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STP-11 TARE

REFERENCE

Sections 31 of the *Specifications Relating to Non-automatic Weighing Devices (1998)*.

PURPOSE

Tare features must be designed and used to ensure accurate measurement and prevent the perpetration of fraud. There are numerous requirements that establish the proper operation of tare features depending upon the type of devices, the type of tare capability and the intended use of the device.

The extent of the requirements depends upon the application. For instance, design and operation requirements for devices used in direct sales are more stringent than those applicable to devices used in other applications. In general, and unless otherwise specified for particular types of tare, devices must provide a clear indication for both the operator and the consumer that a tare value has been entered; platter and keyboard tare values must be visible at some point during the weighing process and the alteration of platter or keyboard tare values, during the weighing process, must be impossible without being noticed. On the other hand, devices that are used in industrial applications or in other applications where the consumer is not normally present need only provide the operator with a clear indication that a tare value has been entered and have a means to display the tare value on demand.

The Approval Service Laboratory (ASL) performs an extensive evaluation of device tare functions, many of which are configurable or programmable. An exception to the rule is POS systems for which the ASL does not conduct the approval testing of the electronic cash registers which perform the tare operations. Field inspectors must therefore ensure that tare functions are configured within allowable parameters, particularly when devices are initially inspected.

EXTRACTS FROM THE APPROVAL EVALUATION MANUAL - NON AUTOMATIC WEIGHING DEVICES

Hereafter are the detailed marking requirements as extracted from the Approval Evaluation Manual - Non Automatic Weighing Devices. This extract is provided to ensure uniform and consistent application of the tare requirements in the field. Note that the numbering of the following sections correspond to the numbering used in the Approval Evaluation Manual - Non Automatic Weighing Devices.

DEFINITIONS

Tare (n): the weight of a container or wrapper. *Tare Weight* is subtracted from *Gross Weight* to obtain *Net Weight*.

Tare: (v): the practice of removing the weight of the container or wrapper. May be accomplished manually or automatically using the devices built in tare features.

Additive Tare: means a tare entry that does not affect the device weighing capacity. A keyboard or platter tare entry of 10 kg on a 15 kg capacity scale that has an additive tare feature will still leave the possibility of weighing a net load of 15 kg.

Automatic/Auto Tare: means an automatic platter tare. With the scale indication at zero, the scale automatically tares, within a pre-determined range, the value of the first load (container) put on the platter. The "Net" weight of the commodity is then determined.

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Keyboard Tare: means a fixed or percentage tare value entered through the keyboard (e.g. 20 g, 1.3%, etc.) or through one of the selectable tare keys to which tare values are assigned.

Percentage Tare: means a tare value, expressed as a percentage (e.g. 5.6%), that represents the percentage of tare material compared to the gross weight of the commodity. A percentage tare is one form of proportional tare.

Platter Tare: means a tare entry achieved by placing an object (e.g. a container, bag, etc.) on the platter and pressing the tare key. The device then indicates zero as the net weight with the object on the platter.

Preprogrammed Tare: means a tare value that has been entered, retained in the device memory and assigned to a PLU code or product name. It can be a fixed tare value and/or a proportional tare value.

Proportional Tare: means a tare value, automatically calculated by the scale, proportional to the gross weight indicated by the scale. A proportional tare can be a percentage tare or a fixed tare value proportional to a range of gross weights (i.e., a 10 g tare for gross weights between 0 and 2 kg, a 20 g tare for gross weights between 2 kg and 4 kg, etc.). A proportional tare is, therefore, not limited to being a percentage tare.

11.1 - APPLICABLE TO ANY TYPE OF SCALE OR WEIGHING SYSTEM AND TO ANY TYPE OF TARE

11.1.1 - The tare mechanism must only operate in the backward direction (under-registration).

11.1.2 - The device must ignore or reject the entry of a zero tare value. The entry of a zero tare (or a 0% proportional tare) must not activate the "Tare Entered" or "Net" annunciator nor cause the display to automatically switch to the "Net" display mode. (Scales with a continuous tare display or tare display mode will indicate zero when the tare entry is zero. However, the entry of a zero tare must not cause the display to automatically switch to the net mode).

11.1.3 - The tare value must be equal to the value of the displayed scale division for all methods of tare entry ($d_{tare} = d$). An attempt to enter a tare value that is not equal to d must be rejected or rounded off to the nearest scale interval (see section STP 28 for specific requirements pertaining to multi-interval and multiple range devices).

11.1.4 - The tare weight signal must be "free floating". If the tare value is changed during the weighing operation, the net weight must be re-adjusted accordingly (**Net + Tare = Gross**).

11.1.5 - The sum of the **Tare** value entered or preprogrammed and the **Net** weight that can be weighed must not exceed the **Gross** weight capability of the device (**Max + 9e** for computing scales - and preferred for all scales; **Max + 5%** for other scales). See the blanking display test in section STP 18.

This does not preclude a device from having a full capacity tare plus a full capacity weighing range (additive tare). In such a case, tests for accuracy, repeatability, eccentricity, etc. must be performed based on the maximum weighing capacity with the maximum tare value entered.

11.1.6 - It shall not be possible to enter a value of tare that exceeds the tare capability range (e.g. a tare entry of 6 kg on a scale with a tare range of 5 kg must be rejected and not taken as 5 kg).

11.1.7 - Whenever **Net**, **Gross** and **Tare** weights are indicated or printed, they must be in exact mathematical

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agreement (**Net + Tare = Gross**) and the total price must be calculated on the basis of the net weight.

11.1.8 - The use of any mechanism to select the unit of measure (lb/kg switch) must be inhibited when a tare is entered (through the keyboard, platter or preprogrammed) unless all weight values, including the tare value, are automatically converted and accurately rounded off to the nearest scale interval.

11.1.9 - If a device is designed to automatically clear the tare after each weighing, it must also be designed to prevent the automatic clearing of a tare before a stable weight indication has been provided and the transaction completed.

CLARIFICATION

On a price computing scale, the transaction is only completed with the entry of a unit price and the computation of the total price. The removal of the commodity from the platter before the total price is computed must not automatically cancel the tare.

11.2 - PLATTER AND KEYBOARD TARE

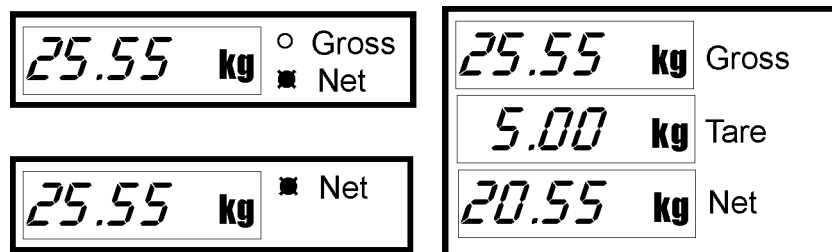
11.2.1 - Pressing the tare button once, or several times, with a load on the platter (platter tare) must set the device to zero and only to zero.

11.2.2 - Except for Point of Sale (POS) systems, the device must provide a visual confirmation or indication that a platter or keyboard tare has been entered (see the particular requirements for preprogrammed tares and POS systems).

ACCEPTABLE MEANS OF PROVIDING VISUAL CONFIRMATION:

- (1) The device has a separate and continuous tare display.
- (2) The device displays simultaneously or in sequence (within a time interval of a few seconds), for both the operator and the consumer, the gross, tare and net weights with their proper descriptors.
- (3) The device displays the net weight only, with net weight annunciator near the weight display. Gross weight is displayed and the net weight or annunciator goes off when the tare weight is zero.
- (4) The device has selectable Gross and Net weight display modes with proper descriptors and annunciators.

(ACCEPTABLE MEANS OF PROVIDING VISUAL CONFIRMATION)



- (5) It is recommended that video display terminals that are the primary indicators of devices simultaneously display the Gross and Tare weights when the Net weight value has been determined.

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NOTE: Appropriate annunciators or descriptors must go "on" when tares are entered; not "off".

11.2.3 - The entry of a platter or keyboard tare must automatically override any previous tare entry or be rejected (i.e. they cannot be additive). A percentage tare value may however be entered in addition to a fixed keyboard or platter tare value.

11.2.4 - Unless a separate tare display is provided, the device must display a negative weight value when the weight of the load on the platter is smaller than the tare weight.

11.3 - PREPROGRAMMED TARE (FIXED OR PERCENTAGE)

11.3.1 - Preprogrammed tare values may only be assigned (programmed) when the device is at gross load zero and in a "configuration" mode.

11.3.2 - Fixed and/or percentage tares may be preprogrammed into PLU codes. PLU codes may be entered or changed at any time, whether or not a load is on the platter.

11.3.3 - Except for POS systems, scales must display the Net weight ("net"on) when a preprogrammed tare is entered through a PLU code.

11.4 - PERCENTAGE TARE

11.4.1 - Fixed and percentage tares may be added to obtain a total tare value for a transaction. For instance, a PLU code may be preprogrammed with cumulative fixed and percentage tares; or a fixed platter or keyboard tare may be entered first, and then, through a PLU code, a percentage tare applied.

11.4.2 - If a device can sum fixed and percentage tare values, the two values must be added first and then the total tare value rounded off to the nearest scale interval. There is therefore no benefit in expressing percentage tare values with more than one decimal place (e.g. 1.5%, 3.3%, etc.).

EXAMPLES:

Scale: 15 kg x 5 g

Total gross weight TGW	Fixed tare weight t FTW	Gross weight GW = TGW-F TW	Percentage tare value %T	Percentage tare weight calculated GW x %T	Total gross weight t TGW	Total tare (fixed + percentage)		Net weight NW
						Calculated	Rounded	
355 g	10 g	345 g	9.2%	31.74 g	355 g	41.74 g	40 g	315 g

Scale: Multi-interval

0-2 kg x 1 g

2-5 kg x 5 g

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Total gross weight TGW	Fixed tare weight FTW	Gross weight GW = TGW- FTW	Percentage tare value %T	Percentage tare weight calculated GW x %T	Total gross weight TGW	Total tare (fixed + percentage)		Net weight NW
						Calculated	Rounded	
2890 g	9 g	2881 g	11.2%	322.672 g	2890 g	331.672 g	330 g ¹	2560 g
							332 g ²	2558 g ³

¹- Tare rounded to the nearest 5 g scale interval (interval for weighing range of the gross weight).

²- Tare rounded to the nearest 1 g scale interval (interval for weighing range of the tare weight).

³ - See sections STP 28.1.7 and STP 28.1.10 for specific requirements applicable to multi-interval and multiple range devices.

11.4.3 - The visual confirmation that a tare has been applied (i.e. Net annunciator) must only be enabled if the percentage tare multiplied by the gross weight represents one or more scale intervals after the appropriate rounding. The turning on of the Net annunciator must only occur if the net weight does not equal the gross weight (i.e. a tare has actually been applied to the gross weight).

NOTE:

These acronyms are used in the following equations:

%T (Percentage tare)

TW (Tare Weight)

GW (Gross Weight)

NW (Net Weight)

TGW (Total Gross Weight)

FTW (Fixed Tare Weight)

The %T of a commodity is determined as follows:

$$\%T = TW \div GW \times 100$$

NW is determined as follows:

$$NW = TGW - FTW - [(\%T)(TGW-FTW)]$$

11.5 - DEVICES USED FOR DIRECT SALES

11.5.1 - Except for preprogrammed tare, proportional tare and POS systems, when keyboard or platter tare values are entered the scale must comply with one of the following requirements:

11.5.1.1 - the tare value is permanently indicated on a separate dedicated display; or

11.5.1.2 - the tare value is indicated as a negative value when there is no load on the load receiving element;

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11.5.2 - A platter or keyboard tare value may not be entered, modified or cancelled unless the device is at gross load zero or the device indicates a negative weight value. This does not apply when the tare is continuously indicated on a separate dedicated display (or, as a minimum, the new tare value is clearly displayed to the customer at some point during the transaction) nor to a preprogrammed tare associated with a PLU.

EXAMPLE:

A platter or keyboard tare value is entered on a computing scale and a negative value is indicated. If the wrong tare value was entered, it may be cancelled and replaced by a new tare value when the platter is empty. This new tare value will be indicated as a negative weight value. However, the correction must not be possible with a commodity resting on the platter (positive weight indication). In such instances, the operator must remove the commodity from the platter and then cancel or change the tare value.

CLARIFICATION:

The zero indication/no load condition does not apply to a preprogrammed tare value. The idea being that the operator should not be capable of altering a tare value without providing the consumer with an indication that a new tare value has been entered. In the case of a preprogrammed tare associated with a PLU code, the tare value is rarely displayed. However, it is unlikely that the operator will select the wrong PLU code or product name, or change the PLU code during the weighing operation, to reduce the tare value. Such actions would affect the unit price and would be detectable by the consumer.

11.5.3 - Platter or keyboard tare values may be retained between transactions.

11.5.4 - Auto-tares are prohibited in direct sale to the public applications.

11.6 - DEVICES INTENDED FOR INDUSTRIAL APPLICATIONS OR OTHER APPLICATIONS WHERE CONSUMERS ARE NOT NORMALLY PRESENT

11.6.1 - A tare may be cancelled or modified while a load is on the load receiving element provided that the device has means to indicate, on demand, the value of the tare. These means include a negative weight value displayed when the platter is empty or a means to recall the tare value. A clear indication must be provided to the operator that a tare has been entered or cancelled (a tare annunciator is sufficient).

11.6.2 - Tare values may be retained between transactions.

11.6.3 - Combined semi-automatic zero/tare buttons are permitted under the following conditions:

11.6.3.1 - The zero/tare mechanism operates only when the scale provides a stable indication; the mechanism sets the indication to zero, only, within $\pm 0.25e$ (or $0.5d$ for Class I and II devices equipped with auxiliary reading means); the zero range does not exceed 4% of scale capacity unless the gross load that can be weighed is not increased beyond scale capacity.

11.6.3.2 - The scale is intended to be used exclusively for industrial applications or applications where consumers are not normally present.

11.6.3.3 - The AZSM or Center-of-Zero annunciator must be effective when the device displays zero after a zero setting operation (within the zero range). The AZSM may also work when zero is indicated after a tare operation.

11.6.3.4 - The AZSM does not re-zero weight values in excess of $0.6e$; the total AZSM range does not exceed

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4% of scale capacity unless the gross load that can be weighed is not increased beyond scale capacity.

11.6.3.5 - The scale must be permanently marked, near the weight display(s), with the legend "Not for Use in Direct Sales" or similar language and the ranges of both zero and tare operation (e.g. Zero Range up to **7d** - TARE RANGE above **7d**).

11.6.3.6 - The range of zero and tare operation must not be user selectable (i.e. fixed or, as a minimum, a sealable parameter).

11.6.3.7 - Visibility of operation - the scale is required to display an indication (Net annunciator) that a tare has been entered when a weight value within the tare range is subtracted by activating the zero/tare button.

11.7 - POINT OF SALE SYSTEMS

11.7.1 - A POS system may display the Gross weight on the scale display; however, it must print the Net weight on the cash register tape. The scale of a POS system is not required to display the net weight nor provide an indication that a tare value has been entered.

11.8 - MULTI-INTERVAL AND MULTIPLE RANGE SCALES

See section STP 28 (Multi Interval / Multi Range Device) of this manual.

11.9 - CUSTOMER DISPLAY

See section STP 7 (Installation and Location of the Device) of this manual.

REVISION

Rev 2.

- removed all remaining references to Laboratory Evaluation Manual.
- 11.1.5 added prefer +9e for all scales, although +5% is still allowable. (9e will always be less than 5% Max).
- change reference from "Direct Sales to the Public" to "Direct Sales".
- change all remaining fractions to decimals to maintain consistency throughout FIM.
- rename section 11.9 to Customer Display
- correct reference to *Specifications Relating to Non-automatic Weighing Devices (1998)*.
- remove definition of POS from this STP. See IPO 2.20 (POS)

Rev 1.

- Section 11.8 reference STP 28 of this manual