Stowage	
						320	316	318	50 kg	500 kg	D	



Markings for a "bulk container" (over 119 gallon capacity) with 12"-sided placards. An authorized variance would have the identification number replace the words on the primary hazard placard (with the number at the bottom corner). Non-bulk containers would use the similar 3"-sided labels and have "UN(ID#)" nearby. The proper shipping name would also appear near the labels or placards.

