			Fuiikura Fiber (Optics Vietnam Ltd.		
		Me	-	System Ana		
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1.Purpo	se: Apply to evalu	uate MSA for me	easurement system	 1	11111111111	
	cation: All measur	•	eed apply MSA			
	ence Document: (000-5-WI-1061				
4.Conte						
	istration informat	tion				
Record						
Record				T		
Propose	е Ву:			Issue Date:		
4.2 Obj	ect Information					
	NUMBER			PART NUMBER		
GAGE N				PART NAME		
PARTS				TRIALS		
APPRA						
APPRA						
APPRA		nalvoia				
REPE	surement Unit A ATABILITY - EQ		ATION (EV)	% TOTAL VARI	ATION (TV)	% TOLERANCE (Tol)
EV = EV =	R x K1	l Troil	1/4	% EV =	100 (E\//T\/)	100(E\//Tal)
EV =		Trail 3	K1 0.5908	% EV = % EV =	100 (EV/TV)	100(EV/Tol)
REPR	ODUCIBILITY - A			% AV=	100(AV/TV)	100(AV/Tol)
AV =	{(xDIFF x K2)2		1/0	% AV=		
AV = AV =		Appraiser 3	K2 0.5231			
REPE	ATABILITY & RE	PRODUCIBILITY	(R&R)	% R&R=	100(R&R/Tol)	
R&R = R&R =	$\{(EV2 + AV2)\}1$	/2 1		% R&R=	#VALUE!	tom Doord on 0/ CDD
R&R =					or Acceptance of Syst surement system is ac	tem Based on %GRR
				10%-30% = May	be acceptable based	on gauge cost.
DADT	VARIATION (PV)		Dorto	Over 30% = Meas	surement system not a 100(PV/TV)	acceptable. 100(PV/ToI)
PV =	RP x K3		Parts 10	% PV=	100(PV/1V)	100(PV/101)
PV =			K3			
PV =			0.3146			
1.200 ¬	μ	Average chart		1.200	Range	chart
1.000		g		1.000	· ·	
0.800						
				0.800		
0.600				0.600		
0.400				0.400		
0.200				0.200		
0.000				0.000		
_	Appraiser A UCL	Appraiser B — Mean.	Appraiser C LCL	Appraiser A UCL	Appraiser B — Mean	Appraiser C
4.4 Con	clusion & Recon					
						_
Evaluate	e by:	C	Confirm by:		Approve by:	

Date:

Date:

Date:

				Optics Vietnam Ltd.,					
			Measurement	System Analysis	3	1			
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5.Mẫu đánh giá	MSA								
Fujikura Fiber Optics Vietnam Ltd.,		GAGE	REPEATABI	LITY & REPRO	DUC	BILITY ST	UDY		
•									
	0			DADT NUMBER					
SAGE NUMBER	0			PART NUMBER PART NAME			0		
BAGE NAME	0					0			
CHARACTERISTIC	ATION LSL			USL TOL.		L			
PECIFICATION						_ ¬			
PPRAISERS			IALS	PARTS		Brasses Control			
BAGE USAGE FOR (I APPRAISER A		Prod	uct Control	0	40	Process Control		1	
APPRAISER A	0		APPRAISER B	0	AP	PRAISER C	0		
Appraiser/Trial #			- 	PARTS		1			
			+ +						
AVG'S									
Range									
AVG'S									
Range									
			+ +						
AVG'S			+						
Range									
Port overege									
Part average									
RANGE VARIATION:		N. 7		≡ x (D₄)				101	
Ra Rb Rc		No. T		#N/A		= =		CL _R #VALUE!	
Rc		3		Note: LCLR is zero with	< 7 trials	_		#VALUE:	
		No. T		$\equiv \times \times$		=	U	CL _X	
		2	2 1.880	#N/A		=		#VALUE!	
		3	3 1.023	$\overline{\overline{X}}$ - $(\overline{\overline{R}} \times A_2)$		=		CL _X	
_				#N/A		=		#VALUE!	
Max X Min X	0.000		_						
Min X K Diff.	0.000	N	lote:						

Fujikura Fiber **GAGE REPEATABILITY & REPRODUCIBILITY STUDY Optics Vietnam** Ltd., Trang 3/4 **MEASUREMENT UNIT ANALYSIS** % TOTAL VARIATION (TV) % TOLERANCE (Tol) **REPEATABILITY - EQUIPMENT VARIATION (EV)** % EV = 100 (EV/TV)100(EV/Tol) $EV = \overline{R} \times K_1$ EV = Trail K_1 EV = #N/A 0 % AV= 100(AV/TV) **REPRODUCIBILITY - APPRAISER VARIATION (AV)** 100(AV/ToI) AV = $\{(x_{DIFF} x K_2)^2 - (EV^2/nr)\}^{1/2}$ % AV= n=Parts r=Trials AV = AV = Appraiser K_2 #N/A 0 REPEATABILITY & REPRODUCIBILITY (R&R) 100(R&R/Tol) $R&R = {(EV^2 + AV^2)}^{1/2}$ #VALUE! R&R = Note: Guidelines for Acceptance of System Based on %GRR Under10% = Measurement system is acceptable. R&R = 10%-30% = May be acceptable based on gauge cost. Over 30% = Measurement system not acceptable. PART VARIATION (PV) % PV= 100(PV/TV) 100(PV/Tol) % PV= $PV = R_P x K_3$ PV = K_3 Parts PV = #N/A **TOTAL VARIATION (TV)** %TV= 100(TV/Tol) $TV = {(GRR^2 + PV^2)}^{1/2}$ TV = NUMBER OF DISTINCT CATEGORIES (ndc) TV = ndc= 1.41(PV/R&R) ndc= #VALUE! Note: Guidelines for Acceptance: ndc greater then or equal to 5=OK. Components of variations 100% 80% ■% TOTAL VARIATION (TV) 60% ■% TOLERANCE (Tol) 40% 20% 0% Gage R&R Repeat. Reprod. Part-to-part Average chart 1.200 1.000 0.800 0.600 0.400 0.200 0.000 Appraiser C LCL Appraiser B Range chart 1.200 1.000 0.800 0.600 0.400 0.200 0.000 UCL — — - Mean Appraiser A Appraiser B Appraiser C For information on the theory and constants used in the form see MSA Reference Manual, Third edition.

		F	ujikura Fiber Opti	cs Vietnam Ltd.,		
		Mea	asurement Sy	stem Analys	sis	
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6.Revision	n History					
Date	Date P.I.C		Description Old content New content		Reason of change	Change requester
22-Aug-18	Võ Văn Hiệp	01	-	New Issue	New Issue	Đặng Công Sơn
4-Sep-18	Võ Văn Hiệp	02		Delete 100(R&R/TV) , only control 100(R&R/Tol)	QMR requirement	Đặng Công Sơn
30-Aug-24	Võ Văn Hiệp	03	% R&R=100(R&R/ TV)	Removed	Only evaluation stability of system by 100(R&R/Tol) parameter. No need evaluate R&R=100(R&R/TV) concern to Manpower , qualify method to control training procedure	Nguyễn Trung Kiên