Hydrazine Specifications & DOT Shipping Information

CHARACTERISTIC	PROCURED/ DELIVERED		DELIVERED (SHUTTLE ONLY)
SPECIFICATION:	MIL-PRF-26536E with Amendment 1 (Zipped files)		SE-S-0073, Table 6.3-11
	Monoprop-Grade	High-Purity	Monoprop-Grade
N_2H_4	98.5% by wt (min)	99.0% by wt (min)	98.3% by wt (min) *98.5% by wt (min)
Water	1.0% by wt (max)	1.0% by wt	1.2% by wt (max) *1.1% by wt (max)
Ammonia	N/A	0.3% by wt (max)	N/A
Particulate	1.0 mg/liter (max)	1.0 mg/liter (max)	N/A
Chloride	0.0005% by wt (max)	0.0005% by wt (max)	0.0005% by wt (max)
Density at 77 °F (25 °C)	N/A	N/A	Engineering information only
Aniline	0.50% by wt (max)	0.003% by wt (max)	0.50% by wt (max)
Iron	0.002% by wt (max)	0.0004% by wt (max)	0.002% by wt (max)
Nonvolatile residue	0.005% by wt (max)	0.001% by wt (max)	0.005% by wt (max)
CO_2	0.003% by wt (max)	0.003% by wt (max)	0.003% by wt (max)
Other volatile carbonaceous material (total as MMH & UDMH, alcohol, percent by wt)	0.02% by wt (max)	0.005% by wt (max)	0.02% by wt (max)

Note: There are no JBOSC filter requirements for N_2H_4. However, 1.0-micron absolute filters are used when filling containers (cylinders and GPTUs).

* For SRB use only

Usage & Other Data: Hydrazine is chemically N2H4. It is a hypergolic (spontaneous ignition without an ignitor) fuel when used with nitrogen tetroxide oxidizers or it can be catalytically decomposed to generate a high temperature gas. It is used on the Shuttles' APU and HPU systems (gas generators to drive hydraulic systems) and for spacecraft in both mono- and bi-propellant propulsion systems. High purity hydrazine differs from MPH-

grade in its production process by not using aniline. Therefore, HPH can allow increased catalyst life, especially for low-duty cycle thrusters and electro-chemical thrusters (e.g. resistojets or arcjets), which would be damaged by the carbon in the aniline. MPH and HPH are available in KSC/CCAFS 500-gallon GPTUs or various DOT4BW cylinders.

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	
	Hydrazine, anhydrous or Hydrazine aqueous solutions with more than 64 percent hydrazine, by mass	8	UN2029	I	8, 3, 6.1	A3, A6, A7, A10, B7, B16, B53, T25	None	201	243	Forbidden	2.5 L	D	21, 40, 42, 100

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. If the container is covered by a DOT Exemption, the number (DOT-E-xxxxx) would also appear on the container. Consult your local DOT-markings experts for clarifications.

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