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Certificate No. : LA-2017-0666-C  
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FIELD OF TESTING : Calibration and Measurement

MEASURED QUANTITIES / INSTRUMENTS / RANGE TO BE CALIBRATED	METHOD / FREQUENCY	CALIBRATION & MEASUREMENT CAPABILITY (CMC*)
<b>A. <u>Electrical (Lab &amp; Site)</u></b>  A1. Calibration of Resistance Measuring Instruments (2 Wire)  0-10.9999 $\Omega$ 11 $\Omega$ -32.9999 $\Omega$ 33 $\Omega$ -109.9999 $\Omega$ 110 $\Omega$ -329.9999 $\Omega$ 0.330 k $\Omega$ -1.099999 k $\Omega$ 1.1 k $\Omega$ -3.299999 k $\Omega$ 3.3 k $\Omega$ -10.99999 k $\Omega$ 11 k $\Omega$ -32.99999 k $\Omega$ 33 k $\Omega$ -109.9999 k $\Omega$ 110 k $\Omega$ -329.9999 k $\Omega$ 330k $\Omega$ -1.0999999 M $\Omega$ 1.1 M $\Omega$ -3.299999 M $\Omega$ 3.3 M $\Omega$ -10.99999 M $\Omega$ 11 M $\Omega$ -32.99999 M $\Omega$ 33 M $\Omega$ -109.9999 M $\Omega$ 110 M $\Omega$ -329.9999 M $\Omega$ 330 M $\Omega$ -1100 M $\Omega$	Technical Procedure Section BSE-01 Jul 2020 (Issue 04 Rev 1)	0.012 $\Omega$ 0.016 $\Omega$ 0.018 $\Omega$ 0.027 $\Omega$ 0.000044 k $\Omega$ 0.00027 k $\Omega$ 0.00044 k $\Omega$ 0.0019 k $\Omega$ 0.0039 k $\Omega$ 0.020 k $\Omega$ 0.000040 M $\Omega$ 0.00032 M $\Omega$ 0.0013 M $\Omega$ 0.009 M $\Omega$ 0.15 M $\Omega$ 1.3 M $\Omega$ 13 M $\Omega$
A2. Calibration of Resistance Measuring Instruments (4 wire)  0 to 10.9999 $\Omega$ 11 $\Omega$ to 32.9999 $\Omega$ 33 $\Omega$ to 109.9999 $\Omega$	Technical Procedure Section BSE-01 Jul 2020 (Issue 04 Rev 1)	0.012 $\Omega$ 0.016 $\Omega$ 0.018 $\Omega$

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110 $\Omega$ to 329.9999 $\Omega$ 330 $\Omega$ to 1.099999 k $\Omega$ 1.1 k $\Omega$ to 3.299999 k $\Omega$ 3.3 k $\Omega$ to 10.99999 k $\Omega$ 11 k $\Omega$ to 32.99999 k $\Omega$ 33 k $\Omega$ to 109.9999 k $\Omega$		0.027 $\Omega$ 0.00044 k $\Omega$ 0.00027 k $\Omega$ 0.00044 k $\Omega$ 0.0019 k $\Omega$ 0.0039 k $\Omega$
A3. Calibration of Resistance Measuring Instruments (2 or 4 Wire)	Technical Procedure Section BSE-02 Jul 2020 (Issue 04 Rev 1)	
0.001 $\Omega$ to 0.0099 $\Omega$ 0.01 $\Omega$ to 0.0999 $\Omega$ 0.1 $\Omega$ to 0.9999 $\Omega$ 1.0 $\Omega$ to 9.999 $\Omega$ 10.0 $\Omega$ to 99.99 $\Omega$ 100.0 $\Omega$ to 0.9999 k $\Omega$ 1.0 k $\Omega$ to 9.999 k $\Omega$ 10.0 k $\Omega$ to 99.99 k $\Omega$ 100.0 k $\Omega$ to 0.9999 M $\Omega$ 1.0 M $\Omega$ to 9.999 M $\Omega$ 10.0 M $\Omega$ to 100 M $\Omega$		0.0002 $\Omega$ 0.0012 $\Omega$ 0.0058 $\Omega$ 0.023 $\Omega$ 0.058 $\Omega$ 0.58 $\Omega$ 0.012k $\Omega$ 0.12k $\Omega$ 0.0012M $\Omega$ 0.012 M $\Omega$ 1.2 M $\Omega$
A4. Calibration of Milliohm meters	Technical Procedure Section BSE-02 Jul 2020 (Issue 04 Rev 1)	
10 m $\Omega$ 30 m $\Omega$ 50 m $\Omega$ 100 m $\Omega$ 330 m $\Omega$ 470 m $\Omega$		1.2 m $\Omega$ 0.35 m $\Omega$ 0.58 m $\Omega$ 1.2 m $\Omega$ 3.8 m $\Omega$ 5.4 m $\Omega$
A5. High Voltage Resistance Measuring Instruments	Technical Procedure Section BSE-03 Jul 2020 (Issue 04 Rev 1)	
10.00 k $\Omega$ to 39.99 k $\Omega$ 40.00 k $\Omega$ to 99.99 k $\Omega$ 100.00 k $\Omega$ to 199.99 k $\Omega$		0.093 k $\Omega$ 0.23 k $\Omega$ 0.46 k $\Omega$

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200.00 k $\Omega$ to 999.9 k $\Omega$ 1.000 M $\Omega$ to 9.999 M $\Omega$ 10.00 M $\Omega$ to 100.00 M $\Omega$ 100.00 M $\Omega$ to 499.9 M $\Omega$ 500.0 M $\Omega$ to 999.9 M $\Omega$ 1.0000 G $\Omega$ to 9.999 G $\Omega$ 10.000 G $\Omega$ to 49.999 G $\Omega$ 50.000 G $\Omega$ to 100.00 G $\Omega$		2.4 k $\Omega$ 0.038 M $\Omega$ 0.6 M $\Omega$ 3.0 M $\Omega$ 7.5 M $\Omega$ 0.12 G $\Omega$ 1.7 G $\Omega$ 3.5 G $\Omega$
A6. Calibration of Resistance Sourcing Instruments  1 $\Omega$ to 10 $\Omega$ 10 $\Omega$ to 100 $\Omega$ 100 $\Omega$ to 1 k $\Omega$ 1 k $\Omega$ to 10 k $\Omega$ 10 k $\Omega$ to 100 k $\Omega$ 0.1 M $\Omega$ to 1 M $\Omega$ 1 M $\Omega$ to 10 M $\Omega$ 10 M $\Omega$ to 100 M $\Omega$	Technical Procedure Section BSE -18 Jul 2020 (Issue 04 Rev 1)	0.39 m $\Omega$ 0.39 m $\Omega$ 23 m $\Omega$ 0.22 $\Omega$ 2.2 $\Omega$ 0.033 k $\Omega$ 1.1 k $\Omega$ 0.12 M $\Omega$
A7. Calibration of DC Voltage Measuring Instruments  0 mV to 329.9999 mV 0.330 V to 3.299999 V 3.30 V to 32.99999 V 33 V to 329.9999 V 330 V to 1000.000 V	Technical Procedure Section BSE-04 Jul 2020 (Issue 04 Rev 1)	0.0061 mV 0.000032 V 0.00036 V 0.005 V 0.016 V
A8. Calibration of DC Voltage Sourcing instruments  0 to 100 mV 0.101 V to 1 V 1.1 V to 10 V 10.1 V to 100 V 100.1 V to 1000 V 1 kV to 10 kV	Technical Procedure Section BSE-13 Jul 2020 (Issue 04 Rev 1)	0.0071 mV 0.000047 V 0.00041 V 0.0053 V 0.053 V 0.063 kV

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10.1 kV to 20 kV 20.1 kV to 30 kV 30.1 kV to 40 kV		0.46 kV 0.35 kV 0.92 kV
A9. Calibration of AC Voltage Measuring Instruments	Technical Procedure Section BSE-05 Jul 2020 (Issue 04 Rev 1)	
1.0 mV to 32.999 mV	10 Hz to 45 Hz 45 Hz to 10 kHz 10 kHz to 20 kHz 20 kHz to 50 kHz 50 kHz to 100 kHz 100 kHz to 450 kHz	0.023 mV 0.0087 mV 0.0098 mV 0.028 mV 0.092 mV 0.23 mV
33 mV to 329.999 mV	10 Hz to 45 Hz 45 Hz to 10 kHz 10 kHz to 20 kHz 20 kHz to 50 kHz 50 kHz to 100 kHz 100 kHz to 450 kHz	0.084 mV 0.044 mV 0.048 mV 0.099 mV 0.23 mV 0.57 mV
0.330 V to 3.2999 V	10 Hz to 45 Hz 45 Hz to 10 kHz 10 kHz to 20 kHz 20 kHz to 50 kHz 50 kHz to 100 kHz 100 kHz to 450 kHz	0.00081 V 0.00043 V 0.00054 V 0.0019 V 0.0019 V 0.0066 V
3.3 V to 32.9999 V	10 Hz to 45 Hz 45 Hz to 10 kHz 10 kHz to 50 kHz 50 kHz to 90 kHz	0.0082 V 0.0044 V 0.0066 V 0.024 V
33 V to 329.999 V	45 Hz to 1 kHz 1 kHz to 10 kHz	0.051 V 0.057 V
33 V to 200 V	10 kHz to 20 kHz 20 kHz to 50 kHz 50 kHz to 90 kHz	0.076 V 0.088 V 0.35 V

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330 V to 750 V	45 Hz to 1 kHz	0.18 V
	1 kHz to 5 kHz	0.15 V
	5 kHz to 8 kHz	0.18 V
750V to 1020 V	20Hz to 10 kHz	0.25 V
A10. Calibration of AC Voltage Sourcing Instruments	Technical Procedure Section BSE-14 Jul 2020 (Issue 04 Rev 1)	
1 mV to 100 mV	10 Hz to 1 kHz	0.083 mV
	1 kHz to 50 kHz	0.15 mV
0.101 V to 1 V	10 Hz to 1 kHz	0.00067 V
	1 kHz to 50 kHz	0.0015 V
	1 kHz to 100 kHz	0.0070 V
1.1 V to 10 V	10 Hz to 1 kHz	0.0067 V
	1 kHz to 50 kHz	0.015 V
10.1 V to 100 V	10 Hz to 1 kHz	0.068 V
	1 kHz to 50 kHz	0.15 V
100.1 V to 700 V	10 Hz to 1 kHz	0.48 V
	1 kHz to 20 kHz	0.66 V
	20 kHz to 50 kHz	1.1 V
0.701 kV to 10 kV	50 to 60 Hz	0.059 kV
10.1 kV to 20 kV	50 Hz	1.2 kV
20.1 kV to 28 kV	50 Hz	1.6 kV
A11. Calibration of DC Current Measuring Instruments	Technical Procedure Section BSE-06 Jul 2020 (Issue 04 Rev 1)	
1 µA to 329.999 µA		0.054 µA
0.330 mA to 3.29999 mA		0.00030 mA
3.30 mA to 32.9999 mA		0.0026 mA
33 mA to 329.999 mA		0.028 mA
0.330 A to 1.0 A		0.00019 A
1.01 A to 2.0 A		0.0012 A
2.01 A to 10.0 A		0.0048 A
10.01 A to 20.5 A		0.019 A

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<b>A12. Calibration of DC Current Clamp Meters</b>  0 to 10 A 10.1 A to 50 A 50.1 A to 100 A 100.1 A to 500 A 501 A to 1000 A	Technical Procedure Section BSE-07 Jul 2020 (Issue 04 Rev 1)	0.1 A 0.38 A 0.54 A 2.5 A 4.7 A
<b>A13. Calibration of DC Current Sourcing Instruments</b> 10 $\mu$ A to 100 $\mu$ A 0.101 mA to 1 mA 1.1 mA to 10 mA 10.1 mA to 100 mA 0.101 A to 1.0 A 1.01 A to 2 A 2.01 A to 50 A 50.1 A to 100 A	Technical Procedure Section BSE-15 Jul 2020 (Issue 04 Rev 1)	0.06 $\mu$ A 0.0024 mA 0.0062 mA 0.058 mA 0.0012 A 0.0029 A 0.29 A 0.58 A
<b>A14. Calibration of AC Current Measuring instruments</b>  29 $\mu$ A to 329.999 $\mu$ A  0.330 mA to 3.2999 mA  3.3 mA to 32.999 mA  33 mA to 329.99 mA  0.330 A to 1.0 A	Technical Procedure Section BSE-08 Jul 2020 (Issue 04 Rev 1)  10 Hz to 45 Hz 45 Hz to 1 kHz 1 kHz to 30 kHz  10 Hz to 45 Hz 45 Hz to 1 kHz 1 kHz to 30 kHz  10 Hz to 45 Hz 45 Hz to 1 kHz 1 kHz to 30 kHz  10 Hz to 45 Hz 45 Hz to 1 kHz 1 kHz to 30 kHz	0.46 $\mu$ A 0.40 $\mu$ A 4.4 $\mu$ A  0.0034 mA 0.0028 mA 0.026 mA  0.026 mA 0.015 mA 0.11 mA  0.26 mA 0.15 mA 1.2 mA  0.0015 A 0.00054 A 0.023 A

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1.01 A to 2.0 A	10 Hz to 45 Hz 45 Hz to 1 kHz 1 kHz to 10 kHz	0.0030 A 0.0012 A 0.043 A
2.01 A to 10.0 A	45 Hz to 1 kHz 1 kHz to 5 kHz	0.010 A 0.23 A
10.1 A to 20.5 A	45 Hz to 1 kHz 1 kHz to 5 kHz	0.031 A 0.47 A
A15. Calibration of AC Current Clamp meters	Technical Procedure Section BSE-08 Jul 2020 (Issue 04 Rev 1)	
0.1 A to 5A 5.1 A to 10 A 10.1 A to 50 A 50.1 A to 100 A 100.1 A to 500 A 500.1 A to 1000 A	30 Hz to 50 Hz	0.073 A 0.1 A 0.38 A 0.54 A 2.5 A 4.7 A
A16. Calibration of AC Current Sourcing Instruments	Technical Procedure Section BSE-16 Jul 2020 (Issue 04 Rev 1)	
600 $\mu$ A to 1000 $\mu$ A 1 mA to 10 mA 10 mA to 100 mA 0.101 A to 1 A 1.01 A to 2 A 2.01 A to 50 A 50.01 A to 100 A	45 Hz to 2kHz 45 Hz to 2 kHz 10 Hz to 1 kHz 10 Hz to 1 kHz 10 Hz to 1 kHz 50 Hz to 60 Hz 50 Hz to 60 Hz	14 $\mu$ A 0.34 mA 0.37 mA 0.0013 A 0.0041A 0.15 A 0.30 A
A17. Calibration of Frequency Measuring Instruments	Technical Procedure Section BSE-09 Jul 2020 (Issue 04 Rev 1)	
0.01 Hz to 119.99 Hz 120.0 Hz to 1.199 kHz 1.2 kHz to 11.999 kHz 12.00 kHz to 100.00 kHz 100.10 kHz to 1199.9 kHz 1.200 MHz to 2.000 MHz		5.8E-03 Hz 5.8E-04 kHz 5.8E-04 kHz 5.8E-03 kHz 5.8E-04 MHz 5.8E-04 MHz

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<p>A18. Calibration of Capacitance Measuring Instruments</p> <p>0.19 nF to 0.3999 nF 0.4 nF to 1.0999 nF 1.1 nF to 3.2999 nF 3.3 nF to 10.9999 nF 11 nF to 32.9999 nF 33 nF to 109.999 nF 110 nF to 329.999 nF 0.33 <math>\mu</math>F to 1.09999 <math>\mu</math>F 1.1 <math>\mu</math>F to 3.29999 <math>\mu</math>F 3.3 <math>\mu</math>F to 10.9999 <math>\mu</math>F 11 <math>\mu</math>F to 32.9999 <math>\mu</math>F 33 <math>\mu</math>F to 109.9999 <math>\mu</math>F 110 <math>\mu</math>F to 329.999 <math>\mu</math>f 0.33 mF to 1.09999 mF 1.1 mF to 3.2999 mF 3.3 mF to 10.9999 mF 11.1 mF to 32.9999 mF 33 mF to 110 mF</p>	<p>Technical Procedure Section BSE-10 Jul 2020 (Issue 04 Rev 1)</p>	<p>0.0094 nF 0.012 nF 0.021 nF 0.032 nF 0.14 nF 0.32 nF 0.92 nF 0.0031 <math>\mu</math>F 0.01 <math>\mu</math>F 0.037 <math>\mu</math>F 0.14 <math>\mu</math>F 0.49 <math>\mu</math>F 1.4 <math>\mu</math>F 0.0047 mF 0.014 mF 0.046 mF 0.22 mF 1.1 mF</p>
<p>A19. Calibration of Inductance Measuring Instruments</p> <p>1 mH 10 mH 20 mH 30 mH 50 mH 100 mH 1 H 10 H</p>	<p>Technical Procedure Section BSE-11 Jul 2020 (Issue 04 Rev 1)</p> <p>1kHz</p>	<p>0.011 mH 0.086 mH 0.16 mH 0.24 mH 0.41 mH 0.83 mH 0.0082 H 0.084 H</p>
<p>A20. Calibration of Electrical Power meter Instruments</p> <p>0.1 W to 1000 W 1.1 kW to 2 kW 2.1 kW to 14 kW</p>	<p>Technical Procedure Section BSE-17 Jul 2020 (Issue 04 Rev 1)</p> <p>40 Hz to 60 Hz</p>	<p>0.0082 W 0.0017 kW 0.0087 kW</p>



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<p>A21. Calibration of Digital Timer, Analog Timer, Stop Watch</p> <p>1 to 60 s 61 to 600 s 601 to 1200 s 1201 to 1800 s 1801 to 3600 s 3601 s to 7200 s</p>	<p>Technical Procedure Section BSE-12 Jul 2020 (Issue 04 Rev 1)</p>	<p>0.1 s 0.1 s 0.2 s 0.2 s 0.3 s 0.5 s</p>
<p>A22. Calibration of Oscilloscope</p> <p>Vertical Deflection ±1mVp-p to ±100mVp-p ±100 mVp-p to ±1 Vp-p ±1 Vp-p to ±6 Vp-p</p> <p>±1 mVp-p to ± 100 mVp-p ±100 mVp-p to ±1 Vp-p ±1 Vp-p to ±100 Vp-p</p> <p>Horizontal Deflection 2 ns to 100 ns 100 ns to 50 ms 50 ms to 5 s</p> <p>Bandwidth 50 kHz to 100 MHz 100 MHz to 300 MHz 300 MHz to 600 MHz</p>	<p>Technical Procedure Section BSE-19 Jul 2020 (Issue 04 Rev 1)</p> <p>50 Ω Input</p> <p>1 MΩ Input</p>	<p>0.46 mV 0.0046 V 0.019 V</p> <p>0.46 mV 0.0047 V 0.47 V</p> <p>0.058 ns 0.030 ms 0.019 s</p> <p>0.29 dB 0.33 dB 0.50 dB</p>
<p>A23. Calibration of RCD Trip Current Measuring</p> <p>3 mA to 30 mA 30 mA to 300 mA 300 mA to 1 A</p>	<p>Technical Procedure Section BSE-20 Jul 2020 (Issue 04 Rev 1)</p>	<p>0.35 mA 3.5 mA 0.012 A</p>

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<b>B. <u>Mechanical (Lab &amp; Site)</u></b>		
<b>B1. Absolute Pressure Instruments</b>  Type of Instruments: Absolute Gauge Absolute Recorder Absolute Calibrator Digital Indicator Transmitters Transducers Barometer Manometer  Range: 0 to 1600 mbar abs	Technical Procedure Section BSM-06 Jul 2020 (Issue 04 Rev 1)	4.0 mbar
<b>B2. Non-Oil/Oxygen Pressure Instruments</b>  Range : 0.000 to 2.000 inH <sub>2</sub> O -13.7 to 30 psi 0 to 1000 psi 10 psi to 10000 psi	Technical Procedure Section BSM-01, BSM-02, BSM-03 Jul 2020 (Issue 04 Rev 1) & BSM-04 Jan 2022 (Issue 04 Rev 2)	0.013 inH <sub>2</sub> O 0.010 psi 0.05 psi 1.2 psi
<b>B3. Pneumatic Instruments</b>  Type of Instruments:  Pneumatic Gauge Calibrators Digital Indicators Data Logger Manometers Transducer Chart Recorders Magnehelic gauge	Technical Procedure Section BSM-02, BSM-03 Jul 2020 (Issue 04 Rev 1) & BSM-04 Jan 2022 (Issue 04 Rev 2)	

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<p>Range :</p> <p>0.000 to 2.000 inH<sub>2</sub>O</p> <p>-13.7 to 30 psi</p> <p>0 to 1000 psi</p> <p>B4. Vacuum Instruments</p> <p>Type of Instruments:</p> <p>Digital Indicator</p> <p>Torr Meter</p> <p>Vacuum Gauges</p> <p>Digital Indicator</p> <p>Manometer</p> <p>Calibrators</p> <p>Magnehelic Gauge and</p> <p>High Vacuum Sensors</p> <p>Range :</p> <p>10 to 0.1 Torr</p> <p>0.1 to 1E-2 Torr</p> <p>1E-2 to 1E-4 Torr</p> <p>1E-4 Torr to 1E-5 Torr</p>	<p>Technical Procedure</p> <p>Section BSM-05</p> <p>Jul 2020 (Issue 04 Rev 1)</p>	<p>0.013 inH<sub>2</sub>O</p> <p>0.010 psi</p> <p>0.05 psi</p>
<p>B5. Hydraulic Pressure Instruments</p> <p>a. Type of Instruments:</p> <p>Oil Pressure Gauge</p> <p>Distilled Water Pressure Gauge</p> <p>Pressure Calibrator</p> <p>Digital Indicator</p> <p>Manometers</p> <p>Controller</p> <p>Data Logger,</p> <p>Chart Recorder,</p> <p>Pressure Switches,</p> <p>Pressure transducer and</p> <p>Transmitters</p>	<p>Technical Procedure</p> <p>Section BSM-01</p> <p>Jul 2020 (Issue 04 Rev 1)</p>	<p>21% of reading</p> <p>19% of reading</p> <p>22% of reading</p> <p>29% of reading</p>

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<p>Range :</p> <p>0 to 16 000 psi</p> <p>0 to 2500 bar</p> <p>b. Ultra-High Pressure Measuring Instruments</p> <p>Pressure Gauge</p> <p>Pressure Transmitters</p> <p>Pressure Transducers</p> <p>Pressure Chart Recorders</p> <p>Pressure Force Gauge</p> <p>Pressure Calibrators</p> <p>Digital Indicators</p> <p>Pressure Controllers</p> <p>Data Loggers</p> <p>Range:</p> <p>0~60000 psi</p>	<p>Deadweight tester</p> <p>High Pressure Calibrator</p> <p>Technical Procedure</p> <p>Section BSM 15</p> <p>Jan 2022 (Issue 04 Rev 0)</p>	<p>0.022 % of Reading</p> <p>1.0 bar</p>
<p>B6. Dead Weight Testers</p> <p>Type of Instruments :</p> <p>Hydraulic Oil Dead Weight Tester (Cross Float)</p> <p>Range :</p> <p>0 to 16000 psi</p>	<p>Technical Procedure</p> <p>Section BSM-01</p> <p>Jul 2020 (Issue 04 Rev 1)</p>	<p>23 psi</p>
<p>B7. Differential Pressure</p> <p>Type of Instruments :</p> <p>Pneumatic Differential Gauge Switches</p> <p>Pneumatic Differential Indicators and Magnehelic Gauge</p> <p>Manometers</p> <p>Flowmeters</p> <p>Anemometer</p> <p>Velometer</p> <p>Balometer</p>	<p>Technical Procedure</p> <p>Section BSM-04</p> <p>Jan 2022 (Issue 04 Rev 2)</p>	<p>0.022 % of Reading</p>

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<p>Range :</p> <p>a. 0 to 2 inH<sub>2</sub>O</p> <p>b. -1000 to 1000 Pa</p>		<p>0.013 inH<sub>2</sub>O</p> <p>2.6 Pa</p>
<p>B8. Force Gauge Instruments</p> <p>Range :</p> <p>0 to 1000 psi</p> <p>0 to 16000 psi</p>	<p>Technical Procedure Section BSM-01 &amp; BSM-02 Jul 2020 (Issue 04 Rev 1)</p> <p>Pneumatic Pressure Calibrator Deadweight tester/ High Pressure Calibrator</p>	<p>0.05 psi</p> <p>0.022 % of reading</p>
<p>B9. Pressure Relief Valve Instruments</p> <p>Gas</p> <p>Up to 70 bar</p>	<p>Technical Procedure Section BSM-07 Jul 2020 (Issue 04 Rev 1)</p>	<p>0.29% of reading</p>
<p>B10. Non-Contact &amp; Contact Tachometer Instruments</p> <p>Non-Contact Tachometer</p> <p>10 rpm to 600 rpm</p> <p>600 rpm to 6000 rpm</p> <p>6000 rpm to 30000 rpm</p> <p>30000 rpm to 60000 rpm</p> <p>60000 rpm to 90000 rpm</p> <p>Contact Tachometer</p> <p>10 rpm to 100 rpm</p> <p>100 rpm to 1000 rpm</p> <p>1000 rpm to 3000 rpm</p> <p>3000 rpm to 4800 rpm</p>	<p>Technical Procedure Section BSM-08 Jul 2020 (Issue 04 Rev 1)</p>	<p>0.06 rpm</p> <p>0.23 rpm</p> <p>1.3 rpm</p> <p>2.5 rpm</p> <p>3.4 rpm</p> <p>0.6 rpm</p> <p>0.8 rpm</p> <p>1.5 rpm</p> <p>2.3 rpm</p>

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<p>B11. Calibration of Balances and Weighing Scale</p> <p>Type of Instruments :</p> <p>Weighing Scales</p> <p>Compact Scales</p> <p>Industrial Balances</p> <p>Electronics Balances</p> <p>Environmental Balances</p> <p>Dust &amp; Waterproof Digital Scales</p> <p>Electronics Pocket Balances</p> <p>Moisture Balance</p> <p>Top Loading Balances</p> <p>Bench / Counting Scale</p> <p>Floor Scale</p> <p>Platform Scale</p> <p>1 mg to 20 mg</p> <p>20 mg to 50 mg</p> <p>50 mg to 100 mg</p> <p>100 mg to 200 mg</p> <p>200 mg to 500 mg</p> <p>500 mg to 220 g</p> <p>220 g to 500 g</p> <p>500 g to 1000 g</p> <p>1000 g to 5000 g</p> <p>5000 g to 10000 g</p> <p>10000 g to 24000 g</p> <p>24 kg to 60 kg</p> <p>60 kg to 200 kg</p> <p>200 kg to 300 kg</p> <p>300 kg to 500 kg</p> <p>500 kg to 600 kg</p> <p>600 kg to 1000 kg</p>	<p>Technical Procedure</p> <p>Section BSM-09</p> <p>Jan 2022 (Issue 04 Rev 2)</p>	<p>0.02 mg</p> <p>0.02 mg</p> <p>0.021 mg</p> <p>0.021 mg</p> <p>0.021 mg</p> <p>0.15 mg</p> <p>0.24 mg</p> <p>1.3 mg</p> <p>2.0 mg</p> <p>20 mg</p> <p>0.14 g</p> <p>0.006 kg</p> <p>0.015 kg</p> <p>0.063 kg</p> <p>0.095 kg</p> <p>0.12 kg</p> <p>0.14 kg</p>

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<p>B12. Calibration of Standard Weights/ Test Weights/ Precision Weights</p> <p>OIML Class M3 Weights or equivalent</p> <p>1 g to 50 g</p> <p>50 g to 200 g</p> <p>200 g to 500 g</p> <p>500 g to 1 kg</p> <p>1 kg to 2 kg</p> <p>2 kg to 5 kg</p> <p>5 kg to 10 kg</p> <p>10 kg to 20 kg</p> <p>OIML Class M2 Weights or equivalent</p> <p>1 kg to 5 kg</p> <p>5 kg to 10 kg</p> <p>10 kg to 20 kg</p> <p>OIML Class M1 Weights or equivalent</p> <p>2 kg to 5 kg</p> <p>5 kg to 10 kg</p> <p>10 kg to 20 kg</p> <p>OIML Class F1 Weights or equivalent</p> <p>1 mg</p> <p>2 mg</p> <p>5 mg</p> <p>10 mg</p> <p>20 mg</p> <p>50 mg</p> <p>100 mg</p> <p>200 mg</p> <p>500 mg</p> <p>1 g</p> <p>2 g</p> <p>5 g</p> <p>10 g</p> <p>20 g</p> <p>50 g</p> <p>100 g</p> <p>200 g</p> <p>500 g</p> <p>1 kg</p> <p>2 kg</p> <p>5 kg</p> <p>10 kg</p>	<p>Technical Procedure Section BSM-12</p> <p>Apr 2023 (Issue 04 Rev 2)</p>	<p>0.0002 g</p> <p>0.0002 g</p> <p>0.012 g</p> <p>0.012 kg</p> <p>0.012 kg</p> <p>0.012 kg</p> <p>0.012 kg</p> <p>0.058 kg</p> <p>0.12 kg</p> <p>0.0058 kg</p> <p>0.029 kg</p> <p>0.058 kg</p> <p>0.012 kg</p> <p>0.029 kg</p> <p>0.058 kg</p> <p>0.011 mg</p> <p>0.014 mg</p> <p>0.014 mg</p> <p>0.014 mg</p> <p>0.014 mg</p> <p>0.016 mg</p> <p>0.016 mg</p> <p>0.022 mg</p> <p>0.023 mg</p> <p>0.000011 g</p> <p>0.000012 g</p> <p>0.000013 g</p> <p>0.000014 g</p> <p>0.000044 g</p> <p>0.00028 g</p> <p>0.00040 g</p> <p>0.00061 g</p> <p>0.006 g</p> <p>0.009 g</p> <p>0.009 g</p> <p>0.00009 kg</p> <p>0.00009 kg</p>

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20 kg		0.00013 kg
OIML Class E2 Weights only		
1 mg	Technical Procedure	0.0025 mg
2 mg	Section BSM-20	0.0025 mg
5 mg	Apr 2023 (Issue 04 Rev 0)	0.0025 mg
10 mg		0.0025 mg
20 mg		0.0025 mg
50 mg		0.0033 mg
100 mg		0.0042 mg
200 mg		0.003 mg
500 mg		0.004 mg
1 g		0.000004 g
2 g		0.000006 g
5 g		0.000006 g
10 g		0.000007 g
20 g		0.000009 g
50 g		0.00002 g
100 g		0.00003 g
200 g		0.00004 g
500 g		0.001 g
1 kg		0.000001 kg
2 kg		0.000001 kg
B13. Torque Measuring Instruments	Technical Procedure	
a. Type of Instruments:	Section BSM-10	
Torque Hand Tools	Jan 2022(Issue 04 Rev 2)	
Round Dial Gauge Torque Screwdriver	Based on ISO 6789:2003	
Torque Gauge (Digital / Analog)		
Dial Indicating Type Torque Wrench		
Indicator Plate Torque Wrench		
Adjustable Torque Wrench		
Rotating Torque Screw Driver		
Preset Torque Wrench		
Data Printout Digital Torque Wrench		
Hydraulic Torque Gauge		
Range:		
10 to 100 ozf.in.		1.3 ozf.in
5 to 50 lb.in.		0.32 lb.in.
50 to 150 lb.in.		0.56 lb.in.
12.5 to 50 lbft.		0.15 lbft.
50 to 100 lbft.		0.56 lbft.
100 to 250 lbft.		0.76 lbft.
250 to 500 lbft.		3.2 lbft.
500 to 1000 lbft.		6.5 lbft.
1000 to 2000 lbft.		13.0 lbft



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<p>b. Torque Hand Tools Torque Wrench Digital Torque Wrench Dial Indicating Type Torque Wrench Indicator Plate Torque Wrench Adjustable Torque Wrench Preset Torque Wrench Data Printout Digital Torque Wrench Hydraulic Torque Wrench</p> <p>Range: 5 to 50 lb.in 50 to 250 lb.in 20 to 100 lb.ft 100 to 600 lb.ft 600 to 2000 lb.ft</p>	<p>Technical Procedure Section BSM-10 Jan 2022 (Issue 04 Rev 2) Based on ISO 6789:2017</p>	<p>0.38 % of reading 0.50 % of reading 0.67 % of reading 0.64 % of reading 0.77 % of reading</p>
<p>B14. Torque Meter Tester Type of Instruments : Torque Checker Torque Meter Tester Torque Analyzer</p> <p>Range : 0 to 10 kgf.cm 10 to 50 kgf.cm 50 to 100 kgf.cm</p>	<p>Technical Procedure Section BSM-11 Jul 2020 (Issue 04 Rev 1)</p>	<p>0.014 kgf.cm 0.14 kgf.cm 0.16 kgf.cm</p>
<p>B15. Force Measuring Instruments Type of Instruments : Push Pull Gauge Force Gauge Tension Meter Gram Gauge Manual Test Stands Motorized Test Stands Dial Tension Gauge Tension Gauge Wire Tension Meter</p>	<p>Technical Procedure Section BSM-13 Jul 2020 (Issue 04 Rev 1)</p>	

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<p>Load Gauge Spring Balance Tensile Tester Cable Tension Meter Force Indicator Dynamometer Belt Tension Gauge Strap Tension Meter</p> <p>Range : 1 gf to 100 gf 100 gf to 1 kgf 1 kgf to 100 kgf 100 kgf to 400 kgf 400 kgf to 600 kgf</p>		<p>0.10gf 0.008 kgf 0.07 kgf 0.25 kgf 0.39 kgf</p>
<p>B16. Rubber Hardness Tester</p> <p>Type of Instruments Hand Durometer Digital Durometer Pencil Durometer Multi Scale Durometer Dial Durometer Tire Hardness Durometer Pocket Durometer Direct Force Verification</p> <p>Range : Up to 100 Div Durometer Type A, B, C</p>	<p>Technical Procedure Section BSM-14 Jul 2020 (Issue 04 Rev 1) Type A, B, C, D</p>	<p>0.31 Div</p>
<p>B17. Hardness testing machine (Lab &amp; Site) In-direct verification methods of Hardness machine Handheld hardness tester Analog Tester Portable hardness Tester</p>	<p>Technical Procedure Section BSM-16 Apr 2023 (Issue 04 Rev 0)</p>	

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Impressor Tester Digital Hardness Tester Brinell Hardness tester  <b>HRA BLOCK</b> 30~40 HRA 65~75 HRA 80~85 HRA  <b>HRBW BLOCK</b> 45~60 HRBW 60~70 HRBW 90~100 HRBW  <b>HRC BLOCK</b> 45~60 HRC 60~70 HRC 90~100 HRC		1.3 HRA 1.3 HRA 0.8 HRA  2.9 HRBW 2.9 HRBW 1.3 HRBW  1.3 HRC 1.3 HRC 0.8 HRC
B18. Sound Pressure level Devices (Lab / Site) Sound Level meter and Noise Analyzers  Range: 94dB@1000 Hz 114dB@1000 Hz	Technical Procedure Section BSM-17 Apr 2023 (Issue 04 Rev 0)	0.43 dB 0.48 dB
B19. Rotational Speed Measurements(Lab/Site)  Range: 10~60 rpm >60~100 rpm >100~500 rpm >500~1000 rpm >1000~5000 rpm >5000~10000 rpm >10000~50000 rpm >50000~90000 rpm	Technical Procedure Section BSM-18 Apr 2023 (Issue 04 Rev 0)	0.028 rpm 0.18 rpm 0.26 rpm 1.1 rpm 2.6 rpm 4 rpm 13 rpm 22 rpm
B20. Volume Measuring Instruments(Lab/site) Volumetric Apparatus 1 ml ~ 10 ml >10 ml ~ 100 ml >100 ml ~ 1000 ml >1000 ml~ 5000 ml >5 l ~30 l >30 l ~100 l	Technical Procedure Section BSM-19 Apr 2023 (Issue 04 Rev 0)	0.029 ml 0.58 ml 5.8 ml 58 ml 2.9 l 7.2 l

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<b>Burettes</b>  >1 ml ~ 10 ml >10 ml ~ 100 ml >100 ml ~ 300 ml  <b>Pipettes</b> 1 µl ~ 10 µl >10 µl ~ 100 µl >100 µl ~ 1000 µl >1ml ~5 ml >5 ml ~ 50 ml		0.0057 ml 0.057 ml 0.59 ml  0.19 µl 0.33 µl 0.60 µl 0.029 ml 0.12 ml
<b>C. <u>Temperature (Lab &amp; Site)</u></b>  C1. Temperature Measuring Instruments a. Glass Thermometer- Total Immersion (Lab)  Range:                      Scale Div. -75 ~ 250 °C              0.02 °C -75 ~ 250 °C              0.05 °C -75 ~ 250 °C              0.1 °C -75 ~ 250 °C              0.2 °C -75 ~ 250 °C              0.25 °C -75 ~ 250 °C              0.5 °C -75 ~ 250 °C              1 °C -75 ~ 250 °C              2 °C  b. Glass Thermometer- Partial Immersion (lab)  Range:                      Scale Div. -75 ~ 250 °C              0.1 °C -75 ~ 250 °C              0.2 °C -75 ~ 250 °C              0.25 °C -75 ~ 250 °C              0.5 °C -75 ~ 250 °C              1 °C -75 ~ 250 °C              2 °C	Technical Procedure Section BST-01 Jul 2020 (Issue 04 Rev 1)	0.11°C 0.13°C 0.16°C 0.26°C 0.31°C 0.59°C 1.2°C 2.3°C  0.16°C 0.26°C 0.31°C 0.59°C 1.2°C 2.3°C

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c. RTD Sensor/ Thermistor Probe Without Indicator Range: - 75 ~ -20°C - 20 ~ 30 °C 30 ~ 100 °C 100 ~ 270-250°C 250 ~ 500°C	Technical Procedure Section BST-02 <del>Jul 2020 (Issue 04 Rev 1)</del> Apr 2023 (Issue 04 Rev 2)	<u>Lab</u> / <u>Site</u> 0.082 °C/0.094 °C / - 0.081°C 0.087°C / 0.33°C 0.27 °C 0.079°C/0.066°C / 0.28°C-0.15 °C 0.13 °C 0.16°C / 0.41 °C-0.19 °C 0.20 °C / 0.25 °C
d. RTD Sensor/ Thermistor Probe with Indicator Range: -75 ~ -20 °C -20 ~ 30 °C 30 ~ 100 °C 100 ~ 270-250°C 250 ~ 500°C		<u>Lab</u> / <u>Site</u> 0.062°C 0.078°C / - 0.061°C 0.036°C / 0.33 °C-0.27 °C 0.059°C 0.040°C / 0.29 °C-0.15 °C 0.084°C 0.12°C / 0.41 °C-0.19 °C 0.17 °C / 0.25 °C
e. Digital Thermometer with sensor, Temperature Switch, Temperature Transmitter, Temperature Transducer, Data Logger with Sensor, Temperature Controller with Sensor Temperature Indicator with Sensor, Temperature Recorder with Sensor  Range : -75 ~ -20 °C -20 ~ 30 °C 30 ~ 100 °C 100 ~ 270 °C 270~ 500 °C 500 ~ 1000 °C	Technical Procedure Section BST-03 Jul 2020 (Issue 04 Rev 1)	<u>Lab</u> / <u>Site</u> 0.11 °C / - 0.076 °C / 0.34 °C 0.074 °C / 0.29 °C 0.085 °C / 0.42 °C 0.42 °C / 0.55 °C 1.5 °C / -
f. Thermocouple without Indicator  Range : -75 ~ -20 °C -20 ~ 30 °C 30 ~ 100 °C 100 ~270 °C 270~ 500 °C 500 ~ 1000 °C	Technical Procedure Section BST-04 Jul 2020 (Issue 04 Rev 1)	<u>Lab</u> / <u>Site</u> 0.26 °C / - 0.25 °C / 0.43 °C 0.25 °C / 0.42 °C 0.47 °C / 0.75 °C 0.74 °C / 0.84 °C 1.7 °C / -

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g. Thermocouple with Indicator Range : -75 ~ -20 °C -20 ~ 30 °C 30 ~ 100 °C 100 ~ 270 °C 270 ~ 500 °C 500 ~ 1000 °C		<table> <tr> <th>Lab</th><th>/</th><th>Site</th></tr> <tr> <td>0.24 °C</td><td>/</td><td>-</td></tr> <tr> <td>0.24 °C</td><td>/</td><td>0.37 °C</td></tr> <tr> <td>0.23 °C</td><td>/</td><td>0.37 °C</td></tr> <tr> <td>0.46 °C</td><td>/</td><td>0.71 °C</td></tr> <tr> <td>0.65 °C</td><td>/</td><td>0.83 °C</td></tr> <tr> <td>1.7 °C</td><td>/</td><td>-</td></tr> </table>	Lab	/	Site	0.24 °C	/	-	0.24 °C	/	0.37 °C	0.23 °C	/	0.37 °C	0.46 °C	/	0.71 °C	0.65 °C	/	0.83 °C	1.7 °C	/	-																								
Lab	/	Site																																													
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0.46 °C	/	0.71 °C																																													
0.65 °C	/	0.83 °C																																													
1.7 °C	/	-																																													
C2. Dry Block Calibrator (Lab/Site) Range : -40 ~ 500 °C	Technical Procedure Section BST-05 Jul 2020 (Issue 04 Rev 1)	0.52 °C																																													
C3. Ice Point  Range : 0 °C	Technical Procedure Section BST-01, BST-02, BST-03 & BST-04 Jul 2020 (Issue 04 Rev 1)	0.054 °C																																													
C4. a. Calibration of Temperature Indicator (Lab/Site)  Type J : -210 ~ 0 °C 0 ~ 600 °C 600 ~ 1200 °C  Type K : -200 ~ 0 °C 0 ~ 1000 °C 1000 ~ 1372 °C  Type T : -250 ~ 0 °C 0 ~ 400 °C  Type R : 0 ~ 200 °C 200 ~ 800 °C 800 ~ 1767 °C	Technical Procedure Section BST-06 Jul 2020 (Issue 04 Rev 1)	<table> <tr> <th>Lab</th><th>/</th><th>Site</th></tr> <tr> <td>0.32 °C</td><td>/</td><td>0.59 °C</td></tr> <tr> <td>0.20 °C</td><td>/</td><td>0.59 °C</td></tr> <tr> <td>0.27 °C</td><td>/</td><td>0.56 °C</td></tr> </table> <table> <tr> <th>Lab</th><th>/</th><th>Site</th></tr> <tr> <td>0.39 °C</td><td>/</td><td>0.80 °C</td></tr> <tr> <td>0.31 °C</td><td>/</td><td>0.67 °C</td></tr> <tr> <td>0.47 °C</td><td>/</td><td>0.81 °C</td></tr> </table> <table> <tr> <th>Lab</th><th>/</th><th>Site</th></tr> <tr> <td>0.74 °C</td><td>/</td><td>0.88 °C</td></tr> <tr> <td>0.19 °C</td><td>/</td><td>0.42 °C</td></tr> </table> <table> <tr> <th>Lab</th><th>/</th><th>Site</th></tr> <tr> <td>0.68 °C</td><td>/</td><td>2.0 °C</td></tr> <tr> <td>0.42 °C</td><td>/</td><td>1.2 °C</td></tr> <tr> <td>0.48 °C</td><td>/</td><td>1.2 °C</td></tr> </table>	Lab	/	Site	0.32 °C	/	0.59 °C	0.20 °C	/	0.59 °C	0.27 °C	/	0.56 °C	Lab	/	Site	0.39 °C	/	0.80 °C	0.31 °C	/	0.67 °C	0.47 °C	/	0.81 °C	Lab	/	Site	0.74 °C	/	0.88 °C	0.19 °C	/	0.42 °C	Lab	/	Site	0.68 °C	/	2.0 °C	0.42 °C	/	1.2 °C	0.48 °C	/	1.2 °C
Lab	/	Site																																													
0.32 °C	/	0.59 °C																																													
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Type S : 0 ~ 200 °C 200 ~ 1200 °C 1200 ~ 1767 °C  Type N : -200 ~ 0 °C 0 ~ 200 °C 200 ~ 1300 °C  Type E : -200 ~ 0 °C 0 ~ 600 °C 600 ~ 1000 °C  b. Calibration of Thermocouple Sourcing Instrument(Lab/Site)  Type J : -210 ~ 0 °C 0 ~ 600 °C 600 ~ 1200 °C  Type K : -200 ~ 0 °C 0 ~ 1000 °C 1000 ~ 1372 °C  Type T : -250 ~ 0 °C 0 ~ 400 °C  Type R : 0 ~ 200 °C 200 ~ 800 °C 800 ~ 1767 °C  Type S : 0 ~ 200 °C 200 ~ 1200 °C 1200 ~ 1767 °C  Type N :	Technical Procedure Section BST-06 Jul 2020 (Issue 04 Rev 1)	<u>Lab</u> / <u>Site</u> 0.56 °C / 1.6 °C 0.44 °C / 1.3 °C 0.54 °C / 1.3 °C  <u>Lab</u> / <u>Site</u> 1.2 °C / 1.6 °C 0.45 °C / 1.2 °C 0.42 °C / 1.2 °C  <u>Lab</u> / <u>Site</u> 0.58 °C / 0.90 °C 0.19 °C / 0.51 °C 0.25 °C / 0.60 °C  <u>Lab</u> / <u>Site</u> 0.33 °C / 0.51 °C 0.22 °C / 0.50 °C 0.28 °C / 0.50 °C  <u>Lab</u> / <u>Site</u> 0.40 °C / 0.72 °C 0.31 °C / 0.68 °C 0.47 °C / 0.74 °C  <u>Lab</u> / <u>Site</u> 0.74 °C / 0.93 °C 0.20 °C / 0.42 °C  <u>Lab</u> / <u>Site</u> 0.68 °C / 1.9 °C 0.43 °C / 1.1 °C 0.48 °C / 1.1 °C  <u>Lab</u> / <u>Site</u> 0.57 °C / 1.5 °C 0.45 °C / 1.5 °C 0.55 °C / 1.2 °C  <u>Lab</u> / <u>Site</u>

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-200 ~ 0 °C 0 ~ 200 °C 200 ~ 1300 °C  Type E : -200 ~ 0 °C 0 ~ 600 °C 600 ~ 1000 °C		1.2 °C / 1.6 °C 0.38 °C / 1.1 °C 0.43 °C / 1.1 °C  <u>Lab</u> / <u>Site</u> 0.58 °C / 0.51 °C 0.20 °C / 0.43 °C 0.26 °C / 0.43 °C
C5. a. PRT Electrical Simulation Instruments (Lab/Site)  Range : Type PT 100 (385) -200 ~ 100 °C 100 ~ 400 °C 400 ~ 800 °C  b. PRT Sourcing Instruments (Lab/Site)  Range : Type PT 100 (385) -200 ~ 100 °C 100 ~ 400 °C 400 ~ 800 °C	Technical Procedure Section BST-07 Jul 2020 (Issue 04 Rev 1)	<u>Lab</u> / <u>Site</u> 0.11 °C / 0.29 °C 0.14 °C / 0.38 °C 0.27 °C / 0.45 °C  <u>Lab</u> / <u>Site</u> 0.06 °C / 0.29 °C 0.15 °C / 0.33 °C 0.15 °C / 0.36 °C
C6. Controlled Temperature Enclosure (Lab/Site)  Freezers Oven & Furnaces  Range : -75 ~ -40 °C -40 ~ 100 °C 100 ~ 200 °C 200 ~ 400 °C 400 ~ 600 °C 600 ~ 1000 °C 1000 ~ 1200 °C  Autoclaves	Technical Procedure Section BST-08 <del>Jul 2020 (Issue 04 Rev 1)</del> Apr 2023 (Issue 04 Rev 2)	<del>1.0 °C</del> 1.1 °C <del>1.4 °C</del> 1.6 °C <del>2.0 °C</del> 1.7 °C <del>2.7 °C</del> 2.8 °C 3.0 °C <del>3.9 °C</del> 4.1 °C 5.0 °C  0.4 °C



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<p>C7. Humidity Chamber(Lab/Site) Humidity Range : 20~ 95 % relative humidity @ (10~50) °C</p> <p>Temperature Range : 10 ~ 50 °C @ (20~ 95) % relative humidity</p>	<p>Technical Procedure Section BST-08 &amp; BST-09 Jul 2020 (Issue 04 Rev 1)</p>	<p>7.2% relative humidity</p> <p>1.2 °C</p>
<p>C8. Calibration of Surface Probes with/without Indicator (Lab/Site)</p> <p>Range : 50 ~ <del>250 °C</del>150°C <del>250 ~ 450 °C</del>150°C~250°C 250°C~500°C</p> <p>Surface Hot Plates Range: 50 ~ 100 °C 100 ~ 250 °C 250 ~ 500 °C</p>	<p>Technical Procedure Section BST-10 <del>Jul 2020 (Issue 04 Rev 1)</del> Apr 2023 (Issue 04 Rev 2)</p> <p>Technical Procedure Section BST-14 Apr 2023 (Issue 04 Rev 0)</p>	<p><del>3.0 °C</del>1.2°C <del>5.5 °C</del>1.4°C 2.1°C</p> <p>3.2°C 3.3°C 5.9°C</p>
<p>C9. Humidity/ Temperature Measuring Instruments (Lab/Site)</p> <p>Reference Used: Hygrogen Air Probes, Datalogger, Weather Meter, Temperature and humidity transmitter, thermohygrometer, Temperature and Humidity Sensor</p> <p>5 ~ 40 °C 12 ~ 90 %<del>rh</del> relative humidity</p> <p>40 ~ 50 °C 12 ~ 90 %<del>rh</del> relative humidity</p> <p>10 ~ 40 °C 90 ~ 95 %<del>rh</del> relative humidity</p> <p>Reference Used: Humidity Chamber Thermohygrograph, Barometer, Datalogger, Thermohygrometer, Humidity Sensor</p>	<p>Technical Procedure Section BST-11 Jul 2020 (Issue 04 Rev 1) (Scope extension)</p>	<p><del>0.5 °C</del>0.3°C 1.9 % <del>rh</del> relative humidity</p> <p><del>0.7 °C</del>0.3°C 1.9 % <del>rh</del> relative humidity</p> <p><del>0.5 °C</del>0.3°C 1.9 % <del>rh</del> relative humidity</p>

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<p>-20 °C ~0 °C 0°C ~60 °C</p> <p>(10 ~ 40) °C (10~95) % relative humidity</p> <p>C10. Calibration of Non-Contact Thermometer Measuring (Lab) Spectral Range: 8~14µm Emissivity (ε): 0.95</p> <p>Range 10 ~ 50 °C 50 ~ 120 °C 120 ~ 250 °C 250 ~ 490 °C</p> <p>C11. System Accuracy Test</p> <p>1.Temperature -60 ~50 °C 50 ~ 200 °C 200 ~ 500 °C 500 ~ 1000 °C</p> <p>2.Temperature and Humidity 2.1Temperature Range:</p>	<p>Technical Procedure Section BST-12 Jul 2020 (Issue 04 Rev 1)</p> <p>Technical Procedure Section BST-13 Apr 2023 (Issue 04 Rev 0)</p>	<p>0.28°C 0.45°C</p> <p>0.37°C 2.5% relative humidity</p> <p>1.1 °C 2.2 °C 3.4 °C 4.8 °C</p> <p>0.8°C 0.9°C 1.3°C 3.0°C</p>

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10~50 °C 2.2Relative Humidity Range: (10 to 70) % Relative Humidity  C12. Dew Point Measuring Instruments  Dew point Meter Dew Meters Elcometers Dew point sensors Dew point Transmitters <b>Range</b> -20~60 °C dP	Technical Procedure Section BST-15 Apr 2023 (Issue 04 Rev 0)	0.24°C  2.3 %relative humidity.        0.76°C dP
<b>D. <u>Dimensional (Lab &amp; Site)</u></b> D1. Micrometer Measuring Instruments  External Micrometer Interchangeable Micrometer Digimatic Micrometer Outside Micrometer Caliper Type Micrometer Screw Thread Micrometer Gear tooth Micrometer Disk Micrometer Sheet Metal Micrometer Spline Micrometer Tube Micrometer Point Micrometer V-Anvil Micrometer Blade Micrometer Groove Micrometer Can Seam Micrometer Digit outside Micrometer Digimatic Bench Micrometer Indicating Micrometer  Range: Flatness  Parallelism: Up to 500 mm >500 mm to 1000 mm >1000 mm to 1500 mm  Accuracy:	Technical Procedure Section BSD-01 Jul 2020 (Issue 04 Rev 1)	Lab     /     Site 1 µm     /     2 µm  Lab     /     Site 2 µm     /     3 µm 2 µm     /     3 µm 3 µm     /     3 µm  Lab     /     Site

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0 mm Up to 500 mm >500 mm to 1000 mm >1000 mm to 1500 mm		1 µm / 2 µm 2 µm / 2 µm 3 µm / 3 µm
D2. End Rod measurements Standard Rod / Extension Rod Range:	Technical Procedure  Section BSD-02 Jul 2020 (Issue 04 Rev 1)	Lab / Site
Up to 500 mm >500 mm to 1000 mm >1000 mm to 1500 mm		2 µm / 3 µm 3 µm / 4 µm 3 µm / 4 µm
D2. Caliper Measuring Instruments Super Caliper Solar Caliper Coolant Proof Caliper Digimatic Caliper Vernier Caliper Dial Caliper Carbon Fiber Caliper Long jaw Caliper Back-jaw Caliper Blade type Caliper Tube thickness Caliper Neck Caliper Hook type Vernier Caliper Low force Caliper	Technical Procedure Section BSD-03 Jul 2020 (Issue 04 Rev 1)	
Range: Resolution:		<u>Lab</u> / <u>Site</u>
0 mm to 500 mm 10 µm		10 µm / 10 µm
20 µm		20 µm / 20 µm
50 µm		50 µm / 50 µm
Range: Resolution:		<u>Lab</u> / <u>Site</u>
0 mm to 1000 mm 10 µm		10 µm / 10 µm
20 µm		20 µm / 20 µm
50 µm		50 µm / 50 µm
Range: Resolution:		<u>Lab</u> / <u>Site</u>
0 mm to 1500 mm 10 µm		10 µm / 10 µm
20 µm		20 µm / 20 µm
50 µm		50 µm / 50 µm

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D3. Height Measuring Instruments Vernier Height Gauge Digimatic Height Gauge Height Gauge  Flatness :  Parallelism: Up to 500 mm >500 mm to 1000 mm >1000 mm to 1500 mm  Accuracy :  Range:                      Resolution: 0 mm to 500 mm      10 µm 20 µm 50 µm  0 mm to 1000 mm      10 µm 20 µm 50 µm  0 mm to 1500 mm      10 µm 20 µm 50 µm	Technical Procedure Section BSD-04 Jul 2020 (Issue 04 Rev 1)	Lab        /        Site 2 µm        /        3 µm  Lab        /        Site 2 µm        /        3 µm 2 µm        /        3 µm 3 µm        /        3 µm  Lab        /        Site 10 µm       /       10 µm 20 µm       /       20 µm 50 µm       /       50 µm  10 µm       /       10 µm 20 µm       /       20 µm 50 µm       /       50 µm  10 µm       /       10 µm 20 µm       /       20 µm 50 µm       /       50 µm
D3. Depth Measuring Instruments Vernier Depth Gauge Digimatic Depth Gauge Dial Depth Gauge Depth Gauge Tire Thread Depth Gage Pitch Depth Gage Thread Depth Gage  Flatness Parallelism  Range:                      Resolution: 0 mm to 500 mm      10 µm 20 µm 50 µm  Range:                      Resolution: 0 mm to 1000 mm      10 µm 20 µm	Technical Procedure Section BSD-05 Jul 2020 (Issue 04 Rev 1)	Lab        /        Site 1 µm        /        2 µm 2 µm        /        3 µm  Lab        /        Site 10 µm       /       10 µm 20 µm       /       20 µm 50 µm       /       50 µm  Lab        /        Site 10 µm       /       10 µm 20 µm       /       20 µm

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50 µm			50 µm	/	50 µm
D4.	Internal Measuring Instruments Stick Micrometers Digimatic Tubular Micrometers Tubular Micrometers Inside Micrometer  Accuracy:  Range : 0 mm to 1500 mm  Extension Rods:  Range: Up to 500 mm >500 mm to 1500 mm	Technical Procedure Section BSD-06 Jul 2020 (Issue 04 Rev 1)	<u>Lab</u> 3 µm	/	<u>Site</u> 4 µm
D4.	Depth Micrometers  Flatness :  Parallelism: Up to 300 mm  Accuracy: 0 mm to 300 mm  Extension Rods: 0 mm to 300 mm	Technical Procedure Section BSD-07 Jul 2020 (Issue 04 Rev 1)	Lab 2 µm	/	Site 3 µm
D5.	Plunger Indicating Instruments Dial indicator Digimatic indicator Hicator Signal Hicator Back plunger dial indicator Deflection Gauge Special Dial Indicator Micro Indicator  Range:                      Resolution: 0 mm to 100 mm      0.1 µm 1 µm	Technical Procedure Section BSD-08 Jul 2020 (Issue 04 Rev 1)	Lab 0.3 µm 1 µm	/	Site 1.0 µm 2 µm

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<p>5 <math>\mu</math>m 10 <math>\mu</math>m</p> <p>D6. Lever Indicating Instruments Dial test Indicator Pocket type dial test indicator</p> <p>Accuracy: 0 mm to 5 mm</p> <p>D7. Limit Gauges Plain Plug &amp; Pin Gauges</p> <p>Range: Up to 100 mm &gt;100 mm to 300 mm</p> <p>Plain Ring Gauges</p> <p>Range: Up to 100 mm &gt;100 mm to 300 mm</p> <p>Plain Gap Gauges</p> <p>Range: Up to 100 mm &gt;100 mm to 300 mm</p> <p>Other limit Gauges (Including Height, Depth &amp; Length) Range: Up to 100 mm &gt;100 mm to 300 mm</p> <p>Precision Balls Range: Up to 100 mm</p> <p>D8. Line Standard Steel Ruler</p> <p>Range: 0 mm to 1000 mm</p>	<p>Technical Procedure Section BSD -09 Jul 2020 (Issue 04 Rev 1)</p> <p>Technical Procedure Section BSD-10 &amp; BSD-11 Jul 2020 (Issue 04 Rev 1)</p> <p>Technical Procedure Section BSD-13 Jul 2020 (Issue 04 Rev 1)</p>	<p>5 <math>\mu</math>m / 5 <math>\mu</math>m 10 <math>\mu</math>m / 10 <math>\mu</math>m</p> <p><u>Lab</u> / <u>Site</u> 0.3 <math>\mu</math>m / 2 <math>\mu</math>m</p> <p>Lab / Site 1 <math>\mu</math>m / 2 <math>\mu</math>m 2 <math>\mu</math>m / 3 <math>\mu</math>m</p> <p>Lab / Site 1 <math>\mu</math>m / 2 <math>\mu</math>m 2 <math>\mu</math>m / 3 <math>\mu</math>m</p> <p>Lab / Site 1 <math>\mu</math>m / 2 <math>\mu</math>m 2 <math>\mu</math>m / 3 <math>\mu</math>m</p> <p>Lab / Site 1 <math>\mu</math>m / 2 <math>\mu</math>m</p> <p>Lab / Site 0.06mm / 0.10 mm</p>

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<p>Scales:</p> <p>Coolant proof Digimatic</p> <p>Scale Units</p> <p>Linear Scale</p> <p>Glass Scale</p> <p>Stage micrometer Scale</p> <p>Objective Scale</p> <p>Microscope Scale</p> <p>Standard Scale</p> <p>Range:</p> <p>0 mm to 300 mm</p>	<p>Technical Procedure</p> <p>Section BSD-14</p> <p>Jul 2020 (Issue 04 Rev 1)</p>	<p><u>Lab</u></p> <p>1 <math>\mu</math>m</p>
<p>D9. Protractor Standard</p> <p>Digimatic Protractor</p> <p>Dial protractor</p> <p>Vernier Protractor</p> <p>Bevel Protractor</p> <p>Range:</p> <p>0 to 360 degree</p> <p>Straightness &amp; Parallelism</p>	<p>Technical Procedure</p> <p>Section BSD-15</p> <p>Jul 2020 (Issue 04 Rev 1)</p>	<p><u>Lab</u> / <u>Site</u></p> <p>5 minutes / 5 minutes</p> <p>2 <math>\mu</math>m / 2 <math>\mu</math>m</p>
<p>D10. Length Measuring Machine</p> <p>Horizontal Measuring System</p> <p>Universal Length Machine</p> <p>Straightness Machine</p> <p>Mic Trac Machine</p> <p>Straight Master</p> <p>Lathe Machine</p> <p>Range: Resolution:</p> <p>0 mm to 100 mm 0.1 <math>\mu</math>m</p> <p>0 mm to 1000 mm 1 <math>\mu</math>m</p> <p>0 mm to 1000 mm 5 <math>\mu</math>m</p> <p>0 mm to 1000 mm 10 <math>\mu</math>m</p>	<p>Technical Procedure</p> <p>Section BSD-16</p> <p>Jul 2020 (Issue 04 Rev 1)</p>	<p><u>Lab</u> / <u>Site</u></p> <p>0.3 <math>\mu</math>m / 0.5 <math>\mu</math>m</p> <p>1 <math>\mu</math>m / 2 <math>\mu</math>m</p> <p>2 <math>\mu</math>m / 5 <math>\mu</math>m</p> <p>5 <math>\mu</math>m / 10 <math>\mu</math>m</p>



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<p>D15. Dial Gage Tester/ Calibration Tester/ Dial Gage Calibrator</p> <p>Range: Resolution: 0 mm to 100 mm 0.1 <math>\mu</math>m 0 mm to 100 mm 1 <math>\mu</math>m 0 mm to 100 mm 10 <math>\mu</math>m</p>	<p>Technical Procedure Section BSD-21 Jul 2020 (Issue 04 Rev 1)</p>	<p><u>Lab</u> / <u>Site</u> 0.3 <math>\mu</math>m / 0.5 <math>\mu</math>m 1 <math>\mu</math>m / 2 <math>\mu</math>m 10 <math>\mu</math>m / 10 <math>\mu</math>m</p>
<p>D16. Lever Measuring Instruments Mu-Checker Inductive probe</p> <p>Range: Resolution: 0 mm to 10 mm 0.1 <math>\mu</math>m 0 mm to 10 mm 1 <math>\mu</math>m 0 mm to 10 mm 10 <math>\mu</math>m</p>	<p>Technical Procedure Section BSD-22 Jul 2020 (Issue 04 Rev 1)</p>	<p><u>Lab</u> / <u>Site</u> 0.3 <math>\mu</math>m / 0.5 <math>\mu</math>m 1 <math>\mu</math>m / 2 <math>\mu</math>m 10 <math>\mu</math>m / 10 <math>\mu</math>m</p>
<p>D17. Linear Indicating Instruments Linear gauge Linear Transducer Digimatic indicator Lever Gauge</p> <p>Range: Resolution: 0 mm to 100 mm 0.1 <math>\mu</math>m 0 mm to 100 mm 1 <math>\mu</math>m 0 mm to 100 mm 10 <math>\mu</math>m</p>	<p>Technical Procedure Section BSD-23 Jul 2020 (Issue 04 Rev 1)</p>	<p><u>Lab</u> / <u>Site</u> 0.3 <math>\mu</math>m / 0.5 <math>\mu</math>m 1 <math>\mu</math>m / 2 <math>\mu</math>m 10 <math>\mu</math>m / 10 <math>\mu</math>m</p>
<p>D18. Bore Gauge Length Accuracy Bore Gage Bore Gage (for extra small holes) Bore Gage (small holes) Absolute Digimatic Bore Gage Dial Bore Gage Bore Gage (for blind holes) Small Hole Gage set Telescoping Gage set</p> <p>Range: 0 mm to 600 mm Accuracy Check : 0 to 1 mm</p>	<p>Technical Procedure Section BSD-24 Jul 2020 (Issue 04 Rev 1)</p>	<p><u>Lab</u> / <u>Site</u> 1 <math>\mu</math>m / 2 <math>\mu</math>m</p>

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D19. Feeler Gauge Coating Thickness foils  Range: Up to 10 mm	Technical Procedure Section BSD-25 Jul 2020 (Issue 04 Rev 1)	<u>Lab</u> / <u>Site</u> 1 $\mu$ m / 2 $\mu$ m
D20. Linear Height Gauge Range: 0 mm to 600 mm 0 mm to 1000 mm	Technical Procedure Section BSD-26 Jul 2020 (Issue 04 Rev 1)	<u>Lab</u> / <u>Site</u> 2 $\mu$ m / 3 $\mu$ m 3 $\mu$ m / 5 $\mu$ m
D21. Micrometer Head Range: 0 mm to 25 mm 0 mm to 50 mm 0 mm to 100 mm	Technical Procedure Section BSD-27 Jul 2020 (Issue 04 Rev 1)	Lab / Site 1 $\mu$ m / 2 $\mu$ m 1 $\mu$ m / 2 $\mu$ m 1 $\mu$ m / 2 $\mu$ m
D22. Depth Micro Checker/ Caliper Checker Flatness :  Parallelism:  Accuracy: 0 mm to 1000 mm	Technical Procedure Section BSD-28 Jul 2020 (Issue 04 Rev 1)	Lab / Site 2 $\mu$ m / 3 $\mu$ m  2 $\mu$ m / 3 $\mu$ m  Lab / Site 1 $\mu$ m / 2 $\mu$ m
D23. Measuring Toolmaker Toolmaker Microscope Microscope  Range: 0 mm to 300 mm-X axis 0 mm to 300 mm-Y & Z axis 0 to 360 ° Magnification up to 100x Perpendicularity measurement	Technical Procedure Section BSD-29 Jul 2020 (Issue 04 Rev 1)	Lab / Site 0.3 $\mu$ m / 2 $\mu$ m 1 $\mu$ m / 2 $\mu$ m 5 minutes / 1° 0.1 % / 0.2 % 3 $\mu$ m / 3 $\mu$ m

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<p>D24. Measuring Profile Profile Projector Optical Comparator</p> <p>Range : 0 ~ 300 mm-X axis 0 ~ 300 mm-Y &amp; Z axis 0 ~ 360 ° Magnification up to 100x Perpendicularity measurement</p>	<p>Technical Procedure Section BSD-30 Jul 2020 (Issue 04 Rev 1)</p>	<table> <tr> <td><u>Lab</u></td><td>/</td><td><u>Site</u></td></tr> <tr> <td>0.3 µm</td><td>/</td><td>3 µm</td></tr> <tr> <td>1 µm</td><td>/</td><td>2 µm</td></tr> <tr> <td>5 minutes</td><td>/</td><td>1°</td></tr> <tr> <td>0.1 %</td><td>/</td><td>0.2 %</td></tr> <tr> <td>3µm</td><td>/</td><td>3 µm</td></tr> </table>	<u>Lab</u>	/	<u>Site</u>	0.3 µm	/	3 µm	1 µm	/	2 µm	5 minutes	/	1°	0.1 %	/	0.2 %	3µm	/	3 µm
<u>Lab</u>	/	<u>Site</u>																		
0.3 µm	/	3 µm																		
1 µm	/	2 µm																		
5 minutes	/	1°																		
0.1 %	/	0.2 %																		
3µm	/	3 µm																		
<p>D25. Coating Thickness gauge Range : 11 to 2000 µm</p>	<p>Technical Procedure Section BSD-31 Jul 2020 (Issue 04 Rev 1)</p>	<table> <tr> <td><u>Lab</u></td><td></td><td></td></tr> <tr> <td>1.4 µm</td><td></td><td></td></tr> </table>	<u>Lab</u>			1.4 µm														
<u>Lab</u>																				
1.4 µm																				
<p>D26. Geometric Measurement Radius Gauge Pitch Gauge Taper Gauge Jigs Step Block Fixtures Angle Gauge Limit Gauges Height Setting Gauge Depth Gauge</p> <p>Flatness:</p> <p>Parallelism:</p> <p>Straightness:</p> <p>0 mm to 1500 mm</p>	<p>Technical Procedure Section BSD-32 Jul 2020 (Issue 04 Rev 1)</p>	<table> <tr> <td><u>Lab</u></td><td>/</td><td><u>Site</u></td></tr> <tr> <td>2 µm</td><td>/</td><td>3 µm</td></tr> <tr> <td>2 µm</td><td>/</td><td>3 µm</td></tr> <tr> <td>2 µm</td><td>/</td><td>3 µm</td></tr> </table>	<u>Lab</u>	/	<u>Site</u>	2 µm	/	3 µm	2 µm	/	3 µm	2 µm	/	3 µm						
<u>Lab</u>	/	<u>Site</u>																		
2 µm	/	3 µm																		
2 µm	/	3 µm																		
2 µm	/	3 µm																		

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<p>Angle: 0 degree to 360 degree</p> <p>Distance/Length: 0 mm to 1000 mm</p> <p>Radius: 0 mm to 100 mm</p> <p>Diameter: 0 mm to 200 mm</p>		<p><u>Lab</u> / <u>Site</u> 5 minutes / 5 minutes</p> <p><u>Lab</u> / <u>Site</u> 4 µm / 5 µm</p> <p><u>Lab</u> / <u>Site</u> 4 µm / 5 µm</p> <p><u>Lab</u> / <u>Site</u> 3 µm / 5 µm</p>
<p>D27. Test Sieve Metal Cloth wire size Range: Up to 15 mm</p> <p>Perforated Metal Plate Range: Up to 125 mm</p>	<p>Technical Procedure Section BSD-33 Jul 2020 (Issue 04 Rev 1)</p>	<p><u>Lab</u> / <u>Site</u> 5 µm / 8 µm</p> <p><u>Lab</u> / <u>Site</u> 8 µm / 10 µm</p>
<p>D31. Tape Measurements: Measuring Tape MMC Tape Hook Tape Surveyor Tape UTI Meter</p> <p>Range: Up to 1000 mm Up to 5000 mm Up to 10000 mm Up to 30000 mm Up to 50000 mm Up to 100000 mm</p>	<p>Technical Procedure Section BSD-12 Jan 2022 (Issue 04 Rev 2)</p>	<p><u>Lab</u> 0.14 mm 0.2 mm 0.29 mm 0.59 mm 1.1 mm 3.9 mm</p>
<p>D32. Ultrasonic Thickness Gauge</p> <p>Range : 0.5 to 200 mm</p>	<p>Technical Procedure Section BSD 34 Jan 2022 (Issue 04 Rev 0)</p>	<p><u>Lab</u> 0.008 mm</p>

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D33. Dial Thickness Gauge Digimatic Thickness Gauge  Range:  Up to 12 mm (Resolution :0.001mm) Up to 50 mm (Resolution :0.01mm)	Technical Procedure Section BSD 35 Jan 2022 (Issue 04 Rev 0)	<u>Lab</u>  0.001 mm 0.01 mm
D34. Thread Wire Measurements  Range: 0 to 10 mm	Technical Procedure Section BSD 36 Jan 2022 (Issue 04 Rev 0)	<u>Lab</u>  0.0004 mm
D35. Length Diameter Measurements  Length: Up to 1 m 1 m to 10 m  Diameter : Upto 500mm	Technical Procedure Section BSD 37 Issue 05	Lab & onsite  0.05 mm 0.002 m  0.007 mm
D36 Surface Roughness Tester and Roughness Specimen  Surface Roughness Tester  Surface Roughness Specimen	Technical Procedure Section BSD 38 Issue 05	Lab & Site  0.10 µm 0.07 µm
D37 Crimping Tool measurements  Length and Height  Diameter	Technical Procedure Section BSD 39 Issue 05	Lab  0.004 mm 0.004 mm
D38 Pi Tape measurements  Up to 48 inch	Technical Procedure Section BSD 40 Issue 05	Lab  0.005 inch
D39 SurfacePlates  Flatness Up to 1000 mm 1000 to 1500 mm  Variation	Technical Procedure Section BSD 41 Issue 05	Lab & Site  2.0 µm 3.0 µm  1.0 µm

\* CMC is expressed as an expanded uncertainty estimated at a level of confidence of approximately 95%.

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