“NASA Grade” Ammonia Specifications & DOT Shipping Information

NH3 Analysis Parameters

CHARACTERISTIC	PROCURED/DELIVERED
Specification: Fed Spec O-A-445 (modified)	**
Purity	99.995% by wt. (min)
Moisture	50 ppm by wt. (max)
Oil	6 ppm by wt. (max)
Nonvolatile residue	Engineering use only
Chlorides	1 ppm (max)
Fluorides	Engineering use only

** FS O-A-445 is obsolete. A specification update is in-work to merge Shuttle & ISS requirements into a new KSC_SPEC_P_xxxx; ECD mid-FY2007.

NOTE: There are no JBOSC filter requirements for NH_3.

Usage & Other Data: Shuttle grade ammonia is used in the Ammonia Boiler System as a sacrificial heat rejection fluid during the final phases of Shuttle landing operations. Ammonia is available in KSC 150-pound capacity DOT4AA480 cylinders.

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

							Packaging (173.***)			Quantity Limitations		Vessel Stowage	
	Ammonia, anhydrous.	2.2	UN1005		2.2	13	None	304	314, 315	Forbidden	25 kg	D	40, 57

Markings for a non-bulk containers would use the 3"-sided labels and have "UN(ID#)" nearby. The proper shipping name would also appear near the labels or placards.

Updated: October 5, 2006