



DEPARTMENT OF THE ARMY
HEADQUARTERS, US ARMY AVIATION SYSTEMS COMMAND
4300 GOODFELLOW BOULEVARD, ST. LOUIS, MO 63120

REPLY TO
ATTENTION OF

DRSAV-X

16 JAN 1984

SUBJECT: NRC Source Material License STB-1433

Commander
US Army Materiel Development and
Readiness Command
ATTN: DRCSF-P
5001 Eisenhower Avenue
Alexandria, VA 22333

1. US Nuclear Regulatory Commission Source Material License STB-1433 was issued to the US Army Aviation Systems Command authorizing limited maintenance of magnesium-thorium alloys containing less than four percent thorium.
2. Subject license application contained a commitment that respiratory protective devices would be utilized for all licensed maintenance involving magnesium-thorium alloys. This commitment resulted from Army concern about the potential for inhalation of thorium as limited air sampling data was available.
3. During the periods 31 May through 3 June 1983 and 5 through 16 July 1983, detailed air sampling studies of magnesium-thorium alloy maintenance were performed by the US Army Environmental Hygiene Agency (Enclosure 1). Fifty-one air samples were collected while various maintenance operations were performed. Results of this air sampling effort support the conclusion that the operations authorized by the license issued to AVSCOM do not pose a potential inhalation hazard. Request that NRC Source Material License STB-1433 be amended to eliminate the requirement that respirators be used when the licensed maintenance is performed.

FOR THE COMMANDER:

1 Encl
as

for *Norbert R. Knapp*
ROBERT D. CHAPLIN
LTC, GS
Chief, Safety Office

8602190671 851217
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STB-1433 PDR

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APPENDIX G

RESULTS OF AIR SAMPLE ANALYSIS

Fifty-one air samples were collected at CCAD and analyzed for gross alpha activity. The results obtained for all air samples as well as several blanks are given in this Appendix.

Field No.	Lab No.	BZ	GA	Sample Duration (min)	Volume (liter)	Location/Operation/Remarks	Gross Alpha $\mu\text{Ci}/\text{m}$ unless otherwise noted
7-8665-1	A198/C3567	X		429	1544	Machine Section. Machining Mg-Th parts. Mr. Flores.	$<8.2 \times 10^{-14}$
7-4903-1	A199/C3568	X		425	1488	Machine Section. Machining Mg-Th parts. Mr. Benavides	$<8.5 \times 10^{-14}$
7-703-1	A200/C3569	X		437	1530	Machine Section. Machining Mg-Th parts. Mr. Honojosa	$(2.1 \pm 1.4) \times 10^{-13}$
7-8772-1	A201/C3570	X		218	734	Machine Section. Machining Mg-Th parts. Mr. Smith	$<1.7 \times 10^{-13}$
7-B-1	A202/C3570		BLANK				$<1.3 \times 10^{-7} \mu\text{Ci}/\text{filter}$
7-1	A203/C3572		X	415	1453	Machine Section. Vacuum Cleaner exhaust next to Radial Drill Press (CCAD 00036).	$<8.7 \times 10^{-14}$
7-2	A204/C3573		X	417	1460	Machine Section. Radial Drill (CCAD 00076).	$<8.6 \times 10^{-14}$
7-3	A205/C3574		X	411	1356	Machine Section. Engine Lathe (CCAD 35591).	$(3.0 \pm 1.6) \times 10^{-13}$
7-4	A206/C3575		X	395	1383	Machine Section. Aisle at GSA Divider along Tool and Die Shop.	$<1.1 \times 10^{-13}$
7-5	A207/C3576		X	345	1242	Machine Section. Rotary Head Milling Machine.	$(2.3 \pm 1.7) \times 10^{-13}$
8-7671-1	A208/C3577	X		361	1264	Welding Shop, Booth #14. Grinding and welding on Mg-Th parts. Mr. Leach.	$(4.2 \pm 1.9) \times 10^{-13}$
8-5236-1	A209/C3578	X		305	1068	Metal Spray Shop. Bead-blasting on Mg-Th parts. Mr. Garcia	$(1.9 \pm 1.9) \times 10^{-13}$
8-1	A210/C3579		X	348	1218	Welding Shop, Booth #14. Outside of booth.	$<1.5 \times 10^{-13}$
8-2	A2311/C3580		X	342	1026	Welding Shop Booth #14. Workbench.	$(4.0 \pm 2.2) \times 10^{-13}$

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Field No.	Lab No.	BZ	GA	Sample Duration (min)	Volume (liter)	Location/Operation/Remarks	Gross Alpha $\mu\text{Ci/ml}$ unless otherwise noted
8-3	A212/C3581		X	372	1302	Metal Spray Shop. Bead-Blasting Machine (CCAD 48690)	$(1.6 \pm 1.5) \times 10^{-13}$
8-4	A213/C3582		X	- -	- -	Welding Shop, Booth #14. Discharge side of local exhaust ventilation extractor. Volume of sampled air cannot be determined because pump malfunction.	$(2.4 \pm 2.0) \times 10^{-7}$ Ci/filter
8-B-1	A214/C3583					BLANK	$<1.3 \times 10^{-7} \mu\text{Ci/filter}$
8-5	A215/C3584		X	340	850	Welding Shop, Booth #14. Above local exhaust ventilation hood.	$<1.5 \times 10^{-13}$
11-4903-1	A216/C3901	X		485	1601	Machine Section. Machining Mg-Th parts. Mr. Benavides.	$<9.8 \times 10^{-14}$
11-0198-1	A217/C3902	X		366	1244	Machine Section. Burning notches on Mg-Th parts with electrical discharge. Mr. Budd.	$<1.0 \times 10^{-13}$
11-8772-1	A218/C3903	X		459	1561	Machine Section. Machining on Mg-Th parts. Mr. Smith.	$(1.5 \pm 1.3) \times 10^{-13}$
11-8685-1	A219/C3904	X		303	1061	Machine Section. Machining on Mg-Th parts. Mr. Torres.	$<1.2 \times 10^{-13}$
11-B-1	A220/C3905					BLANK	
11-1	A221/C3906		X	470	1645	Machine Section. Periphery of work area, Tool Crib, nonrestricted side of plastic curtain.	$<7.6 \times 10^{-14}$
11-2	A222/C3907		X	465	1628	Machine Section. Periphery of work area, Pole 4-10, nonrestricted side of plastic curtain.	$<7.7 \times 10^{-14}$
11-3	A223/C3908		X	465	1581	Machine Section. Periphery of work area, nonrestricted side of plastic curtain.	$<8.0 \times 10^{-14}$
11-4	A224/C3909		X	457	914	Machine Section. Periphery of work area, Pole E27.	$<1.4 \times 10^{-13}$

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11-5	A225/C3910		X	457	914	Machine Section. Periphery of work area, Corner 00999.	$<1.4 \times 10^{-13}$
11-6	A226/C3911		X	458	870	Machine Section. Periphery of work area, Partition, Tool and Die Shop.	$<1.7 \times 10^{-13}$
11-7	A227/C3912		X	459	1148	Machine Section. Periphery of work area, Engine Assembly Line inspection.	$<1.1 \times 10^{-13}$
11-8	A228/C3913		X	459	826	Machine Section. Periphery of work area, Filing Cabinet, nonrestricted side of plastic curtain.	$<1.5 \times 10^{-13}$
11-9	A229/C3914		X	455	1593	Machine Section. Periphery of work area, doorway, Tool & Die Shop.	$<7.9 \times 10^{-14}$
11-10	A230/C3915		X	362	1267	Machine Section. Electrical Discharge Machine (CCAD 48497).	$<9.9 \times 10^{-14}$
11-8118-1	A231/C3916	X		436	1526	Engine Cleaning Shop. Walnut shell blasting on Mg-Th parts. Mr. Trevino.	$<8.2 \times 10^{-14}$
11-11	A232/C3917		X	412	1442	Engine Cleaning Shop, Blasting Machine (CCAD 34301).	$<8.7 \times 10^{-14}$
12-3	A233/C3918		X	411	1439	Plating Shop. Bead-Blasting Machine (CCAD 43609).	$<1.0 \times 10^{-13}$
12-1	A234/C3919		X	372	670	Plating Shop. Bead-Blasting Machine (CCAD 33384).	$<1.9 \times 10^{-13}$
12-2	A235/C3920		X	406	1380	Plating Shop. Bead-Blasting Machine (not used for Mg-Th) (CCAD 43954).	$<9.1 \times 10^{-14}$
12-4	A236/C3921		X	367	881	Plating Shop. Foreman's Office.	$<1.4 \times 10^{-13}$
12-B-1	A237/C3922		BLANK				$<1.3 \times 10^{-7} \mu\text{Ci/filter}$
12-5	A238/C3923		X	357	785	Plating Shop. Hallway near Bead-Blasting Machine (CCAD 33384).	$<1.6 \times 10^{-13}$

Field No.	Lab No.	BZ	GA	Sample Duration (min)	Volume (liter)	Location/Operation/Remarks	Gross Alpha $\mu\text{Ci/ml}$ unless otherwise noted
12-8656-1	A239/C3924	X		332	1096	Plating Shop. Bead-blasting on Mg-Th parts. Ms. Hershback.	$<1.1 \times 10^{-13}$
12-9240-1	A240/C3925	X		335	1139	Plating Shop. Bead-blasting on Mg-Th parts. Mr. Vera.	$<1.3 \times 10^{-13}$
12-9086-1	A241/C3926	X		35	122.5	Plating Shop. Cleaning inside of Bead-Blasting Machines. Mr. Yzaguirre.	$(7.8 \pm 2.2) \times 10^{-12}$
12-5871-1	A242/C3927	X		20	68	Plating Shop. Sweeping floor near and around Bead-Blasting Machine. Mr. Curry.	$<1.9 \times 10^{-12}$
13-1	A243/C3944		X	224	784	Metal Spray Shop. Bead-Blasting Machine (CCAD 48690).	$<2.2 \times 10^{-13}$
13-5236-1	A244/C3945	X		222	777	Metal Spray Shop. Bead-blasting on Mg-Th parts. Mr. Garcia.	$<2.2 \times 10^{-13}$
13-B-1	A245/C3946		BLANK				$<1.7 \times 10^{-7} \mu\text{Ci/filter}$
13-2	A246/C3947	X		194	388	Welding Shop, Booth #14. Discharge side side of local exhaust ventilation extractor.	$<4.4 \times 10^{-13}$
13-3	A247/C3948	X		194	388	Welding Shop, Booth #14. Top of arc welding machine.	$<4.4 \times 10^{-13}$
13-4	A248/C3949	X		206	412	Welding Shop, Booth #14. Above local exhaust ventilation hood.	$<4.1 \times 10^{-13}$
13-5	A249/C3950	X		196	392	Welding Shop, Booth #14. Outside of booth.	$<4.3 \times 10^{-13}$
13-6763-1	A250/C3951	X		191	649	Metal Spray Shop. Bead-blasting on Mg-Th parts. Mr. Garcia.	$(4.9 \pm 4.1) \times 10^{-13}$
14-1657-1	A251/C3952	X		203	711	Paint Shop. Sanding on Mg-Th parts. Mr. Stutts.	$<2.4 \times 10^{-13}$
14-6489-1	A252/C3953	X		437	1530	Paint Shop. Sanding on Mg-Th parts. Mr. Gamez.	$(1.7 \pm 1.7) \times 10^{-13}$

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14-8931-1	A253/C3953	X		379	1327	Paint Shop. Sanding on Mg-Th parts. Mr. Flores.	$(2.4 \pm 2.0) \times 10^{-13}$
14-B-1	A254/C3955		BLANK				$(2.6 \pm 2.6) \times 10^{-7}$ $\mu\text{Ci}/\text{filter}$
14-1	A255/C3956		X	414	1449	Paint Shop. Workbench.	$<1.2 \times 10^{-13}$
14-2	A256/C3957		X	414	1449	Paint Shop. Oven Room.	$<1.2 \times 10^{-13}$
14-3	A257/C3958		X	398	1393	Paint Shop. Workbench.	$<1.3 \times 10^{-13}$
14-4	A258/C3959		X	385	1309	Paint Shop. Top of refrigerator.	$<1.3 \times 10^{-13}$
14-2441-1	A259/C3960	X		373	1306	Engine Disassembly Shop. Inspecting and repairing, to include grinding on, Mg-Th parts. Mr. Gonzalez.	$<1.3 \times 10^{-13}$
14-5	A260/C3961		X	369	1255	Engine Disassembly Shop. Small table opposite workbench.	$<1.3 \times 10^{-13}$
14-6	A261/C3962		X	366	1537	Engine Disassembly Shop. Pole A50 near workbench.	$<1.1 \times 10^{-13}$

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