

MUSSD	Metrological Tests Sample Acceptance/ Rejection Form: Standards Test Measures (STM)	Date of Issue: 2020-01-01	Doc No: LB/PA/VL/F2.1
		Rev No: 1	Page 1 of 12

	Date:		
	Application Number:		
General details			
		Submitted details in documents	Verification details of documents and model
	Applicant Name:		
	ID number:		
	Company:		
	Manufacturer:		
	Instrument:		
	Model:		
	Capacity or range:		

Metrological Requirements

No	Requirement	Description	Accept/ Reject
1	Markings (As per the Annex Markings of Standards Test Measures (STM))		
1.1	Identification placement	Permanently marked, weather & liquid resistant, contrasting color to background?	
1.2	Identification designation	Model number Serial number	
1.3	Nominal capacity	5 L, 10 L or 20 L	
1.4	Reference temperature		
1.5	whether the measure is constructed “to contain” or “to deliver”		

MUSSD	Metrological Tests Sample Acceptance/ Rejection Form: Standards Test Measures (STM)	Date of Issue: 2020-01-01	Doc No: LB/PA/VL/F2.1
		Rev No: 1	Page 2 of 12

1.6	drainage time, in the case of a measure constructed “to deliver”,		
1.7	coefficient of expansion and material ID		
1.8	Manufacture Information	Name and address	
2	Construction		
2.1	Material	stainless steel, mild steel with a suitable interior coating	
2.2	Body shape	Circular cross section in horizontal plane? No fillers or cavities? Shape ensures emptying, drainage; no air trapped?	
2.3	Dimensions	AS per the Table1: Dimensions of Standard Test Measures (STM) and Annex: Dimensional Requirements of Standards Test Measures (STM), accept 10% variation except thickness and cone pitch	
2.4	Fitted with drain line <i>(only model which is mentioned in figure c in Annex : Accepted Models of Standards Test Measures (STM))</i>	A gravity discharge line, between the prove and the shout-off valve, shall have a downward slope of at least 5°	
2.5	Adjustment plungers	If it is available, they shall not move easily after adjustment of the volume and shall be capable of being sealed.	
2.6	Neck diameter	The neck diameter of a test measure shall be sufficient to permit cleaning and inspection.	
		the gauge tube shall be made of borosilicate glass and be clear and free of any markings, irregularities or defects which distort the appearance of the liquid surface.	
		A difference of at least 3 mm in the liquid level in the neck is equivalent to the absolute value of the maximum permissible error of the standard capacity measure	

MUSSD	Metrological Tests Sample Acceptance/ Rejection Form: Standards Test Measures (STM)	Date of Issue: 2020-01-01	Doc No: LB/PA/VL/F2.1
		Rev No: 1	Page 3 of 12

		The neck part shall be of the weir-type, or have glass plates, or be made of glass tube, or have a separate and fixed gauge glass(es).	
		Otherwise, the neck part shall be fitted with a fixed, rustproof metal plate or a sliding plate capable of being sealed , and on which the scale marks corresponding to its nominal capacity, and to the volumes below and above the nominal capacity, are marked	
2.7	Diameter of the gauge glass	large enough to ensure that capillary or meniscus effects do not introduce additional uncertainties such that the maximum permissible errors	
2.8	Scale plate construction and markings	The scale plate shall be rigid and resistant to corrosion and discoloration (i.e., anodized aluminum, clear coated aluminum, or stainless steel).	
		The scale marks corresponding to the nominal capacity and to at least 1 % of the nominal capacity, in plus and in minus, shall be marked on the glass plates, the glass tube neck or the gauge glass.	
		Scale plates shall be clearly marked with the nominal volume of the standard and the identification of the unit of measurement used on the scale plate	
		Markings of the scale plate and graduation lines should be clearly visible, All letters and numbers on a scale plate shall be legible and of adequate size; at least in height than 2 mm	
		All adjustments shall be provided with a means for sealing to prevent movement or play. Removal or movement of the adjusting mechanism or scale plates (top and bottom) shall not be possible without breaking the seal	
2.9	Finishing	Joints leak free and smooth, neck cover, pipe caps, pipe joints sealed?	

MUSSD	Metrological Tests Sample Acceptance/ Rejection Form: Standards Test Measures (STM)	Date of Issue: 2020-01-01	Doc No: LB/PA/VL/F2.1
		Rev No: 1	Page 4 of 12

3	Accuracy		
3.1	General	expanded uncertainty on calibration be within one-fifth of the maximum permissible error on pattern approval	
3.2	MPE	$\pm 1/2000$ of nominal capacity. <i>applies to the scale intervals marked on both sides of the scale mark corresponding to the nominal capacity of a standard test measure</i>	
4.	Other features		
4.1	Level indicator	Ability to check level of the STM, If the scale plates are available in both side of the neck, level sensor is not mandatory	
4.2	Handle	A hand-held test measure shall be equipped with a bail handle and shall hang with its axis vertical when filled with liquid and suspended from the center of the handle.	
4.3	Accepted model	As per the Annex : Accepted Models of Standards Test Measures (STM)	

Recommendation/Approval

Sample Pass/Failed:			
Comments:			
Experiment officer:		Assistant director:	
Recommendations:			
Member1:	Member2:	Member3:	
Decision:			
Director:			

MUSSD	Metrological Tests Sample Acceptance/ Rejection Form: Standards Test Measures (STM)	Date of Issue: 2020-01-01	Doc No: LB/PA/VL/F2.1
		Rev No: 1	Page 5 of 12

Table 1: Dimensions of Standard Test Measures (STM)

Denomination	A, mm	B, mm	C, mm	D, mm	E, mm	F, mm	H mm	Minimum Metal Thickness (mm)	Minimum top cone pitch	Minimum bottom cone pitch	
Resolution, mm/°	1	1	1	1	1	1	1				
20 I	Standard Value	220	50	110	370	65	280	300	2	35°	20°
	Tolerance	±22	±5	±11	±37	±6.5	±28	±30		±5°	±5°
	Measured Values										
	Mean Value										
	Accepted										
10 I	Standard Value	180	50	50	320	60	250	250	2	35°	20°
	Tolerance	±18	±5	±5	±32	±6	±25	±25		±5°	±5°
	Measured Values										
	Mean Value										
	Accepted										
5 L	Standard Value	165	30	30	310	50	170	190	2	35°	20°
	Tolerance	±16.5	±5	±5	±31	±5	±17	±19		±5°	±5°
	Measured Values										
	Mean value										
	Accepted										

Tested by:

Checked by :

Prepared by: TM/DTM

Reviewed by: QM/DQM

Approved by: Director

MUSSD	Metrological Tests Sample Acceptance/ Rejection Form: Standards Test Measures (STM)	Date of Issue: 2020-01-01	Doc No: LB/PA/VL/F2.1
		Rev No: 1	Page 6 of 12

Table 2 : Volumes of Standard Test Measures (STM)

Denomination	Tolerance ml	Measured Volume ml	Measured Mean Volume, ml	Accepted
20 L	+100 ml			
10 L	+50 ml			
5 L	+30 ml			

Tested by:

Checked by :

Prepared by: TM/DTM

Reviewed by: QM/DQM

Approved by: Director

MUSSD	Metrological Tests Sample Acceptance/ Rejection Form: Standards Test Measures (STM)	Date of Issue: 2020-01-01	Doc No: LB/PA/VL/F2.1
		Rev No: 1	Page 7 of 12

Annex

Dimensional Requirements of Standards Test Measures (STM)

Table 3 : Angles of Standards Test Measures (STM)

Nominal Capacity (L)	Minimum Metal Thickness (mm)	Minimum top cone pitch Tolerance: $\pm 5^\circ$	Minimum bottom cone pitch Tolerance: $\pm 5^\circ$
5	2	35°	20°
10	2	35°	20°
20	2	35°	20°

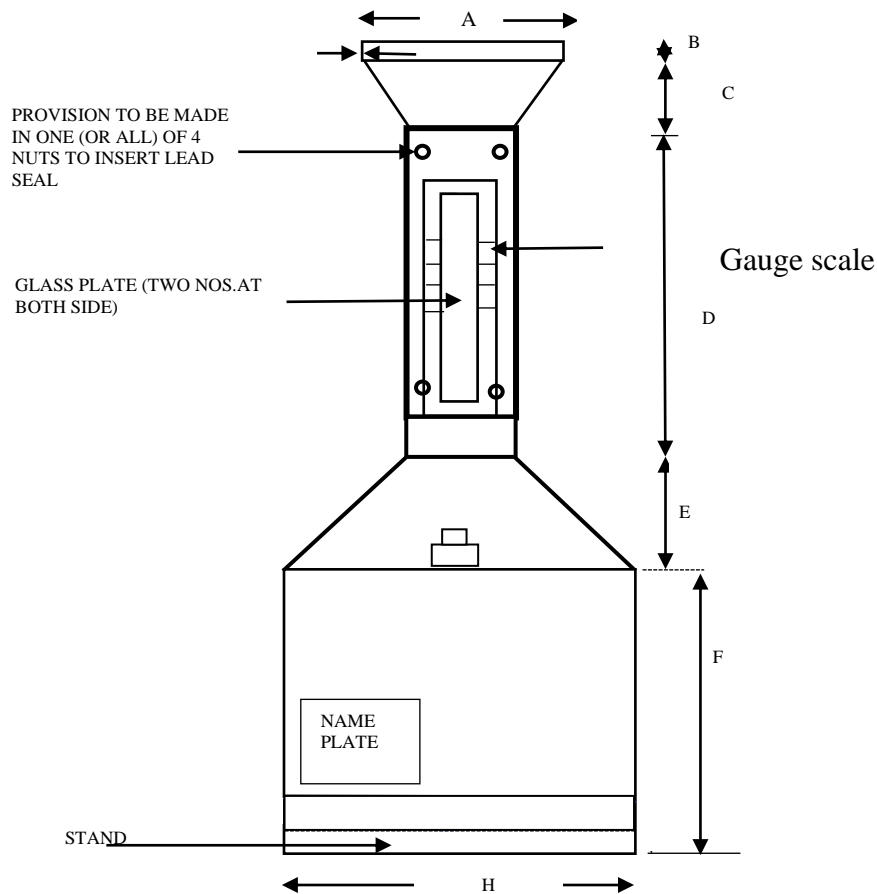


Figure 1 : Dimensions of Standards Test Measures (STM)

MUSSD	Metrological Tests Sample Acceptance/ Rejection Form: Standards Test Measures (STM)	Date of Issue: 2020-01-01	Doc No: LB/PA/VL/F2.1
		Rev No: 1	Page 8 of 12

Table 4 : Dimensions of Standards Test Measures (STM)

Parameter	Standard Value for 20 L (mm) ±10 % or 5 mm whichever is higher	Standard Value for 10 L (mm) ±10 % or 5 mm whichever is higher	Standard Value for 5 L (mm) ±10 % or 5 mm whichever is higher	Measured value (mm)
A	220	180	165	
B	50	50	30	
C	110	50	30	
D	370	320	310	
E	65	60	50	
F	280	250	170	
H	300	250	190	

MUSSD	Metrological Tests Sample Acceptance/ Rejection Form: Standards Test Measures (STM)	Date of Issue: 2020-01-01	Doc No: LB/PA/VL/F2.1
		Rev No: 1	Page 9 of 12

Annex

Accepted Models of Standards Test Measures (STM)

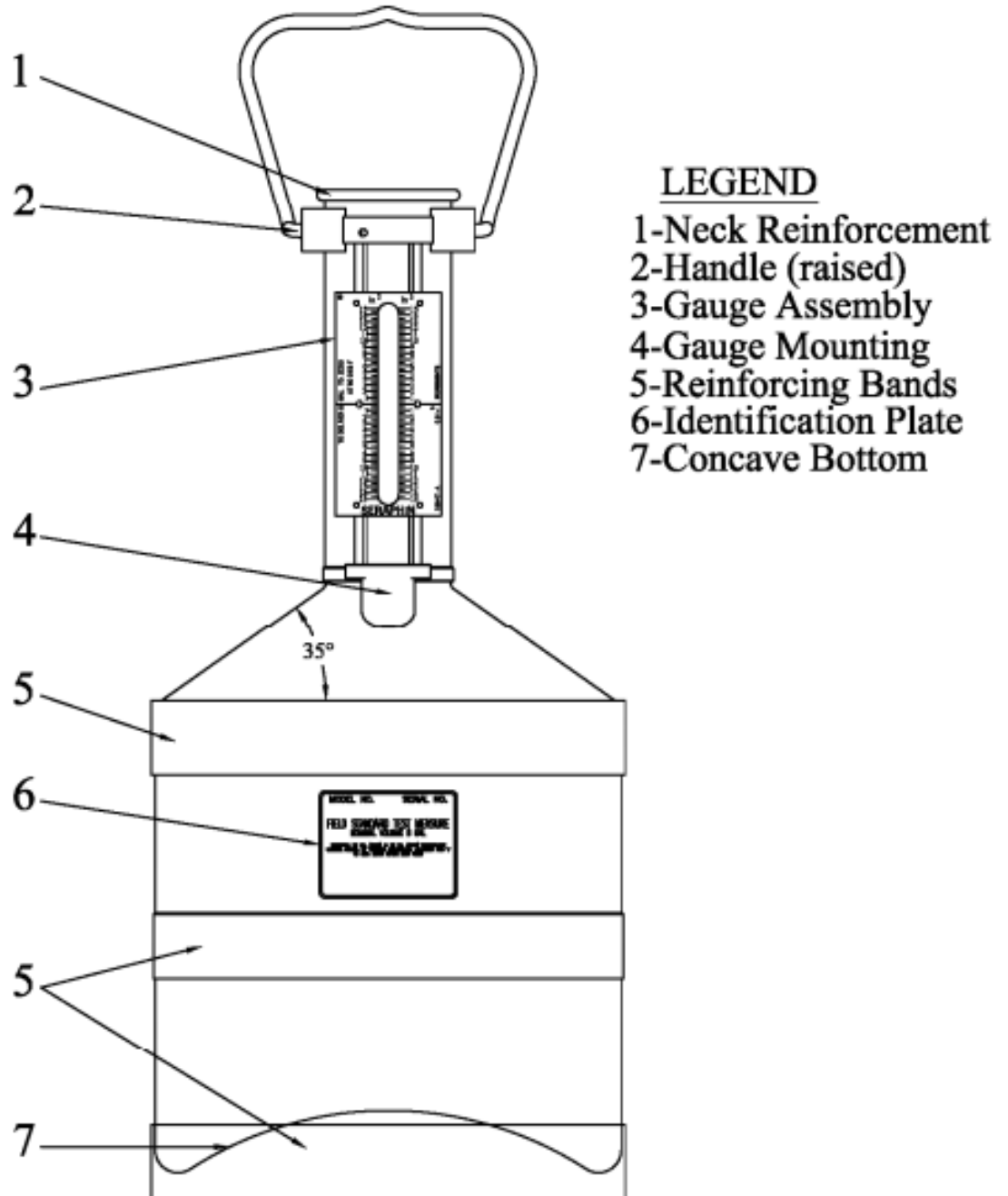


Figure 2: Hand Held Standard Test Measures

MUSSD	Metrological Tests Sample Acceptance/ Rejection Form: Standards Test Measures (STM)	Date of Issue: 2020-01-01	Doc No: LB/PA/VL/F2.1
		Rev No: 1	Page 10 of 12

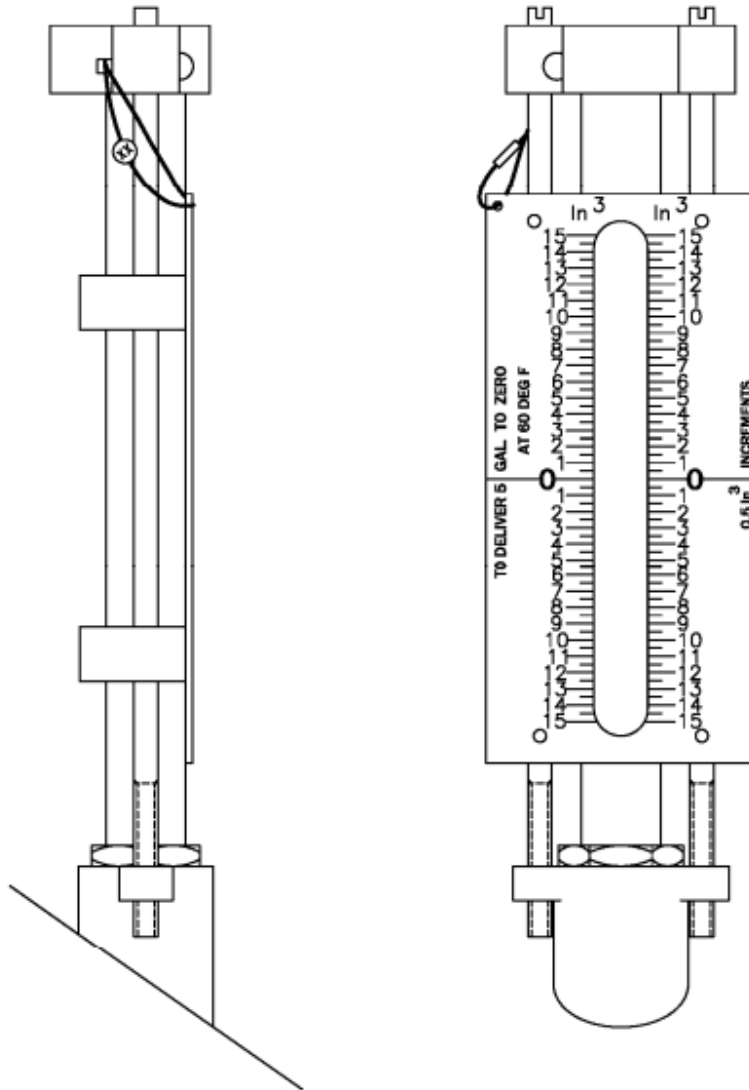


Figure 3: Sight gauge assembly

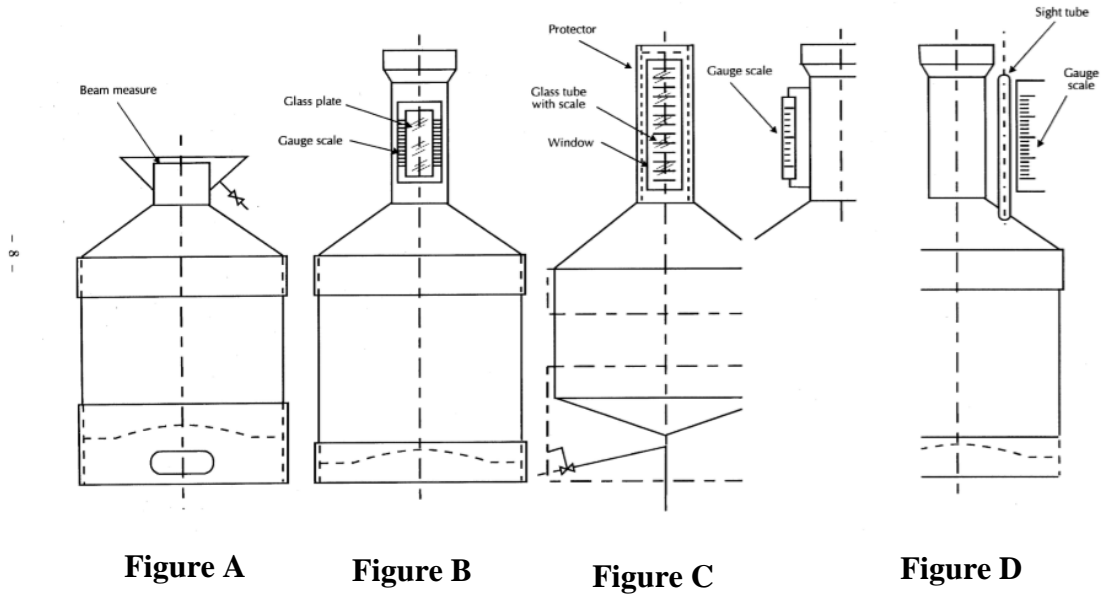


Figure 4. Different kind of Models

