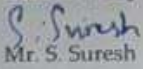




CERTIFICATE OF CALIBRATION

Page 1 of 2

FT-Q-25			
ULR No.	CC293720000000547P	Date of Issue	24-Jul-20
Certificate No	TVCS 20/07/107 - 01	Recom. Due Date	20-Jul-21
Date of Calibration	21-Jul-20	SRF No.	107
Customer Details		Calibrated at	Lab
M/s. ABC MICRO LAB		Date of Receipt	18-Jul-20
34, Vaiyapuri Nagar, 4th Cross,		Cond. On Receipt	Satisfactory
Karur- 639002.			
Details of Test Instrument:			
Description	Micropipette	Model No.	Finnpipette Colour
Range	5-50 μ l	Serial No	W13610
Least Count	0.5 μ l	Identification No.	--
Make	Thermo Labsystem	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 :	5	μl	No. of Measurements : 10
<input type="text" value="5.00"/>	<input type="text" value="5.01"/>	<input type="text" value="4.96"/>	<input type="text" value="4.97"/>
<input type="text" value="4.98"/>	<input type="text" value="5.01"/>	<input type="text" value="5.04"/>	<input type="text" value="5.01"/>
<input type="text" value="5.03"/>	<input type="text" value="5.04"/>		
Mean Value :	5.01	μ l	
Error Limits(\pm)			
Systematic Error :	0.01	μ l	0.13
Systematic Error :	0.14	%	2.50
Random Error :	0.02	μ l	0.08
Random Error :	0.49	%	1.50
Measurement Uncertainty :	\pm		0.14 μ l

Calibrated by :

 Mr. S. Suresh
 (Calibration Engineer)



...redefining the true value



ULR No. : CC29372000000547P
 Certificate No : TVCS 20/07/107 - 01

Page 2 of 2

MECHANICAL CALIBRATION				
(Volume)				
Calibration Results				
2. Middle Volume :	25	μl	No. of Measurements :	10
24.84	24.78		24.81	24.82
24.78	24.85		24.86	24.87
24.83	24.89			
Mean Value :	24.83	μl		
Error Limits(±)				
Systematic Error :	-0.17	μl	0.20	μl
Systematic Error :	-0.67	%	1.00	%
Random Error :	0.04	μl	0.10	μl
Random Error :	0.15	%	0.50	%
Measurement Uncertainty :	±		0.14	μl
3. Nominal Volume :	50	μl	No. of Measurements :	10
49.93	49.99		49.94	49.92
49.87	49.95		49.91	49.98
49.94	49.93			
Mean Value :	49.94	μl		
Error Limits(±)				
Systematic Error :	-0.06	μl	0.50	μl
Systematic Error :	-0.13	%	1.00	%
Random Error :	-0.03	μl	0.20	μl
Random Error :	0.07	%	0.40	%
Measurement Uncertainty :	±		0.14	μl

Remarks

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

Calibrated by :

S. Suresh
 Mr. S. Suresh

(Calibration Engineer)



...redefining the true value

No.170, Opp: EKKI Pumps,
 Athipalayam Road, Ganapathy,
 Coimbatore - 641 006.

Phone : 0422 - 4383752
 Cell : 72996 67876, 80988 60791
 Email : tvcsbe@gmail.com
 www.truevaluecalibration.com
 GSTIN : 33AAMFT6449G1ZV





CERTIFICATE OF CALIBRATION

FT-Q-25		Page 1 of 2	
ULR No.	CC29372000000548F	Date of Issue	24-Jul-20
Certificate No	TVC5 20/07/107 - 02	Recom. Due Date	20-Jul-21
Date of Calibration	21-Jul-20	SRF No.	107
Customer Details		Calibrated at	Lab
M/s. ABC MICRO LAB		Date of Receipt	18-Jul-20
34, Vaiyapuri Nagar, 4th Cross, Karur - 639002.		Cond. On Receipt	Satisfactory
Details of Test Instrument:			
Description	Micropipette	Model	Finnpipette Colour
Range	100-1000µl	Serial No	W14701
Least Count	5µl	Identification No.	-
Make	Thermo LabSystems	Accuracy	As per Manual
Working range	-	Location	Lab
Details of Standard Used			
Name	Certificate No.	Valid upto	Traceability
Electronic SemiMicro Balance	TVCSP 20/05/364 - 01	12-May-21	TVCSP, 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 :	100 µl	No. of Measurements :	10
<input type="text" value="100.19"/>	<input type="text" value="100.22"/>	<input type="text" value="100.16"/>	<input type="text" value="100.11"/>
<input type="text" value="100.25"/>	<input type="text" value="100.24"/>	<input type="text" value="100.19"/>	<input type="text" value="100.18"/>
<input type="text" value="100.17"/>	<input type="text" value="100.23"/>		
Mean Value :	<input type="text" value="100.19"/> µl		
Error Limits(±)			
Systematic Error :	0.19 µl	0.80 µl	
Systematic Error :	0.19 %	0.80 %	
Random Error :	0.04 µl	0.30 µl	
Random Error :	0.04 %	0.30 %	
Measurement Uncertainty :	±	0.14 µl	

Calibrated by :
S. Suresh
Mr. S. Suresh
(Calibration Engineer)



...redefining the true value



ULR No. : CC29372000000548F
 Certificate No : TVCS 20/07/107 - 02

Page 2 of 2

MECHANICAL CALIBRATION				
(Volume)				
Calibration Results				
2. Middle Volume :	500	μl	No. of Measurements :	10
499.49	499.37		499.14	499.15
498.97	499.47		499.57	499.08
499.13	499.19			
Mean Value :	499.25	μl		
Error Limits(\pm)				
Systematic Error :	-0.75	μl	4.00	μl
Systematic Error :	-0.15	%	0.80	%
Random Error :	0.20	μl	1.50	μl
Random Error :	0.04	%	0.30	%
Measurement Uncertainty :	\pm		1.1	μl
3. Nominal Volume :	1000	μl	No. of Measurements :	10
1000.61	1000.77		1000.96	1000.75
1001.13	1000.88		1001.21	1000.92
1001.08	1001.02			
Mean Value :	1000.94	μl		
Error Limits(\pm)				
Systematic Error :	0.94	μl	8.00	μl
Systematic Error :	0.09	%	0.80	%
Random Error :	0.19	μl	3.00	μl
Random Error :	0.02	%	0.30	%
Measurement Uncertainty :	\pm		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. Suresh
 Mr. S. Suresh

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