Form Attribute Measurement Systems Study

PART NO. :		Instument Name:	Visual	Appraiser A:	สมชาย	CHECKED BY.
PINS. NO. :		Serial Number:	-	Appraiser B:	สมหมาย	
Cheracteristic/Specification		Sample:	50 Pcs.	Appraiser C:	สมศรี	APPROVED BY.
Trials.	3	Times. Date Performed		Appraiser:	3 Persons.	

Data Entry

Sample:	Standard	Appraiser/Trial								
		สมชาย			สมหมาย			สมศรี		
		T1	T2	T3	T1	T2	T3	T1	T2	T3
1	g	g	g	g	g	g	g	g	g	g
2	g	g	g	g	g	g	g	g	g	g
3	ng	ng	ng	ng	ng	ng	ng	ng	ng	ng
4	ng	ng	ng	ng	ng	ng	ng	ng	ng	ng
5	ng	ng	ng	ng	ng	ng	ng	ng	ng	ng
6	g	g	g	ng	g	g	ng	g	ng	ng
7	g	g	g	g	g	g	g	g	ng	g
8	g	g	g	g	g	g	g	g	g	g
9	ng	ng	ng	ng	ng	ng	ng	ng	ng	ng
10	g	g	g	g	g	g	g	g	g	g
11	g	g	g	g	g	g	g	g	g	g
12	ng	ng	ng	ng	ng	ng	ng	ng	g	ng
13	g	g	g	g	g	g	g	g	g	g
14	g	g	g	ng	g	g	g	g	ng	ng
15	g	g	g	g	g	g	g	g	g	g
16	g	g	g	g	g	g	g	g	g	g
17	g	g	g	g	g	g	g	g	g	g
18	g	g	g	g	g	g	g	g	g	g
19	g	g	g	g	g	g	g	g	g	g
20	g	g	g	g	g	g	g	g	g	g
21	g	g	g	ng	g	ng	g	ng	g	ng
22	ng	ng	ng	g	ng	ng	Tng	g	ng	ng
23	g	g	g	g	g	g	g	g	g	g
24	g	g	g	g	g	g	g	g	g	g
25	ng	ng	ng	ng	ng	ng	ng	ng	ng	ng
26	ng	ng	ng	ng	ng	ng	ng	ng	ng	g
27	g	g	g	g	g	g	g	g	g	g
28	g	g	g	g	g	g	g	g	g	g
29	g	g	g	g	g	g	g	g	g	g
30	ng	ng	ng	ng	ng	ng	ng	ng	ng	ng
31	g	g	g	g	g	g	g	g	g	g
32	g	g	g	g	g	g	g	g	g	g
33	g	g	g	g	g	g	g	g	g	g
34	ng	ng	ng	g	g	g	g	ng	g	g
35	g	g	g	g	g	g	g	g	g	g

Measurement Factors Analysis

Appraiser

VS	สมหมาย		SUM
	NG	G	
สมชาย NG	44	6	50
	15.7	34.3	
สมชาย G	3	97	100
	31.3	68.7	
SUM	47	103	150

PO = 0.94   PE = 0.562
Kappa   =   **0.863**

Standard

VS	STD.		SUM
	NG	G	
สมชาย NG	45	5	50
	16	34	
สมชาย G	3	97	100
	32	68	
SUM	48	102	150

PO = 0.947   PE =   0.56
Kappa   =   **0.879**

Appraiser

VS	สมศรี		SUM
	NG	G	
สมชาย NG	43	7	50
	17	33	
สมชาย G	8	92	100
	34	66	
SUM	51	99	150

PO = 0.9   PE = 0.553
Kappa   =   **0.776**

Standard

VS	STD.		SUM
	NG	G	
สมหมาย NG	45	2	47
	15	32	
สมหมาย G	3	100	103
	33	70	
SUM	48	102	150

PO = 0.967   PE = 0.567
Kappa   =   **0.923**

Appraiser

VS	สมศรี		SUM
	NG	G	
สมหมาย NG	42	5	47
	16	31	
สมหมาย G	9	94	103
	35	68	
SUM	51	99	150

PO = 0.907   PE =   0.56
Kappa   =   **0.788**

Standard

VS	STD.		SUM
	NG	G	
สมศรี NG	42	9	51
	16.3	34.7	
สมศรี G	6	93	99
	31.7	67.3	
SUM	48	102	150

PO = 0.9   PE = 0.558
Kappa   =   **0.774**

The kappa value is:

Kappa ≥0.75 or higher indicates good agreement

0.40 <Kappa> 0.75 indicates some agreement

kappa ≤ 0.40 indeicates poor agreement

Decision	Effectiveness	Miss Rate	False Alarm Rate
Acceptable	≥90%	≤2%	≤5%
improvement	≥80%	≤5%	≤10%
Unacceptable	<80%	>5%	>10%

36	g	g	g	ng	g	g	g	g	ng	g
37	ng	ng	ng	ng	ng	ng	ng	ng	ng	ng
38	g	g	g	g	g	g	g	g	g	g
39	ng	ng	ng	ng	ng	ng	ng	ng	ng	ng
40	g	g	g	g	g	g	g	g	g	g
41	g	g	g	g	g	g	g	g	g	g
42	ng	ng	ng	ng	ng	ng	ng	ng	ng	ng
43	g	g	ng	g	g	g	g	g	g	ng
44	g	g	g	g	g	g	g	g	g	g
45	ng	ng	ng	ng	ng	ng	ng	ng	ng	ng
46	g	g	g	g	g	g	g	g	g	g
47	g	g	g	g	g	g	g	g	g	g
48	ng	ng	ng	ng	ng	ng	ng	ng	ng	ng
49	g	g	g	g	g	g	g	g	g	g
50	ng	ng	ng	ng	ng	ng	ng	ng	ng	ng

RESULTS SUMMARY		
Appraiser	Miss Rate	False Alarm Rate
สมชาย	6.3	4.9
สมหมาย	6.3	2.0
สมศรี	12.5	8.8

ผลการตัดสินใจ   หมายเหตุ

ผ่าน [ ]

ปรับปรุง [ ]

ไม่ผ่าน [ ]

	% Appraiser[1]			% Score vs. Attribute[2]		
	Appraiser agreed with him/herself on all trials			Appraiser agreed on all trials with standard		
Source	สมชาย	สมหมาย	สมศรี	สมชาย	สมหมาย	สมศรี
จำนวนชิ้นงานทั้งหมด	50	50	50	50	50	50
จำนวนชิ้นงานที่ตัดสินใจถูกทั้งหมดทุกรอบ	42	45	40	42	45	40
จำนวนชิ้นงานที่มีการแจ้งเตือนผิดหมดทุกรอบ α				0	0	0
จำนวนชิ้นงานที่มีการตัดสินใจผิดหมดทุกรอบ β				0	0	0
จำนวนชิ้นงานที่ตัดสินใจไม่เหมือนกันทุกรอบ				8	5	10
95% UCI	92.8	96.7	90.0	92.8	96.7	90.0
Calc. Score	84	90	80	84	90	80
95% LCI	70.9	78.2	66.3	70.9	78.2	66.3

$$\text{Upper confidence} = \frac{v_1 F_{(v_1, v_2, 0.975)}}{v_2 + v_1 F_{(v_1, v_2, 0.975)}}$$

$$\text{Lower confidence} = \frac{v_1 F_{(v_1, v_2, 0.025)}}{v_2 + v_1 F_{(v_1, v_2, 0.025)}}$$

System % Effective Score[3]

All appraisers agreed within and between themselves

System % Effective Score vs. Reference[4]

All appraisers agreed within and between themselves AND agreed with standard

	System % Effective Score	System % Effective Score vs. Reference
จำนวนชิ้นงานทั้งหมด	50	50
จำนวนชิ้นงานที่ตัดสินใจถูกทั้งหมดทุกรอบ	39	39
95% UCI	88.5	88.5
Calculated Score	78	78
95% LCI	64.1	64.1