AMRL Bituminous Proficiency Sample Program
Final Report - June 2001

ASPHALT CEMENT PROFICIENCY SAMPLES		SAMPLE NUMBER 183			SAMPLE NUMBER 184		
TEST RESULT	NO. LABS	AVG.	STAND. DEV.	COEFF. VAR.	AVG.	STAND. DEV.	COEFF. VAR.
AASHTO T49/ASTM D5: Penetration of Original Sample at 25°C	143	46.97	4.0	8.41	47.01	3.7	7.93
	138	46.72	3.1	6.69	46.72	3.2	6.79
Penetration of Original Sample at 4°C	90	19.46	5.7	29.2	19.50	6.0	30.7
	89	19.25	5.3	27.8	19.29	5.7	29.5
AASHTO T48/ASTM D92: Flash Point by Cleveland Open Cup (°C)	120	347.2	25.1	7.22	346.9	25.2	7.26
	117	350.2	14.8	4.23	350.1	14.9	4.25
AASHTO T44/ASTM D2042: Solubility (%)	91	99.931	0.121	0.1207	99.937	0.081	0.0809
	86	99.950	0.034	0.0339	99.954	0.030	0.0304
AASHTO T228/ASTM D70: Specific Gravity at 25°C	131	1.0990	0.68	61.6	1.1030	0.67	61.0
	124	1.0421	0.0041	0.392	1.0429	0.0038	0.368
AASHTO T201/ASTM D2170: Kinematic Viscosity at 135°C (cSt)	117	714.5	48.1	6.73	722.9	53.3	7.37
	108	721.0	25.7	3.57	726.1	25.7	3.54
AASHTO T202/ASTM D2171: Viscosity at 60°C (poise)	128	5332.8	384.6	7.21	5469.8	354.3	6.48
	118	5357.9	215.6	4.02	5500.4	214.8	3.90

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).

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ASPHALT CEMENT PROFICIENCY SAMPLES		SAMPLE NUMBER 183			SAMPLE NUMBER 184		
TEST RESULT	NO. LABS	AVG.	STAND. DEV.	COEFF. VAR.	AVG.	STAND. DEV.	COEFF. VAR.
AASHTO T179/ASTM D1754: Change in Mass (%)	37	-0.0457	0.039	-84.63	-0.0321	0.019	-59.78
	36	-0.0401	0.018	-45.01	-0.0324	0.019	-59.77
Penetration of Residue at 25°C	38	37.2	4.0	10.9	37.6	4.0	10.6
	36	37.9	2.5	6.64	38.3	2.4	6.35
Percent of Original Penetration at 25°C (%)	35	79.5	8.9	11.2	80.4	9.4	11.7
	32	80.9	4.1	5.04	81.7	4.3	5.32
Viscosity of Residue at 60°C (poise)	38	10149.6	1481.1	14.6	10429.1	1536.2	14.7
	37	10269.3	1301.8	12.7	10556.5	1338.4	12.7
Ratio of Viscosity of Residue at 60°C to Original Viscosity at 60°C	36	1.885	0.24	12.6	1.892	0.24	12.7
Kinematic Viscosity of Residue at 135°C (cSt)	33	996.8	112.6	11.3	1023.1	175.0	17.1
	31	1005.3	77.1	7.67	1016.3	102.8	10.12
Ratio of Kinematic Viscosity of Residue at 135°C to Original Kinematic Viscosity at 135°C	32	1.408	0.091	6.48	1.423	0.141	9.89
	30	1.404	0.093	6.59	1.396	0.087	6.25
Penetration of Residue at 4°C	22	17.0	4.1	23.9	17.1	4.0	23.6
	20	18.1	2.2	12.1	18.1	2.1	11.6
Percent of Original Penetration at 4°C (%)	22	85.0	14.7	17.3	85.7	15.5	18.1
	21	87.3	10.2	11.7	88.0	11.2	12.8

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).

AMRL Bituminous Proficiency Sample Program
Final Report - June 2001

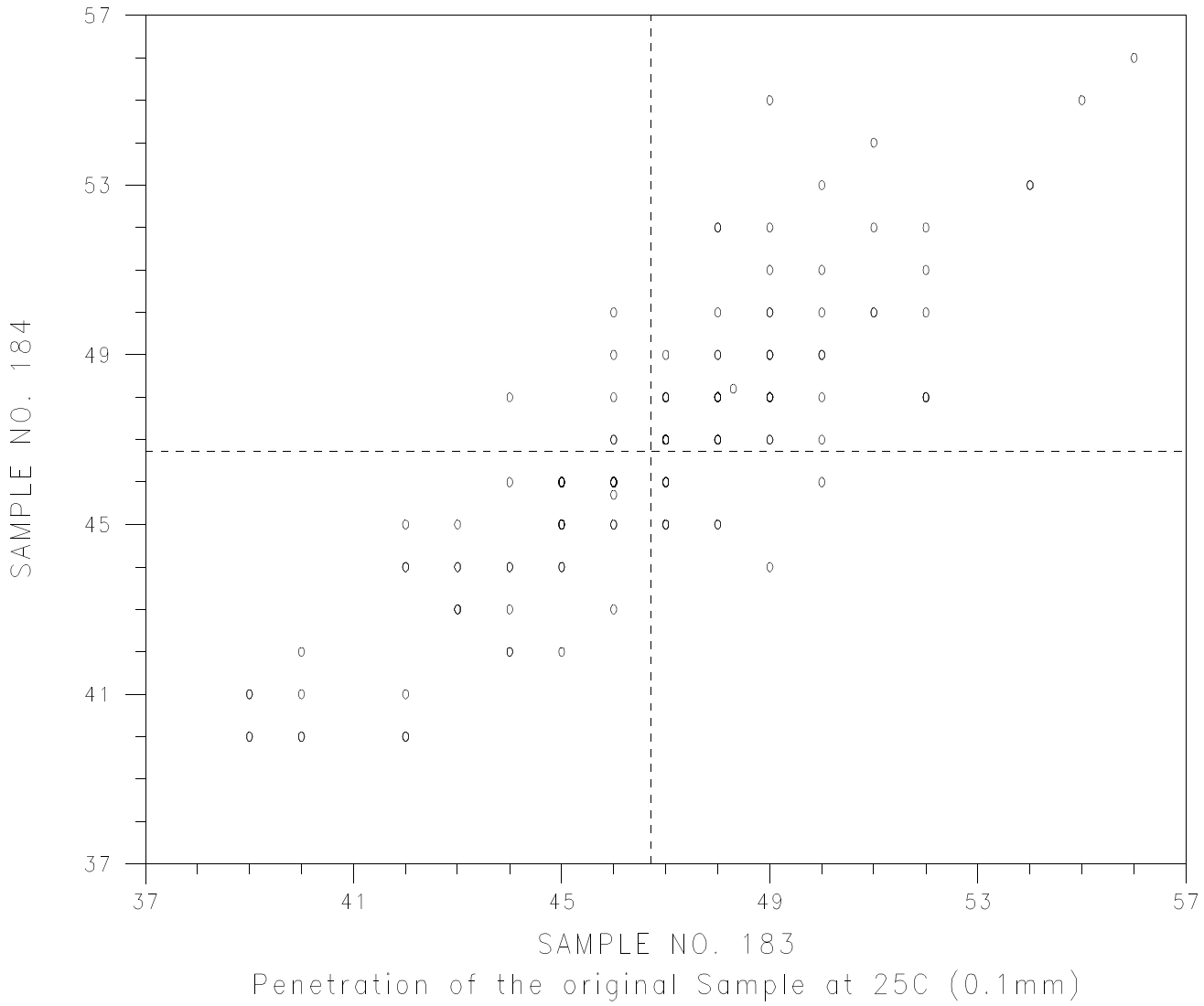
ASPHALT CEMENT PROFICIENCY SAMPLES		SAMPLE NUMBER 183			SAMPLE NUMBER 184		
TEST RESULT	NO. LABS	AVG.	STAND. DEV.	COEFF. VAR.	AVG.	STAND. DEV.	COEFF. VAR.
AASHTO T240/ASTM D2872: Change in Mass (%)	89	-0.0681	0.032	-47.0	-0.0544	0.026	-47.0
	87	-0.0650	0.024	-37.5	-0.0529	0.022	-41.1
Penetration of Residue at 25°C	90	36.3	4.0	11.0	36.7	3.9	10.6
	89	36.5	3.8	10.4	36.8	3.8	10.2
Percent of Original Penetration at 25°C	87	76.1	11.2	14.7	76.9	11.5	14.9
	82	77.6	4.8	6.18	78.1	4.5	5.80
Viscosity of Residue at 60°C (poise)	83	13272.8	1401.1	10.6	13354.2	1630.1	12.2
	80	13265.5	1264.5	9.53	13248.5	1361.3	10.27
Ratio of Viscosity of Residue at 60°C to Original Viscosity at 60°C	80	8.10	46.6	573	5.30	22.0	412
	76	2.453	0.21	8.41	2.400	0.22	9.25
Kinematic Viscosity of Residue at 135°C (cSt)	79	1169.0	157.0	13.4	1167.7	155.7	13.3
	78	1183.9	83.8	7.08	1182.6	81.6	6.90
Ratio of Kinematic Viscosity of Residue at 135°C to Original Kinematic Viscosity at 135°C	76	1.670	0.22	12.9	1.646	0.20	12.3
	73	1.642	0.116	7.06	1.630	0.093	5.73
Penetration of Residue at 4°C	66	15.9	4.7	29.6	16.2	4.5	27.8
	65	16.1	4.4	27.4	16.4	4.2	25.4
Percent of Original Penetration at 4°C (%)	64	80.1	17.6	22.0	82.4	18.9	22.9
	62	81.2	14.6	18.0	82.7	13.6	16.5

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

BITUMINOUS SAMPLE NOS. 183 & 184



Test No. 1 | Penetration of the Original Sample at 25°C | 138 Points

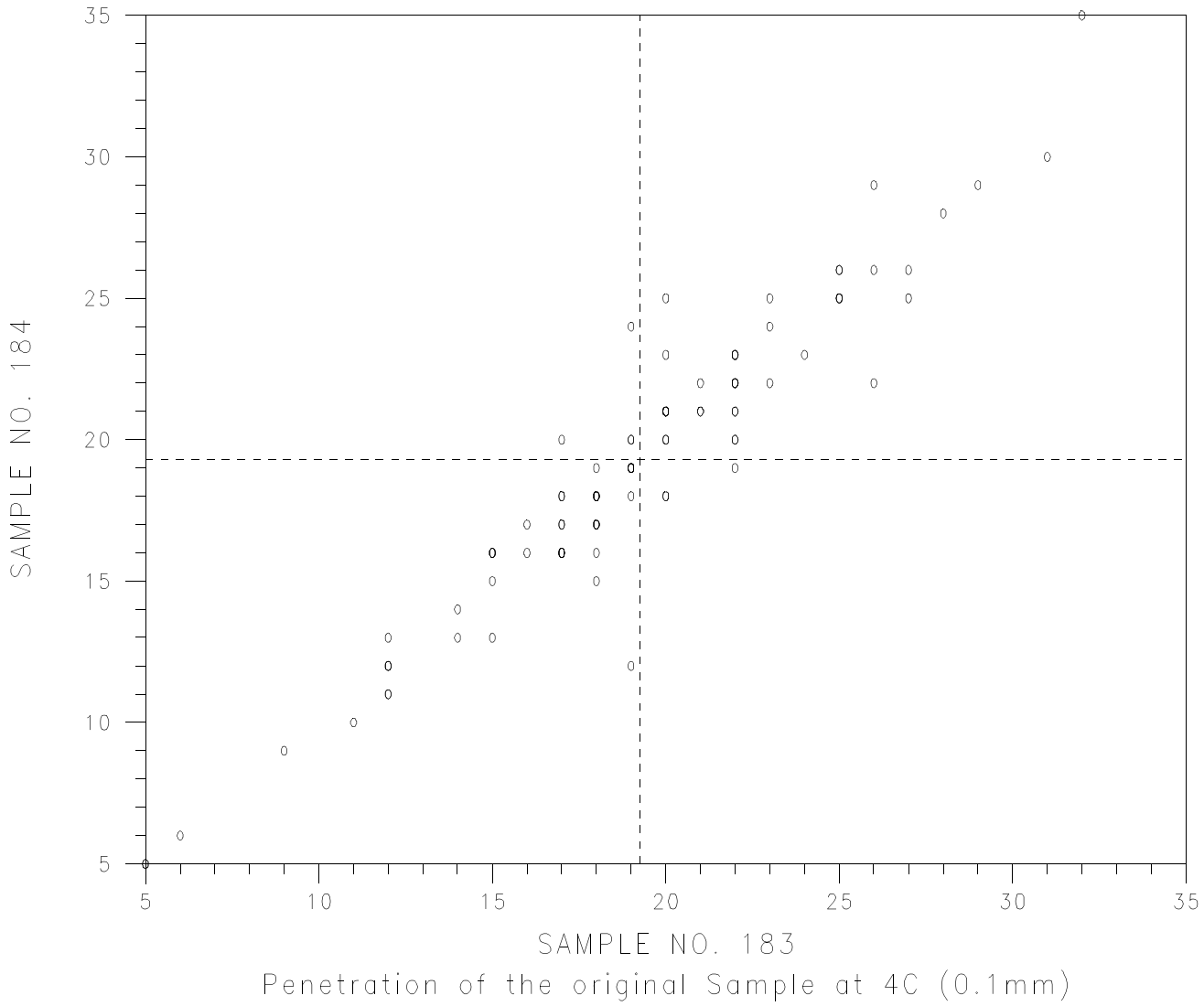
Labs Eliminated: 35 297 3639 3698 3897

Labs off the Diagram: None

June 2001

AMRL PROFICIENCY SAMPLE PROGRAM

BITUMINOUS SAMPLE NOS. 183 & 184



Penetration of the Original Sample at 4°C

Test No. 2

88 Points

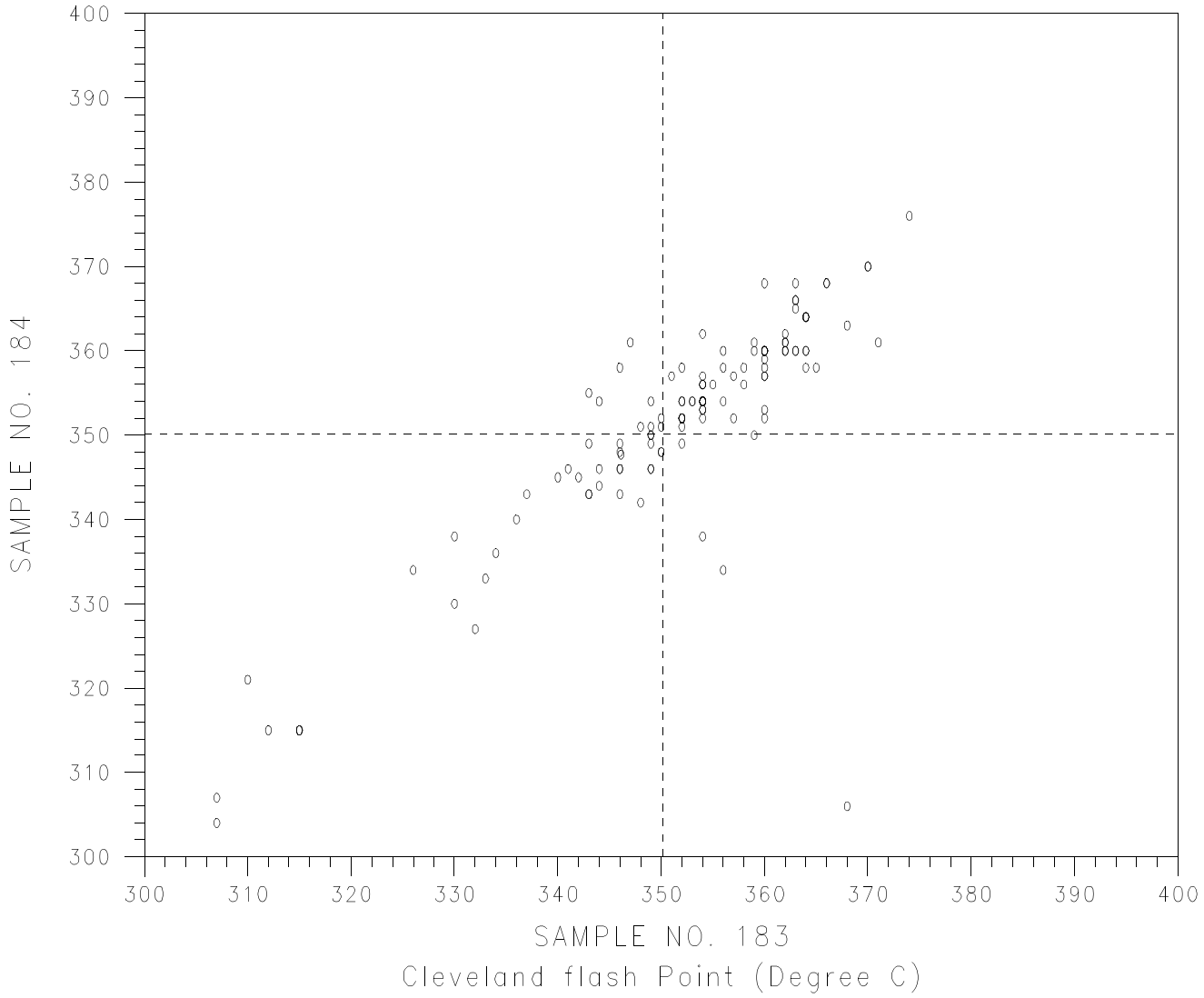
Labs Eliminated: 908

Labs off the Diagram: 455

June 2001

AMRL PROFICIENCY SAMPLE PROGRAM

BITUMINOUS SAMPLE NOS. 183 & 184



Flash Point by Cleveland

Test No. 3 Open Cup 116 Points

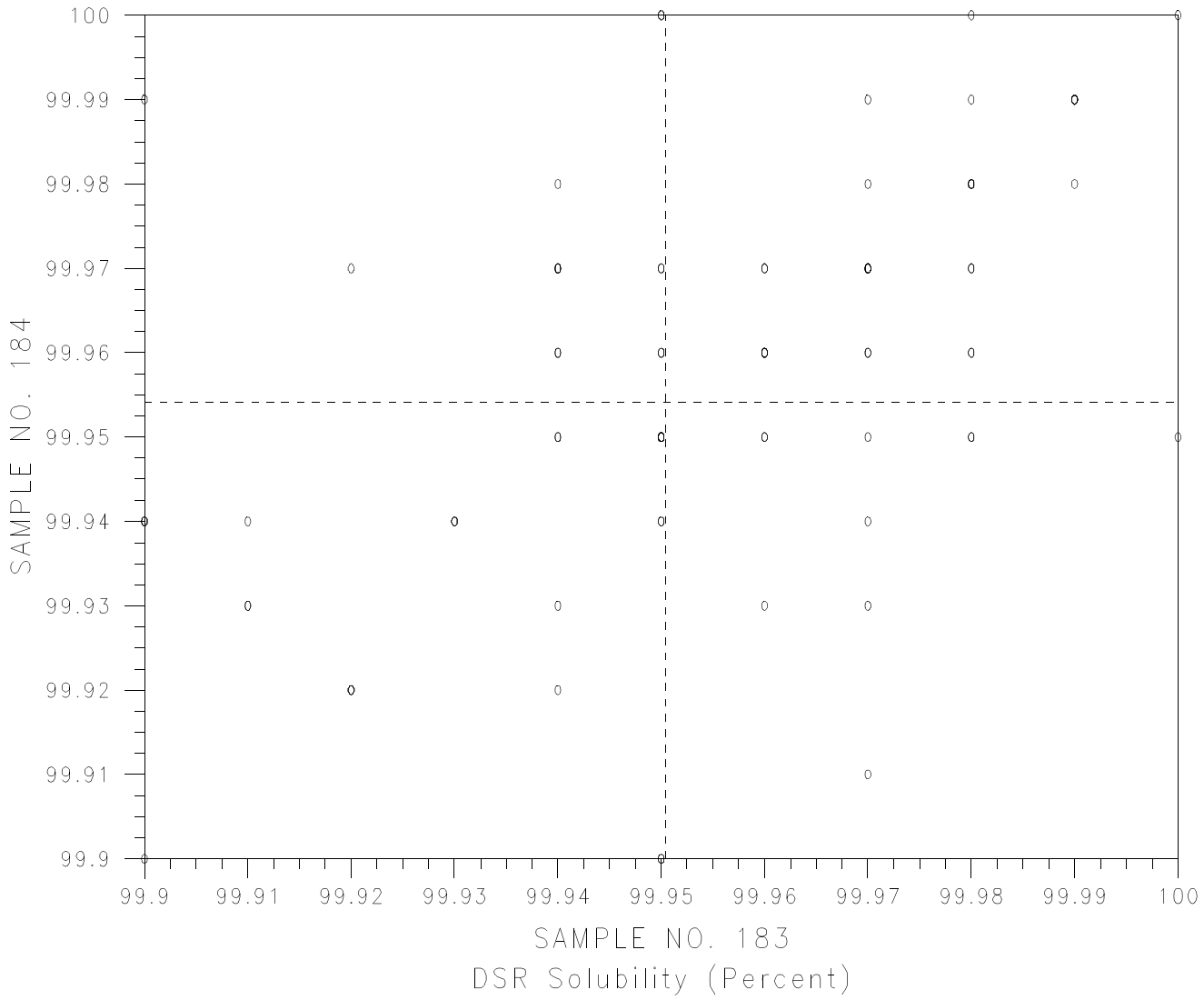
Labs Eliminated: 908 1126 3735

Labs off the Diagram: 455

June 2001

AMRL PROFICIENCY SAMPLE PROGRAM

BITUMINOUS SAMPLE NOS. 183 & 184



Test No. 4 Solubility 80 Points

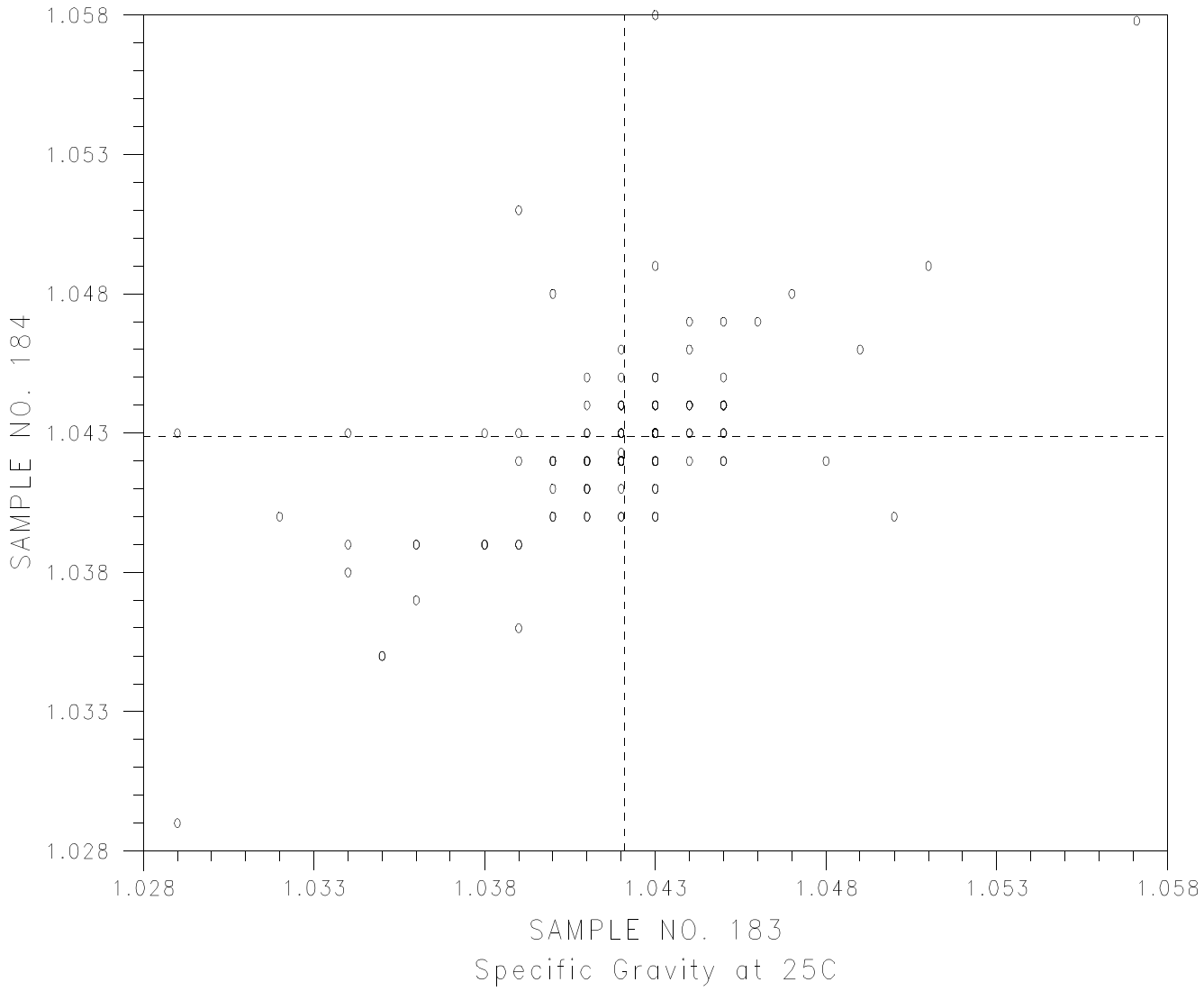
Labs Eliminated: 51 207 319 1126 3464

Labs off the Diagram: 24 114 191 984 3321 3429

June 2001

AMRL PROFICIENCY SAMPLE PROGRAM

BITUMINOUS SAMPLE NOS. 183 & 184



Test No. 5 Specific Gravity at 25°C 121 Points

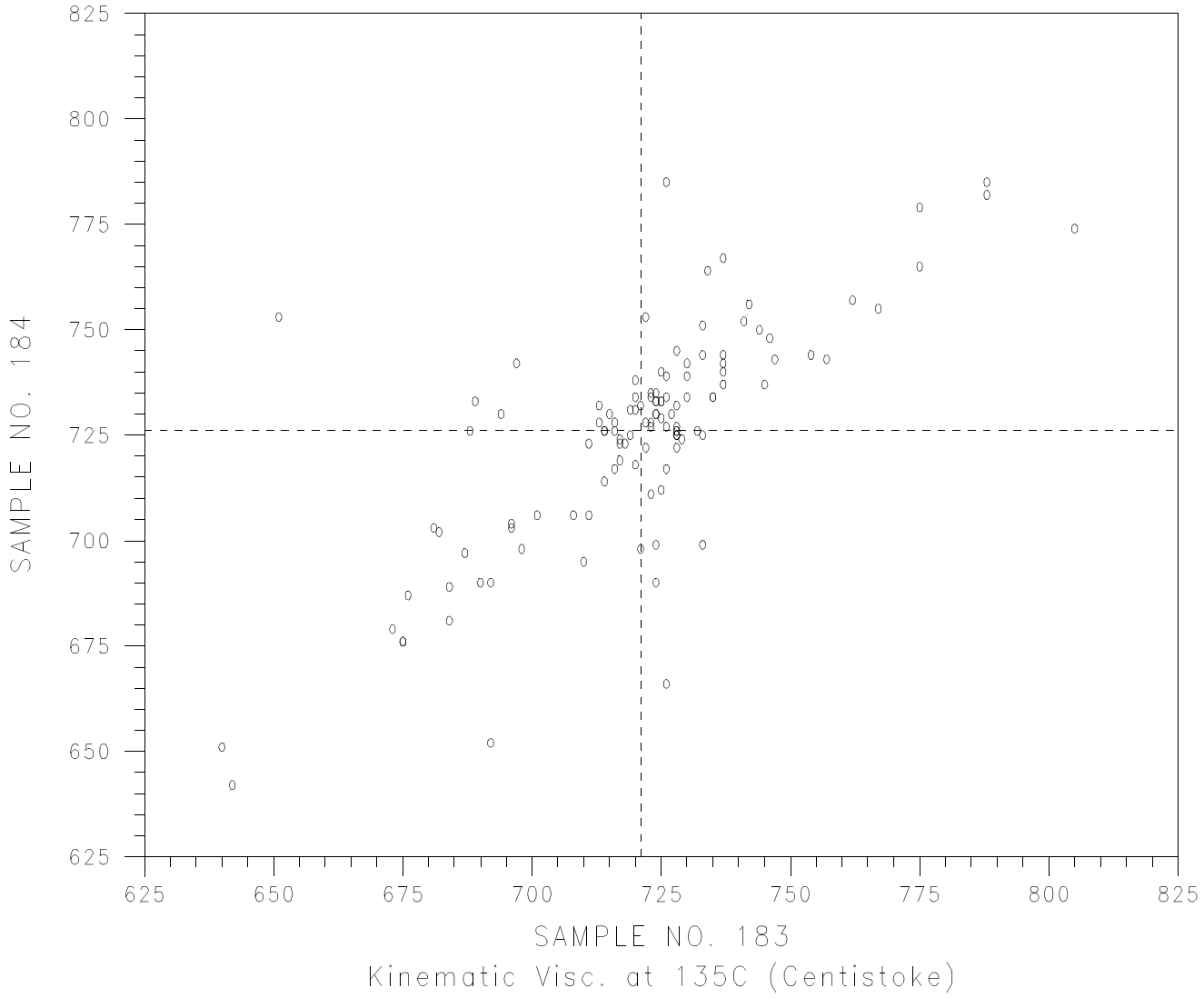
Labs Eliminated: 41 52 251 565 3206 3256 3264

Labs off the Diagram: 1430 3363 3382

June 2001

AMRL PROFICIENCY SAMPLE PROGRAM

BITUMINOUS SAMPLE NOS. 183 & 184



Test No. 6 Kinematic Viscosity at 135°C 108 Points

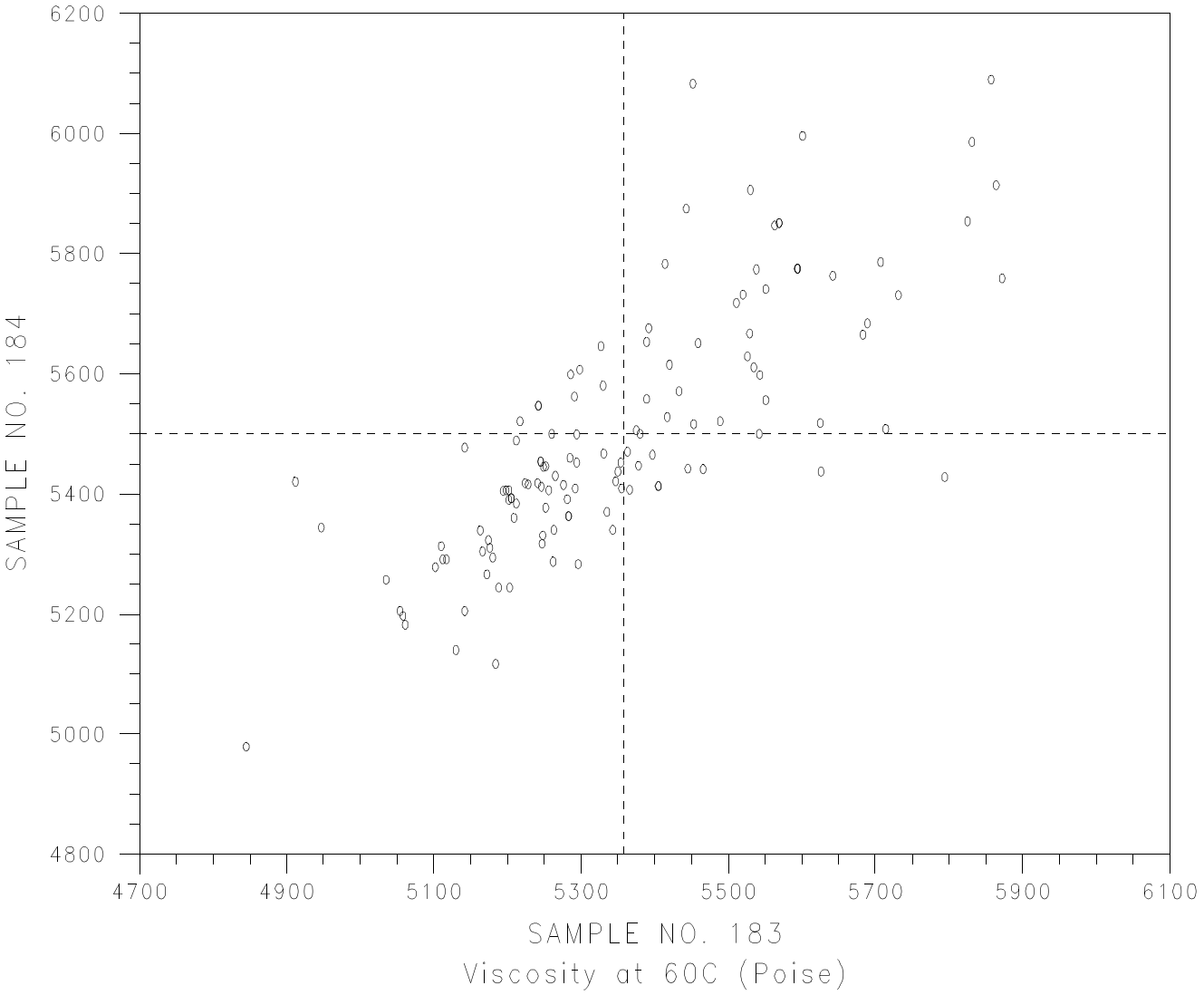
Labs Eliminated: 15 17 38 251 283 455 1277 3698 3991

Labs off the Diagram: None

June 2001

AMRL PROFICIENCY SAMPLE PROGRAM

BITUMINOUS SAMPLE NOS. 183 & 184



Test No. 7 Viscosity at 60°C 117 Points

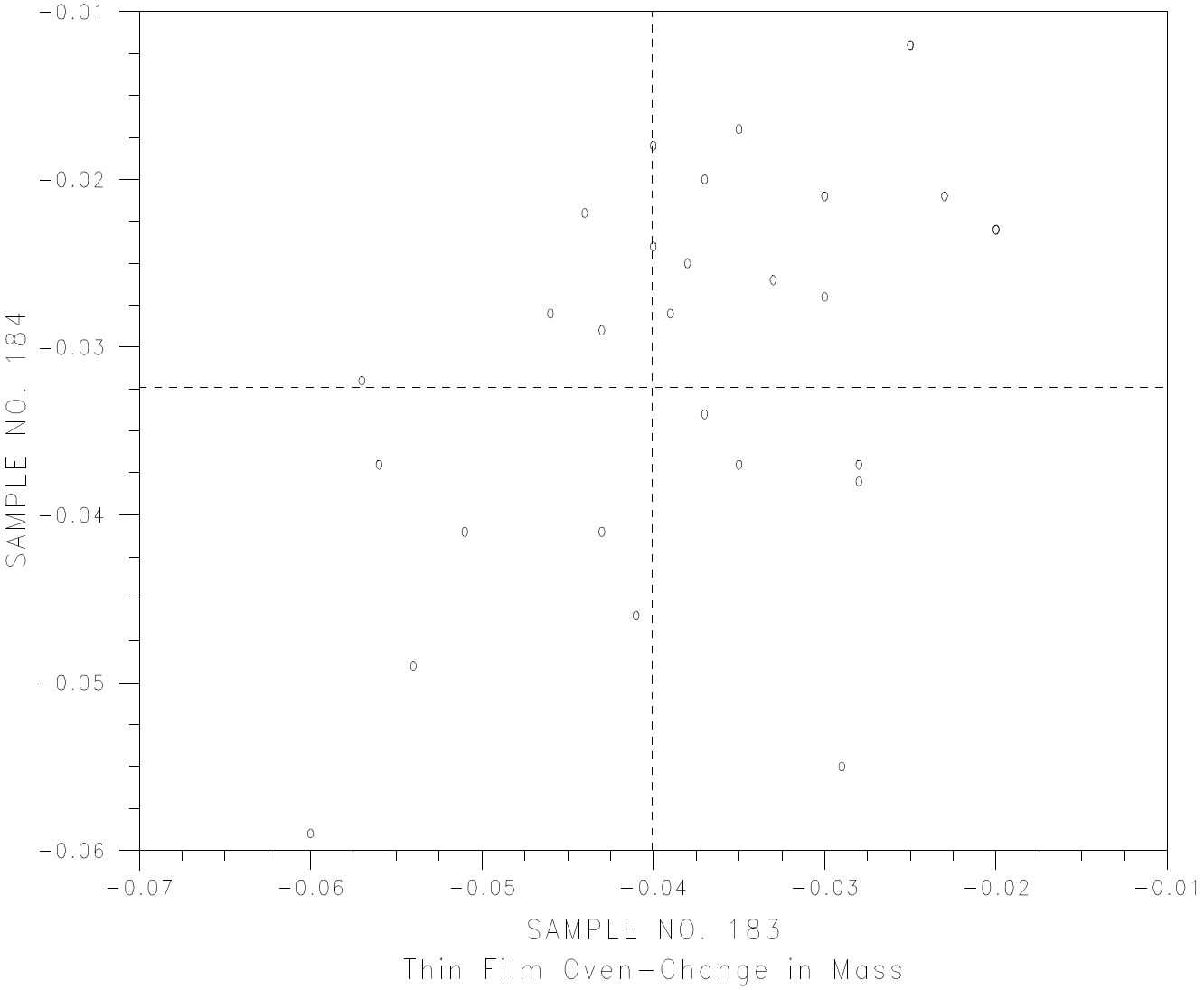
Labs Eliminated: 15 43 46 51 455 707 984 1126 1312 3321

Labs off the Diagram: 3639

June 2001

AMRL PROFICIENCY SAMPLE PROGRAM

BITUMINOUS SAMPLE NOS. 183 & 184



Test No. 8 | Thin Film Oven Change in Mass | 27 Points

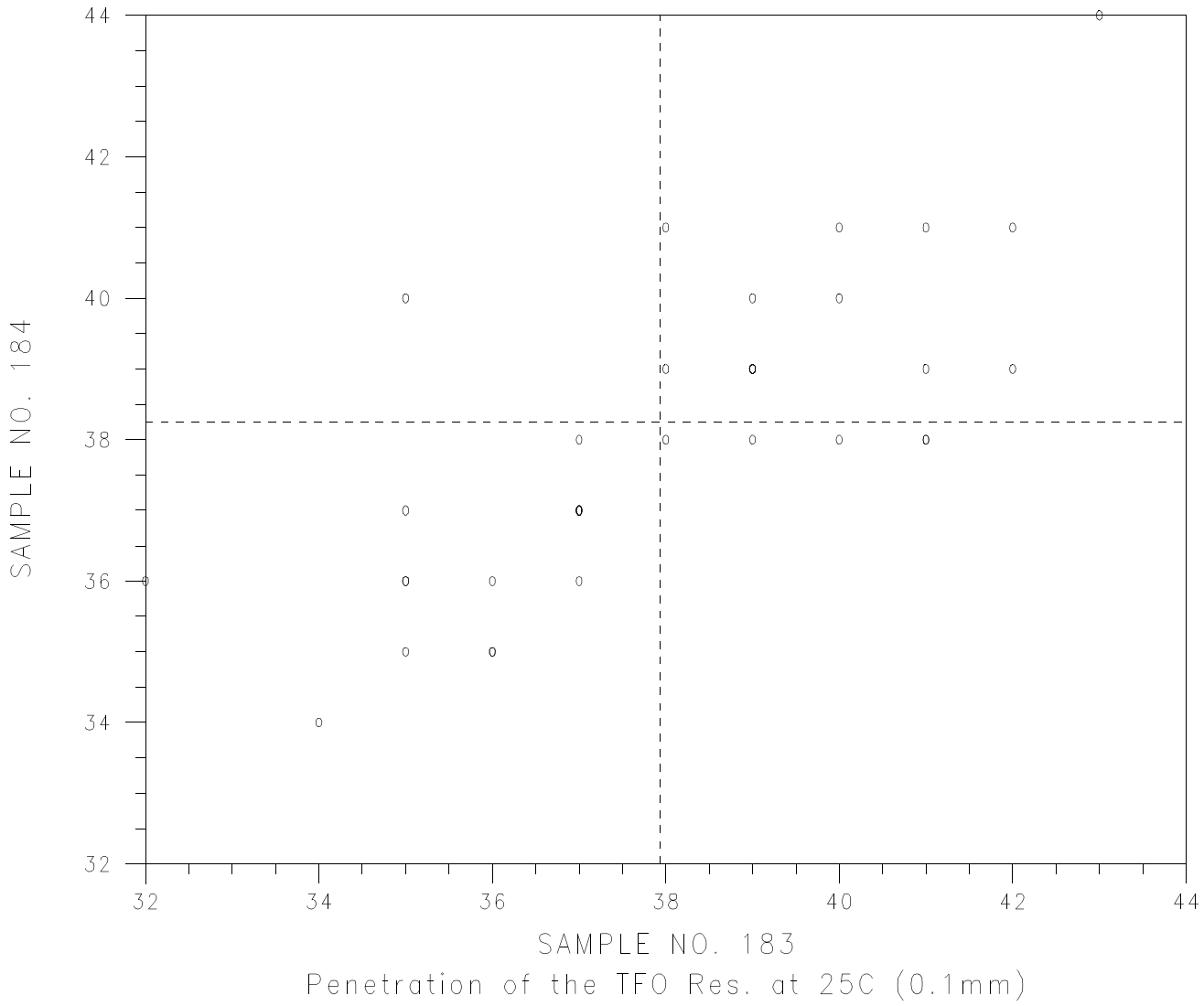
Labs Eliminated: 251

Labs off the Diagram: 24 283 707 771 1118 1437 1494 3295 3382

June 2001

AMRL PROFICIENCY SAMPLE PROGRAM

BITUMINOUS SAMPLE NOS. 183 & 184



Test No. 9 | Penetration of the TFO Residue at 25°C | 35 Points

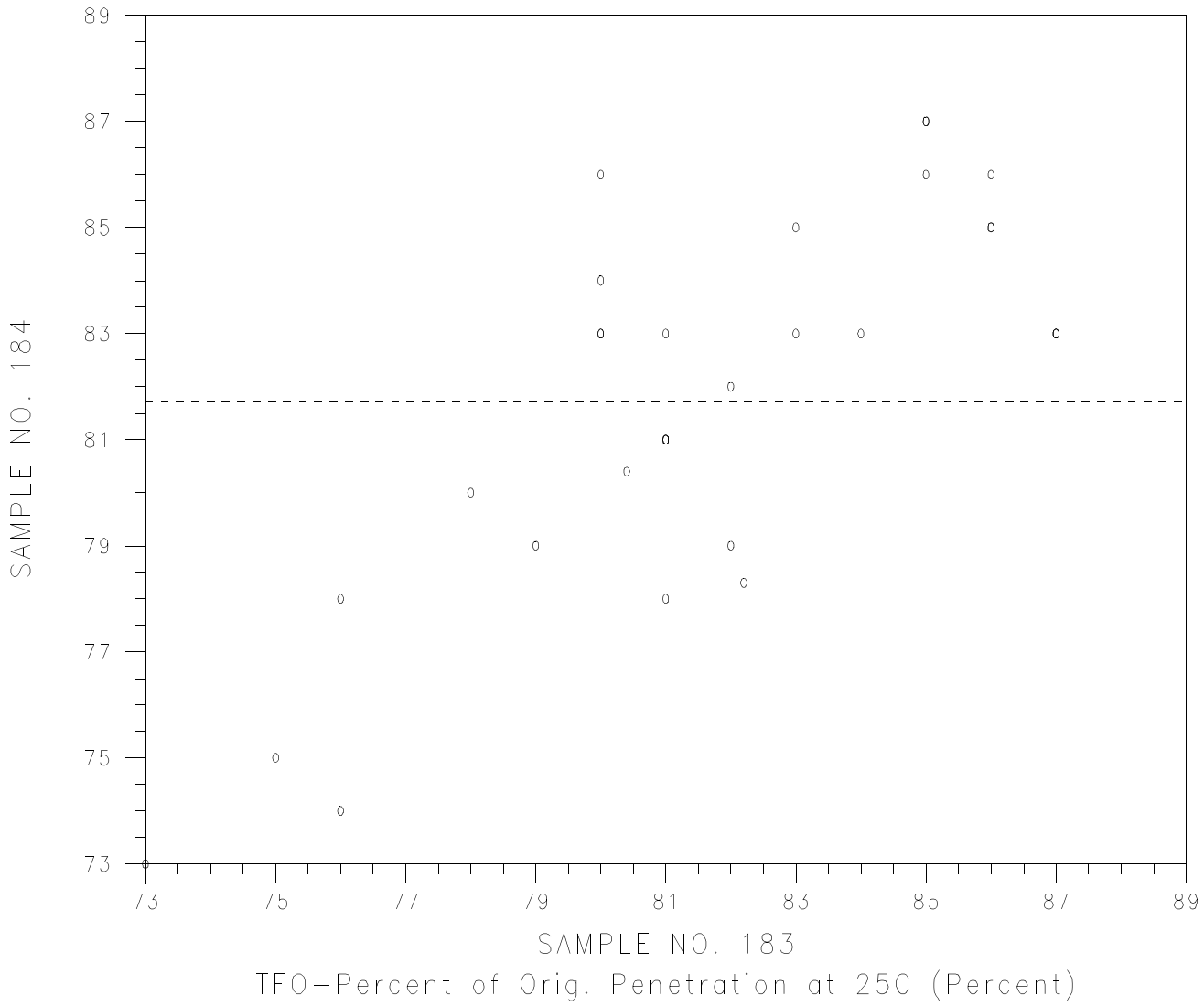
Labs Eliminated: 455 908

Labs off the Diagram: 283

June 2001

AMRL PROFICIENCY SAMPLE PROGRAM

BITUMINOUS SAMPLE NOS. 183 & 184



Test No. 10 | TFO - Percent of Original Penetration at 25°C | 29 Points

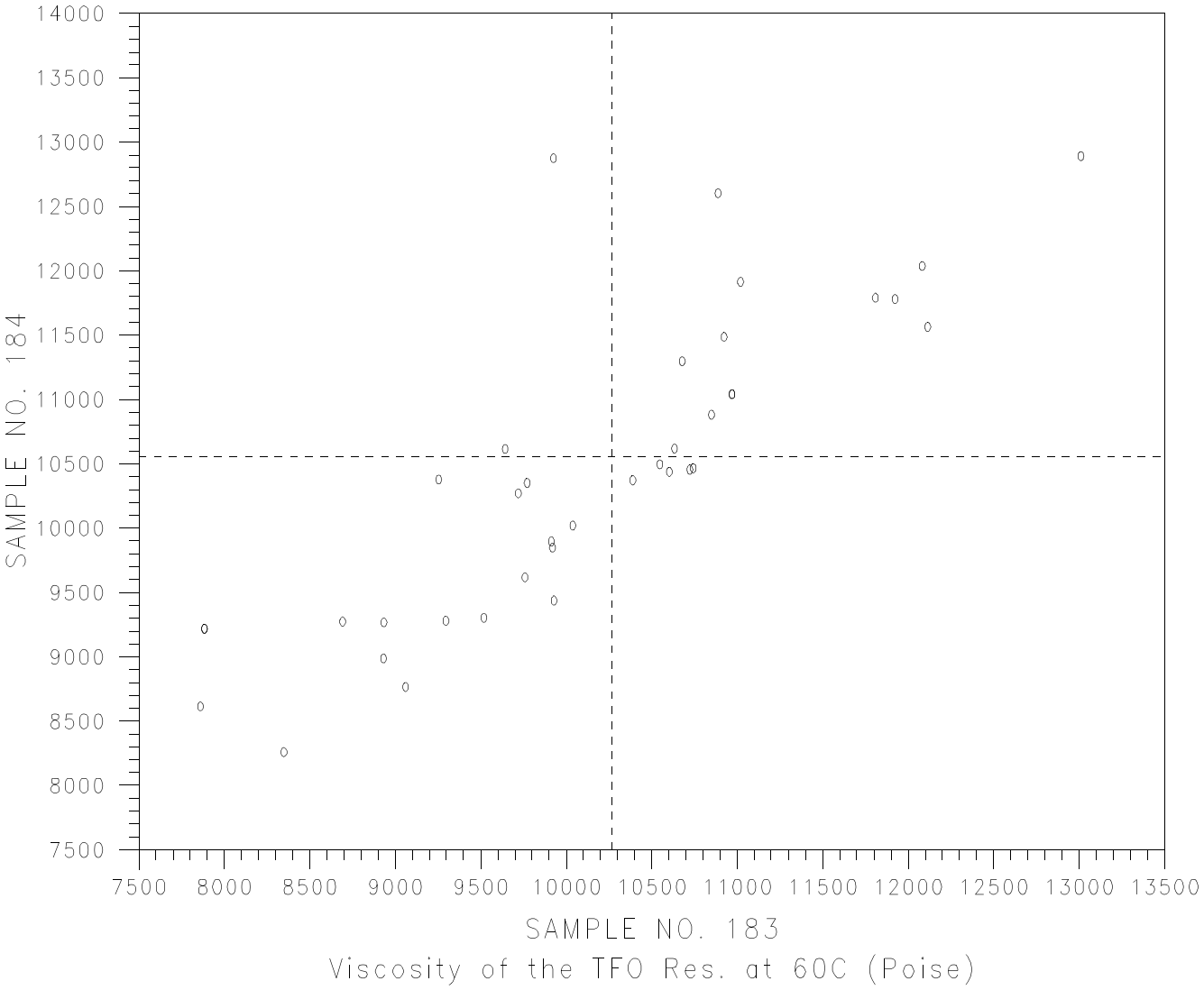
Labs Eliminated: 283 455 908

Labs off the Diagram: 51 565 807

June 2001

AMRL PROFICIENCY SAMPLE PROGRAM

BITUMINOUS SAMPLE NOS. 183 & 184



Test No. 11 | Viscosity of the TFO Residue at 60°C | 36 Points

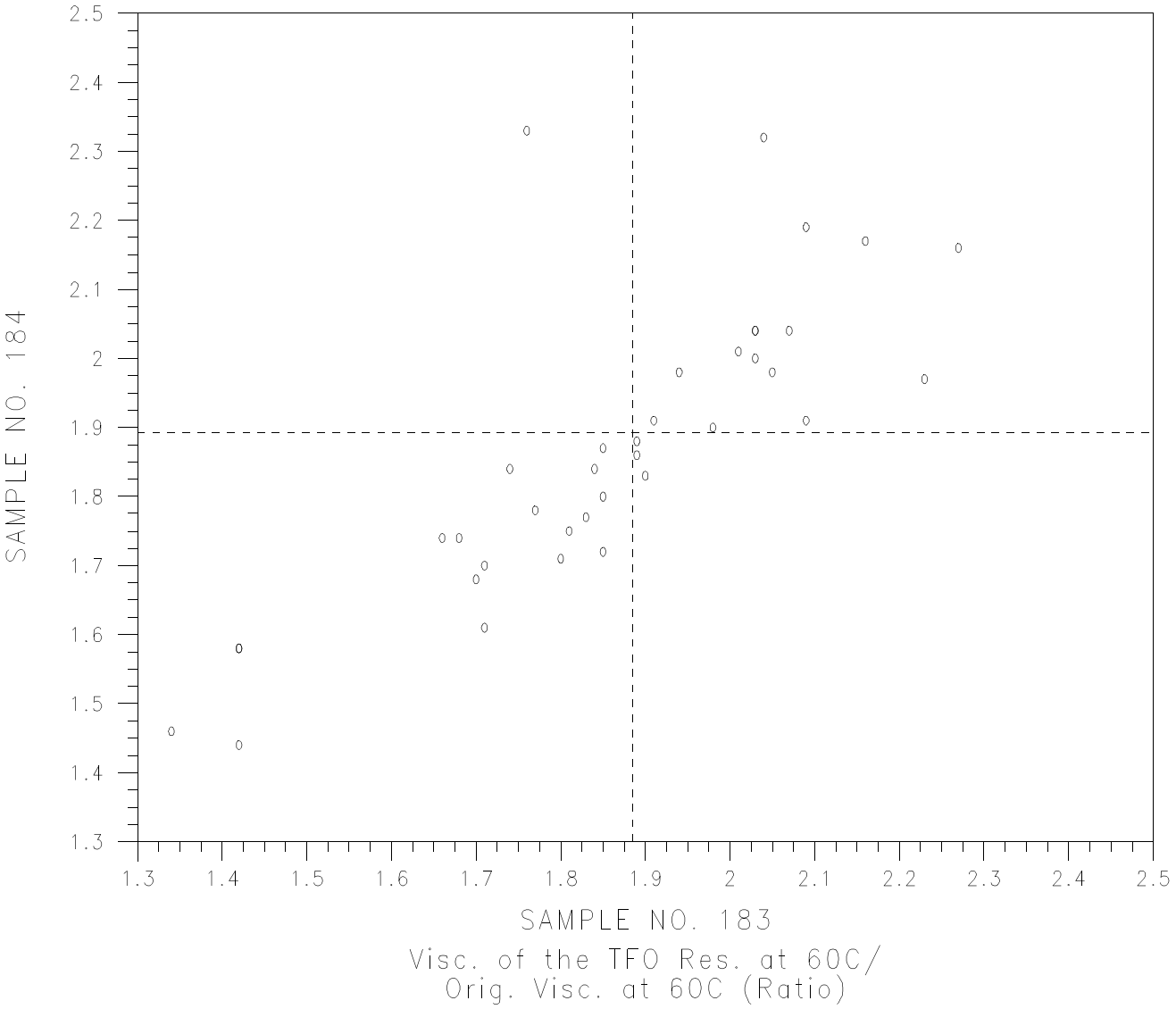
Labs Eliminated: 455

Labs off the Diagram: 1009

June 2001

AMRL PROFICIENCY SAMPLE PROGRAM

BITUMINOUS SAMPLE NOS. 183 & 184



Test No. 12 — Viscosity of the TFO Residue at 60°C / Original Viscosity at 60°C — 35 Points

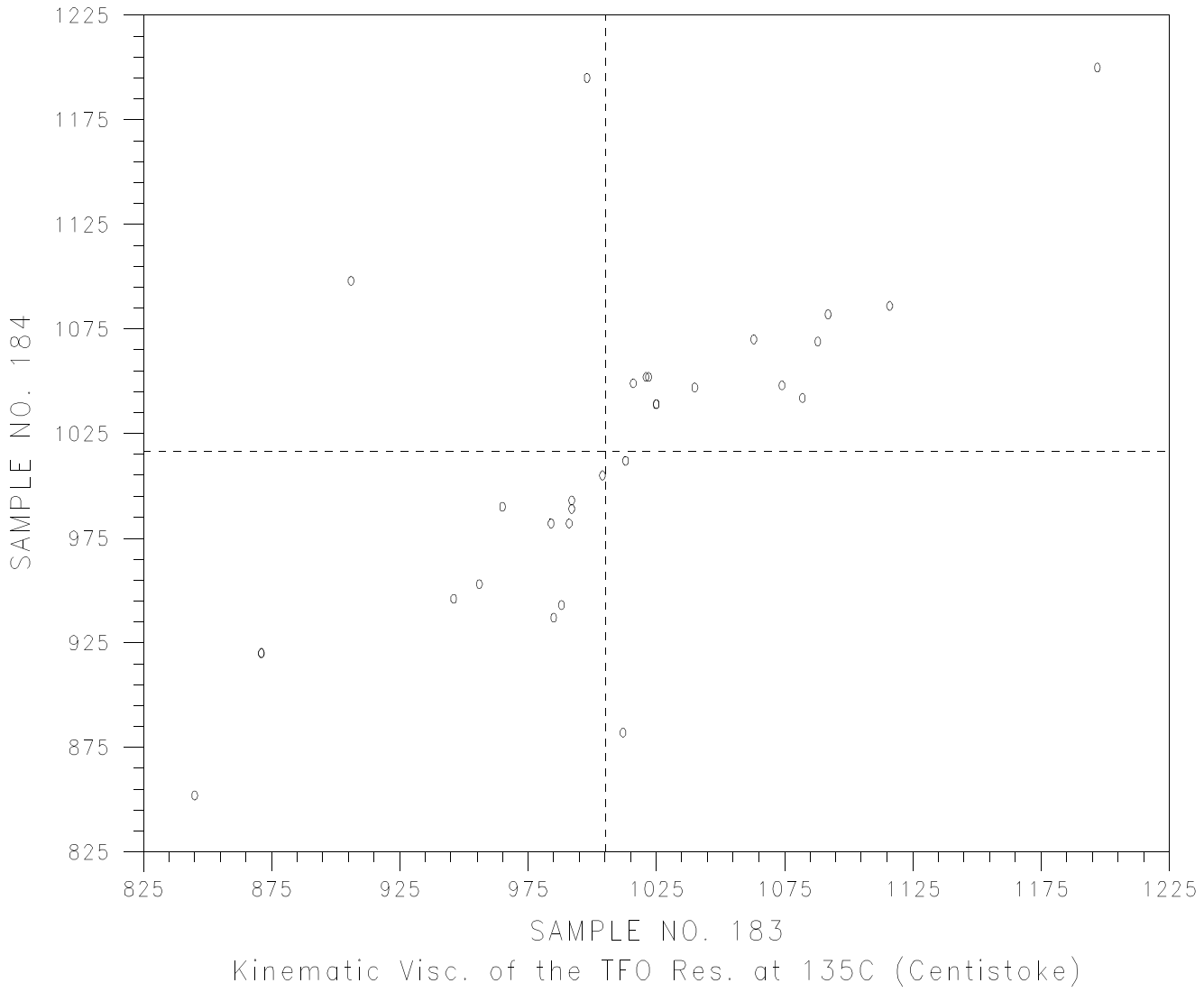
Labs Eliminated: None

Labs off the Diagram: 1009

June 2001

AMRL PROFICIENCY SAMPLE PROGRAM

BITUMINOUS SAMPLE NOS. 183 & 184



Test No. 13 | Kinematic Viscosity of the TFO Residue at 135°C | 28 Points

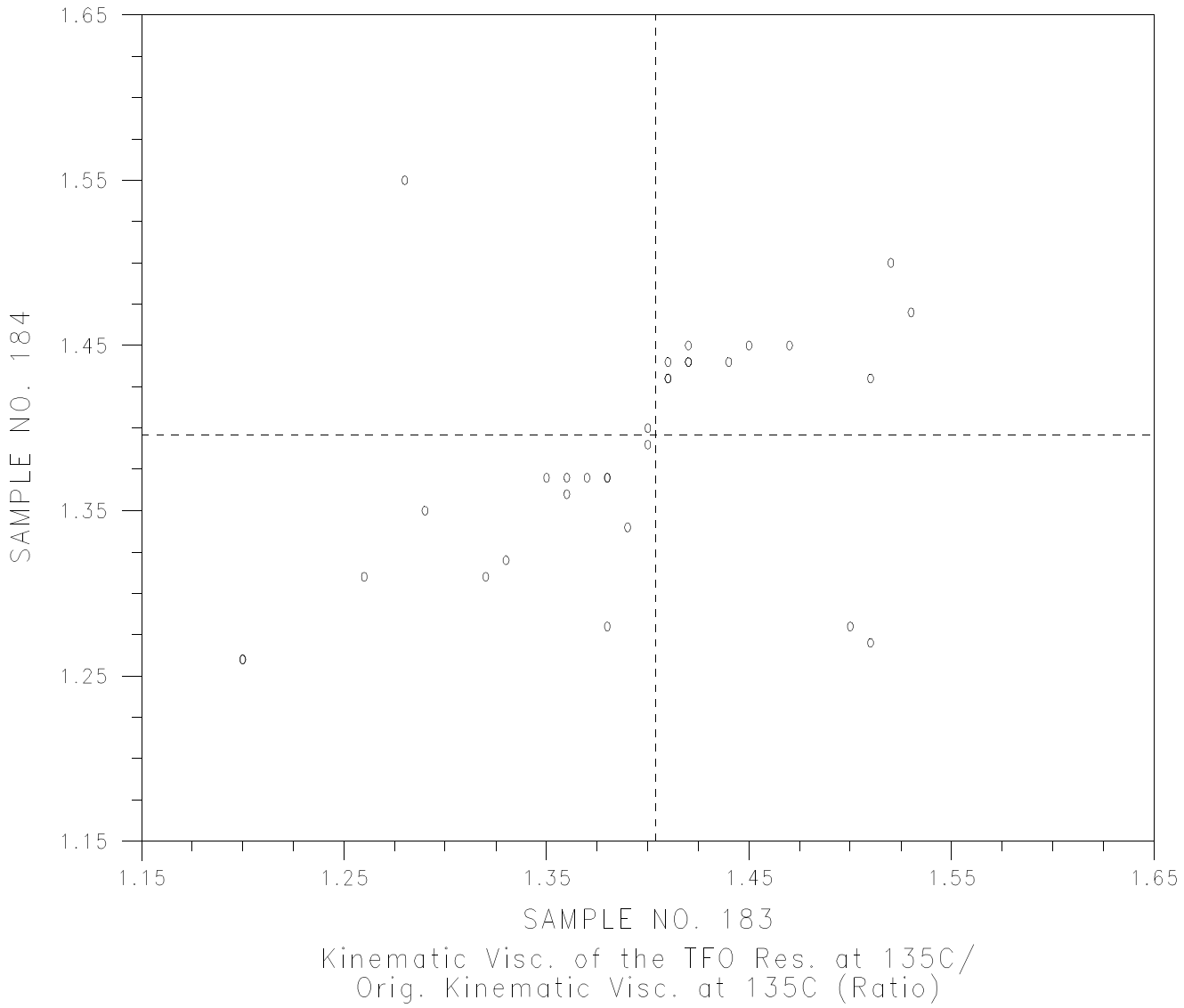
Labs Eliminated: 283 455

Labs off the Diagram: 251 1114 1118

June 2001

AMRL PROFICIENCY SAMPLE PROGRAM

BITUMINOUS SAMPLE NOS. 183 & 184



Kinematic Visc. of the TFO Residue at 135°C / Original Kinematic Viscosity at 135°C

Test No. 14 29 Points

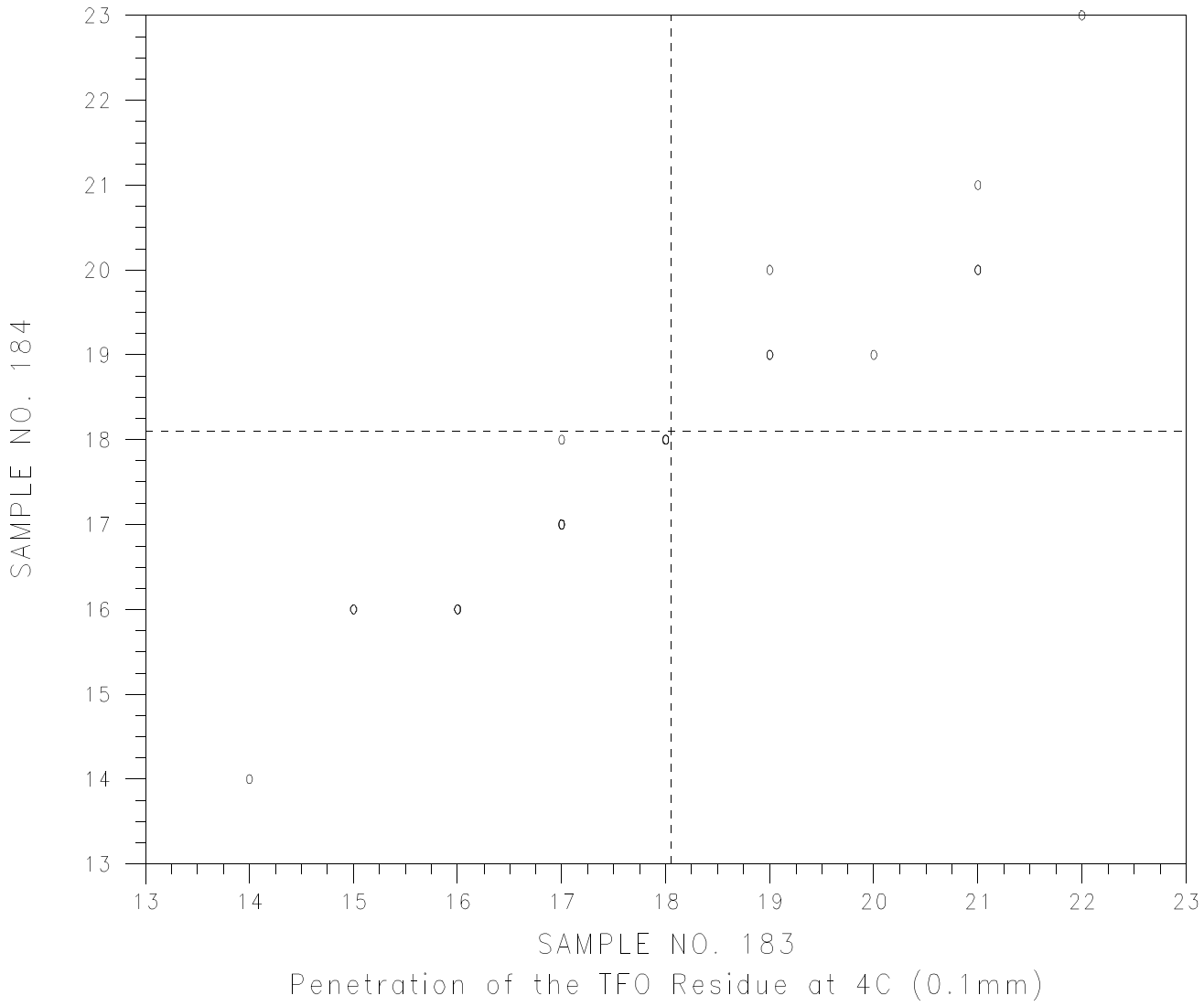
Labs Eliminated: 283 3382

Labs off the Diagram: 1009

June 2001

AMRL PROFICIENCY SAMPLE PROGRAM

BITUMINOUS SAMPLE NOS. 183 & 184



Test No. 15 | Penetration of the TFO Residue at 4°C | 20 Points

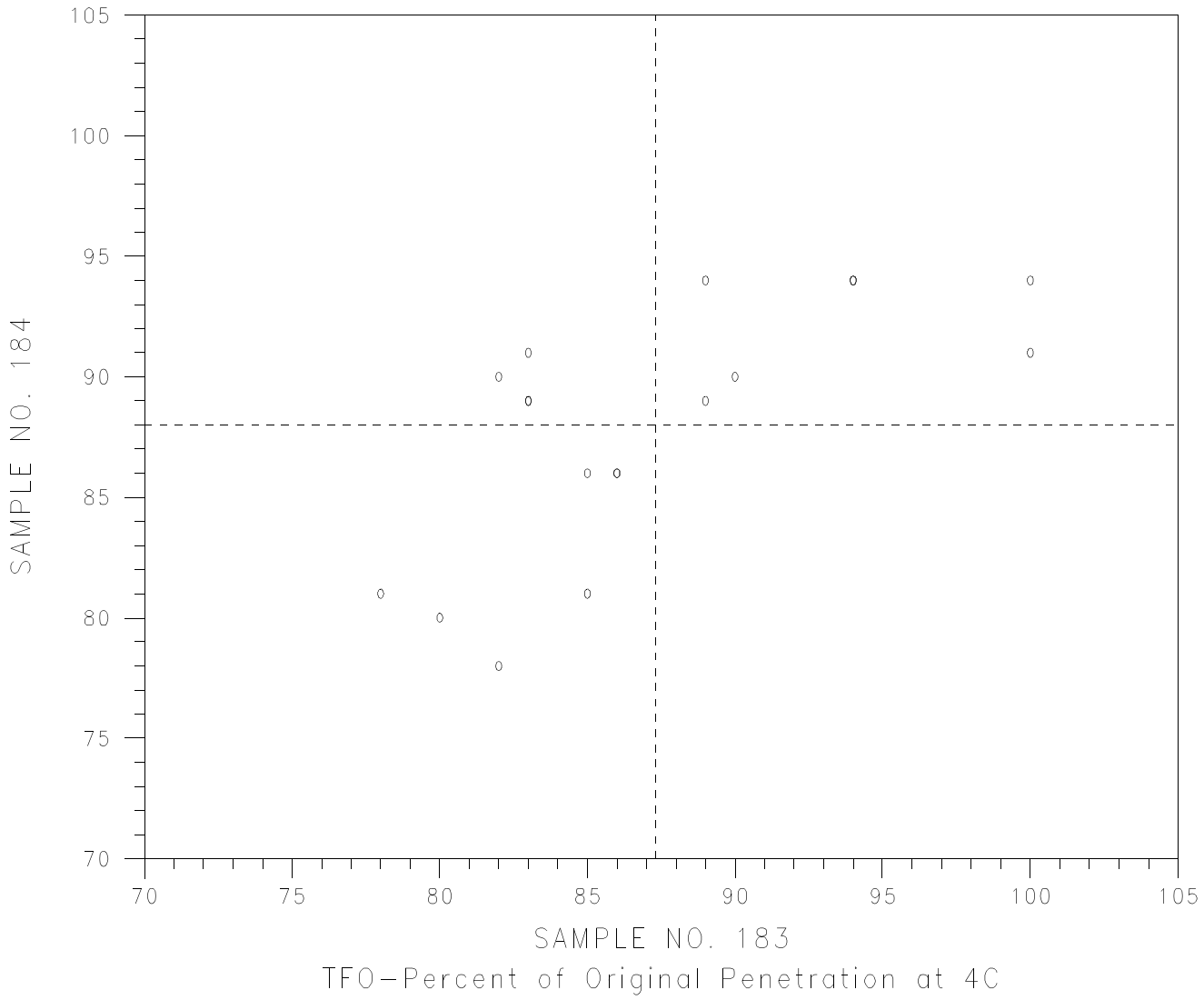
Labs Eliminated: 625 807

Labs off the Diagram: None

June 2001

AMRL PROFICIENCY SAMPLE PROGRAM

BITUMINOUS SAMPLE NOS. 183 & 184



Test No. 16 | TFO - Percent of Original Penetration at 4°C | 17 Points

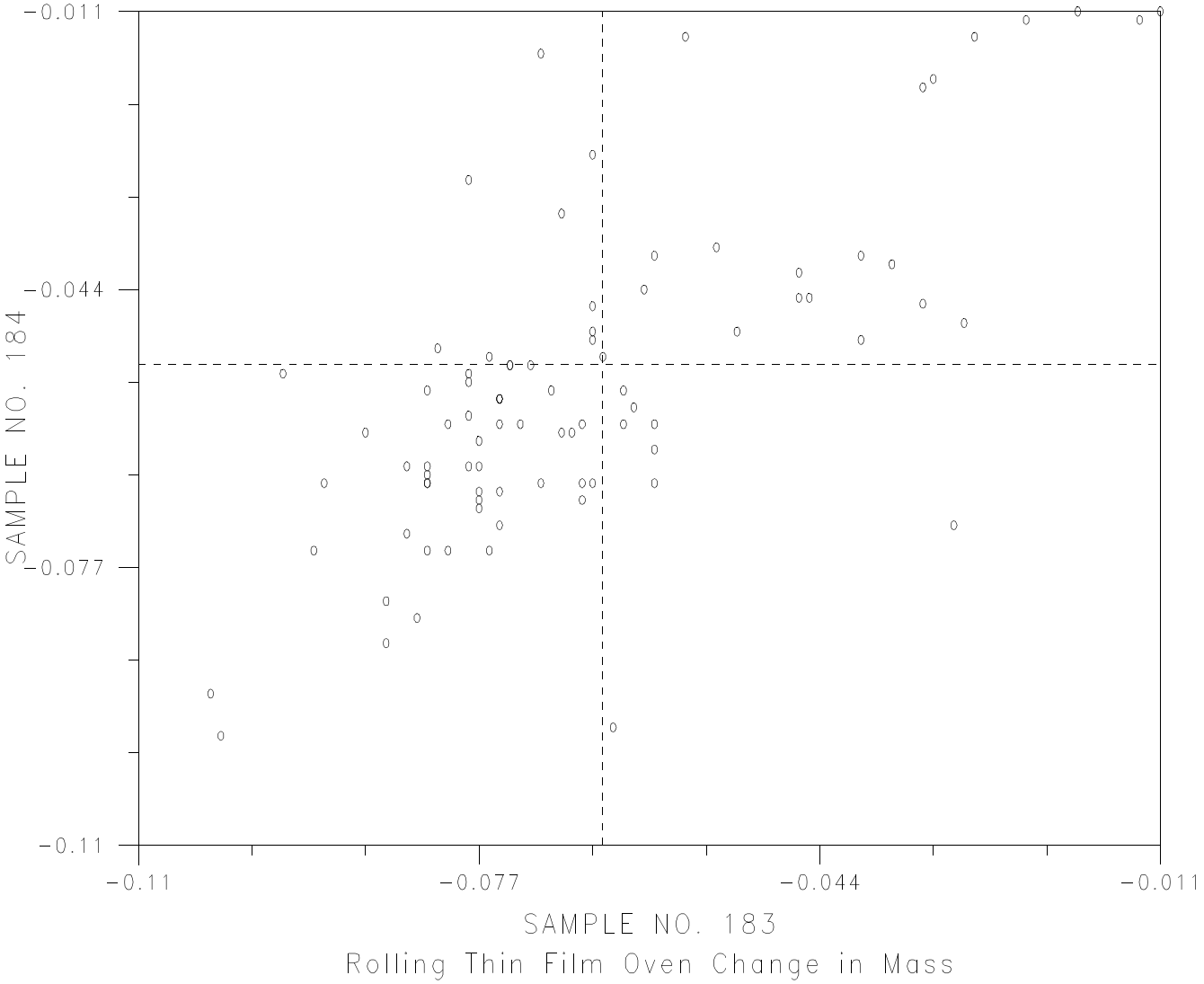
Labs Eliminated: 908

Labs off the Diagram: 283 359 455 3439

June 2001

AMRL PROFICIENCY SAMPLE PROGRAM

BITUMINOUS SAMPLE NOS. 183 & 184



Test No. 17 | Rolling Thin Film Oven Change in Mass | 81 Points

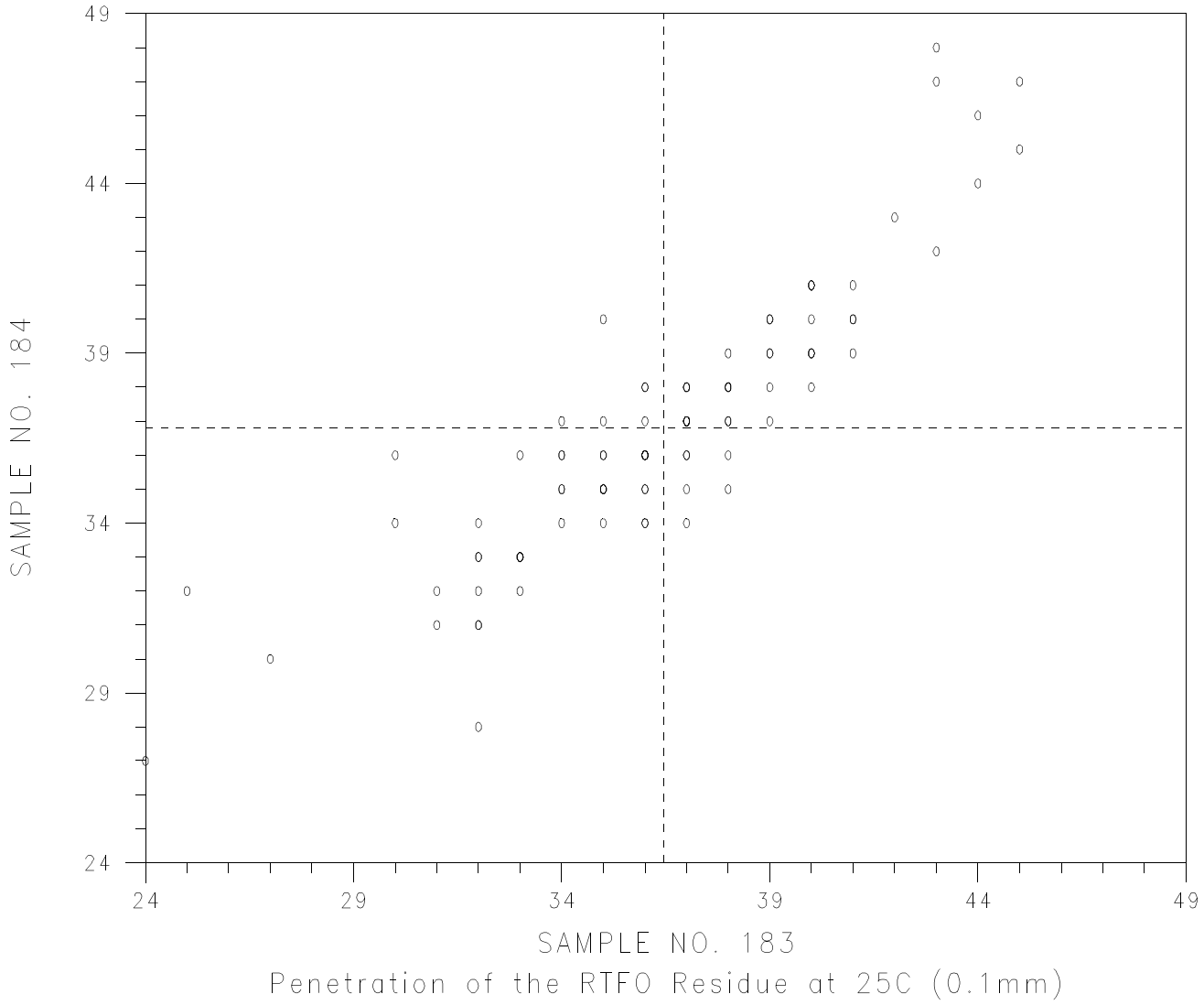
Labs Eliminated: 1 679

Labs off the Diagram: 935 1187 3067 3148 3158 3206

June 2001

AMRL PROFICIENCY SAMPLE PROGRAM

BITUMINOUS SAMPLE NOS. 183 & 184



Test No. 18 | Penetration of the RTFO Residue at 25°C | 89 Points

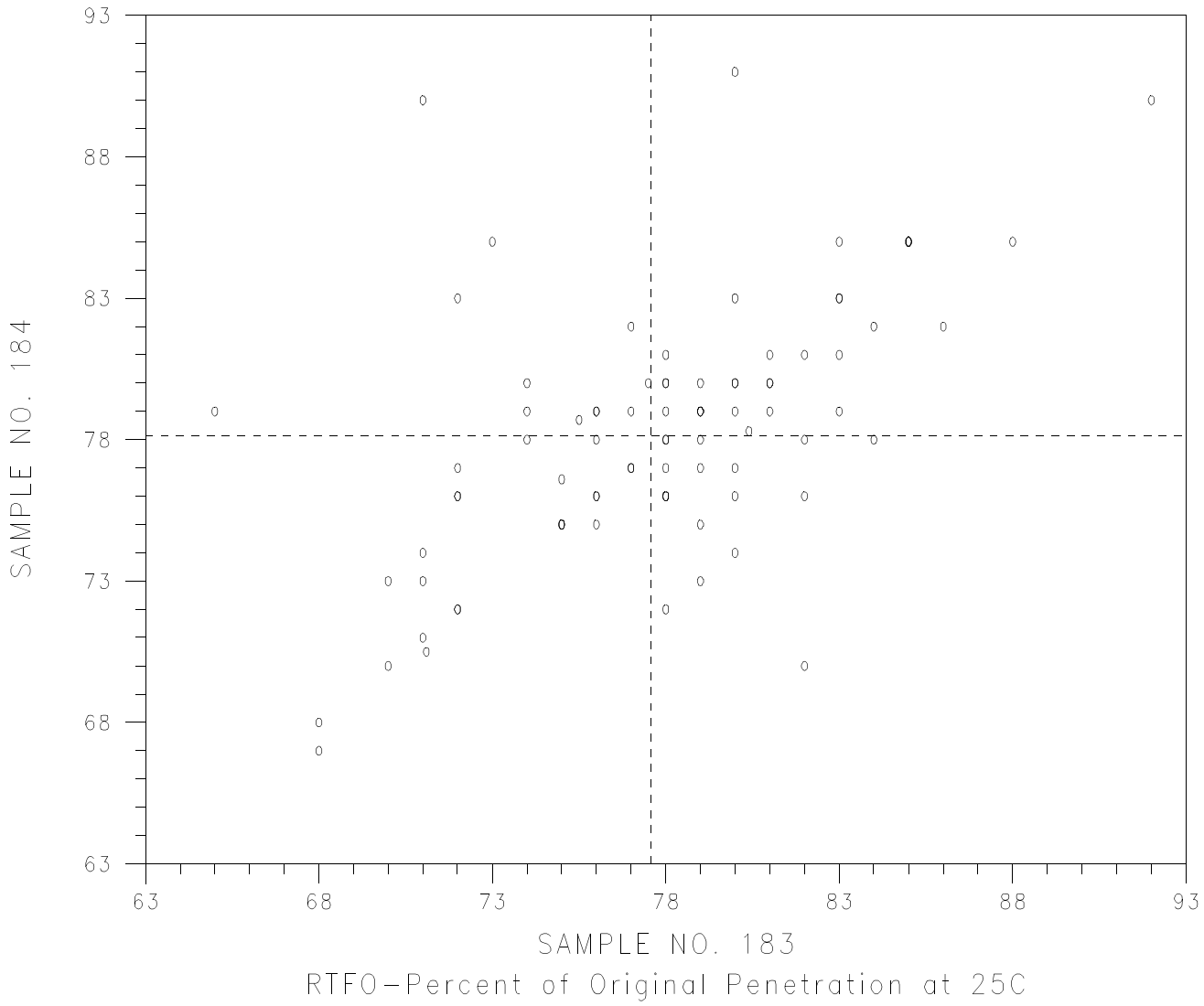
Labs Eliminated: 935

Labs off the Diagram: None

June 2001

AMRL PROFICIENCY SAMPLE PROGRAM

BITUMINOUS SAMPLE NOS. 183 & 184



Test No. 19 | RTFO - Percent of Original Penetration at 25°C | 82 Points

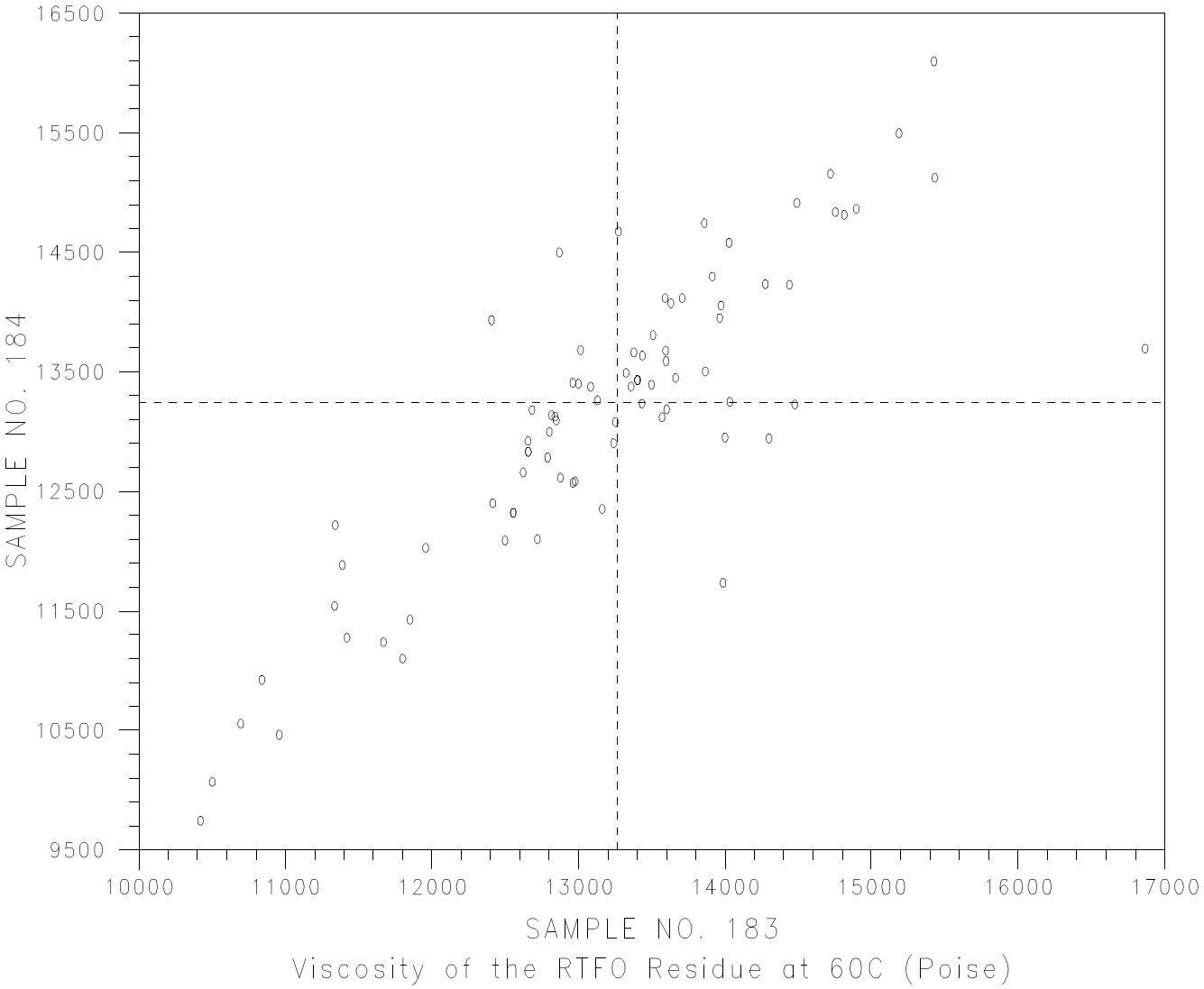
Labs Eliminated: 15 18 43 935 3158

Labs off the Diagram: None

June 2001

AMRL PROFICIENCY SAMPLE PROGRAM

BITUMINOUS SAMPLE NOS. 183 & 184



Test No. 20 | Viscosity of the RTFO Residue at 60°C | 78 Points

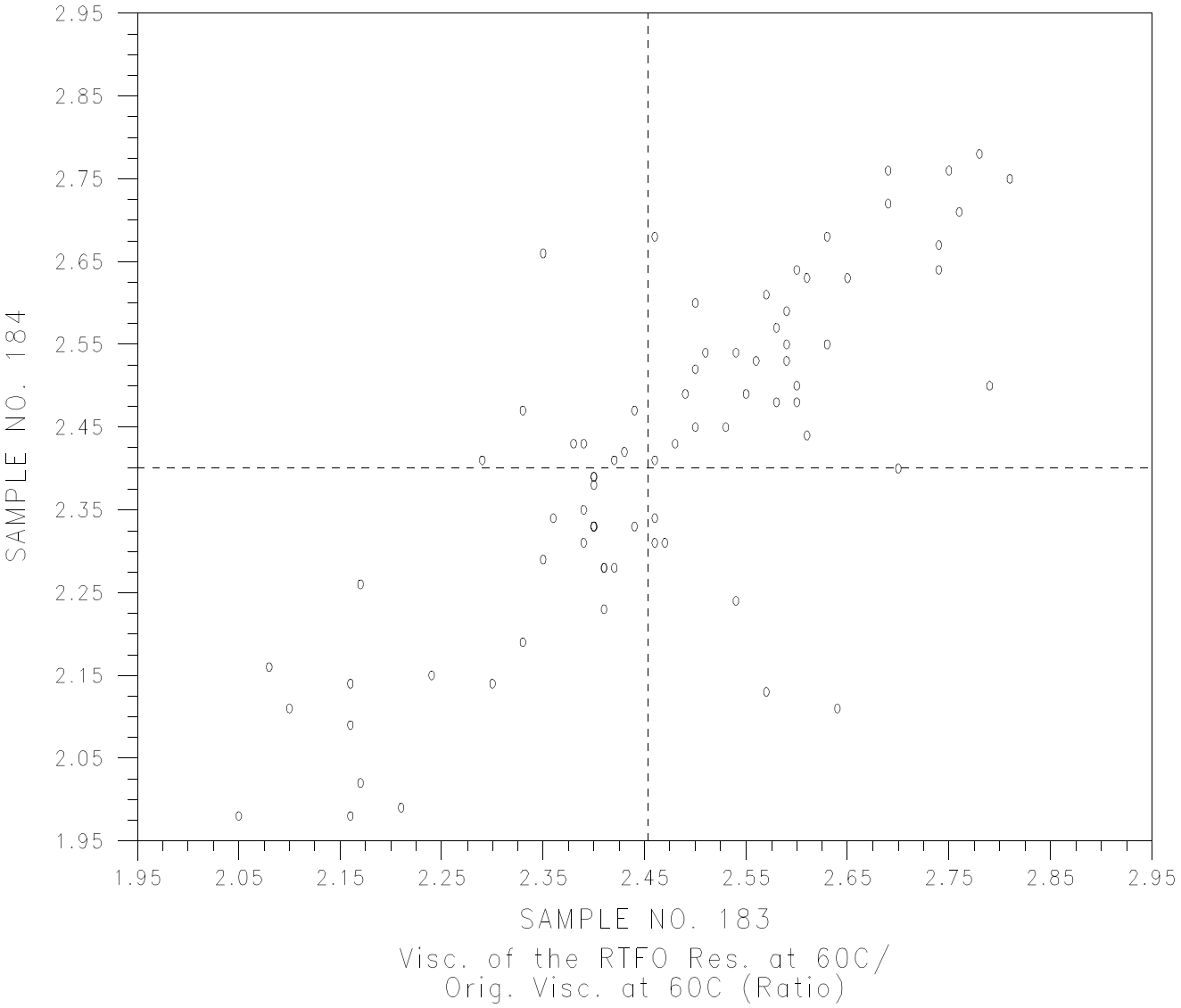
Labs Eliminated: 38 207 3897

Labs off the Diagram: 1170 3321

June 2001

AMRL PROFICIENCY SAMPLE PROGRAM

BITUMINOUS SAMPLE NOS. 183 & 184



Test No. 21 — Viscosity of the RTFO Residue at 60°C/ Original Viscosity at 60°C — 73 Points

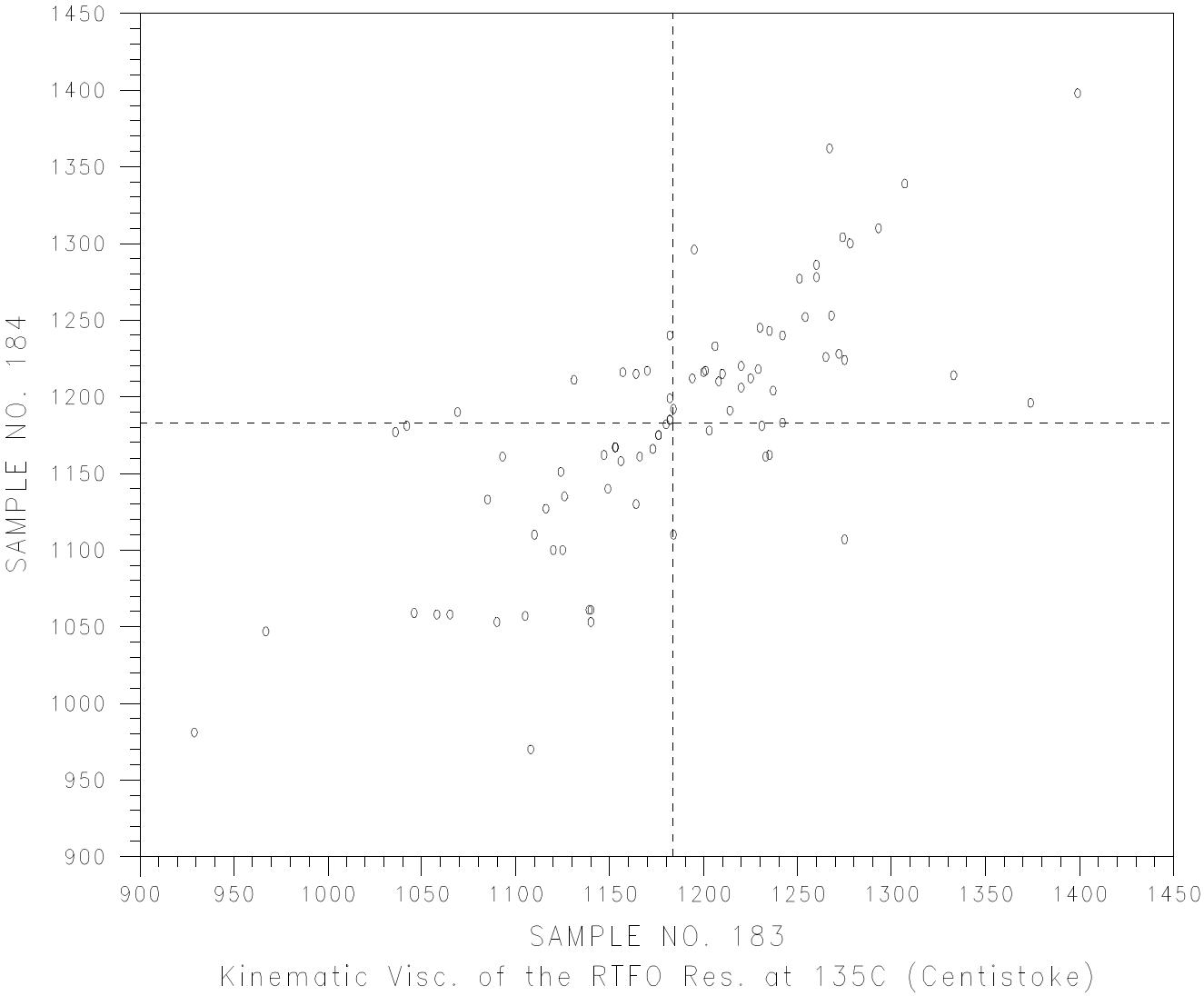
Labs Eliminated: 15 38 1303 3897

Labs off the Diagram: 207 862 3363

June 2001

AMRL PROFICIENCY SAMPLE PROGRAM

BITUMINOUS SAMPLE NOS. 183 & 184



Test No. 22 | Kinematic Viscosity of the RTFO Residue at 135°C | 78 Points

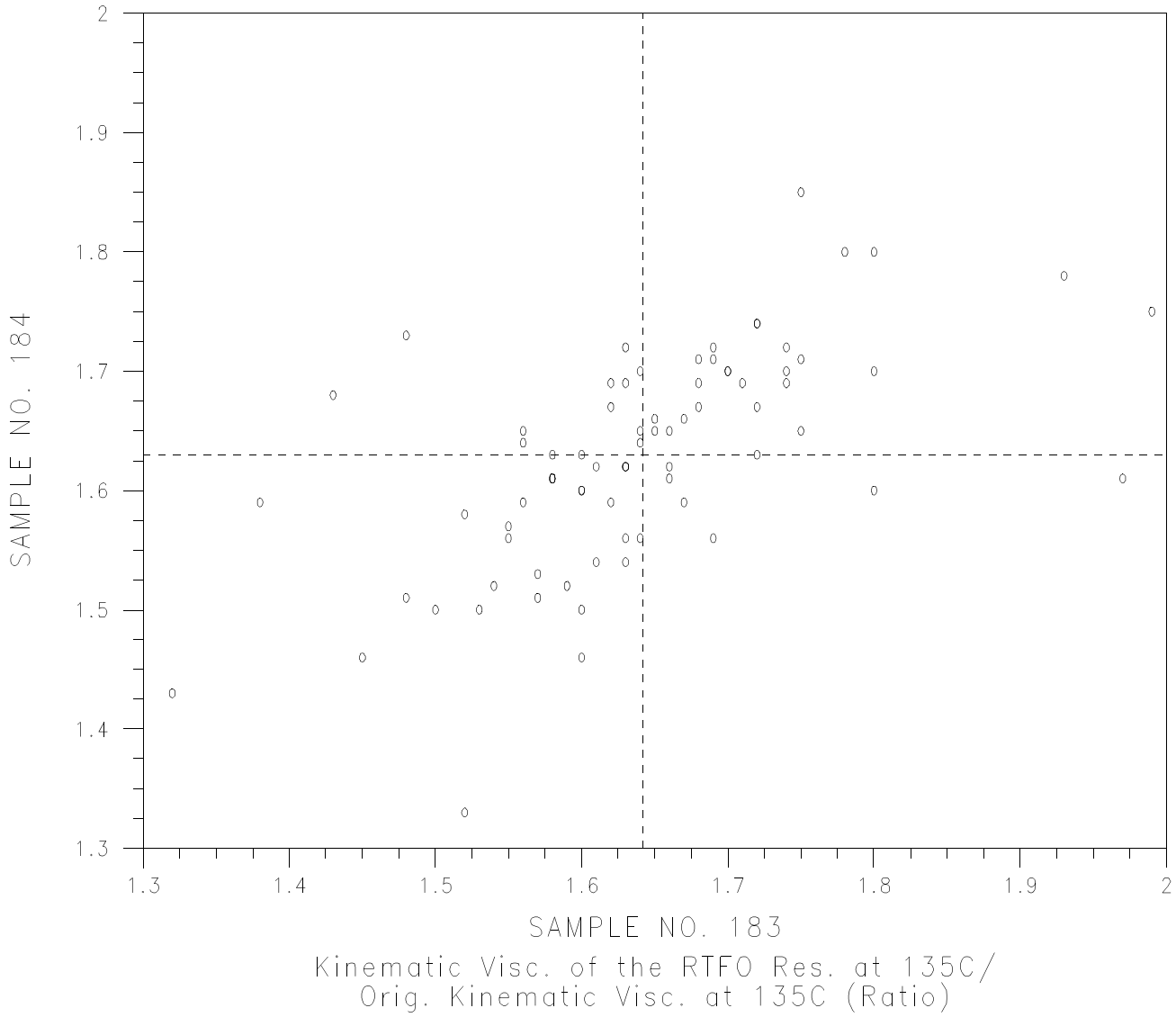
Labs Eliminated: 3363

Labs off the Diagram: None

June 2001

AMRL PROFICIENCY SAMPLE PROGRAM

BITUMINOUS SAMPLE NOS. 183 & 184



Kinematic Visc. of the RTFO Residue at 135°C / Original Kinematic Viscosity at 135°C

Test No. 23 | 73 Points

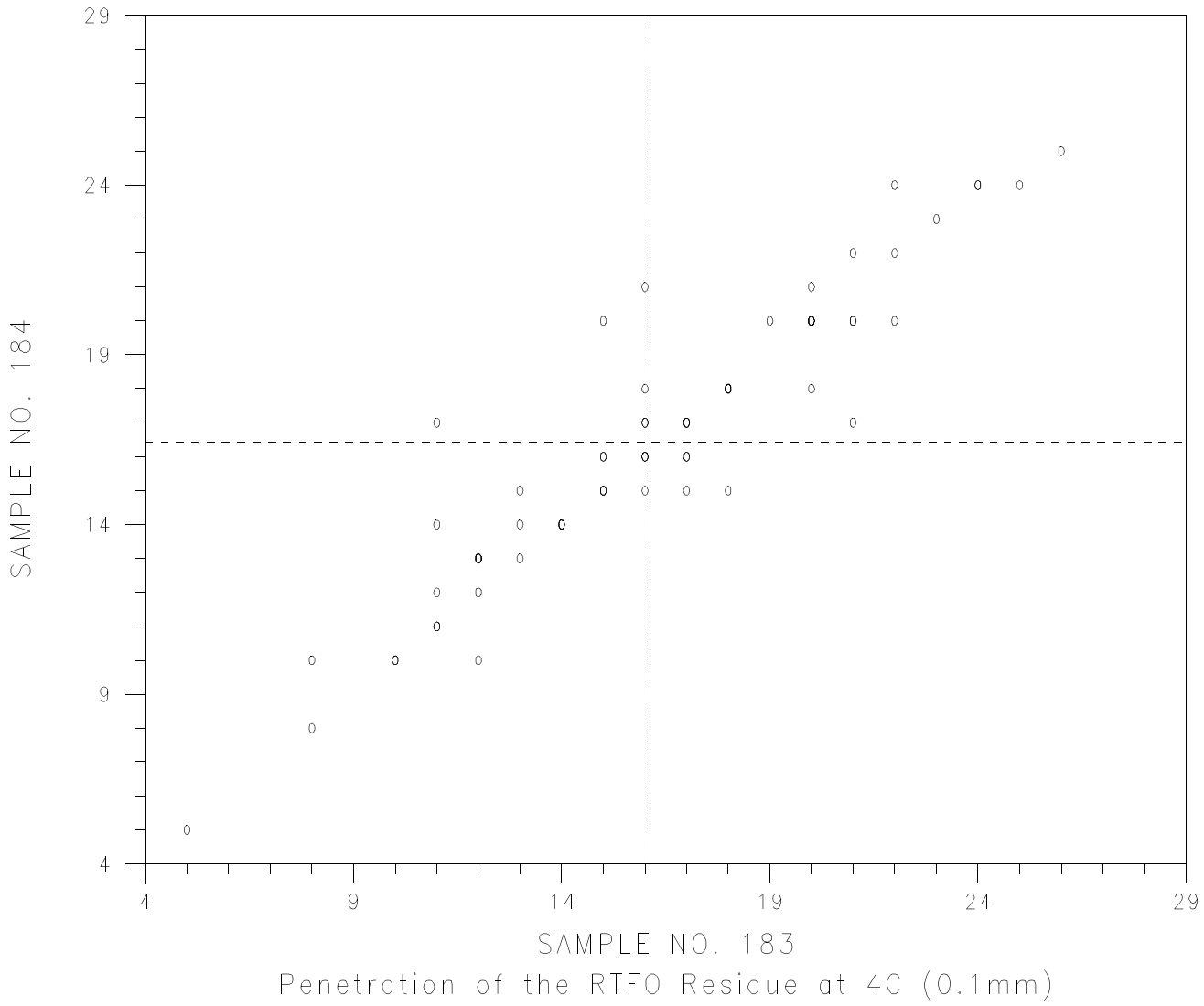
Labs Eliminated: 3 15 1277

Labs off the Diagram: None

June 2001

AMRL PROFICIENCY SAMPLE PROGRAM

BITUMINOUS SAMPLE NOS. 183 & 184



Test No. 24 | Penetration of the RTFO Residue at 4°C | 65 Points

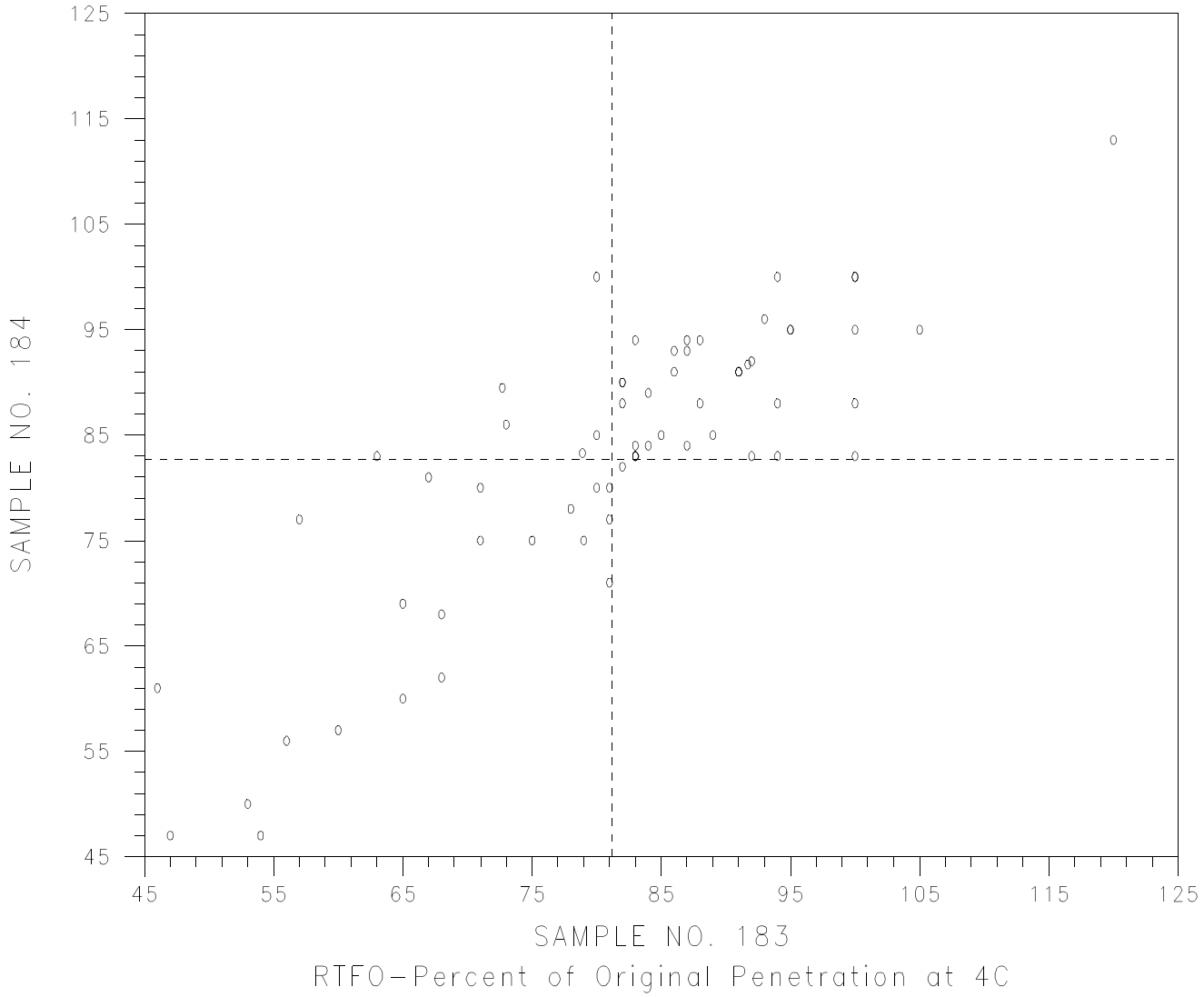
Labs Eliminated: 15

Labs off the Diagram: None

June 2001

AMRL PROFICIENCY SAMPLE PROGRAM

BITUMINOUS SAMPLE NOS. 183 & 184



Test No. 25 | RTFO - Percent of Original Penetration at 4°C | 62 Points

Labs Eliminated: 3 3158

Labs off the Diagram: None