GAUGE R&R REPORT

SSB Engineers Pvt. Ltd.

(PUT DATA IN YELLOW CELLS)

GAUGE NO. :	SSB/APG/88A&B	PART NO. & NAME :	4475_480_053_DES001	MSA	
GAUGE NAME :	Air Plug Gauge	CHARACTERSTIC :	PR 2	DATE	07.09.2023
GAUGE L.COUNT :	0.001	SPECIFICATIONS:	71.8-71.830	PERFORMED BY :	SONU JANGID

	Supervisor :		GOLU								
TRIAL	1	2	3	4	5	6	7	8	9	10	AVERAGE
1	71.800	71.805	71.808	71.811	71.814	71.818	71.820	71.822	71.825	71.826	
2	71.802	71.806	71.809	71.813	71.818	71.819	71.820	71.823	71.820	71.829	
3	71.800	71.805	71.809	71.812	71.813	71.820	71.821	71.822	71.829	71.830	
Avg.	71.801	71.805	71.809	71.812	71.813	71.819	71.820	71.822	71.825	71.829	Xa= 71.8156
Range	0.002	0.001	0.001	0.002	0.001	0.002	0.001	0.001	0.001	0.002	Ra= 0.0014

	Supervisor :		PRATAP								
1	71.800	71.805	71.808	71.812	71.814	71.819	71.820	71.823	71.825	71.828	
2	71.801	71.806	71.809	71.813	71.815	71.819	71.821	71.822	71.826	71.829	
3	71.800	71.805	71.809	71.811	71.814	71.820	71.820	71.823	71.825	71.828	
Avg.	71.800	71.805	71.809	71.812	71.814	71.819	71.820	71.823	71.825	71.828	Xb= 71.8157
Range	0.001	0.001	0.001	0.002	0.001	0.001	0.001	0.001	0.001	0.001	Rb= 0.0011

	Supervisor :		KULDEEP								
1	71.803	71.806	71.808	71.808	71.814	71.820	71.820	71.822	71.825	71.828	
2	71.802	71.809	71.808	71.808	71.814	71.819	71.821	71.822	71.824	71.829	
3	71.800	71.806	71.808	71.808	71.812	71.820	71.820	71.822	71.825	71.828	
Avg.	71.802	71.806	71.808	71.808	71.813	71.820	71.820	71.822	71.825	71.828	Xc= 71.8152
Range	0.003	0.001	0.000	0.000	0.002	0.001	0.001	0.000	0.001	0.001	Rc= 0.0010
Part Avg.Xp	71.801	71.805	71.808	71.811	71.814	71.819	71.820	71.822	71.825	71.829	Rp= 0.028

52

$\overline{R}$ = (Ra+Rb+Rc)/NO OF OPRS. = 0.00117

X Diff =(Max X - Min X) = 0.00050

UCL R = ($\overline{R}$ *D4) = 0.00300

LCL R = ($\overline{R}$*D3) = 0.00000

X(D.BAR) = 71.8155 UCL X BAR = 71.81667

LCL X BAR = 71.81429

NO.OF TRIALS	A2	D3	D4
2	1.880	0	3.267
3	1.020	0	2.575

MEASUREMENT UNIT ANALYSIS

REPEATABILITY-EQUIPMENT VARIATION(EV)

EV = $\overline{R}$*K1 = 0.000689

TRIAL:	K1
3	0.5908

REPRODUCIBILITY-APPRAISER VARIATION

AV = $\sqrt{[(Xdiff*K_2)^2-(EV^2/nr)]}$

AV = 0.0002

OPERATOR	K2
3	0.5231

REPEATABILITY & REPRODUCIBILITY

R&R = $\sqrt{(EV^2 + AV^2)}$

R&R = 0.0007

PART VARIATION (PV)

PV = Rp*K3 = 0.0087

TOTAL VARIATION (TV)

TV = $\sqrt{(R\&R^2 + PV^2)}$

TV = 0.0087

% PROCESS VARIATION

%EV= 100(EV/TV)

= 7.8916

%AV= 100(AV/TV)

= 2.6252

n=no. of parts

r=no. of trials

%R&R = 100(R&R/TV)

= 8.3168

% PV= 100(PV/TV)

= 99.6536

PART	K3
10	0.3146

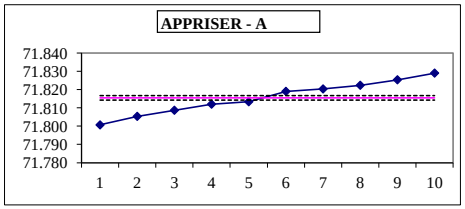
%EV =	7.89
%AV =	2.63
%R&R =	8.32
%PV =	99.654

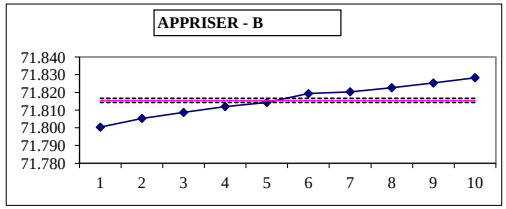
ndc = 1.141 (PV/ GRR)

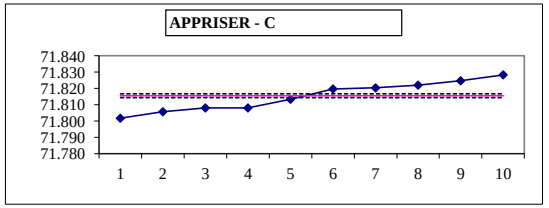
= 16.89

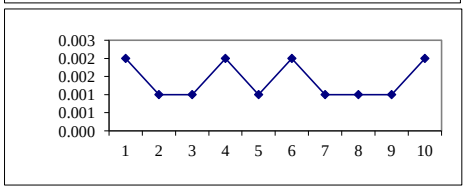
ndc = Number of distinct categories

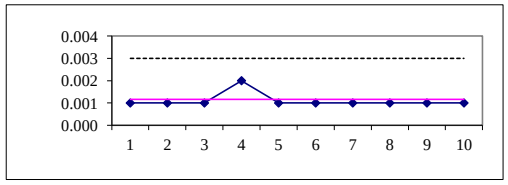
(ndc = or greater than 5)

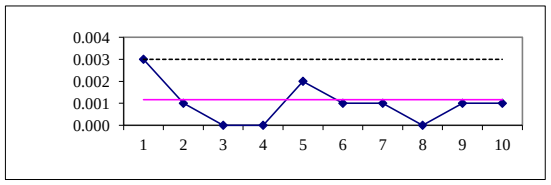












IMPROVEMENT DETAILS

1) WHEN REPEAT. IS BIGGER THEN REPRODU.

1.1. MAINTENANCE OF GAUGE IS REQD.

1.2 HIGH REGID MEAS INSTRUMENT REQD.

2) WHEN REPRO. IS BIGGER THEN REPEAT.

2.1. TRAINING TO OPEARTOR IS REQD.

2.2 ZERO ADJUSTMENT NOT PROPER

Gauge R & R : OK | NOT OK

IMPROVEMENT REQUIRED

Approved by :