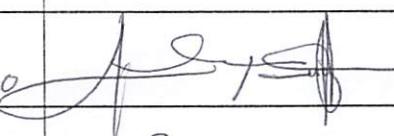
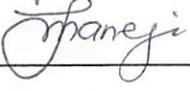
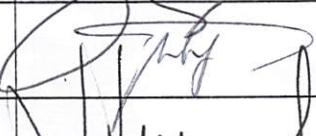
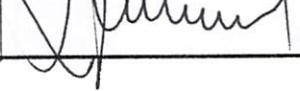


BUY-OFF AND QUALIFICATION REPORT

Machine Description:		Ref No. <u>Q - 0084</u>	
Affected Area: <u>TAPE AND REEL</u>		Package Type : <u>MSOP</u>	
Purpose : <u>TAPING MACHINE QUALIFICATION</u>			
Serial No : <u>486</u>	Model No : <u>AT28</u>	Control No :	
Cal. Spec No: <u>TFP05 - 004</u>	PM Spec No : <u>TFP05 - 002</u>	<u>CNO18</u>	
Type of Qualification Run			
<u>1 LOT QUALIFICATION RUN</u>			
Critical Product Attributes		No. of Sample Units	Summary of Reports
Bent Leads Chipout Coplanarity Others	1 lot	9	
	1 lot	0	
	1 lot	0	
	1 lot	0	
Qualification Requirements: (if applicable) <div style="text-align: right; margin-top: -20px;">  </div>			

GR& R	<u>18.2 %</u>	Calibration	<u>PASSED</u>
Jam Rate	<u>N/A</u>	ESD Grounding	<u>OK</u>
UPH	<u>N/A</u>	Cpk	<u>2.1</u>

Type of Release:			
<u>FULL RELEASE</u>			
Approvals	Name	Signature	Date
Performed by	<u>L. ABAYAN / R. CASBADILLO</u>		<u>12/10/02</u>
Maintenance	<u>L. MANEJA</u>		<u>12/10/02</u>
Production	<u>V. ADOANE</u>		<u>12/10/02</u>
Quality Assurance	<u>R. DERA CRUZ</u>		<u>12/10/02</u>
Operations	<u>L. FERRANCOL</u>		<u>12/12/02</u>

EQUIPMENT QUALIFICATION SAFETY INSPECTION CHECKLIST

ITEMS TO BE CHECKED	YES	NO	REMARKS
ELECTRICAL			
1. Set on the right power requirement?	✓		
2. Provided with the right type of plug?	✓		
3. Provided with the right size of power supply cable?	✓		
4. No temporary wiring installed?	✓		
5. No electrical wires lying on floors which can cause trip injury?	✓		
MACHINE GUARDS:			
7. Machine cover sensors provided?	✓		
8. Emergency Shut-off switch provided?	✓		
SAFETY SIGNS			
9. Warning cover sensors provided?	✓		
10. Hazardous voltage sign provided?	✓		
11. Hazardous temperature signs provided?	✓		
MACHINE LOCATION AND CONDITIONS			
12. Location clean and well lighted?	✓		
13. No leaks of fuel, oil air, water and/or other gases?	✓		
14. No sharp and pointed parts exposed?	✓		
OTHERS:			
15. Equipment safety rules, Operation Manuals and guidelines provided	✓		
16. Operators and technicians properly trained on electrical safety and use of fire extinguisher?	✓		

TO : Process Eng'g (ADGT) /
FROM : Telford SVC., Phils Inc / L. Abayan
DATE : 09 December 2002
SUBJECT : **QUALIFICATION REPORT FOR STI TAPE & REEL # 05**
for msop PACKAGE.

1.0. Background

Telford Equipment qualification for Facility transfer to Totori Sanyo

2.0 Objective

To Qualify the STI AT28 (TnR # 05)machine configured for ADGT MSOP package

3.0 Qualification Process

3.1 STI AT28– Set-up to 8L MSOP

3.2 Performed machine GR&R:

Run 10 unit samples on the machine in GRR mode, in terms of Coplanarity, Pitch Min. and Max. standoff.

3.2.1 Result :all below 20% (See attached file)

3.3 Inspection Accuracy Reading

3.3.1 Telford used an actual unit for the inspection accuracy reading of STI tape & reel
Run 10 units at STI tape and reel and record the reading.

Same unit were measured on Comparator tool.

Data showed two different inspection measurement result.

Delta is the difference between the two recorded measurement.

Coplanarity , Pitch and Stand-off were the lead parameters considered in the inspection qualification. (Attached result)

3.3.2 Result : all correlation data showed delta below of 0.5 mils (see attached)

3.4 ESD Grounding check

3.4.1 Using digital multi-meter, measured all unit path track with respect to ESD ground.
3.4.2 Criteria: All readings should be below 10 Ohms (see below result)

CALIBRATION REPORT

EQUIPMENT:	MANUFACTURER	CONTROL NO.	REPORT NO.
TAPING MACHINE #05	STI	CN 018	010
MODEL NO.	SERIAL NO.	CAL SPEC NO.	
AT28	486	TFP 05-009	
CAL. INTERVAL	CAL. BY	MAINT. CAL ENGR.	
QUARTERLY	002/048	062	
TEMP. (°C) 22 °C	CAL. DATE Dec.19-02	CAL TECH 002	
RH (%) 54 %	CAL. DUE Mar. 03-03		

CALIBRATION STANDARD USED

DESCRIPTION	MANUFACTURER	MODEL No.	CONTROL NO.	SERIAL NO.	ACCURACY	CAL. DATE	CAL. DUE	TRACEABILITY
D.Thermometer	SHINKA	ST300	CN-005	906889	± .75%	4-01-02	4-01-03	MIRDC
Thermocouple	SHINKA	Type K	CN 053	n/a	n/a	8-21-02	8-21-03	MIRDC

CALIBRATION INFORMATION

FUNCTION TESTED	NOMINAL	TOLERANCE	INITIAL READING	FINAL READING	REMARKS
(Sealing Temperature)					
Front	100°C	± 5°C	99.8	99.8	Extended up to
	150°C	~	151°C	151°C	Dec 10, 2002, however
					advance calibration
Rear	100°C	~	101°C	101°C	None w/ regards to
	150°C	~	152°C	152°C	atmosm due to
					facilitate trans fer.



QA REMARKS : _____

Signature and date

PROCESS TRAVELER

Package Type : 8L MSOP	Job No. : 3865			
Customer : ANALOG	Qty per Reel : 3000			
Date Rec'd : DECEMBER 08, 2002 / 1937H	Quantity In : 2450			
Device No : AD8315ARM-REEL	Prepared By : 160			
Lot No : K71046.3	Requirement : TNR TT MS LI			
Carrier Tape Vendor/PN : AIM - MSOP8-3-11250	Width (mm) : W12			
Cover Tape Vendor /PN : SUMILITE - Z7302-9.3	Leader (pkcts) : 30			
Reel Type Vendor /PN : PEAK - P5076	Trailer (pkcts) : 156			
Tray Vendor / PN : N/A	Unit Orientation : C1			
MARKING INSTRUCTIONS		SPECIAL INSTRUCTION		
Recipe / Customer Instruction	Actual Marking	IQA.	TNR	FVI
1) LOGO J	1) []	/	/	/
2) 7A	2) 7A	/	/	/
3)	3) 116	/	/	/
4)	4) 24C	/	/	/
5)	5)	131	088	102
BAKING Oven No. : N/A	Bake Temp. : N/A	Date / Time Start : N/A		
Performed by : N/A	Bake Hrs. : N/A	Date / Time End : N/A		
QA INCOMING		If lot was received in dry pack:		
Quantity : 200	Inspected By: 12/08/2002 EM 01	Reflow Temp Used : N/A		
Sample Size: 100	(0.65 % AQL)	Exposure Time : N/A		
MARK SCAN / LEAD SCAN				
Machine No. : N/A	Quantity In : N/A	Reject Quantity : N/A	Mc Orientator On	◇
Yield : N/A	Residual : N/A	Quantity Out : N/A	Performed By :	N/A
TAPE & REEL				
Peal Back Force Requirement : min. 20 gms	max 30 gms	Mc Orientator On		
Machine No. : TNR - 05	Air Pressure : 60 psi	Performed By : 088/114		
Peal Back Force Result min 26 gm	max 50 gm	Quantity In : 4627		
Temperature Setting : front 180 °C	rear 180 °C	Quantity Out : 3050		
Carrier Tape Lot No. : MSOP8-112502-UI/F		Reject Quantity : 121012 109 127		
Cover Tape Lot No. : 270709A42		Reject Breakdown : 109 BLC-93		
Reel Lot No. : 101002		Residual Quantity : 01 1288 150		
Date/Time Start : 12/08/02	0200	Yield : 100% 95%		
Date/Time End : 12/08/02	0445			
100% VISUAL INSPECTION				
Quantity In : 3000	2nd	3rd	QA OUTGOING (VISUAL INSPECTION)	
Reject Qty : 5				
Quantity Out : 3000			1st	2nd
Type of Defect : UI			3rd	NCMR #
Insp. By / Date : 102 12/08/02				
Carrier Tape Verification		Width W12 mm	QA BUY-OFF	
Quantity per reel : 3000	3.00			
DRY PACK Yes N/A	No N/A	BOXING		
Reflow Temp Used: N/A	Exposure Time : N/A	Performed By / Date :		
Vacuum Mc N/A	Machine Setting: N/A			
Performed By: N/A	Date : N/A	Performed By / Date :		

Leandro Abayan

From: Atienza, Richard-Benedick <richard-benedick.atienza@analog.com>
To: Leandro Abayan <labayan@pacific.net.ph>; <richard-benedick.atienza@analog.com>
Cc: <alice.meniano@analog.com>; <neil.tan@analog.com>; <tspi_process@pacific.net.ph>;
 <lmaneja@pacific.net.ph>; <bobby.delacruz@pacific.net.ph>; <bong.pimentel@analog.com>;
 <maureen.Torralba@analog.com>
Sent: Monday, December 09, 2002 8:43 PM
Subject: RE: Transfer qualification for TnR 05 MSOP

Hello Leand,

Please process the initial qual lot for TnR 05. Thanks.

-----Original Message-----

From: Leandro Abayan [mailto:labayan@pacific.net.ph]
Sent: Monday, December 09, 2002 7:58 PM
To: richard-benedick.atienza@analog.com
Cc: alice.meniano@analog.com; neil.tan@analog.com; tspi_process@pacific.net.ph; lmaneja@pacific.net.ph;
 bobby.delacruz@pacific.net.ph; bong.pimentel@analog.com; maureen.Torralba@analog.com
Subject: Transfer qualification for TnR 05 MSOP

Hello Richard,

Refer to the attached files, qualification report for TnR 05 (MSOP)

Thanks
Leand

Input track : 0.3 Ohms
Vision track : 0.3Ohms
Output track : 0.3 Ohms

3.5 Peel Back Force Test measurement : CpK

- 3.5.1 Seal approximately 12 inches of SSOP carrier tape.
- 3.5.2 Measured 25 samples of sealed carrier tape and get measurement of each strip using GPD peel strength tester at 20 to 80 grams setting.
- 3.5.3 Criteria : Above 1.33 (Result = 2.1 ,see attached data)

4.0 CONCLUSION AND RECOMMENDATION

TNR 05 Serial number 486 has successfully passed all the requirements and is now qualified for production use for MSOP Package, and therefore recommended for ADGT P.E verification.

Part No. and Name: msop 8
 Characteristics Pitch
 Specification: 0.5 mils
 = 5.0000

From Data Sheet: R 0.098667

Gage Name: tnr 05
 Gage No:
 Gage Type: VISION SYSTEM

$\bar{X}_{\text{DIFF}} = 0.016333$

Date: # 12/9/02
 Performed By:
 Leand / Jurie.

$R_p = 3.5233$

Measurement Unit Analysis			% Process Variation	
Repeatability - Equipment Variation (EV)				
EV	= $R \times K_1$ = 0.098667×3.05 = <u>0.300934</u>		Trials	K ₁
Reproducibility - Appraiser Variation (AV)			%EV	= $100[EV/TV]$ = $100[0.3009 / 5.7157]$ = <u>5.3</u> %
AV	= $\sqrt{[(\bar{X}_{\text{DIFF}} \times K_2)^2 - (EV^2/nr)]}$ = $\sqrt{[(0.01633 \times 2.70)^2 - (0.3009^2 / 10 \times 3)]} = 0$		Operators	2 3
			K ₂	3.65 2.70
Repeatability & Reproducibility (R & R)			n = number of parts	
R & R	= $\sqrt{(EV^2 + AV^2)}$ = $\sqrt{(0.30093^2 + 0^2)} = 0.300934$		r = number of trials	
Part Variation (PV)			%R & R	= $100[R & R/TV]$ = $100[0.3009 / 5.7157]$ = <u>5.3</u> %
PV	= $R_p \times K_3$ = 3.5233×1.62 = <u>5.707746</u>		Parts	K ₃
Total Variation (TV)			K ₃	2 3.65 3 2.70 4 2.30 5 2.08 6 1.93 7 1.82 8 1.74 9 1.67 10 1.62
TV	= $\sqrt{(R & R^2 + PV^2)}$ = $\sqrt{(0.30093^2 + 5.7077^2)} = 5.715674$		%PV	= $100[PV/TV]$ = $100[5.7077 / 5.7157]$ = <u>99.9</u> %
			PT/ Ratio	= Tolerance/EV = <u>16.615</u>
(Ratio must be 10 or better)				

All calculations are based upon predicting 5.15 sigma (99.0% of the area under the normal distribution curve).

K1 is 5.15/d2, where d2 is dependent on the number of trials (m) and the number of parts times the number of operators (g) which is assumed to be greater than 15. d2 values are from Appendix E.

AV - If a negative value is calculated under the square root sign, the appraiser variation (AV) defaults to zero (0).

K2 is 5.15/d2*, where d2* is dependent on the number of operators (m) and (g) is 1, since there is only one range calculation.

K3 is 5.15/d2*, where d2* is dependent on the number of parts (m) and (g) is 1, since there is only one range calculation.

d2* is obtained from Table D3, "Quality Control and Industrial Statistics," A. J. Duncan. (See Appendix H, Reference 9).

a

GAGE REPEATABILITY AND REPRODUCIBILITY
DATA SHEET

Appendix 2

Decimal Places:	0	PART										AVERAGE						
OPERATOR/ TRIAL #		1	2	3	4	5	6	7	8	9	10							
1. A 1		.830000	.770000	.800000	.910000	.670000	.720000	.870000	.770000	4.240000	.710000	1.129000						
2. 2		.780000	.840000	.730000	.930000	.740000	.700000	.890000	.590000	4.170000	.750000	1.112000						
3. 3		.960000	.690000	.780000	.870000	.680000	.630000	.870000	.750000	4.400000	.710000	1.134000						
4. AVG.		.856667	.766667	.770000	.903333	.696667	.683333	.876667	.703333	4.270000	.723333	$\bar{X}_a =$ 1.125000						
5. RNG.		.180000	.150000	.070000	.060000	.070000	.090000	.020000	.180000	.230000	.040000	$\bar{R}_a =$.109000						
6. B 1		.860000	.700000	.830000	.740000	.660000	.690000	.910000	.760000	4.100000	.710000	1.096000						
7. 2		.960000	.790000	.770000	.840000	.640000	.690000	.930000	.660000	4.270000	.750000	1.130000						
8. 3		.880000	.670000	.820000	.820000	.770000	.710000	.900000	.790000	3.970000	.790000	1.112000						
9. AVG.		.900000	.720000	.806667	.800000	.690000	.696667	.913333	.736667	4.113333	.750000	$\bar{X}_b =$ 1.112667						
10. RNG.		.100000	.120000	.060000	.100000	.130000	.020000	.030000	.130000	.300000	.080000	$\bar{R}_b =$.107000						
11. C 1		.820000	.770000	.830000	.710000	.730000	.740000	.900000	.760000	4.280000	.710000	1.125000						
12. 2		.810000	.750000	.840000	.810000	.770000	.610000	.940000	.750000	4.190000	.810000	1.128000						
13. 3		.940000	.820000	.830000	.840000	.760000	.630000	.880000	.720000	4.210000	.710000	1.134000						
14. AVG.		.856667	.780000	.833333	.786667	.753333	.660000	.906667	.743333	4.226667	.743333	$\bar{X}_c =$ 1.129000						
15. RNG.		.130000	.070000	.010000	.130000	.040000	.130000	.060000	.040000	.090000	.100000	$\bar{R}_c =$.080000						
16. PART AVG.(\bar{X}_p)		.871111	.755556	.803333	.830000	.713333	.680000	.898889	.727800	4.203300	.738900	$\bar{R}_p =$ 3.523300						
17. $\bar{R}_q =$.109000	$+R_b =$.107000	$+R_c =$.080000]/# OF OPERATORS =				3	=	.098667						
18. $[Max X =$	1.129000	$-Min X =$	1.112667	$] = \bar{X}_{DIFF}$.016333						
19. $[R =$.098667	$\times D_4^* =$	2.580000	$] = UCL_R$.254561						
20. $[R =$.098667	$\times D_3^* =$.000000	$] = LCL_R$.000000						
<table border="1"> <tr> <td>General Info</td> </tr> <tr> <td># Trials 3.000000</td> </tr> <tr> <td># Operators 3.000000</td> </tr> <tr> <td># Parts 10.000000</td> </tr> <tr> <td>Out of tolerance ranges</td> </tr> <tr> <td>Max R 0.3000</td> </tr> </table>													General Info	# Trials 3.000000	# Operators 3.000000	# Parts 10.000000	Out of tolerance ranges	Max R 0.3000
General Info																		
# Trials 3.000000																		
# Operators 3.000000																		
# Parts 10.000000																		
Out of tolerance ranges																		
Max R 0.3000																		

AAG1991.ADI 595

Unit Analysis and Process Variation

Appendix 3

a

Part No. and Name: msop 8
 Characteristics Coplanarity
 Specification: 0-4 mils
 = 5.0000

From Data Sheet: R 0.076

Gage Name: tnr 05
 Gage No:
 Gage Type: VISION SYSTEM

 $\bar{X}_{\text{DIFF}} = 0.008$

Date: # 12/9/02
 Performed By:
 Leand / Jurie,

 $R_p = 2.039989$

Measurement Unit Analysis

Repeatability - Equipment Variation (EV)

$$\begin{aligned} EV &= R \times K_1 \\ &= \underline{0.076} \times \underline{3.05} \\ &= \underline{0.2318} \end{aligned}$$

Trials	K ₁
2	4.56
3	3.05

$$\begin{aligned} \%EV &= 100[\text{EV/TV}] \\ &= 100[\underline{0.2318} / \underline{3.3129}] \\ &= \underline{7.0} \% \end{aligned}$$

Reproducibility - Appraiser Variation (AV)

$$\begin{aligned} AV &= \sqrt{(\bar{X}_{\text{DIFF}} \times K_2)^2 - (EV^2/nr)} \\ &= \sqrt{(\underline{0.008} \times \underline{2.70})^2 - (\underline{0.2318}^2 / \underline{10} \times \underline{3})} \\ &= \underline{0} \end{aligned}$$

Operators	2	3
K ₂	3.65	2.70

$$\begin{aligned} \%AV &= 100[\text{AV/TV}] \\ &= 100[\underline{0} / \underline{3.3129}] \\ &= \underline{0.0} \% \end{aligned}$$

Repeatability & Reproducibility (R & R)

$$\begin{aligned} R &\& R = \sqrt{(EV^2 + AV^2)} \\ &= \sqrt{(\underline{0.2318}^2 + \underline{0}^2)} \\ &= \underline{0.2318} \end{aligned}$$

Parts	K ₃
2	3.65
3	2.70
4	2.30
5	2.08
6	1.93
7	1.82
8	1.74
9	1.67
10	1.62

n = number of parts
 r = number of trials

$$\begin{aligned} \%R &\& R = 100[\text{R & R/TV}] \\ &= 100[\underline{0.2318} / \underline{3.3129}] \\ &= \underline{7.0} \% \end{aligned}$$

Part Variation (PV)

$$\begin{aligned} PV &= R_p \times K_3 \\ &= \underline{2.03999} \times \underline{1.62} \\ &= \underline{3.304782} \end{aligned}$$

$$\begin{aligned} \%PV &= 100[\text{PV/TV}] \\ &= 100[\underline{3.3048} / \underline{3.3129}] \\ &= \underline{99.8} \% \end{aligned}$$

Total Variation (TV)

$$\begin{aligned} TV &= \sqrt{(R &\& R^2 + PV^2)} \\ &= \sqrt{(\underline{0.2318}^2 + \underline{3.3048}^2)} \\ &= \underline{3.312901} \end{aligned}$$

$$\begin{aligned} \text{PT/Ratio} &= \text{Tolerance/EV} \\ &= \underline{21.570} \end{aligned}$$

(Ratio must be 10 or better)

All calculations are based upon predicting 5.15 sigma (99.0% of the area under the normal distribution curve).

K1 is 5.15/d2, where d2 is dependent on the number of trials (m) and the number of parts times the number of operators (g) which is assumed to be greater than 15. d2 values are from Appendix E.

AV - If a negative value is calculated under the square root sign, the appraiser variation (AV) defaults to zero (0).

K2 is 5.15/d2*, where d2* is dependent on the number of operators (m) and (g) is 1, since there is only one range calculation.

K3 is 5.15/d2*, where d2* is dependent on the number of parts (m) and (g) is 1, since there is only one range calculation.

d2* is obtained from Table D3, "Quality Control and Industrial Statistics," A. J. Duncan. (See Appendix H, Reference 9).

a

GAGE REPEATABILITY AND REPRODUCIBILITY
DATA SHEET

Appendix 2

Decimal Places:	0	PART										AVERAGE																																																																														
OPERATOR/ TRIAL #		1	2	3	4	5	6	7	8	9	10																																																																															
1. A 1		.590000	.260000	.150000	.170000	.250000	.490000	.390000	.520000	1.880000	2.230000	.693000																																																																														
2. 2		.640000	.270000	.150000	.180000	.330000	.440000	.220000	.650000	1.790000	2.190000	.686000																																																																														
3. 3		.570000	.280000	.100000	.160000	.250000	.500000	.480000	.500000	1.820000	2.230000	.689000																																																																														
4. AVG.		.600000	.270000	1.33333	.170000	.276667	.476667	.363333	.556667	1.830000	2.216667	$\bar{X}_a = .689333$																																																																														
5. RNG.		.070000	.020000	.050000	.020000	.080000	.060000	.260000	.150000	.090000	.040000	$\bar{R}_a = .084000$																																																																														
6. B 1		.600000	.260000	.160000	.190000	.260000	.500000	.390000	.590000	1.710000	2.230000	.689000																																																																														
7. 2		.650000	.270000	.210000	.170000	.330000	.470000	.320000	.620000	1.850000	2.210000	.710000																																																																														
8. 3		.560000	.240000	.220000	.210000	.250000	.450000	.280000	.700000	1.530000	2.230000	.667000																																																																														
9. AVG.		.603333	.256667	.196667	.190000	.280000	.473333	.330000	.636667	1.696667	2.223333	$\bar{X}_b = .688667$																																																																														
10. RNG.		.090000	.030000	.060000	.040000	.080000	.050000	.110000	.110000	.320000	.020000	$\bar{R}_b = .091000$																																																																														
11. C 1		.550000	.230000	.190000	.200000	.300000	.490000	.310000	.580000	1.800000	2.180000	.683000																																																																														
12. 2		.570000	.260000	.150000	.180000	.240000	.460000	.380000	.610000	1.820000	2.200000	.687000																																																																														
13. 3		.560000	.200000	.210000	.220000	.290000	.490000	.290000	.530000	1.750000	2.200000	.674000																																																																														
14. AVG.		.560000	.230000	1.83333	.200000	.276667	.480000	.326667	.573333	1.790000	2.193333	$\bar{X}_c = .681333$																																																																														
15. RNG.		.020000	.060000	.060000	.040000	.060000	.030000	.090000	.080000	.070000	.020000	$\bar{R}_c = .053000$																																																																														
16. PART AVG.(X_p)		.587778	.252222	.171111	.186667	.277778	.476667	.340000	.588900	1.772200	2.211100	$\bar{R}_p = 2.039989$																																																																														
17. $\bar{R}_a = .084000$	$+R_b = .091000$	$+R_c = .053000$]/[# OF OPERATORS = 3] = .076000									$R = .076000$																																																																														
18. $[Max \bar{X} = .689333 - Min \bar{X} = .681333] = \bar{X}_{diff}$.008000																																																																														
19. $[R = .076000 \times D_4^* = 2.580000] = UCL_R$.196080																																																																														
20. $[R = .076000 \times D_3^* = .000000] = LCL_R$.000000																																																																														
<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td colspan="13" style="padding: 2px;">General Info</td> </tr> <tr> <td># Trials</td> <td>3.000000</td> <td colspan="11"></td> </tr> <tr> <td># Operators</td> <td>3.000000</td> <td colspan="11"></td> </tr> <tr> <td># Parts</td> <td>10.000000</td> <td colspan="11"></td> </tr> <tr> <td colspan="13" style="padding: 2px;">Out of tolerance ranges</td> </tr> <tr> <td>Max R</td> <td>0.3200</td> <td colspan="11"></td> </tr> </table>													General Info													# Trials	3.000000												# Operators	3.000000												# Parts	10.000000												Out of tolerance ranges													Max R	0.3200											
General Info																																																																																										
# Trials	3.000000																																																																																									
# Operators	3.000000																																																																																									
# Parts	10.000000																																																																																									
Out of tolerance ranges																																																																																										
Max R	0.3200																																																																																									

AAIG1991.ADI 5/95

Part No. and Name: msop 8
 Characteristics Max Standoff
 Specification: 6 mils
 = 5.0000
 From Data Sheet: R 0.175

Gage Name: tnr 05
 Gage No:
 Gage Type: VISION SYSTEM

Date: # 12/9/02
 Performed By:
 Leand / Jurie

$$\bar{X}_{\text{DIFF}} = 0.099334$$

$$R_p = 2.736622$$

Measurement Unit Analysis			% Process Variation																						
Repeatability - Equipment Variation (EV)			$\%EV = 100[\frac{EV}{TV}]$ $= 100[\frac{0.5338}{4.4723}]$ $= 11.9 \%$																						
$EV = R \times K_1$ $= 0.175 \times 3.05$ $= 0.53375$			<table border="1"> <thead> <tr> <th>Trials</th><th>K₁</th></tr> </thead> <tbody> <tr> <td>2</td><td>4.56</td></tr> <tr> <td>3</td><td>3.05</td></tr> </tbody> </table>			Trials	K ₁	2	4.56	3	3.05														
Trials	K ₁																								
2	4.56																								
3	3.05																								
Reproducibility - Appraiser Variation (AV)			$\%AV = 100[\frac{AV}{TV}]$ $= 100[\frac{0.2499}{4.4723}]$ $= 5.6 \%$																						
$AV = \sqrt{[(\bar{X}_{\text{DIFF}} \times K_2)^2 - (EV^2/nr)]}$ $= \sqrt{[(0.09933 \times 2.70)^2 - (0.5338^2 / 10 \times 3)]}$ $= 0.249872$			<table border="1"> <thead> <tr> <th>Operators</th><th>2</th><th>3</th></tr> </thead> <tbody> <tr> <td>K₂</td><td>3.65</td><td>2.70</td></tr> </tbody> </table>			Operators	2	3	K ₂	3.65	2.70														
Operators	2	3																							
K ₂	3.65	2.70																							
Repeatability & Reproducibility (R & R)			$\%R \& R = 100[\frac{R \& R}{TV}]$ $= 100[\frac{0.5893}{4.4723}]$ $= 13.2 \%$																						
$R \& R = \sqrt{(EV^2 + AV^2)}$ $= \sqrt{(0.53375^2 + 0.2499^2)}$ $= 0.589343$			<table border="1"> <thead> <tr> <th>Parts</th><th>K₃</th></tr> </thead> <tbody> <tr> <td>2</td><td>3.65</td></tr> <tr> <td>3</td><td>2.70</td></tr> <tr> <td>4</td><td>2.30</td></tr> <tr> <td>5</td><td>2.08</td></tr> <tr> <td>6</td><td>1.93</td></tr> <tr> <td>7</td><td>1.82</td></tr> <tr> <td>8</td><td>1.74</td></tr> <tr> <td>9</td><td>1.67</td></tr> <tr> <td>10</td><td>1.62</td></tr> </tbody> </table>			Parts	K ₃	2	3.65	3	2.70	4	2.30	5	2.08	6	1.93	7	1.82	8	1.74	9	1.67	10	1.62
Parts	K ₃																								
2	3.65																								
3	2.70																								
4	2.30																								
5	2.08																								
6	1.93																								
7	1.82																								
8	1.74																								
9	1.67																								
10	1.62																								
Part Variation (PV)			$\%PV = 100[\frac{PV}{TV}]$ $= 100[\frac{4.433328}{4.4723}]$ $= 99.1 \%$																						
Total Variation (TV)			$PT/\text{Ratio} = \frac{\text{Tolerance}}{EV}$ $= \frac{9.368}{0.589343}$																						
(Ratio must be 10 or better)																									

All calculations are based upon predicting 5.15 sigma (99.0% of the area under the normal distribution curve).

K1 is 5.15/d2, where d2 is dependent on the number of trials (m) and the number of parts times the number of operators (g) which is assumed to be greater than 15. d2 values are from Appendix E.

AV - If a negative value is calculated under the square root sign, the appraiser variation (AV) defaults to zero (0).

K2 is 5.15/d2*, where d2* is dependent on the number of operators (m) and (g) is 1, since there is only one range calculation.

K3 is 5.15/d2*, where d2* is dependent on the number of parts (m) and (g) is 1, since there is only one range calculation.

d2* is obtained from Table D3, "Quality Control and Industrial Statistics," A. J. Duncan. (See Appendix H, Reference 9).

GAGE REPEATABILITY AND REPRODUCIBILITY
DATA SHEET

Appendix 2

a

Decimal Places:	0	PART										AVERAGE																																																																														
OPERATOR/ TRIAL #		1	2	3	4	5	6	7	8	9	10																																																																															
1. A 1		2.100000	4.220000	4.880000	4.020000	3.710000	4.340000	3.950000	3.960000	4.570000	5.130000	4.088000																																																																														
2. 2		2.270000	4.220000	4.900000	4.050000	3.770000	4.310000	3.820000	3.830000	4.460000	4.870000	4.050000																																																																														
3. 3		2.550000	4.290000	5.010000	3.960000	3.710000	4.360000	4.120000	3.950000	4.460000	5.160000	4.157000																																																																														
4. AVG.		2.306667	4.243333	4.930000	4.010000	3.730000	4.336667	3.953333	3.913333	4.496667	5.053333	X _a = 4.098333																																																																														
5. RNG.		.450000	.070000	.130000	.090000	.060000	.050000	.300000	.130000	.110000	.290000	R _a = .168000																																																																														
6. B 1		2.420000	4.360000	5.130000	3.990000	3.750000	4.670000	4.040000	3.920000	4.180000	5.190000	4.165000																																																																														
7. 2		2.330000	4.450000	5.030000	3.950000	3.440000	4.630000	3.890000	3.970000	4.480000	5.410000	4.158000																																																																														
8. 3		2.640000	4.380000	5.020000	4.030000	3.630000	4.670000	3.850000	4.050000	4.380000	5.300000	4.195000																																																																														
9. AVG.		2.463333	4.396667	5.060000	3.990000	3.606667	4.656667	3.926667	3.980000	4.346667	5.300000	X _b = 4.172667																																																																														
10. RNG.		.310000	.090000	.110000	.080000	.310000	.040000	.190000	.130000	.300000	.220000	R _b = .178000																																																																														
11. C 1		2.500000	4.320000	5.050000	4.070000	3.860000	4.710000	4.020000	3.960000	4.510000	5.340000	4.234000																																																																														
12. 2		2.610000	4.350000	4.420000	4.000000	3.730000	4.690000	4.030000	4.070000	4.500000	5.220000	4.162000																																																																														
13. 3		2.790000	4.220000	5.010000	4.030000	3.760000	4.720000	3.970000	3.930000	4.320000	5.220000	4.197000																																																																														
14. AVG.		2.633333	4.296667	4.826667	4.033333	3.783333	4.706667	4.066667	3.986667	4.443333	5.260000	X _c = 4.197667																																																																														
15. RNG.		.290000	.130000	.630000	.070000	.130000	.030000	.060000	.140000	.190000	.120000	R _c = .179000																																																																														
16. PART AVG.(X _p)		2.467778	4.312222	4.938889	4.011111	3.706667	4.566667	3.965556	3.960000	4.428900	5.204400	R _p = 2.736622																																																																														
17. [R _a = .168000 + R _b = .178000 + R _c = .179000]/[# OF OPERATORS = 3] = .175000 R= .175000												.099334																																																																														
18. [Max X= 4.197667 - Min X= 4.098333] = X _{DIFF}												.451500																																																																														
19. [R = .175000 x D ₄ *= 2.580000] = UCL _R												.000000																																																																														
20. [R = .175000 x D ₃ *= .000000] = LCL _R																																																																																										
<table border="1"> <tr> <td colspan="13">General Info</td> </tr> <tr> <td># Trials</td> <td>3.000000</td> <td colspan="11"></td> </tr> <tr> <td># Operators</td> <td>3.000000</td> <td colspan="11"></td> </tr> <tr> <td># Parts</td> <td>10.000000</td> <td colspan="11"></td> </tr> <tr> <td colspan="13">Out of tolerance ranges</td> </tr> <tr> <td>Max R</td> <td>0.6300</td> <td colspan="11"></td> </tr> </table>													General Info													# Trials	3.000000												# Operators	3.000000												# Parts	10.000000												Out of tolerance ranges													Max R	0.6300											
General Info																																																																																										
# Trials	3.000000																																																																																									
# Operators	3.000000																																																																																									
# Parts	10.000000																																																																																									
Out of tolerance ranges																																																																																										
Max R	0.6300																																																																																									

AA/G1991 ADI 5/95

a

Part No. and Name: msop 8
 Characteristics Min Standoff
 Specification: 2 mils
 = 5.0000
 From Data Sheet: R 0.159667

Gage Name: tnr 05
 Gage No:
 Gage Type: VISION SYSTEM

Date: # 12/9/02
 Performed By:
 Leand / Jurie.

$\bar{X}_{\text{DIFF}} = 0.045667$

$R_p = 2.601111$

Measurement Unit Analysis			% Process Variation																				
Repeatability - Equipment Variation (EV)																							
EV	= $R \times K_1$ = <u>0.159667</u> \times <u>3.05</u> = <u>0.486984</u>	<table border="1"> <tr> <th>Trials</th><th>K₁</th></tr> <tr> <td>2</td><td>4.56</td></tr> <tr> <td>3</td><td>3.05</td></tr> </table>	Trials	K ₁	2	4.56	3	3.05	%EV = $100[\frac{EV}{TV}]$ = $100[\frac{0.487}{4.2427}]$ = <u>11.5</u> %														
Trials	K ₁																						
2	4.56																						
3	3.05																						
Reproducibility - Appraiser Variation (AV)			%AV = $100[\frac{AV}{TV}]$ = $100[\frac{0.0854}{4.2427}]$ = <u>2.0</u> %																				
AV	= $\sqrt{[(\bar{X}_{\text{DIFF}} \times K_2)^2 - (EV^2/nr)]}$ = $\sqrt{[(0.04567 \times 2.70)^2 - (0.487^2 / 10 \times 3)]}$ = <u>0.085428</u>	<table border="1"> <tr> <th>Operators</th><th>2</th><th>3</th></tr> <tr> <td>K₂</td><td>3.65</td><td>2.70</td></tr> </table>	Operators	2	3	K ₂	3.65	2.70	n = number of parts r = number of trials														
Operators	2	3																					
K ₂	3.65	2.70																					
Repeatability & Reproducibility (R & R)			%R & R = $100[\frac{R \& R}{TV}]$ = $100[\frac{0.49442}{4.2427}]$ = <u>11.7</u> %																				
R & R	= $\sqrt{EV^2 + AV^2}$ = $\sqrt{(0.48698^2 + 0.0854^2)}$ = <u>0.49442</u>	<table border="1"> <tr> <th>Parts</th><th>K₃</th></tr> <tr> <td>2</td><td>3.65</td></tr> <tr> <td>3</td><td>2.70</td></tr> <tr> <td>4</td><td>2.30</td></tr> <tr> <td>5</td><td>2.08</td></tr> <tr> <td>6</td><td>1.93</td></tr> <tr> <td>7</td><td>1.82</td></tr> <tr> <td>8</td><td>1.74</td></tr> <tr> <td>9</td><td>1.67</td></tr> <tr> <td>10</td><td>1.62</td></tr> </table>	Parts	K ₃	2	3.65	3	2.70	4	2.30	5	2.08	6	1.93	7	1.82	8	1.74	9	1.67	10	1.62	%PV = $100[\frac{PV}{TV}]$ = $100[\frac{4.2138}{4.2427}]$ = <u>99.3</u> %
Parts	K ₃																						
2	3.65																						
3	2.70																						
4	2.30																						
5	2.08																						
6	1.93																						
7	1.82																						
8	1.74																						
9	1.67																						
10	1.62																						
Part Variation (PV)			PT/ Ratio = Tolerance/EV = <u>10.267</u>																				
PV	= $R_p \times K_3$ = <u>2.60111</u> \times <u>1.62</u> = <u>4.2138</u>		(Ratio must be 10 or better)																				
Total Variation (TV)																							
TV	= $\sqrt{(R \& R^2 + PV^2)}$ = $\sqrt{(0.49442^2 + 4.2138^2)}$ = <u>4.242707</u>																						

All calculations are based upon predicting 5.15 sigma (99.0% of the area under the normal distribution curve).

K1 is 5.15/d2, where d2 is dependent on the number of trials (m) and the number of parts times the number of operators (g) which is assumed to be greater than 15. d2 values are from Appendix E.

AV - If a negative value is calculated under the square root sign, the appraiser variation (AV) defaults to zero (0).

K2 is 5.15/d2*, where d2* is dependent on the number of operators (m) and (g) is 1, since there is only one range calculation.

K3 is 5.15/d2*, where d2* is dependent on the number of parts (m) and (g) is 1, since there is only one range calculation.

d2* is obtained from Table D3, "Quality Control and Industrial Statistics," A. J. Duncan. (See Appendix H, Reference 9).

GAGE REPEATABILITY AND REPRODUCIBILITY
DATA SHEET

Appendix 2

a

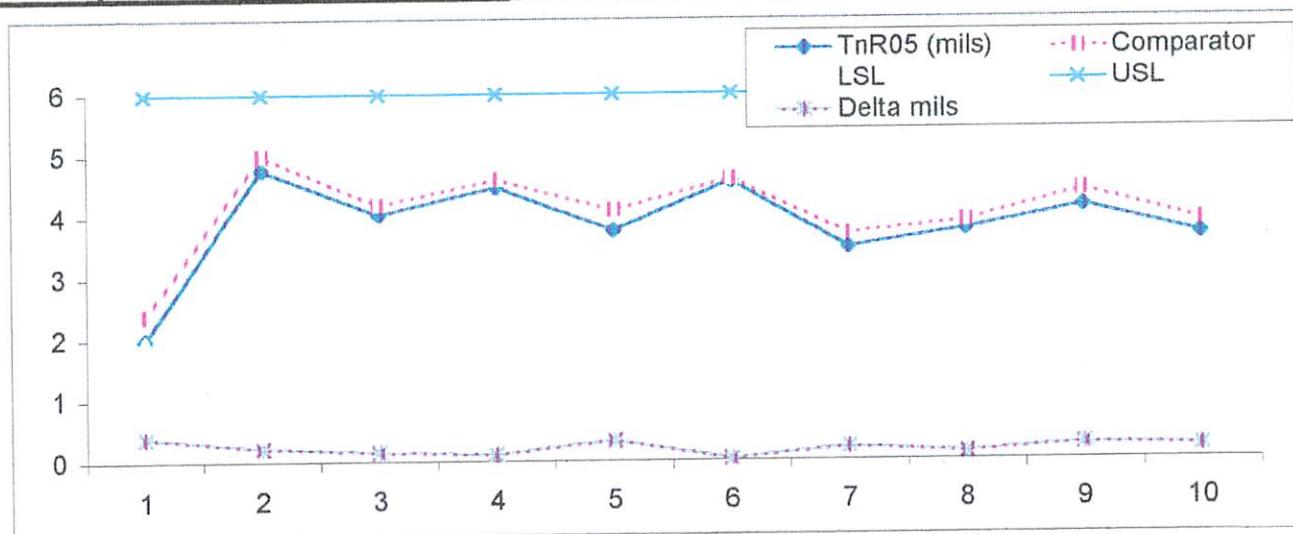
Decimal Places:	0	PART										AVERAGE
OPERATOR/ TRIAL #		1	2	3	4	5	6	7	8	9	10	
1. A 1		2.120000	4.760000	4.180000	4.470000	4.050000	4.680000	3.820000	3.720000	3.970000	3.580000	3.935000
2. 2		2.110000	4.860000	4.150000	4.360000	3.920000	4.670000	3.990000	3.620000	3.740000	3.720000	3.914000
3. 3		2.000000	4.770000	4.040000	4.480000	3.770000	4.570000	3.480000	3.770000	4.140000	3.680000	3.870000
4. AVG.		2.076667	4.796667	4.123333	4.436667	3.913333	4.640000	3.763333	3.703333	3.950000	3.660000	$\bar{X}_d = 3.906333$
5. RNG.		.120000	.100000	.140000	.120000	.280000	.110000	.510000	.150000	.400000	.140000	$R_d = .207000$
6. B 1		2.090000	4.610000	3.930000	4.580000	4.070000	4.230000	3.760000	3.780000	4.180000	3.840000	3.907000
7. 2		2.280000	4.530000	4.120000	4.630000	4.140000	4.270000	4.020000	3.790000	4.160000	3.640000	3.958000
8. 3		2.270000	4.660000	4.190000	4.500000	4.110000	4.280000	3.940000	3.750000	4.180000	3.700000	3.958000
9. AVG.		2.213333	4.600000	4.080000	4.570000	4.106667	4.260000	3.906667	3.773333	4.173333	3.726667	$\bar{X}_b = 3.941000$
10. RNG.		.190000	.130000	.260000	.130000	.070000	.050000	.260000	.040000	.020000	.200000	$R_b = .135000$
11. C 1		2.080000	4.770000	4.080000	4.600000	4.100000	4.260000	3.950000	3.890000	4.190000	3.700000	3.962000
12. 2		2.080000	4.690000	4.370000	4.530000	3.980000	4.060000	3.970000	3.710000	4.130000	3.770000	3.929000
13. 3		1.980000	4.770000	4.130000	4.560000	4.070000	4.140000	3.970000	3.960000	4.230000	3.840000	3.965000
14. AVG.		2.046667	4.743333	4.193333	4.563333	4.050000	4.153333	3.963333	3.853333	4.183333	3.770000	$\bar{X}_e = 3.952000$
15. RNG.		.100000	.080000	.290000	.070000	.120000	.200000	.020000	.250000	.100000	.140000	$R_e = .137000$
16. PART AVG. (\bar{X}_d)		2.112222	4.713333	4.132222	4.523333	4.023333	4.351111	3.877778	3.776700	4.102200	3.718900	$R_d = 2.601111$
17. $\bar{R}_d = .207000$		$+R_d = .135000$	$+R_e = .137000$	$\# \text{ OF OPERATORS} = 3$		$\bar{R} = .159667$		$R = .159667$				
18. $[\text{Max } X = 3.952000 - \text{Min } X = 3.906333] = \bar{X}_{\text{DIFF}}$.045667
19. $[\bar{R} = .159667 \times D_4 = 2.580000] = UCL_R$.411941
20. $[\bar{R} = .159667 \times D_3 = .000000] = LCL_R$.000000
General Info												
# Trials	3.000000											
# Operators	3.000000											
# Parts	10.000000											
Out of tolerance ranges												
Max R	0.5100											

AA/G991/ADI 596

8L MSOP Accuracy Reading (TnR05)

min. standoff

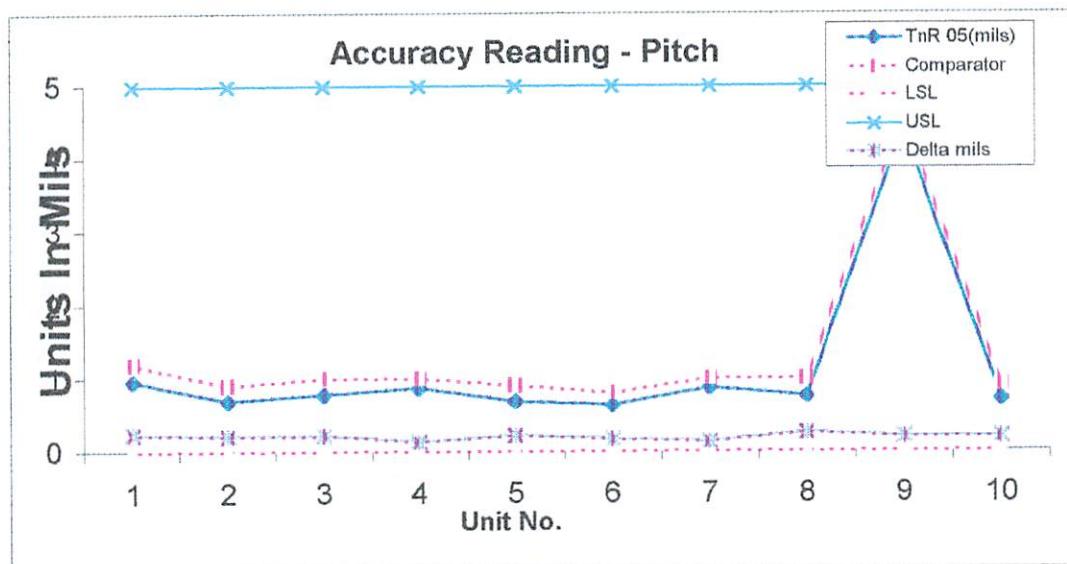
Trial No.	TnR05 (mils)	Comparator	LSL	USL	Delta mils
1	2	2.4	1.97	6	0.4
2	4.77	5	1.97	6	0.23
3	4.04	4.2	1.97	6	0.16
4	4.48	4.6	1.97	6	0.12
5	3.77	4.1	1.97	6	0.33
6	4.57	4.6	1.97	6	0.03
7	3.48	3.7	1.97	6	0.22
8	3.77	3.9	1.97	6	0.13
9	4.14	4.4	1.97	6	0.26
10	3.68	3.9	1.97	6	0.22



8L MSOP Accuracy Reading (TnR05)

Pitch L(Lead pitch offset)

Trial No.	TnR 05(mils)	Comparator	LSL	USL	Delta mils
1	0.96	1.2	0	5	0.24
2	0.69	0.9	0	5	0.21
3	0.78	1	0	5	0.22
4	0.87	1	0	5	0.13
5	0.68	0.9	0	5	0.22
6	0.63	0.8	0	5	0.17
7	0.87	1	0	5	0.13
8	0.75	1	0	5	0.25
9	4.41	4.6	0	5	0.19
10	0.71	0.9	0	5	0.19



CARRIER TAPE PEEL STRENGTH TEST
FOR STI TnR #05 (serial #486)

Sample	Min	Max	Ave.	Range
--------	-----	-----	------	-------

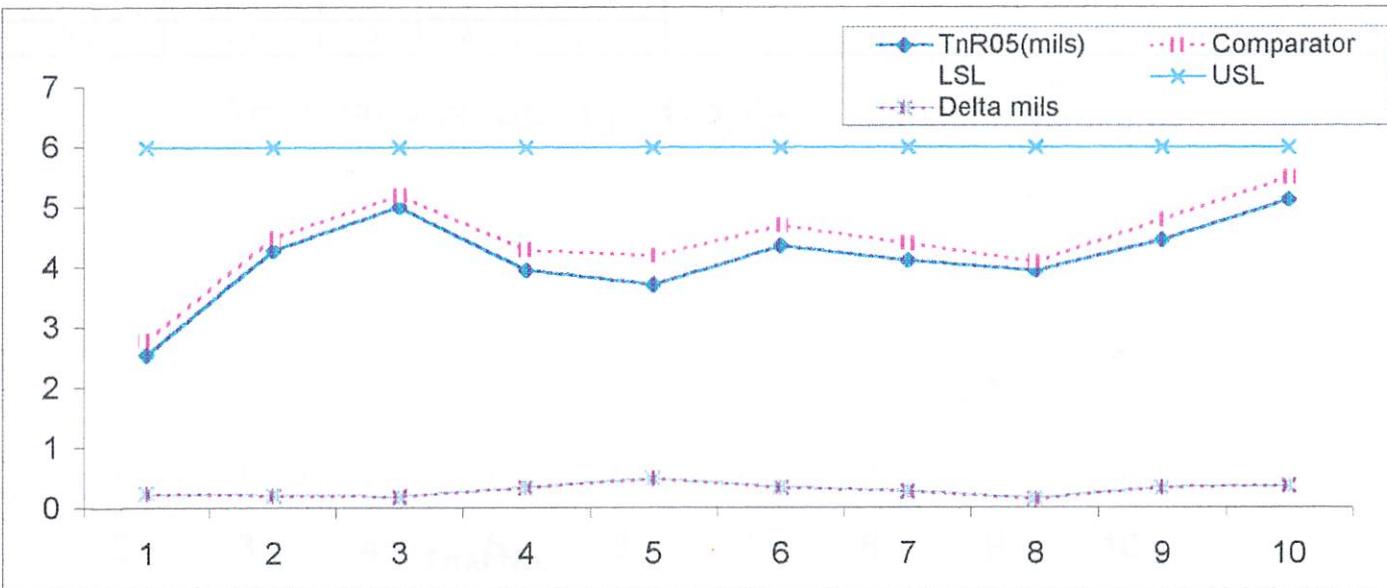
at 3

10

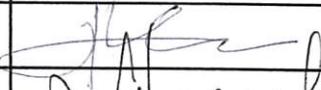
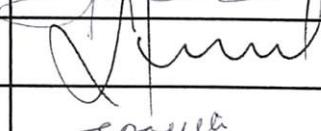
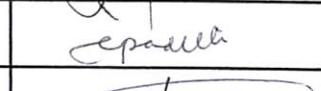
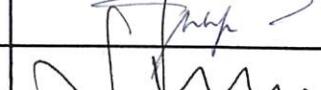
8L MSOP Accuracy Reading (TnR 05)

Max. standoff

Trial No.	TnR05(mils)	Comparat or	LSL	USL	Delta mils
1	2.55	2.8	1.97	6	0.25
2	4.29	4.5	1.97	6	0.21
3	5.01	5.2	1.97	6	0.19
4	3.96	4.3	1.97	6	0.34
5	3.71	4.2	1.97	6	0.49
6	4.36	4.7	1.97	6	0.34
7	4.12	4.4	1.97	6	0.28
8	3.95	4.1	1.97	6	0.15
9	4.46	4.8	1.97	6	0.34
10	5.13	5.5	1.97	6	0.37



BUY-OFF AND QUALIFICATION REPORT

Machine Description: TAPING MACHINE		Ref No. Q - 004	
Affected Area: TAPE & REEL		Package Type : MSOP	
Purpose : TAPING MACHINE QUALIFICATION			
Serial No : 486	Model No : AT2800	Control No : CNO18	
Cal. Spec No: TFP-05 004 PM Spec No : TFP05 -002			
Type of Qualification Run			
3000 UNITS QUALIFICATION RUN			
Critical Product Attributes		No. of Sample Units	Summary of Reports
Bent Leads Chipout Coplanarity Others MARK DEFECTS	3000	0	 QA PASSED 24.8.2000 02
	3000	0	
	3000	0	
	3000	0	
Qualification Requirements: (if applicable)			
GR& R	15-13 %	Calibration	PASSED
Jam Rate	1:3000	ESD Grounding	OK
UPH	7130	Cpk	2.45
Type of Release:			
Full release			
Approvals	Name	Signature	Date
Performed by	L. ABAYAN		8/24/00
Maintenance	L. FERRANCOL		8/24/wm
Production	E. PADILLA		8/24/00
Quality Assurance	R. DELA CRUZ		8/24/00
Operations	L. FERRANCOL		8/24/wm

TELFORD SVC., PHILS. INC.

EQUIPMENT QUALIFICATION SAFETY INSPECTION CHECKLIST

Equipment Description : TAPING MACHINE		Manufacturer: STI	
Serial # : 4B6	Model # : AT2800	Control # : CNO18	
Affected Area: TAPE & REEL	Package type : M60P	Checked By : 002	
ITEMS TO BE CHECK	YES	NO	REMARKS
ELECTRICAL :			
1 Set on the right power requirement?	✓		
2 Provide with the right type of plug?	✓		
3 Provide with the right size of power supply cable ?	✓		
4 No Temporary wiring installed?	✓		
5 No electrical wires lying on floors which can cause trip injury?	✓		
6 Over current safety fuse provided?	✓		
MACHINE GUARDS :			
7 Machine cover sensors provided ?	✓		
8 Emergency Shut-Off switch provided ?	✓		
SAFETY SIGNS :			
9 Warning signs are posted to point out dangerous condition ?	✓		
10 Hazardous voltage sign provided ?	✓		
11 Hazardous Temperature sign provided ?	✓		
MACHINE LOCATION AND CONDITIONS:			
12 Location clean and well lighted ?	✓		
13 No leaks of fuel,oil,air, water and or other gases ?	✓		
14 No sharp and pointed parts exposed ?	✓		
OTHERS :			
15 Equipment safety rules, Operation Manuals & guidelines provided. ?	✓		
16 Operators and Technician properly trained on electrical Safety, use of Fire extinguisher ?	✓		

TELFORD SVC., PHILS. INC.

CALIBRATION REPORT

PAGE | OF |

EQUIPMENT : TAPING MACHINE	MANUFACTURER: STI	CONTROL #: CNC1B	REPORT #: 001
MODEL #: AT2800	SERIAL #: 436	CAL SPEC #: TFP 05 - 004	
CAL. INTERVAL QUARTERLY	CAL. DATE 9-3-00	CAL DUE: 12-3-06	
TEMP.: 21 °C	RH: 53 %	CAL. BY: 002	MAINT.CAL ENG'R
			CAL. TECH. L. ABAYAN

CALIBRATION STANDARD USED

DESCRIPTION	MANUFACTURER	MODEL #	SERIAL #	CONTROL #	ACCURACY	CAL. DATE	CAL. DUE
D. THERMOMETER	SHINKA	N/A	ST300	CNGC5	$\pm .75\%$		
T. PROBE	SHINKA	TYPE K	N/A	CNGC6	N/A		

CALIBRATION INFORMATION

Marian Carubio

From: Arpon, Alberto <alberto.arpon@analog.com>
To: <Alberto.Arpon@analog.com>; Telford Philippines <telford_gbp@PACIFIC.NET.PH>
Cc: Andy ferrancol <lferrancol@PACIFIC.NET.PH>; <rdcruz@telford.com.sg>;
 <laabayan@telford.com.sg>
Sent: Thursday, August 17, 2000 9:03 AM
Subject: RE: correlation

Hi Leand,

Acknowledge...

Regards,
abet arpon

> -----

> From: Telford Philippines[SMTP:telford_gbp@PACIFIC.NET.PH]
> Sent: Wednesday, August 16, 2000 6:00 AM
> To: alberto.arpon@analog.com
> Cc: Andy ferrancol; rdcruz@telford.com.sg; laabayan@telford.com.sg; Telford
 Philippines
> Subject: correlation

>

>

> Sir Abet,

>

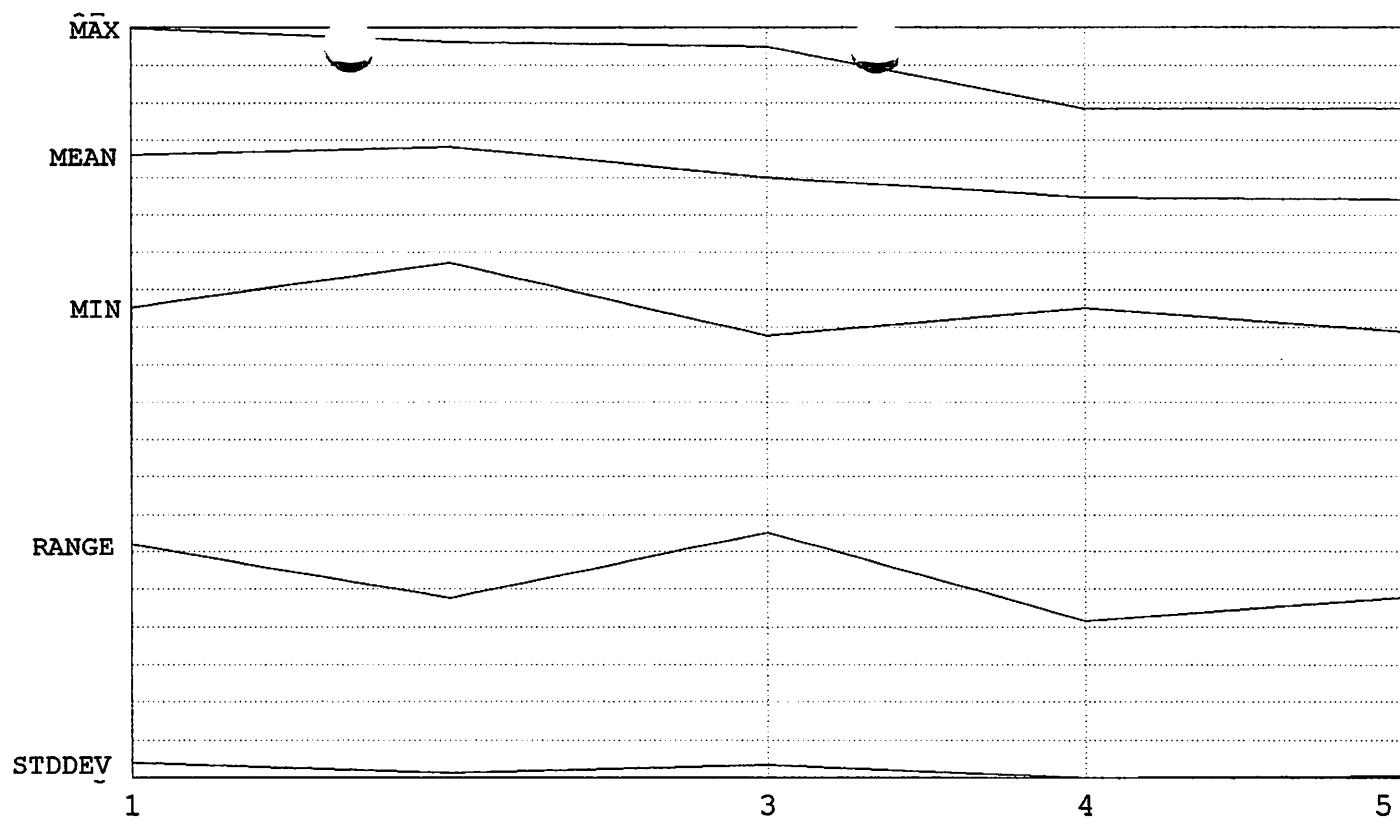
> We are again qualifying our 1 AT28 which configured to TSSOP package, In the
 > correlation of the vision system, we will be using TSSOP dummy that will be
 > measured at the profile projector in the absence of Golden Unit as what we've
 > talked before, but during Qualification of th first AT28 for SOIC8 we were
 > able to used Golden unit during correlation that was provided by STI . For
 > our reference, please reply to this message for your acknowledgement.

>

> thanks and best regards

> Leand

>



Vertical Increment: 4.6g

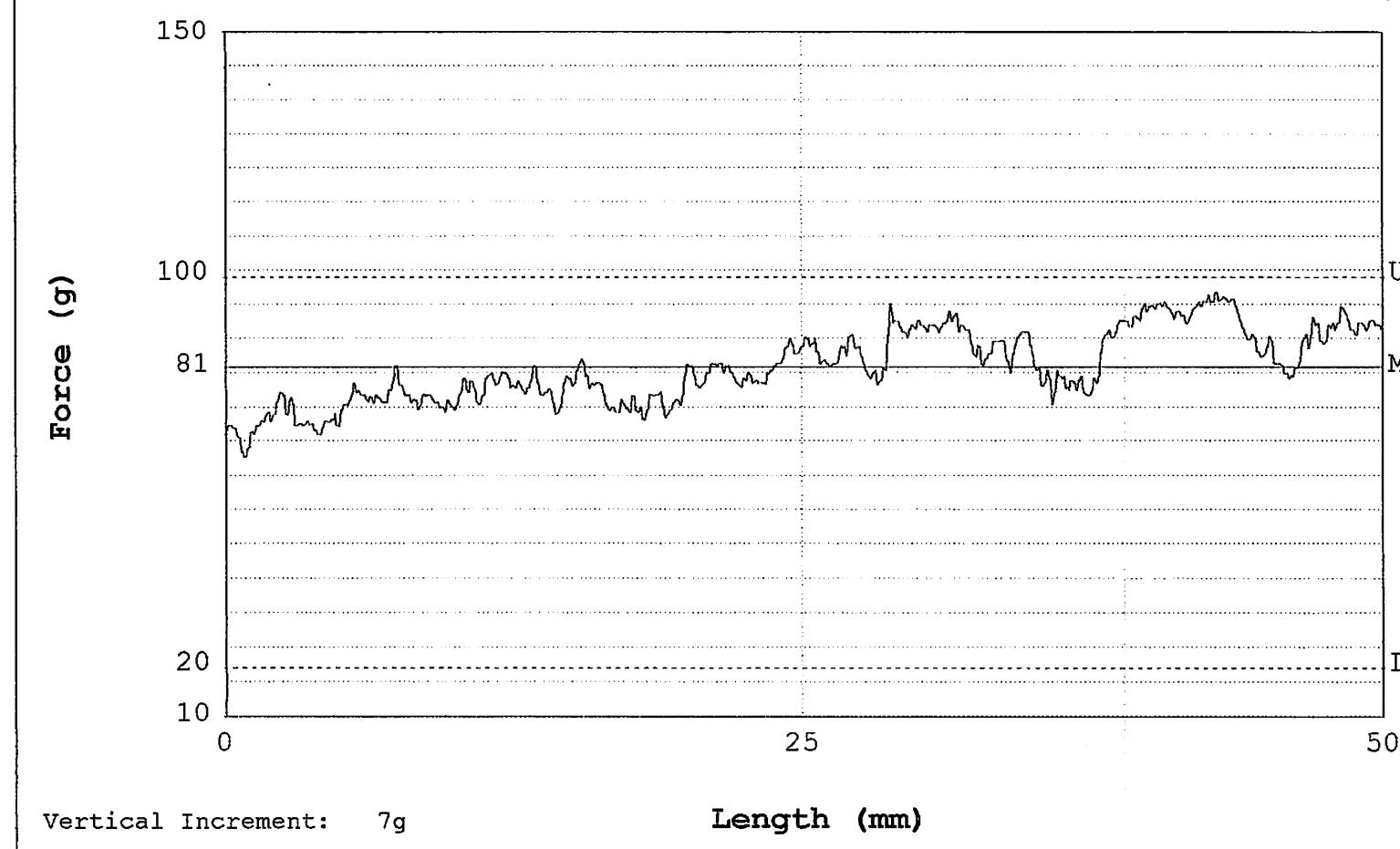
Upper Limit: 100

Lower Limit: 20

Cpk-Upper: 0.1381 Cpk-Lower: 0.1759 Cpk: 2.4479

Comparison Test

Vendor Name: Telford
Product Name: MSOP
Temperature (C): 160 Deg C
Pressure (PSI): 50
Seal Time (sec): 0.35
Operator 002
TnR # 5
Serial # 486



Limit - Max:100g Min: 20g Range: 80g

Result - Max: 97g Min: 63g Range: 34g

Speed: 300mm/min

Mean: 81g

Standard Deviation: 7g

Comparison Test

Vendor Name: Telford

Product Name: MSOP

Temperature (C): 160 Deg C

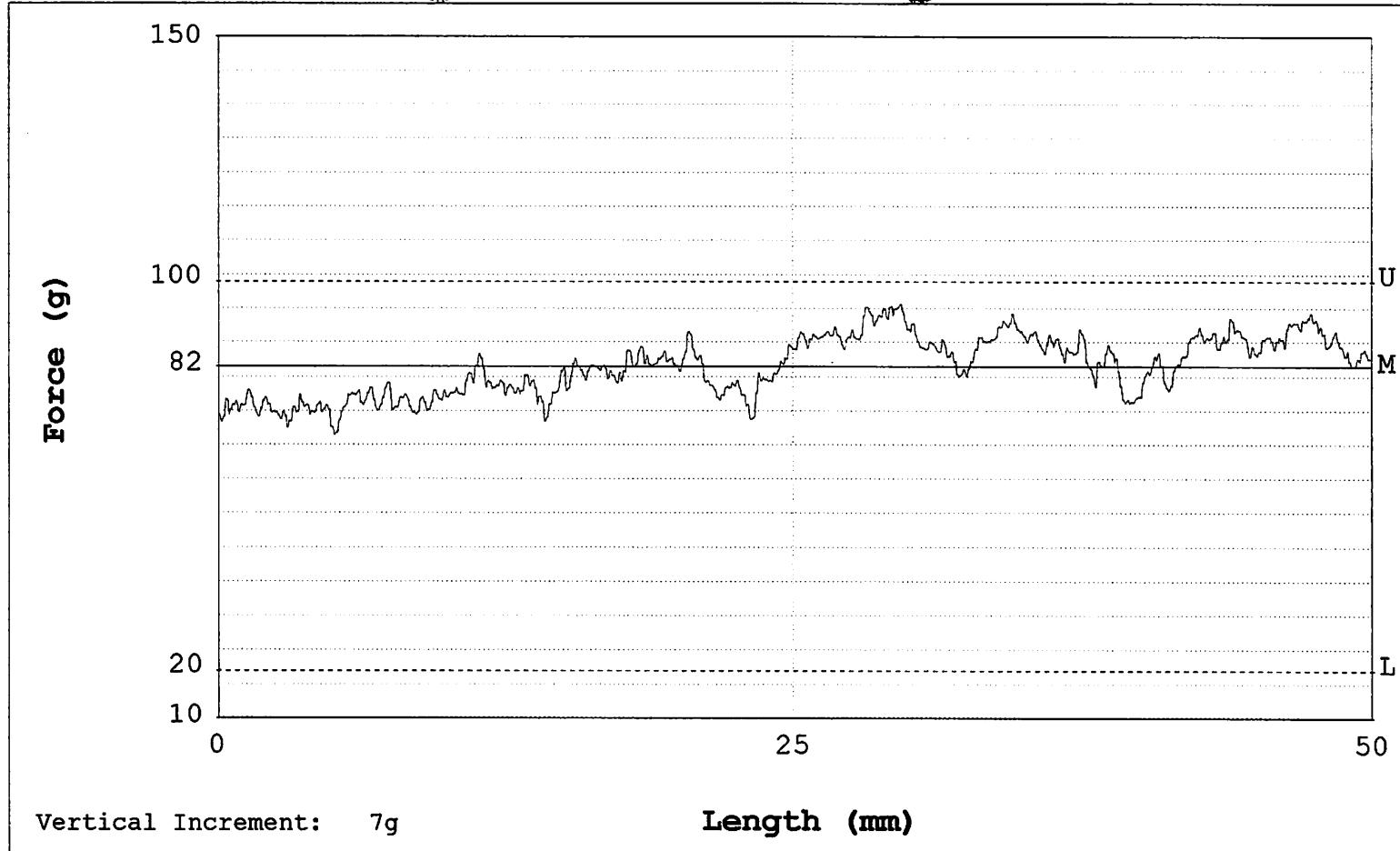
Pressure (PSI): 50

Seal Time (sec): 0.35

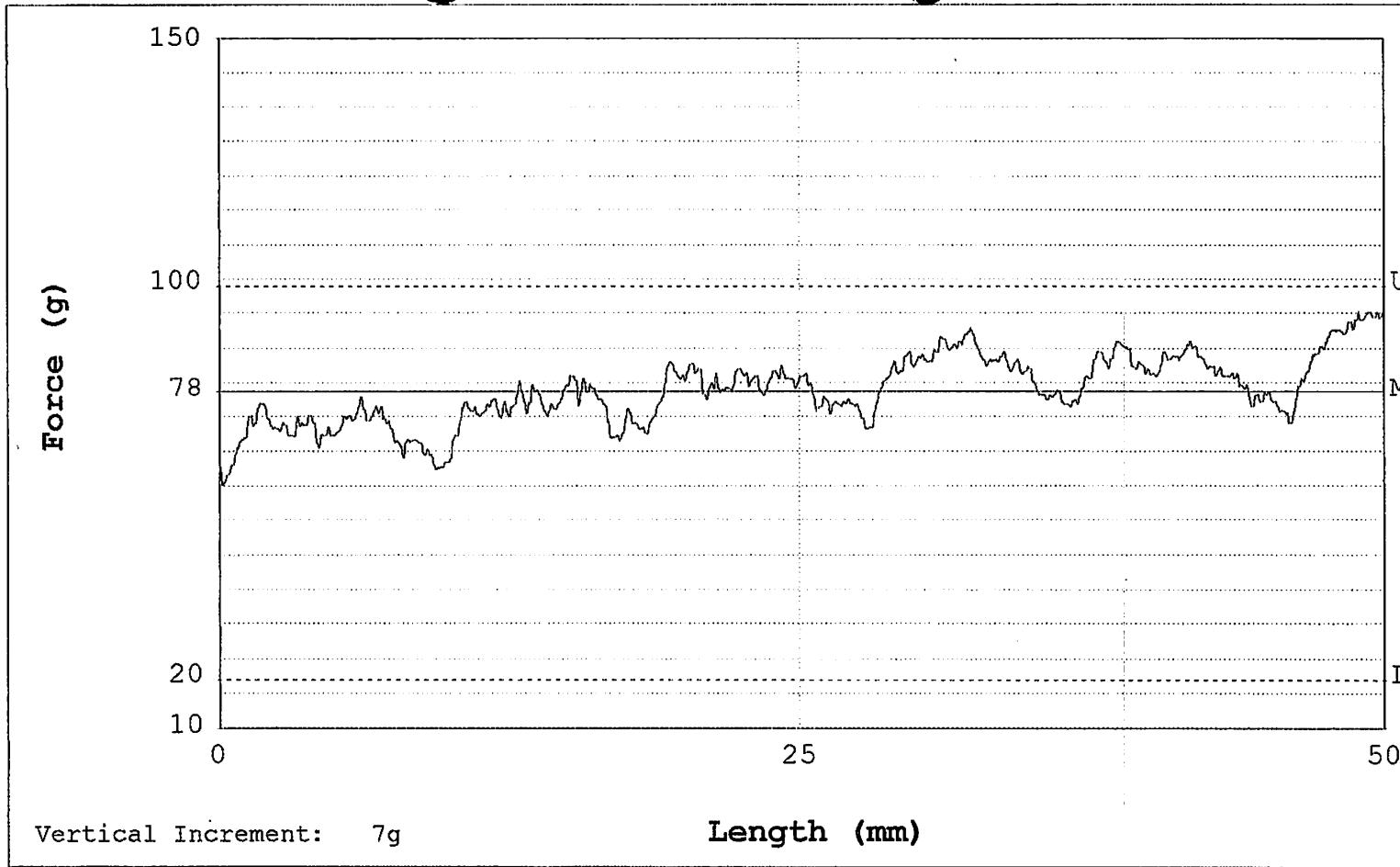
Operator 002

TnR # 5

Serial # 486



Comparison Test
Vendor Name: Telford
Product Name: MSOP
Temperature (C): 160 Deg C
Pressure (PSI): 50
Seal Time (sec): 0.35
Operator 002
TnR # 5
Serial # 486



Vertical Increment: 7g

Length (mm)

Limit - Max:100g Min: 20g Range: 80g

Result - Max: 94g Min: 59g Range: 35g

Speed: 300mm/min

Mean: 78g

Standard Deviation: 7g

Comparison Test

Vendor Name: Telford

Product Name: MSOP

Temperature (C): 160 Deg C

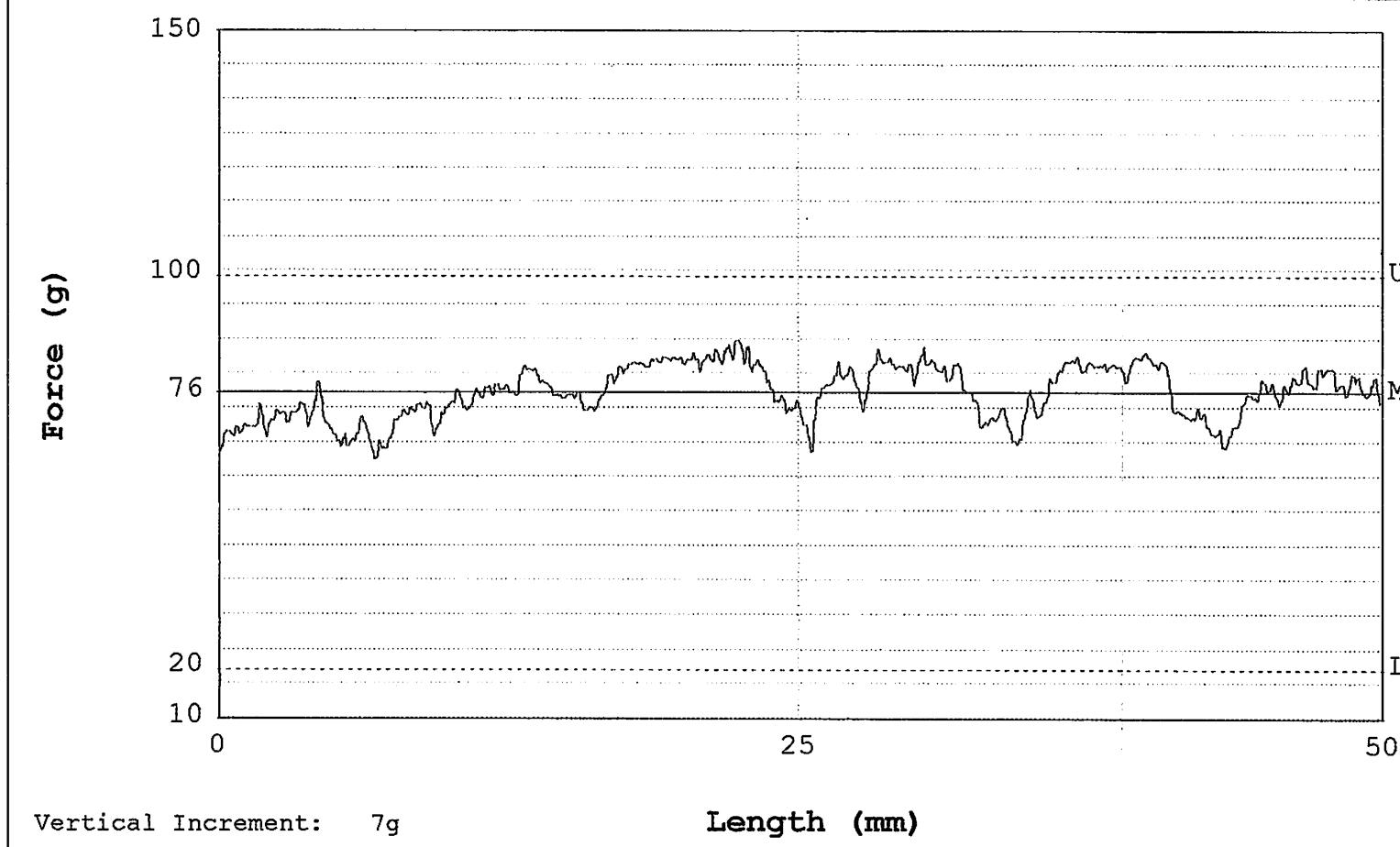
Pressure (PSI): 50

Seal Time (sec): 0.35

Operator 002

TnR # 5

Serial # 486



Vertical Increment: 7g

Length (mm)

Limit - Max:100g Min: 20g Range: 80g

Result - Max: 87g Min: 63g Range: 24g

Speed: 300mm/min

Mean: 76g

Standard Deviation: 5g

Comparison Test

Vendor Name: Telford

Product Name: MSOP

Temperature (C): 160 Deg C

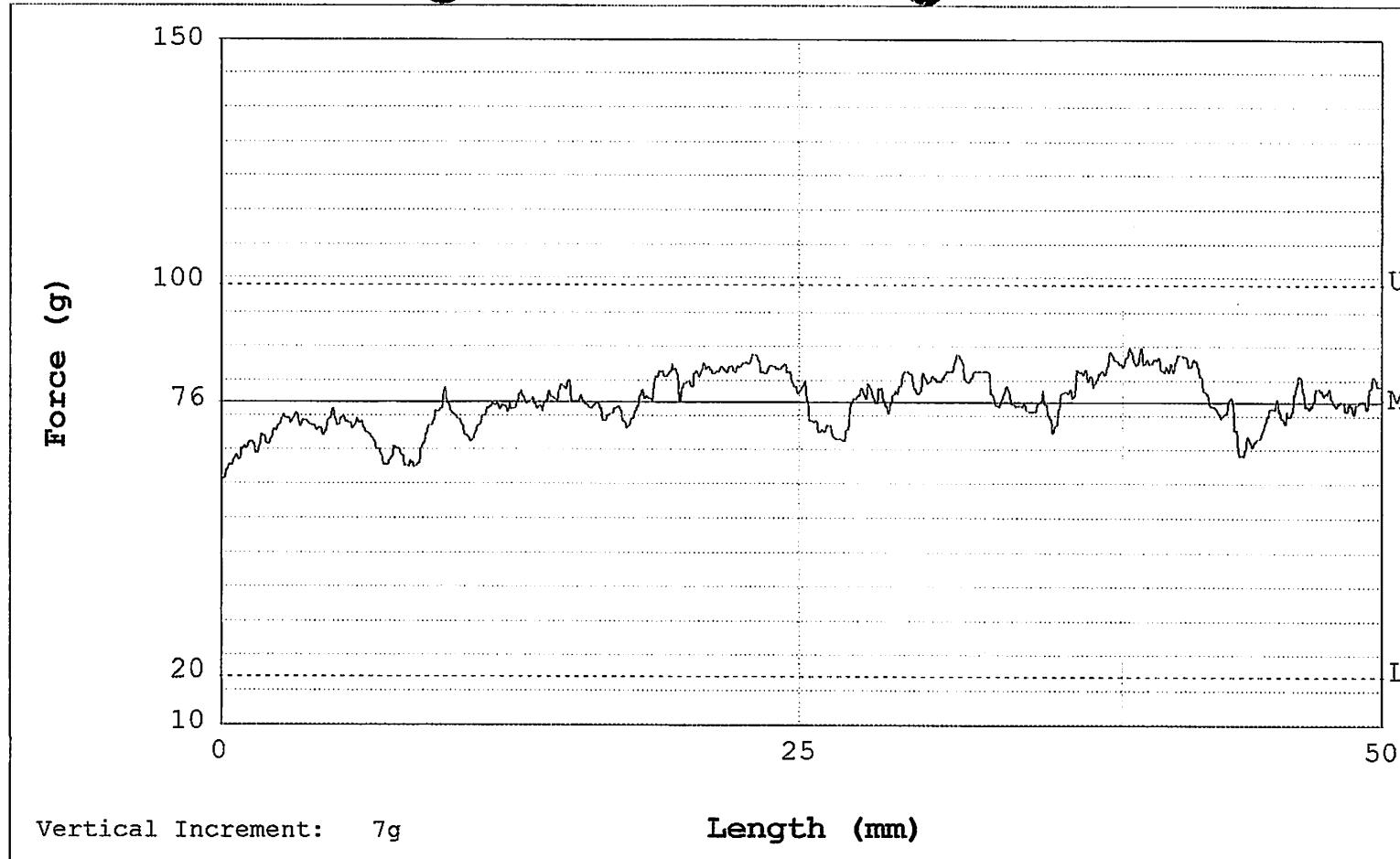
Pressure (PSI): 50

Seal Time (sec): 0.35

Operator 002

TnR # 5

Serial # 486



Vertical Increment: 7g

Length (mm)

Limit - Max:100g Min: 20g Range: 80g

Result - Max: 87g Min: 60g Range: 27g

Speed: 300mm/min

Mean: 76g

Standard Deviation: 6g

Comparison Test

Vendor Name: Telford

Product Name: MSOP

Temperature (C): 160 Deg C

Pressure (PSI): 50

Seal Time (sec): 0.35

Operator 002

TnR # 5

Serial # 486

MSOP8
Stand-off correlation
TnR # 05
Serial # 486
Reading = max. = 9.5 mils (profile projector)
min. = 2.4 mils
Limit = +/- 0.5 mils Vs. Comparator reading

Monday 28/08/2000 17:36:37

SYSTEM : NT4280
MACHINE : 1
PRODUCT ID : 8Msop
LEADS : 8
DIMENSIONS : MILS
LOT NUMBER : 0
PART COUNT : 1

Maximum Copl. Error : 3.79 Side : 2 Pin : 8 PASSED
Maximum Bent Lead : 1.31 Side : 2 Pin : 8 PASSED
Maximum Pitch Error : 1.31 Side : 1 Pin : 2 PASSED
Maximum Standoff : 9.69 PASSED
Minimum Standoff : 2.48 PASSED

Monday 28/08/2000 17:36:38

SYSTEM : NT4280
MACHINE : 1
PRODUCT ID : 8Msop
LEADS : 8
DIMENSIONS : MILS
LOT NUMBER : 0
PART COUNT : 2

Maximum Copl. Error : 3.81 Side : 2 Pin : 8 PASSED
Maximum Bent Lead : 1.33 Side : 2 Pin : 8 PASSED
Maximum Pitch Error : 1.25 Side : 1 Pin : 2 PASSED
Maximum Standoff : 9.70 PASSED

Minimum Standoff : 2.50 PASSED

Monday 28/08/2000 17:36:38

SYSTEM : NT4280
MACHINE : 1
PRODUCT ID : 8Msop
LEADS : 8
DIMENSIONS : MILS
LOT NUMBER : 0
PART COUNT : 3

Maximum Copl. Error : 3.67 Side : 2 Pin : 8 PASSED
Maximum Bent Lead : 1.25 Side : 2 Pin : 8 PASSED
Maximum Pitch Error : 1.19 Side : 1 Pin : 2 PASSED
Maximum Standoff : 9.61 PASSED
Minimum Standoff : 2.52 PASSED

Monday 28/08/2000 17:36:39

SYSTEM : NT4280
MACHINE : 1
PRODUCT ID : 8Msop
LEADS : 8
DIMENSIONS : MILS
LOT NUMBER : 0
PART COUNT : 4

Maximum Copl. Error : 3.78 Side : 2 Pin : 8 PASSED
Maximum Bent Lead : 1.28 Side : 2 Pin : 8 PASSED
Maximum Pitch Error : 1.12 Side : 1 Pin : 2 PASSED
Maximum Standoff : 9.66 PASSED
Minimum Standoff : 2.47 PASSED

Monday 28/08/2000 17:36:40

SYSTEM : NT4280
MACHINE : 1
PRODUCT ID : 8Msop
LEADS : 8

DIMENSIONS : MILS
LOT NUMBER : 0
PART COUNT : 5

Maximum Copl. Error : 3.61 Side : 2 Pin : 8 PASSED
Maximum Bent Lead : 1.37 Side : 2 Pin : 8 PASSED
Maximum Pitch Error : 1.33 Side : 1 Pin : 2 PASSED
Maximum Standoff : 9.58 PASSED
Minimum Standoff : 2.55 PASSED

MSOP8
GRR1 = 10 Samples 3 passes
TnR # 05
Serial Number= 486
Limit = Less or equal 20 %

Guage Repeatability Reproducibility Results

GRR TESTING

Thursday 24/08/2000 14:49:37

Sample Size = (10) Number of Passes = (3) GRR Constant = (0.581) or K1 = (3.546)

PARAMETER	:	SPEC LIMIT	:	RESULT	:	RBar	:	1 SIGMA
-----------	---	------------	---	--------	---	------	---	---------

CoPlanarity	%GRR @	4.00	=	10.24 %		0.117		0.068
-------------	--------	------	---	---------	--	-------	--	-------

Pitch	%GRR @	4.00	=	7.87 %		0.090		0.052
-------	--------	------	---	--------	--	-------	--	-------

Bent Lead	%GRR @	4.00	=	5.75 %		0.066		0.038
-----------	--------	------	---	--------	--	-------	--	-------

Max Standoff	%GRR @	4.00	=	13.94 %		0.160		0.093
--------------	--------	------	---	---------	--	-------	--	-------

Min Standoff	%GRR @	4.00	=	10.34 %		0.119		0.069
--------------	--------	------	---	---------	--	-------	--	-------

RAW DATA FOLLOWS :

Planarity

Device#	1 :	0.584	0.558	0.578	Range = 0.026	Avg = 0.573	Sigma = 0.011
Device#	2 :	0.533	0.572	0.434	Range = 0.139	Avg = 0.513	Sigma = 0.058
Device#	3 :	0.241	0.302	0.253	Range = 0.061	Avg = 0.266	Sigma = 0.026
Device#	4 :	0.322	0.379	0.297	Range = 0.082	Avg = 0.333	Sigma = 0.035
Device#	5 :	0.353	0.336	0.333	Range = 0.020	Avg = 0.341	Sigma = 0.009
Device#	6 :	0.433	0.475	0.429	Range = 0.047	Avg = 0.445	Sigma = 0.021
Device#	7 :	1.141	1.438	1.578	Range = 0.436	Avg = 1.386	Sigma = 0.182
Device#	8 :	0.950	0.629	0.701	Range = 0.322	Avg = 0.760	Sigma = 0.138
Device#	9 :	0.563	0.549	0.559	Range = 0.013	Avg = 0.557	Sigma = 0.006
Device#	10 :	0.603	0.613	0.584	Range = 0.029	Avg = 0.600	Sigma = 0.012

Pitch

Device#	1 :	0.778	0.836	0.812	Range = 0.058	Avg = 0.809	Sigma = 0.024
Device#	2 :	0.699	0.605	0.613	Range = 0.093	Avg = 0.639	Sigma = 0.042
Device#	3 :	1.034	1.001	1.067	Range = 0.066	Avg = 1.034	Sigma = 0.027

Grr1

Device#	4 :	0.894	0.906	0.870	Range = 0.036	Avg = 0.890	Sigma = 0.015
Device#	5 :	0.579	0.599	0.601	Range = 0.022	Avg = 0.593	Sigma = 0.010
Device#	6 :	0.997	0.839	0.850	Range = 0.157	Avg = 0.896	Sigma = 0.072
Device#	7 :	1.021	0.895	0.952	Range = 0.126	Avg = 0.956	Sigma = 0.051
Device#	8 :	0.885	1.017	0.975	Range = 0.132	Avg = 0.959	Sigma = 0.055
Device#	9 :	0.944	0.863	0.868	Range = 0.080	Avg = 0.892	Sigma = 0.037
Device#	10 :	0.769	0.865	0.901	Range = 0.132	Avg = 0.845	Sigma = 0.056

Bent Lead

Device#	1 :	0.888	0.939	0.890	Range = 0.051	Avg = 0.906	Sigma = 0.023
Device#	2 :	0.982	0.953	0.913	Range = 0.069	Avg = 0.950	Sigma = 0.028
Device#	3 :	0.933	0.756	0.725	Range = 0.208	Avg = 0.805	Sigma = 0.092
Device#	4 :	0.854	0.860	0.835	Range = 0.025	Avg = 0.850	Sigma = 0.011
Device#	5 :	0.806	0.813	0.801	Range = 0.012	Avg = 0.807	Sigma = 0.005
Device#	6 :	0.950	0.898	0.890	Range = 0.060	Avg = 0.913	Sigma = 0.027
Device#	7 :	1.241	1.130	1.162	Range = 0.111	Avg = 1.177	Sigma = 0.047
Device#	8 :	0.936	0.877	0.883	Range = 0.059	Avg = 0.899	Sigma = 0.026
Device#	9 :	0.913	0.938	0.924	Range = 0.026	Avg = 0.925	Sigma = 0.010
Device#	10 :	0.938	0.978	0.939	Range = 0.041	Avg = 0.952	Sigma = 0.019

Max Standoff

Device# 1 :	5.815	5.827	5.739	Range = 0.088	Avg = 5.794	Sigma = 0.039
Device# 2 :	5.554	5.481	5.327	Range = 0.227	Avg = 5.454	Sigma = 0.095
Device# 3 :	5.820	5.910	5.856	Range = 0.090	Avg = 5.862	Sigma = 0.037
Device# 4 :	5.759	5.664	5.653	Range = 0.105	Avg = 5.692	Sigma = 0.047
Device# 5 :	5.575	5.620	5.618	Range = 0.045	Avg = 5.604	Sigma = 0.021
Device# 6 :	5.632	5.582	5.611	Range = 0.051	Avg = 5.608	Sigma = 0.021
Device# 7 :	5.259	6.128	6.013	Range = 0.869	Avg = 5.800	Sigma = 0.386
Device# 8 :	5.759	5.696	5.749	Range = 0.064	Avg = 5.735	Sigma = 0.028
Device# 9 :	5.580	5.541	5.535	Range = 0.045	Avg = 5.552	Sigma = 0.020
Device# 10 :	5.823	5.838	5.837	Range = 0.015	Avg = 5.833	Sigma = 0.007

Min Standoff

Device# 1 :	4.241	4.171	4.283	Range = 0.112	Avg = 4.232	Sigma = 0.046
Device# 2 :	4.774	4.811	4.864	Range = 0.089	Avg = 4.816	Sigma = 0.037
Device# 3 :	4.527	4.493	4.463	Range = 0.064	Avg = 4.495	Sigma = 0.026
Device# 4 :	4.899	4.713	4.783	Range = 0.185	Avg = 4.798	Sigma = 0.076

Grr1

Device#	5 :	4.145	4.240	4.205	Range = 0.095	AVG = 4.197	SIGMA = 0.039
Device#	6 :	4.604	4.636	4.610	Range = 0.032	AVG = 4.617	SIGMA = 0.014
Device#	7 :	4.751	4.320	4.362	Range = 0.431	AVG = 4.478	SIGMA = 0.194
Device#	8 :	4.817	4.780	4.730	Range = 0.087	AVG = 4.776	SIGMA = 0.036
Device#	9 :	4.642	4.668	4.674	Range = 0.032	AVG = 4.661	SIGMA = 0.014
Device#	10 :	4.876	4.894	4.837	Range = 0.058	AVG = 4.869	SIGMA = 0.024

MSOP8
GRR2 = 10 Samples 3 passes
Tape n Reel # 05
Serial Number 486
Limit = Less or equal 20 %

Guage Repeatability Reproducibility Results

GRR TESTING

Thursday 24/08/2000 14:55:43

Sample Size = (10) Number of Passes = (3) GRR Constant = (0.581) or K1 = (3.546)

PARAMETER : SPEC LIMIT : RESULT : RBar : 1 SIGMA

CoPlanarity %GRR @ 4.00 = 9.61 % 0.110 0.064

Pitch %GRR @ 4.00 = 9.04 % 0.104 0.060

Bent Lead %GRR @ 4.00 = 6.21 % 0.071 0.041

Max Standoff %GRR @ 4.00 = 15.13 % 0.174 0.101

Min Standoff %GRR @ 4.00 = 13.50 % 0.155 0.090

RAW DATA FOLLOWS :

Planarity

Device# 1 :	0.552	0.407	0.410	Range = 0.145	Avg = 0.456	Sigma = 0.068
Device# 2 :	0.446	0.367	0.438	Range = 0.078	Avg = 0.417	Sigma = 0.035
Device# 3 :	0.252	0.434	0.234	Range = 0.201	Avg = 0.307	Sigma = 0.091
Device# 4 :	0.373	0.386	0.390	Range = 0.017	Avg = 0.383	Sigma = 0.007
Device# 5 :	0.306	0.410	0.343	Range = 0.104	Avg = 0.353	Sigma = 0.043
Device# 6 :	0.401	0.428	0.355	Range = 0.073	Avg = 0.394	Sigma = 0.030
Device# 7 :	1.446	1.536	1.457	Range = 0.090	Avg = 1.480	Sigma = 0.040
Device# 8 :	0.803	0.561	0.545	Range = 0.257	Avg = 0.636	Sigma = 0.118
Device# 9 :	0.497	0.588	0.550	Range = 0.091	Avg = 0.545	Sigma = 0.037
Device# 10 :	0.531	0.484	0.513	Range = 0.047	Avg = 0.509	Sigma = 0.019

Pitch

Device# 1 :	0.719	0.766	0.764	Range = 0.046	Avg = 0.750	Sigma = 0.022
Device# 2 :	0.608	0.588	0.604	Range = 0.019	Avg = 0.600	Sigma = 0.008
Device# 3 :	0.868	0.872	1.036	Range = 0.168	Avg = 0.925	Sigma = 0.078

Grr2

Device# 4 :	0.894	0.904	0.888	Range = 0.016	AVG = 0.895	SIGMA = 0.007
Device# 5 :	0.573	0.592	0.516	Range = 0.077	AVG = 0.560	SIGMA = 0.033
Device# 6 :	1.062	1.045	0.806	Range = 0.255	AVG = 0.971	SIGMA = 0.117
Device# 7 :	1.019	0.999	1.006	Range = 0.020	AVG = 1.008	SIGMA = 0.008
Device# 8 :	0.796	1.057	0.994	Range = 0.261	AVG = 0.949	SIGMA = 0.111
Device# 9 :	0.897	0.947	1.014	Range = 0.117	AVG = 0.953	SIGMA = 0.048
Device# 10 :	0.866	0.924	0.899	Range = 0.058	AVG = 0.896	SIGMA = 0.024

Bent Lead

Device# 1 :	0.867	0.879	0.900	Range = 0.033	AVG = 0.882	SIGMA = 0.014
Device# 2 :	0.886	0.937	0.947	Range = 0.061	AVG = 0.923	SIGMA = 0.027
Device# 3 :	0.815	0.730	0.923	Range = 0.193	AVG = 0.822	SIGMA = 0.079
Device# 4 :	0.832	0.813	0.792	Range = 0.040	AVG = 0.812	SIGMA = 0.016
Device# 5 :	0.806	0.859	0.812	Range = 0.053	AVG = 0.826	SIGMA = 0.024
Device# 6 :	0.977	0.988	0.904	Range = 0.085	AVG = 0.956	SIGMA = 0.038
Device# 7 :	1.198	1.248	1.207	Range = 0.050	AVG = 1.218	SIGMA = 0.022
Device# 8 :	0.977	0.886	0.895	Range = 0.091	AVG = 0.919	SIGMA = 0.041
Device# 9 :	0.974	0.921	0.904	Range = 0.069	AVG = 0.933	SIGMA = 0.030

Grr2

Device# 10 : 0.970 0.932 0.943 Range = 0.038 AVG = 0.948 SIGMA = 0.016

Max Standoff

Device# 1 : 5.787 5.435 5.520 Range = 0.352 AVG = 5.581 SIGMA = 0.150

Device# 2 : 5.594 5.604 5.838 Range = 0.244 AVG = 5.679 SIGMA = 0.113

Device# 3 : 5.768 5.986 5.692 Range = 0.294 AVG = 5.815 SIGMA = 0.125

Device# 4 : 5.738 5.683 5.779 Range = 0.096 AVG = 5.733 SIGMA = 0.039

Device# 5 : 5.573 5.556 5.549 Range = 0.024 AVG = 5.560 SIGMA = 0.010

Device# 6 : 5.616 5.675 5.584 Range = 0.091 AVG = 5.625 SIGMA = 0.038

Device# 7 : 5.855 6.176 6.103 Range = 0.321 AVG = 6.045 SIGMA = 0.137

Device# 8 : 5.667 5.727 5.642 Range = 0.085 AVG = 5.679 SIGMA = 0.036

Device# 9 : 5.513 5.606 5.607 Range = 0.094 AVG = 5.575 SIGMA = 0.044

Device# 10 : 5.692 5.805 5.828 Range = 0.136 AVG = 5.775 SIGMA = 0.059

Min Standoff

Device# 1 : 4.138 3.812 3.828 Range = 0.327 AVG = 3.926 SIGMA = 0.150

Device# 2 : 4.672 4.534 4.404 Range = 0.268 AVG = 4.537 SIGMA = 0.109

Device# 3 : 4.530 4.459 4.620 Range = 0.161 AVG = 4.536 SIGMA = 0.066

Device# 4 : 4.719 4.683 4.571 Range = 0.148 AVG = 4.657 SIGMA = 0.063

Device#	5 :	4.163	4.144	4.120	Range = 0.043	AVG = 4.142	SIGMA = 0.017
Device#	6 :	4.672	4.510	4.665	Range = 0.161	AVG = 4.616	SIGMA = 0.075
Device#	7 :	4.445	4.245	4.296	Range = 0.200	AVG = 4.328	SIGMA = 0.085
Device#	8 :	4.769	4.751	4.774	Range = 0.023	AVG = 4.765	SIGMA = 0.010
Device#	9 :	4.677	4.732	4.593	Range = 0.139	AVG = 4.667	SIGMA = 0.057
Device#	10 :	4.895	4.816	4.825	Range = 0.079	AVG = 4.845	SIGMA = 0.035

MSOP8
GRR3 = 10 Samples 3 passes
Tape n Reel # 05
Serial Number 486
Limit = Less or equal 20 %

Guage Repeatability Reproducibility Results

GRR TESTING

Thursday 24/08/2000 15:01:04

Sample Size = (10) Number of Passes = (3) GRR Constant = (0.581) or K1 = (3.546)

PARAMETER : SPEC LIMIT : RESULT : RBar : 1 SIGMA

CoPlanarity %GRR @ 4.00 = 12.00 % 0.138 0.080

Pitch %GRR @ 4.00 = 10.99 % 0.126 0.073

Bent Lead %GRR @ 4.00 = 5.49 % 0.063 0.037

Max Standoff %GRR @ 4.00 = 14.01 % 0.161 0.093

Min Standoff %GRR @ 4.00 = 10.49 % 0.120 0.070

RAW DATA FOLLOWS :

Planarity

Device#	1 :	0.284	0.390	0.389	Range = 0.106	Avg = 0.355	Sigma = 0.050
Device#	2 :	0.384	0.562	0.539	Range = 0.177	Avg = 0.495	Sigma = 0.079
Device#	3 :	0.223	0.244	0.349	Range = 0.125	Avg = 0.272	Sigma = 0.055
Device#	4 :	0.313	0.322	0.364	Range = 0.051	Avg = 0.333	Sigma = 0.022
Device#	5 :	0.352	0.485	0.312	Range = 0.173	Avg = 0.383	Sigma = 0.074
Device#	6 :	0.483	0.309	0.280	Range = 0.204	Avg = 0.357	Sigma = 0.090
Device#	7 :	1.461	1.316	1.273	Range = 0.188	Avg = 1.350	Sigma = 0.080
Device#	8 :	0.664	0.648	0.493	Range = 0.171	Avg = 0.602	Sigma = 0.077
Device#	9 :	0.514	0.597	0.506	Range = 0.091	Avg = 0.539	Sigma = 0.041
Device#	10 :	0.562	0.471	0.543	Range = 0.090	Avg = 0.525	Sigma = 0.039

Pitch

Device#	1 :	0.870	0.754	0.746	Range = 0.124	Avg = 0.790	Sigma = 0.057
Device#	2 :	0.644	0.560	0.626	Range = 0.084	Avg = 0.610	Sigma = 0.036
Device#	3 :	0.836	0.883	0.999	Range = 0.163	Avg = 0.906	Sigma = 0.068

Grr3

Device#	4 :	0.867	0.929	0.951	Range = 0.084	AVG = 0.916	SIGMA = 0.035
Device#	5 :	0.651	0.538	0.481	Range = 0.170	AVG = 0.556	SIGMA = 0.071
Device#	6 :	0.808	0.934	0.812	Range = 0.126	AVG = 0.851	SIGMA = 0.058
Device#	7 :	1.060	1.011	0.941	Range = 0.119	AVG = 1.004	SIGMA = 0.049
Device#	8 :	1.070	1.046	0.871	Range = 0.199	AVG = 0.996	SIGMA = 0.089
Device#	9 :	0.950	1.026	0.940	Range = 0.086	AVG = 0.972	SIGMA = 0.038
Device#	10 :	0.895	0.904	0.797	Range = 0.107	AVG = 0.865	SIGMA = 0.048

Bent Lead

Device#	1 :	0.925	0.858	0.878	Range = 0.067	AVG = 0.887	SIGMA = 0.028
Device#	2 :	0.932	0.961	0.988	Range = 0.056	AVG = 0.960	SIGMA = 0.023
Device#	3 :	0.874	0.870	0.922	Range = 0.052	AVG = 0.889	SIGMA = 0.024
Device#	4 :	0.829	0.782	0.736	Range = 0.093	AVG = 0.782	SIGMA = 0.038
Device#	5 :	0.788	0.824	0.794	Range = 0.036	AVG = 0.802	SIGMA = 0.016
Device#	6 :	0.962	1.021	0.899	Range = 0.123	AVG = 0.961	SIGMA = 0.050
Device#	7 :	1.240	1.225	1.207	Range = 0.033	AVG = 1.224	SIGMA = 0.013
Device#	8 :	0.891	0.900	0.862	Range = 0.037	AVG = 0.884	SIGMA = 0.016
Device#	9 :	0.891	0.858	0.916	Range = 0.058	AVG = 0.889	SIGMA = 0.024
Device#	10 :	0.936	0.910	0.986	Range = 0.075	AVG = 0.944	SIGMA = 0.031

Max Standoff

Device# 1 :	5.276	5.745	5.727	Range = 0.468	AVG = 5.583	SIGMA = 0.217
Device# 2 :	5.480	5.793	5.661	Range = 0.313	AVG = 5.644	SIGMA = 0.128
Device# 3 :	5.746	5.773	5.766	Range = 0.027	AVG = 5.762	SIGMA = 0.011
Device# 4 :	5.704	5.650	5.684	Range = 0.054	AVG = 5.679	SIGMA = 0.022
Device# 5 :	5.641	5.623	5.539	Range = 0.101	AVG = 5.601	SIGMA = 0.044
Device# 6 :	5.547	5.641	5.665	Range = 0.118	AVG = 5.618	SIGMA = 0.051
Device# 7 :	5.899	5.782	5.684	Range = 0.215	AVG = 5.789	SIGMA = 0.088
Device# 8 :	5.775	5.652	5.734	Range = 0.123	AVG = 5.720	SIGMA = 0.051
Device# 9 :	5.557	5.675	5.569	Range = 0.118	AVG = 5.600	SIGMA = 0.053
Device# 10 :	5.857	5.787	5.842	Range = 0.070	AVG = 5.828	SIGMA = 0.030

Min Standoff

Device# 1 :	4.067	3.991	3.966	Range = 0.101	AVG = 4.008	SIGMA = 0.043
Device# 2 :	4.652	4.453	4.547	Range = 0.198	AVG = 4.551	SIGMA = 0.081
Device# 3 :	4.560	4.579	4.544	Range = 0.035	AVG = 4.561	SIGMA = 0.014
Device# 4 :	4.763	4.688	4.669	Range = 0.094	AVG = 4.707	SIGMA = 0.041

Grr3

Device#	5 :	4.222	4.121	4.152	Range = 0.101	AVG = 4.165	SIGMA = 0.042
Device#	6 :	4.673	4.709	4.670	Range = 0.039	AVG = 4.684	SIGMA = 0.018
Device#	7 :	4.419	4.430	4.608	Range = 0.189	AVG = 4.486	SIGMA = 0.087
Device#	8 :	4.697	4.926	4.760	Range = 0.229	AVG = 4.794	SIGMA = 0.096
Device#	9 :	4.654	4.612	4.706	Range = 0.093	AVG = 4.658	SIGMA = 0.038
Device#	10 :	4.893	4.770	4.795	Range = 0.123	AVG = 4.819	SIGMA = 0.053

MSOP8
Bent leads correlation
TnR # 05
Serial # 486
Reading = 6.4 (profile projector)
Limit = +/- 0.5 mils Vs. Comparator reading

Monday 28/08/2000 17:28:52
SYSTEM : NT4280
MACHINE : 1
PRODUCT ID : 8Msop
LEADS : 8
DIMENSIONS : MILS
LOT NUMBER : 0
PART COUNT : 1

Maximum Copl. Error : 1.82 Side : 2 Pin : 5 PASSED
Maximum Bent Lead : 6.23 Side : 1 Pin : 4 PASSED
Maximum Pitch Error : 6.21 Side : 1 Pin : 3 PASSED
Maximum Standoff : 6.80 PASSED
Minimum Standoff : 3.52 PASSED

Monday 28/08/2000 17:28:53
SYSTEM : NT4280
MACHINE : 1
PRODUCT ID : 8Msop
LEADS : 8
DIMENSIONS : MILS
LOT NUMBER : 0
PART COUNT : 2

Maximum Copl. Error : 1.82 Side : 2 Pin : 5 PASSED
Maximum Bent Lead : 6.17 Side : 1 Pin : 4 PASSED
Maximum Pitch Error : 6.19 Side : 1 Pin : 3 PASSED
Maximum Standoff : 6.85 PASSED
Minimum Standoff : 3.54 PASSED

Monday 28/08/2000 17:28:54

SYSTEM : NT4280
MACHINE : 1
PRODUCT ID : 8Msop
LEADS : 8
DIMENSIONS : MILS
LOT NUMBER : 0
PART COUNT : 3

Maximum Copl. Error : 1.88 Side : 2 Pin : 5 PASSED
Maximum Bent Lead : 6.20 Side : 1 Pin : 4 PASSED
Maximum Pitch Error : 6.18 Side : 1 Pin : 3 PASSED
Maximum Standoff : 6.84 PASSED
Minimum Standoff : 3.50 PASSED

Monday 28/08/2000 17:28:54

SYSTEM : NT4280
MACHINE : 1
PRODUCT ID : 8Msop
LEADS : 8
DIMENSIONS : MILS
LOT NUMBER : 0
PART COUNT : 4

Maximum Copl. Error : 1.88 Side : 2 Pin : 5 PASSED
Maximum Bent Lead : 6.19 Side : 1 Pin : 4 PASSED
Maximum Pitch Error : 6.17 Side : 1 Pin : 3 PASSED
Maximum Standoff : 6.87 PASSED
Minimum Standoff : 3.51 PASSED

Monday 28/08/2000 17:28:55

SYSTEM : NT4280
MACHINE : 1
PRODUCT ID : 8Msop
LEADS : 8
DIMENSIONS : MILS

bent.dat

LOT NUMBER : 0
PART COUNT : 5

Maximum Copl. Error : 1.85 Side : 2 Pin : 5 PASSED
Maximum Bent Lead : 6.17 Side : 1 Pin : 4 PASSED
Maximum Pitch Error : 6.20 Side : 1 Pin : 3 PASSED
Maximum Standoff : 6.84 PASSED
Minimum Standoff : 3.57 PASSED

MSOP8

Coplanarity correlation

TnR # 05

Serial # 486

Reading = 5.4 mils (profile projector)

Limit = +/- 0.5 mils Vs. Comparator reading

Monday 28/08/2000 17:32:00

SYSTEM :	NT4280
MACHINE :	1
PRODUCT ID :	8Msop
LEADS :	8
DIMENSIONS :	MILS
LOT NUMBER :	0
PART COUNT :	1

Maximum Copl. Error :	5.60	Side : 2	Pin : 6	REJECT
Maximum Bent Lead :	1.20	Side : 1	Pin : 1	PASSED
Maximum Pitch Error :	-1.35	Side : 2	Pin : 5	PASSED
Maximum Standoff :	8.91			PASSED
Minimum Standoff :	5.66			PASSED

Monday 28/08/2000 17:32:01

SYSTEM :	NT4280
MACHINE :	1
PRODUCT ID :	8Msop
LEADS :	8
DIMENSIONS :	MILS
LOT NUMBER :	0
PART COUNT :	2

Maximum Copl. Error :	5.67	Side : 2	Pin : 6	REJECT
Maximum Bent Lead :	1.23	Side : 1	Pin : 1	PASSED
Maximum Pitch Error :	-1.35	Side : 2	Pin : 5	PASSED
Maximum Standoff :	8.96			PASSED
Minimum Standoff :	5.63			PASSED

Monday 28/08/2000 17:32:02

SYSTEM : NT4280
MACHINE : 1
PRODUCT ID : 8Msop
LEADS : 8
DIMENSIONS : MILS
LOT NUMBER : 0
PART COUNT : 3

Maximum Copl. Error : 5.65 Side : 2 Pin : 6 REJECT
Maximum Bent Lead : 1.28 Side : 1 Pin : 1 PASSED
Maximum Pitch Error : -1.36 Side : 2 Pin : 5 PASSED
Maximum Standoff : 8.94 PASSED
Minimum Standoff : 5.67 PASSED

Monday 28/08/2000 17:32:02

SYSTEM : NT4280
MACHINE : 1
PRODUCT ID : 8Msop
LEADS : 8
DIMENSIONS : MILS
LOT NUMBER : 0
PART COUNT : 4

Maximum Copl. Error : 5.63 Side : 2 Pin : 6 REJECT
Maximum Bent Lead : 1.25 Side : 1 Pin : 1 PASSED
Maximum Pitch Error : -1.34 Side : 2 Pin : 5 PASSED
Maximum Standoff : 9.00 PASSED
Minimum Standoff : 5.59 PASSED

Monday 28/08/2000 17:32:03

SYSTEM : NT4280
MACHINE : 1
PRODUCT ID : 8Msop
LEADS : 8
DIMENSIONS : MILS

complanarity.dat

LOT NUMBER : 0
PART COUNT : 5

Maximum Copl. Error : 5.64 Side : 2 Pin : 6 REJECT
Maximum Bent Lead : 1.23 Side : 1 Pin : 1 PASSED
Maximum Pitch Error : -1.38 Side : 2 Pin : 5 PASSED
Maximum Standoff : 8.98 PASSED
Minimum Standoff : 5.59 PASSED

MSOP8
TnR # 05
Serial # 486
Tube to tube jame rate
specs = 1:3000

*****AT2800 LOT REPORT*****

Lot no : tubing
 Mode : Tube/Tray
 Package type : MSOP 10L
 Start time : 08/30/00 10:48:58
 Stop time : 08/30/00 11:14:44
 Lot Quantity : 3000
 Output : 3000
 Mark Reject : 0
 Lead Reject : 11
 USO : 0
 Gross UPH : 7382
 Net UPH : 7322
 Net Prod Time: 0:24:23
 Jam Time : 0:00:12
 Total errors : 1

<input type="checkbox"/> Error Code:	Error Description	Occurance
<input type="checkbox"/> 107	Jam before o/p tube entrance.	001

MSOP8
TnR # 05
Serial # = 486
Taping Jam rate
Specs = 1:3000

*****AT2800 LOT REPORT*****

Lot no : taping
 Mode : Taping
 Package type : MSOP 10L
 Start time : 08/30/00 15:14:46
 Stop time : 08/30/00 15:30:56
 Lot Quantity : 2500
 Output : 1666
 Mark Reject : 0
 Lead Reject : 2
 USO : 0
 Gross UPH : 7269
 Net UPH : 7174
 Net Prod Time: 0:13:45
 Jam Time : 0:00:10
 Total errors : 1

<input type="checkbox"/> Error Code:	Error Description	Occurance
<input type="checkbox"/> 37	No tube in Input stacker.	001

MSOP8
TnR # 05
Serial # = 486
Taping Jam rate
Specs = 1:3000

*****AT2800 LOT REPORT*****

Lot no : taping
 Mode : Taping
 Package type : MSOP 10L
 Start time : 08/30/00 17:06:13
 Stop time : 08/30/00 17:21:17
 Lot Quantity : 2500
 Output : 1638
 Mark Reject : 0
 Lead Reject : 7
 USO : 0
 Gross UPH : 7130
 Net UPH : 6970
 Net Prod Time: 0:13:47
 Jam Time : 0:00:12
 Total errors : 1

Error Code:	Error Description	Occurance
<input type="checkbox"/> 23	Empty pocket detected. (X066)	001