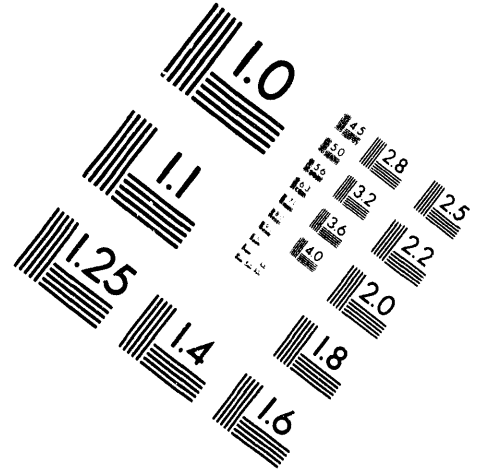
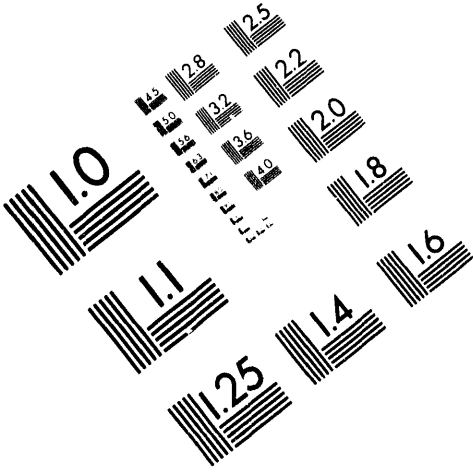




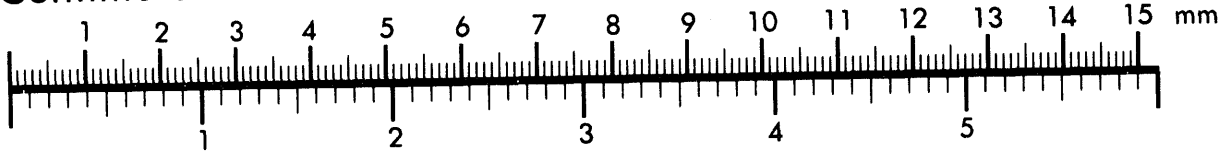
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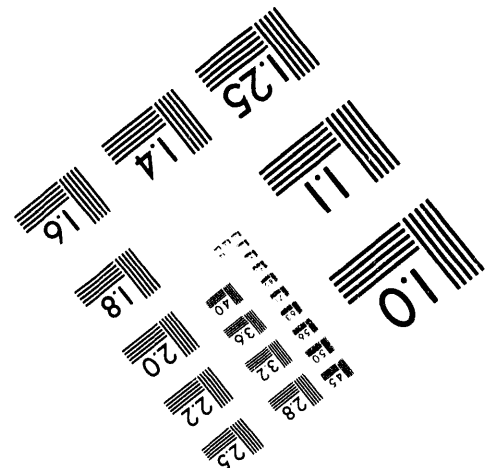
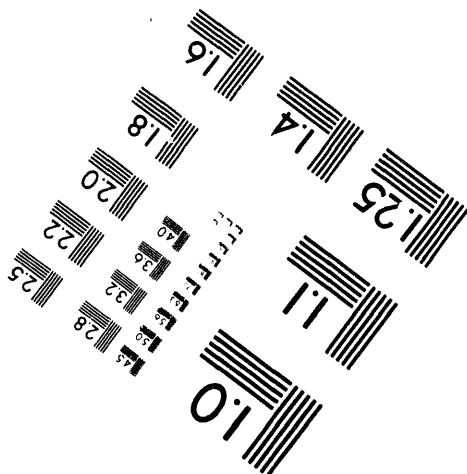
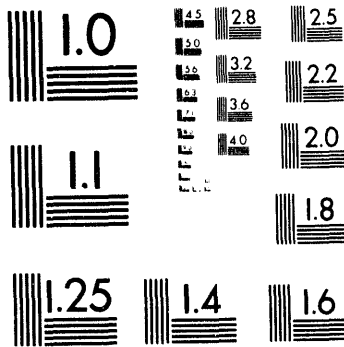
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GENERAL ELECTRIC

HANFORD ATOMIC PRODUCTS OPERATION - RICHLAND, WASHINGTON

DATE
May 27, 1959

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TITLE

RADIATION DECAY DATA OF VARIOUS DUMMIES AND ALUMINUMS

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AUTHOR

A.E. DeMers

W.B. Olson

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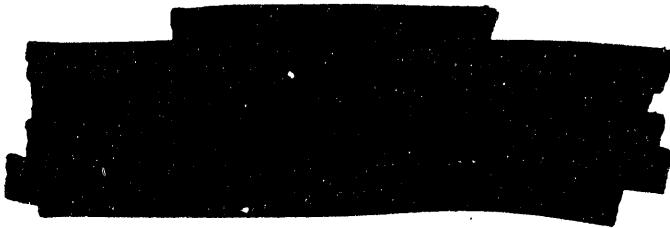
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RADIATION DECAY DATA OF VARIOUS DUMMIES AND ALUMINUMS

Sections of the dummies furnished by Radiological Engineering, Process Reactor Development Operation were machined into 1/4 inch diameter by 1 inch long cylinders and irradiated in the Quickie Facility at F area.

The pieces were discharged directly into a holder one foot from the Beckman chamber. The transient time from in-pile to the chamber is approximately 30 seconds. The readings were taken using a Beckman chamber, Beckman Micro-Micro Ammeter and Recorder. This system has been calibrated with Co⁶⁰ sources obtained from the Oak Ridge National Laboratory.

We are including data taken from a sample of 61-S and 99.998 per cent aluminum which may be of interest.

A. E. DeMers

A. E. DeMers
Irradiation Testing Sub-Section

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Irradiation Testing Sub-Section

MASTER



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99.99 Percent Aluminum

ΔT - 54.9 Flow - 45.0 gpm
Operating Time - 0.854 days Wt. - 0.8094 gm

Time	Beckman Reading	MR/hr	MR/hr/gm
1.5 minutes	2.9×10^{-8}	133690.0	165.70.0
2.0 minutes	2.4×10^{-8}	110640.0	136693.0
2.5 minutes	2.05×10^{-8}	94505.0	116759.3
3.0 minutes	1.95×10^{-8}	89895.0	111063.7
4.0 minutes	1.38×10^{-8}	63618.0	78598.9
5.0 minutes	1.02×10^{-8}	47022.0	58094.0
6.0 minutes	7.2×10^{-9}	33192.0	41008.0
7.0 minutes	5.8×10^{-9}	26738.0	33034.0
8.0 minutes	4.3×10^{-9}	19823.0	24490.0
9.0 minutes	3.15×10^{-9}	14531.5	17941.0
10 minutes	2.35×10^{-9}	10833.5	13384.6
11 minutes	1.48×10^{-9}	6822.8	8429.4
12 minutes	1.07×10^{-9}	4932.7	6094.2
13 minutes	7.5×10^{-10}	3457.5	4271.6
14 minutes	6.05×10^{-10}	2789.0	3445.7
15 minutes	4.35×10^{-10}	2005.3	2477.5
16 minutes	3.15×10^{-10}	1452.1	1794.0
17 minutes	2.2×10^{-10}	1014.2	1253.0
18 minutes	1.8×10^{-10}	829.6	1025.2
19 minutes	1.32×10^{-10}	608.5	751.8
20 minutes	9.6×10^{-11}	442.6	546.8
21 minutes	7.0×10^{-11}	322.7	398.6
22 minutes	5.8×10^{-11}	267.4	330.3
23 minutes	4.4×10^{-11}	202.8	250.5
24 minutes	3.3×10^{-11}	152.1	187.9

99.99 Percent Aluminum (Continued)

Time	Beckman Reading	MR/hr	MR/hr/gm
25 minutes	2.5×10^{-11}	115.2	142.3
26 minutes	1.88×10^{-11}	86.7	107.1
27 minutes	1.45×10^{-11}	66.8	82.5
28 minutes	1.1×10^{-11}	50.7	62.6
29 minutes	8.5×10^{-12}	39.2	48.4
30 minutes	6.9×10^{-12}	31.8	39.2
31 minutes	6.3×10^{-12}	29.0	35.8
32 minutes	5.6×10^{-12}	25.8	31.8
33 minutes	5.0×10^{-12}	23.0	28.4
34 minutes	4.5×10^{-12}	20.7	25.5
35 minutes	4.0×10^{-12}	18.4	22.7

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61 S Aluminum

Operating Time - 12.947 days

Flow - 25.8
Wt. - 1.2135 gm

Time	Beckman Reading	MR/hr at 12"	MR/hr/gm at 12"
0 minutes	2.395×10^{-8}	16717.0	13774.8
3 minutes	1.325×10^{-8}	9248.5	7620.8
5 minutes	$.78 \times 10^{-8}$	5444.4	4485.9
10 minutes	2.1×10^{-9}	1465.8	1207.8
12 minutes	$.9 \times 10^{-9}$	628.2	517.6
16 minutes	3.25×10^{-10}	226.8	186.9
26 minutes	$.88 \times 10^{-10}$	61.4	50.6
1 hr.26 min.	6.3×10^{-11}	44.0	36.2
3 hrs.26 min.	4.9×10^{-11}	34.2	28.1
4 hrs.26 min.	4.3×10^{-11}	30.0	24.7
5 hrs.26 min.	3.8×10^{-11}	26.5	21.8
6 hrs.26 min.	3.4×10^{-11}	23.7	19.5
8 hrs.26 min.	2.85×10^{-11}	19.9	16.3
9 hrs.26 min.	2.7×10^{-11}	18.9	15.5
10hrs.26 min.	2.5×10^{-11}	17.5	14.3
11hrs.26 min.	2.35×10^{-11}	16.4	13.5
12hrs.26 min.	2.25×10^{-11}	15.7	12.9
13hrs.26 min.	2.2×10^{-11}	15.4	12.6
14hrs.26 min.	2.1×10^{-11}	14.7	12.0
15hrs.26 min.	1.97×10^{-11}	13.8	11.3
16hrs.26 min.	1.85×10^{-11}	12.9	10.6
17hrs.26 min.	1.8×10^{-11}	12.6	10.3
18hrs.26 min.	1.75×10^{-11}	12.2	10.0
19hrs.26 min.	1.7×10^{-11}	11.9	9.7
28hrs.26 min.	$.8 \times 10^{-11}$	5.6	4.5
30 hours		6.0(Background)	

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Regular Perf (Price Engineering Co.)

 $\Delta T - 64.8$

Flow - 24.1

Operating Time - 45.234 days Wt. - 2.2102 gm

Time	Beckman Reading at 12"	MR/hr at 12"	MR/hr/gm at 12"
1 minute	3.0×10^{-8}	138300.0	62570.0
2 minutes	2.1×10^{-8}	96810.0	43801.4
3 minutes	1.77×10^{-8}	81597.0	36918.3
4 minutes	1.29×10^{-8}	59469.0	26906.6
5 minutes	9.5×10^{-9}	43795.0	19814.9
10 minutes	2.3×10^{-9}	10603.0	4797.3
15 minutes	5.5×10^{-10}	2535.0	1146.9
20 minutes	2.33×10^{-10}	1074.1	486.0
30 minutes	1.46×10^{-10}	673.1	304.5
1 hour	1.29×10^{-10}	594.7	269.1
2 hours	1.05×10^{-10}	484.1	219.0
3 hours	8.5×10^{-11}	391.9	177.3
4 hours	7.8×10^{-11}	359.6	162.7
5 hours	6.75×10^{-11}	311.2	140.8
10 hours	3.7×10^{-11}	170.6	77.2
22 hours	1.55×10^{-11}	71.5	32.3
28 hours	1.12×10^{-11}	51.6	23.4
34 hours	8.0×10^{-12}	36.9	16.7
40 hours	6.7×10^{-12}	30.9	14.0
46 hours	5.0×10^{-12}	23.1	10.4
8 days		7.0 (Background)	

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Tubular (Harvey Machine Co.)

 Δ T - 62.5
Operating Time - 30.499 daysFlow - 24.1
Wt. - 2.0865 gm

Time	Beckman Reading	MR/hr	MR/hr/gm
2 minutes	2.45×10^{-8}	112945.0	54131.3
5 minutes	1.04×10^{-8}	47944.0	22978.1
10 minutes	2.45×10^{-9}	11294.5	5413.1
15 minutes	5.55×10^{-10}	2558.6	1226.2
20 minutes	2.1×10^{-10}	968.1	464.0
30 minutes	1.15×10^{-10}	530.2	254.1
1 hour	9.5×10^{-11}	438.0	209.9
5 hours	5.0×10^{-11}	230.5	110.5
10 hours	2.85×10^{-11}	131.4	63.0
16 hours	1.78×10^{-11}	82.1	39.3
20 hours	1.37×10^{-11}	63.2	30.3
25 hours	1.04×10^{-11}	47.9	23.0
30 hours	7.8×10^{-12}	36.0	17.2
35 hours	6.75×10^{-12}	31.1	14.9
40 hours	5.3×10^{-12}	24.4	11.7
8 days		7.0 (Background)	

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