

# REPEATABILITY AND REPRODUCIBILITY

GAGE TYPE: 6" Deep Throat Micrometer  
 PART NAME: Gage Block  
 PART NUMBER: 0.025000"  
 PRODUCT SPEC: N/A

DATE: \_\_\_\_\_  
 GAGE NUMBER: MI-30  
 CHARACTERISTIC: Thickness  
 TOLERANCE RANGE: 0.0030

COLUMN#:	1	2	3	4	5	6	7	8	9	10	11	12
OPERATOR:	A- Anne			B- Darrell			C- Mary Mc			D- Suzy		
SAMPLE#	1stTRIAL	2ndTRIAL	DIFF	1stTRIAL	2ndTRIAL	DIFF	1stTRIAL	2ndTRIAL	DIFF	1stTRIAL	2ndTRIAL	DIFF
1	0.0249	0.0250	0.0001	0.0250	0.0251	0.0001	0.0250	0.0250	0.0000	0.0250	0.0248	0.0002
2	0.0252	0.0249	0.0003	0.0251	0.0250	0.0001	0.0251	0.0250	0.0001	0.0253	0.0250	0.0003
3	0.0252	0.0248	0.0004	0.0251	0.0250	0.0001	0.0251	0.0250	0.0001	0.0248	0.0250	0.0002
4	0.0252	0.0250	0.0002	0.0250	0.0250	0.0000	0.0251	0.0250	0.0001	0.0250	0.0248	0.0002
5	0.0250	0.0249	0.0001	0.0251	0.0250	0.0001	0.0250	0.0250	0.0000	0.0250	0.0250	0.0000
6												
7												
8												
9												
10												
TOTALS	0.1255	0.1246	0.0011	0.1253	0.1251	0.0004	0.1253	0.1250	0.0003	0.1251	0.1246	0.0009
AVERAGES	0.0251	0.0249	0.0002	0.0251	0.0250	0.0001	0.0251	0.0250	0.0001	0.0250	0.0249	0.0002

Col1Avg:	0.0251	Col4Avg:	0.0251	Col7Avg:	0.0251	Col10Avg:	0.0250
SumCol1&2Avs:	0.0500	SumCol4&5Avs:	0.0501	SumCol7&8Avs:	0.0501	SumCol10&11Avs:	0.0499
Avg(OperatorA):	0.0250	Avg(OperatorB):	0.0250	Avg(OperatorC):	0.0250	Avg(OperatorD):	0.0250

**RANGE VARIATION**

AvgCol3	0.0002
AvgCol6	0.0001
AvgCol9	0.0001
AvgCol12	0.0002
SUM	0.0005
GndAvg=	0.0001

R<sub>1</sub>=

**REPRODUCIBILITY = OPERATOR VARIATION**

DIFFERENCE IN MEANS

$$X_{Diff} = (AvgOp_{Max}) - (AvgOp_{Min}) = 0.0001$$

Est. STANDARD DEVIATION of MEANS

**REPEATABILITY = EQUIPMENT VARIATION**

DIFFERENCE IN READINGS

$$R_1 = (Table D_4 \text{ Value}) \times (\text{Avg Range})$$

Est. STANDARD DEVIATION of READINGS

Tolerance Range must be inserted for P.T.C. to calculate

SDRR= 0.0001

%= 21.2

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# REPEATABILITY AND REPRODUCIBILITY

GAGE TYPE: \_\_\_\_\_  
 PART NAME: \_\_\_\_\_  
 PART NUMBER: \_\_\_\_\_  
 PRODUCT SPEC: \_\_\_\_\_

DATE: \_\_\_\_\_  
 GAGE NUMBER: \_\_\_\_\_  
 CHARACTERISTIC: \_\_\_\_\_  
 TOLERANCE RANGE: \_\_\_\_\_

COLUMN#:	1	2	3	4	5	6	7	8	9
OPERATOR:	A-			B-			C-		
SAMPLE#	1stTRIAL	2ndTRIAL	DIFF	1stTRIAL	2ndTRIAL	DIFF	1stTRIAL	2ndTRIAL	DIFF
1									
2									
3									
4									
5									
6									
7									
8									
9									
10									
TOTALS									
AVERAGES									

Col1 Avg: _____	Col4 Avg: _____	Col7 Avg: _____
SumCol1&2Avs: _____	SumCol4&5Avs: _____	SumCol7&8Avs: _____
Avg(OperatorA): _____	Avg(OperatorB): _____	Avg(OperatorC): _____

### RANGE VARIATION

AvgCol3	_____
AvgCol6	_____
AvgCol9	_____
SUM	_____
R <sub>1</sub> =GndAvg	_____

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

### REPRODUCIBILITY=OPERATOR VARIATION

#### DIFFERENCE IN MEANS

$$X_{Diff} = (AvgOper_{Max}) - (AvgOper_{Min}) = \underline{\hspace{2cm}}$$

#### Est. STANDARD DEVIATION of MEANS

$$(SDM) = (1/d_2) \times (X_{Diff}) = \underline{\hspace{2cm}}$$

\_\_\_\_\_

\_\_\_\_\_

### REPEATABILITY=EQUIPMENT VARIATION

#### DIFFERENCE IN READINGS

$$R_1 = (\text{Table } D_4 \text{ Value}) \times (\text{Avg Range})$$

#### Est. STANDARD DEVIATION of READINGS

$$(SDR) = (1/d_2) \times (R_1) = \underline{\hspace{2cm}}$$

\_\_\_\_\_

\_\_\_\_\_

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Tolerance Range must be inserted for P.T.C. to calculate.

SDRR= \_\_\_\_\_

%= \_\_\_\_\_

# REPEATABILITY AND REPRODUCIBILITY

GAGE TYPE: \_\_\_\_\_  
 PART NAME: \_\_\_\_\_  
 PART NUMBER: \_\_\_\_\_  
 PRODUCT SPEC: \_\_\_\_\_

DATE: \_\_\_\_\_  
 GAGE NUMBER: \_\_\_\_\_  
 CHARACTERISTIC: \_\_\_\_\_  
 TOLERANCE RANGE: \_\_\_\_\_

COLUMN#:	1	2	3	4	5	6
OPERATOR: A-				B-		
SAMPLE#	1stTRIAL	2ndTRIAL	DIFF	1stTRIAL	2ndTRIAL	DIFF
1						
2						
3						
4						
5						
6						
7						
8						
9						
10						
TOTALS						
AVERAGES						

Col1Avg: \_\_\_\_\_ Col4Avg: \_\_\_\_\_  
 SumCol1&2Avs: \_\_\_\_\_ SumCol4&5Avs: \_\_\_\_\_  
 Avg(OperatorA): \_\_\_\_\_ Avg(OperatorB): \_\_\_\_\_

### RANGE VARIATION

AvgCol3	
AvgCol6	
SUM	
R <sub>1</sub> =GndAvg	



### REPRODUCIBILITY=OPERATOR VARIATION

#### DIFFERENCE IN MEANS

$$X_{Diff} = (AvgOper_{Max}) - (AvgOper_{Min}) = \underline{\hspace{2cm}}$$

#### Est. STANDARD DEVIATION of MEANS



### REPEATABILITY=EQUIPMENT VARIATION

#### DIFFERENCE IN READINGS

$$R_1 = (Table D_4 \text{ Value}) \times (\text{Avg Range})$$

#### Est. STANDARD DEVIATION of READINGS



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Tolerance Range must be inserted for P.T.C. to calculate.

SDRR=

%=