

Gauge R&R Evaluation

Part Number: 20103680	Supplier: Hansin Precision Enginee
Part Name: ASSY WASTE DOOR-CASTING	Date: 26-May-2024
Part Revision: C	Prepared By: Chu Libo

OPERATOR	NAME	DATE
1	Yao Lixia	29-May-2024
2	Qu Ruirong	29-May-2024
3	Bai Aocheng	29-May-2024

Number of Operators	3
Number of Trials	3

SPECIFICATION:	187.45	+ TOL:	0.2	- TOL:	0.2	TOTAL TOLERANCE:	0.4	UNITS:	mm	INSPECTION METHOD:	SS								
MEASUREMENT	OPERATOR 1						OPERATOR 2						OPERATOR 3						
	Trial 1	Trial 2	Trial 3	Min	Max	Range	Trial 1	Trial 2	Trial 3	Min	Max	Range	Trial 1	Trial 2	Trial 3	Min	Max	Range	
1	187.340	187.340	187.330	187.330	187.340	0.010	187.340	187.340	187.340	187.340	187.340	0.000	187.340	187.340	187.340	187.340	187.340	0.000	
2	187.330	187.340	187.340	187.330	187.340	0.010	187.340	187.340	187.340	187.340	187.340	0.000	187.340	187.340	187.340	187.340	187.340	0.000	
3	187.350	187.340	187.340	187.340	187.350	0.010	187.340	187.330	187.340	187.330	187.340	0.010	187.340	187.340	187.340	187.340	187.340	0.000	
4	187.340	187.330	187.340	187.330	187.340	0.010	187.330	187.340	187.340	187.330	187.340	0.010	187.340	187.340	187.340	187.340	187.340	0.000	
5	187.350	187.340	187.330	187.330	187.350	0.020	187.330	187.330	187.340	187.330	187.340	0.010	187.340	187.340	187.340	187.340	187.340	0.000	
6	187.330	187.330	187.330	187.330	187.330	0.000	187.350	187.350	187.330	187.330	187.350	0.020	187.330	187.330	187.340	187.330	187.340	0.010	
7	187.330	187.340	187.340	187.330	187.340	0.010	187.340	187.340	187.340	187.340	187.340	0.000	187.340	187.340	187.340	187.340	187.340	0.000	
8	187.330	187.330	187.330	187.330	187.330	0.000	187.340	187.330	187.330	187.330	187.340	0.010	187.330	187.330	187.330	187.330	187.330	0.000	
9	187.350	187.350	187.350	187.350	187.350	0.000	187.350	187.340	187.350	187.340	187.350	0.010	187.350	187.350	187.350	187.350	187.350	0.000	
10	187.340	187.340	187.340	187.340	187.340	0.000	187.340	187.340	187.340	187.340	187.340	0.000	187.340	187.340	187.340	187.340	187.340	0.000	
TOTALS	1873.390	1873.380	1873.370			0.070	1873.400	1873.380	1873.390			0.070	1873.390	1873.390	1873.400			0.010	
X _{MIN} : 187.3380	Operator						R _A	R _B						R _C					
X _{MAX} : 187.3393	2						SUM	3						SUM					
X _{diff} : 0.0013	(K2*Xdiff) ²						X _A	X _B						X _C					
	Diff																		

TEST FOR CONTROL

Upper Control Limit, UCLr = D4R

D4: 2.570 x R: 0.005 = 0.013

If any individual range exceeds this limit, the measurement or reading should be reviewed, repeated, corrected, or discarded and new averages and ranges should be computed

MEASUREMENT SYSTEM ANALYSIS

STATISTICAL CONSTANT VALUE					
# Trials	2.00	3.00	# Oprs	2	3
K1	4.56	3.05	K2	3.65	2.70
D4	3.27	2.57	n = # of parts	m = # of trials	

QUALITY GOAL	
ACCEPTABLE: LESS THAN 10%	
CONDITIONALLY ACCEPTABLE: BETWEEN 10% to 30%	
NOT ACCEPTABLE: GREATER THAN 30%	

Repeatability - Equipment Variation (E.V)

E.V. = K₁R 3.050 x R 0.005 = 0.015 % E.V. = 3.8

Reproducibility - Appraiser Variation (A.V)

A.V. = Ö [(X_{diff}) x (K₂)]² - [(E.V.)²/(n x m)] Ö 1.296E-05 - 7.75E-06 = 0.002282 % A.V. = 0.6

Repeatability and Reproducibility (R & R)

R&R = Ö (E.V)² + (A.V)² Ö 0.0002326 + 5.21E-06 = 0.01542 % R&R = 3.9

COMMENTS

RESULT: Acceptable
