PGB 70-22

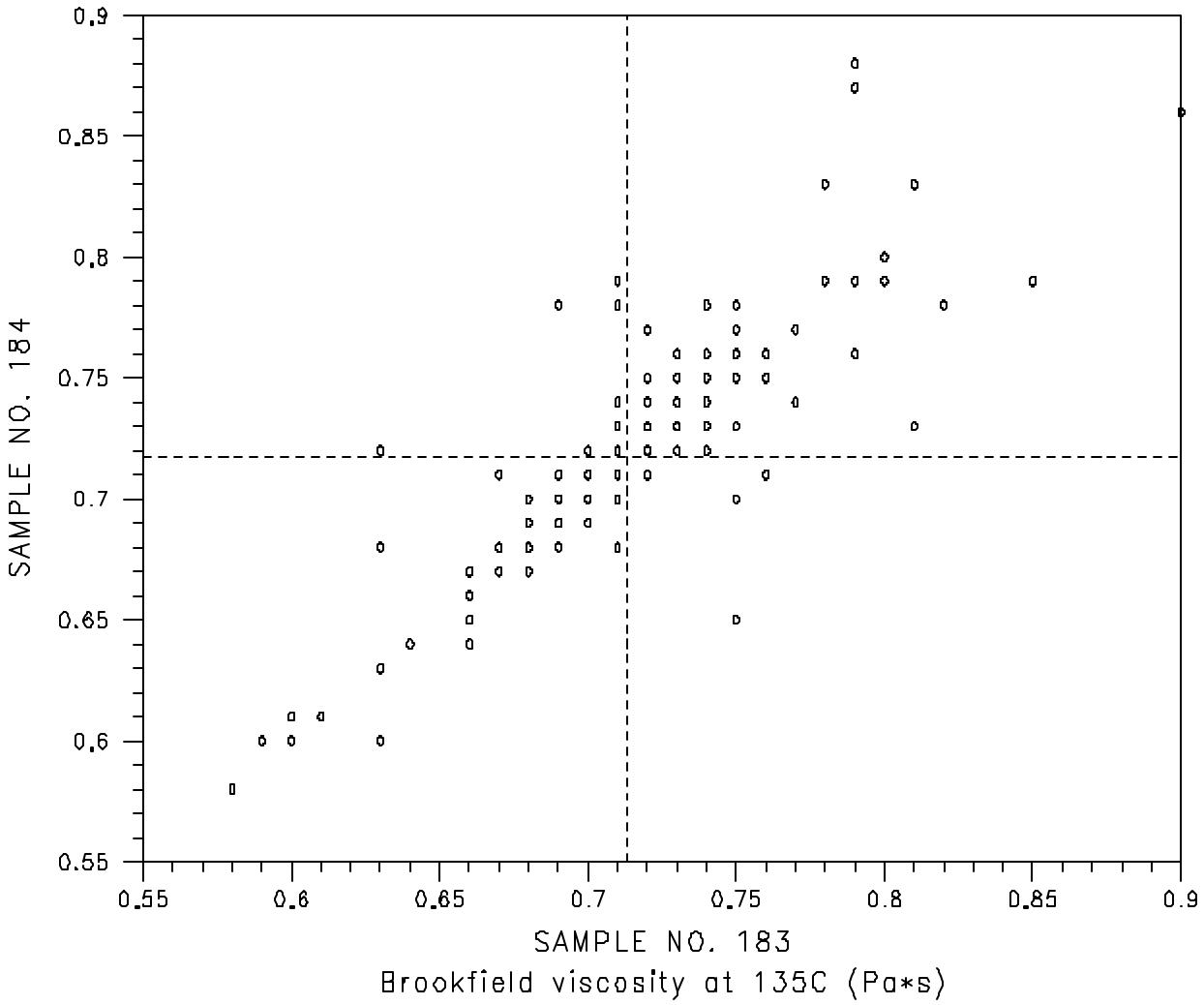
PERFORMANCE GRADED BINDER SAMPLES	NO. LABS	SAMPLE NUMBER 183			SAMPLE NUMBER 184		
TEST RESULT		AVG.	STAND. DEV.	COEFF. VAR.	AVG.	STAND. DEV.	COEFF. VAR.
TESTS ON ORIGINAL BINDER							
ASTM TP48/D4402, Brookfield Viscosity Viscosity at 135°C (Pa·s)	209	0.715	0.049	6.85	0.720	0.050	6.98
	204	0.713	0.042	5.92	0.718	0.043	6.01
AASHTO TP5, Dynamic Shear Rheometer (70°C, 25-mm plate, 1-mm gap) Complex Shear Modulus, G* (kPa)	209	1.354	0.14	10.1	1.361	0.15	10.8
	204	1.342	0.094	6.99	1.344	0.086	6.41
Phase Angle, δ (Degrees)	209	83.76	1.05	1.25	83.76	0.97	1.16
	201	83.82	0.61	0.725	83.80	0.61	0.724
G* / sin δ (kPa)	211	1.362	0.14	10.1	1.366	0.14	10.6
	207	1.350	0.094	6.96	1.351	0.088	6.53
TESTS ON RTFO (T240) RESIDUE							
Change in Mass (Percent)	207	-0.0758	0.091	-119.66	-0.0763	0.093	-122.27
	199	-0.0633	0.047	-74.45	-0.0623	0.050	-79.64
AASHTO TP5, Dynamic Shear Rheometer (70°C, 25-mm plate, 1-mm gap) Complex Shear Modulus, G* (kPa)	207	2.675	0.48	18.1	2.688	0.48	17.8
	203	2.619	0.27	10.43	2.633	0.26	9.83
Phase Angle, δ (Degrees)	205	79.65	0.92	1.16	79.63	1.16	1.45
	199	79.68	0.80	1.01	79.65	0.84	1.05
G* / sin δ (kPa)	207	2.714	0.50	18.3	2.733	0.49	18.0
	203	2.657	0.28	10.48	2.676	0.27	9.99
TESTS ON PAV RESIDUE - PAV AT 100°C							
AASHTO TP5, Dynamic Shear Rheometer (28°C, 8-mm plate, 2-mm gap) Complex Shear Modulus, G* (kPa)	202	3115.70	787.1	25.3	3120.20	784.4	25.1
	200	3066.3	595.5	19.4	3073.5	603.8	19.6
Phase Angle, δ (Degrees)	200	49.54	1.7	3.44	49.57	1.7	3.39
	197	49.54	1.4	2.90	49.55	1.5	2.95
G* sin δ (kPa)	202	2398.5	630.6	26.3	2426.8	660.8	27.2
	198	2344.2	411.5	17.6	2363.8	433.2	18.3
AASHTO TP1, Bending Beam Rheometer (-12°C, 60 s) Creep Stiffness (MPa)	204	177.7	15.6	8.80	178.5	15.2	8.50
	201	178.5	14.1	7.88	179.3	13.6	7.59
Slope, m	204	0.3352	0.014	4.10	0.3334	0.027	8.11
	196	0.3341	0.0087	2.60	0.3338	0.0093	2.78
AASHTO TP3, Direct Tension (-12°C, 1 mm/min) Failure Stress (MPa)	48	3.79	0.99	26.2	3.80	1.05	27.7
	46	3.87	0.87	22.4	3.96	0.77	19.4
Failure Strain (%)	47	1.95	0.88	45.1	1.96	0.88	44.6
	45	1.82	0.65	35.5	1.87	0.72	38.4

NOTE: The rows in blue show results after removing outlying data. Ratings are based on the results shown in blue (Any outlying data have been removed).

June 2001

AMRL PROFICIENCY SAMPLE PROGRAM

PERFORMANCE GRADED BINDER SAMPLE NOS. 183 & 184



Test No. 1 Brookfield Viscosity 204 Points

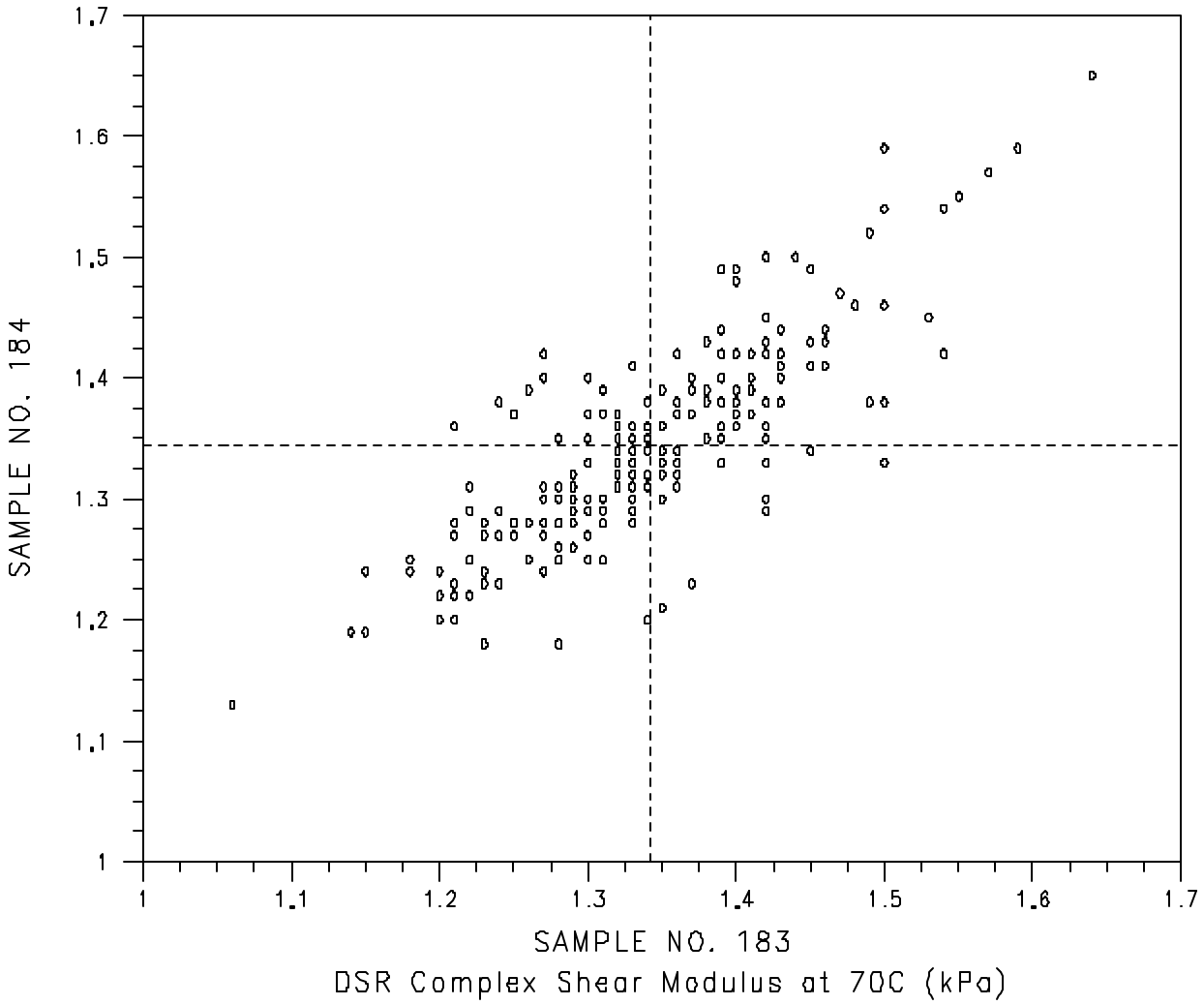
Labs Eliminated: 21 51 679 1426 3389

Labs off the Diagram: None

June 2001

AMRL PROFICIENCY SAMPLE PROGRAM

PERFORMANCE GRADED BINDER SAMPLE NOS. 183 & 184



Test No. 2 Complex Shear Modulus, G^* 203 Points

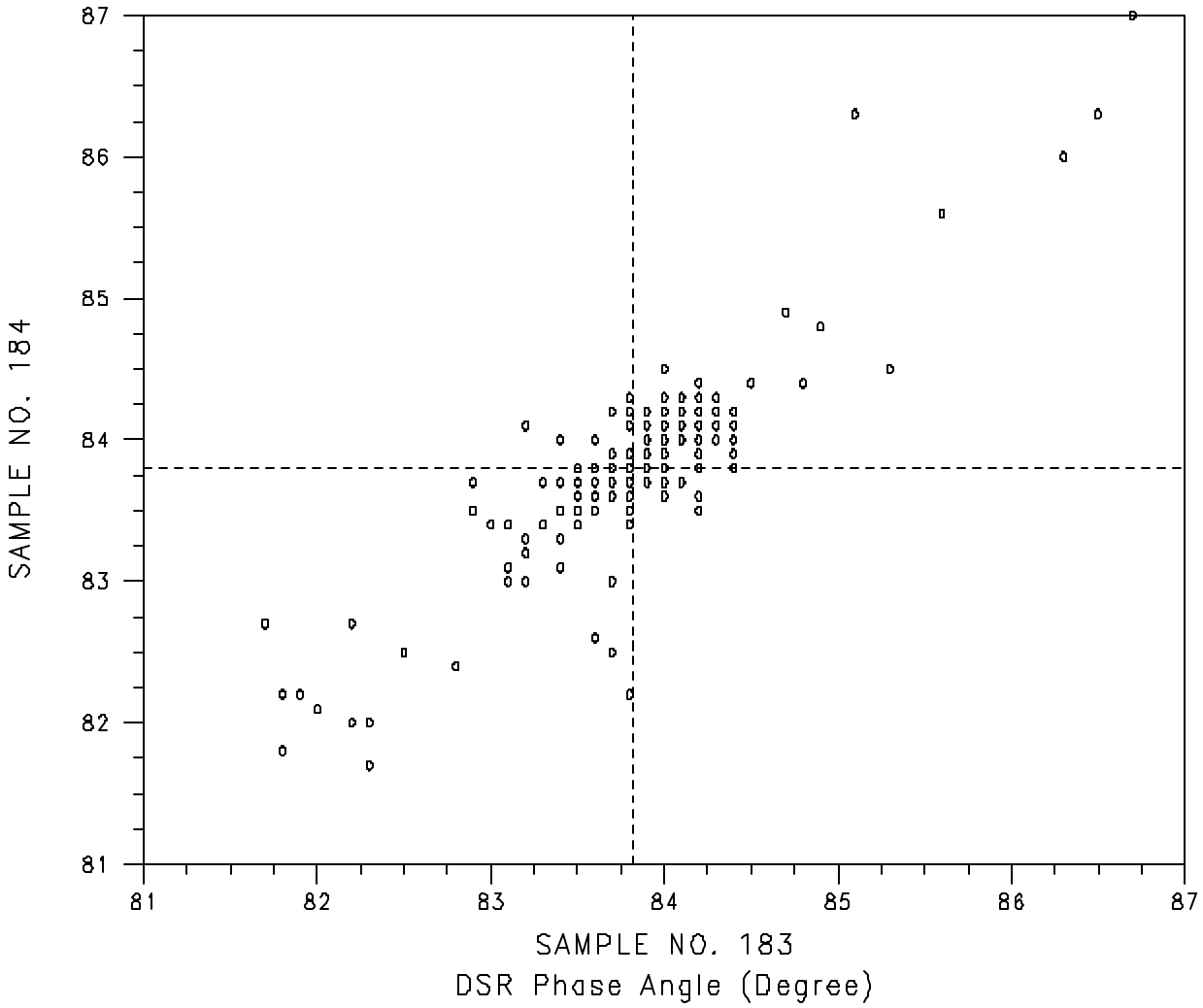
Labs Eliminated: 51 2003 3158 3782 3897

Labs off the Diagram: 3495

June 2001

AMRL PROFICIENCY SAMPLE PROGRAM

PERFORMANCE GRADED BINDER SAMPLE NOS. 183 & 184



Test No. 3 Phase Angle, * 201 Points

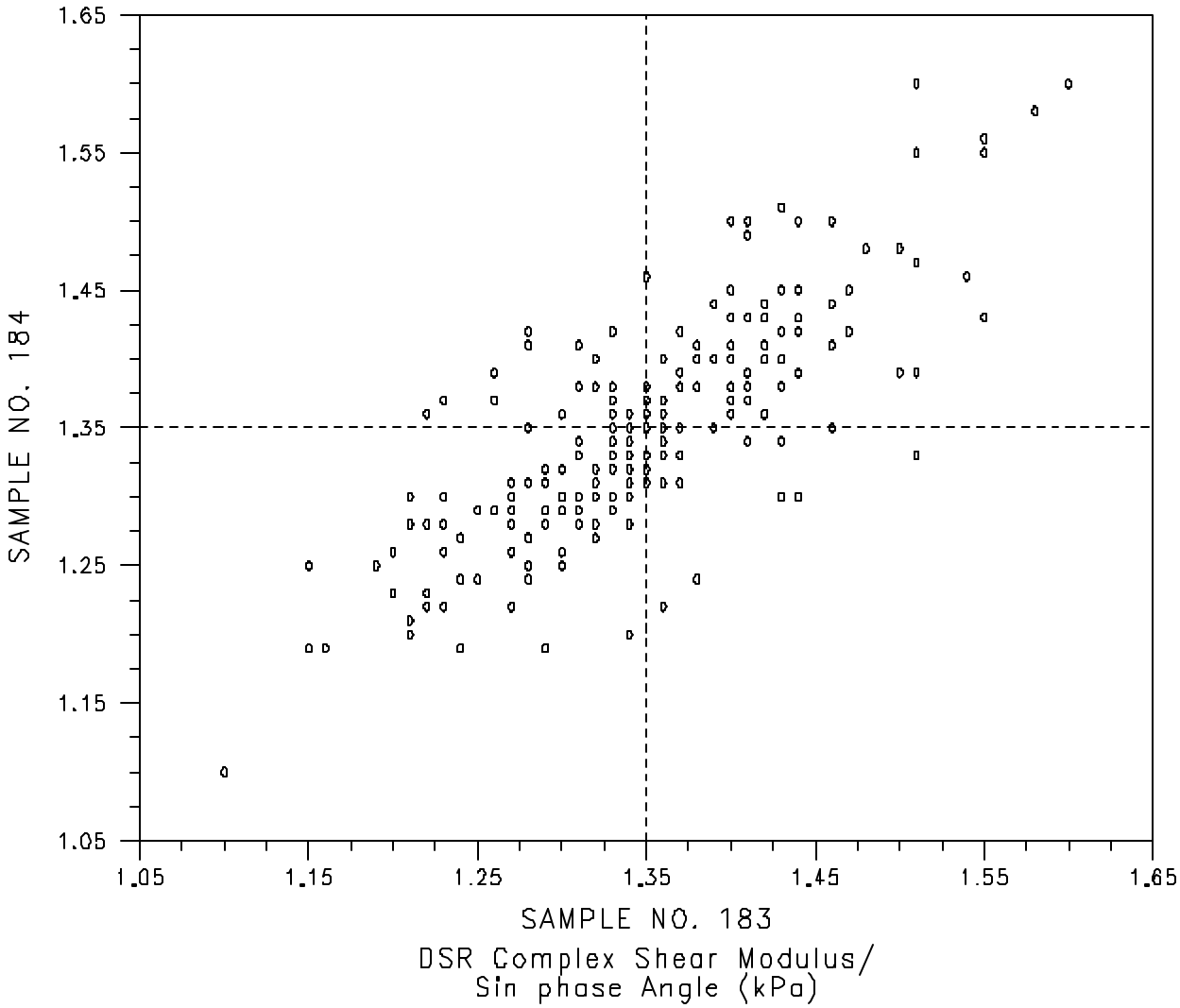
Labs Eliminated: 1218 1285 3144 3158 3349 3677 3800 3971

Labs off the Diagram: None

June 2001

AMRL PROFICIENCY SAMPLE PROGRAM

PERFORMANCE GRADED BINDER SAMPLE NOS. 183 & 184



Test No. 4 G*/ Sin * 205 Points

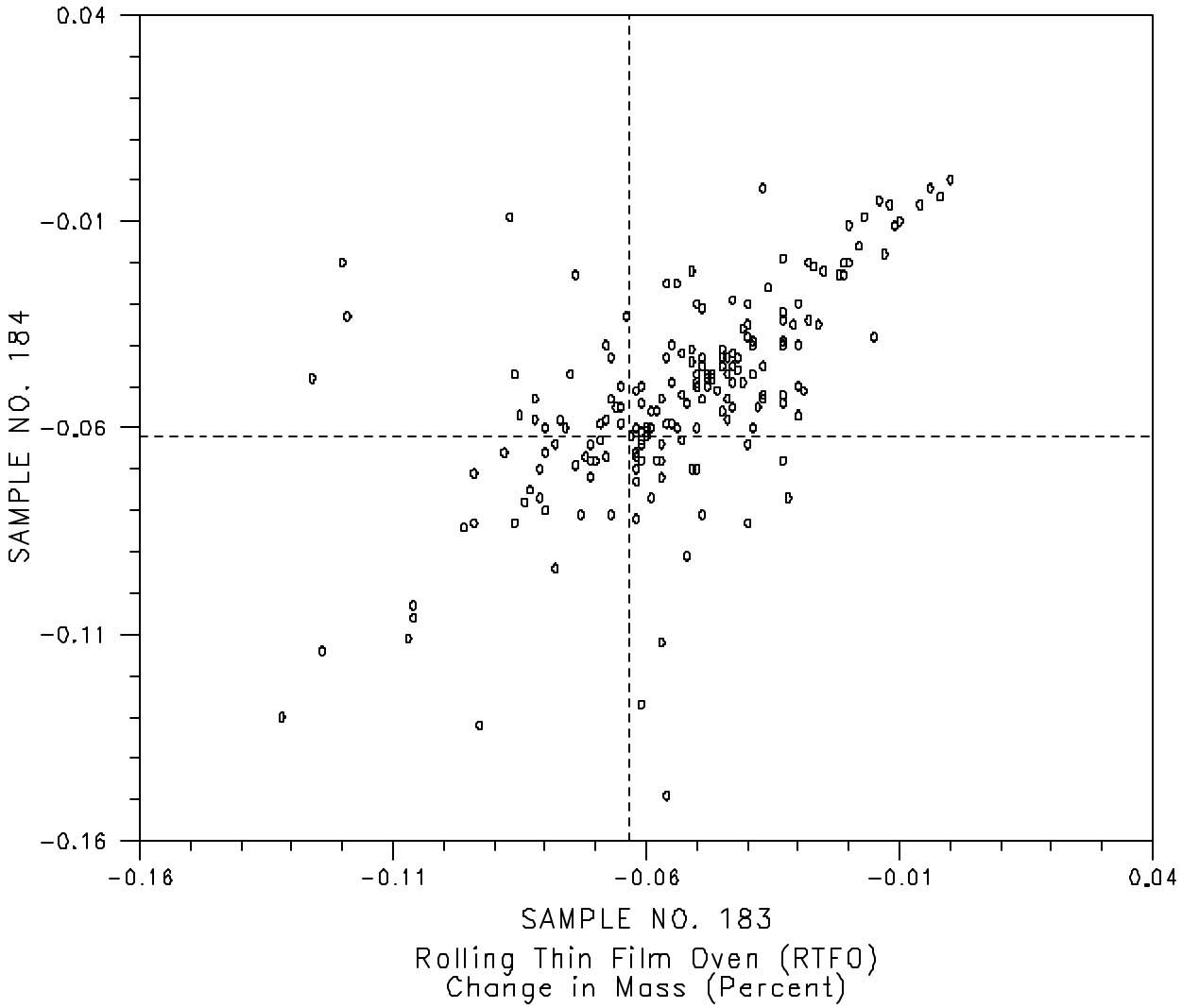
Labs Eliminated: 51 3158 3782 3897

Labs off the Diagram: 37 3495

June 2001

AMRL PROFICIENCY SAMPLE PROGRAM

PERFORMANCE GRADED BINDER SAMPLE NOS. 183 & 184



Test No. 5 RTFO - Change in Mass 189 Points

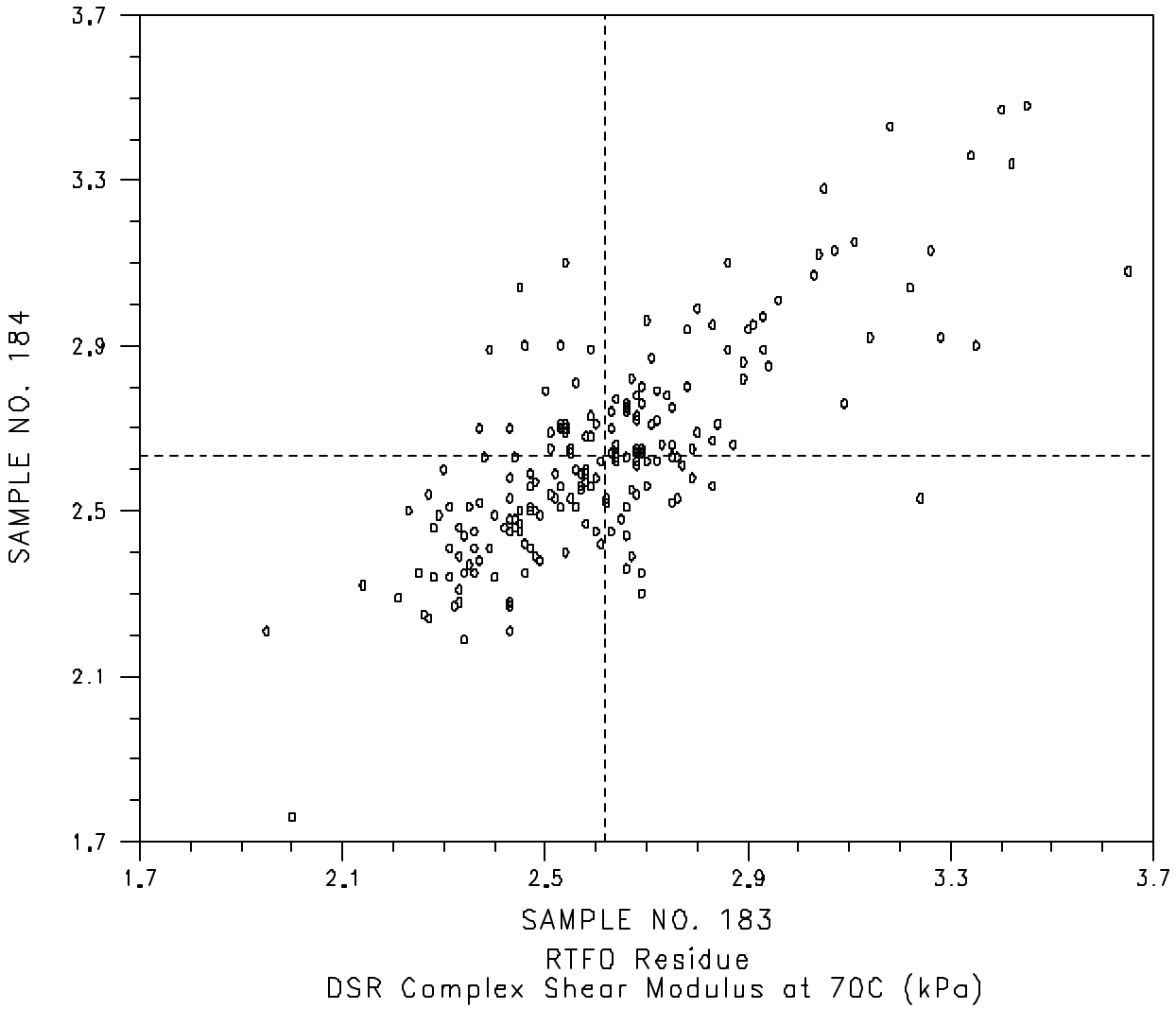
Labs Eliminated: 52 367 370 876 1118 2004 3206 3381

Labs off the Diagram: 3 1426 3181 3319 3495 3582 3640 3650 3782

June 2001

AMRL PROFICIENCY SAMPLE PROGRAM

PERFORMANCE GRADED BINDER SAMPLE NOS. 183 & 184



Test No. 6 RTFO Residue - G* 202 Points

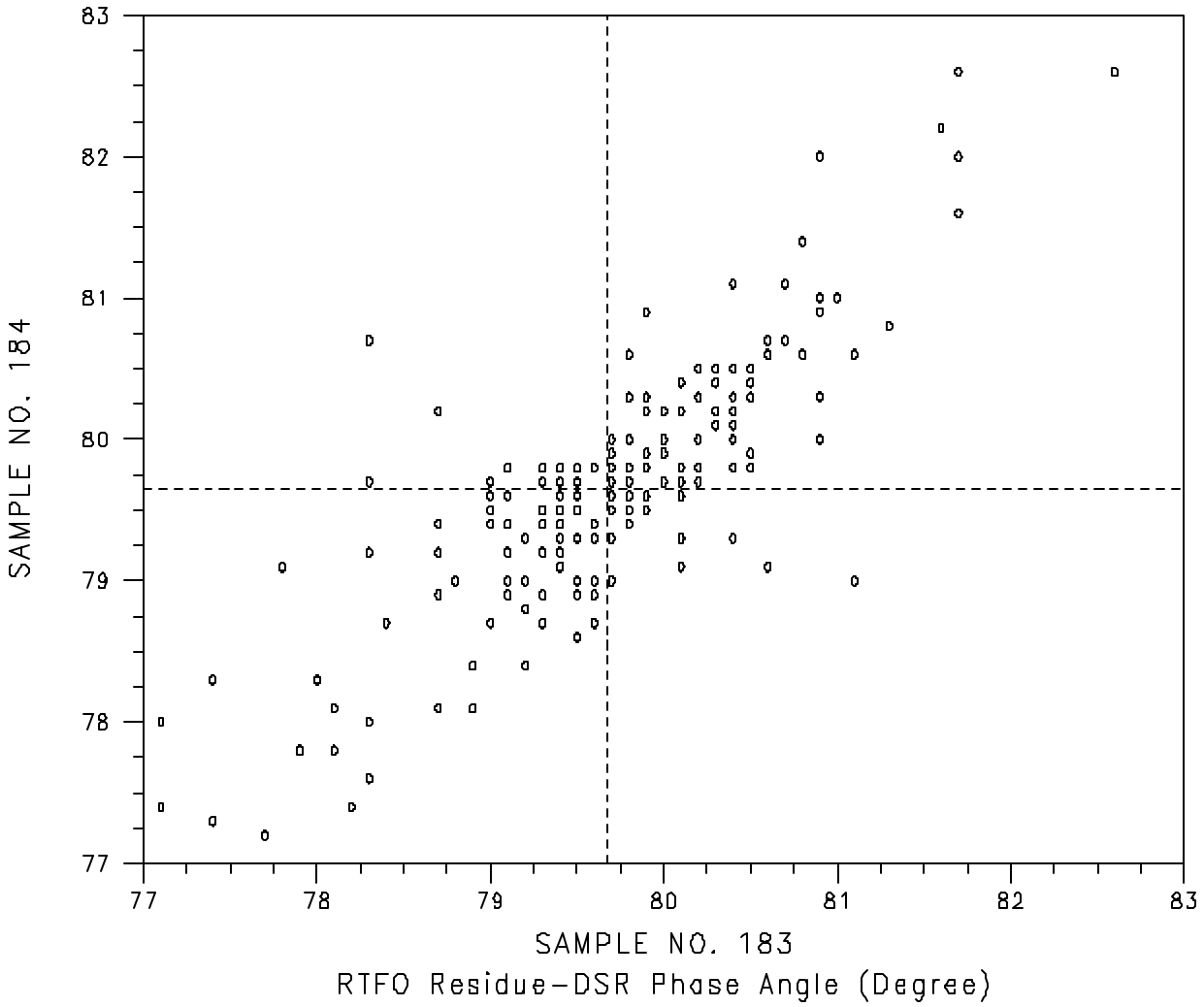
Labs Eliminated: 51 1009 3381 3782

Labs off the Diagram: 25

June 2001

AMRL PROFICIENCY SAMPLE PROGRAM

PERFORMANCE GRADED BINDER SAMPLE NOS. 183 & 184



Test No. 7 RTFO Residue - Phase Angle * 199 Points

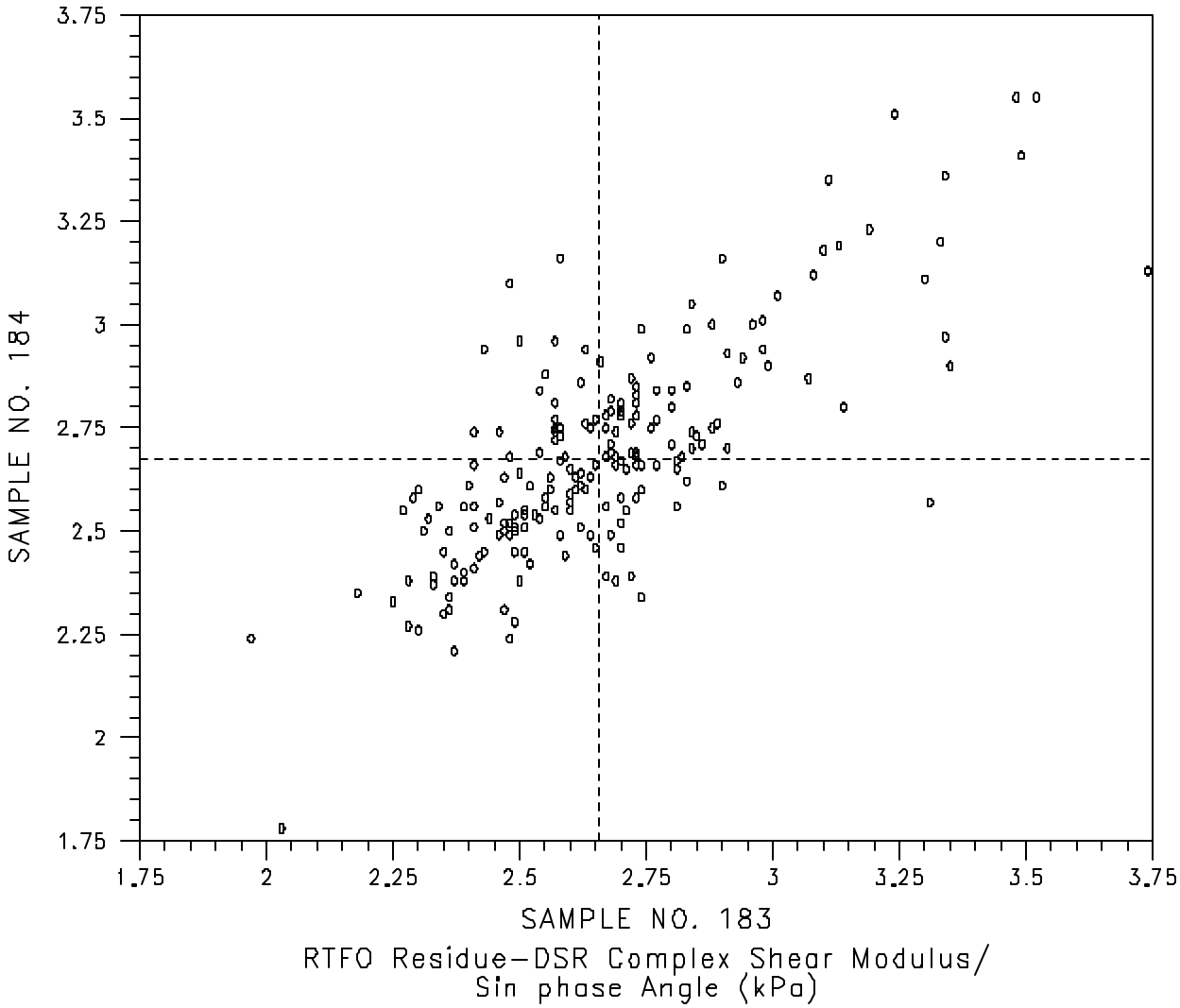
Labs Eliminated: 25 31 335 3155 3268 3349

Labs off the Diagram: None

June 2001

AMRL PROFICIENCY SAMPLE PROGRAM

PERFORMANCE GRADED BINDER SAMPLE NOS. 183 & 184



Test No. 8 RTFO Residue - G* / Sin * 202 Points

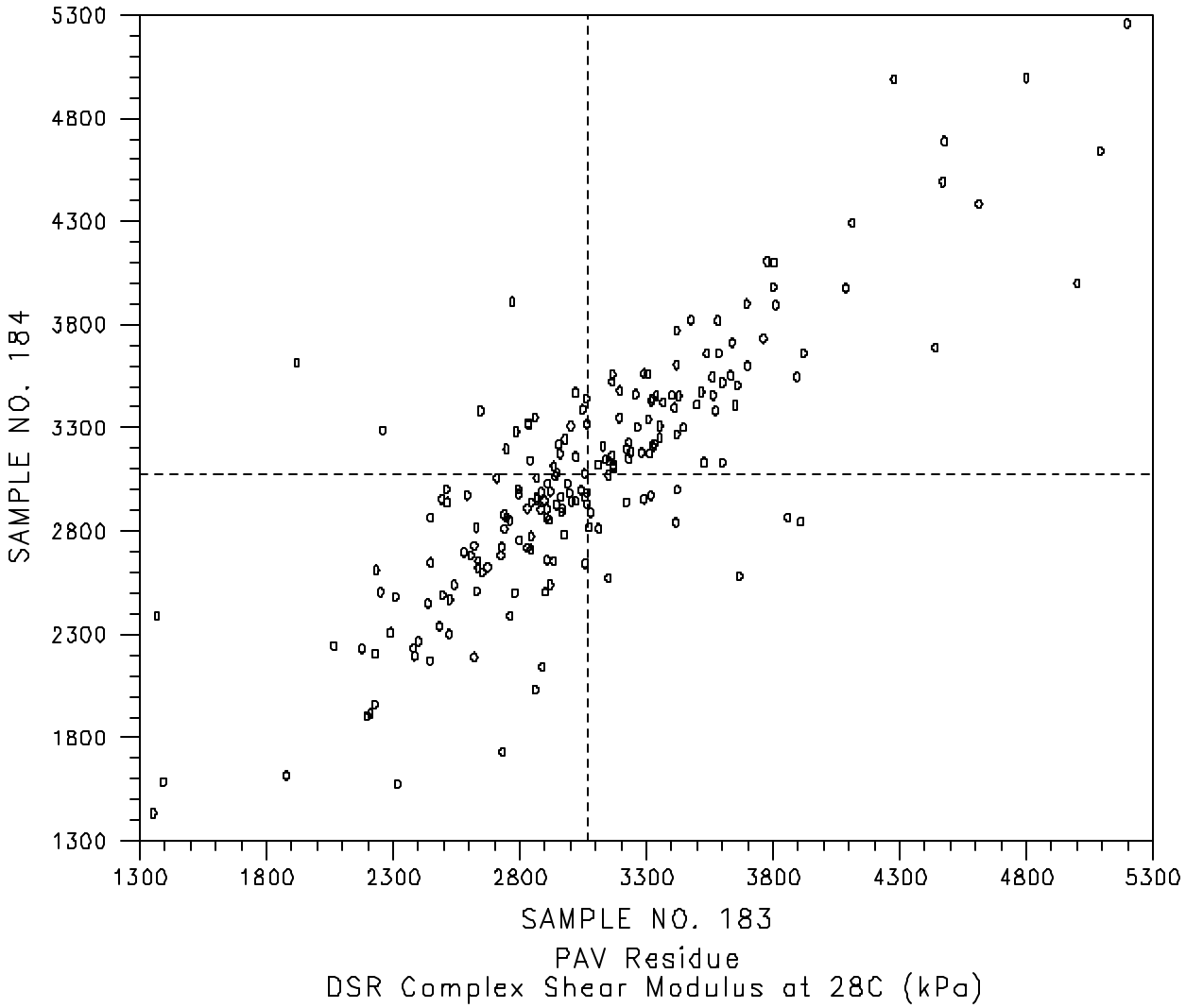
Labs Eliminated: 51 1009 3381 3782

Labs off the Diagram: 25

June 2001

AMRL PROFICIENCY SAMPLE PROGRAM

PERFORMANCE GRADED BINDER SAMPLE NOS. 183 & 184



Test No. 9 PAV Residue - G* 200 Points

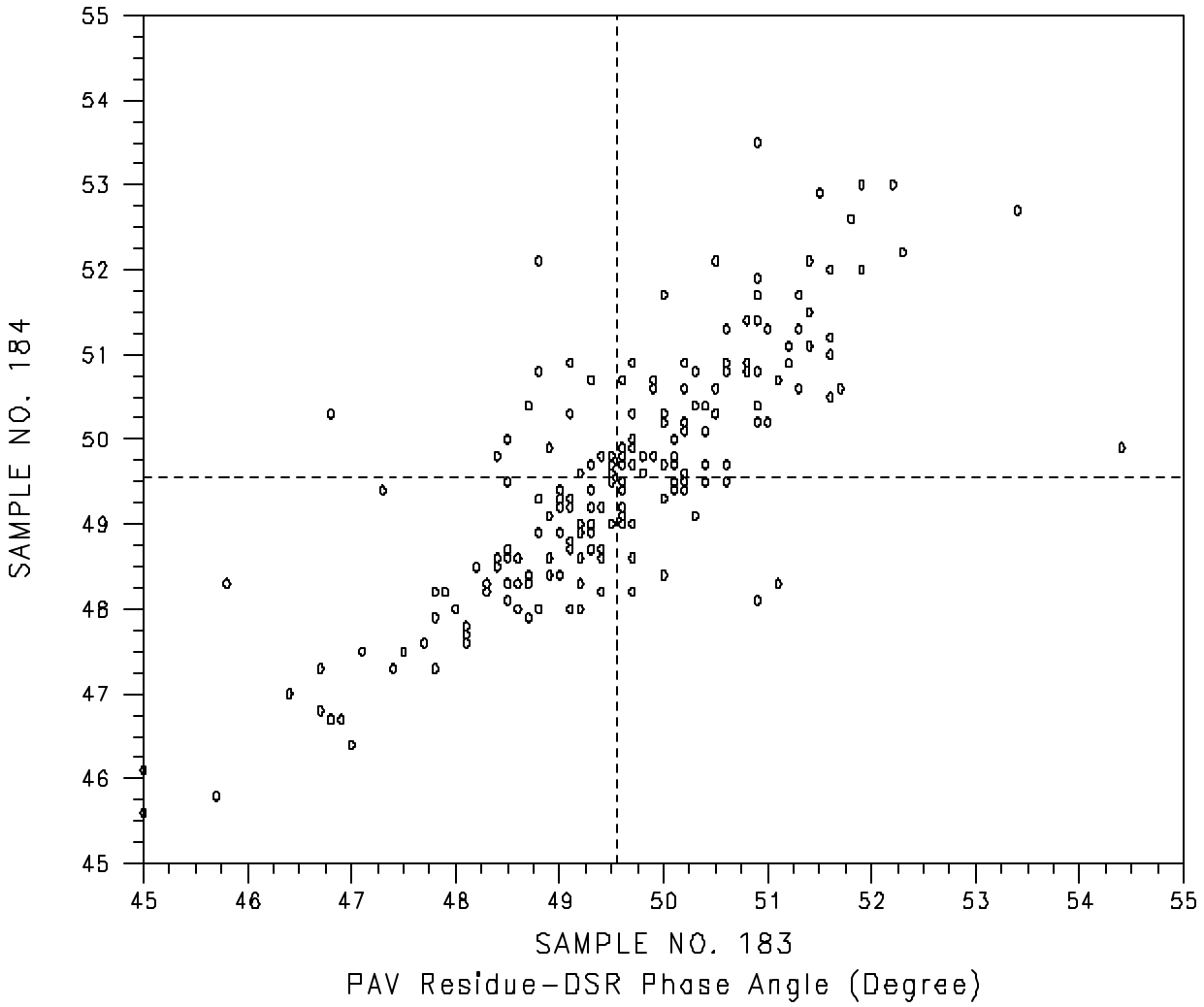
Labs Eliminated: 3155 3381

Labs off the Diagram: None

June 2001

AMRL PROFICIENCY SAMPLE PROGRAM

PERFORMANCE GRADED BINDER SAMPLE NOS. 183 & 184



Test No. 10 PAV Residue - Phase Angle * 196 Points

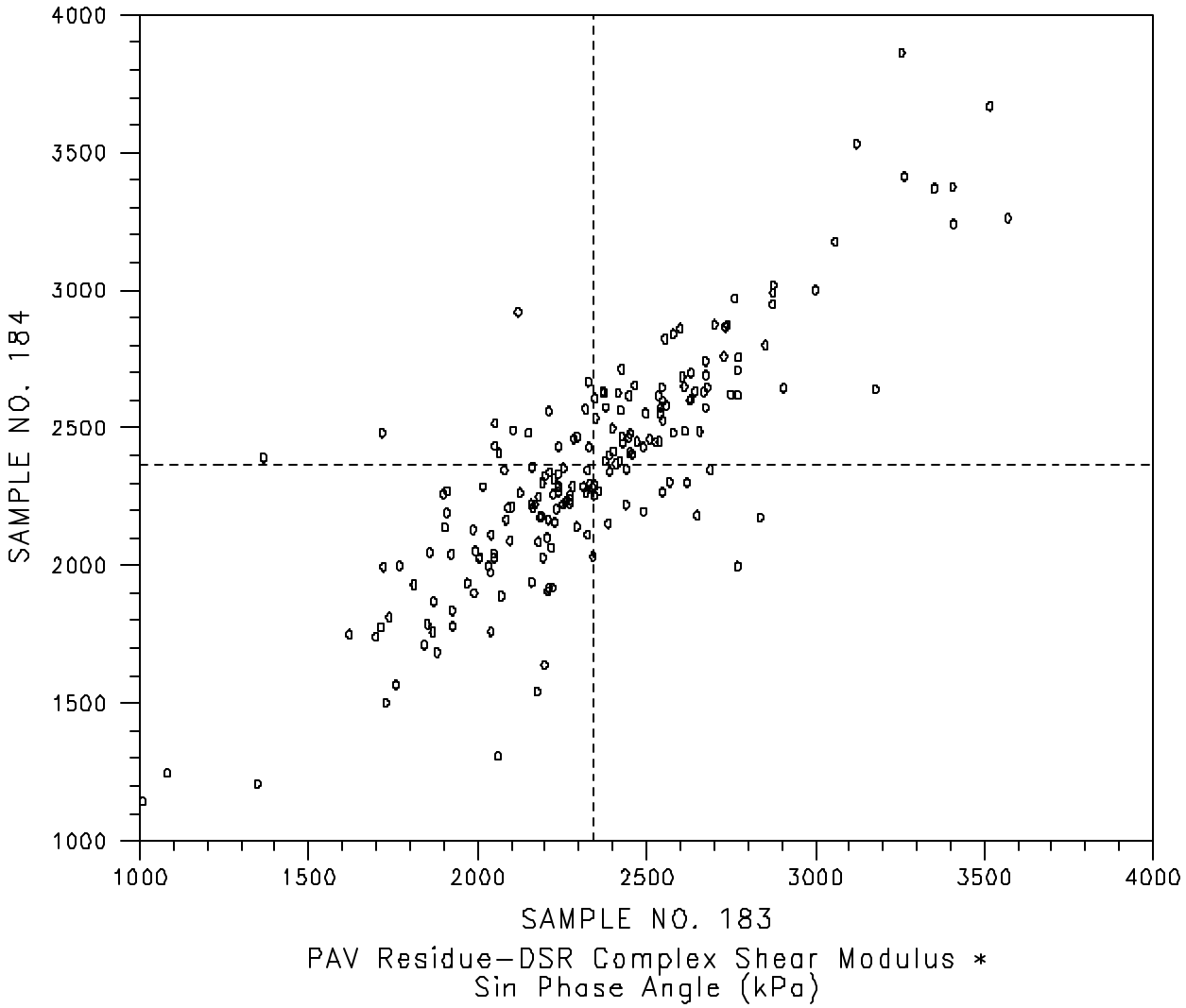
Labs Eliminated: 1426 3155 3206

Labs off the Diagram: 3654

June 2001

AMRL PROFICIENCY SAMPLE PROGRAM

PERFORMANCE GRADED BINDER SAMPLE NOS. 183 & 184



Test No. 11 PAV Residue - G* Sin * 197 Points

Labs Eliminated: 207 3155 3363 3381

Labs off the Diagram: 30

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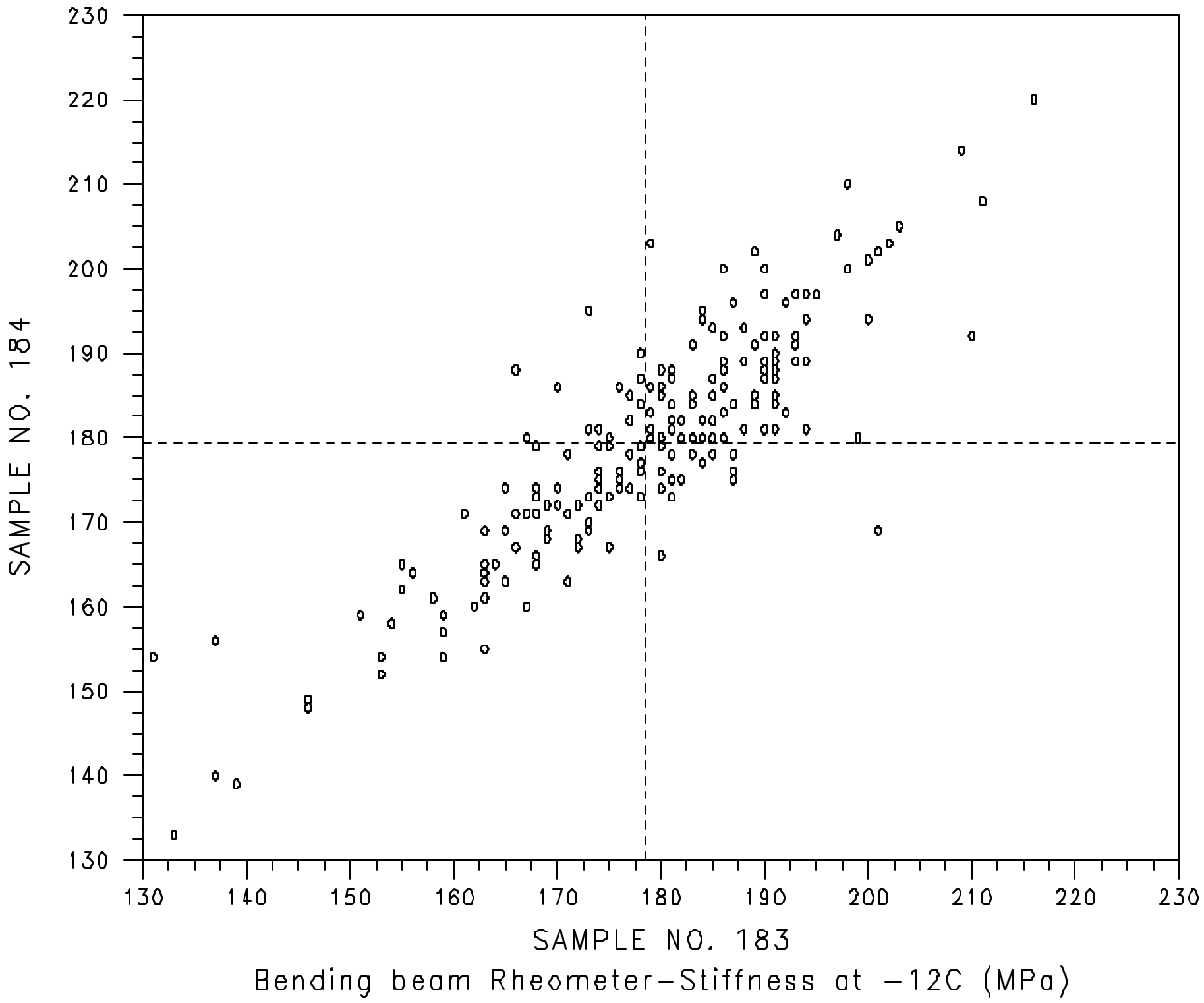
AMRL PROFICIENCY SAMPLE PROGRAM

PERFORMANCE GRADED BINDER SAMPLE NOS. 183 & 184



Test No. 12 BBR Stiffness 201 Points

Labs Eliminated: 23 70 1170

Labs off the Diagram: None

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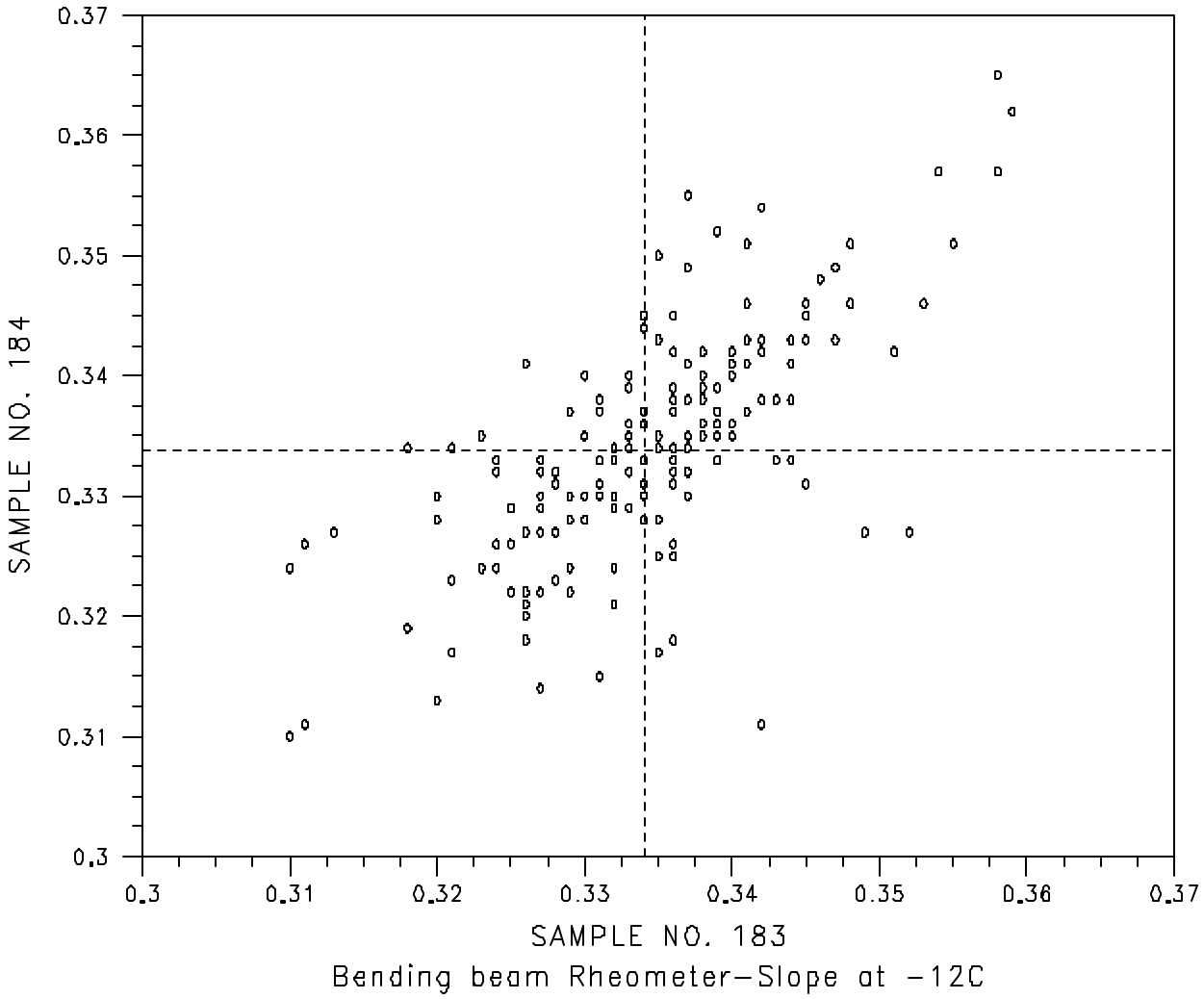
AMRL PROFICIENCY SAMPLE PROGRAM

PERFORMANCE GRADED BINDER SAMPLE NOS. 183 & 184



Test No. 13 BBR Slope 196 Points

Labs Eliminated: 23 70 192 369 370 924 1430 3155

Labs off the Diagram: None

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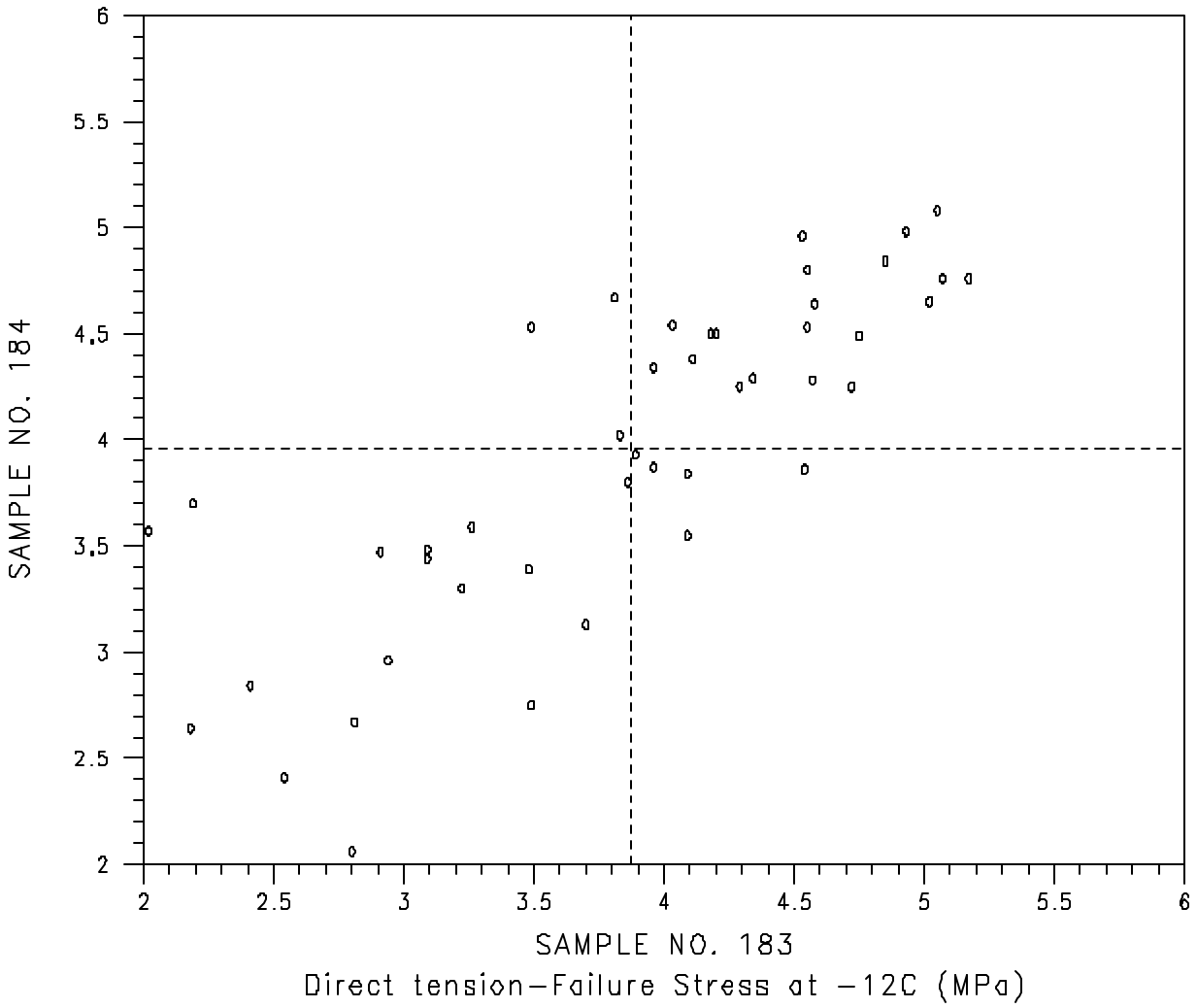
AMRL PROFICIENCY SAMPLE PROGRAM

PERFORMANCE GRADED BINDER SAMPLE NOS. 183 & 184



Test No. 14 Direct Tension Stress 46 Points

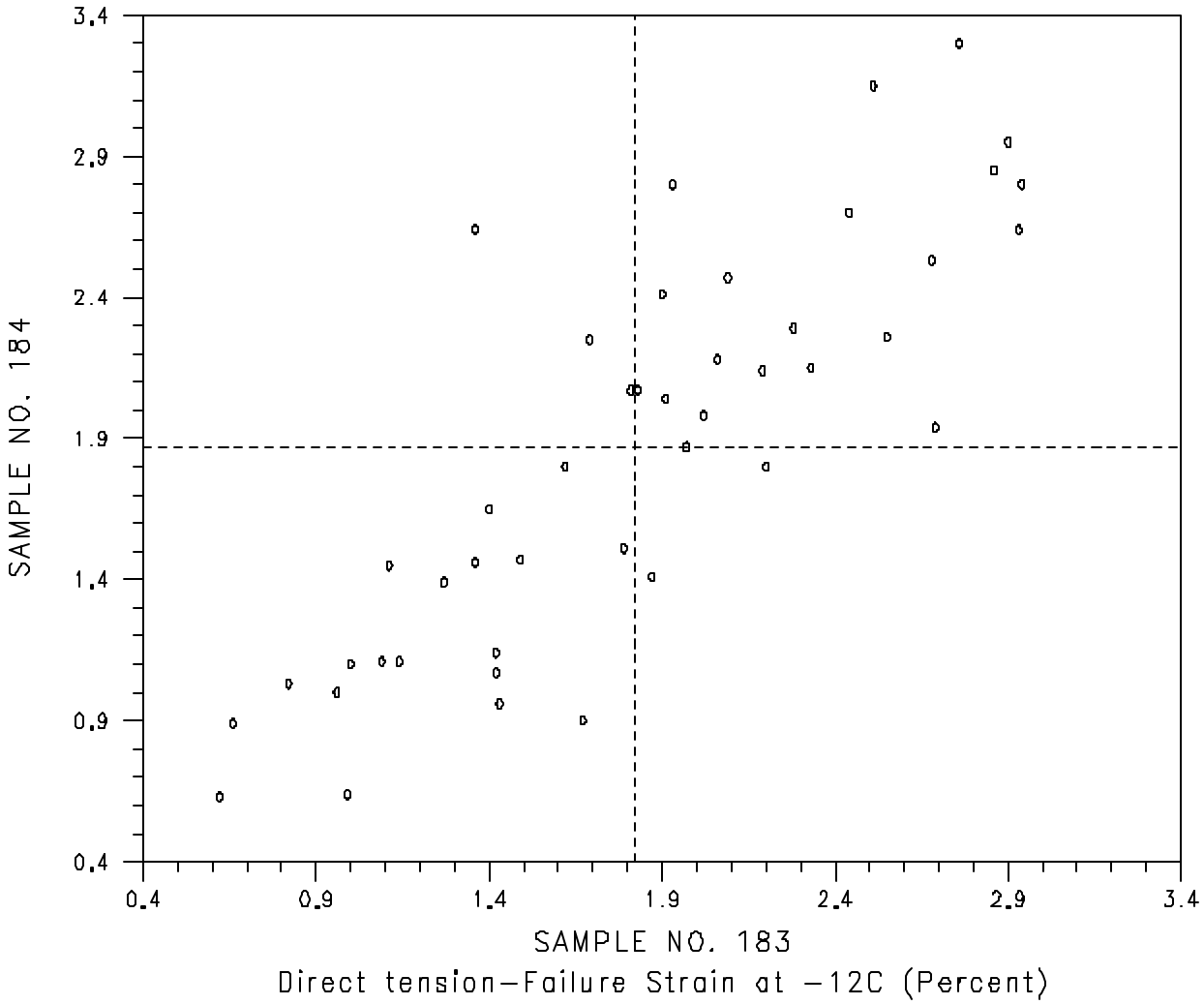
Labs Eliminated: 664 3902

Labs off the Diagram: None

June 2001

AMRL PROFICIENCY SAMPLE PROGRAM

PERFORMANCE GRADED BINDER SAMPLE NOS. 183 & 184



Test No. 15 Direct Tension Strain 45 Points

Labs Eliminated: 279 3524

Labs off the Diagram: None