APPENDICES: CONCRETE PUMPING EFFECTS ON ENTRAINED AIR-VOIDS

WA-RD 313.2

Final Report
June 1994

Washington State Department of Transportation

Washington State Transportation Commission
Transit, Research, and Intermodal Planning (TRIP) Division
in cooperation with the U.S. Department of Transportation
Federal Highway Administration

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This study was conducted in cooperation with the U.S. Department of Transportation, Federal Highway Administration.

16. ABSTRACT

Pumping is a frequently used method of efficiently transporting concrete from the delivery vehicles to the formwork. Unfortunately, pumping concrete can affect the air content of a concrete mix. This has caused concern about the possible loss of resistance of the concrete to freezing and thawing. The actual effect of pumping on the air content measured for the concrete is not consistent; in some cases air content has increased, while in others it has decreased. Previous work has shown that pumping causes pressure in the concrete, and this pressure can alter the air-void system. The purpose of this work was to verify previously identified changes in the air-void system, and to examine the effect of pressure on concrete mixes containing various admixture combinations.

The stability of an air-void system with respect to pressurization was found to depend upon both the actual air content and the admixture(s) used in the mix. Higher air contents improved resistance to changes from pressurization, while the use of lignosulfonate-based water-reducers decreased the stability. Type F flyash improved the stability. Air-entraining agent type appeared to also affect stability, but additional testing would be required to establish statistically significant effects based on air-entraining agent type.

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Final Report
Research Project T9233, Task 21
Concrete Pumping Effects on Entrained Air-Voids

APPENDICES: CONCRETE PUMPING EFFECTS ON ENTRAINED AIR-VOIDS

by

William Elkey
Graduate Research Assistant
Dept. of Civil Engineering
University of Washington

Dr. Donald J. Janssen
Associate Professor,
Dept. of Civil Engineering
University of Washington

Kenneth C. Hover,
Professor,
Structural Engineering
School of Civil and
Environmental Engineering
Cornell University

Washington State Transportation Center (TRAC)
University of Washington, JD-10
University District Building
1107 NE 45th Street, Suite 535
Seattle, Washington 98105-4631

Washington State Department of Transportation
Technical Monitor
Robert Gietz
Assistant Materials Engineer
Materials Laboratory, P.O. Box 167
Olympia, Washington 98507-0167

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June 1994

APPENDIX A

PCC MIX DESIGNS

Table 13. PCC Mix Designs.

Mix No.	SSD Coarse Agg. (lb/cu.yd)	SSD Fine Agg. (lb/cu.yd)	Type I-II Cement (lb/cu.yd)	FlyAsh Type F (lb/cu.yd)	Water (lb/cu.yd)	Admixtures*	w/c	Slump (in.)	Fresh Air Content (%)
P02	1829	1192	667	0	255	AEA2 (65 ml)	0.38	3-3/4	5.0
P04	1835	1216	669	0	248	AEA1 (30 ml)	0.37	5-0	4.7
P06	1802	1234	657	0	228	AEA1 (6 ml) WR1 (50 ml)	0.35	4-0	6.4
P07	1792	1207	495	206	216	AEA1 (4 ml) WR1 (50 ml)	0.44	4-1/2	5.7
P08	1849	1204	674	0	257	AEA1 (45 ml)	0.38	3-3/4	4.0
P09	1818	1262	663	0	224	AEA2 (20 ml) WR2 (50 ml)	0.34	4-0	5.6
P14	1799	1158	656	0	256	AEA2 (86 ml)	0.39	4-1/4	6.6
P16	1819	1165	663	0	255	AEA1 (17 ml)	0.38	5-0	5.9
P17	1815	1244	501	160	215	AEA2 (24 ml) WR2 (50 ml)	0.43	4-1/2	5.5
P18	1806	1188	659	0	247	AEA1 (15 ml)	0.38	5-1/4	6.2
P20	1818	1201	663	0	247	AEA3 (32 ml)	0.37	5-3/4	5.6
Pumped Specimens									
P24	1768	1189	600	100	266	AEA1 (7.5 oz)** RET (56 oz)**	0.44	2-3/4	5.2
P25	1768	1189	600	100	266	AEA1 (7.5 oz)** RET (56 oz)**	0.44	2-1/2	5.4

* Quantities for admixtures are given for 1.2 cu.ft. batch, unless otherwise noted.
** Quantites for admixtures given for one cubic yard

APPENDIX B

SAND GRADATION CURVES

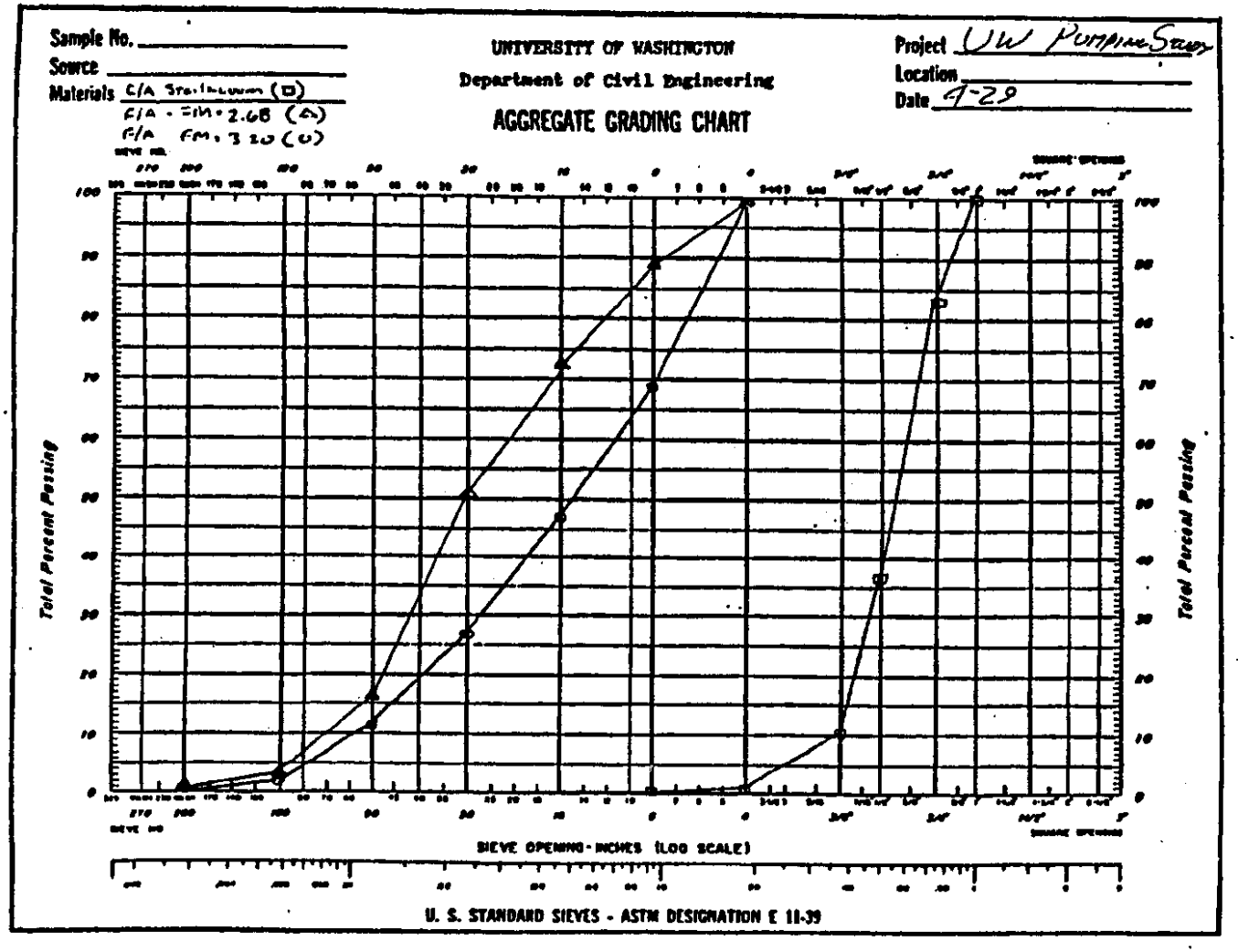


Figure 45. Gradation Curves for Coarse and Fine Aggregate.

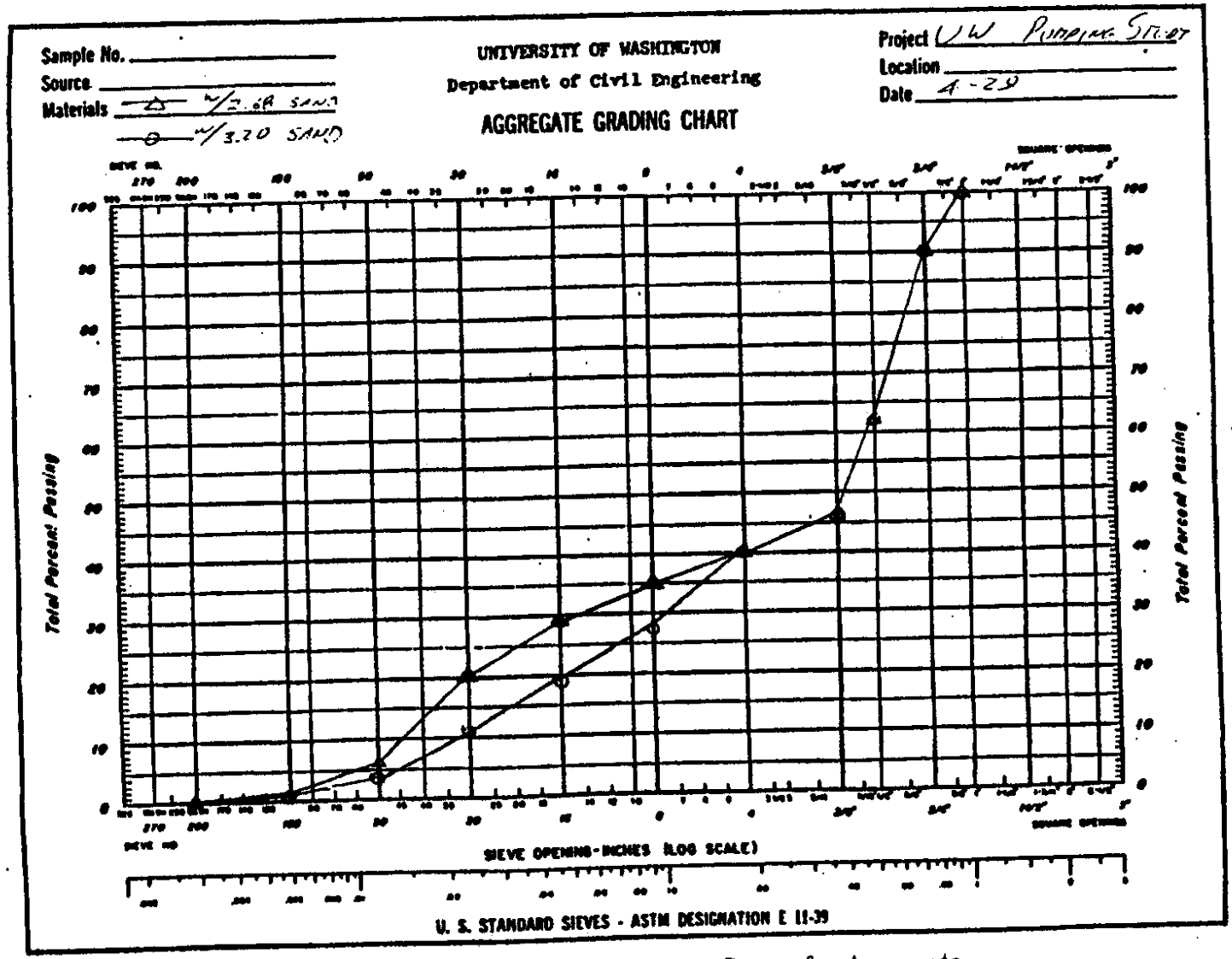


Figure 46. Composite Gradation Curves for Aggregate.

APPENDIX C

BATCHING DESCRIPTION

MIXING PROCEDURE

The procedure used for mixing a PCC butter batch was the following:

1. Wet inside of 1.5 ft^3 capacity drum mixer.
2. Add half of coarse aggregate and all of fine aggregate.
3. Cover and mix for one minute or until aggregates are thoroughly mixed.
4. Add all of the required cement.
5. Cover and mix for one minute or until C/A, F/A, and cement are thoroughly mixed.
6. Add all of water and air entraining agent.
7. Cover and mix for 1-1/2 minutes.
8. Add remaining fine aggregate.
9. Add water reducing or retarding admixture (optional).
10. Cover and mix for 1-1/2 minutes.
11. Empty concrete into wetted wheelbarrow, making sure to coat the sides of the mixer when dumping.
12. Mix in wheelbarrow using scoop, hoe, or shovel.

Upon completing the butter batch, usually 0.5 ft^3, the mix is discarded. The procedure for a full batch, usually 1.2 ft^3, is the following:

1. Repeat steps 1 through 10 for butter batch, using full batch quantities. Mixer should be buttered.
2. After the last 1-1/2 minutes of mixing, stop mixer for two minutes.
3. Mix for 3 minutes.
4. Empty concrete into buttered wheelbarrow.
5. Mix in wheelbarrow thoroughly with scoop, hoe, or shovel.

The mix is now ready for air content test, slump test, and specimen preparation.

APPENDIX D

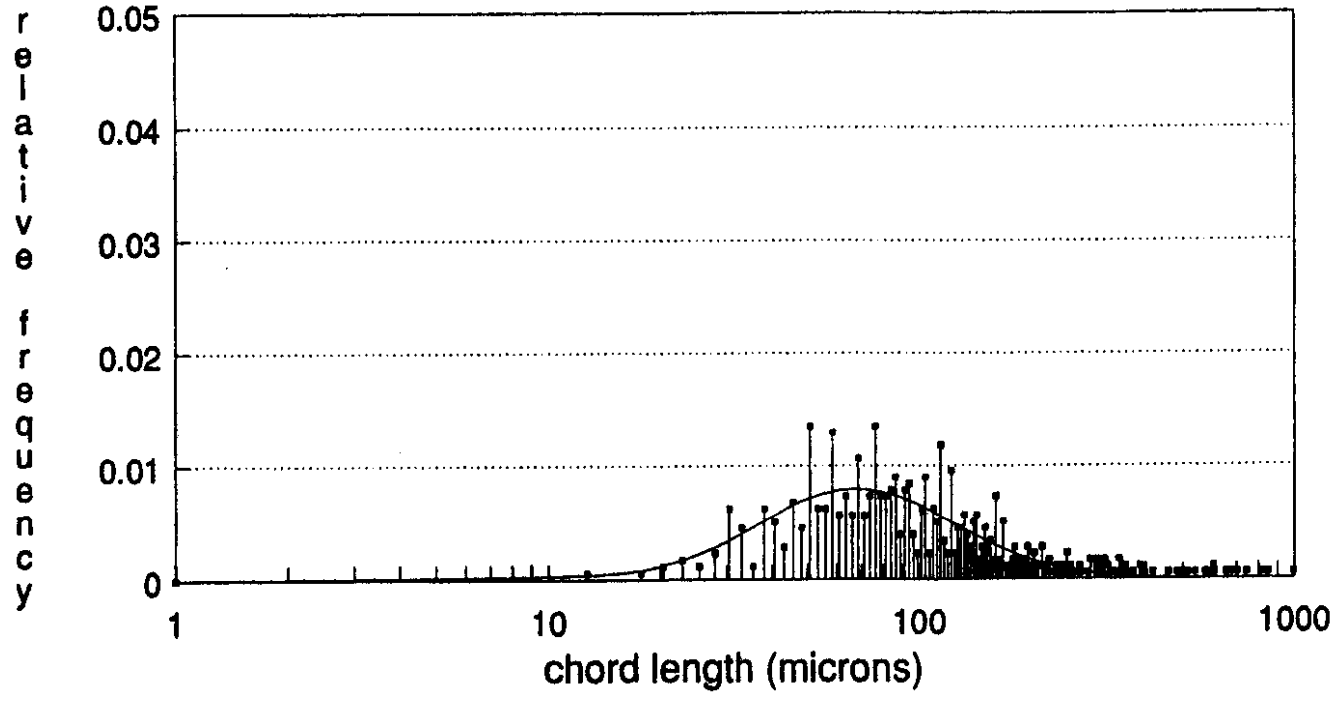
LINEAR TRAVERSE DATA SHEETS AND HISTOGRAMS

INPUT FILE IS P021BET.AIR

MAXIMUM CHORD SIZE INCLUDED IN ENTRAINED AIR IS 1000 MICRONS

	ENTRAINED AIR ONLY	ALL AIR < 1000	ALL AIR
CALCULATED FROM ACTUAL DATA			
TOTAL LENGTH OF TRAVERSE (MM)	2371.1		
LINEAR TRAVERSE PASTE CONTENT (%)	27.6		
MIX DESIGN PASTE CONTENT (%)	27.5		
HARDENED AIR CONTENT (%)	2.1	3.9	4.6
PASTE TO AIR RATIO (LT PASTE)	13.1	7.1	6.1
PASTE TO AIR RATIO (MIX DES.)	13.0	7.1	6.0
AVERAGE AIRVOID CHORD LENGTH (MM)	.126	.132	.152
TOTAL NUMBER OF AIRVOIDS	399.	700.	709.
VOIDS PER MM TRAVERSE	.168	.295	.299
SPACING FACTOR (LT PASTE, MM)	.224	.179	.193
SPACING FACTOR (MIX DES., MM)	.224	.179	.192
SPECIFIC SURFACE (SQ.MM/CU.MM)	31.8	30.3	26.2
CALCULATED FROM BEST FIT LOGNORMAL DISTRIBUTION			
AVERAGE AIRVOID CHORD LENGTH (MM)	.124	.119	.120
TOTAL NUMBER OF AIRVOIDS	405.	777.	900.
VOIDS PER MM TRAVERSE	.171	.328	.380
SPACING FACTOR (LT PASTE, MM)	.221	.162	.152
SPACING FACTOR (MIX DES., MM)	.220	.161	.152
SPECIFIC SURFACE (SQ.MM/CU.MM)	32.3	33.6	33.3
# OF VOIDS PER CUBIC MM	13.7	29.6	34.0
2 PHILLEO FACTOR(S) DETERMINED			
PHILLEO FACTOR AT 90.% (LT PASTE, MM)	.084	.043	.034
PHILLEO FACTOR AT 90.% (MIX DES., MM)	.084	.042	.034
PHILLEO FACTOR AT 99.% (LT PASTE, MM)	.142	.088	.077
PHILLEO FACTOR AT 99.% (MIX DES., MM)	.142	.087	.077
1 SPACING(S) FOR WHICH PHILLEO PROTECTIONS HAVE BEEN DETERMINED			
% OF PASTE WITHIN .100 MM. (LT PASTE)	94.	100.	100.
% OF PASTE WITHIN .100 MM. (MIX DES.)	94.	100.	100.

AIRVOID DISTRIBUTION
Mix P02-1
Actual Data and Best Fit Curve



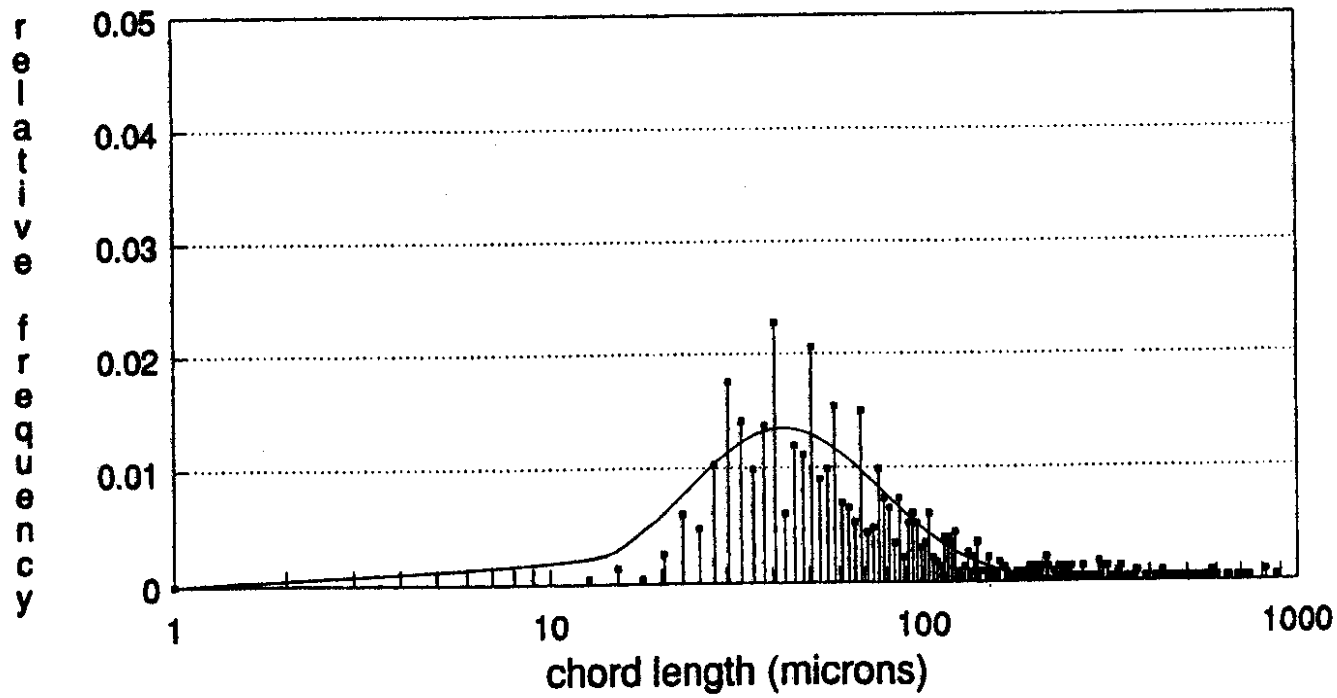
Mode = 67.680 microns
Std. Dev. = 0.6132

INPUT FILE IS P022BET.AIR

MAXIMUM CHORD SIZE INCLUDED IN ENTRAINED AIR IS 1000 MICRONS

	ENTRAINED AIR ONLY	ALL AIR < 1000	ALL AIR
CALCULATED FROM ACTUAL DATA			
TOTAL LENGTH OF TRAVERSE (MM)	2366.0		
LINEAR TRAVERSE PASTE CONTENT (%)	29.2		
MIX DESIGN PASTE CONTENT (%)	27.5		
HARDENED AIR CONTENT (%)	1.7	4.0	4.7
PASTE TO AIR RATIO (LT PASTE)	17.6	7.2	6.2
PASTE TO AIR RATIO (MIX DES.)	16.5	6.8	5.8
AVERAGE AIRVOID CHORD LENGTH (MM)	.092	.104	.121
TOTAL NUMBER OF AIRVOIDS	428.	918.	927.
VOIDS PER MM TRAVERSE	.181	.388	.392
SPACING FACTOR (LT PASTE, MM)	.187	.142	.154
SPACING FACTOR (MIX DES., MM)	.182	.139	.150
SPECIFIC SURFACE (SQ.MM/CU.MM)	43.5	38.5	33.1
CALCULATED FROM BEST FIT LOGNORMAL DISTRIBUTION			
AVERAGE AIRVOID CHORD LENGTH (MM)	.078	.071	.072
TOTAL NUMBER OF AIRVOIDS	506.	1340.	1563.
VOIDS PER MM TRAVERSE	.214	.566	.661
SPACING FACTOR (LT PASTE, MM)	.158	.098	.091
SPACING FACTOR (MIX DES., MM)	.154	.095	.089
SPECIFIC SURFACE (SQ.MM/CU.MM)	51.5	56.3	55.8
# OF VOIDS PER CUBIC MM	41.4	135.5	156.8
2 PHILLEO FACTOR(S) DETERMINED			
PHILLEO FACTOR AT 90.% (LT PASTE, MM)	.068	.027	.021
PHILLEO FACTOR AT 90.% (MIX DES., MM)	.065	.025	.020
PHILLEO FACTOR AT 99.% (LT PASTE, MM)	.109	.054	.048
PHILLEO FACTOR AT 99.% (MIX DES., MM)	.105	.052	.045
1 SPACING(S) FOR WHICH PHILLEO PROTECTIONS HAVE BEEN DETERMINED			
% OF PASTE WITHIN .100 MM. (LT PASTE)	98.	100.	100.
% OF PASTE WITHIN .100 MM. (MIX DES.)	99.	100.	100.

AIRVOID DISTRIBUTION
Mix P02-2
Actual Data and Best Fit Curve



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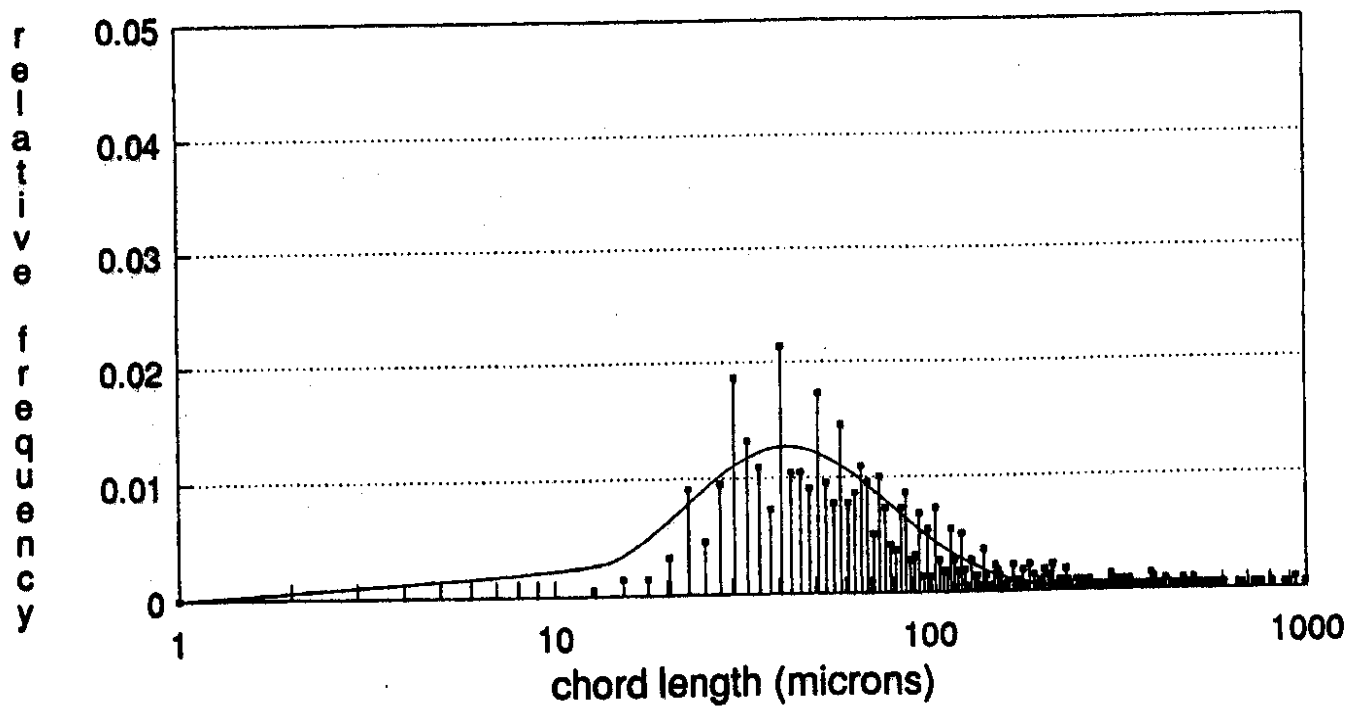
Std. Dev. = 0.5841

INPUT FILE IS P023BET.AIR

MAXIMUM CHORD SIZE INCLUDED IN ENTRAINED AIR IS 1000 MICRONS

	ENTRAINED AIR ONLY	ALL AIR < 1000	ALL AIR
CALCULATED FROM ACTUAL DATA			
TOTAL LENGTH OF TRAVERSE (MM)	2378.5		
LINEAR TRAVERSE PASTE CONTENT (%)	28.9		
MIX DESIGN PASTE CONTENT (%)	27.5		
HARDENED AIR CONTENT (%)	1.6	3.8	5.5
PASTE TO AIR RATIO (LT PASTE)	18.0	7.5	5.2
PASTE TO AIR RATIO (MIX DES.)	17.1	7.2	5.0
AVERAGE AIRVOID CHORD LENGTH (MM)	.092	.105	.148
TOTAL NUMBER OF AIRVOIDS	414.	866.	884.
VOIDS PER MM TRAVERSE	.174	.364	.372
SPACING FACTOR (LT PASTE, MM)	.189	.147	.175
SPACING FACTOR (MIX DES., MM)	.185	.144	.171
SPECIFIC SURFACE (SQ.MM/CU.MM)	43.4	38.0	27.0
CALCULATED FROM BEST FIT LOGNORMAL DISTRIBUTION			
AVERAGE AIRVOID CHORD LENGTH (MM)	.085	.074	.076
TOTAL NUMBER OF AIRVOIDS	450.	1225.	1730.
VOIDS PER MM TRAVERSE	.189	.515	.727
SPACING FACTOR (LT PASTE, MM)	.174	.104	.090
SPACING FACTOR (MIX DES., MM)	.170	.101	.088
SPECIFIC SURFACE (SQ.MM/CU.MM)	47.1	53.8	52.9
# OF VOIDS PER CUBIC MM	36.3	120.3	167.3
2 PHILLEO FACTOR(S) DETERMINED			
PHILLEO FACTOR AT 90.% (LT PASTE, MM)	.072	.029	.017
PHILLEO FACTOR AT 90.% (MIX DES., MM)	.069	.027	.015
PHILLEO FACTOR AT 99.% (LT PASTE, MM)	.114	.057	.043
PHILLEO FACTOR AT 99.% (MIX DES., MM)	.111	.055	.041
1 SPACING(S) FOR WHICH PHILLEO PROTECTIONS HAVE BEEN DETERMINED			
% OF PASTE WITHIN .100 MM. (LT PASTE)	98.	100.	100.
% OF PASTE WITHIN .100 MM. (MIX DES.)	98.	100.	100.

AIRVOID DISTRIBUTION
Mix P02-3
Actual Data and Best Fit Curve



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Std. Dev. = 0.6169

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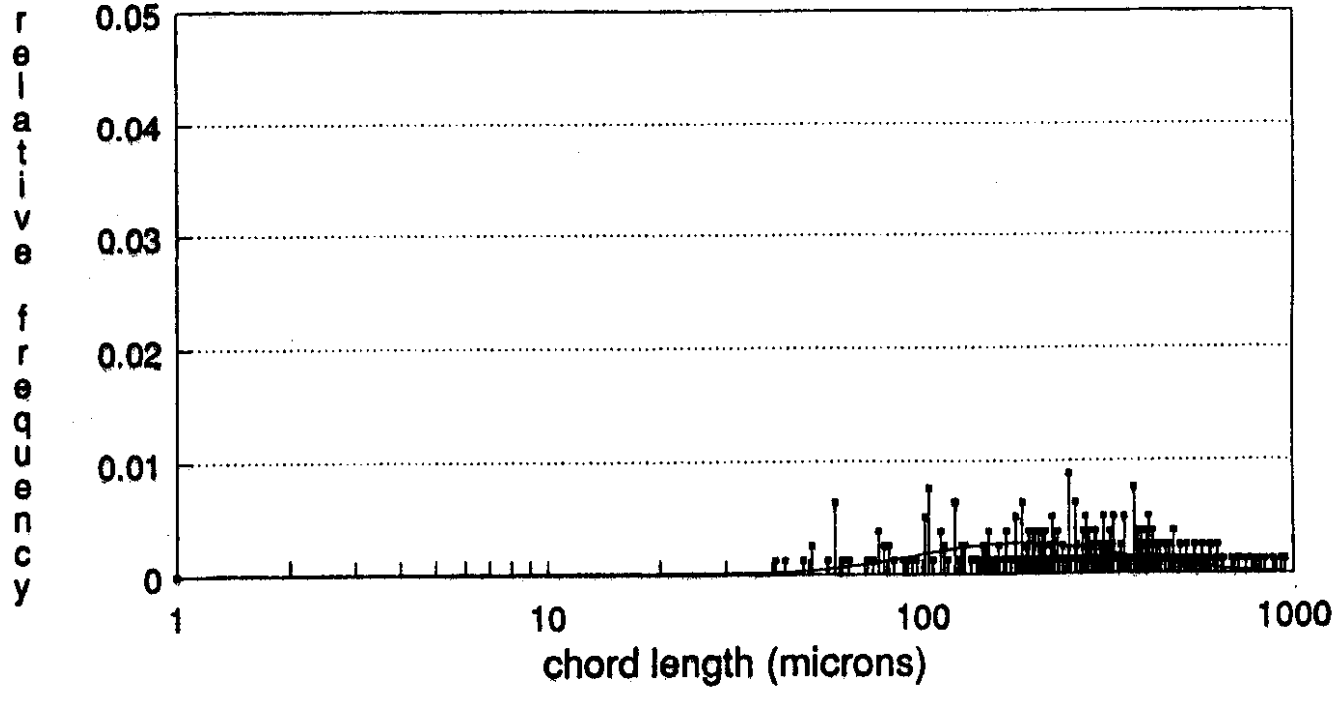
MAXIMUM CHORD SIZE INCLUDED IN ENTRAINED AIR IS 1000 MICRONS

	ENTRAINED AIR ONLY	ALL AIR < 1000	ALL AIR
CALCULATED FROM ACTUAL DATA			
TOTAL LENGTH OF TRAVERSE (MM)	2332.1		
LINEAR TRAVERSE PASTE CONTENT (%)	25.3		
MIX DESIGN PASTE CONTENT (%)	27.5		
HARDENED AIR CONTENT (%)	.3	4.1	4.9
PASTE TO AIR RATIO (LT PASTE)	84.5	6.2	5.2
PASTE TO AIR RATIO (MIX DES.)	91.8	6.7	5.6
AVERAGE AIRVOID CHORD LENGTH (MM)	.249	.306	.355
TOTAL NUMBER OF AIRVOIDS	28.	311.	322.
VOIDS PER MM TRAVERSE	.012	.133	.138
SPACING FACTOR (LT PASTE, MM)	.967	.391	.417
SPACING FACTOR (MIX DES., MM)	.999	.406	.433
SPECIFIC SURFACE (SQ.MM/CU.MM)	16.0	13.1	11.3
CALCULATED FROM BEST FIT LOGNORMAL DISTRIBUTION			
AVERAGE AIRVOID CHORD LENGTH (MM)	.226	.320	.324
TOTAL NUMBER OF AIRVOIDS	31.	305.	363.
VOIDS PER MM TRAVERSE	.013	.131	.156
SPACING FACTOR (LT PASTE, MM)	.875	.409	.381
SPACING FACTOR (MIX DES., MM)	.904	.424	.395
SPECIFIC SURFACE (SQ.MM/CU.MM)	17.7	12.5	12.3
# OF VOIDS PER CUBIC MM	.4	1.5	1.8
2 PHILLEO FACTOR(S) DETERMINED			
PHILLEO FACTOR AT 90.% (LT PASTE, MM)	.462	.097	.073
PHILLEO FACTOR AT 90.% (MIX DES., MM)	.482	.109	.083
PHILLEO FACTOR AT 99.% (LT PASTE, MM)	.645	.215	.184
PHILLEO FACTOR AT 99.% (MIX DES., MM)	.669	.230	.198
1 SPACING(S) FOR WHICH PHILLEO PROTECTIONS HAVE BEEN DETERMINED			
% OF PASTE WITHIN .100 MM. (LT PASTE)	22.	90.	94.
% OF PASTE WITHIN .100 MM. (MIX DES.)	21.	89.	94.

AIRVOID DISTRIBUTION
Mix P02-4
Actual Data and Best Fit Curve



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Std. Dev. = 0.6498

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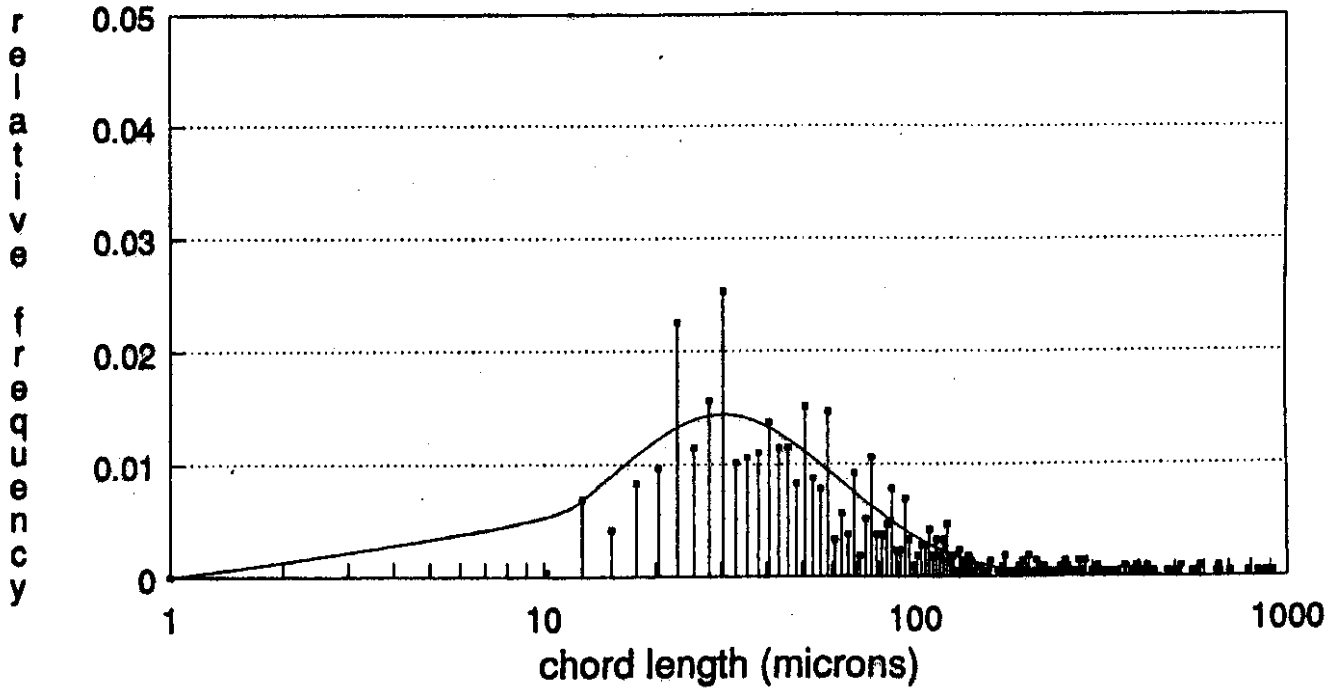
MAXIMUM CHORD SIZE INCLUDED IN ENTRAINED AIR IS 1000 MICRONS

	ENTRAINED AIR ONLY	ALL AIR < 1000	ALL AIR
CALCULATED FROM ACTUAL DATA			
TOTAL LENGTH OF TRAVERSE (MM)	2334.3		
LINEAR TRAVERSE PASTE CONTENT (%)	28.4		
MIX DESIGN PASTE CONTENT (%)	27.5		
HARDENED AIR CONTENT (%)	2.1	3.3	4.3
PASTE TO AIR RATIO (LT PASTE)	13.2	8.5	6.6
PASTE TO AIR RATIO (MIX DES.)	12.8	8.2	6.4
AVERAGE AIRVOID CHORD LENGTH (MM)	.085	.091	.115
TOTAL NUMBER OF AIRVOIDS	588.	857.	869.
VOIDS PER MM TRAVERSE	.252	.367	.372
SPACING FACTOR (LT PASTE, MM)	.153	.134	.151
SPACING FACTOR (MIX DES., MM)	.151	.132	.149
SPECIFIC SURFACE (SQ.MM/CU.MM)	47.0	44.1	34.9
CALCULATED FROM BEST FIT LOGNORMAL DISTRIBUTION			
AVERAGE AIRVOID CHORD LENGTH (MM)	.068	.064	.065
TOTAL NUMBER OF AIRVOIDS	740.	1212.	1529.
VOIDS PER MM TRAVERSE	.317	.519	.655
SPACING FACTOR (LT PASTE, MM)	.121	.095	.086
SPACING FACTOR (MIX DES., MM)	.120	.093	.085
SPECIFIC SURFACE (SQ.MM/CU.MM)	59.1	62.3	61.4
# OF VOIDS PER CUBIC MM	124.3	201.8	252.2
2 PHILLEO FACTOR(S) DETERMINED			
PHILLEO FACTOR AT 90.% (LT PASTE, MM)	.041	.026	.020
PHILLEO FACTOR AT 90.% (MIX DES., MM)	.040	.026	.019
PHILLEO FACTOR AT 99.% (LT PASTE, MM)	.069	.050	.042
PHILLEO FACTOR AT 99.% (MIX DES., MM)	.068	.049	.041
1 SPACING(S) FOR WHICH PHILLEO PROTECTIONS HAVE BEEN DETERMINED			
% OF PASTE WITHIN .100 MM. (LT PASTE)	100.	100.	100.
% OF PASTE WITHIN .100 MM. (MIX DES.)	100.	100.	100.

AIRVOID DISTRIBUTION
Mix P02-5
Actual Data and Best Fit Curve



Mode = 30.422 microns
Std. Dev. = 0.7059

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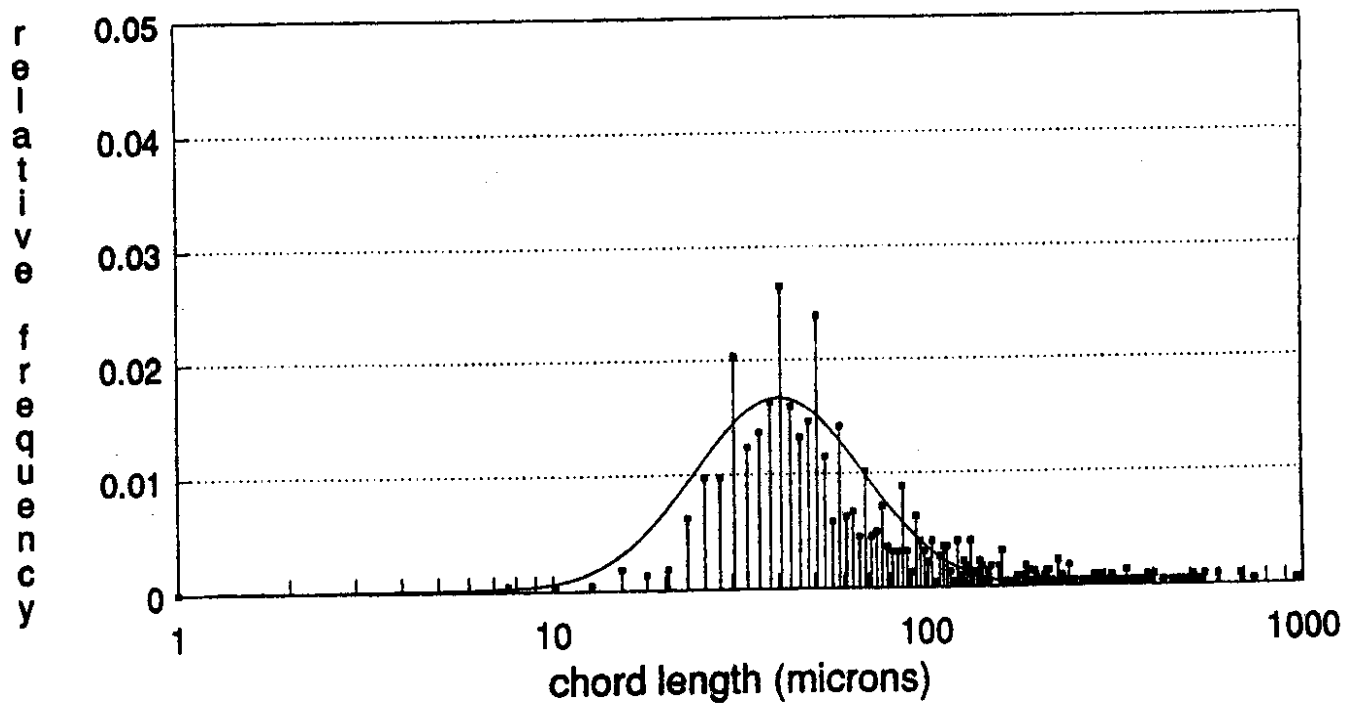
MAXIMUM CHORD SIZE INCLUDED IN ENTRAINED AIR IS 1000 MICRONS

	ENTRAINED AIR ONLY	ALL AIR < 1000	ALL AIR
CALCULATED FROM ACTUAL DATA			
TOTAL LENGTH OF TRAVERSE (MM)	2323.9		
LINEAR TRAVERSE PASTE CONTENT (%)	27.8		
MIX DESIGN PASTE CONTENT (%)	27.5		
HARDENED AIR CONTENT (%)	1.8	3.5	4.4
PASTE TO AIR RATIO (LT PASTE)	15.6	7.9	6.4
PASTE TO AIR RATIO (MIX DES.)	15.4	7.8	6.3
AVERAGE AIRVOID CHORD LENGTH (MM)	.095	.092	.113
TOTAL NUMBER OF AIRVOIDS	437.	891.	901.
VOIDS PER MM TRAVERSE	.188	.383	.388
SPACING FACTOR (LT PASTE, MM)	.183	.131	.146
SPACING FACTOR (MIX DES., MM)	.182	.131	.145
SPECIFIC SURFACE (SQ.MM/CU.MM)	42.2	43.4	35.5
CALCULATED FROM BEST FIT LOGNORMAL DISTRIBUTION			
AVERAGE AIRVOID CHORD LENGTH (MM)	.074	.060	.061
TOTAL NUMBER OF AIRVOIDS	558.	1366.	1675.
VOIDS PER MM TRAVERSE	.240	.588	.721
SPACING FACTOR (LT PASTE, MM)	.143	.086	.078
SPACING FACTOR (MIX DES., MM)	.142	.085	.078
SPECIFIC SURFACE (SQ.MM/CU.MM)	53.9	66.5	66.0
# OF VOIDS PER CUBIC MM	54.5	178.3	216.5
2 PHILLEO FACTOR(S) DETERMINED			
PHILLEO FACTOR AT 90.% (LT PASTE, MM)	.058	.026	.020
PHILLEO FACTOR AT 90.% (MIX DES., MM)	.058	.025	.019
PHILLEO FACTOR AT 99.% (LT PASTE, MM)	.095	.050	.043
PHILLEO FACTOR AT 99.% (MIX DES., MM)	.094	.050	.043
1 SPACING(S) FOR WHICH PHILLEO PROTECTIONS HAVE BEEN DETERMINED			
% OF PASTE WITHIN .100 MM. (LT PASTE)	99.	100.	100.
% OF PASTE WITHIN .100 MM. (MIX DES.)	99.	100.	100.

AIRVOID DISTRIBUTION
Mix P02-8
Actual Data and Best Fit Curve



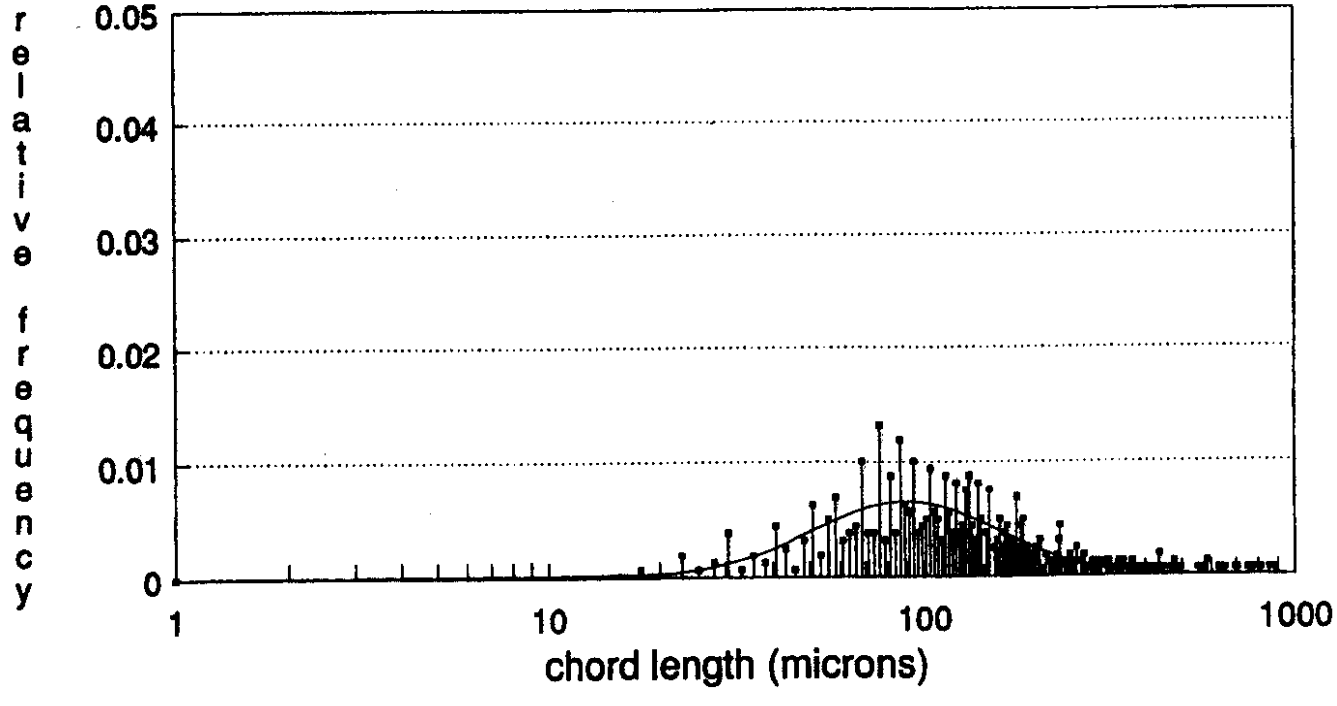
Mode = 40.134 microns
Std. Dev. = 0.5190

INPUT FILE IS P029BET.AIR

MAXIMUM CHORD SIZE INCLUDED IN ENTRAINED AIR IS 1000 MICRONS

	ENTRAINED AIR ONLY	ALL AIR < 1000	ALL AIR
CALCULATED FROM ACTUAL DATA			
TOTAL LENGTH OF TRAVERSE (MM)	2343.4		
LINEAR TRAVERSE PASTE CONTENT (%)	28.5		
MIX DESIGN PASTE CONTENT (%)	27.5		
HARDENED AIR CONTENT (%)	1.8	4.2	4.9
PASTE TO AIR RATIO (LT PASTE)	15.9	6.7	5.8
PASTE TO AIR RATIO (MIX DES.)	15.4	6.5	5.6
AVERAGE AIRVOID CHORD LENGTH (MM)	.135	.159	.181
TOTAL NUMBER OF AIRVOIDS	311.	627.	637.
VOIDS PER MM TRAVERSE	.133	.268	.272
SPACING FACTOR (LT PASTE, MM)	.262	.210	.224
SPACING FACTOR (MIX DES., MM)	.258	.207	.221
SPECIFIC SURFACE (SQ.MM/CU.MM)	29.7	25.2	22.1
CALCULATED FROM BEST FIT LOGNORMAL DISTRIBUTION			
AVERAGE AIRVOID CHORD LENGTH (MM)	.149	.148	.149
TOTAL NUMBER OF AIRVOIDS	282.	674.	773.
VOIDS PER MM TRAVERSE	.120	.288	.330
SPACING FACTOR (LT PASTE, MM)	.289	.195	.185
SPACING FACTOR (MIX DES., MM)	.285	.192	.182
SPECIFIC SURFACE (SQ.MM/CU.MM)	26.9	27.1	26.8
# OF VOIDS PER CUBIC MM	6.1	15.7	17.9
2 PHILLEO FACTOR(S) DETERMINED			
PHILLEO FACTOR AT 90.% (LT PASTE, MM)	.122	.050	.041
PHILLEO FACTOR AT 90.% (MIX DES., MM)	.119	.048	.038
PHILLEO FACTOR AT 99.% (LT PASTE, MM)	.199	.106	.094
PHILLEO FACTOR AT 99.% (MIX DES., MM)	.195	.103	.092
1 SPACING(S) FOR WHICH PHILLEO PROTECTIONS HAVE BEEN DETERMINED			
% OF PASTE WITHIN .100 MM. (LT PASTE)	84.	99.	99.
% OF PASTE WITHIN .100 MM. (MIX DES.)	85.	99.	99.

AIRVOID DISTRIBUTION
Mix P02-9
Actual Data and Best Fit Curve



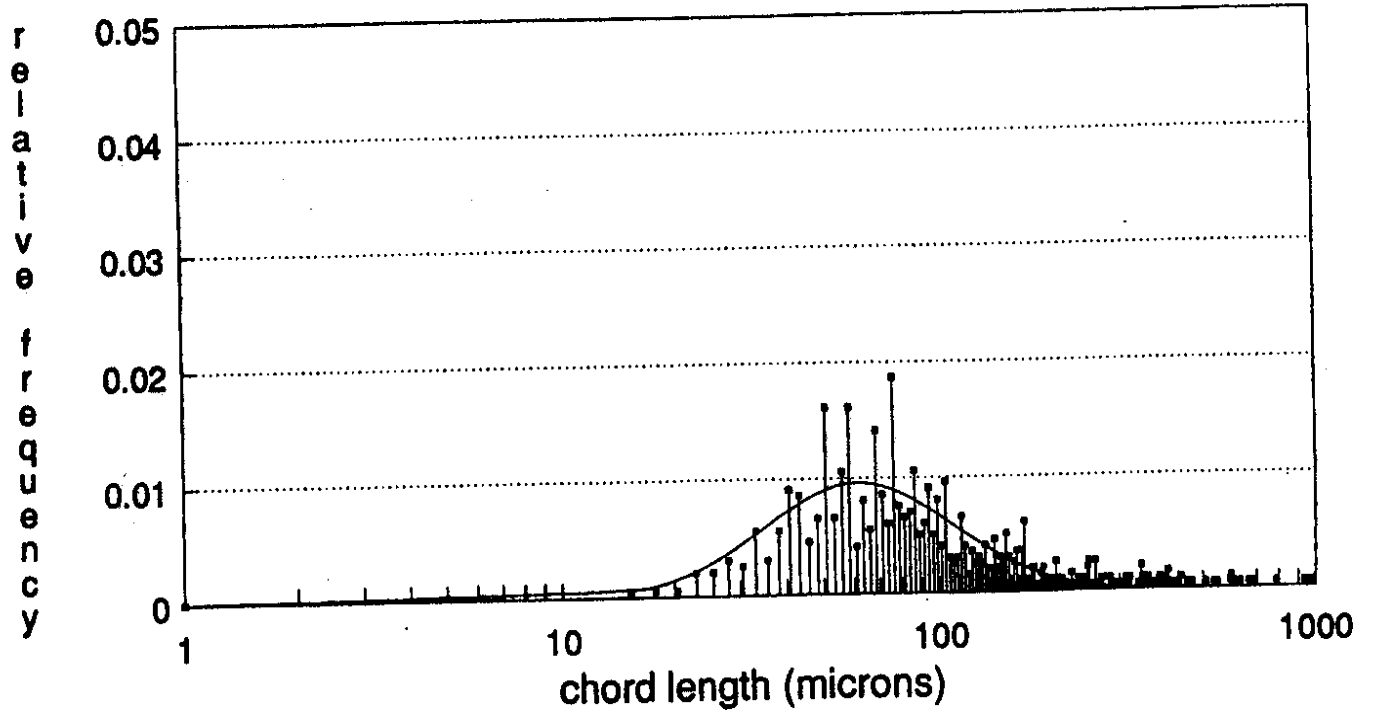
Mode = 89.662 microns
Std. Dev. = 0.5770

INPUT FILE IS p0210bet.air

MAXIMUM CHORD SIZE INCLUDED IN ENTRAINED AIR IS 1000 MICRONS

	ENTRAINED AIR ONLY	ALL AIR < 1000	ALL AIR
CALCULATED FROM ACTUAL DATA			
TOTAL LENGTH OF TRAVERSE (MM)	2414.4		
LINEAR TRAVERSE PASTE CONTENT (%)	28.6		
MIX DESIGN PASTE CONTENT (%)	27.5		
HARDENED AIR CONTENT (%)	1.5	4.0	4.7
PASTE TO AIR RATIO (LT PASTE)	18.5	7.2	6.1
PASTE TO AIR RATIO (MIX DES.)	17.8	6.9	5.9
AVERAGE AIRVOID CHORD LENGTH (MM)	.109	.123	.143
TOTAL NUMBER OF AIRVOIDS	341.	780.	787.
VOIDS PER MM TRAVERSE	.141	.323	.326
SPACING FACTOR (LT PASTE, MM)	.227	.168	.182
SPACING FACTOR (MIX DES., MM)	.223	.165	.179
SPECIFIC SURFACE (SQ.MM/CU.MM)	36.6	32.5	27.9
CALCULATED FROM BEST FIT LOGNORMAL DISTRIBUTION			
AVERAGE AIRVOID CHORD LENGTH (MM)	.102	.101	.101
TOTAL NUMBER OF AIRVOIDS	367.	952.	1110.
VOIDS PER MM TRAVERSE	.152	.394	.460
SPACING FACTOR (LT PASTE, MM)	.211	.138	.129
SPACING FACTOR (MIX DES., MM)	.207	.135	.127
SPECIFIC SURFACE (SQ.MM/CU.MM)	39.4	39.7	39.4
# OF VOIDS PER CUBIC MM	16.3	45.9	53.2
2 PHILLEO FACTOR(S) DETERMINED			
PHILLEO FACTOR AT 90.% (LT PASTE, MM)	.094	.038	.030
PHILLEO FACTOR AT 90.% (MIX DES., MM)	.092	.036	.029
PHILLEO FACTOR AT 99.% (LT PASTE, MM)	.150	.077	.068
PHILLEO FACTOR AT 99.% (MIX DES., MM)	.146	.075	.066
1 SPACING(S) FOR WHICH PHILLEO PROTECTIONS HAVE BEEN DETERMINED			
% OF PASTE WITHIN .100 MM. (LT PASTE)	92.	100.	100.
% OF PASTE WITHIN .100 MM. (MIX DES.)	93.	100.	100.

AIRVOID DISTRIBUTION
Mix P02-10
Actual Data and Best Fit Curve



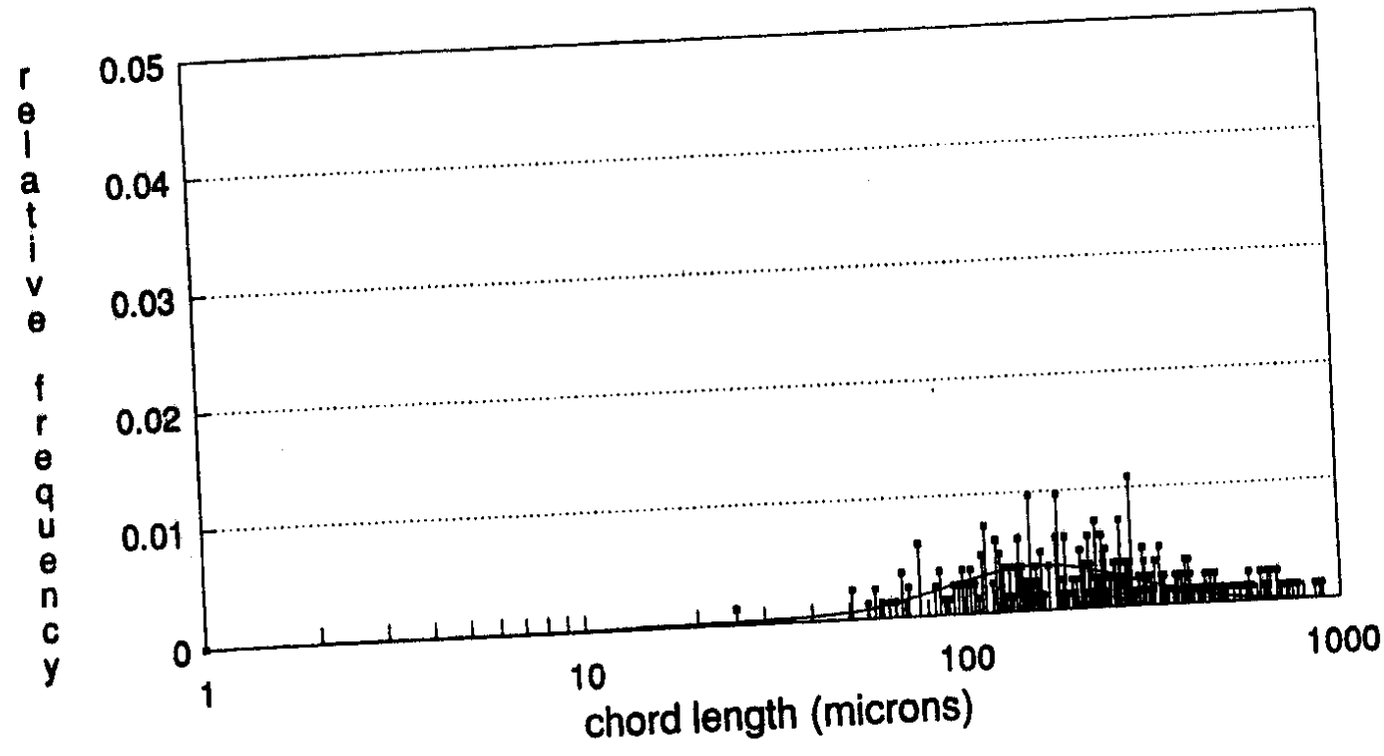
Mode = 61.707 microns
Std. Dev. = 0.5719

INPUT FILE IS P041BBET.AIR

MAXIMUM CHORD SIZE INCLUDED IN ENTRAINED AIR IS 1000 MICRONS

	ENTRAINED AIR ONLY	ALL AIR < 1000	ALL AIR
CALCULATED FROM ACTUAL DATA			
TOTAL LENGTH OF TRAVERSE (MM)	2334.1		
LINEAR TRAVERSE PASTE CONTENT (%)	27.2		
MIX DESIGN PASTE CONTENT (%)	27.3		
HARDENED AIR CONTENT (%)	1.5	3.6	4.2
PASTE TO AIR RATIO (LT PASTE)	17.8	7.5	6.4
PASTE TO AIR RATIO (MIX DES.)	17.8	7.6	6.5
AVERAGE AIRVOID CHORD LENGTH (MM)	.250	.259	.297
TOTAL NUMBER OF AIRVOIDS	143.	325.	333.
VOIDS PER MM TRAVERSE	.061	.139	.143
SPACING FACTOR (LT PASTE, MM)	.509	.362	.385
SPACING FACTOR (MIX DES., MM)	.510	.362	.386
SPECIFIC SURFACE (SQ.MM/CU.MM)	16.0	15.4	13.5
CALCULATED FROM BEST FIT LOGNORMAL DISTRIBUTION			
AVERAGE AIRVOID CHORD LENGTH (MM)	.251	.256	.259
TOTAL NUMBER OF AIRVOIDS	142.	330.	383.
VOIDS PER MM TRAVERSE	.061	.141	.164
SPACING FACTOR (LT PASTE, MM)	.512	.357	.337
SPACING FACTOR (MIX DES., MM)	.513	.358	.337
SPECIFIC SURFACE (SQ.MM/CU.MM)	15.9	15.6	15.4
# OF VOIDS PER CUBIC MM	1.0	2.5	2.8
2 PHILLEO FACTOR(S) DETERMINED			
PHILLEO FACTOR AT 90.% (LT PASTE, MM)	.232	.102	.084
PHILLEO FACTOR AT 90.% (MIX DES., MM)	.232	.103	.084
PHILLEO FACTOR AT 99.% (LT PASTE, MM)	.370	.204	.182
PHILLEO FACTOR AT 99.% (MIX DES., MM)	.371	.205	.182
1 SPACING(S) FOR WHICH PHILLEO PROTECTIONS HAVE BEEN DETERMINED			
% OF PASTE WITHIN .100 MM. (LT PASTE)	62.	90.	93.
% OF PASTE WITHIN .100 MM. (MIX DES.)	62.	90.	93.

AIRVOID DISTRIBUTION
Mix P04-1
Actual Data and Best Fit Curve



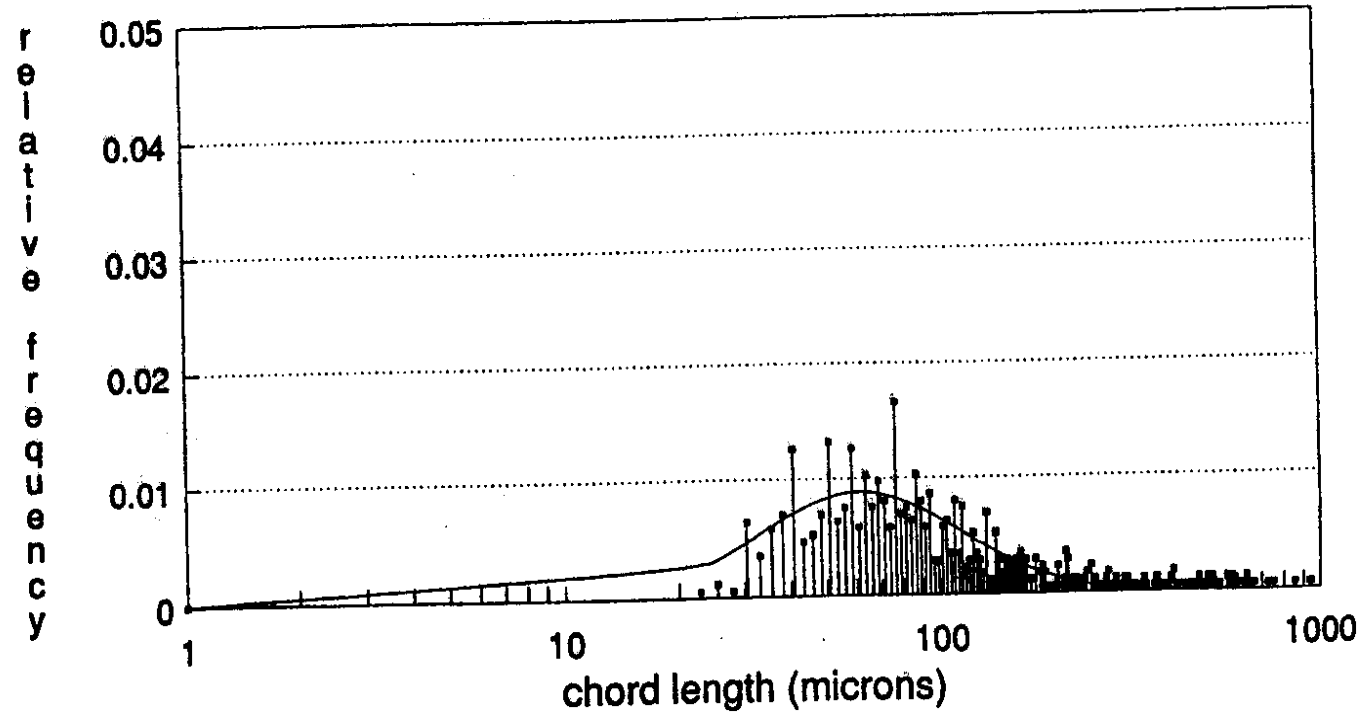
Mode = 157.99 microns
Std. Dev. = 0.5769

INPUT FILE IS P043BET.AIR

MAXIMUM CHORD SIZE INCLUDED IN ENTRAINED AIR IS 1000 MICRONS

	ENTRAINED AIR ONLY	ALL AIR < 1000	ALL AIR
CALCULATED FROM ACTUAL DATA			
TOTAL LENGTH OF TRAVERSE (MM)	2313.7		
LINEAR TRAVERSE PASTE CONTENT (%)	28.0		
MIX DESIGN PASTE CONTENT (%)	27.3		
HARDENED AIR CONTENT (%)	2.0	4.1	5.3
PASTE TO AIR RATIO (LT PASTE)	14.1	6.8	5.3
PASTE TO AIR RATIO (MIX DES.)	13.8	6.6	5.1
AVERAGE AIRVOID CHORD LENGTH (MM)	.124	.138	.175
TOTAL NUMBER OF AIRVOIDS	368.	690.	704.
VOIDS PER MM TRAVERSE	.159	.298	.304
SPACING FACTOR (LT PASTE, MM)	.230	.184	.207
SPACING FACTOR (MIX DES., MM)	.227	.182	.205
SPECIFIC SURFACE (SQ.MM/CU.MM)	32.2	28.9	22.9
CALCULATED FROM BEST FIT LOGNORMAL DISTRIBUTION			
AVERAGE AIRVOID CHORD LENGTH (MM)	.106	.108	.110
TOTAL NUMBER OF AIRVOIDS	430.	887.	1122.
VOIDS PER MM TRAVERSE	.186	.383	.485
SPACING FACTOR (LT PASTE, MM)	.197	.143	.130
SPACING FACTOR (MIX DES., MM)	.195	.142	.128
SPECIFIC SURFACE (SQ.MM/CU.MM)	37.6	37.2	36.5
# OF VOIDS PER CUBIC MM	19.4	42.3	52.7
2 PHILLEO FACTOR(S) DETERMINED			
PHILLEO FACTOR AT 90.% (LT PASTE, MM)	.078	.036	.025
PHILLEO FACTOR AT 90.% (MIX DES., MM)	.077	.035	.024
PHILLEO FACTOR AT 99.% (LT PASTE, MM)	.130	.076	.062
PHILLEO FACTOR AT 99.% (MIX DES., MM)	.128	.075	.061
1 SPACING(S) FOR WHICH PHILLEO PROTECTIONS HAVE BEEN DETERMINED			
% OF PASTE WITHIN .100 MM. (LT PASTE)	96.	100.	100.
% OF PASTE WITHIN .100 MM. (MIX DES.)	96.	100.	100.

AIRVOID DISTRIBUTION
Mix P04-3
Actual Data and Best Fit Curve



Mode = 61.255 microns
Std. Dev. = 0.6133

INPUT FILE IS P044BET.AIE

MAXIMUM CHORD SIZE INCLUDED IN ENTRAINED AIR IS 1000 MICRONS

CALCULATED FROM ACTUAL DATA	ENTRAINED AIR ONLY	ALL AIR < 1000	ALL AIR
TOTAL LENGTH OF TRAVERSE (MM)	2326.2		
LINEAR TRAVERSE PASTE CONTENT (%)	25.7		
MIX DESIGN PASTE CONTENT (%)	27.3		
HARDENED AIR CONTENT (%)	3.7	3.7	4.4
PASTE TO AIR RATIO (LT PASTE)	6.8	6.8	5.8
PASTE TO AIR RATIO (MIX DES.)	7.3	7.3	6.2
AVERAGE AIRVOID CHORD LENGTH (MM)	.377	.377	.431
TOTAL NUMBER OF AIRVOIDS	231.	231.	238.
VOIDS PER MM TRAVERSE	.099	.099	.102
SPACING FACTOR (LT PASTE, MM)	.505	.505	.535
SPACING FACTOR (MIX DES., MM)	.519	.519	.550
SPECIFIC SURFACE (SQ.MM/CU.MM)	10.6	10.6	9.3

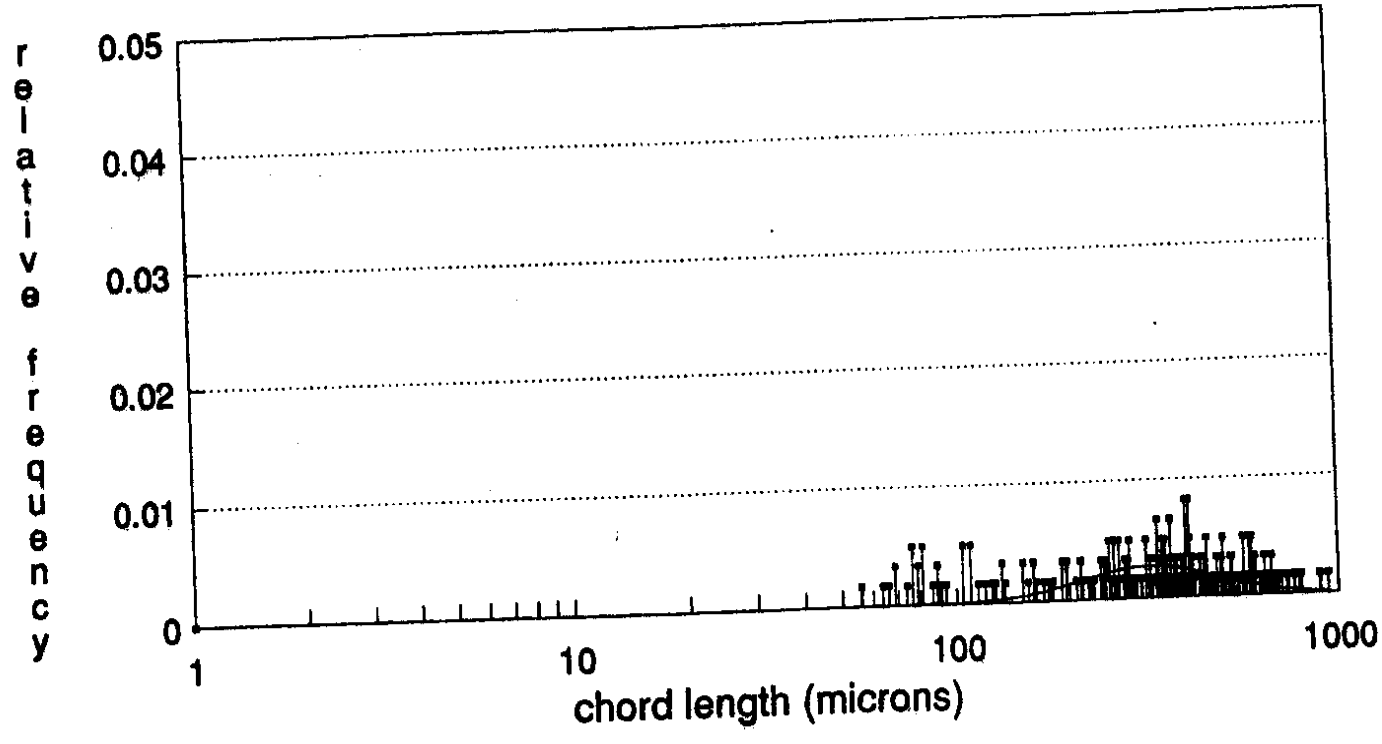
CALCULATED FROM BEST FIT LOGNORMAL DISTRIBUTION

AVERAGE AIRVOID CHORD LENGTH (MM)	.413	.413	.414
TOTAL NUMBER OF AIRVOIDS	213.	213.	251.
VOIDS PER MM TRAVERSE	.092	.092	.108
SPACING FACTOR (LT PASTE, MM)	.552	.552	.514
SPACING FACTOR (MIX DES., MM)	.567	.567	.529
SPECIFIC SURFACE (SQ.MM/CU.MM)	9.7	9.7	9.7
# OF VOIDS PER CUBIC MM	.5	.5	.6
2 PHILLEO FACTOR(S) DETERMINED			
PHILLEO FACTOR AT 90.% (LT PASTE, MM)	.154	.154	.123
PHILLEO FACTOR AT 90.% (MIX DES., MM)	.166	.166	.134
PHILLEO FACTOR AT 99.% (LT PASTE, MM)	.322	.322	.283
PHILLEO FACTOR AT 99.% (MIX DES., MM)	.338	.338	.297

1 SPACING(S) FOR WHICH PHILLEO PROTECTIONS HAVE BEEN DETERMINED

% OF PASTE WITHIN .100 MM. (LT PASTE)	83.	83.	87.
% OF PASTE WITHIN .100 MM. (MIX DES.)	81.	81.	87.

AIRVOID DISTRIBUTION
Mix P04-4
Actual Data and Best Fit Curve



Mode = 325.25 microns
Std. Dev. = 0.4189

INPUT FILE IS P045BET.AIR

MAXIMUM CHORD SIZE INCLUDED IN ENTRAINED AIR IS 1000 MICRONS

CALCULATED FROM ACTUAL DATA	ENTRAINED AIR ONLY	ALL AIR < 1000	ALL AIR
TOTAL LENGTH OF TRAVERSE (MM)	2334.4		
LINEAR TRAVERSE PASTE CONTENT (%)	28.9		
MIX DESIGN PASTE CONTENT (%)	27.3		
HARDENED AIR CONTENT (%)	2.3	3.7	4.2
PASTE TO AIR RATIO (LT PASTE)	12.3	7.8	6.8
PASTE TO AIR RATIO (MIX DES.)	11.6	7.3	6.5
AVERAGE AIRVOID CHORD LENGTH (MM)	.114	.116	.131
TOTAL NUMBER OF AIRVOIDS	479.	747.	754.
VOIDS PER MM TRAVERSE	.205	.320	.323
SPACING FACTOR (LT PASTE, MM)	.199	.165	.175
SPACING FACTOR (MIX DES., MM)	.194	.160	.170
SPECIFIC SURFACE (SQ.MM/CU.MM)	34.9	34.4	30.6

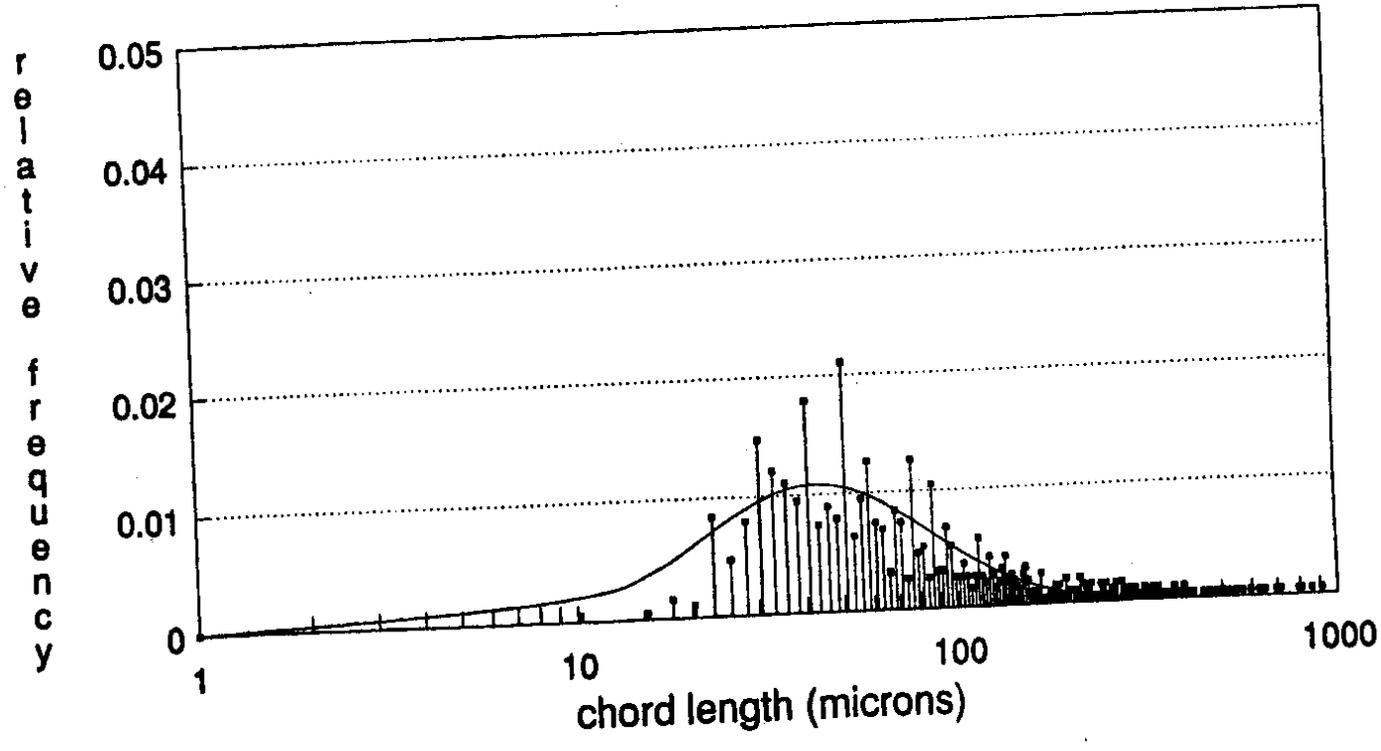
CALCULATED FROM BEST FIT LOGNORMAL DISTRIBUTION

AVERAGE AIRVOID CHORD LENGTH (MM)	.099	.086	.087
TOTAL NUMBER OF AIRVOIDS	556.	1015.	1140.
VOIDS PER MM TRAVERSE	.238	.435	.488
SPACING FACTOR (LT PASTE, MM)	.172	.121	.116
SPACING FACTOR (MIX DES., MM)	.167	.118	.113
SPECIFIC SURFACE (SQ.MM/CU.MM)	40.5	46.7	46.2
# OF VOIDS PER CUBIC MM	46.7	89.0	99.5
2 PHILLEO FACTOR(S) DETERMINED			
PHILLEO FACTOR AT 90.% (LT PASTE, MM)	.055	.032	.028
PHILLEO FACTOR AT 90.% (MIX DES., MM)	.052	.030	.026
PHILLEO FACTOR AT 99.% (LT PASTE, MM)	.094	.064	.058
PHILLEO FACTOR AT 99.% (MIX DES., MM)	.091	.061	.056

1 SPACING(S) FOR WHICH PHILLEO PROTECTIONS HAVE BEEN DETERMINED

% OF PASTE WITHIN .100 MM. (LT PASTE)	99.	100.	100.
% OF PASTE WITHIN .100 MM. (MIX DES.)	100.	100.	100.

AIRVOID DISTRIBUTION
Mix P04-5
Actual Data and Best Fit Curve



Mode = 42.586 microns
Std. Dev. = 0.6826

INPUT FILE IS P061BET.AIR

MAXIMUM CHORD SIZE INCLUDED IN ENTRAINED AIR IS 1000 MICRONS

CALCULATED FROM ACTUAL DATA	ENTRAINED AIR ONLY	ALL AIR < 1000	ALL AIR
TOTAL LENGTH OF TRAVERSE (MM)	2356.1		
LINEAR TRAVERSE PASTE CONTENT (%)	26.3		
MIX DESIGN PASTE CONTENT (%)	25.9		
HARDENED AIR CONTENT (%)	.9	4.8	5.7
PASTE TO AIR RATIO (LT PASTE)	29.0	5.5	4.6
PASTE TO AIR RATIO (MIX DES.)	28.5	5.4	4.5
AVERAGE AIRVOID CHORD LENGTH (MM)	.189	.247	.285
TOTAL NUMBER OF AIRVOIDS	113.	458.	471.
VOIDS PER MM TRAVERSE	.048	.194	.200
SPACING FACTOR (LT PASTE, MM)	.475	.298	.318
SPACING FACTOR (MIX DES., MM)	.472	.296	.316
SPECIFIC SURFACE (SQ.MM/CU.MM)	21.1	16.2	14.0

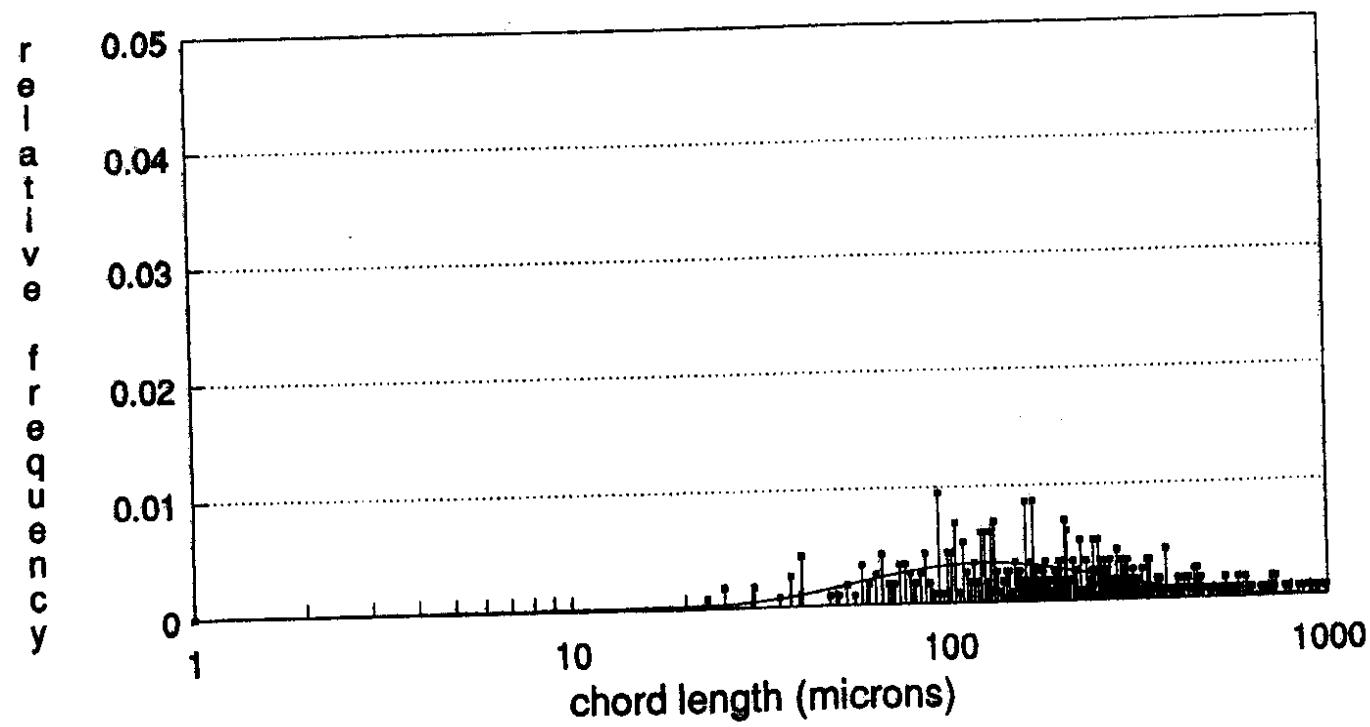
CALCULATED FROM BEST FIT LOGNORMAL DISTRIBUTION

AVERAGE AIRVOID CHORD LENGTH (MM)	.184	.256	.261
TOTAL NUMBER OF AIRVOIDS	116.	449.	525.
VOIDS PER MM TRAVERSE	.049	.191	.223
SPACING FACTOR (LT PASTE, MM)	.463	.309	.291
SPACING FACTOR (MIX DES., MM)	.460	.307	.289
SPECIFIC SURFACE (SQ.MM/CU.MM)	21.7	15.6	15.4
# OF VOIDS PER CUBIC MM	1.6	4.3	5.0
2 PHILLEO FACTOR(S) DETERMINED			
PHILLEO FACTOR AT 90.% (LT PASTE, MM)	.234	.059	.043
PHILLEO FACTOR AT 90.% (MIX DES., MM)	.231	.058	.042
PHILLEO FACTOR AT 99.% (LT PASTE, MM)	.351	.144	.123
PHILLEO FACTOR AT 99.% (MIX DES., MM)	.348	.142	.122

1 SPACING(S) FOR WHICH PHILLEO PROTECTIONS HAVE BEEN DETERMINED

% OF PASTE WITHIN .100 MM. (LT PASTE)	55.	96.	98.
% OF PASTE WITHIN .100 MM. (MIX DES.)	55.	96.	98.

AIRVOID DISTRIBUTION
Mix P06-1
Actual Data and Best Fit Curve



Mode = 124.03 microns
Std. Dev. = 0.7244

INPUT FILE IS P062BET.AIR

MAXIMUM CHORD SIZE INCLUDED IN ENTRAINED AIR IS 1000 MICRONS

CALCULATED FROM ACTUAL DATA	ENTRAINED AIR ONLY	ALL AIR < 1000	ALL AIR
TOTAL LENGTH OF TRAVERSE (MM)	2392.2		
LINEAR TRAVERSE PASTE CONTENT (%)	26.2		
MIX DESIGN PASTE CONTENT (%)	25.9		
HARDENED AIR CONTENT (%)	1.7	4.6	6.7
PASTE TO AIR RATIO (LT PASTE)	15.8	5.7	3.9
PASTE TO AIR RATIO (MIX DES.)	15.6	5.6	3.9
AVERAGE AIRVOID CHORD LENGTH (MM)	.123	.132	.185
TOTAL NUMBER OF AIRVOIDS	324.	835.	858.
VOIDS PER MM TRAVERSE	.135	.349	.359
SPACING FACTOR (LT PASTE, MM)	.238	.162	.183
SPACING FACTOR (MIX DES., MM)	.236	.161	.181
SPECIFIC SURFACE (SQ.MM/CU.MM)	32.6	30.3	21.6

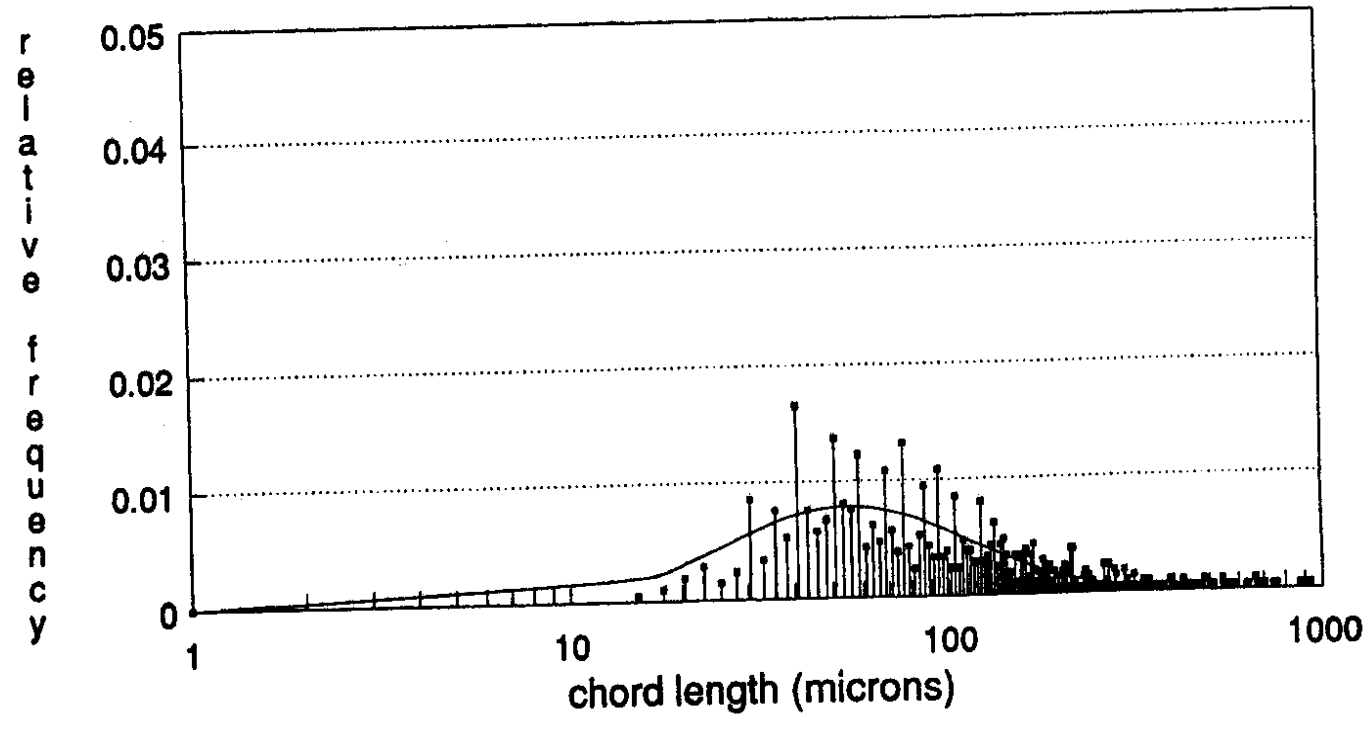
CALCULATED FROM BEST FIT LOGNORMAL DISTRIBUTION

AVERAGE AIRVOID CHORD LENGTH (MM)	.122	.119	.122
TOTAL NUMBER OF AIRVOIDS	324.	929.	1306.
VOIDS PER MM TRAVERSE	.136	.388	.546
SPACING FACTOR (LT PASTE, MM)	.237	.146	.120
SPACING FACTOR (MIX DES., MM)	.236	.145	.119
SPECIFIC SURFACE (SQ.MM/CU.MM)	32.7	33.7	32.8
# OF VOIDS PER CUBIC MM	13.3	45.6	63.2
2 PHILLEO FACTOR(S) DETERMINED			
PHILLEO FACTOR AT 90.% (LT PASTE, MM)	.092	.028	.013
PHILLEO FACTOR AT 90.% (MIX DES., MM)	.091	.028	.012
PHILLEO FACTOR AT 99.% (LT PASTE, MM)	.149	.067	.047
PHILLEO FACTOR AT 99.% (MIX DES., MM)	.148	.066	.047

1 SPACING(S) FOR WHICH PHILLEO PROTECTIONS HAVE BEEN DETERMINED

% OF PASTE WITHIN .100 MM. (LT PASTE)	92.	100.	100.
% OF PASTE WITHIN .100 MM. (MIX DES.)	93.	100.	100.

AIRVOID DISTRIBUTION
Mix P06-2
Actual Data and Best Fit Curve



Mode = 54.770 microns
Std. Dev. = 0.7196

INPUT FILE IS P063BET.AIR

MAXIMUM CHORD SIZE INCLUDED IN ENTRAINED AIR IS 1000 MICRONS

CALCULATED FROM ACTUAL DATA	ENTRAINED AIR ONLY	ALL AIR < 1000	ALL AIR
TOTAL LENGTH OF TRAVERSE (MM)	2433.1		
LINEAR TRAVERSE PASTE CONTENT (%)	27.4		
MIX DESIGN PASTE CONTENT (%)	25.9		
HARDENED AIR CONTENT (%)	1.8	4.9	6.2
PASTE TO AIR RATIO (LT PASTE)	14.9	5.5	4.4
PASTE TO AIR RATIO (MIX DES.)	14.1	5.2	4.2
AVERAGE AIRVOID CHORD LENGTH (MM)	.152	.161	.199
TOTAL NUMBER OF AIRVOIDS	294.	745.	762.
VOIDS PER MM TRAVERSE	.121	.306	.313
SPACING FACTOR (LT PASTE, MM)	.288	.196	.217
SPACING FACTOR (MIX DES., MM)	.280	.191	.207
SPECIFIC SURFACE (SQ.MM/CU.MM)	26.3	24.8	20.1

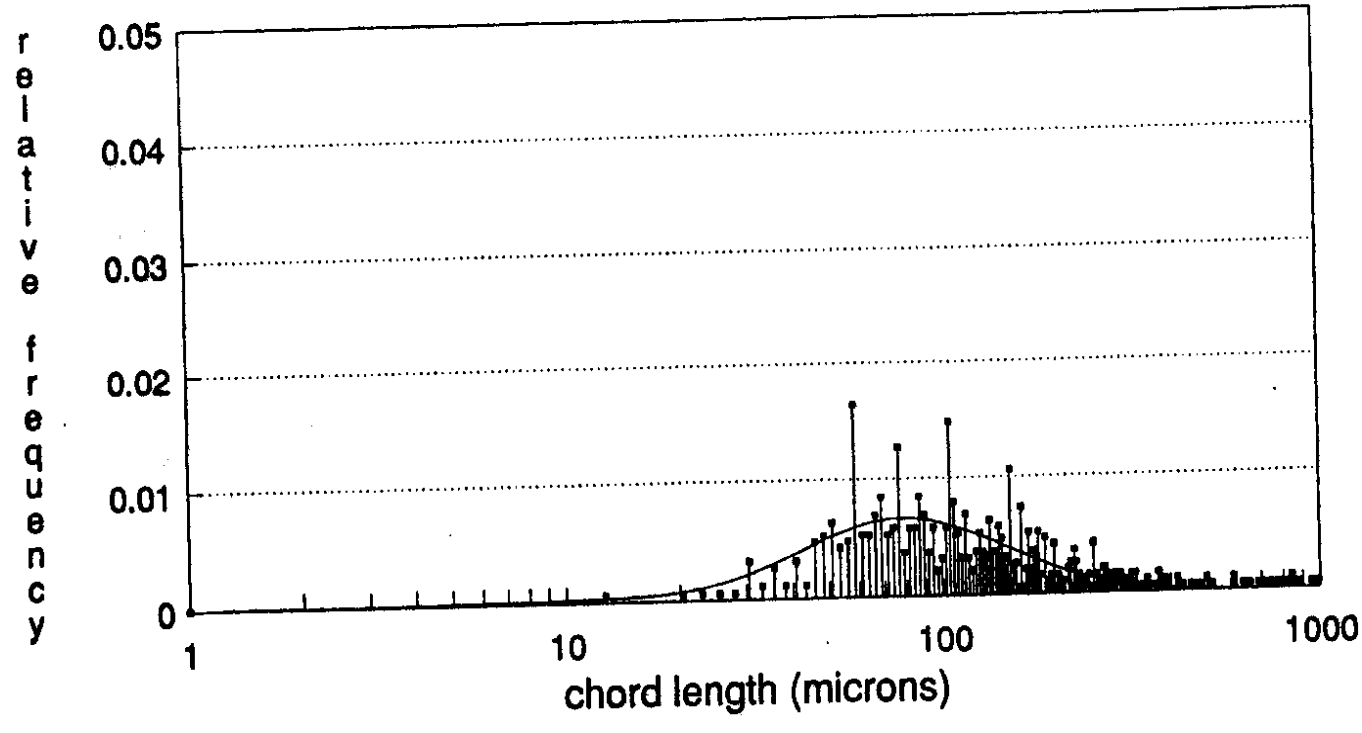
CALCULATED FROM BEST FIT LOGNORMAL DISTRIBUTION

AVERAGE AIRVOID CHORD LENGTH (MM)	.159	.142	.144
TOTAL NUMBER OF AIRVOIDS	282.	849.	1050.
VOIDS PER MM TRAVERSE	.116	.349	.432
SPACING FACTOR (LT PASTE, MM)	.300	.172	.158
SPACING FACTOR (MIX DES., MM)	.293	.168	.150
SPECIFIC SURFACE (SQ.MM/CU.MM)	25.2	28.2	27.7
# OF VOIDS PER CUBIC MM	5.5	22.8	27.8
2 PHILLEO FACTOR(S) DETERMINED			
PHILLEO FACTOR AT 90.% (LT PASTE, MM)	.122	.035	.022
PHILLEO FACTOR AT 90.% (MIX DES., MM)	.116	.032	.019
PHILLEO FACTOR AT 99.% (LT PASTE, MM)	.200	.084	.068
PHILLEO FACTOR AT 99.% (MIX DES., MM)	.194	.080	.065

1 SPACING(S) FOR WHICH PHILLEO PROTECTIONS HAVE BEEN DETERMINED

% OF PASTE WITHIN .100 MM. (LT PASTE)	84.	100.	100.
% OF PASTE WITHIN .100 MM. (MIX DES.)	86.	100.	100.

AIRVOID DISTRIBUTION
Mix P06-3
Actual Data and Best Fit Curve



Mode = 78.574 microns
Std. Dev. = 0.6280

INPUT FILE IS P064BET.AIR

MAXIMUM CHORD SIZE INCLUDED IN ENTRAINED AIR IS 1000 MICRONS

CALCULATED FROM ACTUAL DATA	ENTRAINED AIR ONLY	ALL AIR < 1000	ALL AIR
TOTAL LENGTH OF TRAVERSE (MM)	2349.8		
LINEAR TRAVERSE PASTE CONTENT (%)	28.5		
MIX DESIGN PASTE CONTENT (%)	25.9		
HARDENED AIR CONTENT (%)	.8	5.4	7.8
PASTE TO AIR RATIO (LT PASTE)	36.5	5.3	3.6
PASTE TO AIR RATIO (MIX DES.)	33.1	4.8	3.3
AVERAGE AIRVOID CHORD LENGTH (MM)	.287	.327	.441
TOTAL NUMBER OF AIRVOIDS	64.	388.	418.
VOIDS PER MM TRAVERSE	.027	.165	.178
SPACING FACTOR (LT PASTE, MM)	.793	.388	.401
SPACING FACTOR (MIX DES., MM)	.763	.372	.364
SPECIFIC SURFACE (SQ.MM/CU.MM)	13.9	12.2	9.1

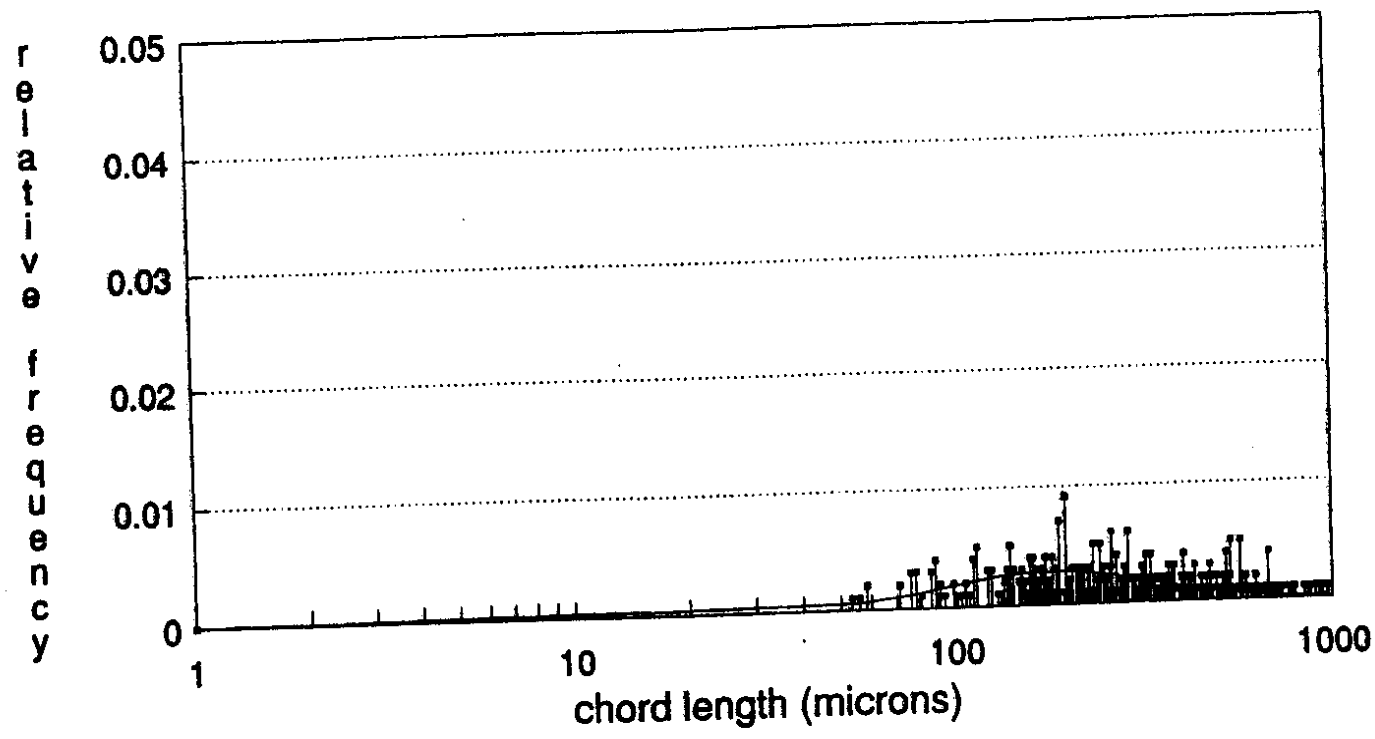
CALCULATED FROM BEST FIT LOGNORMAL DISTRIBUTION

AVERAGE AIRVOID CHORD LENGTH (MM)	.247	.313	.324
TOTAL NUMBER OF AIRVOIDS	74.	414.	587.
VOIDS PER MM TRAVERSE	.032	.176	.250
SPACING FACTOR (LT PASTE, MM)	.682	.372	.295
SPACING FACTOR (MIX DES., MM)	.656	.356	.268
SPECIFIC SURFACE (SQ.MM/CU.MM)	16.2	12.8	12.3
# OF VOIDS PER CUBIC MM	.5	2.2	2.9
2 PHILLEO FACTOR(S) DETERMINED			
PHILLEO FACTOR AT 90.% (LT PASTE, MM)	.366	.072	.027
PHILLEO FACTOR AT 90.% (MIX DES., MM)	.346	.061	.017
PHILLEO FACTOR AT 99.% (LT PASTE, MM)	.539	.181	.126
PHILLEO FACTOR AT 99.% (MIX DES., MM)	.513	.167	.113

1 SPACING(S) FOR WHICH PHILLEO PROTECTIONS HAVE BEEN DETERMINED

% OF PASTE WITHIN .100 MM. (LT PASTE)	38.	94.	98.
% OF PASTE WITHIN .100 MM. (MIX DES.)	41.	95.	98.

AIRVOID DISTRIBUTION
Mix P06-4
Actual Data and Best Fit Curve



Mode = 178.69 microns
Std. Dev. = 0.6479

INPUT FILE IS P065BET.AIR

MAXIMUM CHORD SIZE INCLUDED IN ENTRAINED AIR IS 1000 MICRONS

CALCULATED FROM ACTUAL DATA	ENTRAINED AIR ONLY	ALL AIR < 1000	ALL AIR
TOTAL LENGTH OF TRAVERSE (MM)	2437.8		
LINEAR TRAVERSE PASTE CONTENT (%)	27.4		
MIX DESIGN PASTE CONTENT (%)	25.9		
HARDENED AIR CONTENT (%)	2.8	5.3	6.3
PASTE TO AIR RATIO (LT PASTE)	9.7	5.2	4.3
PASTE TO AIR RATIO (MIX DES.)	9.1	4.9	4.1
AVERAGE AIRVOID CHORD LENGTH (MM)	.132	.121	.144
TOTAL NUMBER OF AIRVOIDS	524.	1065.	1075.
VOIDS PER MM TRAVERSE	.215	.437	.441
SPACING FACTOR (LT PASTE, MM)	.206	.143	.155
SPACING FACTOR (MIX DES., MM)	.201	.139	.147
SPECIFIC SURFACE (SQ.MM/CU.MM)	30.3	32.9	27.9

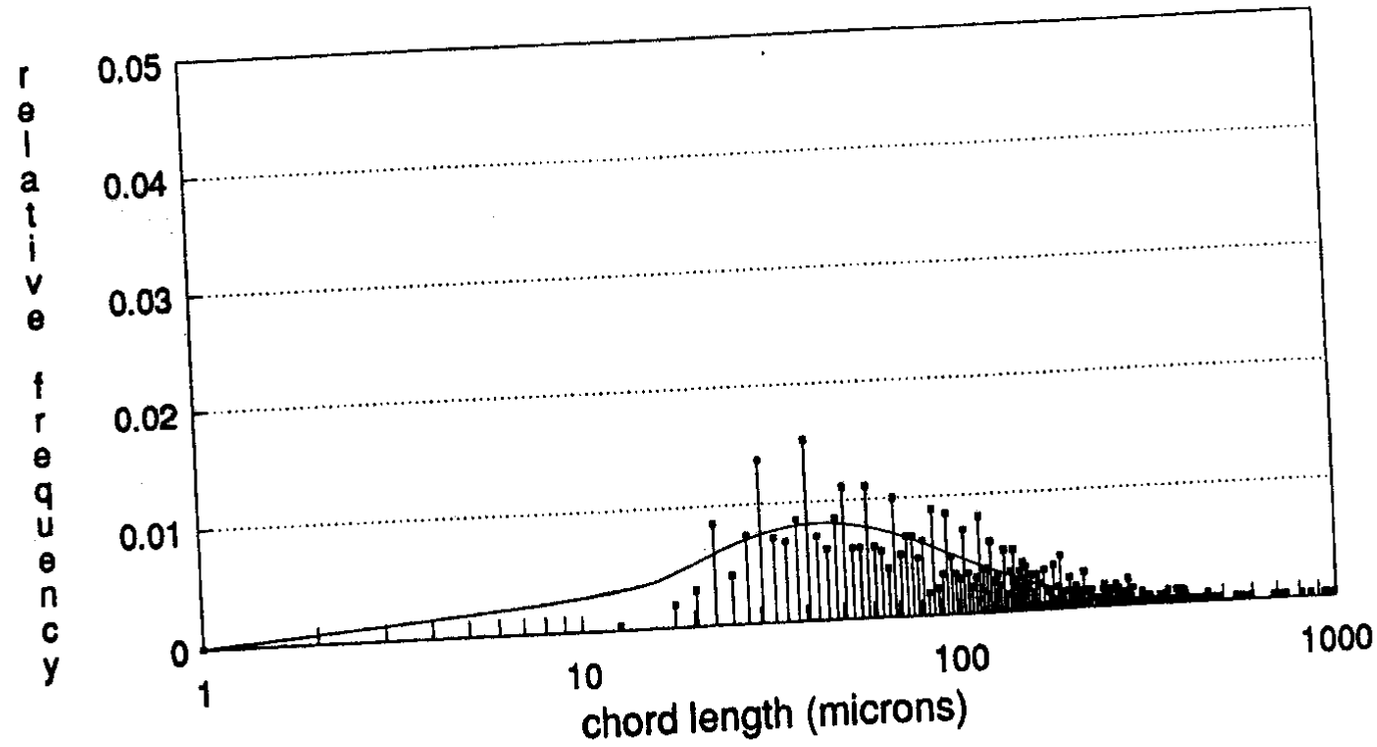
CALCULATED FROM BEST FIT LOGNORMAL DISTRIBUTION

AVERAGE AIRVOID CHORD LENGTH (MM)	.144	.115	.116
TOTAL NUMBER OF AIRVOIDS	481.	1130.	1334.
VOIDS PER MM TRAVERSE	.197	.463	.547
SPACING FACTOR (LT PASTE, MM)	.225	.135	.125
SPACING FACTOR (MIX DES., MM)	.220	.131	.118
SPECIFIC SURFACE (SQ.MM/CU.MM)	27.7	34.9	34.5
# OF VOIDS PER CUBIC MM	23.6	76.9	90.5
2 PHILLEO FACTOR(S) DETERMINED			
PHILLEO FACTOR AT 90.% (LT PASTE, MM)	.059	.021	.014
PHILLEO FACTOR AT 90.% (MIX DES., MM)	.055	.019	.013
PHILLEO FACTOR AT 99.% (LT PASTE, MM)	.107	.054	.045
PHILLEO FACTOR AT 99.% (MIX DES., MM)	.103	.051	.043

1 SPACING(S) FOR WHICH PHILLEO PROTECTIONS HAVE BEEN DETERMINED

% OF PASTE WITHIN .100 MM. (LT PASTE)	99.	100.	100.
% OF PASTE WITHIN .100 MM. (MIX DES.)	99.	100.	100.

AIRVOID DISTRIBUTION
Mix P06-5
Actual Data and Best Fit Curve



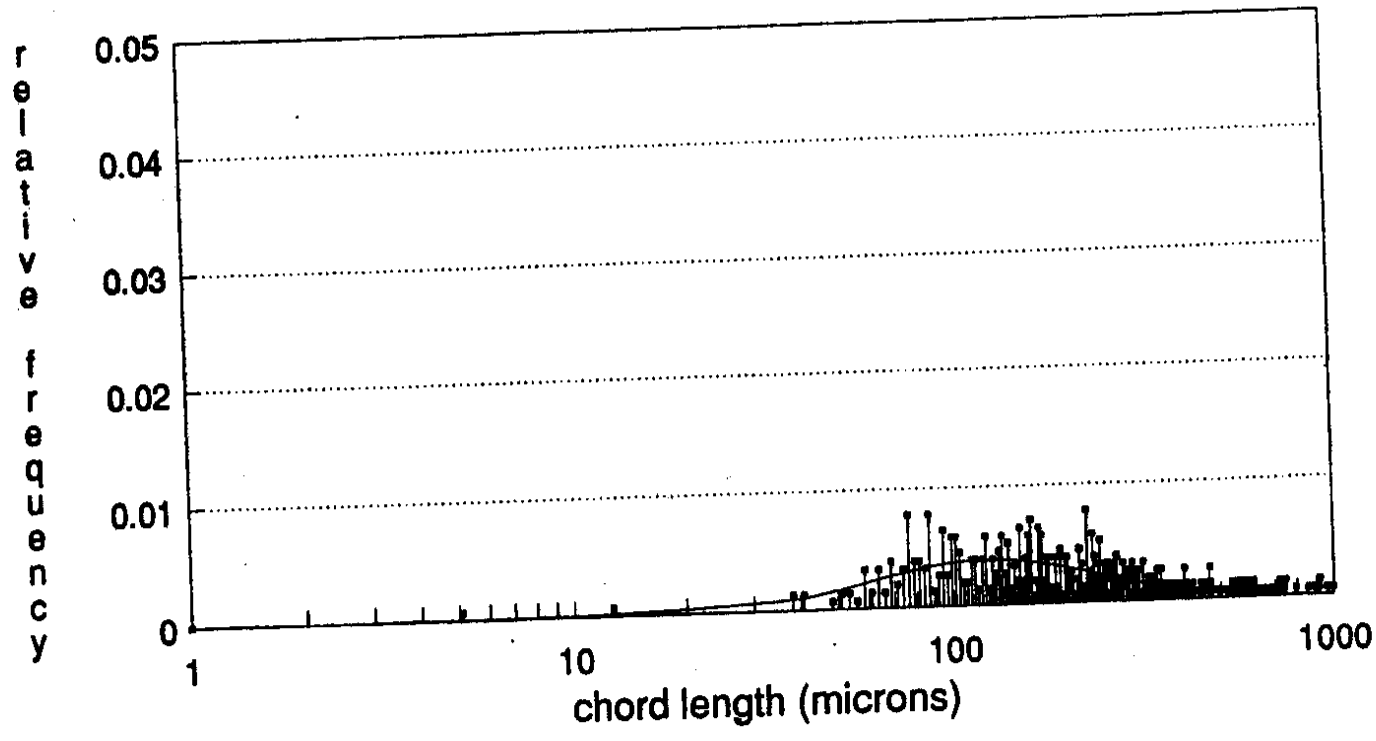
Mode = 43.500 microns
Std. Dev. = 0.8081

INPUT FILE IS P066DJT.AIR

MAXIMUM CHORD SIZE INCLUDED IN ENTRAINED AIR IS 1000 MICRONS

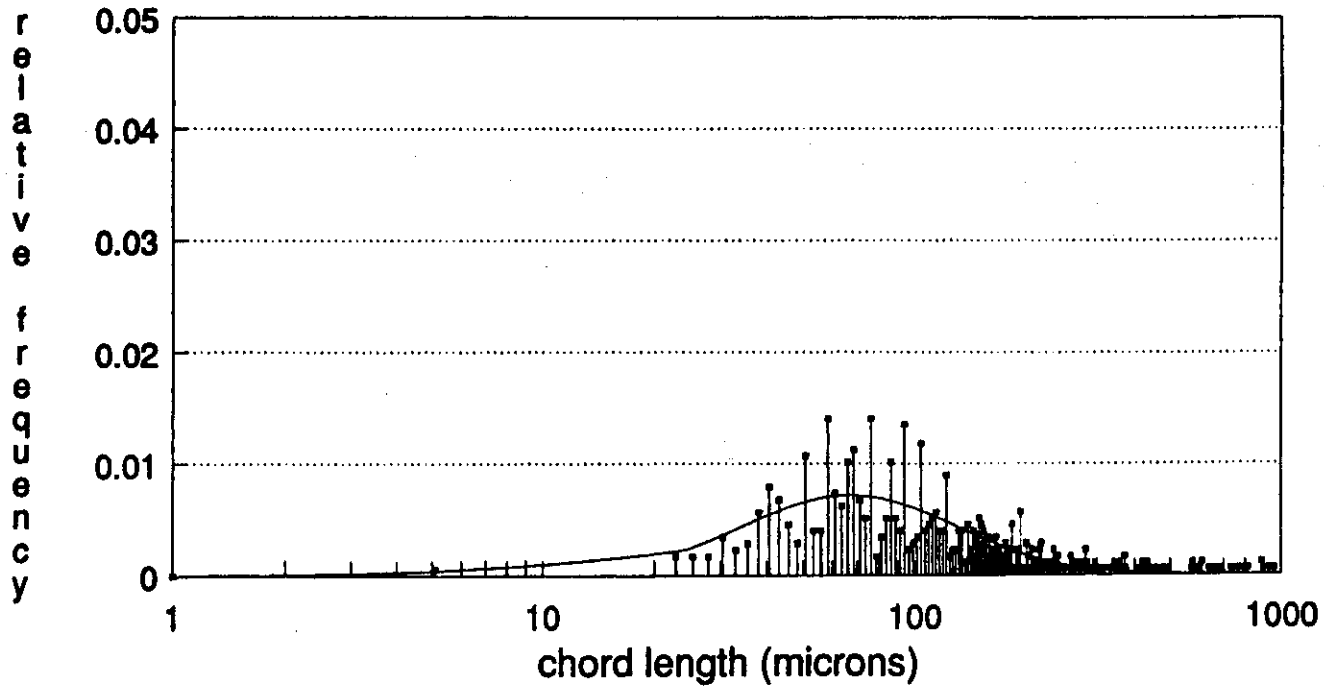
	ENTRAINED AIR ONLY	ALL AIR < 1000	ALL AIR
CALCULATED FROM ACTUAL DATA			
TOTAL LENGTH OF TRAVERSE (MM)	2405.4		
LINEAR TRAVERSE PASTE CONTENT (%)	27.0		
MIX DESIGN PASTE CONTENT (%)	25.9		
HARDENED AIR CONTENT (%)	5.6	5.8	7.6
PASTE TO AIR RATIO (LT PASTE)	4.8	4.6	3.5
PASTE TO AIR RATIO (MIX DES.)	4.6	4.5	3.4
AVERAGE AIRVOID CHORD LENGTH (MM)	.227	.230	.292
TOTAL NUMBER OF AIRVOIDS	595.	608.	629.
VOIDS PER MM TRAVERSE	.247	.253	.261
SPACING FACTOR (LT PASTE, MM)	.258	.258	.258
SPACING FACTOR (MIX DES., MM)	.253	.253	.248
SPECIFIC SURFACE (SQ.MM/CU.MM)	17.6	17.4	13.7
CALCULATED FROM BEST FIT LOGNORMAL DISTRIBUTION			
AVERAGE AIRVOID CHORD LENGTH (MM)	.232	.235	.240
TOTAL NUMBER OF AIRVOIDS	586.	600.	773.
VOIDS PER MM TRAVERSE	.244	.250	.321
SPACING FACTOR (LT PASTE, MM)	.264	.263	.212
SPACING FACTOR (MIX DES., MM)	.259	.258	.203
SPECIFIC SURFACE (SQ.MM/CU.MM)	17.3	17.0	16.7
# OF VOIDS PER CUBIC MM	6.1	6.3	7.9
2 PHILLEO FACTOR(S) DETERMINED			
PHILLEO FACTOR AT 90.% (LT PASTE, MM)	.044	.041	.017
PHILLEO FACTOR AT 90.% (MIX DES., MM)	.040	.037	.014
PHILLEO FACTOR AT 99.% (LT PASTE, MM)	.120	.116	.087
PHILLEO FACTOR AT 99.% (MIX DES., MM)	.115	.111	.083
1 SPACING(S) FOR WHICH PHILLEO PROTECTIONS HAVE BEEN DETERMINED			
% OF PASTE WITHIN .100 MM. (LT PASTE)	98.	98.	99.
% OF PASTE WITHIN .100 MM. (MIX DES.)	98.	98.	99.

AIRVOID DISTRIBUTION
Mix P06-6
Actual Data and Best Fit Curve



Mode = 122.42 microns
Std. Dev. = 0.6747

AIRVOID DISTRIBUTION
Mix P06-7
Actual Data and Best Fit Curve



Mode = 122.42 microns
Std. Dev. = 0.6747

INPUT FILE IS P067BET.AIR

MAXIMUM CHORD SIZE INCLUDED IN ENTRAINED AIR IS 1000 MICRONS

	ENTRAINED AIR ONLY	ALL AIR < 1000	ALL AIR
CALCULATED FROM ACTUAL DATA			
TOTAL LENGTH OF TRAVERSE (MM)	2315.2		
LINEAR TRAVERSE PASTE CONTENT (%)	24.0		
MIX DESIGN PASTE CONTENT (%)	25.9		
HARDENED AIR CONTENT (%)	1.9	4.5	5.8
PASTE TO AIR RATIO (LT PASTE)	12.9	5.3	4.1
PASTE TO AIR RATIO (MIX DES.)	14.0	5.8	4.5
AVERAGE AIRVOID CHORD LENGTH (MM)	.132	.148	.188
TOTAL NUMBER OF AIRVOIDS	325.	699.	713.
VOIDS PER MM TRAVERSE	.140	.302	.308
SPACING FACTOR (LT PASTE, MM)	.235	.177	.194
SPACING FACTOR (MIX DES., MM)	.243	.184	.207
SPECIFIC SURFACE (SQ.MM/CU.MM)	30.3	27.0	21.2
CALCULATED FROM BEST FIT LOGNORMAL DISTRIBUTION			
AVERAGE AIRVOID CHORD LENGTH (MM)	.133	.130	.132
TOTAL NUMBER OF AIRVOIDS	324.	800.	1017.
VOIDS PER MM TRAVERSE	.140	.345	.439
SPACING FACTOR (LT PASTE, MM)	.235	.155	.136
SPACING FACTOR (MIX DES., MM)	.243	.161	.145
SPECIFIC SURFACE (SQ.MM/CU.MM)	30.2	30.8	30.3
# OF VOIDS PER CUBIC MM	11.1	29.4	37.0
2 PHILLEO FACTOR(S) DETERMINED			
PHILLEO FACTOR AT 90.% (LT PASTE, MM)	.086	.030	.017
PHILLEO FACTOR AT 90.% (MIX DES., MM)	.091	.034	.021
PHILLEO FACTOR AT 99.% (LT PASTE, MM)	.145	.073	.057
PHILLEO FACTOR AT 99.% (MIX DES., MM)	.152	.078	.062
1 SPACING(S) FOR WHICH PHILLEO PROTECTIONS HAVE BEEN DETERMINED			
% OF PASTE WITHIN .100 MM. (LT PASTE)	94.	100.	100.
% OF PASTE WITHIN .100 MM. (MIX DES.)	92.	100.	100.

INPUT FILE IS P068DJT.AIR

MAXIMUM CHORD SIZE INCLUDED IN ENTRAINED AIR IS 1000 MICRONS

CALCULATED FROM ACTUAL DATA	ENTRAINED AIR ONLY	ALL AIR < 1000	ALL AIR
TOTAL LENGTH OF TRAVERSE (MM)	2291.9		
LINEAR TRAVERSE PASTE CONTENT (%)	25.7		
MIX DESIGN PASTE CONTENT (%)	25.9		
HARDENED AIR CONTENT (%)	6.1	6.2	7.3
PASTE TO AIR RATIO (LT PASTE)	4.2	4.1	3.5
PASTE TO AIR RATIO (MIX DES.)	4.2	4.2	3.5
AVERAGE AIRVOID CHORD LENGTH (MM)	.121	.123	.142
TOTAL NUMBER OF AIRVOIDS	1160.	1165.	1177.
VOIDS PER MM TRAVERSE	.506	.508	.514
SPACING FACTOR (LT PASTE, MM)	.127	.126	.125
SPACING FACTOR (MIX DES., MM)	.128	.127	.126
SPECIFIC SURFACE (SQ.MM/CU.MM)	33.1	32.6	28.1

CALCULATED FROM BEST FIT LOGNORMAL DISTRIBUTION

AVERAGE AIRVOID CHORD LENGTH (MM)	.105	.106	.107
TOTAL NUMBER OF AIRVOIDS	1330.	1352.	1568.
VOIDS PER MM TRAVERSE	.580	.590	.684
SPACING FACTOR (LT PASTE, MM)	.111	.109	.094
SPACING FACTOR (MIX DES., MM)	.112	.110	.095
SPECIFIC SURFACE (SQ.MM/CU.MM)	38.0	37.8	37.5
# OF VOIDS PER CUBIC MM	77.5	78.7	90.9

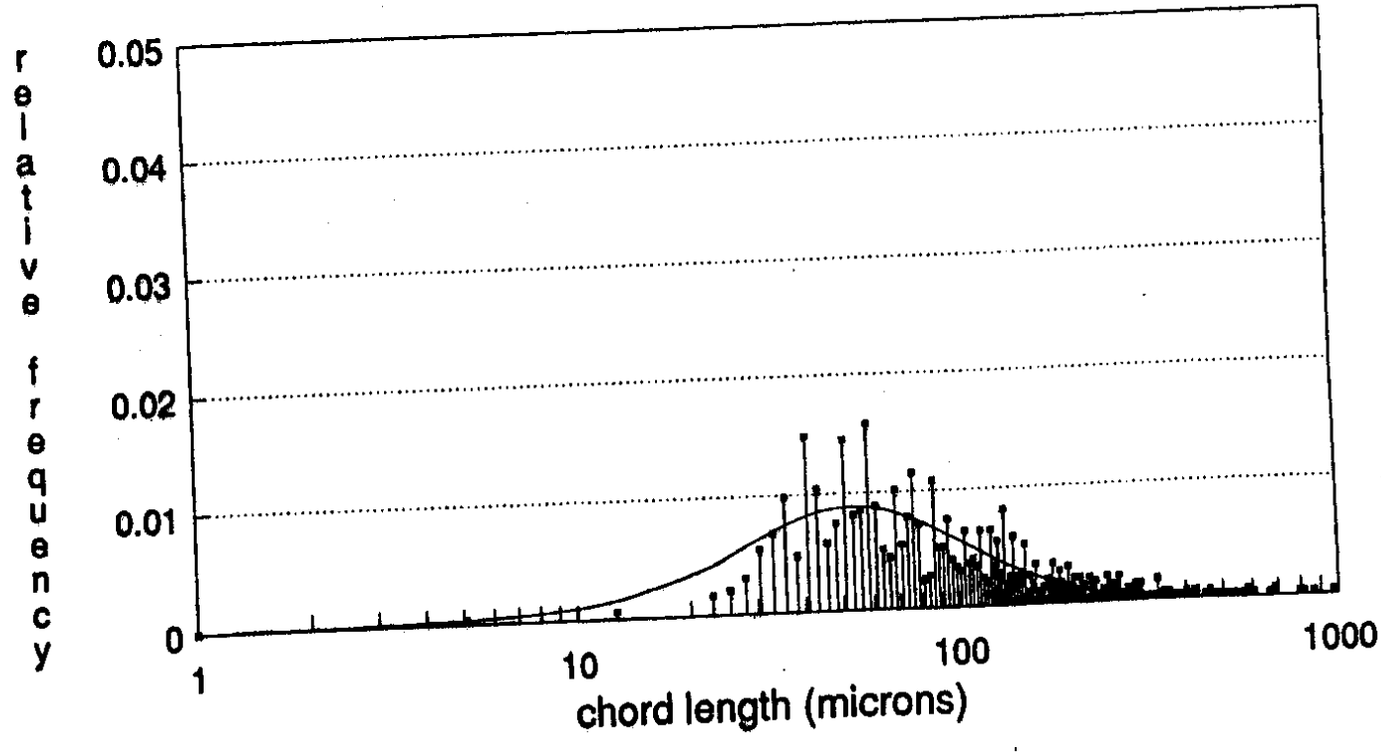
2 PHILLEO FACTOR(S) DETERMINED

PHILLEO FACTOR AT 90.% (LT PASTE, MM)	.014	.013	.008
PHILLEO FACTOR AT 90.% (MIX DES., MM)	.014	.014	.008
PHILLEO FACTOR AT 99.% (LT PASTE, MM)	.046	.045	.038
PHILLEO FACTOR AT 99.% (MIX DES., MM)	.046	.046	.038

1 SPACING(S) FOR WHICH PHILLEO PROTECTIONS HAVE BEEN DETERMINED

% OF PASTE WITHIN .100 MM. (LT PASTE)	100.	100.	100.
% OF PASTE WITHIN .100 MM. (MIX DES.)	100.	100.	100.

AIRVOID DISTRIBUTION
Mix P06-8
Actual Data and Best Fit Curve



Mode = 52.848 microns
Std. Dev. = 0.6808

INPUT FILE IS P069DJT.AIR

MAXIMUM CHORD SIZE INCLUDED IN ENTRAINED AIR IS 1000 MICRONS

CALCULATED FROM ACTUAL DATA	ENTRAINED AIR ONLY	ALL AIR < 1000	ALL AIR
TOTAL LENGTH OF TRAVERSE (MM)	2368.8		
LINEAR TRAVERSE PASTE CONTENT (%)	25.0		
MIX DESIGN PASTE CONTENT (%)	25.9		
HARDENED AIR CONTENT (%)	5.5	5.8	7.6
PASTE TO AIR RATIO (LT PASTE)	4.5	4.3	3.3
PASTE TO AIR RATIO (MIX DES.)	4.7	4.4	3.4
AVERAGE AIRVOID CHORD LENGTH (MM)	.197	.203	.257
TOTAL NUMBER OF AIRVOIDS	664.	680.	697.
VOIDS PER MM TRAVERSE	.280	.287	.294
SPACING FACTOR (LT PASTE, MM)	.218	.217	.212
SPACING FACTOR (MIX DES., MM)	.221	.223	.220
SPECIFIC SURFACE (SQ.MM/CU.MM)	20.4	19.7	15.6

CALCULATED FROM BEST FIT LOGNORMAL DISTRIBUTION

AVERAGE AIRVOID CHORD LENGTH (MM)	.198	.201	.204
TOTAL NUMBER OF AIRVOIDS	662.	690.	878.
VOIDS PER MM TRAVERSE	.279	.291	.371
SPACING FACTOR (LT PASTE, MM)	.219	.215	.169
SPACING FACTOR (MIX DES., MM)	.223	.220	.175
SPECIFIC SURFACE (SQ.MM/CU.MM)	20.2	19.9	19.6
# OF VOIDS PER CUBIC MM	9.3	9.7	12.2

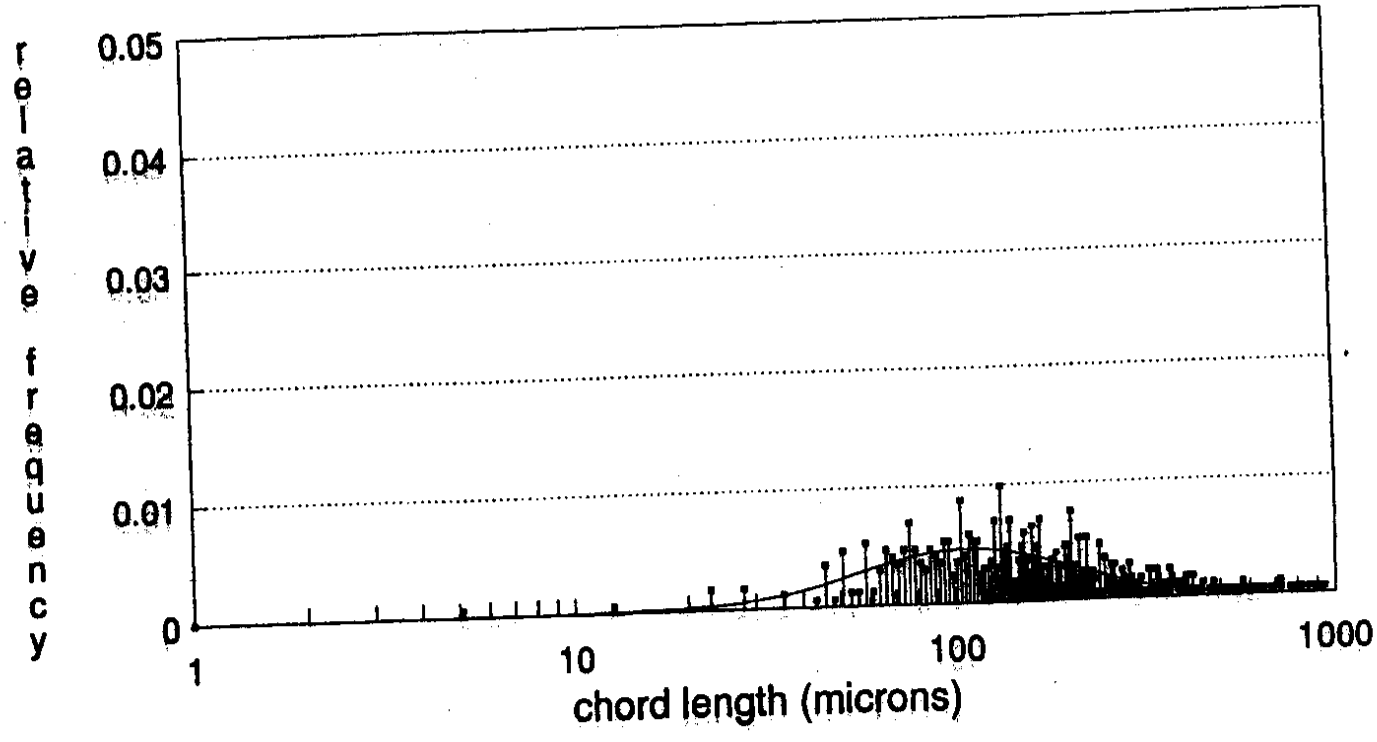
2 PHILLEO FACTOR(S) DETERMINED

PHILLEO FACTOR AT 90.% (LT PASTE, MM)	.033	.029	.011
PHILLEO FACTOR AT 90.% (MIX DES., MM)	.036	.032	.013
PHILLEO FACTOR AT 99.% (LT PASTE, MM)	.098	.093	.070
PHILLEO FACTOR AT 99.% (MIX DES., MM)	.101	.096	.073

1 SPACING(S) FOR WHICH PHILLEO PROTECTIONS HAVE BEEN DETERMINED

% OF PASTE WITHIN .100 MM. (LT PASTE)	99.	99.	100.
% OF PASTE WITHIN .100 MM. (MIX DES.)	99.	99.	100.

AIRVOID DISTRIBUTION
Mix P06-9
Actual Data and Best Fit Curve



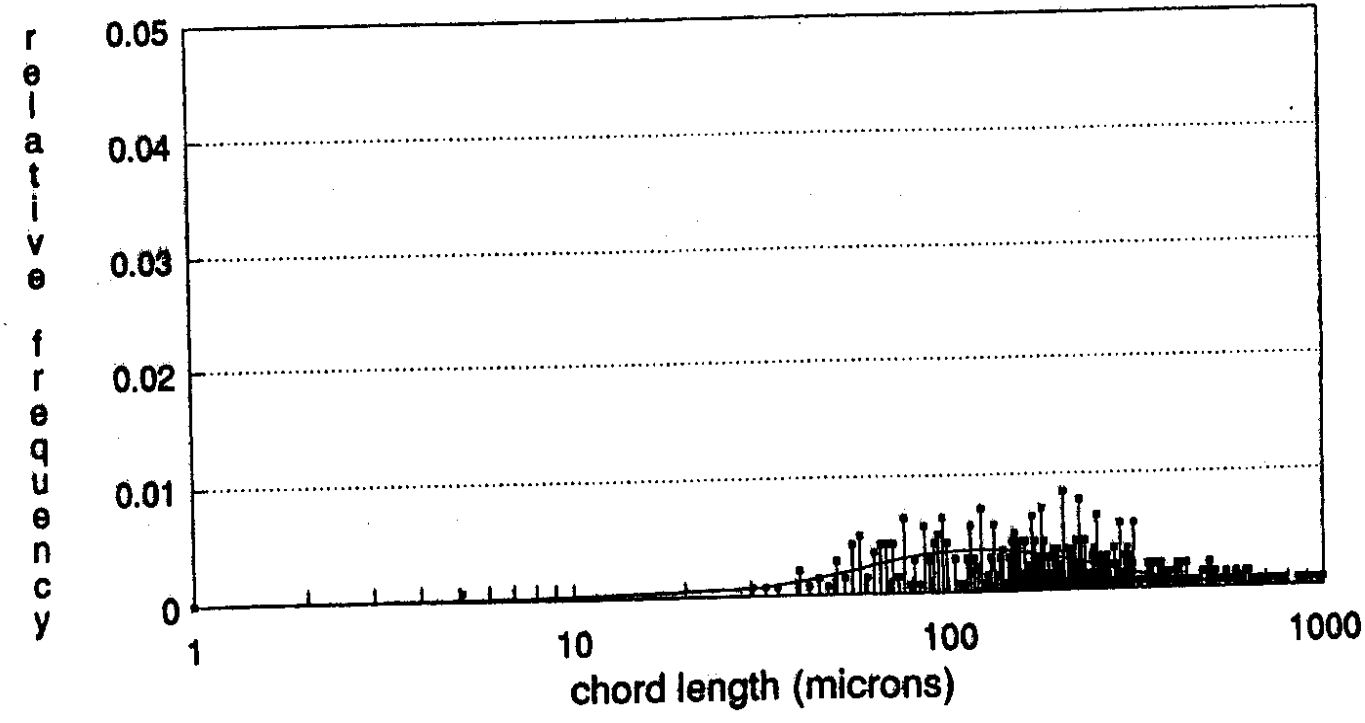
Mode = 108.08 microns
Std. Dev. = 0.6497

INPUT FILE IS P0610DJT.AIR

MAXIMUM CHORD SIZE INCLUDED IN ENTRAINED AIR IS 1000 MICRONS

	ENTRAINED AIR ONLY	ALL AIR < 1000	ALL AIR
CALCULATED FROM ACTUAL DATA			
TOTAL LENGTH OF TRAVERSE (MM)	2521.2		
LINEAR TRAVERSE PASTE CONTENT (%)	23.3		
MIX DESIGN PASTE CONTENT (%)	25.9		
HARDENED AIR CONTENT (%)	5.0	5.2	6.7
PASTE TO AIR RATIO (LT PASTE)	4.7	4.5	3.5
PASTE TO AIR RATIO (MIX DES.)	5.2	5.0	3.9
AVERAGE AIRVOID CHORD LENGTH (MM)	.229	.236	.292
TOTAL NUMBER OF AIRVOIDS	548.	558.	576.
VOIDS PER MM TRAVERSE	.217	.221	.228
SPACING FACTOR (LT PASTE, MM)	.258	.260	.255
SPACING FACTOR (MIX DES., MM)	.270	.272	.283
SPECIFIC SURFACE (SQ.MM/CU.MM)	17.4	16.9	13.7
CALCULATED FROM BEST FIT LOGNORMAL DISTRIBUTION			
AVERAGE AIRVOID CHORD LENGTH (MM)	.243	.246	.251
TOTAL NUMBER OF AIRVOIDS	524.	543.	679.
VOIDS PER MM TRAVERSE	.208	.215	.269
SPACING FACTOR (LT PASTE, MM)	.272	.271	.220
SPACING FACTOR (MIX DES., MM)	.286	.284	.244
SPECIFIC SURFACE (SQ.MM/CU.MM)	16.5	16.2	15.9
# OF VOIDS PER CUBIC MM	5.1	5.3	6.6
2 PHILLEO FACTOR(S) DETERMINED			
PHILLEO FACTOR AT 90.% (LT PASTE, MM)	.042	.038	.018
PHILLEO FACTOR AT 90.% (MIX DES., MM)	.052	.047	.026
PHILLEO FACTOR AT 99.% (LT PASTE, MM)	.119	.114	.089
PHILLEO FACTOR AT 99.% (MIX DES., MM)	.131	.126	.099
1 SPACING(S) FOR WHICH PHILLEO PROTECTIONS HAVE BEEN DETERMINED			
% OF PASTE WITHIN .100 MM. (LT PASTE)	98.	98.	99.
% OF PASTE WITHIN .100 MM. (MIX DES.)	97.	98.	99.

AIRVOID DISTRIBUTION
Mix P06-10
Actual Data and Best Fit Curve



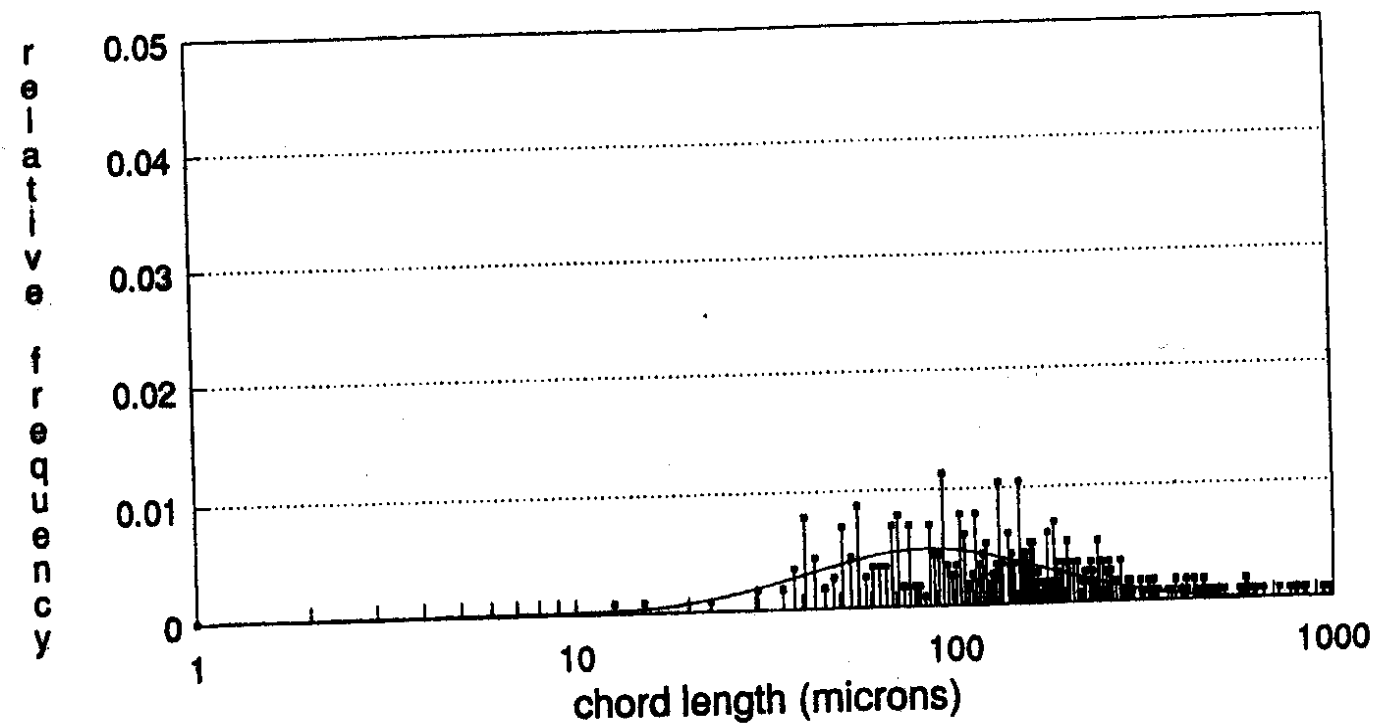
Mode = 118.85 microns
Std. Dev. = 0.7232

INPUT FILE IS P071BET.AIR

MAXIMUM CHORD SIZE INCLUDED IN ENTRAINED AIR IS 1000 MICRONS

	ENTRAINED AIR ONLY	ALL AIR < 1000	ALL AIR
CALCULATED FROM ACTUAL DATA			
TOTAL LENGTH OF TRAVERSE (MM)	2359.0		
LINEAR TRAVERSE PASTE CONTENT (%)	27.6		
MIX DESIGN PASTE CONTENT (%)	27.5		
HARDENED AIR CONTENT (%)	1.8	3.6	3.9
PASTE TO AIR RATIO (LT PASTE)	15.7	7.8	7.1
PASTE TO AIR RATIO (MIX DES.)	15.6	7.7	7.1
AVERAGE AIRVOID CHORD LENGTH (MM)	.200	.186	.201
TOTAL NUMBER OF AIRVOIDS	208.	451.	455.
VOIDS PER MM TRAVERSE	.088	.191	.193
SPACING FACTOR (LT PASTE, MM)	.386	.263	.274
SPACING FACTOR (MIX DES., MM)	.385	.263	.273
SPECIFIC SURFACE (SQ.MM/CU.MM)	20.0	21.5	19.9
CALCULATED FROM BEST FIT LOGNORMAL DISTRIBUTION			
AVERAGE AIRVOID CHORD LENGTH (MM)	.196	.186	.187
TOTAL NUMBER OF AIRVOIDS	212.	453.	491.
VOIDS PER MM TRAVERSE	.090	.192	.208
SPACING FACTOR (LT PASTE, MM)	.379	.263	.255
SPACING FACTOR (MIX DES., MM)	.379	.263	.254
SPECIFIC SURFACE (SQ.MM/CU.MM)	20.4	21.5	21.4
# OF VOIDS PER CUBIC MM	2.7	9.2	9.9
2 PHILLEO FACTOR(S) DETERMINED			
PHILLEO FACTOR AT 90.% (LT PASTE, MM)	.159	.068	.061
PHILLEO FACTOR AT 90.% (MIX DES., MM)	.158	.068	.061
PHILLEO FACTOR AT 99.% (LT PASTE, MM)	.259	.135	.126
PHILLEO FACTOR AT 99.% (MIX DES., MM)	.259	.134	.126
1 SPACING(S) FOR WHICH PHILLEO PROTECTIONS HAVE BEEN DETERMINED			
% OF PASTE WITHIN .100 MM. (LT PASTE)	75.	96.	97.
% OF PASTE WITHIN .100 MM. (MIX DES.)	75.	96.	97.

AIRVOID DISTRIBUTION
Mix P07-1
Actual Data and Best Fit Curve



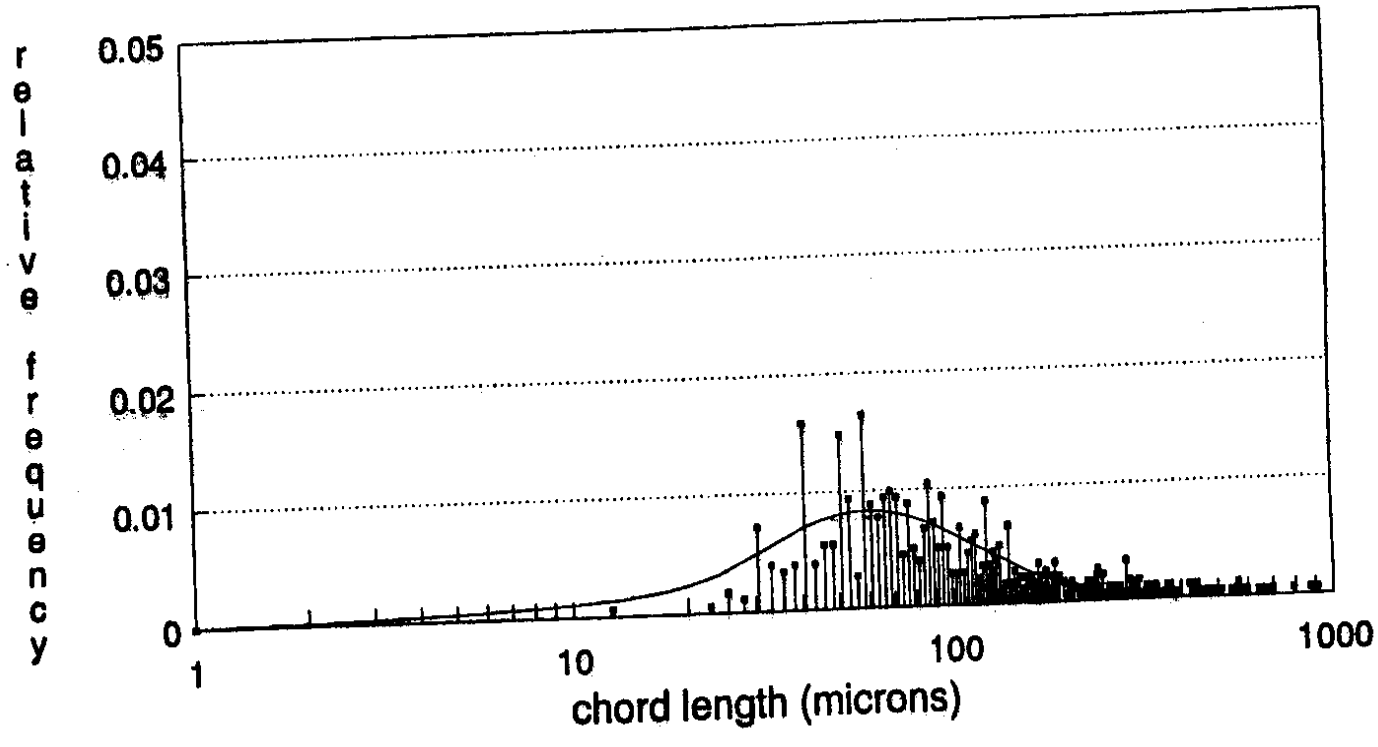
Mode = 84.902 microns
Std. Dev. = 0.7345

INPUT FILE IS P073BET.AIR

MAXIMUM CHORD SIZE INCLUDED IN ENTRAINED AIR IS 1000 MICRONS

	ENTRAINED AIR ONLY	ALL AIR < 1000	ALL AIR
CALCULATED FROM ACTUAL DATA			
TOTAL LENGTH OF TRAVERSE (MM)	2346.9		
LINEAR TRAVERSE PASTE CONTENT (%)	31.5		
MIX DESIGN PASTE CONTENT (%)	27.5		
HARDENED AIR CONTENT (%)	2.0	4.2	5.4
PASTE TO AIR RATIO (LT PASTE)	15.6	7.5	5.9
PASTE TO AIR RATIO (MIX DES.)	13.6	6.6	5.1
AVERAGE AIRVOID CHORD LENGTH (MM)	.136	.137	.173
TOTAL NUMBER OF AIRVOIDS	349.	717.	729.
VOIDS PER MM TRAVERSE	.149	.306	.311
SPACING FACTOR (LT PASTE, MM)	.262	.191	.215
SPACING FACTOR (MIX DES., MM)	.247	.180	.202
SPECIFIC SURFACE (SQ.MM/CU.MM)	29.5	29.2	23.1
CALCULATED FROM BEST FIT LOGNORMAL DISTRIBUTION			
AVERAGE AIRVOID CHORD LENGTH (MM)	.130	.112	.114
TOTAL NUMBER OF AIRVOIDS	366.	875.	1104.
VOIDS PER MM TRAVERSE	.156	.373	.470
SPACING FACTOR (LT PASTE, MM)	.250	.157	.142
SPACING FACTOR (MIX DES., MM)	.236	.147	.134
SPECIFIC SURFACE (SQ.MM/CU.MM)	30.9	35.6	35.0
# OF VOIDS PER CUBIC MM	12.8	41.0	51.2
2 PHILLEO FACTOR(S) DETERMINED			
PHILLEO FACTOR AT 90.% (LT PASTE, MM)	.098	.042	.030
PHILLEO FACTOR AT 90.% (MIX DES., MM)	.088	.035	.024
PHILLEO FACTOR AT 99.% (LT PASTE, MM)	.160	.084	.069
PHILLEO FACTOR AT 99.% (MIX DES., MM)	.147	.076	.061
1 SPACING(S) FOR WHICH PHILLEO PROTECTIONS HAVE BEEN DETERMINED			
% OF PASTE WITHIN .100 MM. (LT PASTE)	91.	100.	100.
% OF PASTE WITHIN .100 MM. (MIX DES.)	93.	100.	100.

AIRVOID DISTRIBUTION
Mix P07-3
Actual Data and Best Fit Curve



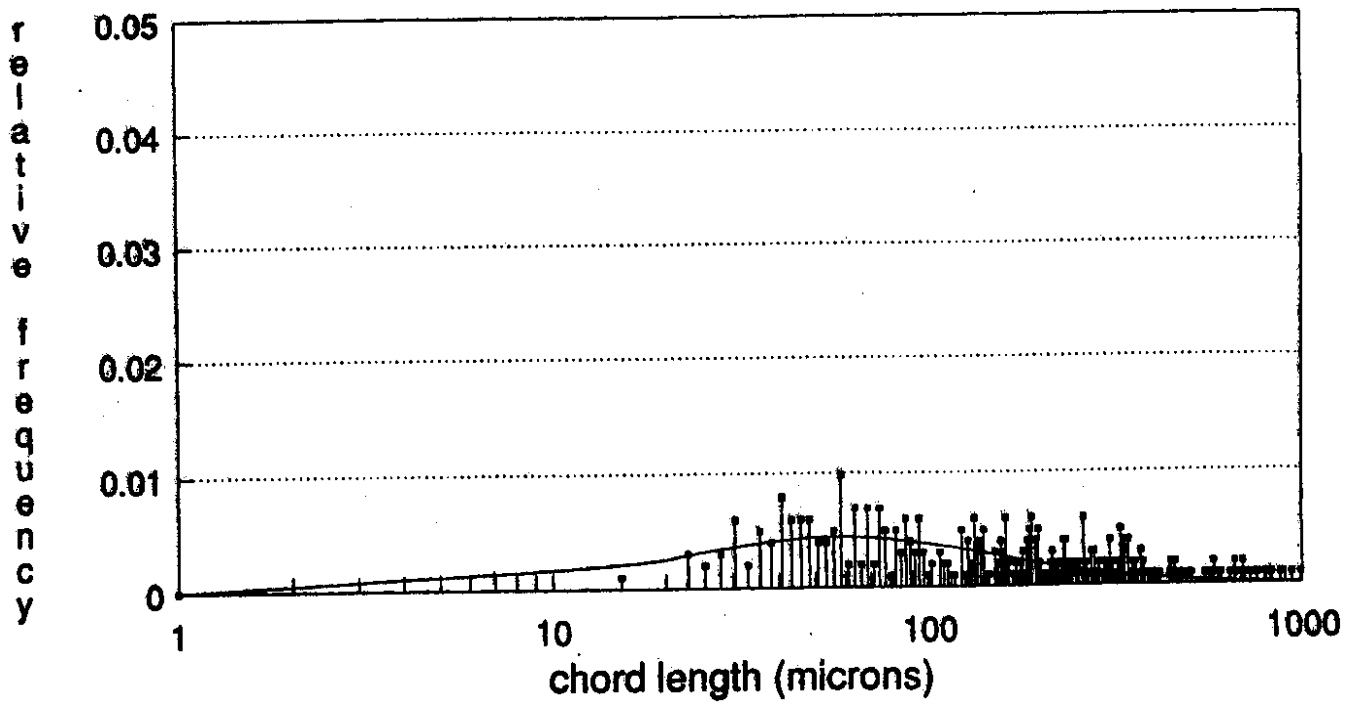
Mode = 59.451 microns
Std. Dev. = 0.6522

INPUT FILE IS P074BET.AIR

MAXIMUM CHORD SIZE INCLUDED IN ENTRAINED AIR IS 1000 MICRONS

	ENTRAINED AIR ONLY	ALL AIR < 1000	ALL AIR
CALCULATED FROM ACTUAL DATA			
TOTAL LENGTH OF TRAVERSE (MM)	2321.8		
LINEAR TRAVERSE PASTE CONTENT (%)	26.2		
MIX DESIGN PASTE CONTENT (%)	27.5		
HARDENED AIR CONTENT (%)	1.4	3.6	4.8
PASTE TO AIR RATIO (LT PASTE)	18.6	7.3	5.5
PASTE TO AIR RATIO (MIX DES.)	19.5	7.6	5.8
AVERAGE AIRVOID CHORD LENGTH (MM)	.164	.209	.266
TOTAL NUMBER OF AIRVOIDS	200.	401.	415.
VOIDS PER MM TRAVERSE	.086	.173	.179
SPACING FACTOR (LT PASTE, MM)	.341	.287	.322
SPACING FACTOR (MIX DES., MM)	.348	.293	.329
SPECIFIC SURFACE (SQ.MM/CU.MM)	24.4	19.1	15.0
CALCULATED FROM BEST FIT LOGNORMAL DISTRIBUTION			
AVERAGE AIRVOID CHORD LENGTH (MM)	.158	.207	.213
TOTAL NUMBER OF AIRVOIDS	209.	416.	536.
VOIDS PER MM TRAVERSE	.090	.179	.231
SPACING FACTOR (LT PASTE, MM)	.328	.284	.258
SPACING FACTOR (MIX DES., MM)	.335	.290	.263
SPECIFIC SURFACE (SQ.MM/CU.MM)	25.4	19.3	18.8
# OF VOIDS PER CUBIC MM	10.4	14.2	18.0
2 PHILLEO FACTOR(S) DETERMINED			
PHILLEO FACTOR AT 90.% (LT PASTE, MM)	.107	.055	.037
PHILLEO FACTOR AT 90.% (MIX DES., MM)	.110	.058	.040
PHILLEO FACTOR AT 99.% (LT PASTE, MM)	.169	.111	.089
PHILLEO FACTOR AT 99.% (MIX DES., MM)	.174	.115	.093
1 SPACING(S) FOR WHICH PHILLEO PROTECTIONS HAVE BEEN DETERMINED			
% OF PASTE WITHIN .100 MM. (LT PASTE)	88.	98.	99.
% OF PASTE WITHIN .100 MM. (MIX DES.)	87.	98.	99.

AIRVOID DISTRIBUTION
Mix P07-4
Actual Data and Best Fit Curve



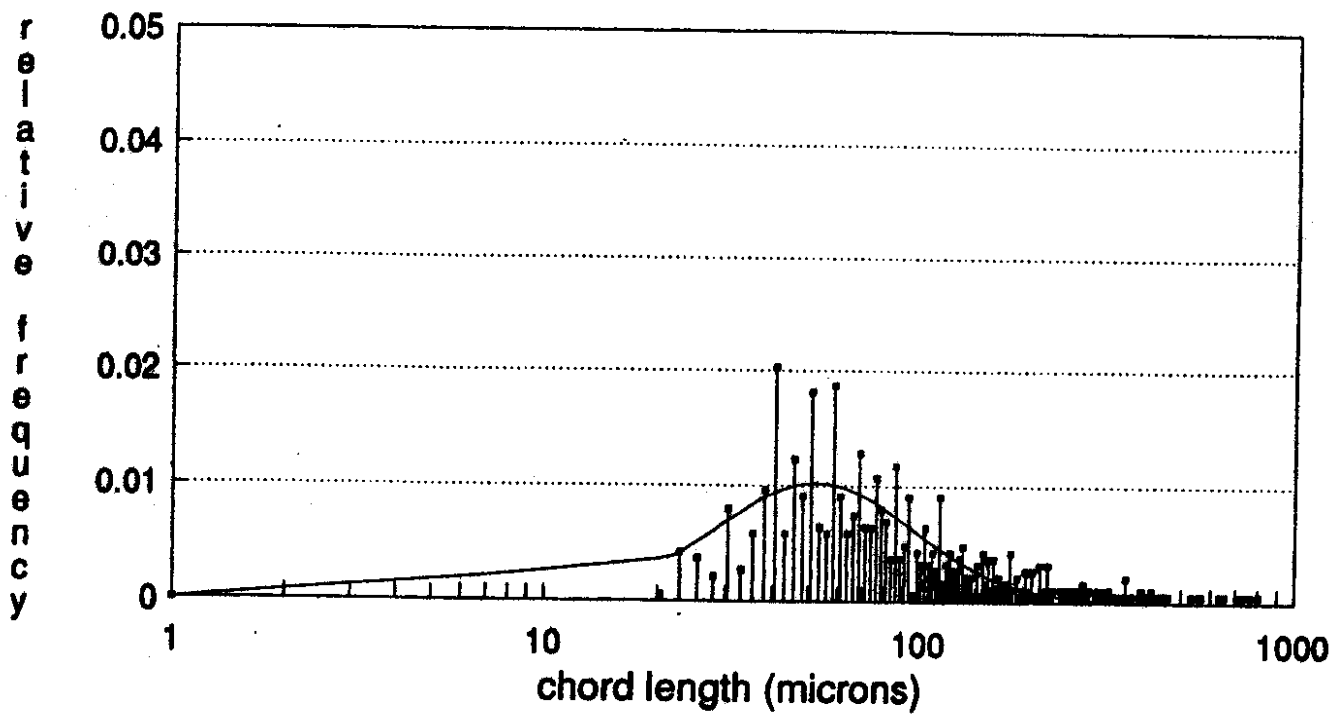
Mode = 57.054 microns
Std. Dev. = 0.9835

INPUT FILE IS P075BET.AIR

MAXIMUM CHORD SIZE INCLUDED IN ENTRAINED AIR IS 1000 MICRONS

	ENTRAINED AIR ONLY	ALL AIR < 1000	ALL AIR
CALCULATED FROM ACTUAL DATA			
TOTAL LENGTH OF TRAVERSE (MM)	2382.8		
LINEAR TRAVERSE PASTE CONTENT (%)	32.6		
MIX DESIGN PASTE CONTENT (%)	27.5		
HARDENED AIR CONTENT (%)	1.8	3.5	4.7
PASTE TO AIR RATIO (LT PASTE)	18.1	9.2	7.0
PASTE TO AIR RATIO (MIX DES.)	15.2	7.8	5.9
AVERAGE AIRVOID CHORD LENGTH (MM)	.116	.114	.149
TOTAL NUMBER OF AIRVOIDS	372.	738.	748.
VOIDS PER MM TRAVERSE	.156	.310	.314
SPACING FACTOR (LT PASTE, MM)	.238	.175	.201
SPACING FACTOR (MIX DES., MM)	.221	.162	.186
SPECIFIC SURFACE (SQ.MM/CU.MM)	34.6	35.0	26.9
CALCULATED FROM BEST FIT LOGNORMAL DISTRIBUTION			
AVERAGE AIRVOID CHORD LENGTH (MM)	.100	.092	.094
TOTAL NUMBER OF AIRVOIDS	429.	912.	1191.
VOIDS PER MM TRAVERSE	.180	.383	.500
SPACING FACTOR (LT PASTE, MM)	.206	.141	.126
SPACING FACTOR (MIX DES., MM)	.191	.131	.117
SPECIFIC SURFACE (SQ.MM/CU.MM)	40.0	43.3	42.8
# OF VOIDS PER CUBIC MM	22.5	57.7	74.7
2 PHILLEO FACTOR(S) DETERMINED			
PHILLEO FACTOR AT 90.% (LT PASTE, MM)	.087	.044	.032
PHILLEO FACTOR AT 90.% (MIX DES., MM)	.077	.037	.025
PHILLEO FACTOR AT 99.% (LT PASTE, MM)	.139	.082	.067
PHILLEO FACTOR AT 99.% (MIX DES., MM)	.126	.073	.059
1 SPACING(S) FOR WHICH PHILLEO PROTECTIONS HAVE BEEN DETERMINED			
% OF PASTE WITHIN .100 MM. (LT PASTE)	94.	100.	100.
% OF PASTE WITHIN .100 MM. (MIX DES.)	96.	100.	100.

AIRVOID DISTRIBUTION
Mix P07-5
Actual Data and Best Fit Curve



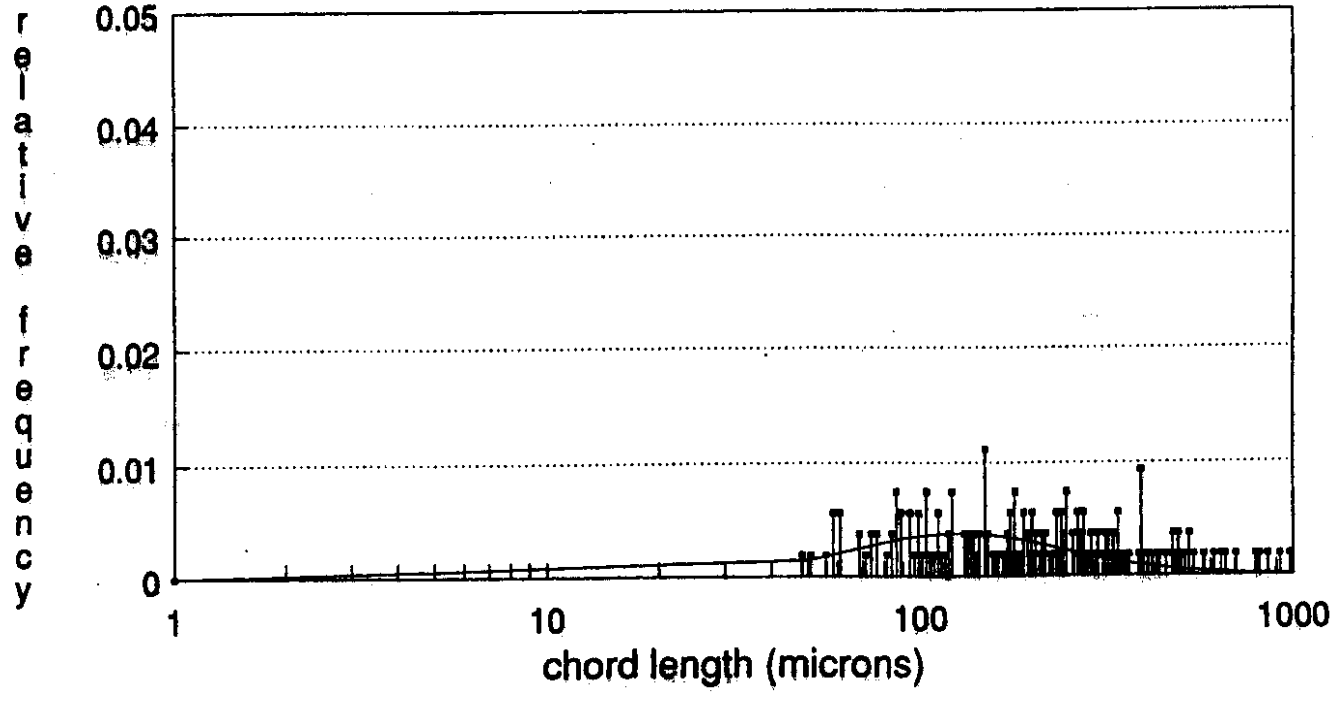
Mode = 52.190 microns
Std. Dev. = 0.6171

INPUT FILE IS P081BET.AIR

MAXIMUM CHORD SIZE INCLUDED IN ENTRAINED AIR IS 1000 MICRONS

	ENTRAINED AIR ONLY	ALL AIR < 1000	ALL AIR
CALCULATED FROM ACTUAL DATA			
TOTAL LENGTH OF TRAVERSE (MM)	2333.5		
LINEAR TRAVERSE PASTE CONTENT (%)	26.7		
MIX DESIGN PASTE CONTENT (%)	28.0		
HARDENED AIR CONTENT (%)	.6	2.4	3.0
PASTE TO AIR RATIO (LT PASTE)	46.6	11.3	8.9
PASTE TO AIR RATIO (MIX DES.)	48.9	11.9	9.3
AVERAGE AIRVOID CHORD LENGTH (MM)	.252	.260	.321
TOTAL NUMBER OF AIRVOIDS	53.	211.	219.
VOIDS PER MM TRAVERSE	.023	.090	.094
SPACING FACTOR (LT PASTE, MM)	.770	.436	.482
SPACING FACTOR (MIX DES., MM)	.785	.446	.492
SPECIFIC SURFACE (SQ.MM/CU.MM)	15.9	15.4	12.5
CALCULATED FROM BEST FIT LOGNORMAL DISTRIBUTION			
AVERAGE AIRVOID CHORD LENGTH (MM)	.196	.242	.247
TOTAL NUMBER OF AIRVOIDS	68.	229.	288.
VOIDS PER MM TRAVERSE	.029	.098	.123
SPACING FACTOR (LT PASTE, MM)	.599	.405	.370
SPACING FACTOR (MIX DES., MM)	.612	.414	.379
SPECIFIC SURFACE (SQ.MM/CU.MM)	20.4	16.5	16.2
# OF VOIDS PER CUBIC MM	.8	2.3	2.8
2 PHILLEO FACTOR(S) DETERMINED			
PHILLEO FACTOR AT 90.% (LT PASTE, MM)	.335	.140	.111
PHILLEO FACTOR AT 90.% (MIX DES., MM)	.345	.146	.117
PHILLEO FACTOR AT 99.% (LT PASTE, MM)	.484	.244	.208
PHILLEO FACTOR AT 99.% (MIX DES., MM)	.496	.252	.216
1 SPACING(S) FOR WHICH PHILLEO PROTECTIONS HAVE BEEN DETERMINED			
% OF PASTE WITHIN .100 MM. (LT PASTE)	37.	81.	88.
% OF PASTE WITHIN .100 MM. (MIX DES.)	36.	80.	88.

AIRVOID DISTRIBUTION
Mix P08-1
Actual Data and Best Fit Curve



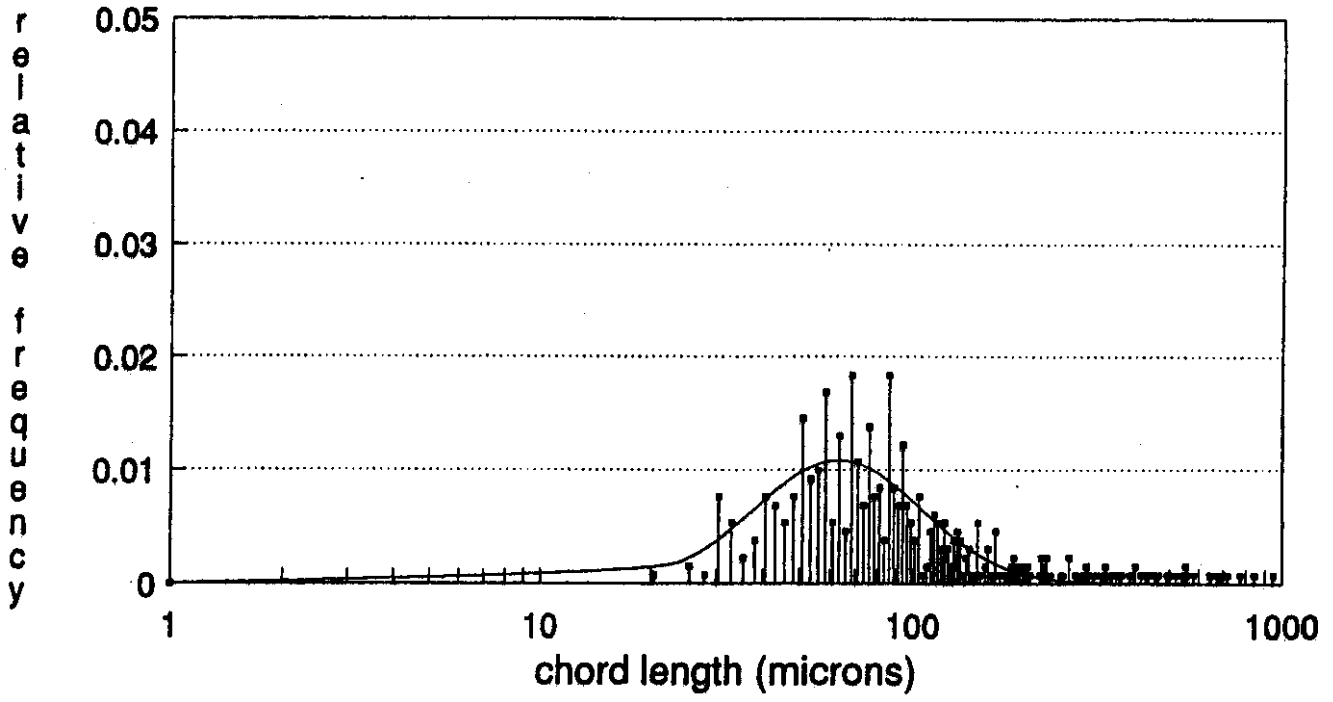
Mode = 127.11 microns
Std. Dev. = 0.6721

INPUT FILE IS P083BET.AIR

MAXIMUM CHORD SIZE INCLUDED IN ENTRAINED AIR IS 1000 MICRONS

	ENTRAINED AIR ONLY	ALL AIR < 1000	ALL AIR
CALCULATED FROM ACTUAL DATA			
TOTAL LENGTH OF TRAVERSE (MM)	2322.1		
LINEAR TRAVERSE PASTE CONTENT (%)	30.0		
MIX DESIGN PASTE CONTENT (%)	28.0		
HARDENED AIR CONTENT (%)	1.2	2.8	3.9
PASTE TO AIR RATIO (LT PASTE)	24.5	10.8	7.7
PASTE TO AIR RATIO (MIX DES.)	22.8	10.1	7.2
AVERAGE AIRVOID CHORD LENGTH (MM)	.114	.125	.172
TOTAL NUMBER OF AIRVOIDS	249.	515.	528.
VOIDS PER MM TRAVERSE	.107	.222	.227
SPACING FACTOR (LT PASTE, MM)	.267	.205	.242
SPACING FACTOR (MIX DES., MM)	.260	.199	.234
SPECIFIC SURFACE (SQ.MM/CU.MM)	35.0	32.0	23.3
CALCULATED FROM BEST FIT LOGNORMAL DISTRIBUTION			
AVERAGE AIRVOID CHORD LENGTH (MM)	.104	.093	.095
TOTAL NUMBER OF AIRVOIDS	273.	688.	955.
VOIDS PER MM TRAVERSE	.117	.296	.411
SPACING FACTOR (LT PASTE, MM)	.244	.154	.134
SPACING FACTOR (MIX DES., MM)	.237	.149	.130
SPECIFIC SURFACE (SQ.MM/CU.MM)	38.3	42.8	42.1
# OF VOIDS PER CUBIC MM	11.9	36.8	50.2
2 PHILLEO FACTOR(S) DETERMINED			
PHILLEO FACTOR AT 90.% (LT PASTE, MM)	.118	.056	.039
PHILLEO FACTOR AT 90.% (MIX DES., MM)	.113	.052	.036
PHILLEO FACTOR AT 99.% (LT PASTE, MM)	.180	.099	.078
PHILLEO FACTOR AT 99.% (MIX DES., MM)	.174	.094	.074
1 SPACING(S) FOR WHICH PHILLEO PROTECTIONS HAVE BEEN DETERMINED			
% OF PASTE WITHIN .100 MM. (LT PASTE)	84.	99.	100.
% OF PASTE WITHIN .100 MM. (MIX DES.)	86.	99.	100.

AIRVOID DISTRIBUTION
Mix P08-3
Actual Data and Best Fit Curve



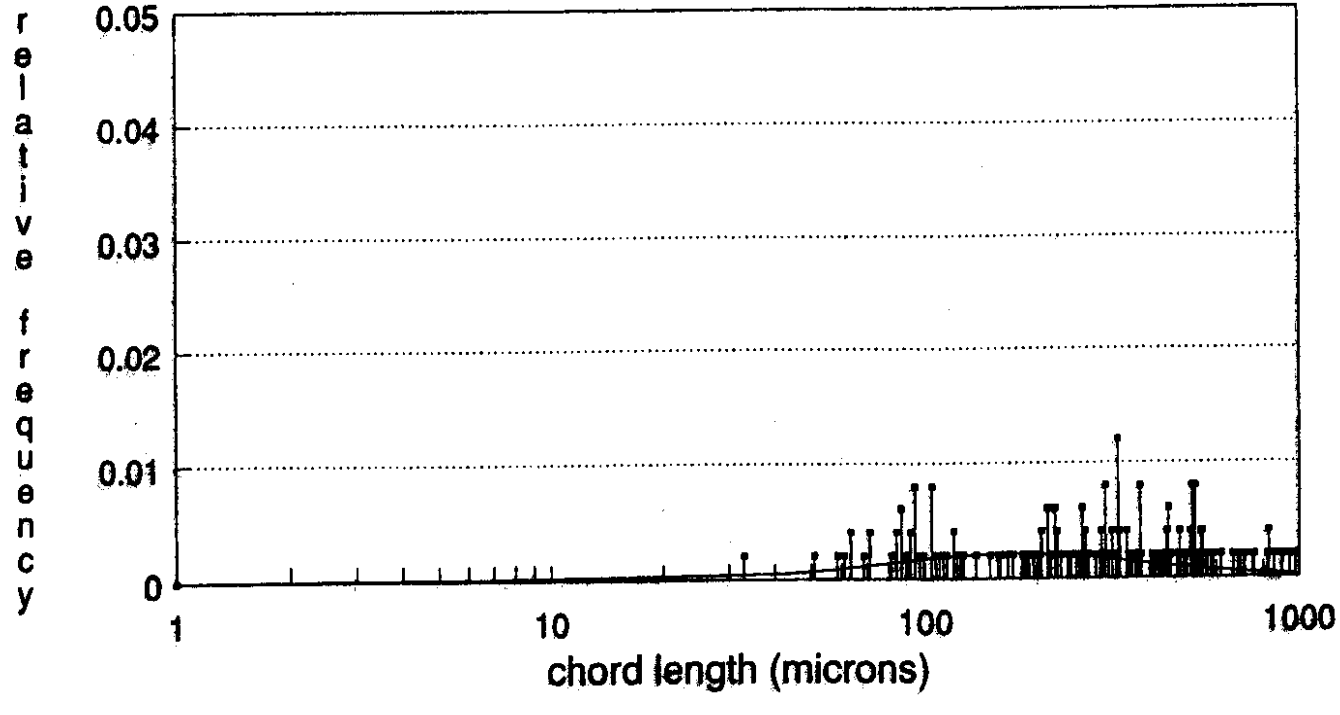
Mode = 63.221 microns
Std. Dev. = 0.5104

INPUT FILE IS P084BET.AIE

MAXIMUM CHORD SIZE INCLUDED IN ENTRAINED AIR IS 1000 MICRONS

	ENTRAINED AIR ONLY	ALL AIR < 1000	ALL AIR
CALCULATED FROM ACTUAL DATA			
TOTAL LENGTH OF TRAVERSE (MM)	2315.7		
LINEAR TRAVERSE PASTE CONTENT (%)	28.8		
MIX DESIGN PASTE CONTENT (%)	28.0		
HARDENED AIR CONTENT (%)		2.8	3.9
PASTE TO AIR RATIO (LT PASTE)		10.4	7.3
PASTE TO AIR RATIO (MIX DES.)		10.1	7.1
AVERAGE AIRVOID CHORD LENGTH (MM)		.351	.461
TOTAL NUMBER OF AIRVOIDS		183.	197.
VOIDS PER MM TRAVERSE		.079	.085
SPACING FACTOR (LT PASTE, MM)		.566	.636
SPACING FACTOR (MIX DES., MM)		.559	.628
SPECIFIC SURFACE (SQ.MM/CU.MM)		11.4	8.7
CALCULATED FROM BEST FIT LOGNORMAL DISTRIBUTION			
AVERAGE AIRVOID CHORD LENGTH (MM)		.351	.355
TOTAL NUMBER OF AIRVOIDS		196.	278.
VOIDS PER MM TRAVERSE		.085	.120
SPACING FACTOR (LT PASTE, MM)		.565	.490
SPACING FACTOR (MIX DES., MM)		.558	.483
SPECIFIC SURFACE (SQ.MM/CU.MM)		11.4	11.3
# OF VOIDS PER CUBIC MM		.9	1.3
2 PHILLEO FACTOR(S) DETERMINED			
PHILLEO FACTOR AT 90.% (LT PASTE, MM)		.186	.127
PHILLEO FACTOR AT 90.% (MIX DES., MM)		.181	.122
PHILLEO FACTOR AT 99.% (LT PASTE, MM)		.333	.257
PHILLEO FACTOR AT 99.% (MIX DES., MM)		.327	.251
1 SPACING(S) FOR WHICH PHILLEO PROTECTIONS HAVE BEEN DETERMINED			
% OF PASTE WITHIN .100 MM. (LT PASTE)		75.	86.
% OF PASTE WITHIN .100 MM. (MIX DES.)		76.	86.

AIRVOID DISTRIBUTION
Mix P08-4
Actual Data and Best Fit Curve



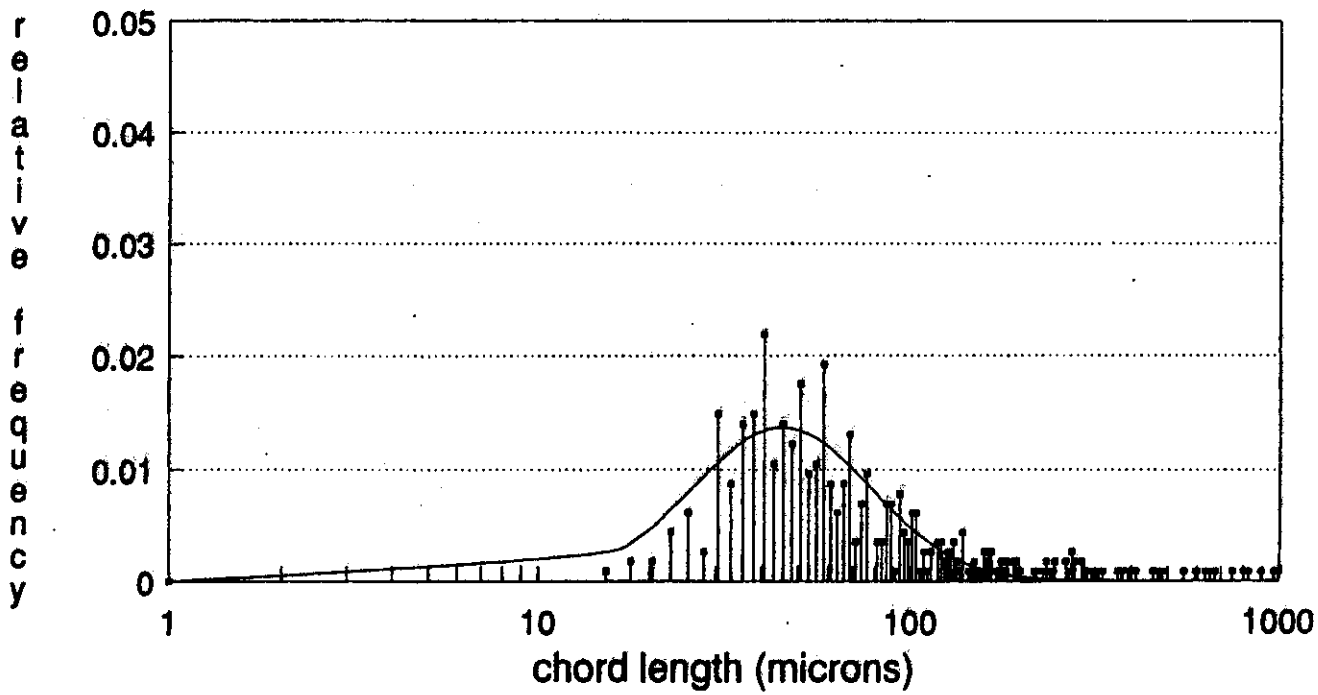
Mode = 172.97 microns
Std. Dev. = 0.7960

INPUT FILE IS P085BET.AIR

MAXIMUM CHORD SIZE INCLUDED IN ENTRAINED AIR IS 1000 MICRONS

	ENTRAINED AIR ONLY	ALL AIR < 1000	ALL AIR
CALCULATED FROM ACTUAL DATA			
TOTAL LENGTH OF TRAVERSE (MM)	2301.5		
LINEAR TRAVERSE PASTE CONTENT (%)	29.6		
MIX DESIGN PASTE CONTENT (%)	28.0		
HARDENED AIR CONTENT (%)	.9	2.2	3.0
PASTE TO AIR RATIO (LT PASTE)	31.2	13.8	9.7
PASTE TO AIR RATIO (MIX DES.)	29.6	13.0	9.2
AVERAGE AIRVOID CHORD LENGTH (MM)	.100	.110	.152
TOTAL NUMBER OF AIRVOIDS	218.	450.	459.
VOIDS PER MM TRAVERSE	.095	.196	.199
SPACING FACTOR (LT PASTE, MM)	.259	.201	.239
SPACING FACTOR (MIX DES., MM)	.253	.196	.233
SPECIFIC SURFACE (SQ.MM/CU.MM)	40.0	36.3	26.3
CALCULATED FROM BEST FIT LOGNORMAL DISTRIBUTION			
AVERAGE AIRVOID CHORD LENGTH (MM)	.077	.071	.072
TOTAL NUMBER OF AIRVOIDS	284.	694.	964.
VOIDS PER MM TRAVERSE	.123	.302	.419
SPACING FACTOR (LT PASTE, MM)	.199	.130	.114
SPACING FACTOR (MIX DES., MM)	.194	.127	.111
SPECIFIC SURFACE (SQ.MM/CU.MM)	52.1	56.1	55.2
# OF VOIDS PER CUBIC MM	25.0	67.7	92.7
2 PHILLEO FACTOR(S) DETERMINED			
PHILLEO FACTOR AT 90.% (LT PASTE, MM)	.099	.052	.038
PHILLEO FACTOR AT 90.% (MIX DES., MM)	.095	.050	.036
PHILLEO FACTOR AT 99.% (LT PASTE, MM)	.147	.087	.070
PHILLEO FACTOR AT 99.% (MIX DES., MM)	.143	.084	.067
1 SPACING(S) FOR WHICH PHILLEO PROTECTIONS HAVE BEEN DETERMINED			
% OF PASTE WITHIN .100 MM. (LT PASTE)	90.	100.	100.
% OF PASTE WITHIN .100 MM. (MIX DES.)	92.	100.	100.

AIRVOID DISTRIBUTION
Mix P08-5
Actual Data and Best Fit Curve



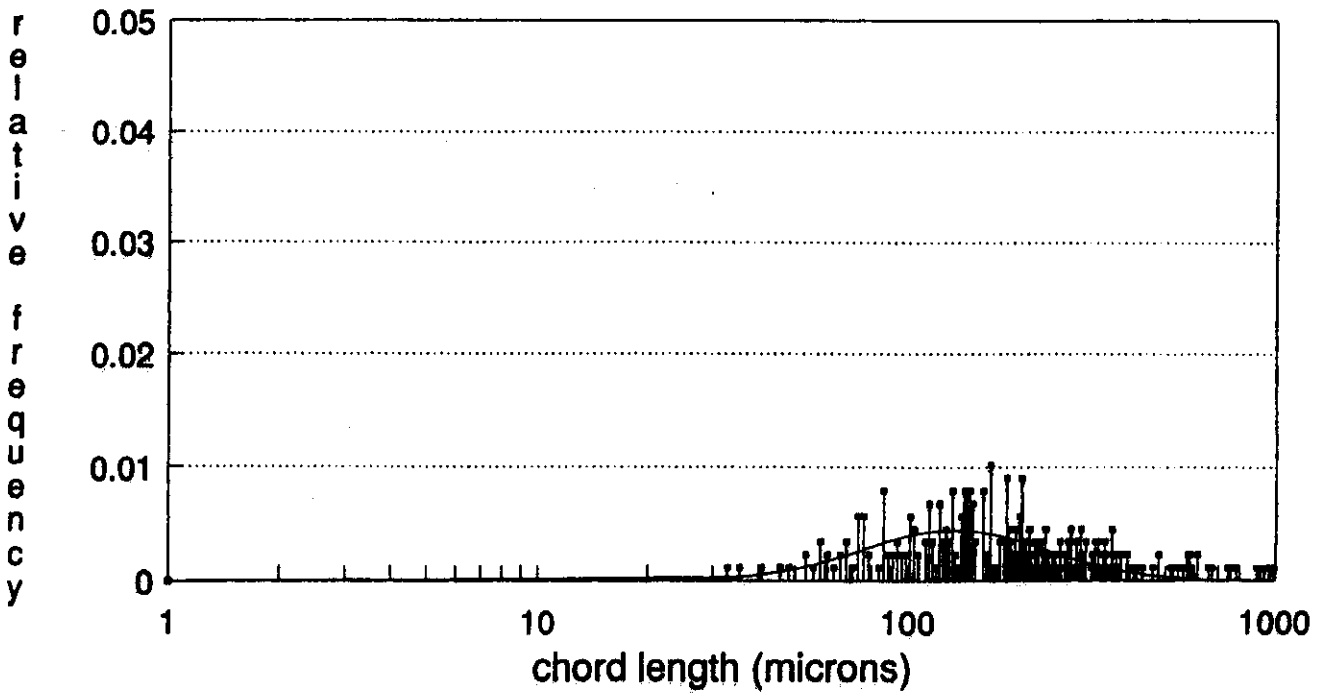
Mode = 45.258 microns
Std. Dev. = 0.5509

INPUT FILE IS P091BET.AIR

MAXIMUM CHORD SIZE INCLUDED IN ENTRAINED AIR IS 1000 MICRONS

	ENTRAINED AIR ONLY	ALL AIR < 1000	ALL AIR
CALCULATED FROM ACTUAL DATA			
TOTAL LENGTH OF TRAVERSE (MM)	2366.8		
LINEAR TRAVERSE PASTE CONTENT (%)	26.8		
MIX DESIGN PASTE CONTENT (%)	25.8		
HARDENED AIR CONTENT (%)	1.4	3.3	4.6
PASTE TO AIR RATIO (LT PASTE)	18.7	8.1	5.9
PASTE TO AIR RATIO (MIX DES.)	18.0	7.8	5.7
AVERAGE AIRVOID CHORD LENGTH (MM)	.208	.225	.296
TOTAL NUMBER OF AIRVOIDS	163.	347.	364.
VOIDS PER MM TRAVERSE	.069	.147	.154
SPACING FACTOR (LT PASTE, MM)	.434	.325	.369
SPACING FACTOR (MIX DES., MM)	.427	.319	.363
SPECIFIC SURFACE (SQ.MM/CU.MM)	19.2	17.8	13.5
CALCULATED FROM BEST FIT LOGNORMAL DISTRIBUTION			
AVERAGE AIRVOID CHORD LENGTH (MM)	.185	.216	.223
TOTAL NUMBER OF AIRVOIDS	183.	362.	484.
VOIDS PER MM TRAVERSE	.077	.153	.205
SPACING FACTOR (LT PASTE, MM)	.387	.312	.278
SPACING FACTOR (MIX DES., MM)	.381	.307	.273
SPECIFIC SURFACE (SQ.MM/CU.MM)	21.6	18.5	18.0
# OF VOIDS PER CUBIC MM	2.3	3.8	4.9
2 PHILLEO FACTOR(S) DETERMINED			
PHILLEO FACTOR AT 90.% (LT PASTE, MM)	.178	.094	.063
PHILLEO FACTOR AT 90.% (MIX DES., MM)	.173	.090	.059
PHILLEO FACTOR AT 99.% (LT PASTE, MM)	.282	.183	.144
PHILLEO FACTOR AT 99.% (MIX DES., MM)	.276	.178	.140
1 SPACING(S) FOR WHICH PHILLEO PROTECTIONS HAVE BEEN DETERMINED			
% OF PASTE WITHIN .100 MM. (LT PASTE)	70.	91.	96.
% OF PASTE WITHIN .100 MM. (MIX DES.)	71.	92.	96.

AIRVOID DISTRIBUTION
Mix P09-1
Actual Data and Best Fit Curve



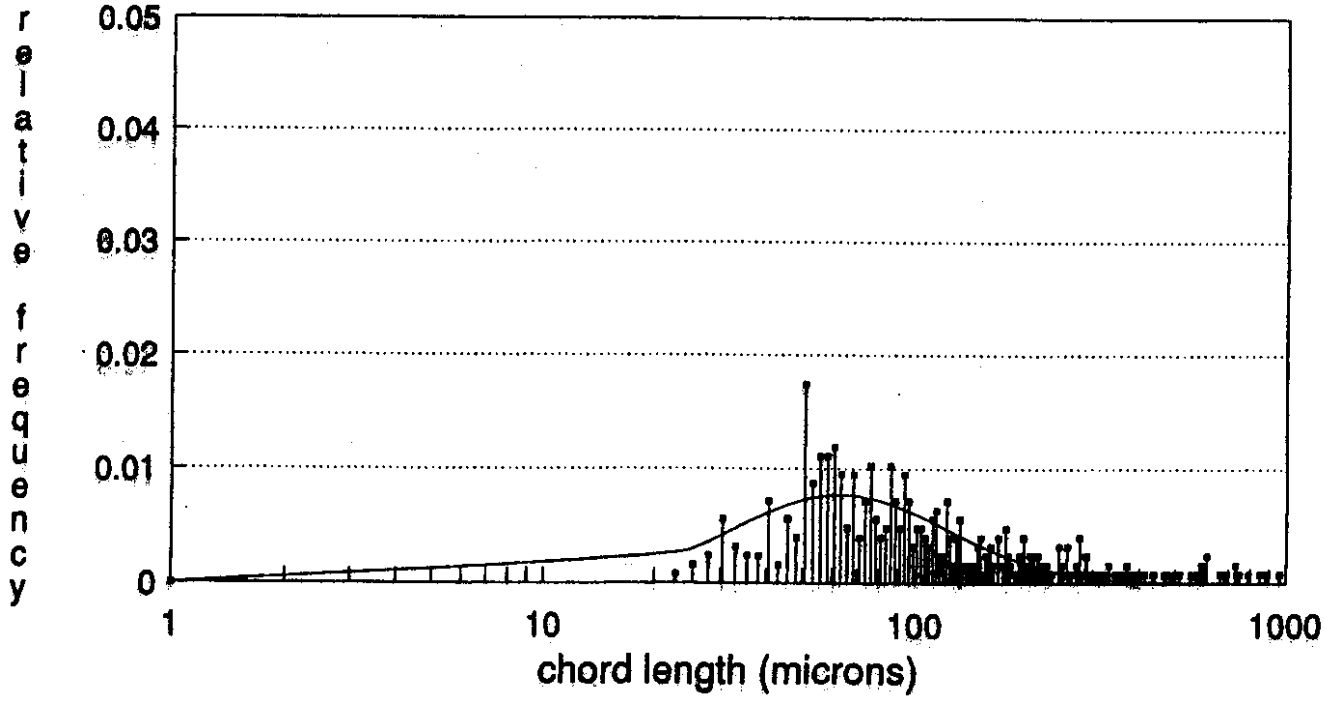
Mode = 133.87 microns
Std. Dev. = 0.5690

INPUT FILE IS P093BET.AIR

MAXIMUM CHORD SIZE INCLUDED IN ENTRAINED AIR IS 1000 MICRONS

	ENTRAINED AIR ONLY	ALL AIR < 1000	ALL AIR
CALCULATED FROM ACTUAL DATA			
TOTAL LENGTH OF TRAVERSE (MM)	2331.7		
LINEAR TRAVERSE PASTE CONTENT (%)	26.5		
MIX DESIGN PASTE CONTENT (%)	25.8		
HARDENED AIR CONTENT (%)	1.2	3.3	4.9
PASTE TO AIR RATIO (LT PASTE)	21.5	8.0	5.4
PASTE TO AIR RATIO (MIX DES.)	21.0	7.8	5.3
AVERAGE AIRVOID CHORD LENGTH (MM)	.124	.155	.220
TOTAL NUMBER OF AIRVOIDS	231.	500.	518.
VOIDS PER MM TRAVERSE	.099	.214	.222
SPACING FACTOR (LT PASTE, MM)	.275	.222	.264
SPACING FACTOR (MIX DES., MM)	.272	.219	.261
SPECIFIC SURFACE (SQ.MM/CU.MM)	32.3	25.9	18.2
CALCULATED FROM BEST FIT LOGNORMAL DISTRIBUTION			
AVERAGE AIRVOID CHORD LENGTH (MM)	.122	.122	.126
TOTAL NUMBER OF AIRVOIDS	234.	637.	902.
VOIDS PER MM TRAVERSE	.100	.273	.387
SPACING FACTOR (LT PASTE, MM)	.271	.174	.152
SPACING FACTOR (MIX DES., MM)	.268	.172	.150
SPECIFIC SURFACE (SQ.MM/CU.MM)	32.7	32.9	31.7
# OF VOIDS PER CUBIC MM	8.3	26.2	36.2
2 PHILLEO FACTOR(S) DETERMINED			
PHILLEO FACTOR AT 90.% (LT PASTE, MM)	.122	.049	.029
PHILLEO FACTOR AT 90.% (MIX DES., MM)	.120	.047	.028
PHILLEO FACTOR AT 99.% (LT PASTE, MM)	.189	.095	.070
PHILLEO FACTOR AT 99.% (MIX DES., MM)	.187	.093	.069
1 SPACING(S) FOR WHICH PHILLEO PROTECTIONS HAVE BEEN DETERMINED			
% OF PASTE WITHIN .100 MM. (LT PASTE)	83.	99.	100.
% OF PASTE WITHIN .100 MM. (MIX DES.)	84.	99.	100.

AIRVOID DISTRIBUTION
Mix P09-3
Actual Data and Best Fit Curve



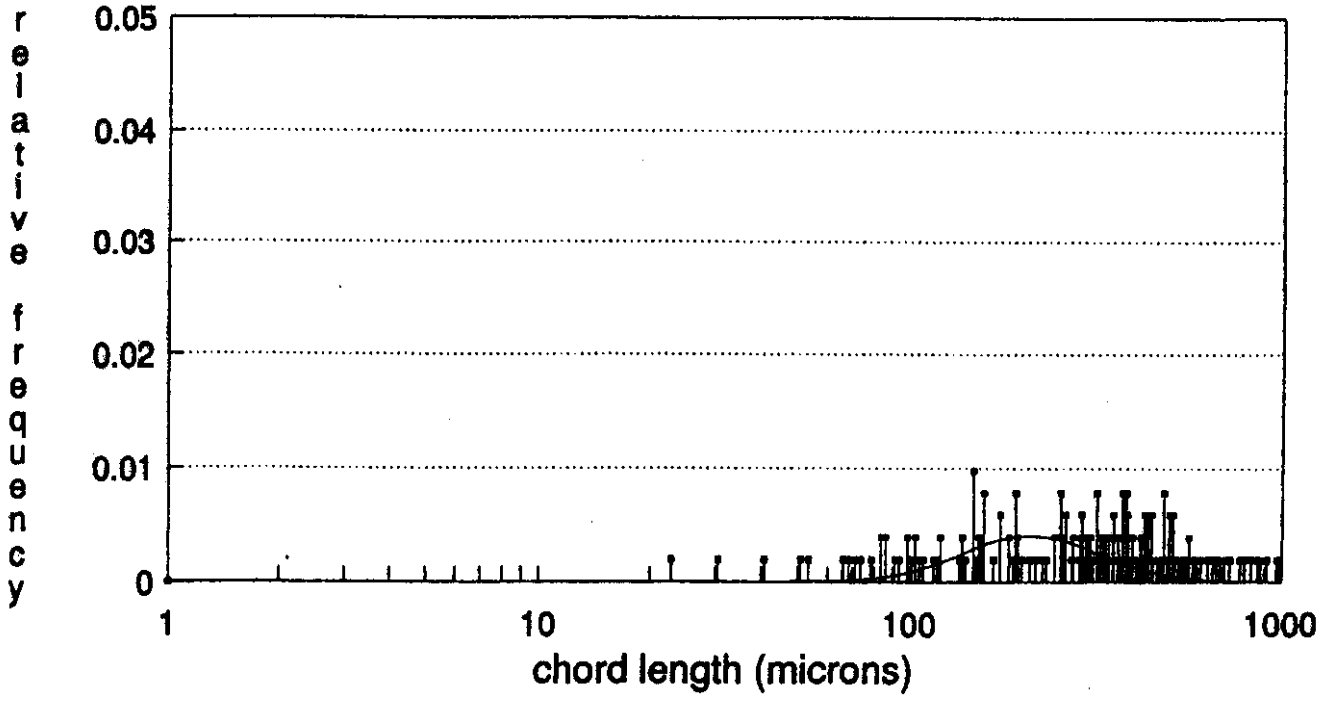
Mode = 63.123 microns
Std. Dev. = 0.6617

INPUT FILE IS p094bet.air

MAXIMUM CHORD SIZE INCLUDED IN ENTRAINED AIR IS 1000 MICRONS

	ENTRAINED AIR ONLY	ALL AIR < 1000	ALL AIR
CALCULATED FROM ACTUAL DATA			
TOTAL LENGTH OF TRAVERSE (MM)	2313.1		
LINEAR TRAVERSE PASTE CONTENT (%)	23.8		
MIX DESIGN PASTE CONTENT (%)	25.8		
HARDENED AIR CONTENT (%)	.5	3.0	4.2
PASTE TO AIR RATIO (LT PASTE)	52.0	8.0	5.7
PASTE TO AIR RATIO (MIX DES.)	56.3	8.7	6.2
AVERAGE AIRVOID CHORD LENGTH (MM)	.279	.343	.457
TOTAL NUMBER OF AIRVOIDS	38.	201.	211.
VOIDS PER MM TRAVERSE	.016	.087	.091
SPACING FACTOR (LT PASTE, MM)	.890	.491	.562
SPACING FACTOR (MIX DES., MM)	.920	.510	.584
SPECIFIC SURFACE (SQ.MM/CU.MM)	14.4	11.7	8.7
CALCULATED FROM BEST FIT LOGNORMAL DISTRIBUTION			
AVERAGE AIRVOID CHORD LENGTH (MM)	.162	.278	.286
TOTAL NUMBER OF AIRVOIDS	66.	248.	337.
VOIDS PER MM TRAVERSE	.028	.107	.146
SPACING FACTOR (LT PASTE, MM)	.516	.399	.352
SPACING FACTOR (MIX DES., MM)	.533	.414	.365
SPECIFIC SURFACE (SQ.MM/CU.MM)	24.8	14.4	14.0
# OF VOIDS PER CUBIC MM	1.4	1.4	1.8
2 PHILLEO FACTOR(S) DETERMINED			
PHILLEO FACTOR AT 90.% (LT PASTE, MM)	.274	.125	.082
PHILLEO FACTOR AT 90.% (MIX DES., MM)	.286	.136	.092
PHILLEO FACTOR AT 99.% (LT PASTE, MM)	.392	.243	.191
PHILLEO FACTOR AT 99.% (MIX DES., MM)	.408	.257	.204
1 SPACING(S) FOR WHICH PHILLEO PROTECTIONS HAVE BEEN DETERMINED			
% OF PASTE WITHIN .100 MM. (LT PASTE)	42.	86.	93.
% OF PASTE WITHIN .100 MM. (MIX DES.)	39.	84.	93.

AIRVOID DISTRIBUTION
Mix P09-4
Actual Data and Best Fit Curve



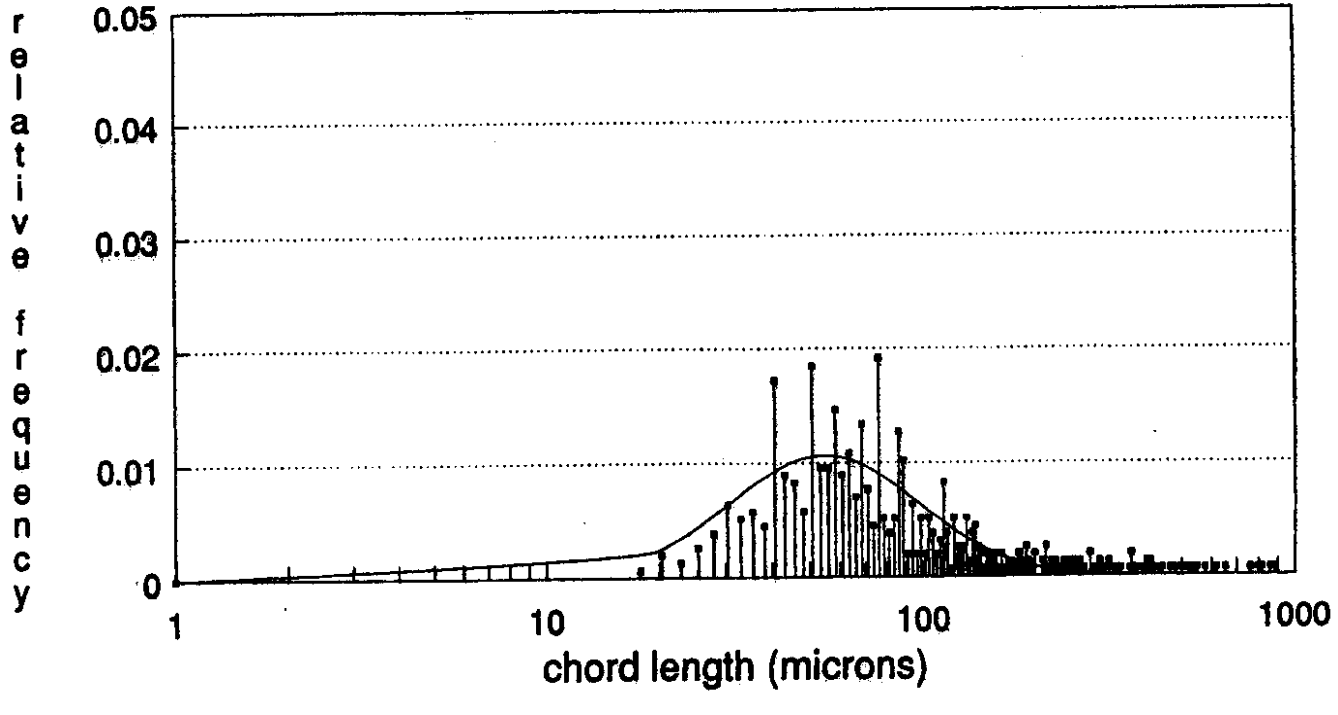
Mode = 212.69 microns
Std. Dev. = 0.4250

INPUT FILE IS P095BET.AIR

MAXIMUM CHORD SIZE INCLUDED IN ENTRAINED AIR IS 1000 MICRONS

	ENTRAINED AIR ONLY	ALL AIR < 1000	ALL AIR
CALCULATED FROM ACTUAL DATA			
TOTAL LENGTH OF TRAVERSE (MM)	2334.0		
LINEAR TRAVERSE PASTE CONTENT (%)	25.9		
MIX DESIGN PASTE CONTENT (%)	25.8		
HARDENED AIR CONTENT (%)	1.5	3.2	4.2
PASTE TO AIR RATIO (LT PASTE)	17.8	8.0	6.2
PASTE TO AIR RATIO (MIX DES.)	17.7	8.0	6.1
AVERAGE AIRVOID CHORD LENGTH (MM)	.117	.123	.157
TOTAL NUMBER OF AIRVOIDS	291.	616.	625.
VOIDS PER MM TRAVERSE	.125	.264	.268
SPACING FACTOR (LT PASTE, MM)	.238	.176	.200
SPACING FACTOR (MIX DES., MM)	.238	.176	.200
SPECIFIC SURFACE (SQ.MM/CU.MM)	34.3	32.6	25.5
CALCULATED FROM BEST FIT LOGNORMAL DISTRIBUTION			
AVERAGE AIRVOID CHORD LENGTH (MM)	.100	.090	.091
TOTAL NUMBER OF AIRVOIDS	339.	836.	1073.
VOIDS PER MM TRAVERSE	.145	.358	.460
SPACING FACTOR (LT PASTE, MM)	.205	.130	.116
SPACING FACTOR (MIX DES., MM)	.204	.129	.116
SPECIFIC SURFACE (SQ.MM/CU.MM)	39.9	44.3	43.8
# OF VOIDS PER CUBIC MM	17.5	52.4	66.4
2 PHILLEO FACTOR(S) DETERMINED			
PHILLEO FACTOR AT 90.% (LT PASTE, MM)	.088	.038	.028
PHILLEO FACTOR AT 90.% (MIX DES., MM)	.087	.038	.027
PHILLEO FACTOR AT 99.% (LT PASTE, MM)	.140	.075	.061
PHILLEO FACTOR AT 99.% (MIX DES., MM)	.140	.075	.061
1 SPACING(S) FOR WHICH PHILLEO PROTECTIONS HAVE BEEN DETERMINED			
% OF PASTE WITHIN .100 MM. (LT PASTE)	94.	100.	100.
% OF PASTE WITHIN .100 MM. (MIX DES.)	94.	100.	100.

AIRVOID DISTRIBUTION
Mix P09-5
Actual Data and Best Fit Curve



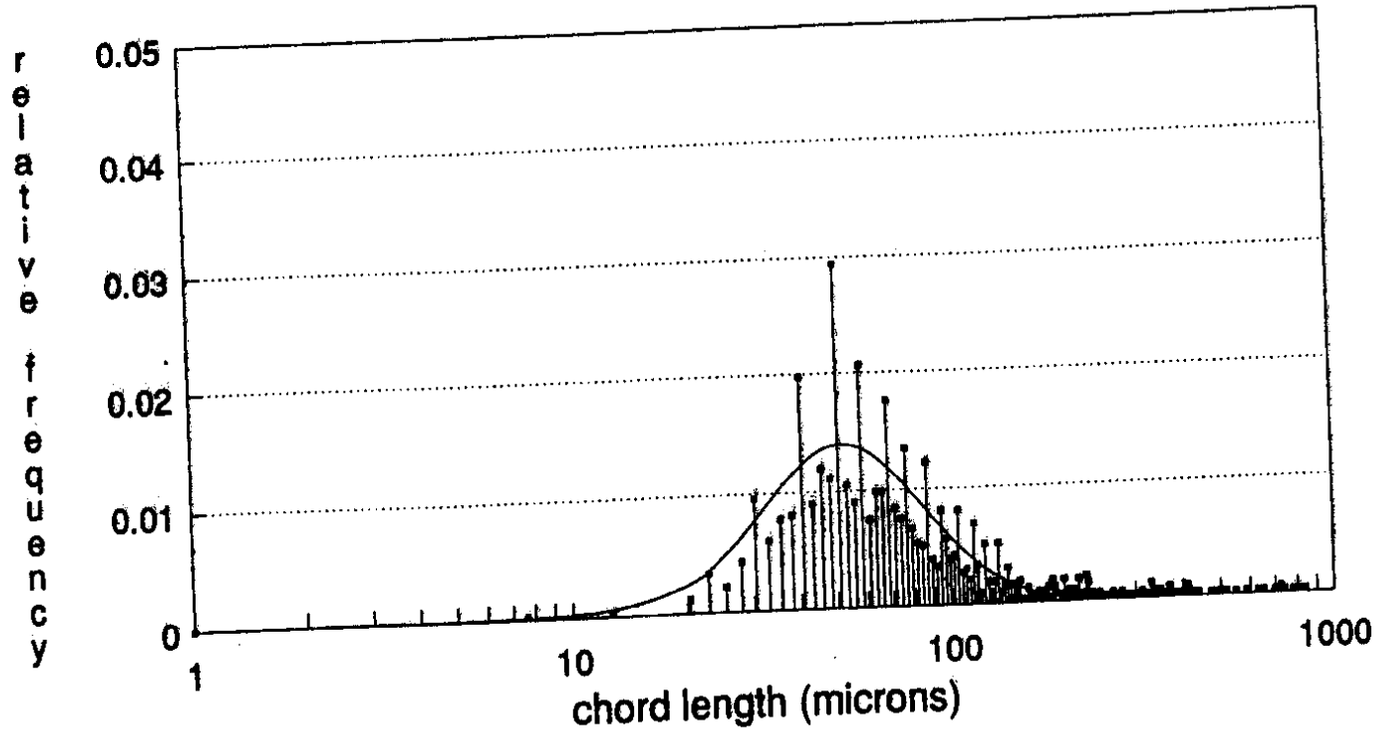
Mode = 54.849 microns
Std. Dev. = 0.5767

INPUT FILE IS P141BET.AIR

MAXIMUM CHORD SIZE INCLUDED IN ENTRAINED AIR IS 1000 MICRONS

	ENTRAINED AIR ONLY	ALL AIR < 1000	ALL AIR
CALCULATED FROM ACTUAL DATA			
TOTAL LENGTH OF TRAVERSE (MM)	2310.2		
LINEAR TRAVERSE PASTE CONTENT (%)	25.2		
MIX DESIGN PASTE CONTENT (%)	27.5		
HARDENED AIR CONTENT (%)	1.6	5.4	6.4
PASTE TO AIR RATIO (LT PASTE)	16.2	4.6	3.9
PASTE TO AIR RATIO (MIX DES.)	17.7	5.1	4.3
AVERAGE AIRVOID CHORD LENGTH (MM)	.077	.095	.112
TOTAL NUMBER OF AIRVOIDS	468.	1316.	1326.
VOIDS PER MM TRAVERSE	.203	.570	.574
SPACING FACTOR (LT PASTE, MM)	.151	.107	.110
SPACING FACTOR (MIX DES., MM)	.156	.111	.120
SPECIFIC SURFACE (SQ.MM/CU.MM)	52.1	41.9	35.6
CALCULATED FROM BEST FIT LOGNORMAL DISTRIBUTION			
AVERAGE AIRVOID CHORD LENGTH (MM)	.072	.074	.074
TOTAL NUMBER OF AIRVOIDS	496.	1693.	2000.
VOIDS PER MM TRAVERSE	.214	.733	.866
SPACING FACTOR (LT PASTE, MM)	.142	.083	.073
SPACING FACTOR (MIX DES., MM)	.148	.086	.079
SPECIFIC SURFACE (SQ.MM/CU.MM)	55.2	54.0	53.7
# OF VOIDS PER CUBIC MM	41.9	141.6	166.4
2 PHILLEO FACTOR(S) DETERMINED			
PHILLEO FACTOR AT 90.% (LT PASTE, MM)	.063	.014	.009
PHILLEO FACTOR AT 90.% (MIX DES., MM)	.067	.017	.011
PHILLEO FACTOR AT 99.% (LT PASTE, MM)	.101	.040	.034
PHILLEO FACTOR AT 99.% (MIX DES., MM)	.107	.043	.037
1 SPACING(S) FOR WHICH PHILLEO PROTECTIONS HAVE BEEN DETERMINED			
% OF PASTE WITHIN .100 MM. (LT PASTE)	99.	100.	100.
% OF PASTE WITHIN .100 MM. (MIX DES.)	98.	100.	100.

AIRVOID DISTRIBUTION
Mix P14-1
Actual Data and Best Fit Curve



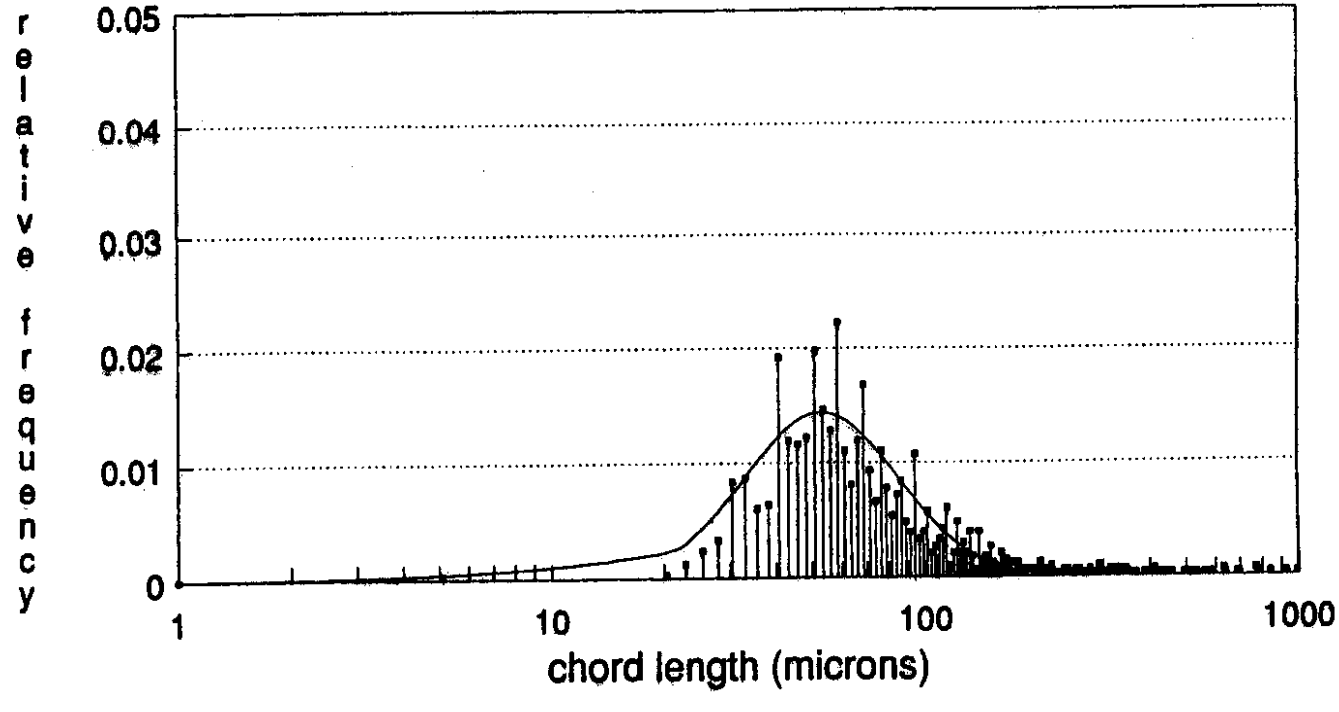
Mode = 51.870 microns
Std. Dev. = 0.4879

INPUT FILE IS P143BET.AIR

MAXIMUM CHORD SIZE INCLUDED IN ENTRAINED AIR IS 1000 MICRONS

	ENTRAINED AIR ONLY	ALL AIR < 1000	ALL AIR
CALCULATED FROM ACTUAL DATA			
TOTAL LENGTH OF TRAVERSE (MM)	2314.9		
LINEAR TRAVERSE PASTE CONTENT (%)	26.6		
MIX DESIGN PASTE CONTENT (%)	27.5		
HARDENED AIR CONTENT (%)	2.3	5.5	6.4
PASTE TO AIR RATIO (LT PASTE)	11.4	4.8	4.2
PASTE TO AIR RATIO (MIX DES.)	11.8	5.0	4.3
AVERAGE AIRVOID CHORD LENGTH (MM)	.082	.097	.111
TOTAL NUMBER OF AIRVOIDS	661.	1312.	1323.
VOIDS PER MM TRAVERSE	.286	.567	.572
SPACING FACTOR (LT PASTE, MM)	.137	.111	.116
SPACING FACTOR (MIX DES., MM)	.139	.112	.120
SPECIFIC SURFACE (SQ.MM/CU.MM)	48.9	41.2	36.0
CALCULATED FROM BEST FIT LOGNORMAL DISTRIBUTION			
AVERAGE AIRVOID CHORD LENGTH (MM)	.075	.073	.074
TOTAL NUMBER OF AIRVOIDS	723.	1737.	1998.
VOIDS PER MM TRAVERSE	.312	.751	.863
SPACING FACTOR (LT PASTE, MM)	.126	.083	.077
SPACING FACTOR (MIX DES., MM)	.127	.085	.080
SPECIFIC SURFACE (SQ.MM/CU.MM)	53.5	54.6	54.4
# OF VOIDS PER CUBIC MM	57.5	146.4	167.3
2 PHILLEO FACTOR(S) DETERMINED			
PHILLEO FACTOR AT 90.% (LT PASTE, MM)	.048	.015	.011
PHILLEO FACTOR AT 90.% (MIX DES., MM)	.049	.016	.012
PHILLEO FACTOR AT 99.% (LT PASTE, MM)	.083	.041	.036
PHILLEO FACTOR AT 99.% (MIX DES., MM)	.085	.043	.037
1 SPACING(S) FOR WHICH PHILLEO PROTECTIONS HAVE BEEN DETERMINED			
% OF PASTE WITHIN .100 MM. (LT PASTE)	100.	100.	100.
% OF PASTE WITHIN .100 MM. (MIX DES.)	100.	100.	100.

AIRVOID DISTRIBUTION
Mix P14-3
Actual Data and Best Fit Curve



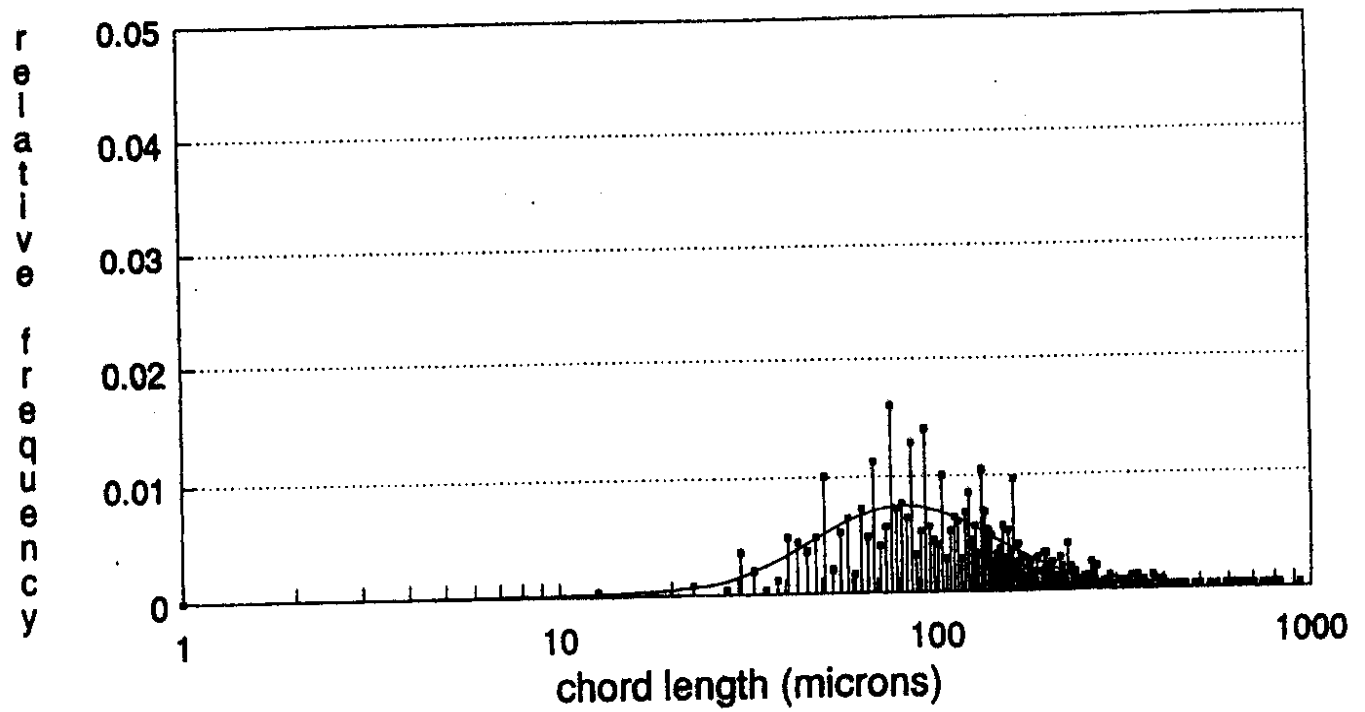
Mode = 52.704 microns
Std. Dev. = 0.4684

INPUT FILE IS P144BET.AIR

MAXIMUM CHORD SIZE INCLUDED IN ENTRAINED AIR IS 1000 MICRONS

	ENTRAINED AIR ONLY	ALL AIR < 1000	ALL AIR
CALCULATED FROM ACTUAL DATA			
TOTAL LENGTH OF TRAVERSE (MM)	2326.8		
LINEAR TRAVERSE PASTE CONTENT (%)	27.5		
MIX DESIGN PASTE CONTENT (%)	27.5		
HARDENED AIR CONTENT (%)	.7	5.9	7.6
PASTE TO AIR RATIO (LT PASTE)	39.8	4.7	3.6
PASTE TO AIR RATIO (MIX DES.)	39.8	4.7	3.6
AVERAGE AIRVOID CHORD LENGTH (MM)	.097	.140	.177
TOTAL NUMBER OF AIRVOIDS	165.	979.	1001.
VOIDS PER MM TRAVERSE	.071	.421	.430
SPACING FACTOR (LT PASTE, MM)	.279	.157	.160
SPACING FACTOR (MIX DES., MM)	.279	.157	.160
SPECIFIC SURFACE (SQ.MM/CU.MM)	41.0	28.7	22.6
CALCULATED FROM BEST FIT LOGNORMAL DISTRIBUTION			
AVERAGE AIRVOID CHORD LENGTH (MM)	.104	.131	.133
TOTAL NUMBER OF AIRVOIDS	155.	1045.	1336.
VOIDS PER MM TRAVERSE	.067	.449	.574
SPACING FACTOR (LT PASTE, MM)	.297	.147	.120
SPACING FACTOR (MIX DES., MM)	.297	.147	.120
SPECIFIC SURFACE (SQ.MM/CU.MM)	38.6	30.6	30.2
# OF VOIDS PER CUBIC MM	6.6	30.3	38.2
2 PHILLEO FACTOR(S) DETERMINED			
PHILLEO FACTOR AT 90.% (LT PASTE, MM)	.160	.024	.011
PHILLEO FACTOR AT 90.% (MIX DES., MM)	.160	.024	.011
PHILLEO FACTOR AT 99.% (LT PASTE, MM)	.234	.069	.053
PHILLEO FACTOR AT 99.% (MIX DES., MM)	.234	.069	.053
1 SPACING(S) FOR WHICH PHILLEO PROTECTIONS HAVE BEEN DETERMINED			
% OF PASTE WITHIN .100 MM. (LT PASTE)	67.	100.	100.
% OF PASTE WITHIN .100 MM. (MIX DES.)	67.	100.	100.

AIRVOID DISTRIBUTION
Mix P14-4
Actual Data and Best Fit Curve



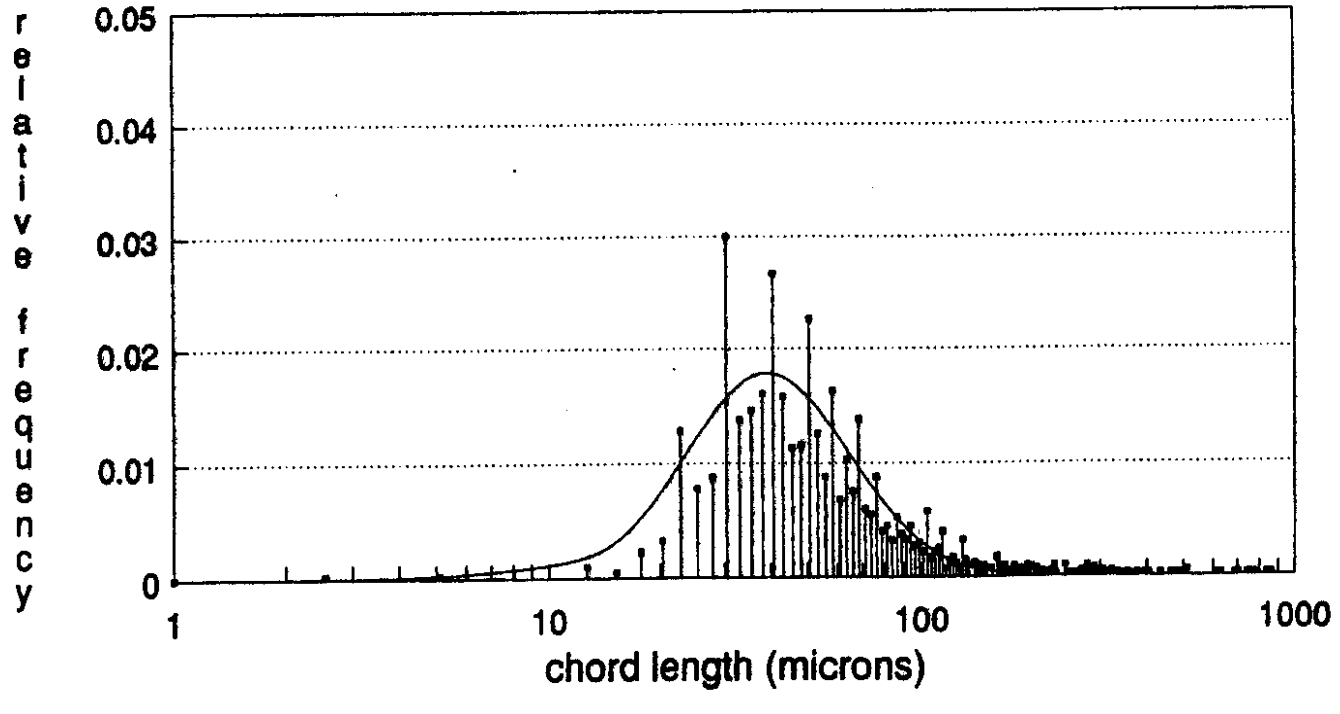
Mode = 82.142 microns
Std. Dev. = 0.5569

INPUT FILE IS P145BET.AIR

MAXIMUM CHORD SIZE INCLUDED IN ENTRAINED AIR IS 1000 MICRONS

	ENTRAINED AIR ONLY	ALL AIR < 1000	ALL AIR
CALCULATED FROM ACTUAL DATA			
TOTAL LENGTH OF TRAVERSE (MM)	2282.9		
LINEAR TRAVERSE PASTE CONTENT (%)	28.0		
MIX DESIGN PASTE CONTENT (%)	27.5		
HARDENED AIR CONTENT (%)	2.4	5.0	5.8
PASTE TO AIR RATIO (LT PASTE)	11.7	5.6	4.8
PASTE TO AIR RATIO (MIX DES.)	11.5	5.5	4.7
AVERAGE AIRVOID CHORD LENGTH (MM)	.070	.073	.084
TOTAL NUMBER OF AIRVOIDS	779.	1566.	1576.
VOIDS PER MM TRAVERSE	.341	.686	.690
SPACING FACTOR (LT PASTE, MM)	.120	.089	.096
SPACING FACTOR (MIX DES., MM)	.118	.088	.095
SPECIFIC SURFACE (SQ.MM/CU.MM)	56.8	54.9	47.6
CALCULATED FROM BEST FIT LOGNORMAL DISTRIBUTION			
AVERAGE AIRVOID CHORD LENGTH (MM)	.063	.057	.057
TOTAL NUMBER OF AIRVOIDS	865.	1997.	2309.
VOIDS PER MM TRAVERSE	.379	.875	1.011
SPACING FACTOR (LT PASTE, MM)	.108	.070	.065
SPACING FACTOR (MIX DES., MM)	.107	.069	.065
SPECIFIC SURFACE (SQ.MM/CU.MM)	63.1	70.0	69.7
# OF VOIDS PER CUBIC MM	101.8	288.1	331.7
2 PHILLEO FACTOR(S) DETERMINED			
PHILLEO FACTOR AT 90.% (LT PASTE, MM)	.041	.015	.012
PHILLEO FACTOR AT 90.% (MIX DES., MM)	.040	.015	.011
PHILLEO FACTOR AT 99.% (LT PASTE, MM)	.071	.037	.032
PHILLEO FACTOR AT 99.% (MIX DES., MM)	.070	.036	.031
1 SPACING(S) FOR WHICH PHILLEO PROTECTIONS HAVE BEEN DETERMINED			
% OF PASTE WITHIN .100 MM. (LT PASTE)	100.	100.	100.
% OF PASTE WITHIN .100 MM. (MIX DES.)	100.	100.	100.

AIRVOID DISTRIBUTION
Mix P14-5
Actual Data and Best Fit Curve



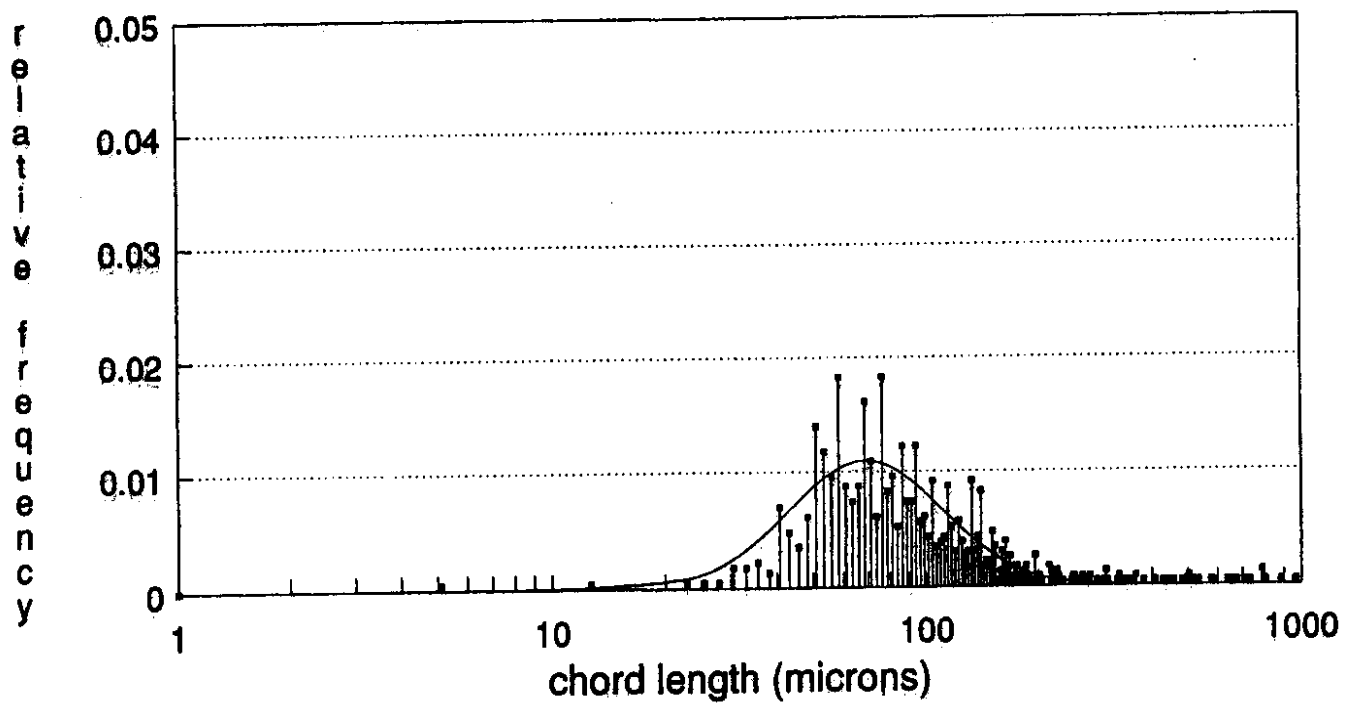
Mode = 39.187 microns
Std. Dev. = 0.5017

INPUT FILE IS P161BET.AIR

MAXIMUM CHORD SIZE INCLUDED IN ENTRAINED AIR IS 1000 MICRONS

	ENTRAINED AIR ONLY	ALL AIR < 1000	ALL AIR
CALCULATED FROM ACTUAL DATA			
TOTAL LENGTH OF TRAVERSE (MM)	2318.4		
LINEAR TRAVERSE PASTE CONTENT (%)	27.5		
MIX DESIGN PASTE CONTENT (%)	27.6		
HARDENED AIR CONTENT (%)	2.2	4.7	6.5
PASTE TO AIR RATIO (LT PASTE)	12.4	5.9	4.3
PASTE TO AIR RATIO (MIX DES.)	12.4	5.9	4.3
AVERAGE AIRVOID CHORD LENGTH (MM)	.100	.120	.163
TOTAL NUMBER OF AIRVOIDS	519.	905.	922.
VOIDS PER MM TRAVERSE	.224	.390	.398
SPACING FACTOR (LT PASTE, MM)	.173	.150	.173
SPACING FACTOR (MIX DES., MM)	.174	.150	.174
SPECIFIC SURFACE (SQ.MM/CU.MM)	40.2	33.4	24.6
CALCULATED FROM BEST FIT LOGNORMAL DISTRIBUTION			
AVERAGE AIRVOID CHORD LENGTH (MM)	.093	.096	.097
TOTAL NUMBER OF AIRVOIDS	555.	1125.	1540.
VOIDS PER MM TRAVERSE	.239	.485	.664
SPACING FACTOR (LT PASTE, MM)	.162	.120	.104
SPACING FACTOR (MIX DES., MM)	.162	.120	.104
SPECIFIC SURFACE (SQ.MM/CU.MM)	42.9	41.5	41.1
# OF VOIDS PER CUBIC MM	28.3	54.8	73.9
2 PHILLEO FACTOR(S) DETERMINED			
PHILLEO FACTOR AT 90.% (LT PASTE, MM)	.064	.028	.015
PHILLEO FACTOR AT 90.% (MIX DES., MM)	.064	.028	.015
PHILLEO FACTOR AT 99.% (LT PASTE, MM)	.110	.065	.048
PHILLEO FACTOR AT 99.% (MIX DES., MM)	.110	.065	.048
1 SPACING(S) FOR WHICH PHILLEO PROTECTIONS HAVE BEEN DETERMINED			
% OF PASTE WITHIN .100 MM. (LT PASTE)	98.	100.	100.
% OF PASTE WITHIN .100 MM. (MIX DES.)	98.	100.	100.

AIRVOID DISTRIBUTION
Mix P16-1
Actual Data and Best Fit Curve



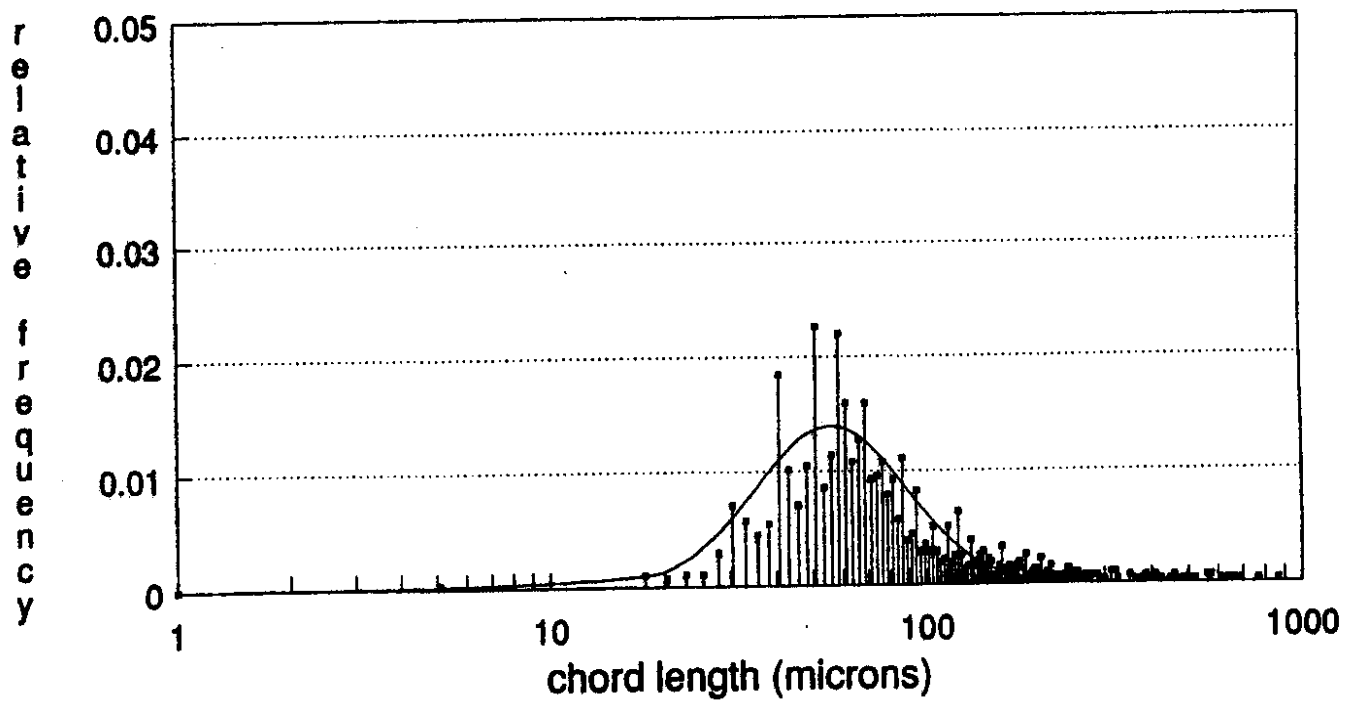
Mode = 68.969 microns
Std. Dev. = 0.4726

INPUT FILE IS p163bet.air

MAXIMUM CHORD SIZE INCLUDED IN ENTRAINED AIR IS 1000 MICRONS

	ENTRAINED AIR ONLY	ALL AIR < 1000	ALL AIR
CALCULATED FROM ACTUAL DATA			
TOTAL LENGTH OF TRAVERSE (MM)	2358.8		
LINEAR TRAVERSE PASTE CONTENT (%)	29.9		
MIX DESIGN PASTE CONTENT (%)	27.6		
HARDENED AIR CONTENT (%)	2.4	5.2	7.0
PASTE TO AIR RATIO (LT PASTE)	12.3	5.7	4.3
PASTE TO AIR RATIO (MIX DES.)	11.3	5.3	4.0
AVERAGE AIRVOID CHORD LENGTH (MM)	.087	.099	.131
TOTAL NUMBER OF AIRVOIDS	660.	1239.	1257.
VOIDS PER MM TRAVERSE	.280	.525	.533
SPACING FACTOR (LT PASTE, MM)	.151	.122	.140
SPACING FACTOR (MIX DES., MM)	.146	.118	.129
SPECIFIC SURFACE (SQ.MM/CU.MM)	45.9	40.3	30.6
CALCULATED FROM BEST FIT LOGNORMAL DISTRIBUTION			
AVERAGE AIRVOID CHORD LENGTH (MM)	.075	.076	.077
TOTAL NUMBER OF AIRVOIDS	768.	1608.	2133.
VOIDS PER MM TRAVERSE	.326	.682	.904
SPACING FACTOR (LT PASTE, MM)	.130	.094	.083
SPACING FACTOR (MIX DES., MM)	.126	.091	.076
SPECIFIC SURFACE (SQ.MM/CU.MM)	53.3	52.3	51.9
# OF VOIDS PER CUBIC MM	59.4	121.3	159.1
2 PHILLEO FACTOR(S) DETERMINED			
PHILLEO FACTOR AT 90.% (LT PASTE, MM)	.051	.021	.012
PHILLEO FACTOR AT 90.% (MIX DES., MM)	.048	.019	.010
PHILLEO FACTOR AT 99.% (LT PASTE, MM)	.088	.050	.038
PHILLEO FACTOR AT 99.% (MIX DES., MM)	.083	.047	.035
1 SPACING(S) FOR WHICH PHILLEO PROTECTIONS HAVE BEEN DETERMINED			
% OF PASTE WITHIN .100 MM. (LT PASTE)	100.	100.	100.
% OF PASTE WITHIN .100 MM. (MIX DES.)	100.	100.	100.

AIRVOID DISTRIBUTION
Mix P16-3
Actual Data and Best Fit Curve



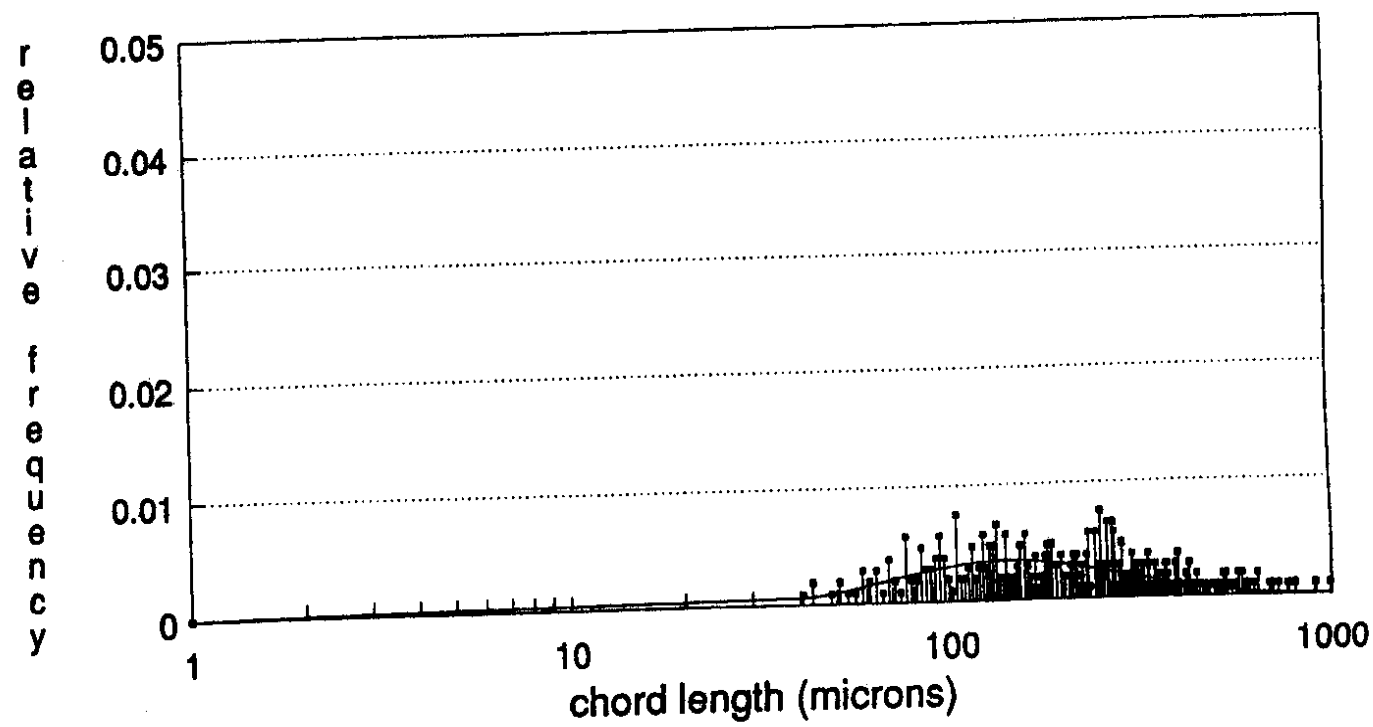
Mode = 55.596 microns
Std. Dev. = 0.4612

INPUT FILE IS p164bet.air

MAXIMUM CHORD SIZE INCLUDED IN ENTRAINED AIR IS 1000 MICRONS

	ENTRAINED AIR ONLY	ALL AIR < 1000	ALL AIR
CALCULATED FROM ACTUAL DATA			
TOTAL LENGTH OF TRAVERSE (MM)	2333.4		
LINEAR TRAVERSE PASTE CONTENT (%)	29.4		
MIX DESIGN PASTE CONTENT (%)	27.6		
HARDENED AIR CONTENT (%)	.6	4.6	5.2
PASTE TO AIR RATIO (LT PASTE)	50.6	6.4	5.6
PASTE TO AIR RATIO (MIX DES.)	47.5	6.1	5.3
AVERAGE AIRVOID CHORD LENGTH (MM)	.208	.250	.281
TOTAL NUMBER OF AIRVOIDS	65.	425.	432.
VOIDS PER MM TRAVERSE	.028	.182	.185
SPACING FACTOR (LT PASTE, MM)	.659	.326	.344
SPACING FACTOR (MIX DES., MM)	.642	.316	.335
SPECIFIC SURFACE (SQ.MM/CU.MM)	19.2	16.0	14.2
CALCULATED FROM BEST FIT LOGNORMAL DISTRIBUTION			
AVERAGE AIRVOID CHORD LENGTH (MM)	.160	.265	.267
TOTAL NUMBER OF AIRVOIDS	85.	407.	461.
VOIDS PER MM TRAVERSE	.036	.174	.197
SPACING FACTOR (LT PASTE, MM)	.506	.344	.327
SPACING FACTOR (MIX DES., MM)	.493	.335	.318
SPECIFIC SURFACE (SQ.MM/CU.MM)	25.0	15.1	15.0
# OF VOIDS PER CUBIC MM	1.5	3.3	3.7
2 PHILLEO FACTOR(S) DETERMINED			
PHILLEO FACTOR AT 90.% (LT PASTE, MM)	.286	.082	.067
PHILLEO FACTOR AT 90.% (MIX DES., MM)	.276	.075	.060
PHILLEO FACTOR AT 99.% (LT PASTE, MM)	.410	.177	.159
PHILLEO FACTOR AT 99.% (MIX DES., MM)	.398	.168	.151
1 SPACING(S) FOR WHICH PHILLEO PROTECTIONS HAVE BEEN DETERMINED			
% OF PASTE WITHIN .100 MM. (LT PASTE)	41.	93.	95.
% OF PASTE WITHIN .100 MM. (MIX DES.)	43.	94.	95.

AIRVOID DISTRIBUTION
Mix P16-4
Actual Data and Best Fit Curve



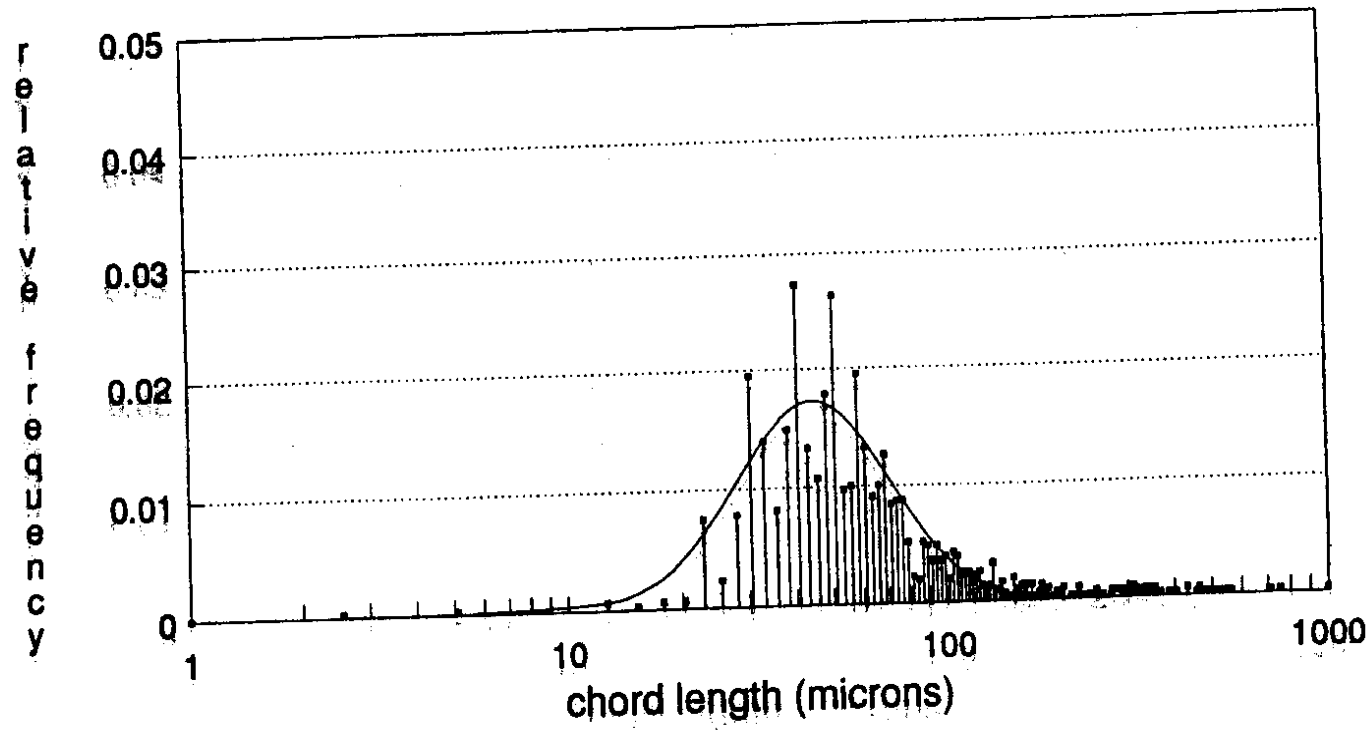
Mode = 141.11 microns
Std. Dev. = 0.6718

INPUT FILE IS P165BET.AIR

MAXIMUM CHORD SIZE INCLUDED IN ENTRAINED AIR IS 1000 MICRONS

	ENTRAINED AIR ONLY	ALL AIR < 1000	ALL AIR
CALCULATED FROM ACTUAL DATA			
TOTAL LENGTH OF TRAVERSE (MM)	2353.6		
LINEAR TRAVERSE PASTE CONTENT (%)	28.9		
MIX DESIGN PASTE CONTENT (%)	27.6		
HARDENED AIR CONTENT (%)	2.2	4.3	5.7
PASTE TO AIR RATIO (LT PASTE)	13.2	6.8	5.1
PASTE TO AIR RATIO (MIX DES.)	12.6	6.4	4.9
AVERAGE AIRVOID CHORD LENGTH (MM)	.080	.083	.109
TOTAL NUMBER OF AIRVOIDS	641.	1212.	1226.
VOIDS PER MM TRAVERSE	.272	.515	.521
SPACING FACTOR (LT PASTE, MM)	.144	.111	.127
SPACING FACTOR (MIX DES., MM)	.141	.108	.125
SPECIFIC SURFACE (SQ.MM/CU.MM)	49.7	48.1	36.7
CALCULATED FROM BEST FIT LOGNORMAL DISTRIBUTION			
AVERAGE AIRVOID CHORD LENGTH (MM)	.064	.062	.062
TOTAL NUMBER OF AIRVOIDS	806.	1640.	2160.
VOIDS PER MM TRAVERSE	.343	.697	.918
SPACING FACTOR (LT PASTE, MM)	.115	.082	.072
SPACING FACTOR (MIX DES., MM)	.112	.080	.071
SPECIFIC SURFACE (SQ.MM/CU.MM)	62.5	65.0	64.6
# OF VOIDS PER CUBIC MM	87.8	192.2	251.1
2 PHILLEO FACTOR(S) DETERMINED			
PHILLEO FACTOR AT 90.% (LT PASTE, MM)	.046	.022	.014
PHILLEO FACTOR AT 90.% (MIX DES., MM)	.044	.021	.013
PHILLEO FACTOR AT 99.% (LT PASTE, MM)	.078	.046	.037
PHILLEO FACTOR AT 99.% (MIX DES., MM)	.076	.045	.035
1 SPACING(S) FOR WHICH PHILLEO PROTECTIONS HAVE BEEN DETERMINED			
% OF PASTE WITHIN .100 MM. (LT PASTE)	100.	100.	100.
% OF PASTE WITHIN .100 MM. (MIX DES.)	100.	100.	100.

AIRVOID DISTRIBUTION
Mix P16-5
Actual Data and Best Fit Curve



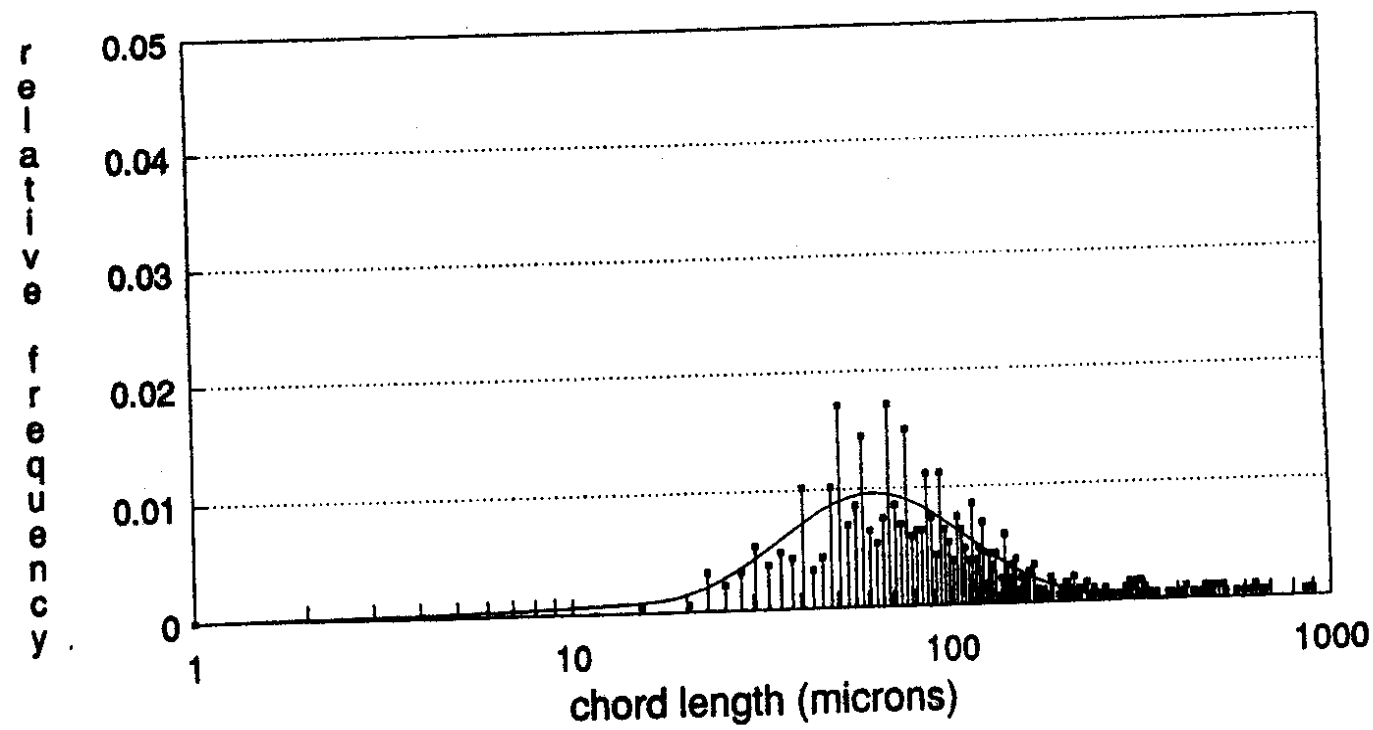
Mode = 44.439 microns
Std. Dev. = 0.4656

INPUT FILE IS p171bet.air

MAXIMUM CHORD SIZE INCLUDED IN ENTRAINED AIR IS 1000 MICRONS

	ENTRAINED AIR ONLY	ALL AIR < 1000	ALL AIR
CALCULATED FROM ACTUAL DATA			
TOTAL LENGTH OF TRAVERSE (MM)	2288.2		
LINEAR TRAVERSE PASTE CONTENT (%)	29.0		
MIX DESIGN PASTE CONTENT (%)	28.5		
HARDENED AIR CONTENT (%)	2.2	3.9	4.5
PASTE TO AIR RATIO (LT PASTE)	13.4	7.4	6.5
PASTE TO AIR RATIO (MIX DES.)	13.2	7.3	6.4
AVERAGE AIRVOID CHORD LENGTH (MM)	.109	.122	.137
TOTAL NUMBER OF AIRVOIDS	456.	735.	743.
VOIDS PER MM TRAVERSE	.199	.321	.325
SPACING FACTOR (LT PASTE, MM)	.196	.169	.179
SPACING FACTOR (MIX DES., MM)	.194	.168	.178
SPECIFIC SURFACE (SQ.MM/CU.MM)	36.9	32.7	29.1
CALCULATED FROM BEST FIT LOGNORMAL DISTRIBUTION			
AVERAGE AIRVOID CHORD LENGTH (MM)	.100	.101	.102
TOTAL NUMBER OF AIRVOIDS	497.	892.	1005.
VOIDS PER MM TRAVERSE	.217	.390	.439
SPACING FACTOR (LT PASTE, MM)	.180	.139	.133
SPACING FACTOR (MIX DES., MM)	.178	.138	.132
SPECIFIC SURFACE (SQ.MM/CU.MM)	40.1	39.7	39.4
# OF VOIDS PER CUBIC MM	25.2	44.9	50.3
2 PHILLEO FACTOR(S) DETERMINED			
PHILLEO FACTOR AT 90.% (LT PASTE, MM)	.071	.039	.033
PHILLEO FACTOR AT 90.% (MIX DES., MM)	.070	.038	.032
PHILLEO FACTOR AT 99.% (LT PASTE, MM)	.119	.079	.071
PHILLEO FACTOR AT 99.% (MIX DES., MM)	.118	.078	.070
1 SPACING(S) FOR WHICH PHILLEO PROTECTIONS HAVE BEEN DETERMINED			
% OF PASTE WITHIN .100 MM. (LT PASTE)	97.	100.	100.
% OF PASTE WITHIN .100 MM. (MIX DES.)	97.	100.	100.

AIRVOID DISTRIBUTION
Mix P17-1
Actual Data and Best Fit Curve



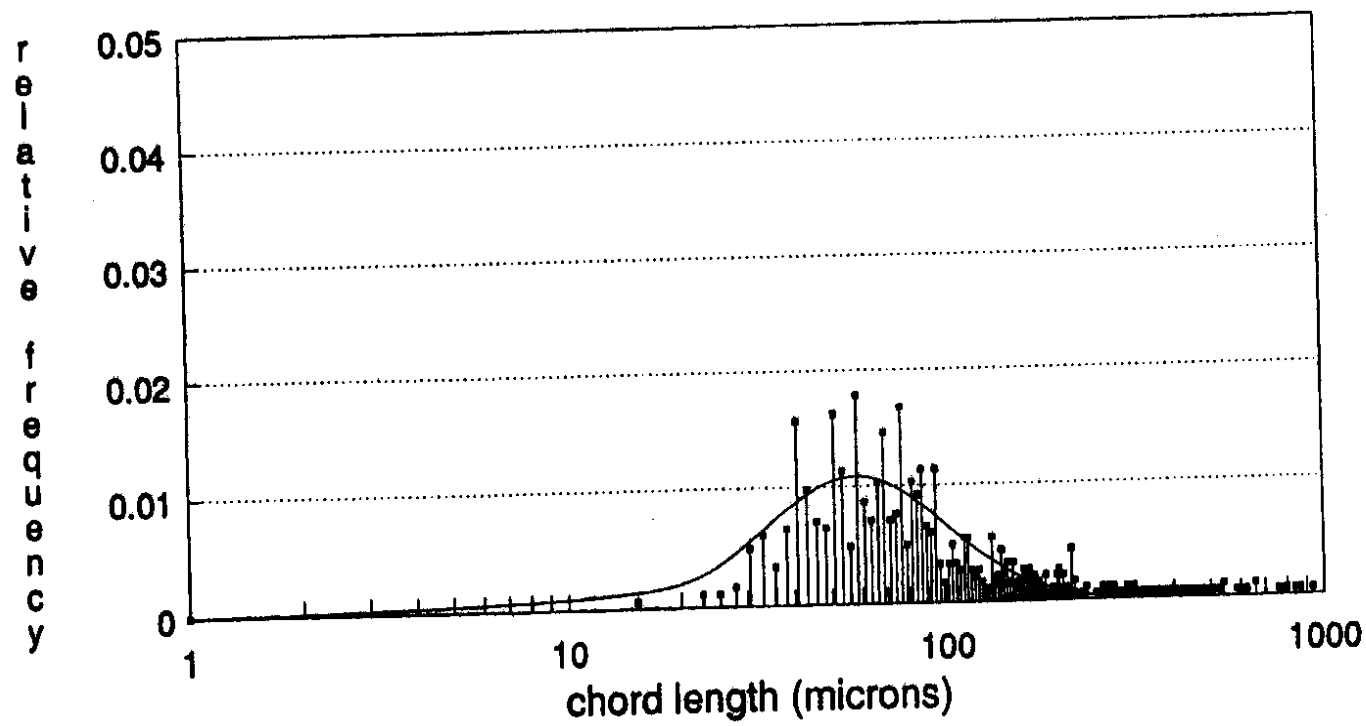
Mode = 62.338 microns
Std. Dev. = 0.5659

INPUT FILE IS p173bet.air

MAXIMUM CHORD SIZE INCLUDED IN ENTRAINED AIR IS 1000 MICRONS

	ENTRAINED AIR ONLY	ALL AIR < 1000	ALL AIR
CALCULATED FROM ACTUAL DATA			
TOTAL LENGTH OF TRAVERSE (MM)	2313.9		
LINEAR TRAVERSE PASTE CONTENT (%)	26.0		
MIX DESIGN PASTE CONTENT (%)	28.5		
HARDENED AIR CONTENT (%)	2.2	3.8	4.4
PASTE TO AIR RATIO (LT PASTE)	12.1	6.8	5.9
PASTE TO AIR RATIO (MIX DES.)	13.2	7.4	6.4
AVERAGE AIRVOID CHORD LENGTH (MM)	.103	.122	.139
TOTAL NUMBER OF AIRVOIDS	486.	728.	737.
VOIDS PER MM TRAVERSE	.210	.315	.319
SPACING FACTOR (LT PASTE, MM)	.177	.162	.174
SPACING FACTOR (MIX DES., MM)	.184	.169	.181
SPECIFIC SURFACE (SQ.MM/CU.MM)	38.9	32.8	28.7
CALCULATED FROM BEST FIT LOGNORMAL DISTRIBUTION			
AVERAGE AIRVOID CHORD LENGTH (MM)	.088	.091	.091
TOTAL NUMBER OF AIRVOIDS	569.	979.	1124.
VOIDS PER MM TRAVERSE	.246	.423	.486
SPACING FACTOR (LT PASTE, MM)	.151	.121	.114
SPACING FACTOR (MIX DES., MM)	.157	.126	.119
SPECIFIC SURFACE (SQ.MM/CU.MM)	45.6	44.1	43.7
# OF VOIDS PER CUBIC MM	35.9	58.6	66.5
2 PHILLEO FACTOR(S) DETERMINED			
PHILLEO FACTOR AT 90.% (LT PASTE, MM)	.057	.032	.026
PHILLEO FACTOR AT 90.% (MIX DES., MM)	.062	.036	.030
PHILLEO FACTOR AT 99.% (LT PASTE, MM)	.099	.067	.060
PHILLEO FACTOR AT 99.% (MIX DES., MM)	.105	.072	.064
1 SPACING(S) FOR WHICH PHILLEO PROTECTIONS HAVE BEEN DETERMINED			
% OF PASTE WITHIN .100 MM. (LT PASTE)	99.	100.	100.
% OF PASTE WITHIN .100 MM. (MIX DES.)	99.	100.	100.

AIRVOID DISTRIBUTION
Mix P17-3
Actual Data and Best Fit Curve



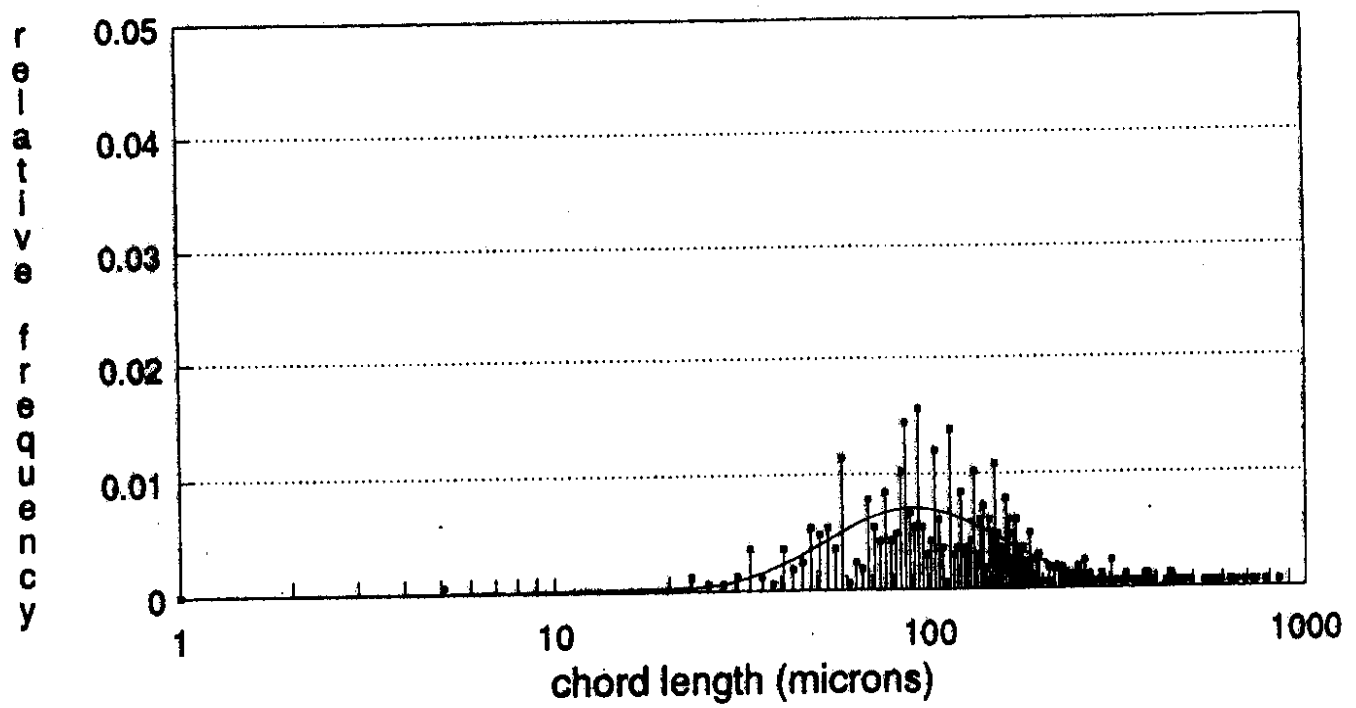
Mode = 57.956 microns
Std. Dev. = 0.5461

INPUT FILE IS p174bet.air

MAXIMUM CHORD SIZE INCLUDED IN ENTRAINED AIR IS 1000 MICRONS

	ENTRAINED AIR ONLY	ALL AIR < 1000	ALL AIR
CALCULATED FROM ACTUAL DATA			
TOTAL LENGTH OF TRAVERSE (MM)	2360.6		
LINEAR TRAVERSE PASTE CONTENT (%)	27.6		
MIX DESIGN PASTE CONTENT (%)	28.5		
HARDENED AIR CONTENT (%)	2.1	4.1	5.1
PASTE TO AIR RATIO (LT PASTE)	13.0	6.7	5.5
PASTE TO AIR RATIO (MIX DES.)	13.5	6.9	5.6
AVERAGE AIRVOID CHORD LENGTH (MM)	.131	.148	.179
TOTAL NUMBER OF AIRVOIDS	382.	656.	667.
VOIDS PER MM TRAVERSE	.162	.278	.283
SPACING FACTOR (LT PASTE, MM)	.233	.196	.216
SPACING FACTOR (MIX DES., MM)	.236	.199	.219
SPECIFIC SURFACE (SQ.MM/CU.MM)	30.6	27.0	22.4
CALCULATED FROM BEST FIT LOGNORMAL DISTRIBUTION			
AVERAGE AIRVOID CHORD LENGTH (MM)	.139	.140	.142
TOTAL NUMBER OF AIRVOIDS	359.	694.	843.
VOIDS PER MM TRAVERSE	.152	.294	.357
SPACING FACTOR (LT PASTE, MM)	.248	.185	.171
SPACING FACTOR (MIX DES., MM)	.251	.188	.173
SPECIFIC SURFACE (SQ.MM/CU.MM)	28.8	28.5	28.3
# OF VOIDS PER CUBIC MM	8.5	16.8	20.2
2 PHILLEO FACTOR(S) DETERMINED			
PHILLEO FACTOR AT 90.% (LT PASTE, MM)	.099	.049	.036
PHILLEO FACTOR AT 90.% (MIX DES., MM)	.101	.051	.038
PHILLEO FACTOR AT 99.% (LT PASTE, MM)	.167	.103	.087
PHILLEO FACTOR AT 99.% (MIX DES., MM)	.170	.105	.089
1 SPACING(S) FOR WHICH PHILLEO PROTECTIONS HAVE BEEN DETERMINED			
% OF PASTE WITHIN .100 MM. (LT PASTE)	90.	99.	100.
% OF PASTE WITHIN .100 MM. (MIX DES.)	90.	99.	100.

AIRVOID DISTRIBUTION
Mix P17-4
Actual Data and Best Fit Curve



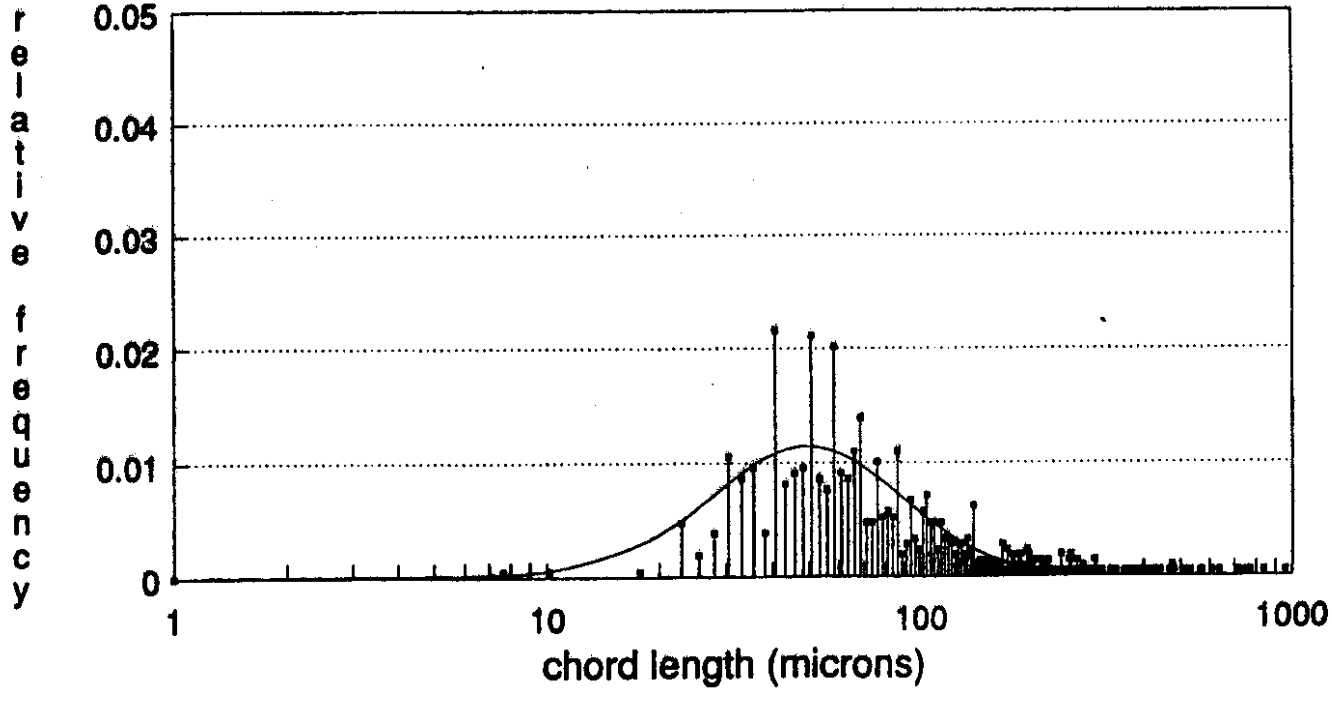
Mode = 90.991 microns
Std. Dev. = 0.5367

INPUT FILE IS p175bet.air

MAXIMUM CHORD SIZE INCLUDED IN ENTRAINED AIR IS 1000 MICRONS

	ENTRAINED AIR ONLY	ALL AIR < 1000	ALL AIR
CALCULATED FROM ACTUAL DATA			
TOTAL LENGTH OF TRAVERSE (MM)	2324.6		
LINEAR TRAVERSE PASTE CONTENT (%)	26.4		
MIX DESIGN PASTE CONTENT (%)	28.5		
HARDENED AIR CONTENT (%)	2.3	3.8	4.5
PASTE TO AIR RATIO (LT PASTE)	11.3	6.9	5.8
PASTE TO AIR RATIO (MIX DES.)	12.2	7.5	6.3
AVERAGE AIRVOID CHORD LENGTH (MM)	.104	.108	.127
TOTAL NUMBER OF AIRVOIDS	525.	821.	829.
VOIDS PER MM TRAVERSE	.226	.353	.357
SPACING FACTOR (LT PASTE, MM)	.173	.145	.158
SPACING FACTOR (MIX DES., MM)	.179	.150	.163
SPECIFIC SURFACE (SQ.MM/CU.MM)	38.6	37.0	31.5
CALCULATED FROM BEST FIT LOGNORMAL DISTRIBUTION			
AVERAGE AIRVOID CHORD LENGTH (MM)	.086	.083	.084
TOTAL NUMBER OF AIRVOIDS	631.	1067.	1254.
VOIDS PER MM TRAVERSE	.271	.459	.539
SPACING FACTOR (LT PASTE, MM)	.144	.112	.104
SPACING FACTOR (MIX DES., MM)	.149	.116	.108
SPECIFIC SURFACE (SQ.MM/CU.MM)	46.3	48.0	47.7
# OF VOIDS PER CUBIC MM	45.6	80.9	94.6
2 PHILLEO FACTOR(S) DETERMINED			
PHILLEO FACTOR AT 90.% (LT PASTE, MM)	.051	.029	.023
PHILLEO FACTOR AT 90.% (MIX DES., MM)	.055	.032	.026
PHILLEO FACTOR AT 99.% (LT PASTE, MM)	.090	.061	.053
PHILLEO FACTOR AT 99.% (MIX DES., MM)	.094	.065	.057
1 SPACING(S) FOR WHICH PHILLEO PROTECTIONS HAVE BEEN DETERMINED			
% OF PASTE WITHIN .100 MM. (LT PASTE)	100.	100.	100.
% OF PASTE WITHIN .100 MM. (MIX DES.)	99.	100.	100.

AIRVOID DISTRIBUTION
Mix P17-5
Actual Data and Best Fit Curve



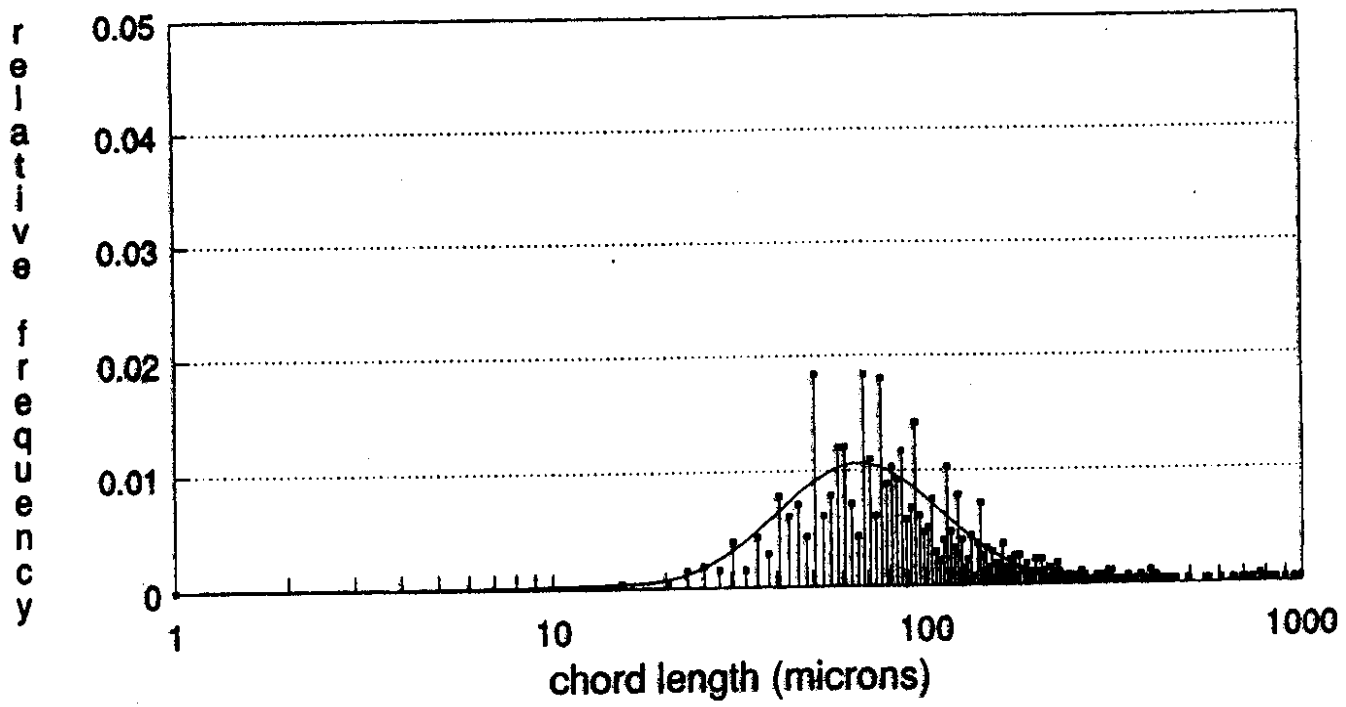
Mode = 49.340 microns
Std. Dev. = 0.5907

INPUT FILE IS P181BET.AIR

MAXIMUM CHORD SIZE INCLUDED IN ENTRAINED AIR IS 1000 MICRONS

	ENTRAINED AIR ONLY	ALL AIR < 1000	ALL AIR
CALCULATED FROM ACTUAL DATA			
TOTAL LENGTH OF TRAVERSE (MM)	2299.3		
LINEAR TRAVERSE PASTE CONTENT (%)	28.7		
MIX DESIGN PASTE CONTENT (%)	27.1		
HARDENED AIR CONTENT (%)	2.5	5.7	7.7
PASTE TO AIR RATIO (LT PASTE)	11.6	5.0	3.7
PASTE TO AIR RATIO (MIX DES.)	11.0	4.7	3.5
AVERAGE AIRVOID CHORD LENGTH (MM)	.095	.119	.156
TOTAL NUMBER OF AIRVOIDS	596.	1112.	1133.
VOIDS PER MM TRAVERSE	.259	.484	.493
SPACING FACTOR (LT PASTE, MM)	.162	.138	.146
SPACING FACTOR (MIX DES., MM)	.158	.134	.137
SPECIFIC SURFACE (SQ.MM/CU.MM)	41.9	33.7	25.6
CALCULATED FROM BEST FIT LOGNORMAL DISTRIBUTION			
AVERAGE AIRVOID CHORD LENGTH (MM)	.092	.097	.098
TOTAL NUMBER OF AIRVOIDS	616.	1367.	1815.
VOIDS PER MM TRAVERSE	.268	.594	.789
SPACING FACTOR (LT PASTE, MM)	.156	.112	.091
SPACING FACTOR (MIX DES., MM)	.152	.109	.086
SPECIFIC SURFACE (SQ.MM/CU.MM)	43.3	41.4	41.0
# OF VOIDS PER CUBIC MM	32.6	68.4	89.6
2 PHILLEO FACTOR(S) DETERMINED			
PHILLEO FACTOR AT 90.% (LT PASTE, MM)	.060	.021	.010
PHILLEO FACTOR AT 90.% (MIX DES., MM)	.057	.019	.008
PHILLEO FACTOR AT 99.% (LT PASTE, MM)	.104	.056	.041
PHILLEO FACTOR AT 99.% (MIX DES., MM)	.100	.053	.039
1 SPACING(S) FOR WHICH PHILLEO PROTECTIONS HAVE BEEN DETERMINED			
% OF PASTE WITHIN .100 MM. (LT PASTE)	99.	100.	100.
% OF PASTE WITHIN .100 MM. (MIX DES.)	99.	100.	100.

AIRVOID DISTRIBUTION
Mix P18-1
Actual Data and Best Fit Curve



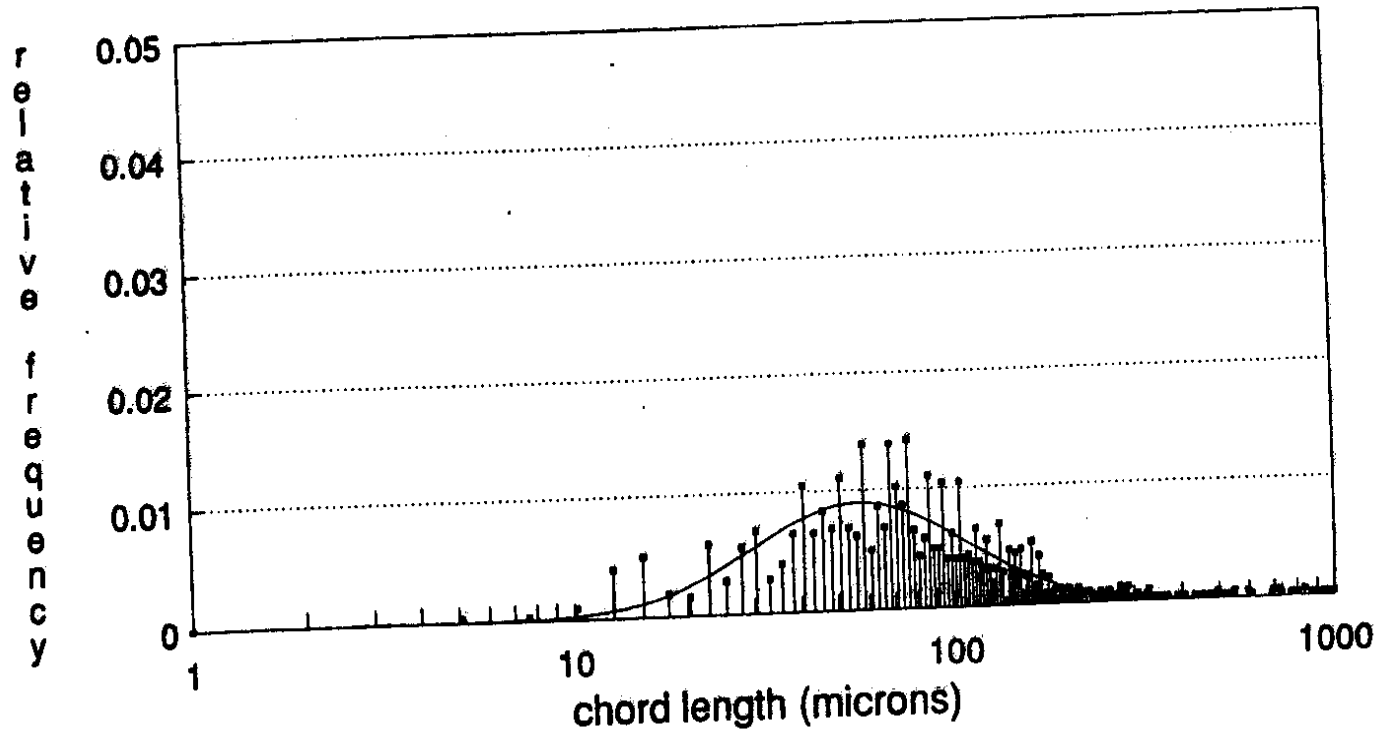
Mode = 66.490 microns
Std. Dev. = 0.4987

INPUT FILE IS P18-3T.AIR

MAXIMUM CHORD SIZE INCLUDED IN ENTRAINED AIR IS 1000 MICRONS

	ENTRAINED AIR ONLY	ALL AIR < 1000	ALL AIR
CALCULATED FROM ACTUAL DATA			
TOTAL LENGTH OF TRAVERSE (MM)	2381.6		
LINEAR TRAVERSE PASTE CONTENT (%)	26.8		
MIX DESIGN PASTE CONTENT (%)	27.1		
HARDENED AIR CONTENT (%)	5.6	6.1	6.8
PASTE TO AIR RATIO (LT PASTE)	4.8	4.4	3.9
PASTE TO AIR RATIO (MIX DES.)	4.8	4.5	4.0
AVERAGE AIRVOID CHORD LENGTH (MM)	.106	.113	.127
TOTAL NUMBER OF AIRVOIDS	1260.	1278.	1287.
VOIDS PER MM TRAVERSE	.529	.537	.540
SPACING FACTOR (LT PASTE, MM)	.120	.124	.124
SPACING FACTOR (MIX DES., MM)	.121	.124	.125
SPECIFIC SURFACE (SQ.MM/CU.MM)	37.6	35.3	31.6
CALCULATED FROM BEST FIT LOGNORMAL DISTRIBUTION			
AVERAGE AIRVOID CHORD LENGTH (MM)	.104	.105	.106
TOTAL NUMBER OF AIRVOIDS	1293.	1380.	1543.
VOIDS PER MM TRAVERSE	.543	.579	.648
SPACING FACTOR (LT PASTE, MM)	.117	.115	.103
SPACING FACTOR (MIX DES., MM)	.118	.115	.105
SPECIFIC SURFACE (SQ.MM/CU.MM)	38.6	38.1	37.9
# OF VOIDS PER CUBIC MM	66.6	71.0	79.1
2 PHILLEO FACTOR(S) DETERMINED			
PHILLEO FACTOR AT 90.% (LT PASTE, MM)	.019	.016	.012
PHILLEO FACTOR AT 90.% (MIX DES., MM)	.020	.017	.012
PHILLEO FACTOR AT 99.% (LT PASTE, MM)	.053	.050	.044
PHILLEO FACTOR AT 99.% (MIX DES., MM)	.054	.050	.044
1 SPACING(S) FOR WHICH PHILLEO PROTECTIONS HAVE BEEN DETERMINED			
% OF PASTE WITHIN .100 MM. (LT PASTE)	100.	100.	100.
% OF PASTE WITHIN .100 MM. (MIX DES.)	100.	100.	100.

AIRVOID DISTRIBUTION
Mix P18-3
Actual Data and Best Fit Curve



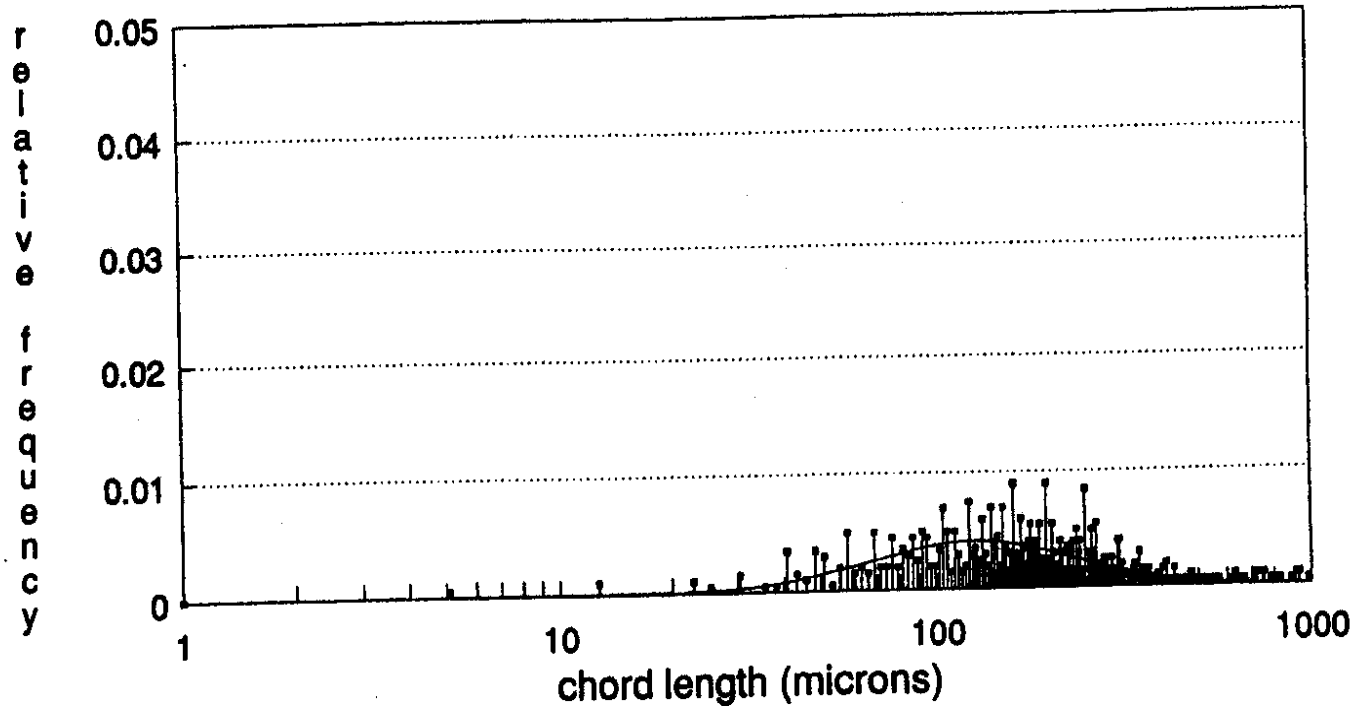
Mode = 56.936 microns
Std. Dev. = 0.6389

INPUT FILE IS P184DJT.AIR

MAXIMUM CHORD SIZE INCLUDED IN ENTRAINED AIR IS 1000 MICRONS

	ENTRAINED AIR ONLY	ALL AIR < 1000	ALL AIR
CALCULATED FROM ACTUAL DATA			
TOTAL LENGTH OF TRAVERSE (MM)	2430.0		
LINEAR TRAVERSE PASTE CONTENT (%)	23.3		
MIX DESIGN PASTE CONTENT (%)	27.1		
HARDENED AIR CONTENT (%)	6.1	6.8	8.6
PASTE TO AIR RATIO (LT PASTE)	3.8	3.4	2.7
PASTE TO AIR RATIO (MIX DES.)	4.5	4.0	3.1
AVERAGE AIRVOID CHORD LENGTH (MM)	.195	.209	.258
TOTAL NUMBER OF AIRVOIDS	755.	794.	813.
VOIDS PER MM TRAVERSE	.311	.327	.335
SPACING FACTOR (LT PASTE, MM)	.187	.178	.174
SPACING FACTOR (MIX DES., MM)	.214	.207	.203
SPECIFIC SURFACE (SQ.MM/CU.MM)	20.5	19.2	15.5
CALCULATED FROM BEST FIT LOGNORMAL DISTRIBUTION			
AVERAGE AIRVOID CHORD LENGTH (MM)	.220	.227	.230
TOTAL NUMBER OF AIRVOIDS	669.	734.	915.
VOIDS PER MM TRAVERSE	.275	.302	.376
SPACING FACTOR (LT PASTE, MM)	.212	.193	.155
SPACING FACTOR (MIX DES., MM)	.243	.225	.181
SPECIFIC SURFACE (SQ.MM/CU.MM)	18.1	17.6	17.4
# OF VOIDS PER CUBIC MM	6.9	7.6	9.3
2 PHILLEO FACTOR(S) DETERMINED			
PHILLEO FACTOR AT 90.% (LT PASTE, MM)	.024	.015	-.003
PHILLEO FACTOR AT 90.% (MIX DES., MM)	.037	.027	.008
PHILLEO FACTOR AT 99.% (LT PASTE, MM)	.094	.083	.061
PHILLEO FACTOR AT 99.% (MIX DES., MM)	.109	.097	.074
1 SPACING(S) FOR WHICH PHILLEO PROTECTIONS HAVE BEEN DETERMINED			
% OF PASTE WITHIN .100 MM. (LT PASTE)	99.	100.	100.
% OF PASTE WITHIN .100 MM. (MIX DES.)	99.	99.	100.

AIRVOID DISTRIBUTION
Mix P18-4
Actual Data and Best Fit Curve



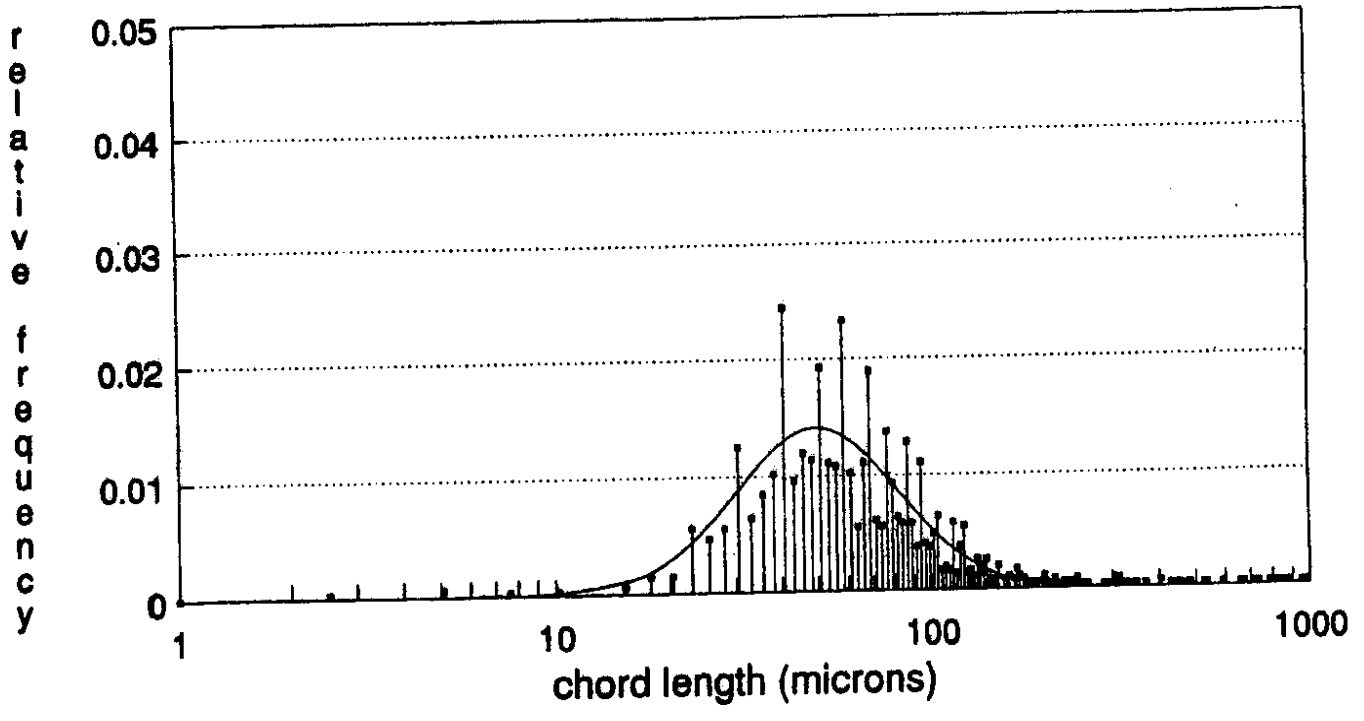
Mode = 126.23 microns
Std. Dev. = 0.6351

INPUT FILE IS p185bet.air

MAXIMUM CHORD SIZE INCLUDED IN ENTRAINED AIR IS 1000 MICRONS

	ENTRAINED AIR ONLY	ALL AIR < 1000	ALL AIR
CALCULATED FROM ACTUAL DATA			
TOTAL LENGTH OF TRAVERSE (MM)	2328.5		
LINEAR TRAVERSE PASTE CONTENT (%)	27.7		
MIX DESIGN PASTE CONTENT (%)	27.1		
HARDENED AIR CONTENT (%)	2.8	4.9	5.4
PASTE TO AIR RATIO (LT PASTE)	9.7	5.7	5.1
PASTE TO AIR RATIO (MIX DES.)	9.5	5.5	5.0
AVERAGE AIRVOID CHORD LENGTH (MM)	.082	.084	.092
TOTAL NUMBER OF AIRVOIDS	814.	1355.	1363.
VOIDS PER MM TRAVERSE	.350	.582	.585
SPACING FACTOR (LT PASTE, MM)	.128	.103	.108
SPACING FACTOR (MIX DES., MM)	.126	.102	.107
SPECIFIC SURFACE (SQ.MM/CU.MM)	49.1	47.6	43.3
CALCULATED FROM BEST FIT LOGNORMAL DISTRIBUTION			
AVERAGE AIRVOID CHORD LENGTH (MM)	.074	.073	.073
TOTAL NUMBER OF AIRVOIDS	899.	1569.	1732.
VOIDS PER MM TRAVERSE	.386	.674	.744
SPACING FACTOR (LT PASTE, MM)	.116	.089	.085
SPACING FACTOR (MIX DES., MM)	.114	.088	.084
SPECIFIC SURFACE (SQ.MM/CU.MM)	54.2	55.2	55.0
# OF VOIDS PER CUBIC MM	75.3	138.2	151.9
2 PHILLEO FACTOR(S) DETERMINED			
PHILLEO FACTOR AT 90.% (LT PASTE, MM)	.040	.020	.017
PHILLEO FACTOR AT 90.% (MIX DES., MM)	.039	.019	.016
PHILLEO FACTOR AT 99.% (LT PASTE, MM)	.073	.047	.043
PHILLEO FACTOR AT 99.% (MIX DES., MM)	.072	.046	.042
1 SPACING(S) FOR WHICH PHILLEO PROTECTIONS HAVE BEEN DETERMINED			
% OF PASTE WITHIN .100 MM. (LT PASTE)	100.	100.	100.
% OF PASTE WITHIN .100 MM. (MIX DES.)	100.	100.	100.

AIRVOID DISTRIBUTION
Mix P18-5
Actual Data and Best Fit Curve



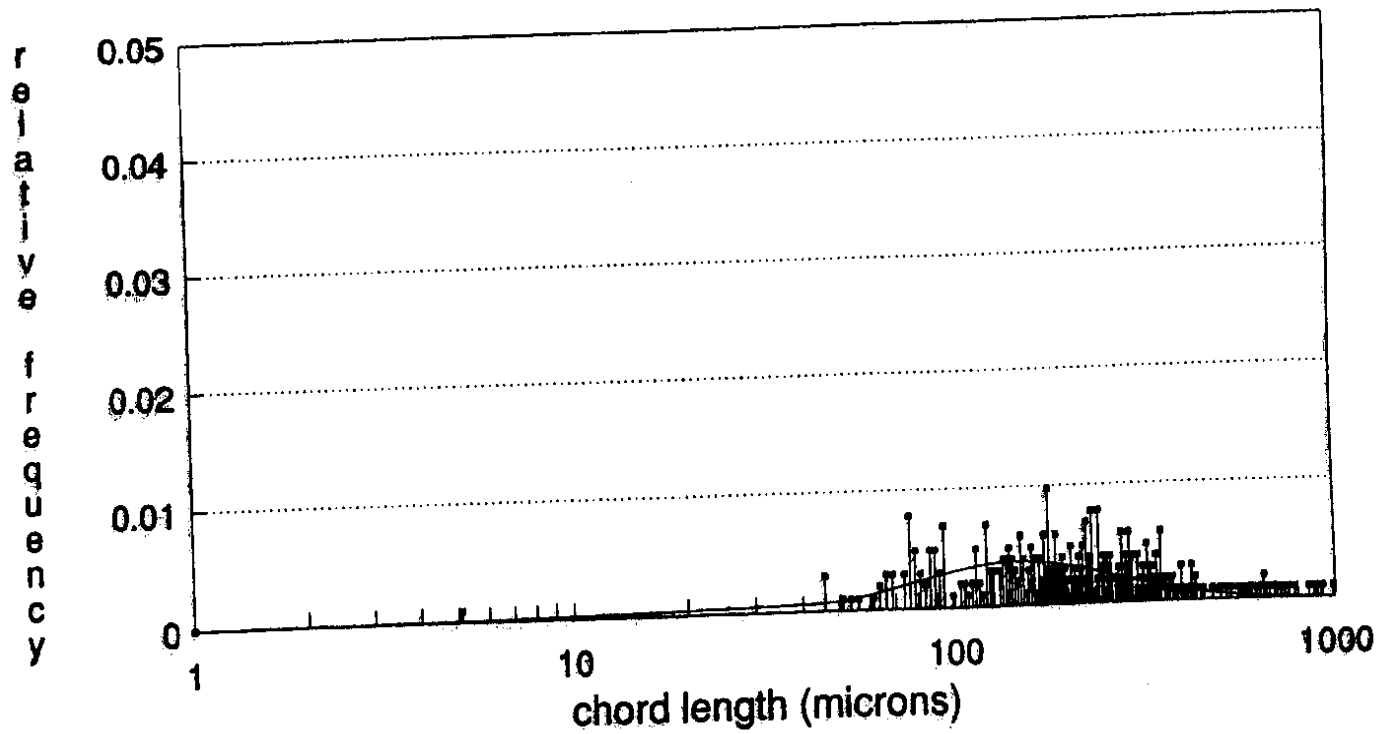
Mode = 49.563 microns
Std. Dev. = 0.5036

INPUT FILE IS P201BET.AIR

MAXIMUM CHORD SIZE INCLUDED IN ENTRAINED AIR IS 1000 MICRONS

	ENTRAINED AIR ONLY	ALL AIR < 1000	ALL AIR
CALCULATED FROM ACTUAL DATA			
TOTAL LENGTH OF TRAVERSE (MM)	2312.9		
LINEAR TRAVERSE PASTE CONTENT (%)	24.5		
MIX DESIGN PASTE CONTENT (%)	27.1		
HARDENED AIR CONTENT (%)	.5	4.3	5.3
PASTE TO AIR RATIO (LT PASTE)	51.2	5.8	4.6
PASTE TO AIR RATIO (MIX DES.)	56.6	6.4	5.1
AVERAGE AIRVOID CHORD LENGTH (MM)	.191	.243	.295
TOTAL NUMBER OF AIRVOIDS	58.	404.	417.
VOIDS PER MM TRAVERSE	.025	.175	.180
SPACING FACTOR (LT PASTE, MM)	.606	.301	.329
SPACING FACTOR (MIX DES., MM)	.631	.315	.345
SPECIFIC SURFACE (SQ.MM/CU.MM)	21.0	16.4	13.6
CALCULATED FROM BEST FIT LOGNORMAL DISTRIBUTION			
AVERAGE AIRVOID CHORD LENGTH (MM)	.173	.252	.256
TOTAL NUMBER OF AIRVOIDS	64.	393.	484.
VOIDS PER MM TRAVERSE	.028	.170	.209
SPACING FACTOR (LT PASTE, MM)	.550	.311	.285
SPACING FACTOR (MIX DES., MM)	.572	.325	.299
SPECIFIC SURFACE (SQ.MM/CU.MM)	23.1	15.9	15.6
# OF VOIDS PER CUBIC MM	.9	3.3	4.0
2 PHILLEO FACTOR(S) DETERMINED			
PHILLEO FACTOR AT 90.% (LT PASTE, MM)	.314	.068	.046
PHILLEO FACTOR AT 90.% (MIX DES., MM)	.331	.079	.055
PHILLEO FACTOR AT 99.% (LT PASTE, MM)	.450	.159	.131
PHILLEO FACTOR AT 99.% (MIX DES., MM)	.472	.172	.143
1 SPACING(S) FOR WHICH PHILLEO PROTECTIONS HAVE BEEN DETERMINED			
% OF PASTE WITHIN .100 MM. (LT PASTE)	38.	95.	97.
% OF PASTE WITHIN .100 MM. (MIX DES.)	35.	94.	97.

AIRVOID DISTRIBUTION
Mix P20-1
Actual Data and Best Fit Curve



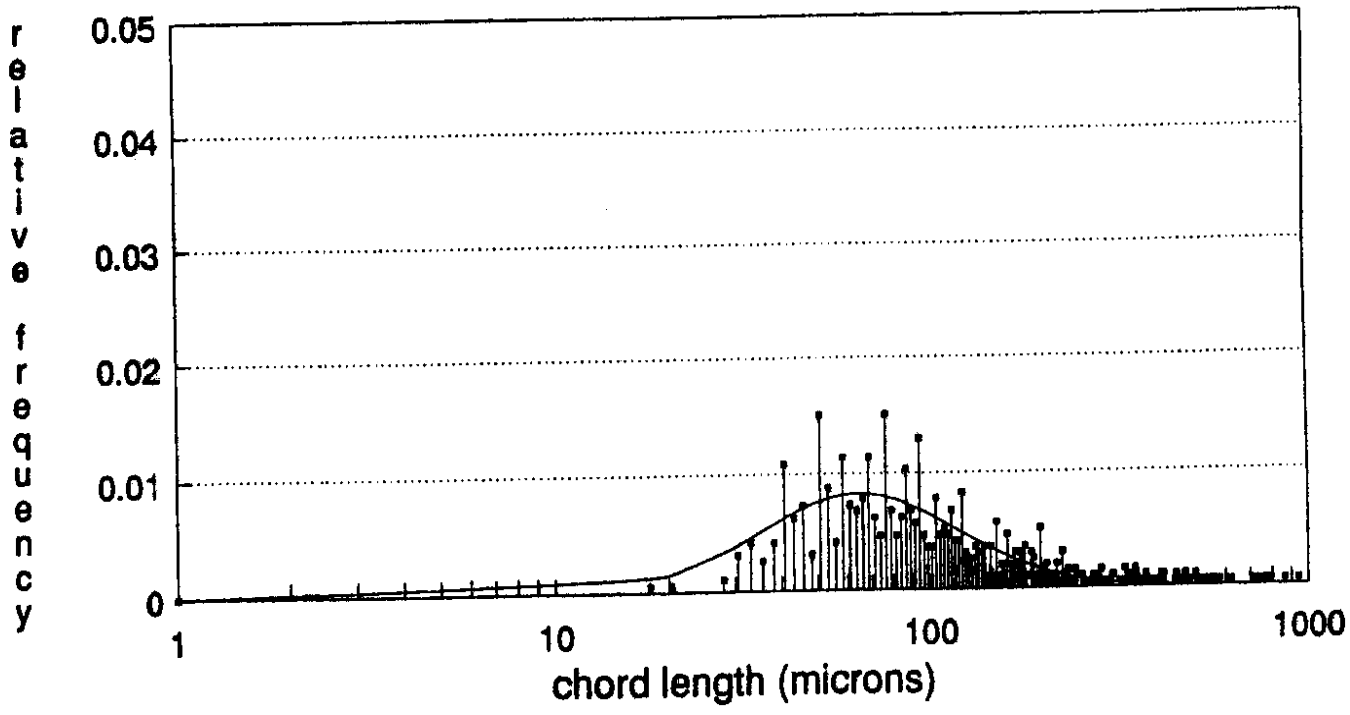
Mode = 146.57 microns
Std. Dev. = 0.6127

INPUT FILE IS P203BET.AIR

MAXIMUM CHORD SIZE INCLUDED IN ENTRAINED AIR IS 1000 MICRONS

	ENTRAINED AIR ONLY	ALL AIR < 1000	ALL AIR
CALCULATED FROM ACTUAL DATA			
TOTAL LENGTH OF TRAVERSE (MM)	2321.1		
LINEAR TRAVERSE PASTE CONTENT (%)	27.6		
MIX DESIGN PASTE CONTENT (%)	27.1		
HARDENED AIR CONTENT (%)	.8	4.4	5.7
PASTE TO AIR RATIO (LT PASTE)	32.9	6.2	4.8
PASTE TO AIR RATIO (MIX DES.)	32.3	6.1	4.8
AVERAGE AIRVOID CHORD LENGTH (MM)	.105	.136	.171
TOTAL NUMBER OF AIRVOIDS	186.	758.	771.
VOIDS PER MM TRAVERSE	.080	.327	.332
SPACING FACTOR (LT PASTE, MM)	.277	.174	.196
SPACING FACTOR (MIX DES., MM)	.275	.173	.194
SPECIFIC SURFACE (SQ.MM/CU.MM)	38.2	29.4	23.4
CALCULATED FROM BEST FIT LOGNORMAL DISTRIBUTION			
AVERAGE AIRVOID CHORD LENGTH (MM)	.093	.115	.116
TOTAL NUMBER OF AIRVOIDS	210.	901.	1136.
VOIDS PER MM TRAVERSE	.091	.388	.489
SPACING FACTOR (LT PASTE, MM)	.245	.146	.133
SPACING FACTOR (MIX DES., MM)	.243	.145	.132
SPECIFIC SURFACE (SQ.MM/CU.MM)	43.2	34.9	34.4
# OF VOIDS PER CUBIC MM	11.9	38.2	47.7
2 PHILLEO FACTOR(S) DETERMINED			
PHILLEO FACTOR AT 90.% (LT PASTE, MM)	.125	.034	.022
PHILLEO FACTOR AT 90.% (MIX DES., MM)	.124	.033	.022
PHILLEO FACTOR AT 99.% (LT PASTE, MM)	.186	.075	.061
PHILLEO FACTOR AT 99.% (MIX DES., MM)	.184	.074	.060
1 SPACING(S) FOR WHICH PHILLEO PROTECTIONS HAVE BEEN DETERMINED			
% OF PASTE WITHIN .100 MM. (LT PASTE)	80.	100.	100.
% OF PASTE WITHIN .100 MM. (MIX DES.)	81.	100.	100.

AIRVOID DISTRIBUTION
Mix P20-3
Actual Data and Best Fit Curve



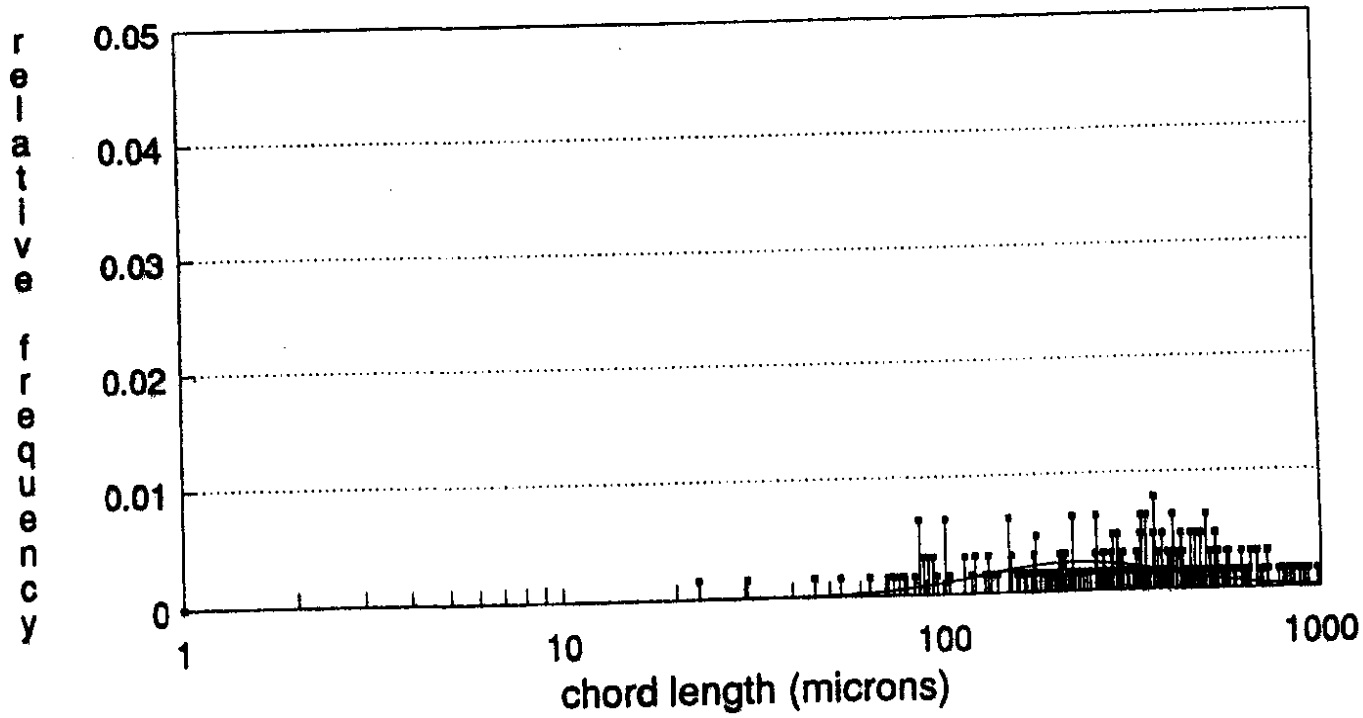
Mode = 64.484 microns
Std. Dev. = 0.6198

INPUT FILE IS P204BET.AIR

MAXIMUM CHORD SIZE INCLUDED IN ENTRAINED AIR IS 1000 MICRONS

	ENTRAINED AIR ONLY	ALL AIR < 1000	ALL AIR
CALCULATED FROM ACTUAL DATA			
TOTAL LENGTH OF TRAVERSE (MM)	2292.3		
LINEAR TRAVERSE PASTE CONTENT (%)	25.1		
MIX DESIGN PASTE CONTENT (%)	27.1		
HARDENED AIR CONTENT (%)	.1	3.9	5.6
PASTE TO AIR RATIO (LT PASTE)	185.3	6.5	4.5
PASTE TO AIR RATIO (MIX DES.)	200.0	7.0	4.8
AVERAGE AIRVOID CHORD LENGTH (MM)	.222	.358	.478
TOTAL NUMBER OF AIRVOIDS	14.	249.	269.
VOIDS PER MM TRAVERSE	.006	.109	.117
SPACING FACTOR (LT PASTE, MM)	1.164	.466	.526
SPACING FACTOR (MIX DES., MM)	1.198	.482	.545
SPECIFIC SURFACE (SQ.MM/CU.MM)	18.0	11.2	8.4
CALCULATED FROM BEST FIT LOGNORMAL DISTRIBUTION			
AVERAGE AIRVOID CHORD LENGTH (MM)	.074	.363	.368
TOTAL NUMBER OF AIRVOIDS	42.	254.	365.
VOIDS PER MM TRAVERSE	.018	.111	.159
SPACING FACTOR (LT PASTE, MM)	.391	.472	.405
SPACING FACTOR (MIX DES., MM)	.402	.488	.420
SPECIFIC SURFACE (SQ.MM/CU.MM)	53.7	11.0	10.9
# OF VOIDS PER CUBIC MM	3.5	.9	1.3
2 PHILLEO FACTOR(S) DETERMINED			
PHILLEO FACTOR AT 90.% (LT PASTE, MM)	.249	.121	.063
PHILLEO FACTOR AT 90.% (MIX DES., MM)	.258	.133	.074
PHILLEO FACTOR AT 99.% (LT PASTE, MM)	.338	.261	.188
PHILLEO FACTOR AT 99.% (MIX DES., MM)	.348	.277	.202
1 SPACING(S) FOR WHICH PHILLEO PROTECTIONS HAVE BEEN DETERMINED			
% OF PASTE WITHIN .100 MM. (LT PASTE)	33.	87.	94.
% OF PASTE WITHIN .100 MM. (MIX DES.)	31.	85.	94.

AIRVOID DISTRIBUTION
Mix P20-4
Actual Data and Best Fit Curve



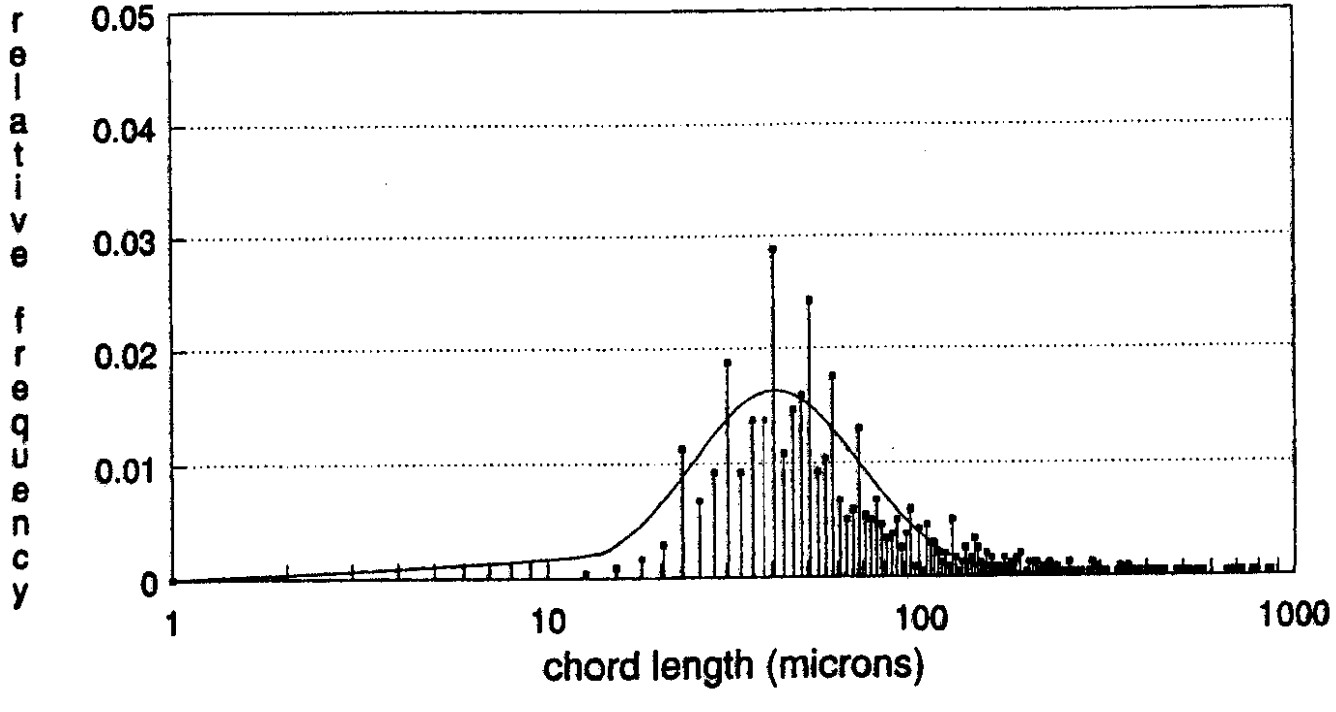
Mode = 226.43 microns
Std. Dev. = 0.6066

INPUT FILE IS P205BET.AIR

MAXIMUM CHORD SIZE INCLUDED IN ENTRAINED AIR IS 1000 MICRONS

	ENTRAINED AIR ONLY	ALL AIR < 1000	ALL AIR
CALCULATED FROM ACTUAL DATA			
TOTAL LENGTH OF TRAVERSE (MM)	2337.7		
LINEAR TRAVERSE PASTE CONTENT (%)	26.2		
MIX DESIGN PASTE CONTENT (%)	27.1		
HARDENED AIR CONTENT (%)	1.6	3.8	4.8
PASTE TO AIR RATIO (LT PASTE)	16.1	7.0	5.5
PASTE TO AIR RATIO (MIX DES.)	16.7	7.2	5.7
AVERAGE AIRVOID CHORD LENGTH (MM)	.082	.093	.118
TOTAL NUMBER OF AIRVOIDS	461.	943.	950.
VOIDS PER MM TRAVERSE	.197	.403	.406
SPACING FACTOR (LT PASTE, MM)	.161	.125	.142
SPACING FACTOR (MIX DES., MM)	.164	.127	.144
SPECIFIC SURFACE (SQ.MM/CU.MM)	48.5	43.0	34.0
CALCULATED FROM BEST FIT LOGNORMAL DISTRIBUTION			
AVERAGE AIRVOID CHORD LENGTH (MM)	.065	.061	.062
TOTAL NUMBER OF AIRVOIDS	589.	1429.	1811.
VOIDS PER MM TRAVERSE	.252	.611	.775
SPACING FACTOR (LT PASTE, MM)	.126	.083	.074
SPACING FACTOR (MIX DES., MM)	.128	.084	.076
SPECIFIC SURFACE (SQ.MM/CU.MM)	61.9	65.2	64.8
# OF VOIDS PER CUBIC MM	68.2	178.7	224.9
2 PHILLEO FACTOR(S) DETERMINED			
PHILLEO FACTOR AT 90.% (LT PASTE, MM)	.054	.023	.016
PHILLEO FACTOR AT 90.% (MIX DES., MM)	.055	.024	.017
PHILLEO FACTOR AT 99.% (LT PASTE, MM)	.087	.047	.038
PHILLEO FACTOR AT 99.% (MIX DES., MM)	.089	.048	.040
1 SPACING(S) FOR WHICH PHILLEO PROTECTIONS HAVE BEEN DETERMINED			
% OF PASTE WITHIN .100 MM. (LT PASTE)	100.	100.	100.
% OF PASTE WITHIN .100 MM. (MIX DES.)	100.	100.	100.

AIRVOID DISTRIBUTION
Mix P20-5
Actual Data and Best Fit Curve



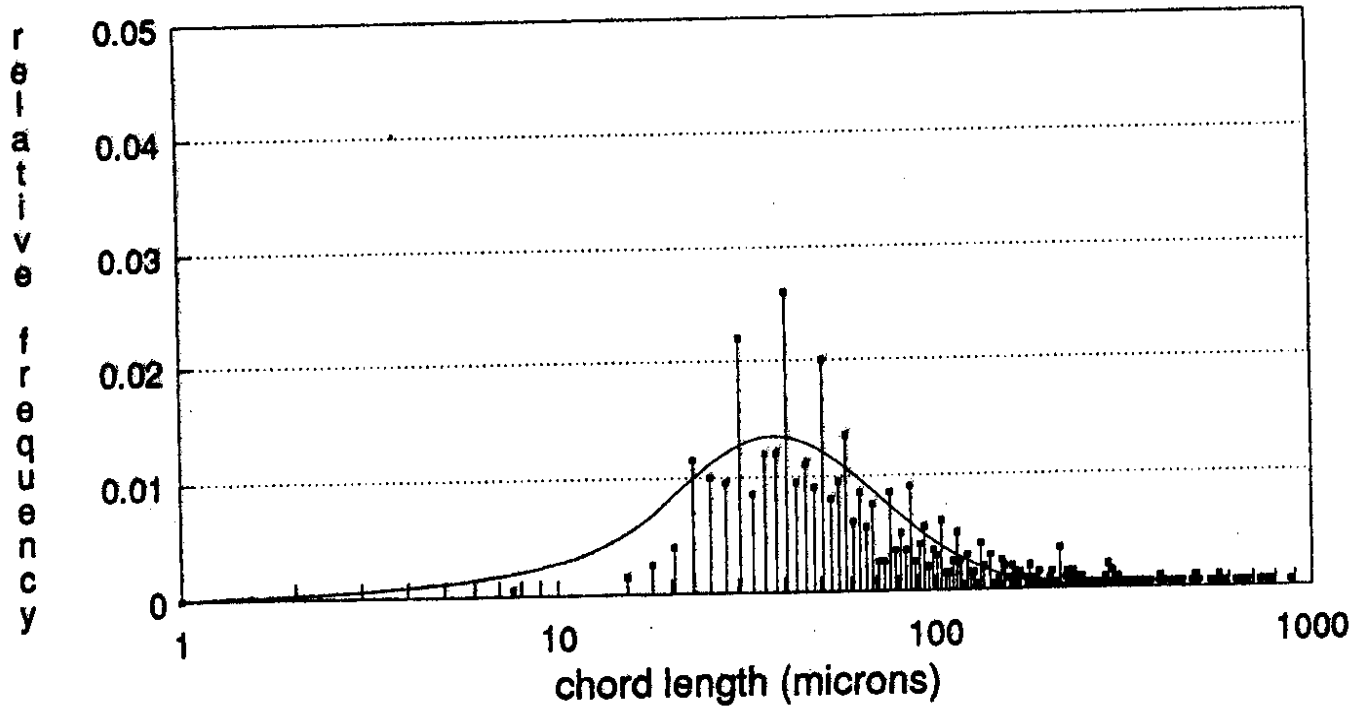
Mode = 40.814 microns
Std. Dev. = 0.5214

INPUT FILE IS p244bet.air

MAXIMUM CHORD SIZE INCLUDED IN ENTRAINED AIR IS 1000 MICRONS

	ENTRAINED AIR ONLY	ALL AIR < 1000	ALL AIR
CALCULATED FROM ACTUAL DATA			
TOTAL LENGTH OF TRAVERSE (MM)	2336.4		
LINEAR TRAVERSE PASTE CONTENT (%)	30.0		
MIX DESIGN PASTE CONTENT (%)	29.4		
HARDENED AIR CONTENT (%)	1.2	3.5	4.3
PASTE TO AIR RATIO (LT PASTE)	25.6	8.4	7.0
PASTE TO AIR RATIO (MIX DES.)	25.1	8.3	6.9
AVERAGE AIRVOID CHORD LENGTH (MM)	.106	.105	.126
TOTAL NUMBER OF AIRVOIDS	257.	788.	796.
VOIDS PER MM TRAVERSE	.110	.337	.341
SPACING FACTOR (LT PASTE, MM)	.254	.155	.170
SPACING FACTOR (MIX DES., MM)	.252	.153	.168
SPECIFIC SURFACE (SQ.MM/CU.MM)	37.6	38.0	31.8
CALCULATED FROM BEST FIT LOGNORMAL DISTRIBUTION			
AVERAGE AIRVOID CHORD LENGTH (MM)	.084	.070	.070
TOTAL NUMBER OF AIRVOIDS	324.	1191.	1423.
VOIDS PER MM TRAVERSE	.138	.510	.609
SPACING FACTOR (LT PASTE, MM)	.201	.102	.095
SPACING FACTOR (MIX DES., MM)	.200	.101	.094
SPECIFIC SURFACE (SQ.MM/CU.MM)	47.4	57.5	56.9
# OF VOIDS PER CUBIC MM	33.2	142.4	168.9
2 PHILLEO FACTOR(S) DETERMINED			
PHILLEO FACTOR AT 90.% (LT PASTE, MM)	.085	.030	.024
PHILLEO FACTOR AT 90.% (MIX DES., MM)	.084	.029	.023
PHILLEO FACTOR AT 99.% (LT PASTE, MM)	.129	.057	.050
PHILLEO FACTOR AT 99.% (MIX DES., MM)	.128	.057	.049
1 SPACING(S) FOR WHICH PHILLEO PROTECTIONS HAVE BEEN DETERMINED			
% OF PASTE WITHIN .100 MM. (LT PASTE)	95.	100.	100.
% OF PASTE WITHIN .100 MM. (MIX DES.)	95.	100.	100.

AIRVOID DISTRIBUTION
Mix P24-4
Actual Data and Best Fit Curve



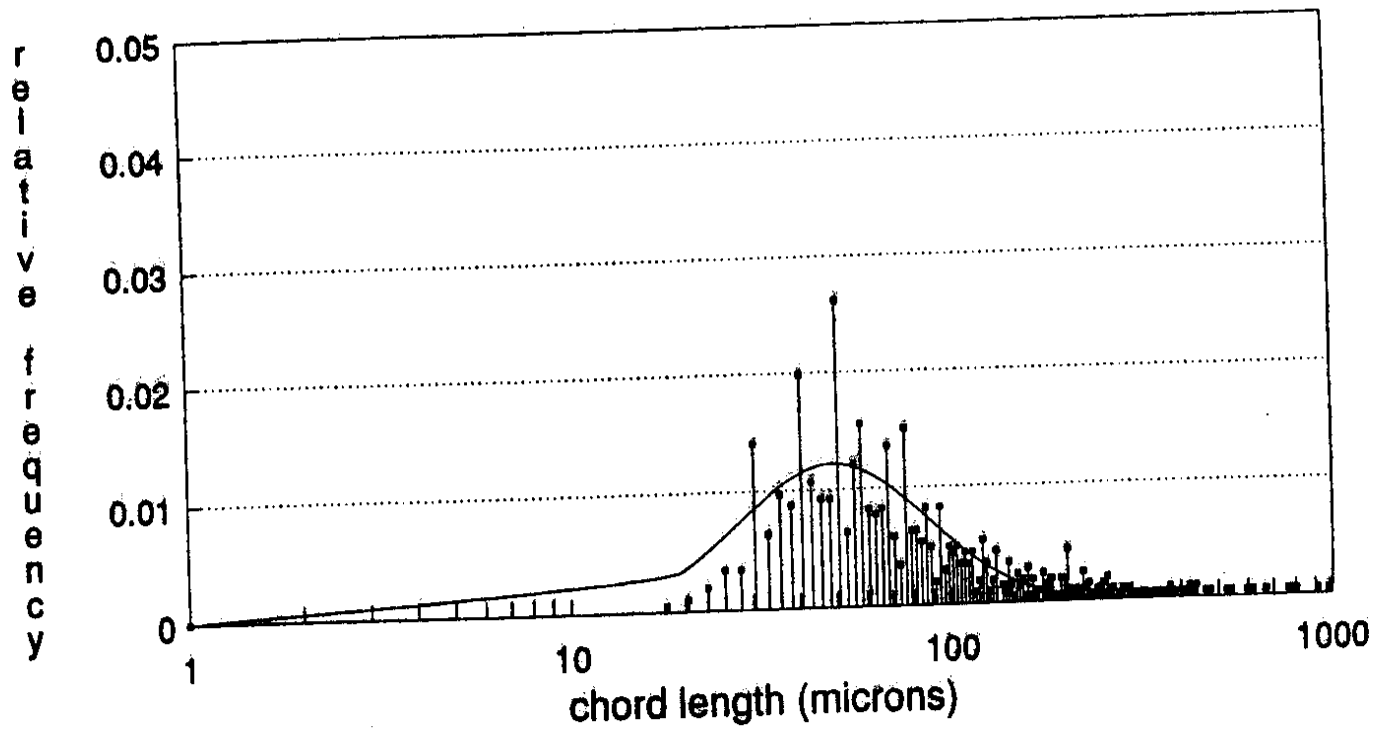
Mode = 37.677 microns
Std. Dev. = 0.6397

INPUT FILE IS p254bet.air

MAXIMUM CHORD SIZE INCLUDED IN ENTRAINED AIR IS 1000 MICRONS

	ENTRAINED AIR ONLY	ALL AIR < 1000	ALL AIR
CALCULATED FROM ACTUAL DATA			
TOTAL LENGTH OF TRAVERSE (MM)	2331.1		
LINEAR TRAVERSE PASTE CONTENT (%)	30.1		
MIX DESIGN PASTE CONTENT (%)	29.4		
HARDENED AIR CONTENT (%)	1.7	3.7	4.0
PASTE TO AIR RATIO (LT PASTE)	17.7	8.2	7.5
PASTE TO AIR RATIO (MIX DES.)	17.3	8.0	7.3
AVERAGE AIRVOID CHORD LENGTH (MM)	.109	.105	.115
TOTAL NUMBER OF AIRVOIDS	365.	813.	819.
VOIDS PER MM TRAVERSE	.157	.349	.351
SPACING FACTOR (LT PASTE, MM)	.221	.153	.160
SPACING FACTOR (MIX DES., MM)	.219	.151	.158
SPECIFIC SURFACE (SQ.MM/CU.MM)	36.8	38.0	34.8
CALCULATED FROM BEST FIT LOGNORMAL DISTRIBUTION			
AVERAGE AIRVOID CHORD LENGTH (MM)	.089	.079	.080
TOTAL NUMBER OF AIRVOIDS	447.	1076.	1178.
VOIDS PER MM TRAVERSE	.192	.462	.505
SPACING FACTOR (LT PASTE, MM)	.181	.115	.111
SPACING FACTOR (MIX DES., MM)	.179	.114	.110
SPECIFIC SURFACE (SQ.MM/CU.MM)	45.0	50.3	50.0
# OF VOIDS PER CUBIC MM	31.8	85.6	93.2
2 PHILLEO FACTOR(S) DETERMINED			
PHILLEO FACTOR AT 90.% (LT PASTE, MM)	.075	.035	.031
PHILLEO FACTOR AT 90.% (MIX DES., MM)	.074	.034	.030
PHILLEO FACTOR AT 99.% (LT PASTE, MM)	.120	.067	.063
PHILLEO FACTOR AT 99.% (MIX DES., MM)	.119	.066	.062
1 SPACING(S) FOR WHICH PHILLEO PROTECTIONS HAVE BEEN DETERMINED			
% OF PASTE WITHIN .100 MM. (LT PASTE)	97.	100.	100.
% OF PASTE WITHIN .100 MM. (MIX DES.)	97.	100.	100.

AIRVOID DISTRIBUTION
Mix P25-4
Actual Data and Best Fit Curve



Mode = 49.174 microns
Std. Dev. = 0.5656