



CERTIFICATE OF CALIBRATION

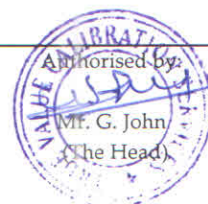
FT-Q-25		Page 1 of 2	
ULR No.	: CC29372000000797P	Date of Issue	: 21-Nov-20
Certificate No	: TVCS 20/11/187 - 01	Recom. Due Date	: 17-May-21
Date of Calibration	: 18-Nov-20	SRF No.	: 187
Customer Details:		Calibrated at	: Lab
M/s. MEDLINE LABS,		Date of Receipt	: 17-Nov-20
# 75, SP Pudur, Opp. Priya Towers,		Cond. On Receipt	: Satisfactory
Paramathi Road			
Namakkal - 637001.			
Details of Test Instrument:			
Description	: Micropipette	Model No.	: --
Range	: 5-50 µl	Serial No	: YE199AL0532012
Least Count	: 0.5 µl	Identification No.	: --
Make	: D - Lab	Accuracy	: As per Manual
Working range	: --	Location	: Lab
Details of Standard Used			
Name	Certificate No.	Valid upto	Traceability
Electronic SemiMicro Balance	TVCSPL 20/05/364-01	12-May-21	TVCSPL, Chennai.
Work Instruction	: WI-M-03	(Reference Standard ISO 8655-6)	
Environmental Details	: Temperature : 25±2°C	Relative Humidity : 50±10 % RH	
MECHANICAL CALIBRATION			
(Volume)			
Calibration Results			
1. Lower Volume :	5 µl	No. of Measurements :	10
<input type="text" value="4.94"/>	<input type="text" value="5.00"/>	<input type="text" value="4.97"/>	<input type="text" value="4.92"/>
<input type="text" value="5.00"/>	<input type="text" value="5.04"/>	<input type="text" value="4.99"/>	<input type="text" value="4.97"/>
<input type="text" value="4.95"/>	<input type="text" value="5.01"/>		
Mean Value :	4.98 µl		
Error Limits(±)			
Systematic Error :	-0.02 µl	0.13 µl	
Systematic Error :	-0.34 %	2.50 %	
Random Error :	0.03 µl	0.08 µl	
Random Error :	0.69 %	1.50 %	
Measurement Uncertainty :	±	0.14 µl	

Calibrated by :

S. Manikala

Ms. S. Manikala

(Calibration Engineer)



...redefining the true value



ULR No. : CC293720000000797P
Certificate No : TVCS 20/11/187 - 01

MECHANICAL CALIBRATION				
(Volume)				
Calibration Results				
2. Middle Volume :	25	μl	No. of Measurements :	10
<input type="text" value="24.81"/>	<input type="text" value="24.92"/>		<input type="text" value="24.94"/>	<input type="text" value="24.82"/>
<input type="text" value="24.86"/>	<input type="text" value="24.93"/>		<input type="text" value="24.89"/>	<input type="text" value="24.97"/>
<input type="text" value="24.90"/>	<input type="text" value="24.93"/>			
Mean Value :	24.90	μl		
Error Limits(±)				
Systematic Error :	-0.10	μl	0.20	μl
Systematic Error :	-0.41	%	1.00	%
Random Error :	0.05	μl	0.10	μl
Random Error :	0.21	%	0.50	%
Measurement Uncertainty :		±	0.14	μl
3. Nominal Volume :	50	μl	No. of Measurements :	10
<input type="text" value="50.09"/>	<input type="text" value="50.04"/>		<input type="text" value="49.98"/>	<input type="text" value="50.07"/>
<input type="text" value="50.11"/>	<input type="text" value="50.19"/>		<input type="text" value="50.12"/>	<input type="text" value="50.04"/>
<input type="text" value="50.08"/>	<input type="text" value="50.11"/>			
Mean Value :	50.08	μl		
Error Limits(±)				
Systematic Error :	0.08	μl	0.50	μl
Systematic Error :	0.17	%	1.00	%
Random Error :	0.06	μl	0.20	μl
Random Error :	0.11	%	0.40	%
Measurement Uncertainty :		±	0.14	μl

Remarks

1. The reported Expanded Uncertainty is calculated at 95.45 % C.L with coverage factor $k=2$
2. The Above Results are within the maximum permissible Error

Calibrated by :

S. Manik
Ms. S. Manikala

(Calibration Engineer)




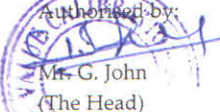
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CERTIFICATE OF CALIBRATION

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ULR No. :	CC29372000000798F	Date of Issue :	21-Nov-20
Certificate No :	TVCS 20/11/187 - 02	Recom. Due Date :	17-May-21
Date of Calibration :	18-Nov-20	SRF No. :	187
Customer Details:		Calibrated at :	Lab
M/s. MEDLINE LABS,		Date of Receipt :	17-Nov-20
# 75, SP Pudur, Opp. Priya Towers,		Cond. On Receipt :	Satisfactory
Paramathi Road			
Namakkal - 637001.			
Details of Test Instrument:			
Description :	Micropipette	Model :	--
Range :	100 - 1000 μ l	Serial No :	YE199AL0547643
Least Count :	1 μ l	Identification No. :	--
Make :	D - Lab	Accuracy :	As per Manual
Working range :	--	Location :	Lab
Details of Standard Used :			
Name	Certificate No.	Valid upto	Traceability
Electronic SemiMicro Balance	TVCSPL 20/05/364 - 01	12-May-21	TVCSPL, Chennai.
Work Instruction :	WI-M-03	(Reference Standard ISO 8655-6)	
Environmental Details :	Temperature : 25 \pm 2 $^{\circ}$ C	Relative Humidity : 50 \pm 10 % RH	
MECHANICAL CALIBRATION			
(Volume)			
Calibration Results			
1. Lower Volume :	100 μ l	No. of Measurements :	10
<input type="text" value="100.20"/>	<input type="text" value="100.31"/>	<input type="text" value="100.28"/>	<input type="text" value="100.26"/>
<input type="text" value="100.19"/>	<input type="text" value="100.26"/>	<input type="text" value="100.22"/>	<input type="text" value="100.32"/>
<input type="text" value="100.30"/>	<input type="text" value="100.35"/>		
Mean Value :	100.27 μ l		
Error Limits(\pm)			
Systematic Error :	0.27 μ l	0.80 μ l	
Systematic Error :	0.27 %	0.80 %	
Random Error :	0.05 μ l	0.30 μ l	
Random Error :	0.05 %	0.30 %	
Measurement Uncertainty :	\pm	0.14 μ l	

Calibrated by :

 Ms. S. Manikala
 (Calibration Engineer)

Authorised by:

 Mr. G. John
 (The Head)

...redefining the true value



ULR No. : CC293720000000798F
Certificate No : TVCS 20/11/187 - 02

MECHANICAL CALIBRATION (Volume) Calibration Results				
2. Middle Volume :	500	μl	No. of Measurements :	10
499.68	499.47		499.75	499.81
499.21	499.34		499.08	499.58
499.64	499.35			
Mean Value :	499.49	μl		
Error Limits(±)				
Systematic Error :	-0.51	μl	4.00	μl
Systematic Error :	-0.10	%	0.80	%
Random Error :	0.24	μl	1.50	μl
Random Error :	0.05	%	0.30	%
Measurement Uncertainty :	±		1.1 μl	
3. Nominal Volume :	1000	μl	No. of Measurements :	10
1001.33	1001.40		1001.81	1001.58
1002.18	1001.53		1001.94	1001.83
1001.76	1001.62			
Mean Value :	1001.70	μl		
Error Limits(±)				
Systematic Error :	1.70	μl	8.00	μl
Systematic Error :	0.17	%	0.80	%
Random Error :	0.26	μl	3.00	μl
Random Error :	0.03	%	0.30	%
Measurement Uncertainty :	±		1.1 μl	

Remarks

1. The reported Expanded Uncertainty is calculated at 95.45 % C.L with coverage factor $k=2$
2. The Above Results are within the maximum permissible Error

Calibrated by :

S. Mani
Ms. S. Manikala
(Calibration Engineer)



...redefining the true value