

# **TEST MANUAL FOR DISPENSING PUMPS (DRAFT)**

## **1.0 GENERAL REQUIREMENTS FOR MEASURING INSTRUMENTS**

- (a) A measuring instrument shall be of such material, design and construction as to ensure, under normal working conditions, the following requirements:-
  - (i) accuracy is maintained;
  - (ii) operating parts continue functioning satisfactorily, and
  - (iii) adjustment remains reasonably permanent.
- (b) A measuring instrument shall not be stamped unless it is complete with all parts and attachments concerned with the operation of measurement and delivery.
- (c) Where an instrument has interchangeable or reversible parts, their interchangeability or reversal shall not affect the accuracy of the instrument.
- (d) Every measuring instrument of fixed type shall be so installed that the viewer can readily obtain a clear and unobstructed view of the indication of measurement and delivery.
- (e) The design and construction of measuring instrument shall be such as would prevent, as far as possible tampering with the accuracy of the instrument either by inadvertent use or otherwise.

## **2.0 DEFINITION OF DISPENSING PUMPS**

- (a) A dispensing pump is a measuring instrument used in conjunction with a storage tank or tanks for effecting deliveries of liquid products by specified volumes.
- (b) A 'Wet Hose' System is a type of device designed to be operated with the discharge hose full of liquid at all times. A 'Wet Hose' is the discharge hose in this type of device.
- (c) A 'Dry Hose' System is a type of device in which the discharge hose is completely drained following each delivery. A 'Dry Hose' is the discharge hose in this type of device.

## **3.0 TYPES**

*Dispensing pumps* shall be either of the *meter type* or the *container type*.

## **4.0 GENERAL REQUIREMENTS FOR DISPENSING PUMPS**

- (a) A dispensing pump shall essentially consist of:-
  - (i) Suitable casing or housing,
  - (ii) Pumping unit,
  - (iii) Metering unit or volumetric container,
  - (iv) Register for quantities, and
  - (v) Flexible hose with nozzle.

- (b) Every dispensing pump shall be provided with an individual scale indicator, graduated to indicate all possible deliveries. Any other counting or totalizing device that may be provided, shall be so arranged as to avoid any possibility of confusion with the individual sales indicator.
- (c) A dispensing pump of meter type shall be so constructed that, after a particular delivery cycle has been completed by movement of the starting lever to its shut-off position, an effective automatic inter-lock shall prevent a subsequent delivery being started until the indicating element have been returned to their correct zero position.
- (d) A dispensing pump of container type shall be so constructed that the individual sales indicator shall register only when the discharge from each container has commenced. A notice shall be prominently exhibited on the pump panel to indicate clearly and prominently the following:-
  - PLEASE ENSURE BEFORE STARTING DELIVERY THAT:-***
  - (i) Sales indicators are set at zero.***
  - (ii) Container is full***
- (e) Dispensing pumps of container type shall be provided with observation windows or other means for showing clearly that the container or containers are properly charged and discharged.
- (f) Dispensing pumps delivering the liquid under pressure shall work on the 'wet hose' system, fitted with a nozzle having combination control valve and automatic pressure discharge valve which should operate under the pressure at which the pump is designed to deliver.
- (g) Dispensing pumps delivering liquid under gravity shall work on the 'dry hose' system. The 'dry hose' shall be of such length and fitness as to facilitate complete and rapid drainage of the hose pipe and shall be provided with a nozzle without any valve.
- (h) The length of the discharge hose on a dispensing pump shall not exceed 5 meters from the outside of the housing of the pump to the inlet end of the discharge nozzle: Provided that the length of the discharge hose may be more than 5 meters, if the Commissioner for Weights and measures or any authorized person, is satisfied that it is expedient to allow for length more than 5 meters.
- (i) A dispensing pump of the meter type shall have an effective air eliminator unit situated after the pumping unit and immediately preceding the metering unit.
- (j) A dispensing pump of the container type shall have a suitable air vent to preclude the possibilities of the air trap in the volumetric container.

## **5.0 ACCURACY TESTS**

- (a) A dispensing pump shall be tested under practical working conditions with the liquid that the instrument is intended to deliver.
- (b) All dispensing pumps shall be verified by check measures. The check measures may be of the denominations 5, 10 and 20 litres.

- (c) Every check measure shall be tested for accuracy against the appropriate working standard measure at least once in every period of six months and duly sealed.
- (d) Before commencing checking of dispensing pump, the pump shall be run for a few minutes to ensure that all the units are functioning smoothly and also the discharge hose has been wetted.
- (e) A dispensing pump before being tested for accuracy shall be tested for leakage by being first fully primed.
- (f) The procedure for testing a dispensing pump shall be as follows:-
  - (i) The pointer (meter type) or reading (container type) of the recording mechanism shall then be set to zero.
  - (ii) The pump shall be operated to dispense the liquid into the standard check measure until the pointer (meter type) is at zero position again or the reading (container type) records the capacity of the check measure.
  - (iii) If the quantity of liquid delivered is in error beyond the permissible limits, the instrument shall be adjusted so that it delivers a quantity within maximum permissible limits of error.
  - (iv) Steps (i), (ii) & (iii) shall be repeated until the pump gives two consecutive deliveries within maximum permissible limits of error.
  - (v) If the instrument has been found to give correct measure in the initial test itself, at least one more test of accuracy shall be made and recorded.
- (g) Every dispensing pump shall deliver correctly at reasonable uniform speed which shall be not less than 10 liters per minute.

## 6. MAXIMUM PERMISSIBLE ERROR

Quantity	Verification <i>(Error in Excess only)</i>	Inspection	
		<i>(Error in Excess)</i>	<i>(Error in Deficiency)</i>
20 litres	100ml	100ml	50ml
10 litres	50ml	50ml	25ml
5 litres	25ml	25ml	12.5ml

*No error in deficiency shall be permitted during verification.*

## **7. SEALING AND STAMPING**

(a) After adjustment for correct delivery lead and wire seals shall be applied in such manner that no further adjustment can be made, without manipulating the seal or seals. Plain wire shall not be used or lead and wire seal or seals. The stamp or seal of the verification authority shall be affixed on the lead and wire seal or seals by means of a plier or any other suitable device. The stamp of the verification authority shall also be marked on the name plate fixed on the dispensing pump.

## **8. CAPACITY**

The capacity of dispensing pump of meter type shall be the maximum graduation on the dial or register.

The capacity of a dispensing pump of container type shall be the capacity of the container or where there is more than one container the aggregate capacity of the containers.

## **VOLUMETRIC CONTAINER FILLING MACHINES (DISPENSING PUMPS OF CONTAINER TYPE)**

### **1. DESCRIPTION**

- (a) A volumetric container filling machine shall consist of a basin or basins, the capacity of each of which shall depend on the capacity of the containers, which intended to fill. The operations shall consist of first filling the machine to the required level and then emptying out the contents into the container or containers.
- (b) The machine shall have any one or more of the following capacities:- 1,2,5, 10, 15, 20, 50, 100 and 200 litres.

### **2. GENERAL REQUIREMENTS**

- (a) The design of the filling machine shall be such that the measured quantity shall be entirely drained out on opening of the delivery valve.
- (b) The basin shall be provided with adequate sight glasses, observation windows, cut-off valve or other means indicating clearly that the basin or basins are properly filled.
- (c) The basin shall be provided with a suitable device such as a displacer to enable adjustment of the capacity of the basin.
- (d) Every flexible hose for discharging liquid from the basin together with the rigid delivery pipe which empties itself on discharge, shall be so arranged as to provide for ready and adequate drainage of the liquid.
- (e) The filling machine shall be rigidly fitted on a stand.
- (f) The walls of the basin shall be strong enough as not to cause any appreciable deflection due to the pressure of the liquid.

### **3. TESTS**

- (a) A volumetric container filling machine shall be tested under the actual working conditions with a suitable liquid preferably the one which the instrument is intended to deliver.
- (b) Before checking a volumetric container filling machine, the inside of the basin or basins and the discharge hose and pipe shall be wetted by filling the machine and emptying.
- (c) For testing volumetric container filling machines check measure of appropriate capacity shall be used.
- (d) The check measure shall be tested, for accuracy, against a working standard capacity measure of appropriate capacity and accuracy.
- (e) The procedure for testing the accuracy of volumetric container filling machines shall be as follows:-
  - (i) The machine shall be filled to the full capacity.
  - (ii) The contents of each container of the machine shall be measured with a check measure/measures and the quantity so measured will indicate whether the capacity is within or beyond the maximum permissible error.

(iii) If the capacity is beyond the maximum permissible error, the container shall be adjusted until the errors are brought within the permissible limits; and the test shall be repeated until the filling machines give two consecutive deliveries within the maximum permissible error.

#### **4. MAXIMUM PERMISSIBLE ERROR**

<b>Capacity</b>	<b>Error in Excess only</b>
<b>10 litres and above</b>	<b>0.1 per cent</b>
<b>Below 10 litres</b>	<b>0.2 per cent</b>

#### **5. SEALING**

The volumetric container filling machines shall be provided by the manufacturer with a plug/plugs or stud/studs of such soft metal to receive the stamp or seal of the verifying authority. Such plug/plugs or stud/studs shall be provided in a conspicuous part of the machine and shall be made in such a manner as to prevent its removal without obliterating the seal/seals. The adjusting device also shall be properly sealed so as to avoid any tampering of capacity.

**THE UNITED REPUBLIC OF TANZANIA:**  
**[Enforcement of the Weights and Measures Act number 20 of year 1982**  
**together with its cognate regulations by the Weights and Measures Agency**  
**(WMA)]**

**TEST FORM FOR DISPENSING PUMPS**

**1. OWNER'S NAME AND ADDRESS:** -----  
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**2. GENERAL EXAMINATION:**

*( Note that the instrument shall be examined for Recognition/Identification, Entirety, Denomination, Strength, Individual novel features, Trade mark, Model, Stamping plug and whether instrument bears a valid stamp)*

**(A) IDENTIFICATION**

- (i) Oil company responsible for the service station .....
- (ii) Name of service station .....
- (iii) Where situated .....
- (iv) Type of pump .....
- (v) Model No .....
- (vi) Serial No .....
- (vii) Type of product .....
- (viii) Density of product .....

**(B) VISUAL EXAMINATION**

- (i) Note down the features of non-compliance with the Act and Regulations  
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.....  
.....  
.....  
.....
- (ii) Note down the Initial Meter (totalizer) reading .....

### 3. ACCURACY TESTS

#### (a) On verification (when new or after repair)

Working Standard Capacity Measures (Litres)	5		10		20	
Maximum Limits of Error in Excess only (milliliters)	+25		+50		+100	
Maximum Limits of Error of Price Mechanism		+0.5%x		+0.5%x		+0.5%x
Error recorded at Slow Speed Delivery	(a) ..... (b) ..... (c) .....	(a) ..... (b) ..... (c) .....	(a) ... (b) ... (c) ...	(a) ..... (b) ..... (c) .....	(a) ... (b) ... (c) ...	(a) ..... (b) ..... (c) .....
Error recorded at Normal-use Speed Delivery	(a) ..... (b) ..... (c) .....	(a) ..... (b) ..... (c) .....	(a) ... (b) ... (c) ...	(a) ..... (b) ..... (c) .....	(a) ... (b) ... (c) ...	(a) ..... (b) ..... (c) .....
Error recorded at Fast Speed Delivery	(a) ..... (b) ..... (c) .....	(a) ..... (b) ..... (c) .....	(a) ... (b) ... (c) ...	(a) ..... (b) ..... (c) .....	(a) ... (b) ... (c) ...	(a) ..... (b) ..... (c) .....

Key: %x = Maximum Limits of Error of Price Computing Mechanism  
x = Price per Litre of a product

#### (b) On Re-verification or Inspection

Working Standard Capacity Measures (Litres)	5		10		20	
Maximum Limits of Error (milliliters)	-12.5 to +25		-25 to +50		-50 to +100	
Maximum Limits of Error of Price Mechanism		-0.25%x to +0.5%x		-0.25%x to +0.5%x		-0.25%x to +0.5%x
Error recorded at Slow Speed Delivery	(a) ..... (b) ..... (c) .....	(a) ..... (b) ..... (c) .....	(a) ..... (b) ..... (c) .....	(a) ..... (b) ..... (c) .....	(a) ..... (b) ..... (c) .....	(a) ..... (b) ..... (c) .....
Error recorded at Normal-use Speed Delivery	(a) ..... (b) ..... (c) .....	(a) ..... (b) ..... (c) .....	(a) ..... (b) ..... (c) .....	(a) ..... (b) ..... (c) .....	(a) ..... (b) ..... (c) .....	(a) ..... (b) ..... (c) .....
Error recorded at Fast Speed Delivery	(a) ..... (b) ..... (c) .....	(a) ..... (b) ..... (c) .....	(a) ..... (b) ..... (c) .....	(a) ..... (b) ..... (c) .....	(a) ..... (b) ..... (c) .....	(a) ..... (b) ..... (c) .....

Key: %x = Maximum Limits of Error of Price Computing Mechanism  
x = Price per Litre of a product

(c) Final meter (totalizer) reading .....

(d) Difference between initial and final meter reading .....

**VOLUMETRIC CONTAINER FILLING MACHINES**

Working Standard Capacity Measures (Litres)	Below 10 litres	10 litres and above
Maximum Limits of Error in Excess only (milliliters)	0.2 per cent	0.1 per cent
Error recorded at Normal-Use Speed Delivery	(a) ..... (b) ..... (c) .....	(a) ..... (b) ..... (c) .....

**4. DECISION**

- (a) (i) Pump sealed as fit for use for trade  
 (ii) Certificate of Correctness No. .... issued to owner/user.
- (b) (i) Pump rejected for repairs  
 (ii) Owner/User served with Rejection Note No.....
- (c) (i) Pump condemned as unfit for use for trade  
 (ii) Owner/User served with Condemnation Note No.....
- (d) Other legal enforcements decisions.....  
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 .....  
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**SIGNATURE OF OWNER/USER**

.....  
**SIGNATURE OF ASSIZER**

.....  
**NAME OF OWNER/USER**

.....  
**NAME OF ASSIZER**