APPENDIX C—MATERIAL PROPERTY TEST DATA

This appendix contains the *da/dN* data of Al 2024-T3 clad sheet in either the L-T or T-L directions, as discussed in section 4.

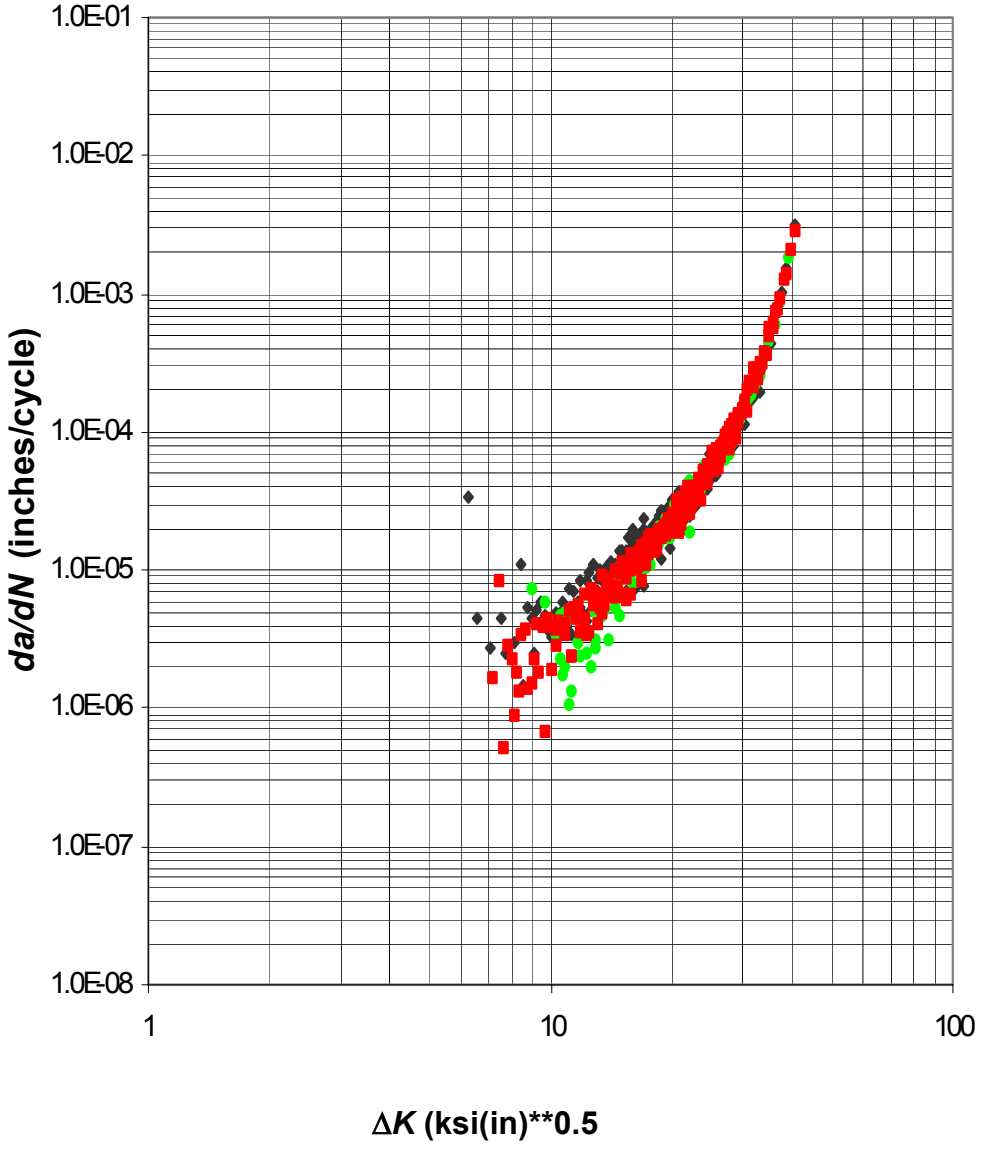

FIGURE C-1. *da/dN* FOR Al 2024-T3 CLAD L-T DIRECTION, R = 0.0, LAB AIR, ROOM TEMPERATURE, SPECIMEN NO. CR-3 (diamond symbols), CR-4 (circle symbols), AND CR-5 (square symbols)

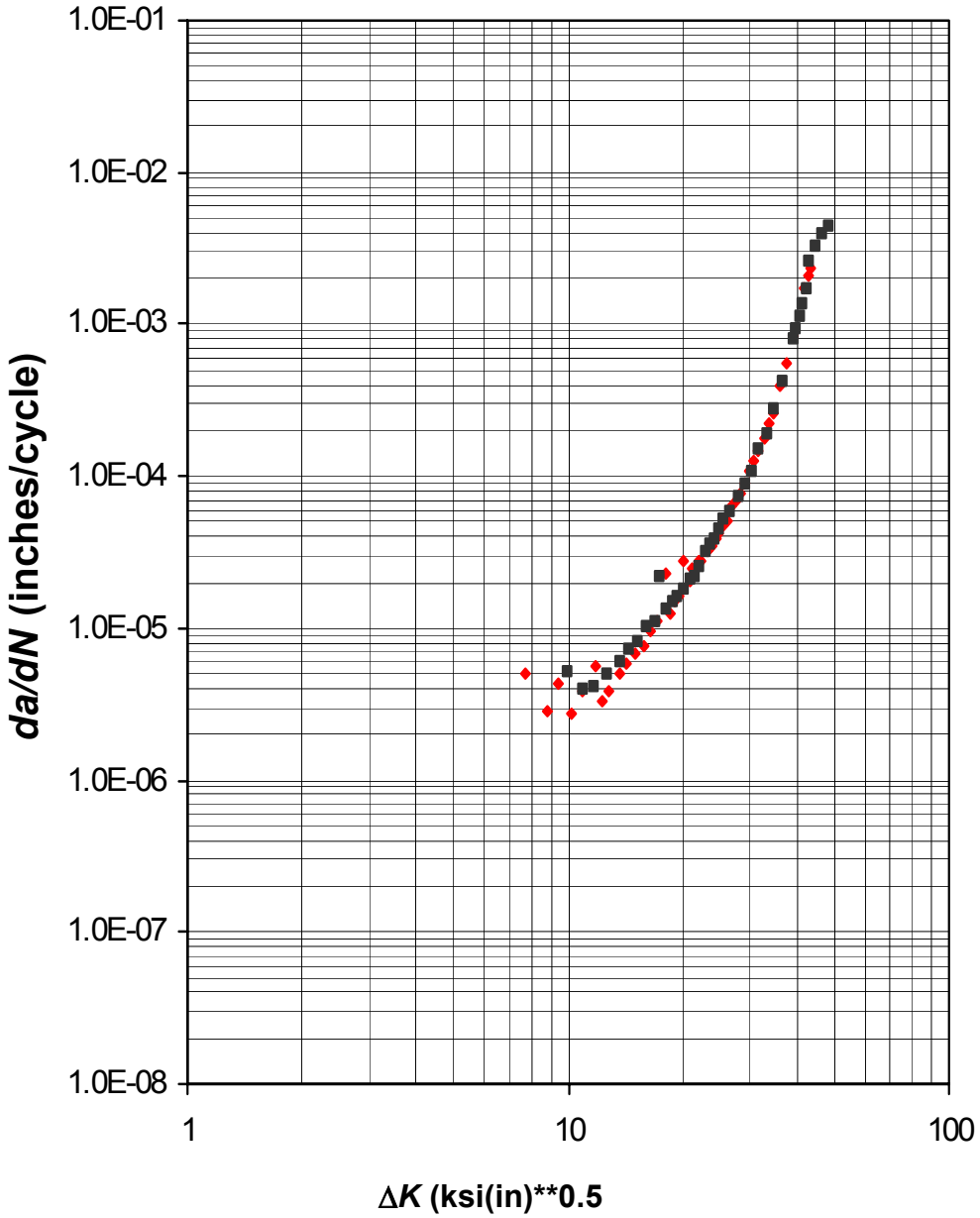

FIGURE C-2. *da/dN* FOR Al 2024-T3 CLAD L-T DIRECTION, R = -0.1, LAB AIR, ROOM TEMPERATURE, SPECIMEN NO. CR-6 (diamond symbols) AND CR-7 (square symbols)

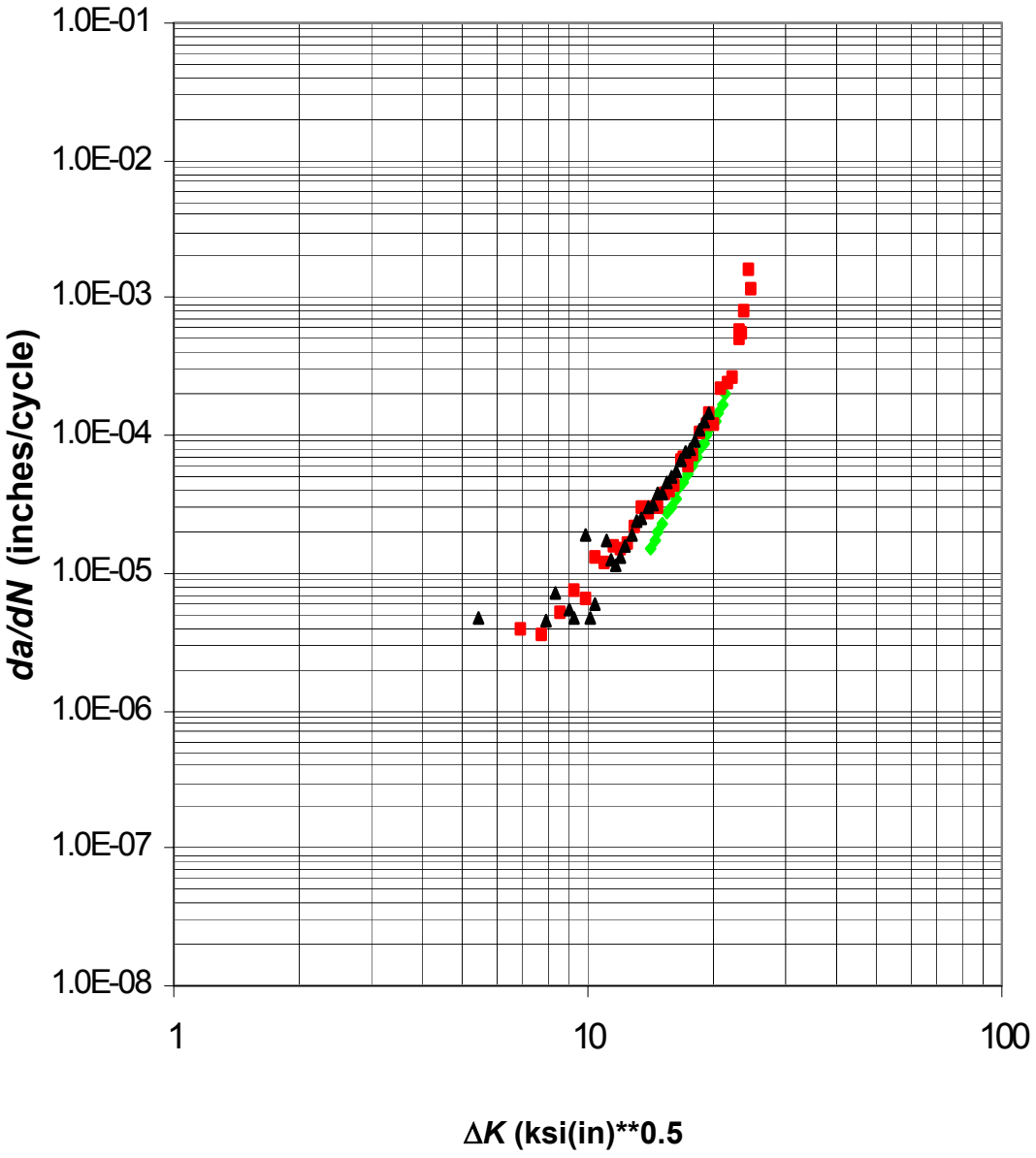

FIGURE C-3. *da/dN* FOR Al 2024-T3 CLAD T-L DIRECTION, R = 0.5, LAB AIR, ROOM TEMPERATURE, SPECIMEN NO. CR-8 (diamond symbols), CR-9 (square symbols), AND CR-10 (triangle symbols)

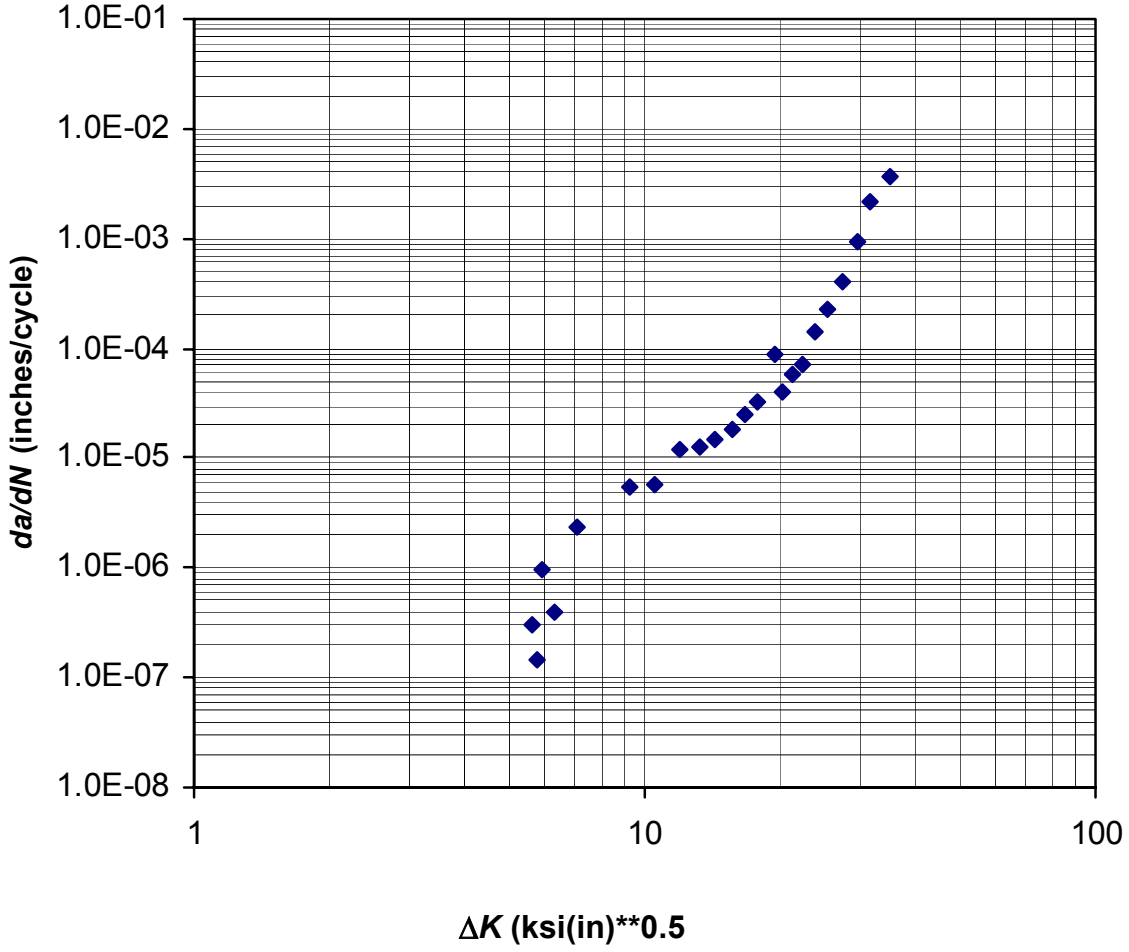

FIGURE C-4. *da/dN* FOR Al 2024-T3 CLAD T-L DIRECTION, R = 0.1, LAB AIR, ROOM TEMPERATURE, SPECIMEN NO. CR-11

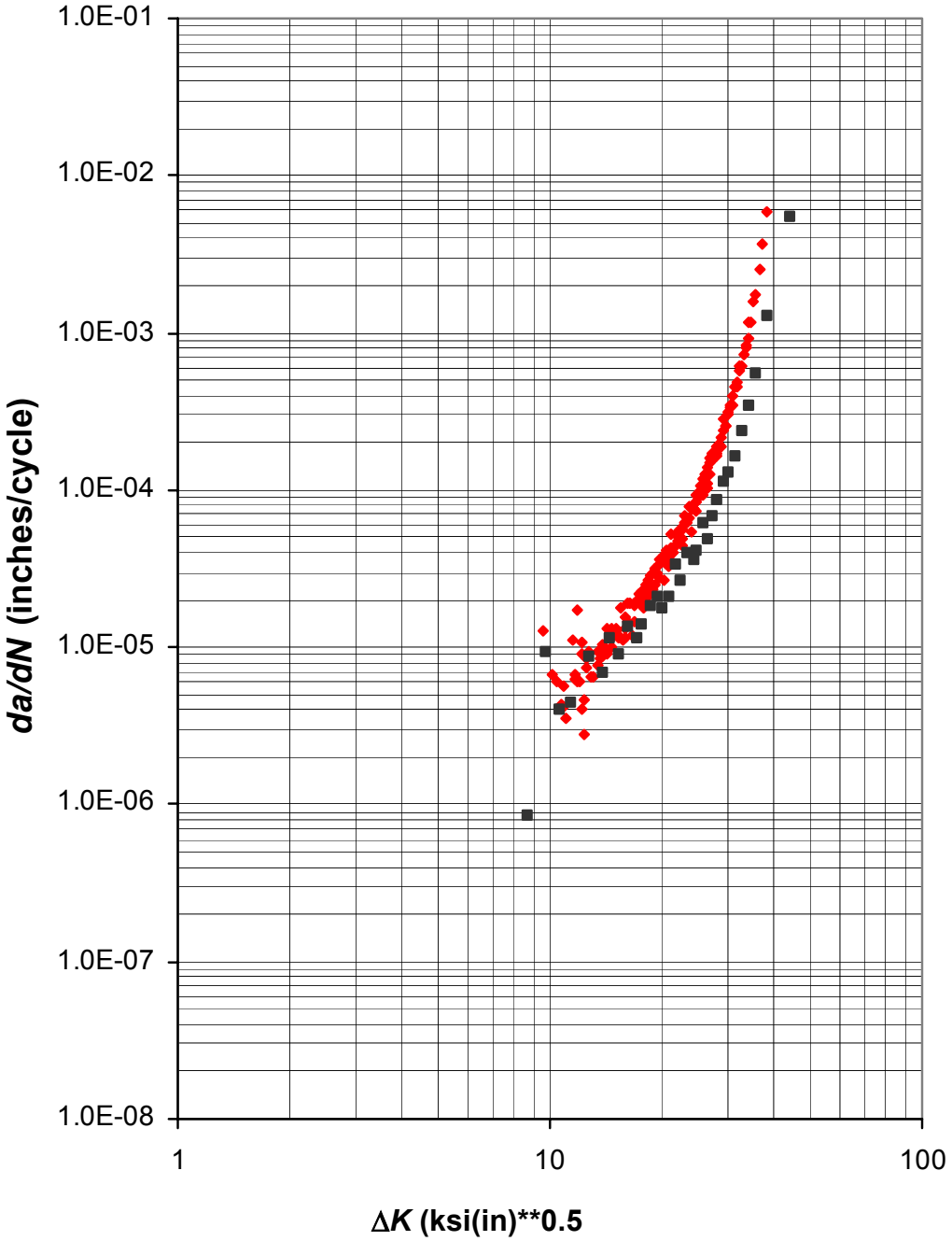

FIGURE C-5. *da/dN* FOR Al 2024-T3 CLAD T-L DIRECTION, R = 0.0, LAB AIR, ROOM TEMPERATURE, SPECIMEN NO. CR-12 (diamond symbols) AND CR-13 (square symbols)

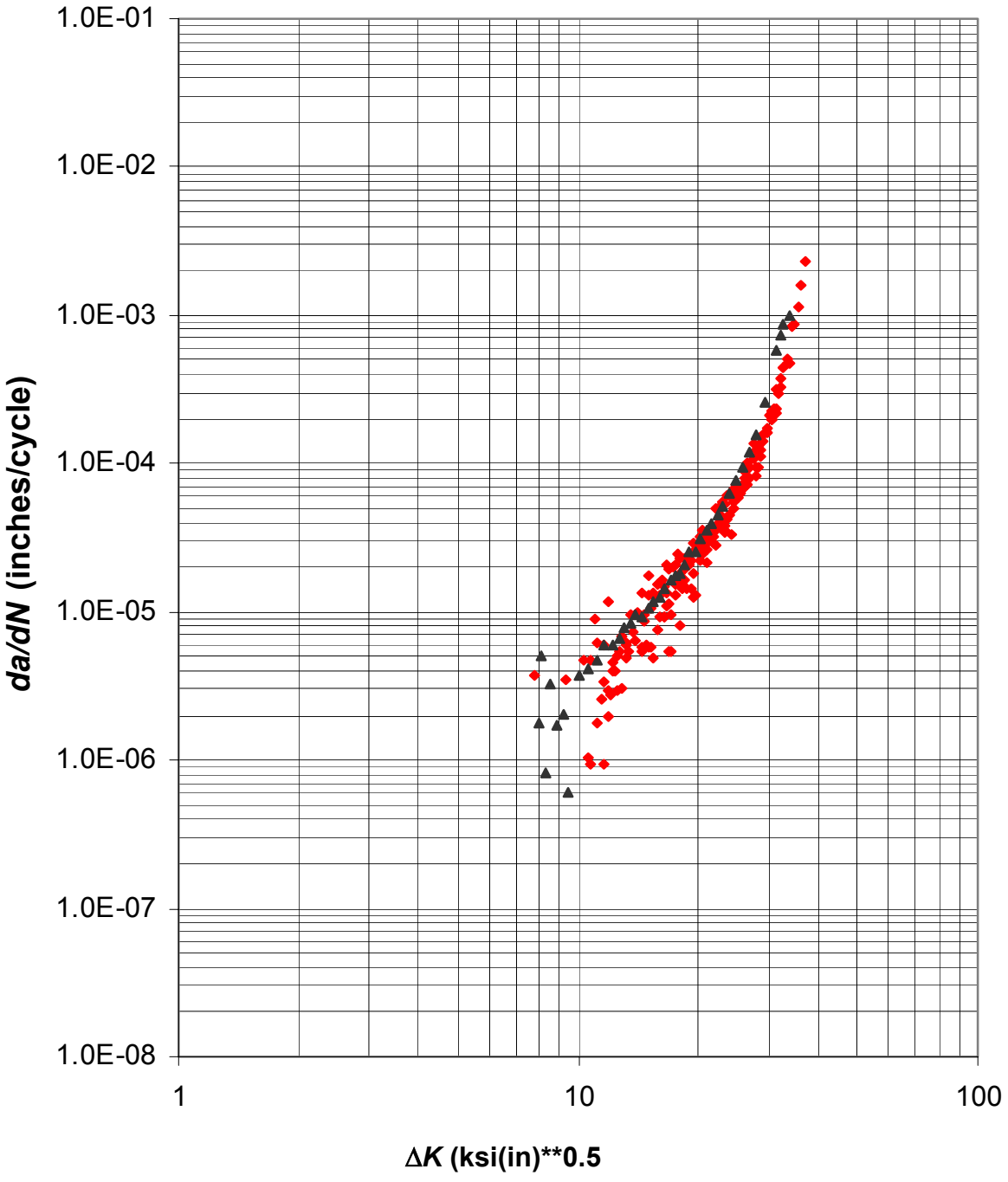

FIGURE C-6. *da/dN* FOR Al 2024-T3 CLAD T-L DIRECTION, R = -0.1, LAB AIR, ROOM TEMPERATURE, SPECIMEN NO. CR-14 (diamond symbols) AND CR-15 (triangle symbols)

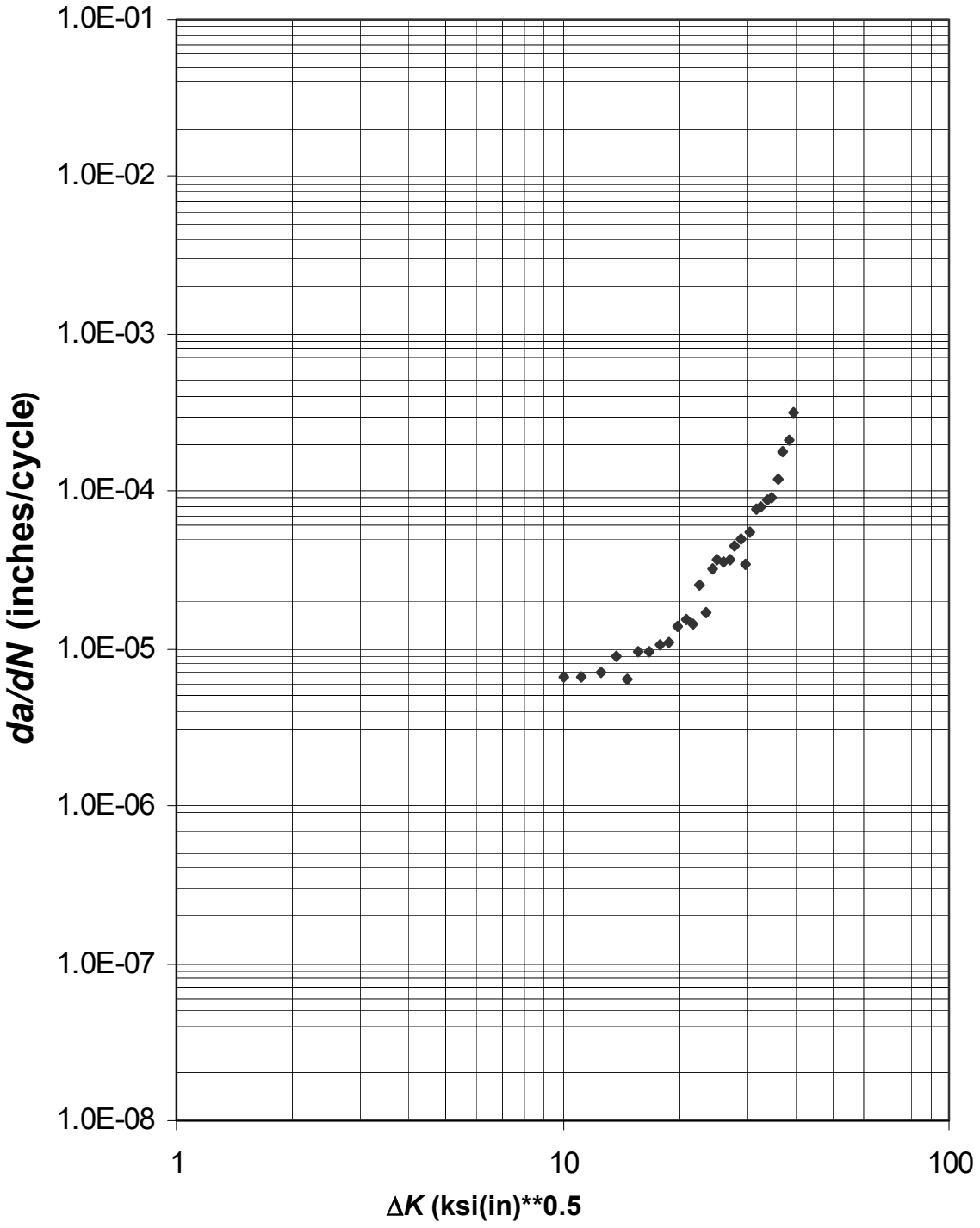

FIGURE C-7. *da/dN* FOR Al 2024-T3 CLAD T-L DIRECTION, R = -0.5, LAB AIR, ROOM TEMPERATURE, SPECIMEN NO. CR-16

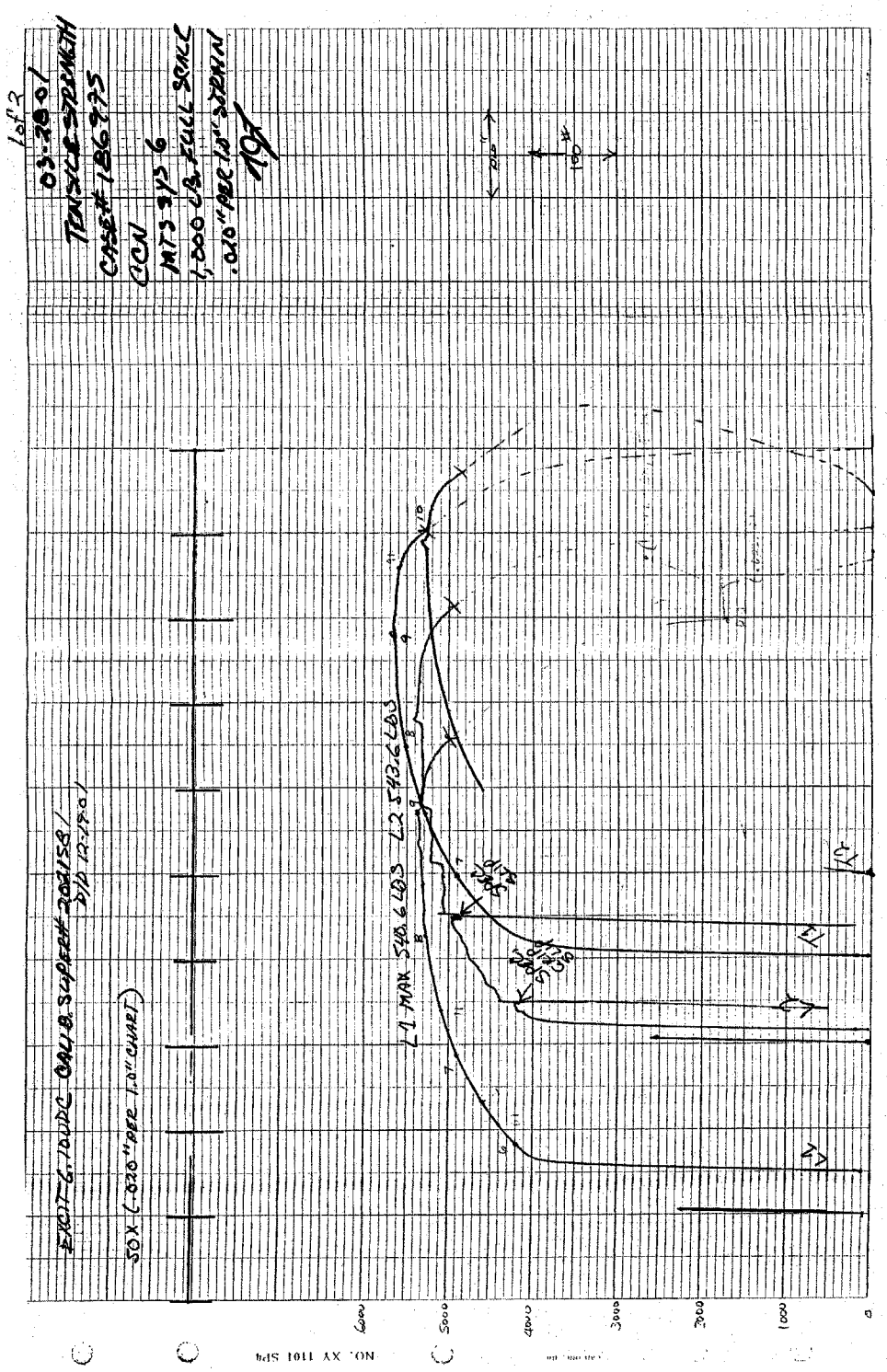

FIGURE C-8. TENSILE TESTING, Al 2024-T3 LOAD VS DISPLACEMENT PLOTS (0.02″ PER 1.0″ SCALE)

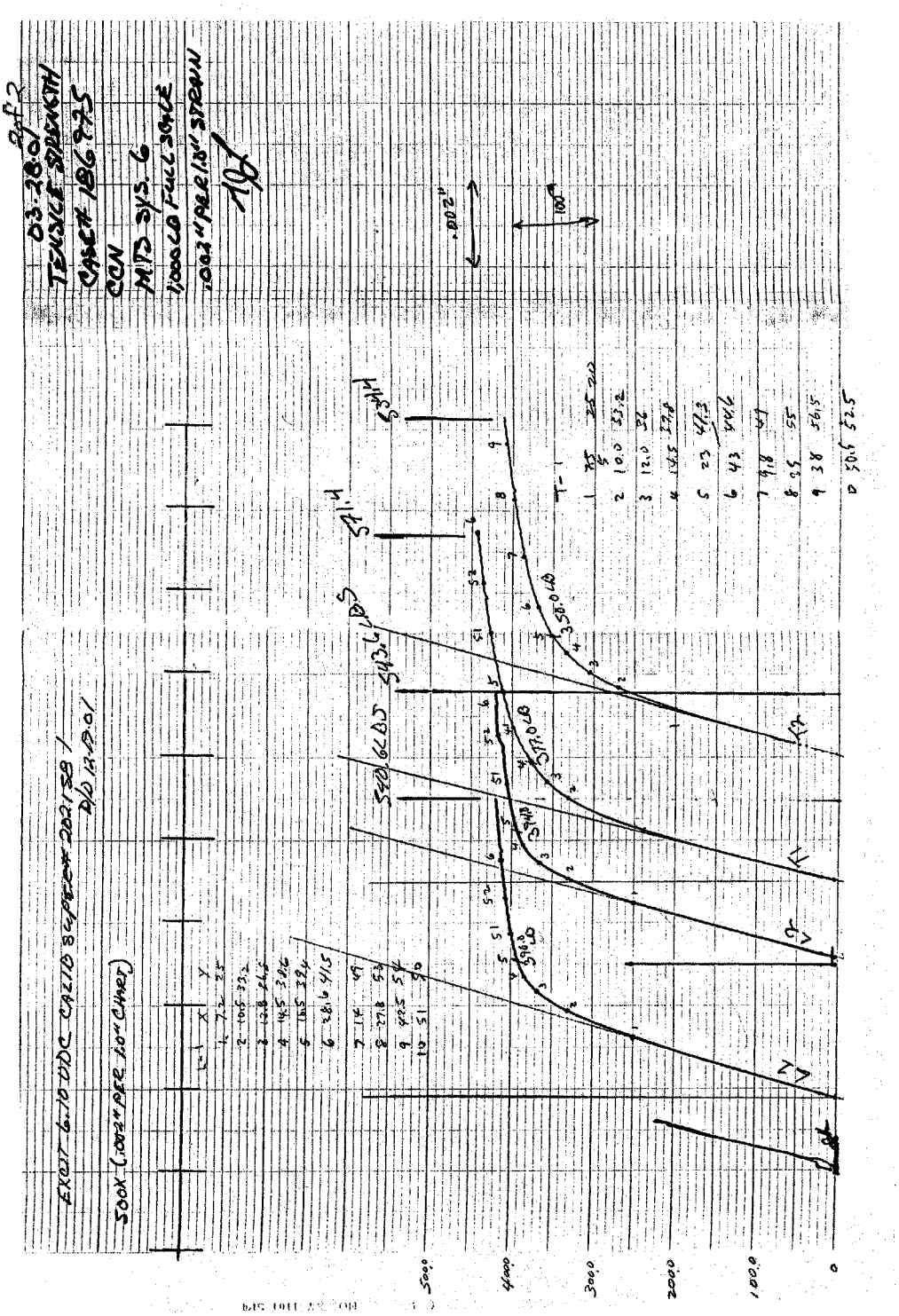

FIGURE C-9. TENSILE TESTING, Al 2024-T3 LOAD VS DISPLACEMENT PLOTS (0.002″ PER 1.0″ SCALE)

MECHANICAL PROPERTIES TESTING LABORATORY

CASE: 186975
SHEET: 1 OF
DATE: 03-28-01

TYPE TEST: TENSILE STR
MATERIAL: 2024-T3
TIME CHARGE:
SUBMITTER: CHING-LONG HSU
TEST RATE: .05"/MIN.
TESTING MACHINE: MTS SYS 6
INSTRUMENTATION: .50" GAGE LENGTH
TECHNICIANS: PREPARED BY:
TESTED BY: TK
CALCULATED BY:

NO.	CODE	THICK	WIDTH	AREA	YIELD LOAD LBS.	YIELD STRESS KSI	ULT LOAD LBS	ULT STRESS KSI	0.750" INT. G.L. ELONG % *	CHART
L1		.0630	.1340	.0084	390.0	46.43	540.6	64.36	~~12.88~~	19.8
L2		.0628	.1335	.0084	394.0	46.90	543.6	64.71	~~20.83~~	19.6
T1		.0625	.1435	.0080	372.0	41.89	571.4	63.49	~~25.83~~	19.6
T2		.0625	.1345	.0084	350.0	41.67	534.4	63.62	~~10.95~~	18.0

* FITBACK TOO SUSPECT
CORRECT % ELO OBTAINED FROM CHART

DATA AND RESULTS CHECKED: [signature]
DATE: 3-29-01

MD-1021 (01 AUG 94) Replaces SSC-1021

FIGURE C-10. TENSILE TESTING, Al 2024-T3 MECHANICAL PROPERTY CALCULATION

ORIENTATION:	T-L	YIELD STRENGTH:	****** PSI
SPECIMEN TYPE:	M(T)	YOUNGS MODULUS:	10.5E+06 PSI
TEMPERATURE:	ROOM TEMPERATURE	THICKNESS:	0.0630 IN
CEB RATIO:	0.9744	WIDTH :	48.000 IN
Y:	0.4 IN	PRECRACK:	7.3635 IN
POISSONS RATIO:	.33		

PT. NO.	P LB	V IN	CEBT	CEBA	F(A/W)	DELTA A PHYS IN	A EFF IN	DELTA A EFF IN	KR EFF KSI-IN**.5
1	19040	.019	0.674	0.657			7.363		32.17
2	29554	.031	0.694	0.676		-0.081	7.558	0.194	50.76
3	39289	.042	0.711	0.692		0.024	7.718	0.354	68.39
4	47319	.055	0.766	0.746		0.378	8.246	0.882	85.99
5	54785	.068	0.822	0.801		0.724	8.764	1.401	103.73
6	57578	.074	0.851	0.829		0.895	9.027	1.663	111.26
7	59794	.081	0.894	0.871		1.098	9.402	2.039	118.93
8	61016	.087	0.948	0.923		1.413	9.865	2.501	125.68
9	63553	.095	0.987	0.961		1.548	10.195	2.831	134.19
10	64547	.103	1.054	1.027		1.915	10.737	3.374	141.92
11	65151	.111	1.128	1.099		2.301	11.319	3.956	149.56
12	62425	.116	1.229	1.198		2.795	12.070	4.706	151.52
13	62532	.123	1.302	1.269		3.158	12.583	5.219	157.70
14	65768	.137	1.375	1.340		3.354	13.072	5.708	172.10
15	63647	.147	1.524	1.485		4.084	14.004	6.640	178.95
16	62426	.155	1.639	1.597		4.583	14.671	7.307	185.08
17	60935	.163	1.773	1.727		5.081	15.382	8.019	191.58
18	57766	.173	1.981	1.930		5.808	16.381	9.017	198.15
19	54181	.183	2.231	2.173		6.648	17.418	10.055	205.11
20	47843	.192	2.652	2.584		7.722	18.849	11.485	211.67

1 PHYSICAL A WAS CALCULATED USING IRWINS PLASTIC ZONE
2 FAILED SPECIMEN STARTING NOTCH REQUIREMENT
3 FAILED FINAL PRECRACK LOAD REQUIREMENT
4 FAILED UNCRACKED LIGAMENT REQUIREMENT (C(T))
5 FAILED NET SECTION YIELD REQUIREMENT (M(T))

FIGURE C-11. R-CURVE TESTING, PANEL NO. 1(KR-1) LABOROTORY CALCULATION SHEET

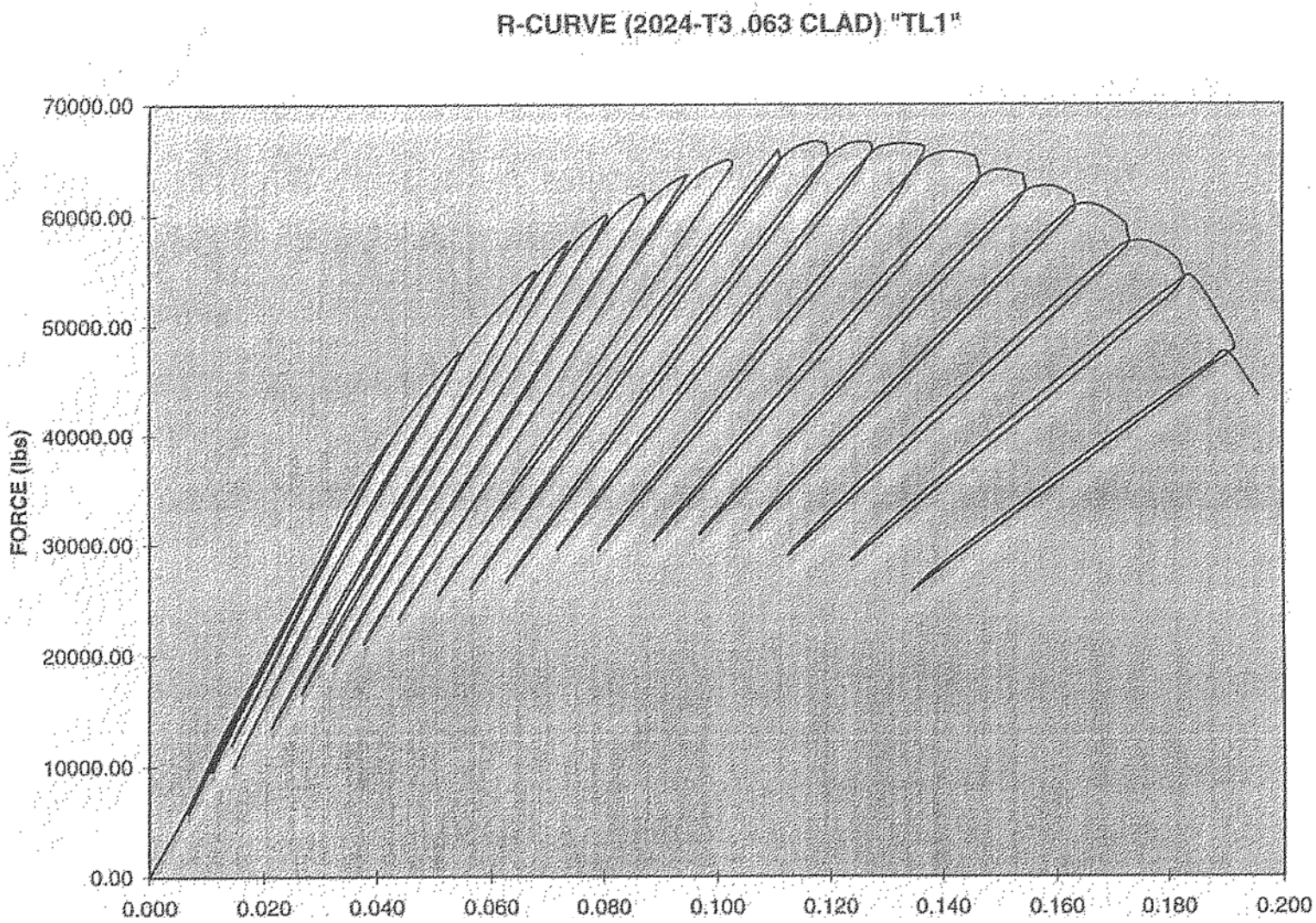

FIGURE C-12. R-CURVE TESTING, PANEL NO. 1(KR-1) LOAD VS COD PLOT

ORIENTATION:	T-L	YIELD STRENGTH:	****** PSI
SPECIMEN TYPE:	M(T)	YOUNGS MODULUS:	10.5E+06 PSI
TEMPERATURE:	ROOM TEMPERATURE	THICKNESS:	0.0630 IN
CEB RATIO:	0.9149	WIDTH :	48.000 IN
Y:	0.4 IN	PRECRACK:	7.2100 IN
POISSONS RATIO:	.33		

PT. NO.	P LB	V IN	CEBT	CEBA	F(A/W)	DELTA A PHYS IN	A EFF IN	DELTA A EFF IN	KR EFF KSI-IN**.5
1	20000	.021	0.701	0.642			7.210		33.35
2	30000	.032	0.699	0.640		-1.025	7.190	-0.020	49.94
3	41700	.048	0.765	0.700		-0.114	7.789	0.579	73.01
4	47600	.059	0.825	0.755		0.415	8.331	1.121	87.09
5	50600	.066	0.856	0.783		0.515	8.597	1.387	94.55
6	56200	.080	0.942	0.862		0.876	9.318	2.108	111.06
7	58200	.093	1.062	0.971		1.057	10.277	3.067	123.65
8	60150	.102	1.125	1.029		1.363	10.761	3.551	132.48
9	61850	.111	1.184	1.083		1.548	11.194	3.984	140.68
10	63360	.119	1.240	1.135		1.533	11.596	4.386	148.47
11	64300	.127	1.304	1.193		1.622	12.039	4.829	155.71
12	65000	.134	1.368	1.251		1.663	12.459	5.249	162.42
13	65500	.142	1.436	1.314		1.876	12.896	5.686	169.13
14	65300	.151	1.535	1.404		1.738	13.496	6.286	176.50
15	65030	.160	1.629	1.490		1.890	14.036	6.826	183.30
16	64800	.168	1.719	1.573		1.839	14.529	7.319	189.94
17	64300	.175	1.800	1.647		1.994	14.950	7.740	195.03
18	63420	.183	1.908	1.745		2.092	15.477	8.267	200.99
19	62000	.191	2.040	1.866		2.766	16.080	8.870	207.03
20	60450	.199	2.175	1.990		3.211	16.652	9.442	212.59
21	56440	.205	2.406	2.201		3.834	17.529	10.319	216.04
22	53800	.213	2.614	2.392		4.599	18.224	11.014	221.57

1 PHYSICAL A WAS CALCULATED USING IRWINS PLASTIC ZONE
2 FAILED SPECIMEN STARTING NOTCH REQUIREMENT
3 FAILED FINAL PRECRACK LOAD REQUIREMENT
4 FAILED UNCRACKED LIGAMENT REQUIREMENT (C(T))
5 FAILED NET SECTION YIELD REQUIREMENT (M(T))

FIGURE C-13. R-CURVE TESTING, PANEL NO. 2 (KR-2) LABOROTORY CALCULATION SHEET