



Precision, Quality, Innovation

MEASUREMENT SYSTEMS FOR THE TIRE INDUSTRY

OFF-LINE PROFILOMETER (OFLP)

Off-Line Profilometer (OFLP)

Off-Line Profilometer SL (PSL)

Off-Line Profilometer 3D (3DP)

On-Line Profilometer (OLP)

Ply, Belt, and Extrusion Feature Tracker (FT)

Profile360 for Apex and Bead Measurement (P360)

Green Tire Uniformity Diagnostic System (GTU)

Green Tire Uniformity Integrated System (GTUint)

Bead-to-Bead Profile Measurement System (B2B)

Bead-to-Bead Tire Scanner (Tire360)

Circumferential Tread Wear System (CTWIST)



OFF-LINE PROFILOMETER (OFLP)

Tread and sidewall extrusions can be no more precise than the dies used to make them. When a new die is cut it should be well-centered, so the Operator has the flexibility to optimize the extruder set-up. After some time in service, die wear can be uneven so that certain areas along the profile get excessive rubber flow. This is a very costly waste of raw materials. Unbalanced flow can also disrupt the symmetry of the tread - a factor that influences cured tire uniformity and balance.

The Starrett-Byewise Profilometer was developed as an automated, non-contact measurement system to displace checking with hand tools. The Profilometer is used to verify the accuracy of newly-cut dies. Its accuracy and speed helps reduce the number of die trials needed to approve a new die for production. Once in production, the Profilometer is used to check each run for overall quality, and to monitor for die wear.

SPECIFICATIONS

	Car Tire Model	Truck Tire Model
Thickness Measurement Range	30mm	60mm
Width Measurement Range	600mm	1000mm
Thickness Error of Measure	0.050mm	
Thickness Bias (typical)	0.025mm	
Thickness Repeatability (typical)	0.010mm	
Area Calculation Repeatability	<.25%	<.25%
Area Calculation Accuracy	<.25%	<.25%
Sample Interval (width resolution)	0.1mm	0.1mm
Measurement Spot Size	0.3mm	0.3mm
Dimensions (W x D x H)	1225 x 775 x 1400mm	1524 x 775 x 1400mm

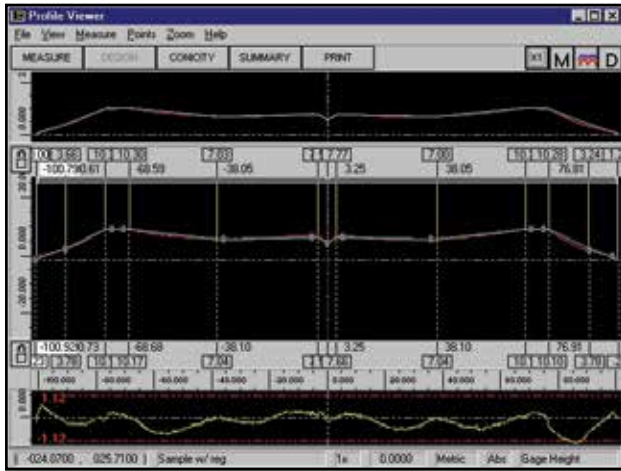
FEATURES AND SPECIFICATIONS

- The visual display overlays the measurement onto the specified design
- The point and gage analysis measures the thickness and width of each breakpoint
- The conicity analysis compares the right and left extrusion halves
- The regional analysis reports the area and center of gravity for each region
- The statistical analysis allows export of data for analysis in spreadsheet applications
- Experienced users report that fewer die trials are needed, conserving time and raw materials
- Dies can be designed to increasingly tighter tolerances for materials that are more difficult to extrude uniformly

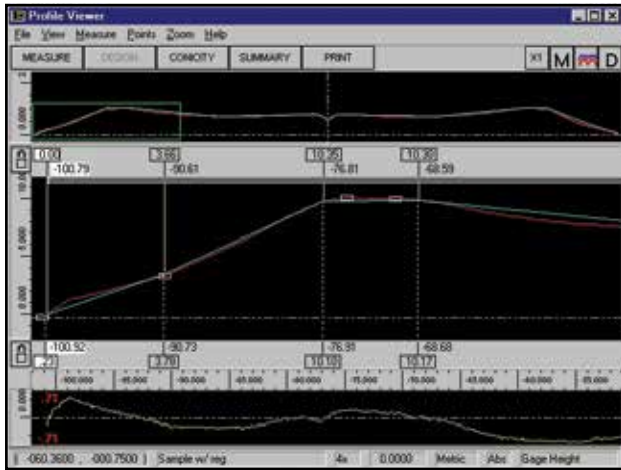


OPERATIONAL OVERVIEW

A. Full Profile View



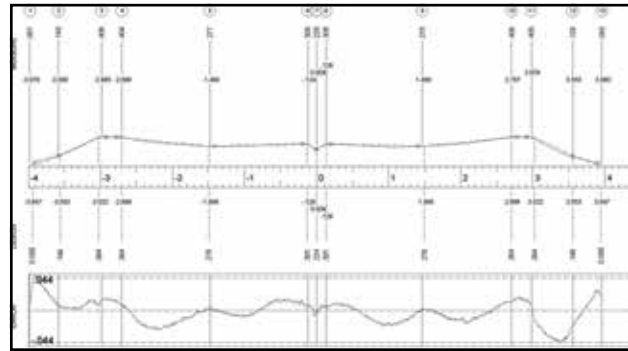
B. Zoom View of Full Profile



C. Table View of Conicity Effects

Fields	Symmetry	Regions	Point Gage	Point Position
Units: Metric				
	Left Profile	Right Profile	Left Profile - Right Profile	
Point Gage				
*1, 13	0.00	1.24	-1.24	
2, 12	3.66	3.24	.42	
3, 11	10.35	10.28	.06	
4, 10	10.30	10.36	-.06	
5, 9	7.03	7.00	.03	
6, 8	7.86	7.77	.09	
Region Width	100.79	100.79	0.00	
Region Area				
*Left - Right	732.65	716.13	16.52	
Region CG Error				
*Left - Right	20, -.03	-52, -.12	72, .09	

EASY-TO-READ GRAPHICAL REPORTS...



#	Point Name	Width			Gage			Area		
		Design	Measure	Error	Design	Measure	Error	Design	Measure	Error
1	Left End	-3.947	-3.976	-.030	0.000	.051	-.051	0.000	N/A	0.00%
2	Left Break	-3.553	-3.580	-.026	144	143	-.005	129	135	<-33.69%
3	Left Shoulder	-3.022	-2.985	.037	384	408	0.14	144	165	<-14.45%
4	Right Shoulder	-2.899	-2.899	0.000	384	404	0.11	127	115	<-6.42%
5	Right Base	-1.498	-1.480	0.018	276	277	0.01	422	392	<-2.54%
6	Right Shoulder	-.128	-.124	.003	301	309	0.08	395	395	0.00%
7	Bottom Peak	0.000	0.000	0.000	224	228	0.04	154	152	<-3.30%
8	Left Shoulder	1.26	1.26	0.000	301	308	0.05	134	133	<-2.13%
9	Left Base	1.488	1.468	-.020	276	275	0.000	385	378	<-4.27%
10	Left Shoulder	2.899	2.797	-.095	384	408	0.14	402	408	1.42%
11	Right Shoulder	3.922	3.876	-.046	384	405	0.12	127	109	<-14.51%
12	Right Break	3.553	3.553	0.000	148	129	-.018	144	140	1.33%
13	Right End	3.947	3.960	.013	0.000	.043	-.043	0.000	0.00%	



MEASUREMENT SYSTEMS FOR THE TIRE INDUSTRY



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