

Budget Definition - CMM Measurement Uncertainty

Environment Component T1010_P2020 Variable

Source	Value	Expression	Type	Sensitivity	Distribution	Distribution Divisor
Max Temperature Variation	Constant	1.0	Type B	1.000000	U	1.414214
Thermometer Accuracy	Constant	0.5	Type B	1.000000	Rectangular	1.732051
Thermometer Resolution	Constant	0.1	Type B	1.000000	Step	3.464102

Probe Component Probe 4x20 Variable

Source	Value	Expression	Type	Sensitivity	Distribution	Distribution Divisor
Probing Error	Constant	0.0048	Type B	1.000000	Rectangular	1.732051
Articulation Error	Constant	0.0035	Type B	1.000000	Rectangular	1.732051
Size Error	Constant	0.0025	Type B	1.000000	Rectangular	1.732051

Calibration Sphere Component SPH 90210 Variable

Source	Value	Expression	Type	Sensitivity	Distribution	Distribution Divisor
Form Error	Constant	0.00013	Type B	1.000000	Rectangular	1.732051
Size Uc	Constant	0.00021	Type B	1.000000	Normal	1.000000
Form Uc	Constant	0.00003	Type B	1.000000	Normal	1.000000

CMM Component Omega 001

Source	Value	Expression	Type	Sensitivity	Distribution	Distribution Divisor
Expansion Coefficient Uc	Length Dependent	$ENV_uc * CTE_m * 0.1$	Type B	1.000000	Normal	1.000000
Scale Resolution	Constant	Sr	Type B	1.000000	Step	3.464102
Probe Uc	Constant	PROBE_uc	Type B	1.000000	Normal	1.000000
Specification	Constant	$0.0034 + 0.0026 * L / 1000$	Type B	1.000000	Rectangular	1.732051
Calibration Sphere Uc	Constant	CALSPH_uc	Type B	1.000000	Normal	1.000000

Inspected Part Component

Source	Value	Expression	Type	Sensitivity	Distribution	Distribution Divisor
Expansion Coefficient Uc	Length Dependent	$ENV_uc * CTE_c * 0.1$	Type B	1.000000	Normal	1.000000
Expansion Difference	Length Dependent	$ENV_uc * CTE_d$	Type B	1.000000	Normal	1.000000

Global Variables

CTEm	0.010000
Sr	0.001000
Td	0.000000
Tr	2.000000
Sdev	0.000000

Budget Data - CMM Measurement Uncertainty

	Position (mm)	0.0	250.0	500.0	750.0	1000.0	1250.0	1500.0	1750.0	2000.0	2250.0	2500.0
Environment Component T1010_P2020 Variable												
Export Variables	ENV_uc	0.76431	0.76431	0.76431	0.76431	0.76431	0.76431	0.76431	0.76431	0.76431	0.76431	0.76431
Source	Max Temperature Variation	0.70711	0.70711	0.70711	0.70711	0.70711	0.70711	0.70711	0.70711	0.70711	0.70711	0.70711
	Thermometer Accuracy	0.28868	0.28868	0.28868	0.28868	0.28868	0.28868	0.28868	0.28868	0.28868	0.28868	0.28868
	Thermometer Resolution	0.02887	0.02887	0.02887	0.02887	0.02887	0.02887	0.02887	0.02887	0.02887	0.02887	0.02887
Probe Component Probe 4x20 Variable												
Export Variables	PROBE_uc	0.00372	0.00372	0.00372	0.00372	0.00372	0.00372	0.00372	0.00372	0.00372	0.00372	0.00372
Source	Probing Error	0.00277	0.00277	0.00277	0.00277	0.00277	0.00277	0.00277	0.00277	0.00277	0.00277	0.00277
	Articulation Error	0.00202	0.00202	0.00202	0.00202	0.00202	0.00202	0.00202	0.00202	0.00202	0.00202	0.00202
	Size Error	0.00144	0.00144	0.00144	0.00144	0.00144	0.00144	0.00144	0.00144	0.00144	0.00144	0.00144
Calibration Sphere Component SPH 90210 Variable												
Export Variables	CALSPH_uc	0.00023	0.00023	0.00023	0.00023	0.00023	0.00023	0.00023	0.00023	0.00023	0.00023	0.00023
Source	Form Error	0.00008	0.00008	0.00008	0.00008	0.00008	0.00008	0.00008	0.00008	0.00008	0.00008	0.00008
	Size Uc	0.00021	0.00021	0.00021	0.00021	0.00021	0.00021	0.00021	0.00021	0.00021	0.00021	0.00021
	Form Uc	0.00003	0.00003	0.00003	0.00003	0.00003	0.00003	0.00003	0.00003	0.00003	0.00003	0.00003
CMM Component Omega 001												
Local Variables	L	0.00000	250.000	500.000	750.000	1000.00	1250.00	1500.00	1750.00	2000.00	2250.00	2500.00
Source	Expansion Coefficient Uc	0.00000	0.00019	0.00038	0.00057	0.00076	0.00096	0.00115	0.00134	0.00153	0.00172	0.00191
	Scale Resolution	0.00029	0.00029	0.00029	0.00029	0.00029	0.00029	0.00029	0.00029	0.00029	0.00029	0.00029
	Probe Uc	0.00372	0.00372	0.00372	0.00372	0.00372	0.00372	0.00372	0.00372	0.00372	0.00372	0.00372
	Specification	0.00196	0.00234	0.00271	0.00309	0.00346	0.00384	0.00421	0.00459	0.00497	0.00534	0.00572
	Calibration Sphere Uc	0.00023	0.00023	0.00023	0.00023	0.00023	0.00023	0.00023	0.00023	0.00023	0.00023	0.00023
Inspected Part Component												
Local Variables	CTEd	0.00200	0.00200	0.00200	0.00200	0.00200	0.00200	0.00200	0.00200	0.00200	0.00200	0.00200
	CTEc	0.01200	0.01200	0.01200	0.01200	0.01200	0.01200	0.01200	0.01200	0.01200	0.01200	0.01200
Source	Expansion Coefficient Uc	0.00000	0.00023	0.00046	0.00069	0.00092	0.00115	0.00138	0.00161	0.00183	0.00206	0.00229
	Expansion Difference	0.00000	0.00038	0.00076	0.00115	0.00153	0.00191	0.00229	0.00268	0.00306	0.00344	0.00382
Uncertainty												
	Combined	0.00422	0.00444	0.00472	0.00506	0.00545	0.00588	0.00634	0.00682	0.00733	0.00785	0.00838
Uncertainty Expression												
		Uc(K=1): 0.00418+0.00103L/1000+0.00027(L/1000)^2										
		Uc(K=2): 0.00835+0.00205L/1000+0.00053(L/1000)^2										