

# Prepackaged Commodities Rules

Legal Metrology (Packaged Commodities) Rules, 2011

*Amended upto March 31<sup>st</sup>, 2020*

*Compiled by:*

Dr.M.Kantha Rao, IPS  
*Inspector General of Police  
and  
Controller of Legal Metrology  
Andhra Pradesh  
India*

**Hand Book 5**

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<http://www.aplm.gov.in>

Labelling Requirements: Net Content Checking

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## *Preface*

The object is to bring this Hand Book-5 on Prepackaged Commodities is to make available on Net Contents Checking and Testing Procedures, are to be made on the Prepackaged Commodities. The Net Contents Checking is explained with real time practices. These are procedures are in practice and some are in practice in other countries such as USA, UK and other EU countries. How net contents checked was explained in some training classes by the OIML. The USA developed a Hand Book over this.

In this Hand Book, the test method looks very simple, but in reality there are several nuisances involved. Sometimes it looks not in favour of the persons involved. There a care is required to explain to the parties about the test procedures and equipment using or required and environmental conditions required. If necessary about authorizations in this regard.

I hope, this will reduce the gap between the bare Rules, Amendments and Mandatory Declarations and practical method of testings. While bringing this Edition 2020, the Government of India's recent advisory issued on April, 2020, on 'use of printed packing material' upto September 30th, 2020, which was not exhausted, is also examined.

Every effort has been made to bring accurate version of the Rules. However, one can also go through the Original Gazette Notifications of the Government of India or other document which necessitate.

It is a continuous process, which requires monitoring and to incorporate the amendments from time to time and making available in the form of yearly edition. This will help the enforcement agencies and others in taking decisions and discharging duties without any ambiguity.

This Hand Book 5 on Prepackaged Commodities – Net Contents Checking, is meant for official use only and not for sale. It is made available on the web site of the department: <http://www.aplm.gov.in>.

I specially acknowledge the efforts of the OIML, PTB, APLMF, NIST and NMI, UK in spreading requirements for prepackaged commodities, which helped developing these Hand Books.

I hope this will serve and guides the enforcement official of the Legal Metrology.

We views and suggestions are welcome, to improve further and make meaningful.

Dr. M. Kantha Rao, IPS  
Inspector General of Police  
and  
Controller of Legal Metrology  
Andhra Pradesh  
India





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## DEFINITIONS

### Definitions:-

These definitions are in relation to enforcement of packaged commodities in India.

(a) **“Act”** means the Legal Metrology Act 2009, (1 of 2010);

(b) **“Consumer”** shall have the same meaning as assigned to it in Consumer Protection Act;

**Under said the “Consumer” means any person who—**

(i) buys any goods for a consideration which has been paid or promised or partly paid and partly promised, or under any system of deferred payment and includes any user of such goods other than the person who buys such goods for consideration paid or promised or partly paid or partly promised, or under any system of deferred payment, when such use is made with the approval of such person, but does not include a person who obtains such goods for resale or for any commercial purpose; or

(ii) hires or avails of any service for a consideration which has been paid or promised or partly paid and partly promised, or under any system of deferred payment and includes any beneficiary of such service other than the person who hires or avails of the services for consideration paid or promised, or partly paid and partly promised, or under any system of deferred payment, when such services are availed of with the approval of the first mentioned person, but does not include a person who avails of such service for any commercial purpose.

Further *Explanation* under this is :

(a) the expression "commercial purpose" does not include use by a person of goods bought and used by him exclusively for the purpose of earning his livelihood, by means of self-employment;

(b) the expressions "buys any goods" and "hires or avails any services" includes offline or online transactions through electronic means or by teleshopping or direct selling or multi-level marketing;

**Comment:**

(i) it does not include a person buys goods and sells under the Consumer Protection Act

(ii) it includes if a person buys goods through

(a) election means

(b) teleshopping

(c) direct selling

(d) multi-level marketing

(c) **“dealer”** in relation to any commodity in packaged form, means a person who, or a firm which, carries on directly or otherwise, the business of buying, selling, supplying or distributing any such commodity whether for cash or for deferred payment or for commission, remuneration or other valuable consideration, and includes a commission agent who carries on such business on behalf of any principal, but does not include a manufacturer who manufactures any commodity which is sold or distributed in a packaged form except where such commodity is sold by such manufacturer to any other person other than a dealer ;

**Comment:**

- (i) if Person buys and sells goods is a dealer
- (ii) If manufacturer or packer sells goods, will also be a dealer

(c) **“industrial consumer”** means the consumer who buys packaged commodities directly from the manufacturer or from an importer or from wholesale dealer for use that industry and the package shall have declaration ‘not for retail sale’;

**Comment:**

Usually Industry buys goods in bulk through a negotiation on price and supply of goods, if will also sometimes forms a part of its raw material.

The object making of packaged commodities rules it is protect interest of consumer as defined above.

(bc) **“institutional consumer”** means the institution which buys packaged commodities bearing a declaration ‘not for retail sale’, directly from the manufacturer or from an importer or from wholesale dealer for use by that institution and not for commercial or trade purposes;

**Comment:**

Institutions like air lines, railways, corporate etc buys in bulk for its consumption say supply to its customers at free of cost, say.

Eg. IRCTC buys packaged drinking water bottles and supplies to the passengers in Rajdhani Express, then it is an Institutional Consumer. Because here no commercial or trade purpose directly involved.

If the IRCTC buys packaged drinking water bottles and supplies to the passengers in Satabdi Express at charge and collects price, then it is NOT an Institutional Consumer. Because here commercial or trade purpose directly involved.

An Airliner buys packaged drinking water bottles and supplies to the passengers in its charter, then it is an

*Institutional Consumer. Because here no commercial or trade purpose directly involved.*

*If the Airliner buys packaged drinking water bottles and supplies to the passengers in Satabdi Express at charge and collects price, then it is NOT an Institutional Consumer. Because here commercial or trade purpose directly involved.*

**(bd) “E-commerce”** means buying and selling of goods and services including digital products over digital and electronic network;

***Comment:***

*Examples of ecommerce : Amazon, flip cart, Snap deal, Naaptol, Amway, Home Shopping etc*



Some examples of the e commerce companies

**(be) “E-commerce entity”** means a company incorporated under the Companies Act, 1956 or the Companies Act, 2013 or a foreign company covered under clause (42) of section 2 of the Companies Act, 2013, or an office, branch or agency in India covered under sub-clause (ii) of clause (v) of section 2 of the Foreign Exchange Management Act, 1999 (42 of 1999) owned or controlled by a person resident outside India and conducting e-commerce business;



**E commerce process**

***under clause (42) of section 2 of the Companies Act, 2013***

(42) —foreign company means any company or body corporate incorporated outside India which— (a) has a place of business in India whether by itself or through an agent, physically or through electronic mode; and (b) conducts any business activity in India in any other manner.

***under sub-clause (ii) of clause (v) of section 2 of the Foreign Exchange Management Act, 1999 (42 of 1999)***

(v) “person resident in India” means— (i) a person residing in India for more than one hundred and eighty-two days during the course of the preceding financial year but does not include— (A) a person who has gone out of India or who stays outside India, in either case— (a) for or on taking up employment outside India, or (b) for carrying on outside India a business or vocation outside India, or (c) for any other purpose, in such circumstances as would indicate his intention to stay outside India for an uncertain period; (B) a person who has come to or stays in India, in either case, otherwise than— (a) for or on taking up employment in India, or (b) for carrying on in India a business or vocation in India, or (c) for any other purpose, in such circumstances as would indicate his intention to stay in India for an uncertain period; ***(ii) any person or body corporate registered or incorporated in India,*** (iii) an office, branch or agency in India owned or controlled by a person resident outside India, (iv) an office, branch or agency outside India owned or controlled by a person resident in India;

***Comment:***

An **entity** is a facility that allows electronic communication of goods.

There are different sorts of **e-commerce entities**

e.g. manufacturers, retailers and businesses that are set up just should trade on the internet these are named e-Tailers.

**Notes on ecommerce instructions issued by the Government of India:**

***1 Subject to provisions of FDI Policy, e-commerce entities would engage only in Business to Business (B2B) e-commerce and not in Business to Consumer (B2C) e-commerce,***

***2 Definitions:***

***E-commerce-***

*E-commerce means buying and selling of goods and services including digital products over digital & electronic network.*

***E-commerce entity-***

*E-commerce entity means a company incorporated under the Companies Act 1956 or the Companies Act 2013 or a foreign company covered under section 2 (42) of the Companies Act, 2013 or an office, branch or agency in India as provided in section 2 (v) (iii) of FEMA 1999, owned or controlled by a person resident outside India and conducting the e-commerce business.*

***Inventory based model of e-commerce-***

*Inventory based model of e-commerce means an e-commerce activity where inventory of goods and*

*services is owned by e-commerce entity and is sold to the consumers directly.*

### **Marketplace based model of e-commerce-**

*Marketplace based model of e-commerce means providing of an information technology platform by an e-commerce entity on a digital & electronic network to act as a facilitator between buyer and seller.*

### **3 Guidelines for Foreign Direct Investment on e-commerce sector**

- i. 100% FDI under automatic route is permitted in marketplace model of e-commerce.*
- ii. FDI is not permitted in inventory based model of e-commerce.*

### **4 Other Conditions**

*Digital & electronic network will include network of computers, television channels and any other Internet application used in automated manner such as web pages, extranets, mobiles etc.*

- i. Marketplace e-commerce entity will be permitted to enter into transactions with sellers registered on its platform on B2B basis.*
- ii. E-commerce marketplace may provide support services to sellers in respect of warehousing, logistics, order fulfillment, call centre, payment collection and other services.*
- iii. E-commerce entity providing a marketplace will not exercise ownership or control over the inventory i.e. goods purported to be sold. Such an ownership or control over the inventory will render the business into inventory based model. Inventory of a vendor will be deemed to be controlled by e-commerce marketplace entity if more than 25% of purchases of such vendor are from the marketplace entity or its group companies.*
- iv. An entity having equity participation by e-commerce marketplace entity or its group companies, or having control on its inventory by e-commerce marketplace entity or its group companies, will not be permitted to sell its products on the platform run by such marketplace entity.*
- v. In marketplace model goods/services made available for sale electronically on website should clearly provide name, address and other contact details of the seller. Post sales, delivery of goods to the customers and customer satisfaction will be responsibility of the seller.*
- vi. In marketplace model, payments for sale may be facilitated by the e-commerce entity in conformity with the guidelines of the Reserve Bank of India.*
- vii. In marketplace model, any warrantee/ guarantee of goods and services sold will be responsibility of the seller.*
- viii. E-commerce entities providing marketplace will not directly or indirectly influence the sale price of goods or services and shall maintain level playing field. Services should be provided by e-commerce marketplace entity or other entities in which e-commerce marketplace entity has direct or indirect equity participation or common control, to vendors on the platform at arm's length and in a fair and nondiscriminatory manner. Such services will include but not limited to fulfilment, logistics, warehousing, advertisement/ marketing, payments, financing etc. Cash back provided by group companies of marketplace entity to buyers shall be fair and non-discriminatory. For the purposes of this clause, provision of services to any vendor on such terms which are not made available to other vendors in similar circumstances will be deemed unfair and discriminatory.*
- ix. Guidelines on cash and carry wholesale trading as given in para 5.2.15.1.2 of Consolidated FDI Policy Circular 2017 will apply on B2B e-commerce.*
- x. e-commerce marketplace entity will not mandate any seller to sell any product exclusively on its platform only.*

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xi. e-commerce marketplace entity will be required to furnish a certificate along with a report of statutory auditor to Reserve Bank of India, confirming compliance of above guidelines, by 30th of September of every year for the preceding financial year.

Subject to the conditions of FDI policy on services sector and applicable laws/regulations, security and other conditionalities, sale of services through e-commerce will be under automatic route.

**(bf) “market place based model of e-commerce”** means providing of an information technology platform by an ecommerce entity on a digital and electronic network to act as a facilitator between buyer and seller;

**Comment:**  
 The company acts as a platform for buyers and sellers without storing goods. Sometimes they may offer shipping and payment assistance.  
 eg. Amazon, flipcart, Naaptol, ebay etc.

**(c) “lot”** means –

(i) in the case of packages which have been stored, the total number of such packages stored; and



example : storing

(ii) in the case of packages which are on or at the end of the packing line, the maximum hourly output of packages;’



example



production line



**Comment:**

*For the purpose of determining the quantity filled in the package, using a statistical system, a pooled or stacked packages selected are usually called a LOT. From the LOT, a few packages picked out randomly, is samples.*

*In the place of stored packages, production line packages can also picked out for the purpose. In this case, a lot is determined based on the hourly production rate.*

**(d) “manufacturer”** in relation to any commodity in packaged form, means a person who, or a firm which, produces, makes or manufactures such commodity and includes a person, firm which puts, or causes to be put, any mark on any packaged commodity, not produced, made or manufactured by him or it, and the mark claims the commodity in the package to be commodity produced, made or manufactured by such person or firm as the case may be;

**Comment:**

*Manufacturer is defined in 3 ways: if a person or firm*

- *originally produces, makes or manufactures*
- *just puts, or causes to be put, any mark, but not produced, made or manufactured him or it*
- *simply claims mark that the commodity in the package to be commodity produced, made or manufactured.*

**(e) “Maximum permissible error”**, in relation to the quantity contained in an individual package, means an error in deficiency which, subject to the provision of these rules, does not exceed the limits specified in the First Schedule;

**Comment:**

*Error in filling of quantity is allowed to take care of:*

- (a) *variations caused by unavoidable deviation in weighing, measuring or counting the contents of individual packages that may occur in good packaging practice;*
- (b) *variations caused by the ordinary and customary exposure to conditions, such as, climate, transport, storage or the like that normally occur in good distribution practice after the commodity is introduced in trade or commerce; and*
- (c) *variations due to the nature of packaging material or container.*

**Characteristics of Good Packaging practices:**

*A Good packaging should be convenient*

*A Good Package should be very attractive and fascinating*

*A Good Packaging is to be economical*

*A Good Packaging is to protect products from different risks such as  
A Good packaging should also be communicative*



*example of package*

**Good Distribution Practice:**

*Good distribution practices (GDP) are that part of quality assurance that ensure that the quality of products is maintained through adequate control throughout the numerous activities which occur during the **distribution** process.*

*Good Distribution Practice refers to the regulatory guidelines governing the wholesale distribution of products to ensure their quality and integrity is maintained throughout the supply chain from the manufacturer to the end user.*

*Good Distribution Practice extends beyond the distribution of the finished product and includes the sourcing, storage and transportation of APIs and other ingredients prior to manufacturing.*

*Failure to adhere to the guidelines at any point within the supply chain, including all intermediate points of storage and transport, can have a serious impact on the quality of the product.*



*Packaging machinery is equipment for uses such as canning; container cleaning, filling, and forming; bagging, packing, unpacking, bottling, sealing and placing of lid; inspection and check weighing; wrapping, shrink film and heat sealing; case forming, labelling and encoding; palletizing and depalletizing, and related uses. (US Dept of Commerce, 2009).*

*For example for 100 g tooth paste packages, not more than 4.5 g of deficiency allowed.*



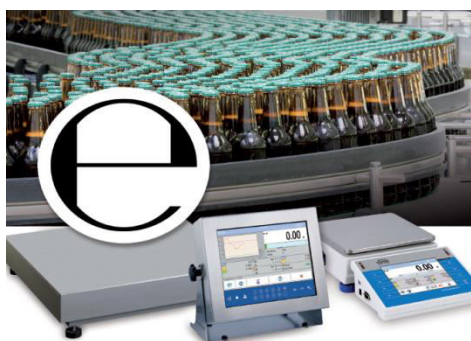
(f) **“net quantity”**, in relation to commodity contained in a package, means the quantity by weight, measure or number of such commodity contained in that package, excluding the packaging or wrapper;

**Comment:**

*It is the actual quantity of commodity filled or kept in the package, but does not include weight of container or package with which commodity come in contact.*

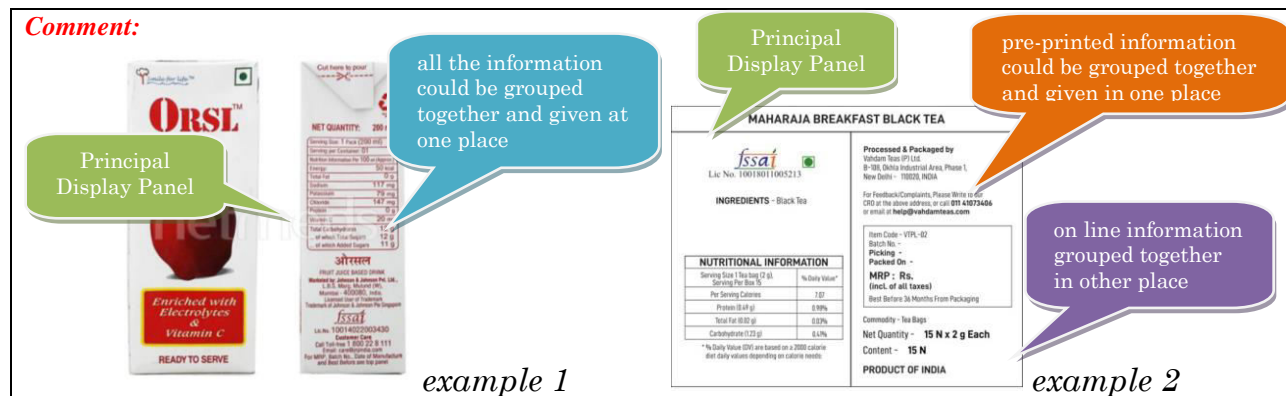


(g) **“packer”** means a person who, or a firm which pre-packs any commodity, whether in any bottle, tin, wrapper or otherwise, in units suitable for sale whether wholesale or retail;



(h) **“principal display panel”**, in relation to a package, means the total surface area of the package where the information required under these rules are to be given in the following manner, namely;

- (i) all the information could be grouped together and given at one place; or
- (ii) the pre-printed information could be grouped together and given in one place and on line information grouped together in other place;



(i) **“quantity”** in relation to commodity contained in a package, means the quantity by weight, measure or number of such commodity contained in that package;

(j) **“retail dealer”** in relation to any commodity in packaged form means a dealer who directly sells such packages to the consumer and includes, in relation to packages as are sold directly to the consumer, a wholesale dealer who makes such direct sale to customer;

**Comment:**

*a retail dealer is a person or a firm buys from a distributor or manufacturer and sells directly to the consumer from a fixed or mobile location.*

*Usually distributor is a wholesaler who sells to dealers and dealers usually retailers who sell directly to the consumer.*

*Sometimes distributors in other words wholesale dealer sell directly to consumer*



Examples of retail dealer

(k) **“retail package”** means the packages which are intended for retail sale to the ultimate consumer for the purpose of consumption of the commodity contained therein and includes the imported packages :

Examples of retail packages;



Provided that for the purpose or **“retail food package”**, the definition of the same contained in the rules or regulations made under the **Food Safety and Standards Act, 2006 (34 of 2006)** shall apply.

**Comment:**

Under **Food Safety and Standards Act, 2006 (34 of 2006)**, it is defined “package” means a pre-packed box, bottle, casket, tin, barrel, case, pouch, receptacle, sack, bag, wrapper or such other things in which an article of food is packed;

Under **Food Safety and Standards (Packaging and labelling) Regulations, 2011**, it is defined as **“pre-packaged or Pre-packed food”** .

“Pre-packaged” or “Pre-packed food”, means food, which is placed in a package of any nature, in such a manner that the contents cannot be changed without tampering it and which is ready for sale to the



consumer.

Note: The expression “package” wherever it occurs in these Regulations, shall be construed as package containing pre-packed food articles.

“multipice package” is available> “Multipiece package” means a package containing two or more individually packaged or labelled pieces of the same commodity of identical quantity, intended for retail either in individual pieces or packages as a whole.

(l) “**retail sale**”, in relation to a commodity, means the sale, distribution or delivery of such commodity through retail sales shops agencies or other instrumentalities for consumption by an individual or a group of individuals or any other consumer;



(m) “**retail sale price**” means the maximum price at which the commodity in packaged form may be sold to the consumer inclusive of all taxes; (n) “section” means a section of the Act;

**Comment:**

It is the price at consumer get from the retail dealer or with wholesale dealer.



**Cold Drink**

Rs 10/ Bottle



*Jays Overseas - offering Nescafe Cold Coffee,  
Packaging Size: 240 ML at Rs 55/unit in Delhi*

(o) “**Schedule**” means a Schedule appended to these rules;

**Comment:**

*Where certain information or instructions provided separately. Example it is instructed to pack certain commodities in fixed quantizes, for benefit of consumer.*

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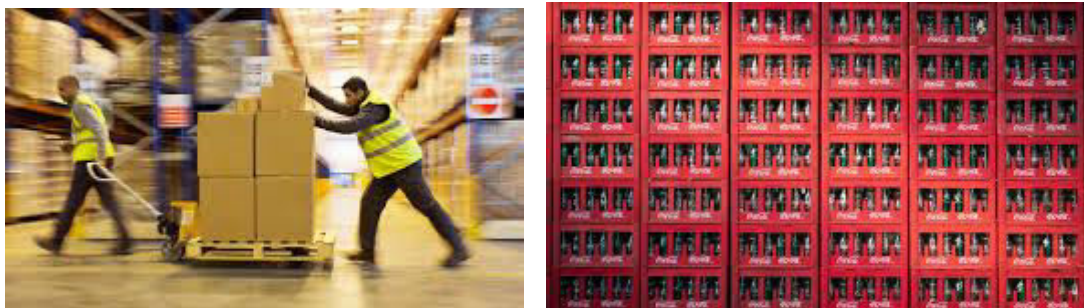
*Say Coffee is to be packed in quantities below 25g no restriction, 25g, 50g, 75g, 100g, 150g, 200g, 250g, 500g, 750g, 1kg, 1.5kg, and thereafter in multiples of 1kg.*

(p) **“standard package”** means a package containing the specified quantity of a commodity;

**Comment:**



(q) **“wholesale dealer”** in relation to any commodity in packaged form means a dealer who does not directly sell such commodity to any consumer but distributes or sells such commodity through one or more intermediaries;



**Commerce:**


Wholesalers	Retailers
1. Wholesalers buy from the manufactures and sell goods to the retailers.	Retailers buy from the wholesalers and sell goods to the consumers.
2. Wholesalers usually sell on credit to the retailers.	Retailers usually sell for cash.
3. They specialise in a particular product.	They deal in different kinds of goods.
4. They buy in bulk quantities from the manufacturers and sell in small quantities to the retailers.	They buy in small quantities from the wholesalers and sell in smaller quantities to the ultimate consumers.
5. Wholesalers always deliver goods at the doorstep of the retailers.	Retailers usually sell at their shops. They provide door delivery only at the request of the consumers.

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6. A wholesaler needs mainly a godown to stock the goods he handles.	A retailer needs a shop or a showroom to sell.
7. A wholesaler goes to different places to supply.	A retailer usually sells at a particular place. Sometime he may have branches in other places.
8. A wholesaler need not provide shopping comforts like luxurious, interiors, provision of air-condition, trolleys, etc.	A retailer usually provides shopping comforts mainly to attract customers.
9. As the wholesaler specialises in a particular product, he has to necessarily convince the retailers about the product quality. Only then the latter will place an order.	As the retailer deals in a variety of goods, he need not influence buyers. He can let the buyer choose any brand of product the he likes.
10. As per the custom of their trade, wholesalers allow the retailers trade discount each time the retailers buy.	The retailers normally do not allow any discount to their customers. Some of them may offer cash discount to bulk buyers. Sometimes, they may offer seasonal discounts.
<a href="https://accountlearning.com/top-10-differences-wholesalers-retailers/">https://accountlearning.com/top-10-differences-wholesalers-retailers/</a>	


(r) **“wholesale package”** means a package containing- (i) a number of retail packages, where such first mentioned package is intended for sale, distribution or delivery to an intermediary and is not intended for sale direct to a single consumer; or  
 (ii) a commodity sold to an intermediary in bulk to enable such intermediary to sell, distribute or deliver such commodity to the consumer in similar quantities or;  
 (iii) packages containing **ten or more than ten retail packages** provided that the retail packages are labeled as required under the rules.




**Black Coca Cola Cold Drink,**  
**Packaging Size: 750 ml, Packagin...**  
**Rs 490/ Box** [Get Latest Price](#)  
 Color: Black  
 Brand: Coca-Cola  
 Flavor: Cola  
 Packaging Type: Bottle  
 Form: Liquid  
 Packaging Size: 750 ml  
[read more...](#)



250ml Coca Cola Cold Drink,  
 Packaging Size: 250 ml,  
 Packaging...  
**Rs 360/ Box**  
[Get Quote](#)





Black Diet Coca Cola Cold Drink, Packaging Size: 300 ml, Packaging...  
**Rs 650/ Box**  
[Get Quote](#)

(s) **words and expression** used herein and not defined but defined in the Act, shall have the meanings respectively assigned to them in the Act.



### Net Quantity Checking at manufacturing or packing premises

#### 19. Inspection of quantity and error in packages at the premises of the manufacturer or packer.-

(1) With a view to ascertaining whether any package or lot of packages complies with provisions of these rules in all respects, the Director, Controller or any Legal Metrology Officer empowered to inspect under section 15 of the Act (hereafter referred to as in these rules) the authorized person may examine the packages and carry out the tests at the premises of the manufacturer or where the manufacturer is not the packer, of the packer and when he carries out such examination or tests, he shall draw samples from such lot of packages, in such manner and in such number as are specified in the Fifth Schedule and the tests aforesaid shall be carried out in accordance with the method specified in the Sixth Schedule.

(2) The Director, Controller or any Legal Metrology Officer shall enter in the Form set out in the Seventh Schedule, the detailed results of the tests carried out by him under sub-rule (1) and shall obtain, on the said Form, the signature of the manufacturer or, as the case may be, of the packer, or his authorized agent, or, in the absence of both, or on their refusal to affix such signature, the signature of a competent witness and copy of the data sheet containing the result shall be given to the manufacturer or packer, as the case may be.

(3) On the completion of the examination and tests carried out under sub-rule (1), the Director, Controller or any Legal Metrology Officer shall make a report indicating therein his findings with regard to the declarations required to be made under these rules and as to the net quantity actually contained in the sample packages and the extent of error, if any, noticed by him and furnish a copy of such report to the manufacturer or the packer, as the case may be.

(4) If it appears from the report referred to in sub-rule (3) that-

(a) the corrected average of the net quantity contained in the packages drawn as samples is lesser than the quantity declared on the packages or on the labels affixed thereto; or

(b) the number of packages that show an error in deficiency exceeding the maximum permissible error is greater than that shown in column 4 of Table under Fifth Schedule; or

(c) any such package shows an error in deficiency exceeding twice the maximum permissible error;

(d) the Director, Controller or the Legal Metrology Officer shall require the manufacturer or packer to make a cent percent check of the packages contained in the lot and authorise sale, distribution or delivery of only such packages with error in deficiency in the net quantity less than the maximum permissible error and the remaining packages shall be allowed to be sold distributed or delivered by the manufacturer or packer after it has been repacked or relabeled, as the case may be, so as to comply with the provisions of the Act and these Rules.

(6) A lot of packages shall be approved for sale if as a result of the test carried out under this rule, it is found that-

(a) the corrected average net quantity of the sample packages is equal to or more than the declared net quantity;

(b) the number of packages that show an error in deficiency exceeding the maximum permissible error is not more than that shown in column 4 of the Table under Fifth Schedule;

(c) no package shows an error in deficiency exceeding twice the maximum permissible error;  
 (d) every package bears thereon or on a label affixed thereto the declarations required to be made under these rules.

(7) The requirement of mandatory declarations on the packages shall be ensured at the factory level and at the depot of the factory.

(8) For non-compliance of the provisions of this rule, action may be taken after seizing five representative samples of the packages as evidence and the rest of the packages may be released only after compliance is completed by the manufacturer or the packer, as the case may be.

**Object:**

- to ascertaining whether any package or lot of packages complies with provisions of these rules in all respects,

**Authority:**

- Director, Controller or any Legal Metrology Officer to inspect under section 15 of the Act (hereafter referred to as in these rules) the authorized person

**Things to attend:**

- examine the packages and
- carry out the tests

**Where to do:**

- at the premises of the manufacturer or where the manufacturer is not the packer, of the packer

**How to do:**

- draw samples from such lot of packages,
- in a manner and in a number as specified in the Fifth Schedule

**Methods to follow:**

- method specified in the Sixth Schedule.

**Who Records:**

- Director, Controller or any Legal Metrology Officer

**Recordings:**

- Enter in the Form set out in the Seventh Schedule,
- detailed results of the tests carried out
- obtain, on the said Form, the signature of:
  - the manufacturer or, as the case may be,
  - of the packer, or
  - his authorized agent, or,
  - in the absence of both, or
  - on their refusal to affix such signature,
  - the signature of a competent witness
- give copy of the data sheet containing the result to the manufacturer or packer, as the case may be.

**Findings:**

- make a report indicating findings with regard to:

- declarations required to be made under these rules and
- net quantity actually contained in the sample packages and
- extent of error, if any, noticed

**Conclusions:**

- corrected average of the net quantity is lesser than the quantity declared or
- number of packages having an error in deficiency exceeding the maximum permissible error is greater than the specified in Fifth Schedule; or
- any package showing error in deficiency exceeding twice the maximum permissible error;

**Action required, when conclusions are Positive:**

- to make a cent percent check of the packages contained in the lot **by manufacturer or packer:**
- authorise sale, distribution or delivery of only such packages with
  - error in deficiency in the net quantity less than the maximum permissible error and
  - the remaining packages allowed to be sold distributed or delivered by the manufacturer or packer after it has been repacked or relabeled,

**Action required, when conclusions are Negative:**

- lot of packages approved for sale  
*that is if as a result of the test are found:*
- corrected average net quantity of the sample packages is equal to or more than the declared net quantity;
- number of packages having an error in deficiency exceeding the maximum permissible error is not more than the specified in the Fifth Schedule;
- no package shows an error in deficiency exceeding twice the maximum permissible error;
- every package bears or on a label affixed the declarations required

**Declarations either at factory level or at the depot of the factory**

The requirement of mandatory declarations on the packages shall be ensured at the factory level and at the depot of the factory.

**Penal action:**

If non-compliance of the provisions of this rule by the manufacturer or the packer, action may be taken after

- seizing five representative samples of the packages as evidence and
- rest of the packages may be released only after compliance is completed by the manufacturer or the packer, as the case may be.

### Action to be taken after completion of Inspection

**20. Action to be taken on completion of inspection of packages at the premises of the manufacturers or the packer.-** (1) If it appears from the report referred to in sub-rule (3) of rule 19 that,-

- (a) the corrected average net quantity contained in the packages drawn as samples is lesser than the quantity declared on the package or the label affixed thereto; or
- (b) any such packages showing an error in deficiency exceeding the maximum permissible error is greater than the number specified in column 4 of the Table in the Fifth schedule; or
- (c) any package has an error in deficiency exceeding twice the maximum permissible error; or
- (d) any such package does not bear thereon or on label affixed thereto the declarations to be made under these Rules;

the Director, Controller, or the Legal Metrology Officer shall take following action, namely:-

- (i) seize the packages drawn by him as samples and take adequate steps for the safe custody of the seized packages until they are produced in the appropriate court as evidence;
- (ii) based on the evidence initiate action for violations as per the provisions of the Act and these rules.

(2) The disposal of the seized packages shall be done in accordance with the provisions of the Code of Criminal Procedure, 1973(2 of 1974).

#### When it appears from the report :

- corrected average net quantity of the samples is lesser than the quantity declared on the package or the label affixed thereto; or
- any such packages having an error in deficiency exceeding the maximum permissible error is greater than the number specified in the Fifth schedule; or
- any package has an error in deficiency exceeding twice the maximum permissible error; or
- any package does not bear or on label affixed the declarations to be made under the Rules;

#### Director, Controller, or the Legal Metrology Officer shall take following action:

- seize the packages drawn by him as samples and
- take adequate steps for the safe custody of the seized packages
- until they are produced in the appropriate court as evidence;
- based on the evidence
- initiate action for violations as per the provisions of the Act and these rules.
- Dispose of the seized packages accordance with the Code of Criminal Procedure

### Net Quantity Checking at Retail or wholesale dealer

#### Inspection of quantity and error at the wholesale dealer or retail dealer Premises:

#### 21. Inspection of quantity and error in packages at the premises of the wholesale dealer or retail dealer.

(1) Ordinarily, any test in relation to the net quantity contained in a package shall not be carried out at the premises of the retail dealer or the wholesale dealer, unless-

(i) a complaint is received by the Director or Controller or any Legal Metrology Officer to the effect that the package sold or delivered to the complainant does not contain quantity declared on the package or on the label affixed thereto;

(ii) the Director or Controller or any Legal Metrology Officer has reason to suspect that any package has been tampered with or that there has been any pilferage or leakage of the commodity contained in the packages

(iii) the Director or Controller or any Legal Metrology Officer has reason to suspect that any package, or any label affixed thereto, does not bear thereon all or any of the declarations which are required to be made under these rules.

(2) Where any test is carried out in pursuance of the provisions of sub-rule (1), the Director, Controller or any Legal Metrology Officer shall verify whether the quantity contained in the package corresponds to the quantity declared on such packages or any label affixed thereto and where quantity contained in package is less than the declared quantity, whether the deficiency is more than the maximum permissible error in relation to that commodity.

(3) Where the Director, Controller or any Legal Metrology Officer finds on a test carried out under this rule that the error in deficiency in any package kept or stored for sale, distribution or delivery at the premises of the retail or wholesale dealer is more than the maximum permissible error in relation to that commodity, he shall seize such package and take appropriate action against the retail dealer or the wholesale dealer, as the case may be, in accordance with the provisions of the Act:

Provided that where the package bears the legend 'when packed', no punitive action shall be taken against the retail dealer or wholesale dealer if the Director, Controller or any Legal Metrology Officer is satisfied after necessary test that the deficiency in the net quantity contained in package is due to environmental conditions.

(4) Whereas a result of any test made under this rule, it is found that the net quantity contained in the package conforms to the declared quantity or where there is a deficiency, such deficiency is not more than the maximum permissible error, the retail dealer shall be at liberty to sell or deliver or distribute such commodity at the price determined on the basis of the quantity found on such tests.

(5) Where, as a result of any test made under this rule, it is found that any package, or any label affixed thereto, does not bear thereon all or any of the declarations required to be made under these rules, it shall be lawful for the Director, Controller or any Legal Metrology Officer to make such enquiries as to the source from which such package was received by the whole sale dealer or the retail dealer as the case may be, as he may think fit.

**Net Quantity Checking at Retail or wholesale dealer Premise:**

- It is ordinarily, not to be carried out at the retail dealer or the wholesale dealer premises: unless-
  - a complaint is received by the Director or Controller or
  - any Legal Metrology Officer to the effect
  - the Director or Controller or any Legal Metrology Officer has reason to suspect that any package tampered or any pilferage or leakage of the commodity contained in the packages
  - the Director or Controller or any Legal Metrology Officer has reason to suspect that any package, or any label affixed not bear all or any of the declarations, required under these rules.
- Any test is carried out to verify whether the quantity contained in the package corresponds to the quantity declared:
  - is less than the declared quantity,
  - deficiency is more than the maximum permissible error in relation to the commodity.
- finds on a test carried, error in deficiency is more than the maximum permissible error in relation to that commodity,
  - seize such package and
  - take appropriate action against the retail dealer or the wholesale dealer
  - where the package bears the legend 'when packed', no punitive action shall be taken if satisfied after necessary tests
  - deficiency in the net quantity is due to environmental conditions.
- result of any test found that the net quantity in deficiency is not more than the maximum permissible error, the retail dealer shall be at liberty to sell or deliver or distribute such commodity at the price determined on the basis of the quantity found on such tests.

**Conducting Enquiry about source of supply:**

- result of any test found that any package, or any label affixed, does not bear all or any of the declarations required :
  - make enquiries as to the source from which the package was received
  - as he may think fit.



### Establishment of maximum permissible error

#### Establishment of maximum permissible error:

#### 22. Establishment of maximum permissible error on package.-

(1) The maximum permissible error in relation to the commodities shall be such as is indicated in the First Schedule.

(2) While establishing the maximum permissible error in relation to the net quantity of commodities contained in packages, due account shall be taken of the following causes which may lead to variation in quantity, namely:-

(a) variations caused by unavoidable deviation in weighing, measuring or counting the contents of individual packages that may occur in good packaging practice;

(b) variations caused by the ordinary and customary exposure to conditions, such as, climate, transport, storage or the like that normally occur in good distribution practice after the commodity is introduced in trade or commerce; and

(c) variations due to the nature of packaging material or container.

(3) The Director or Controller or the Legal Metrology officer shall determine, or cause to be determined, in relation to any commodity, the declaration in respect of the net quantity of which is permitted to be qualified by the words 'when packed'; the reasonable variations which may take place by reason of the environmental conditions.

(1) The maximum permissible error in relation to the commodities is as indicated in the First Schedule.

(2) for establishing the maximum permissible error in relation to the net quantity of commodities contained in packages, following causes are to be taken into account:-

(a) variations caused by unavoidable deviation in:

- weighing,
- measuring or
- counting the contents of individual packages
- occur in good packaging practice;

(b) variations caused by the ordinary and customary exposure to conditions:

- climate,
- transport,
- storage or
- the like
- occur in good distribution practice

(c) variations due to the nature of:

- packaging material or
- container.

(3) The Director or Controller or the Legal Metrology officer are authorized to determine, or cause in relation to any commodity, which is permitted to use the words 'when packed'.

(4) the reasonable variations which may take place due to the environmental conditions.

**(5). Maximum permissible errors on net quantity declared by weight or volume.-**

(1) The maximum permissible error, in *excess or in deficiency*, in the net quantity by weight or volume of any commodity, as specified in Table I:-

**TABLE-I**

**Maximum permissible errors on net quantities declared by *weight or by volume*:**

Sl. No.	Declared quantity g or ml	Maximum permissible error in <i>excess or in deficiency</i>	
		As percentage of declared quantity	g or ml
(i)	up to 50	9	-
(ii)	50 to 100	-	4.5
(iii)	100 to 200	4.5	-
(iv)	200 to 300	-	9
(v)	300 to 500	3	-
(vi)	500 to 1000	-	15
(vii)	1000 to 10000	1.5	-
(viii)	10000 to 15000	-	150
(ix)	More than 15000	1.0	-

**Rounding of errors:**

(2) The maximum permissible error specified as percentage is rounded off:

- to the nearest one-tenth of a g or ml, for a declared quantities < or = to 1000 g or ml and
- to the next whole g or ml for declared quantities > 1000 g or ml.

**(6) The maximum permissible errors on net quantity declared by length, area or number. -**

(1) The maximum permissible error, in *excess or in deficiency*, in the net quantity declared in terms of ***length, area or number*** of any commodity not specified in the First Schedule be as specified in Table II below:-

**TABLE -II**

**The maximum permissible errors on net quantities declared by length, area or number**

Sl. No.	Quantity Declared	Maximum permissible error in excess or in deficiency
(i)	in units of length	2% of declared quantity up to 10 metre and thereafter 1% of declared quantity.
(ii)	in units of area	4% of declared quantity up to 10 sq. metre and thereafter 1% of declared quantity.
(iii)	by number	2% of declared quantity.



### Deceptive packages to be repacked or in default to be seized

#### Deceptive Packages:

##### 23. Deceptive packages to be repacked or in default to be seized.-

(1) If, on the determination of the quantity contained in the sample packages, the Director or Controller or the Legal Metrology officer the authorized person finds that the quantity contained in the package agrees with the declaration of the quantity made on the package or label thereon but the package is a deceptive package, he shall require the manufacturer or the packer, as the case may be, to repack and re-label such package and in the event of the omission or failure on the part of the manufacturer or the packer, as the case may be, to repack or re-label such deceptive package, in accordance with the standards established by or under these rules, seize them, take appropriate punitive action in accordance with the Act and take adequate steps for the safe custody of such packages until they are produced in a court as evidence.

Explanation: For the purpose of this rule, 'deceptive package' means a package which is so designed as to deliberately given to the consumer an exaggerated or misleading impression as to the quantity of the commodity contained therein, except where bigger dimensions of the package can be justified by the manufacturer or the packer, as the case may be, on the ground that such dimensions are necessary for giving protection to the commodity contained in such package or for meeting the requirements of the machine used for filling such package.

(2) If the seized packages contain any commodity which is subject to speedy or natural decay, the Director or Controller or the Legal Metrology officer shall dispose of the commodity in accordance with the rules made under the Act.

#### What is a Deceptive Package:

'*deceptive package*' means a package which is so designed as to deliberately given to the consumer an exaggerated or misleading impression as to the quantity of the commodity contained therein, except where bigger dimensions of the package can be justified by the manufacturer or the packer, as the case may be, on the ground that such dimensions are necessary for giving protection to the commodity contained in such package or for meeting the requirements of the machine used for filling such package.

#### Action to be taken when the package is deceptive:

When the quantity contained in the package agrees with the quantity declared , but the package is a deceptive package,

- the manufacturer or the packer, has to repack and re-label such package
- if omission or failure to repack or re-label such deceptive package,
  - seize them,
  - take appropriate punitive action

- take adequate steps for the safe custody of such packages until they are produced in a court as evidence.
- If the seized packages contain any commodity is a speedy or natural decay, dispose of the commodity



### Misleading practices

- General
- Fill level
- Design and display of packing material
- Duplication of information
- Additional or free quantities

### General

- The label on a prepackage not contain any information or ambiguous statements likely to mislead a purchaser
- This includes the ambiguous expressions prohibited
- Ambiguous expressions such as “approximately” or “standard” or “when packed” not be used as part of the quantity declaration or when authorised to do so.
- Another expression of this type would be “between”
- For example: “between 125 g -175 g”

### Fill level

- Purchaser may not reasonably be misled as to the **quantity** and **identity** of the product contained within the package
- Taking into consideration any recognized and accepted production practices that may be necessary for the manufacturer or packer
- If a purchaser cannot fully view the product in a prepackage, it shall be considered to be filled, and misleading

- if it contains excessive **non-functional slack fill** that is not required by any production process
- Consideration must be had for accepted or recognised production practises necessary for the manufacturer or packer, i.e. food hygiene and quality
- complete filling of a prepackage is required, unless the slack fill is functional

**Slack fill is...**

- The difference between the actual capacity of the packaging material and the volume of product it contains

**Functional slack fill is...**

- Protection of product
- Requirements of machines used for enclosing the prepackage
- Unavoidable product settling during transit
- Specific Function

**Slack fill can be used...**

- To protect the product
- When required by the machines used for enclosing the prepackage
- When product settling during transit is unavoidable
- When is has a specific function

**Example 1: Protection –Box of Chocolates**

**Protection:**

Slack fill for this box of chocolates is approximately 50%



**Example 2: Unavoidable settling –Laundry Powder**



**Unavoidable product settling during shipping and handling:**  
Slack fill is approximately 37%



**Example 3 :**

**Specific function - 'Pot Noddle'**

The product is packaged in a plastic pot from which the noodles are cooked and eaten



**Other Examples : Cosmetic Products**

The cardboard packaging is twice the size of the container



**Other Examples :**

**Meat Products**

Industry standard packaging?



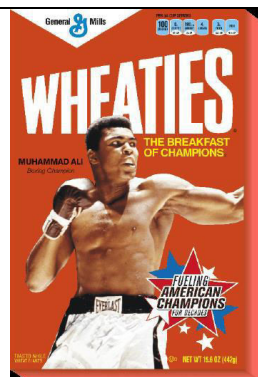
Half price meat?  
Or just half the meat?





**Other examples: Cereal boxes...**

- Two similar products
- Same net quantity (750 g)
- Same price (Rs.350/-)
- Different packaging
- Different slack fill

**Design and display of packing material:**

- A prepackage shall not have: false bottom, sidewalls, lid or covering, or be otherwise so constructed or filled, wholly or partially, that may deceive the purchaser
- Concave bottoms may be justified for safety reasons.

**Duplication of information:**

If the prepackage is labelled on more than one location, the information on all labels shall be equivalent and in accordance with the requirements

**Additional or free quantities:**

- Unless the packer declares that the free quantity is included in the nominal quantity, any such declaration shall be made in a manner which will reasonably prevent a purchaser from being misled with respect to the total quantity

**Prohibition of misleading prepackages****General:**

- A prepackage may not have a shape, size or any feature that may mislead or deceive a consumer as to the actual quantity contained in such prepackage
- This includes a false bottom, sidewalls, lid or other covering
- A prepackage may not be constructed or filled in such a way that may mislead or deceive a consumer

**Complete filling:**

A prepackagemay not be partially filled in such a way that may deceive a consumer unless the difference between the actual volume of the packing material and the volume of the product it contains (slack fill) is required in the production process

- If a consumer cannot fully view the product in a prepackageit may be considered to be filled
- A prepackage with excessive non functional slack fill (slack fill that is not required by any production process) is considered to be a misleading one

#### Functional slack fill:

- Protection of product
- Requirements of machines used for enclosing the prepackage
- Unavoidable product settling during transit
- Specific Function

#### Aerosol dispensers:

- National requirements or recognized industry standards specified in national requirements are to be followed
- Statement to declare the net quantity in mass that will be expelled
- This includes the propellant



### Declarations applicable to wholesale package

#### Declarations applicable to wholesale package

##### 24. Declarations applicable to be made on every wholesale package

Every wholesale package shall bear thereon a legible, definite, plain and conspicuous declaration as to -

- (a) The name and address of the manufacturer or importer or where the manufacturer or importer is not the packer, of the packer;
- (b) the identity of the commodity contained in the package; and
- (c) the total number of retail package contained in such wholesale package or the net quantity in terms of standard units of weights, measures or number of the commodity contained in wholesale package;

Provided that nothing in this rule shall apply in relation to a wholesale package if a declaration similar to the declarations specified in this rule, is required to be made on such wholesale packages by or under any other law for the time being in force.



Every wholesale packages are requires to bear following declarations in a legible, definite, plain and conspicuous manner: -

- (a) name and address of the:
  - manufacturer or
  - importer or
  - where the manufacturer or importer is not the packer, of the packer;
- (b) identity of the commodity contained in the package; and
- (c) total number of retail package contained in such wholesale package or the net quantity
- (d) net quantity in terms of standard units of weights, measures or number of the commodity contained in wholesale package;

#### Exception:



This provision is not applicable to the wholesale package if a similar declaration is required under any other law for the time being in force.



## Declarations on EXPORT OF PACKAGED COMMODITIES

### Restrictions on sale of export packages in India.-

#### EXPORT OF PACKAGED COMMODITIES

**25. Restrictions on sale of export packages in India.**-An export package shall not be sold in India unless the manufacturer or packer has re-packed or relabeled the commodity in accordance with the provisions contained in Chapter II, and where any export package is sold in India without such re-packing or re-labeling, such package shall be liable to be seized in accordance with the provisions of the Act.

### The Restrictions on sale of export packages in India;

- The packages meant for export not allowed to sale in India.
- The packages meant for export allowed to sale in India, if the manufacturer or packer is
  - re-packed or
  - relabeled the commodity
 in accordance with the provisions applicable to the retail sale packages.
- If any export package is sold in India without such re-packing or re-labeling, such package will be seized



## Exemptions

### Exemptions on compliance of Mandatory Declarations:

#### EXEMPTIONS

26. Exemption in respect of certain packages.-Nothing contained in these rules shall apply to any package containing a commodity if—

(a) the net weight or measure of the commodity is ten gram or ten millilitre or less, if sold by weight or measure;

Provided that the provisions of this clause shall not be applicable for tobacco and tobacco products.

(b) any package containing fast food items packed by restaurant or hotel and the like;

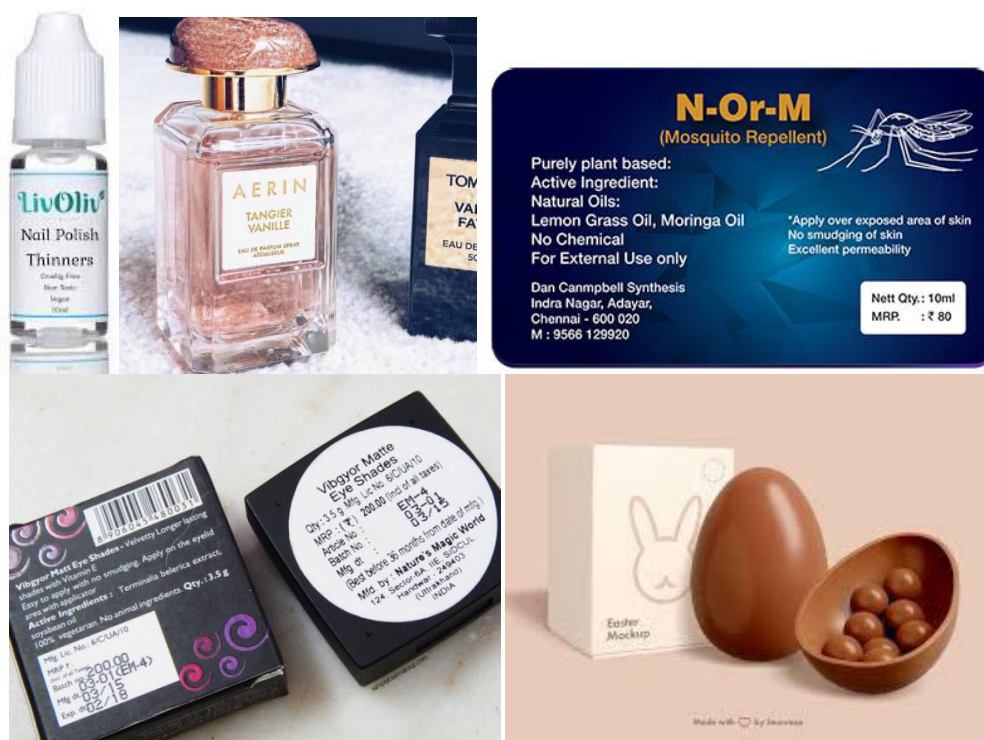
(c) it contains scheduled formulations and non-scheduled formulations covered under the Drugs (Price Control) Order, 2013 made under section 3 of the Essential Commodities Act, 1955 (10 of 1955):

Provided that no exemption shall be applicable to medical devices declared as drugs.

(e) Any thread which is sold in coil to handloom weavers.

Following are the certain Exemptions

a) When Net weight or measure of the commodity is ten gram or ten millilitre or less





Exceptions to these provision:

- tobacco and tobacco products.

It means products of tobacco and tobacco requires to comply the provisions applicable to the retail packages.



Major types of Smokeless Tobacco (in the Western world)



(b) any package containing fast food items packed by restaurant or hotel and the like;



(c) it contains scheduled formulations and non-scheduled formulations covered under the Drugs (Price Control) Order, 2013 made under section 3 of the Essential Commodities Act, 1955 (10 of 1955):



#### Exception from this Exemption:

- medical devices which declared as drugs, are required to comply the Packaged Commodities Regulations.

As per the notification, effective April 1, 2020, the medical devices that fall under the following definition will be regulated as “drug” under the Drugs and Cosmetics Act, and Medical Devices Regulations:

*“All devices including an instrument, apparatus, appliance, implant, material or other article, whether used alone or in combination, including a software or an accessory, intended by its manufacturer to be used specially for human beings or animals which does not achieve the primary intended action in or on human body or animals by any pharmacological or immunological or metabolic means, but which may assist in its intended*

function by such means for one or more of the specific purposes of — (i) diagnosis, prevention, monitoring, treatment or alleviation of any disease or disorder; (ii) diagnosis, monitoring, treatment, alleviation or assistance for, any injury or disability; (iii) investigation, replacement or modification or support of the anatomy or of a physiological process; (iv) supporting or sustaining life; (v) disinfection of medical devices; and (vi) control of conception.”

The Government had regulated or notified 37 categories of medical devices as drugs (see list of these 37 categories of medical devices



List of 37 categories of medical devices regulated or proposed to be regulated but notified before February 11, 2020

- |   |  |  |   |
|---|--|--|---|
| 1. Disposable Hypodermic Syringes;                                | 2. Disposable Hypodermic Needles;                    | 3. Disposable Perfusion Sets;                                  | 4. Substances used for in vitro diagnosis including Blood Grouping Sera;      |
| 5. Cardiac Stents;  | 6. Drug Eluting Stents;                              | 7. Catheters;  | 8. Intra Ocular Lenses;   |
| 9. I.V. Cannulae;   | 10. Bone Cements;                                    | 11. Heart Valves;  | 12. Scalp Vein Set;   |
| 13. Orthopedic Implants;  | 14. Internal Prosthetic Replacements;                | 15. Ablation Devices;  | 16. Ligatures, Sutures and Staplers;  |
| 17. Intra Uterine Devices (Cu-T)                                  | 18. Condoms;   | 19. Tubal Rings;   | 20. Surgical Dressings;   |
| 21. Umbilical tapes;  | 22. Blood/Blood Component Bags;                      | 23. Organ Preservative Solution;                               | 24. Nebulizer (effective from 1 Jan.2021);                                    |
| 25. Blood Pressure Monitoring Device (effective from 1 Jan.2021); | 26. Glucometer (effective from 1 Jan.2021);          | 27. Digital Thermometer (effective from 1 Jan.2021);           | 28. All implantable medical devices Equipment (effective from 1, April,2021); |
| 29. CT Scan Equipment (effective from 1, April,2021);             | 30. MRI Equipment (effective from 1, April,2021);    | 31. Defibrillators (effective from 1, April,2021);             | 32. PET Equipment(effective from 1, April,2021);                              |
| 33. X-Ray Machine (effective from 1, April,2021);                 | 34. Dialysis Machine (effective from 1, April,2021); | 35. Bone marrow cell separator (effective from 1, April,2021); | 36. Disinfectants and insecticide specified in Medical Devices Rules, 2017;   |
| 37. Ultrasound equipment (effective from 1, November, 2020)       |  |  |   |



(e) Any thread which is sold in coil to handloom weavers.



## Registration of manufacturers, packers and importers & Short Address

### Registration of manufacturers, packers and importers & Short Address

#### 27. Registration of manufacturers, packers and importers.-

(1) Every individual, firm, Hindu undivided family, society, company or corporation who or which pre-packs or imports any commodity for sale, distribution or delivery shall make an application, accompanied by a fee of rupees five hundred, to the Director or the Controller for the registration of his or its name and complete address; and every such application shall be made,-

- (i) in the case of an applicant pre-packing or importing any commodity at the commencement of these rules, within ninety days from such commencement; or
- (ii) in the case of any applicant who or which commences pre-packing or importing of any commodity after the commencement of these rules, within thirty days from the date on which he or it commences such pre-packing.

(2) Every application referred in sub-rule (1) shall contain the following particulars, namely:-

- (a) the name of the applicant;
- (b) the complete address of the premises at which the pre-packing or import of one or more commodities is made by the applicant; and
- (c) the name of the commodity or commodities pre-packed or imported by the applicant.

Explanation: In this sub-rule, 'complete address' has the meaning assigned to it in the explanation to sub-rule (1) of rule 10.'

(3) For making any alteration in the registration certificate issued under sub rule (1), a fee of rupees one hundred shall be paid by the concerned manufacturer or packer or importer to the Director or Controller.

(4) On receipt of the application made under sub-rule (1), the Director or Controller, who shall be the Registering Authority, shall-

- (a) if the application is not complete in all respects, return the same to the applicant within a period of seven working days from the date of receipt of the application;
- (b) if the application is complete in all respects, register the applicant and grant a registration certificate to the applicant to that effect.

**28. Registration of shorter address permissible.**-(1) It shall be lawful for any manufacturer or packer to make an application to the Director or the Controller for the registration of a shorter address, in addition to the complete address referred to in sub-rule (2) of rule 27.

(2) The Director or the Controller may, if he is satisfied after an inquiry that the shorter address is sufficient to enable the consumer or any other person to identify the manufacturer or the packer, register such a shorter address.

(3) Where a shorter address is registered by the Director or the Controller, it shall be lawful for the manufacturer or packer to state such a shorter address on the label of each commodity pre-packed by him or it.

### Registration of manufacturers, packers and importers:



(1) Every individual, firm, Hindu undivided family, society, company or corporation who or which pre-packs or imports any commodity for sale, distribution or delivery requires to be registered with the Director or the Controller.

- Application to register registration of name and complete address;
- On payment of fee ₹ 500/--
- Within 90 days of commencement of these rules, or
- Within 30 days from the date on which commences pre-packing.
- Director or Controller of Legal Metrology of State or UTs or Registration Authorities
- The Application should contain the following particulars, namely:-
  - (a) name of the applicant;
  - (b) complete address of the premises at which the pre-packing or import of one or more commodities is made by the applicant ('complete address' as assigned in the rule 10' ; and
  - (c) name of the commodity or commodities pre-packed or imported by the applicant.

#### Alterations in the Registration Certificate:

- For making any alteration in the registration certificate:
  - Pay a fee of rupees 100 (one hundred) rupees
  - Application to the Director or Controller.
  - By the manufacturer or packer or importer
  - Giving details of Registration Certificate and
  - Alterations required

#### Processing of the Application:

- On receipt of the application, the Director or Controller, requires to :-
  - (a) within a period of 7 (seven) working days if the application is not
  - (b) if the application is complete in all respects, register and grant a registration certificate to the applicant to that effect.



#### Registration of Short Address

(2) It is lawful for manufacturer or packer to make an application to the Director or the Controller for the registration of a shorter address, in addition to the complete address.

- For registration of short address only by the manufacturer or packer is allowed
- For registration of short address by the importer is NOT allowed
- Application to the Director or the Controller
- The Director or the Controller conduct inquiry that the Short Address is sufficient

- The Director or the Controller after satisfaction and after the inquiry that the consumer or any other person to identify the manufacturer or the packer,
- Register such a shorter address.

(3) After registration of Short Address, the manufacturer or packer can mark the shorter address

NUTRITIONAL INFORMATION	
Oolong Tea	Typical Value for 100g of product
Protein / g	26.67
Total Fat / g	0.37
Carbs / g	6.53
Energy / Kcal	136.16

**Packed & Marketed By:**  
 Golden Tips Tea Co. (P) Ltd.  
 52-A, Shakespeare Sarani, Kolkata – 700017, India

Customer Care Cell:  
 Quality Manager  
 Phone: +91 33 228 300 30  
 E-mail: info@goldentipstea.in

**Packed At:**  
 Mollar Gate, P.O Maheshtala, Kolkata - 700141

Content: Tea  
 Net Quantity: 50g  
 Item Code: GTL 28

Date of Packaging:  
 Batch No.:  
 Max Retail Price: ₹ 490.00  
 (INCLUSIVE OF ALL TAXES)

BEST BEFORE 24 MONTHS FROM THE DATE OF PACKAGING  
 buy online: [www.goldentipstea.com](http://www.goldentipstea.com)



## Register of Registrations and Compilation

### Maintenance of Register of Registrations and Compilation

#### 29. Registration of manufacturers and packers, etc.-

(1) The Director or the Controller shall enter in a register, to be maintained by him for the purpose, the name and complete address of each manufacturer or packer by whom application for such registration has been made to him under rule 27.

(2) The register referred to in sub-rule (1) shall be open to the inspection of the public without payment of any fee.

**30. Compilation of lists of manufacturers or packers and their circulation.** - The Director or the Controller shall compile a State-wise list of the manufacturers and packers registered by him under rule 29 and shall circulate such list to the Controller of the concerned State to enable the Controller to take, or cause to be taken, samples at the premises of the manufacturer or, where the manufacturer is not the packer, of the packer.

#### Maintenance of Register of Registrations:

The Director or the Controller requires to :

- maintain a Register
- enter in a register
  - name and complete address of each manufacturer or packer or importer
- the register is open to the inspection of the public *without payment of any fee*.

#### Compilation of Registrations

The Director or the Controller requires to:

- Compile a State-wise list of the manufacturers , packers and importers registered
- Circulate Complied List to the Controller of the concerned State
- Enable the Controller to take, or cause to be taken, samples at the premises

## Advertisement

## Advertisement of Retail Sale Price &amp; Net Quantity;

31. (1) Any advertisement mentioning the retail sale price of the pre-packaged commodity shall contain a declaration as to the net quantity or number of the commodity contained in the package.

(2) The font size of the net quantity in the advertisement shall be same as that of retail sale price.

(1) Any advertisement mentions retail sale price of the pre-packaged commodity,  
Also contain a declaration of the net quantity or number of the commodity contained in the package.

(2) The font size of the net quantity in the advertisement be the same as that of retail sale price.



## Fine for contravention of rules

## Fine for contravention of rules:

**32. Fine for contravention of rules.-**

Whoever contravenes any provisions of these rules, for which no punishment is provided, shall be punished with a fine of five thousand rupees.

32A. Sum of compounding of offences.- The sum of compounding of offences committed under the Act shall be as specified in the following Table, namely:—

TABLE

Sr. No.	Offence	Compounding Amount	
		If the application for compounding is by retailer or wholesale dealer	If the application for compounding is by manufacturer or importer
1	2	3	4
1	Contravention of section 29	Rupees two thousand	Rupees ten thousand
2	Contravention of sub-section (1) section 36	Rupees five thousand	Rupees twenty five thousand
3	Contravention of sub-section (2) section 36	Rupees ten thousand	Rupees fifty thousand

(1) where there no fine is provided, be fined a *five thousand rupees*. Or

(2) sum of fines for compounding of offences specified in the following::

**(a) in respect of manufacturer or importer:**

S. No.	Offence	Compounding Amount
		If the application for compounding is by <b>manufacturer or importer</b>
1	Contravention of section 29	Rupees ten thousand
2	Contravention of sub-section (1) section 36	Rupees twenty five thousand
3	Contravention of sub-section (2) section 36	Rupees fifty thousand

(b) in respect of retail dealers or wholesale dealers:

S. No.	Offence	Compounding Amount
		If the application for compounding is by <b>retailer or wholesale dealer</b>
1	Contravention of section 29	Rupees two thousand
2	Contravention of sub-section (1) section 36	Rupees five thousand
3	Contravention of sub-section (2) section 36	Rupees ten thousand

## Power to Relax

### Power to Relax of certain provisions:

**33. Power to relax:**(1) The Central Government may, after ascertaining the genuineness permit a manufacturer or packer to pack for sale the packages for a reasonable period by relaxing one or more provision of these Rules with such corrective measures as may be specified.

(2) The Central Government may, after ascertaining the genuineness of a case stated in the application, permit a manufacturer or packer or importer to pack or sell of the packages other than the specified in the second schedule for a maximum period of one year by relaxing rules.

The Central Government:

- after ascertaining the genuineness
- permit a manufacturer or packer to pack
- for sale the packages for a reasonable period
- relaxing one or more provision of these Rules
- with corrective measures as specified.

Also the Central Government:

- after ascertaining the genuineness
- permit a manufacturer or packer or importer
- to pack or sell of the packages other than the specified in the second schedule
- for a maximum period of one year
- relaxing rules.

In other words:

- Second specifies to pack in Standard Quantities
- The provision relax to pack in Non-Standard Quantities

Suppose the second Schedule specifies: biscuits to in the quantities:

Biscuits	25g, 50g, 60g, 75g, 100g, 120g, 150g, 200g, 250g, 300g 350g, 400g and thereafter in multiples of 100g up to 1 kg and thereafter in multiples of 500g upto 5 kg,
----------	---

The provision gives relaxation to pack in quantities eg: 80 g, 90 g also.

But the relaxation is only after ascertaining facts.

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### Procedure for checking Net Quantities at Factories

#### Rule Position:

#### THE FIFTH SCHEDULE

(See Rule 19)

#### Manner of Selection of Sample Packages

1. For determination of the net quantity for any commodity contained in a package, the sample size shall be such as is specified in the corresponding entry column 2 of the Table below against the lot size specified in Column 1 of the said Table.

Serial number	Inspection lot size (1)	Sample size (n) (2)	Correction factor (C) (3)	Number of packages showing an error more than the maximum permissible error but less than twice the maximum permissible error (4)
1	100 to 500	50	0.379	3
2	501 to 3200	80	0.295	5
3	More than 3200	125	0.234	7

2. The sample shall be selected at random in accordance with the manner specified in paragraphs 3 and 4.

3. Where, for the determination of the net quantity of any commodity contained in a package it is necessary to take samples of packages stored by the manufacture or packer in a ware house, go-down or at any other place, the sample shall be selected at random, from ever lot of packages and shall be picked out from the top, bottom, center, right, left, front and rear of the stocks so that the samples may adequately represent the packages in the lot.

4. Where, for the determination of the net quantity of any commodity contained in a package it is necessary to take samples form the place where the package is being filled such samples shall be selected from among the package which have already been filled, or in the alternatively, the requisite number of empty containers may be taken over and each of them shall be adequately marked for proper identification and the tare weight of each container shall be accurately noted and thereafter the marked containers shall be introduced at random in the packing process so that, after the packages are filled in may be possible to determine the net quantity

Explanation: In this schedule 'Sample size' means the umber of packages to be selected as sample.

#### THE SIXTH SCHEDULE

(See Rule 19)

#### Determination of the Net Quantity of Commodities in Packages

##### Part-I - Equipment

1. Equipments required- (1) The Director, Controller or any Legal Metrology Officer authorized by or under the Act, to determine the net quantity; of commodity contained in any package, shall be provided by the concerned Government with adequate equipments and facilities to carry out his work to the required degree of accuracy in an Expedient and efficient manner.

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(2) The equipments, referred to in sub-paragraph (1), shall ordinarily consist of working standard weights and balances, or any other weight or measure declared by the Director to be suitable for determining the net quantity contained in the concerned package.

(3) The Director, Controller or any Legal Metrology Officer shall, before determining the net quantity contained in any package, ensure that the working standards and other equipments are functioning properly.

2. Working standards to be ordinarily used.- (1) Ordinarily, working standards and other weights and measures, duly verified shall be used for determining the net quantities contained in packages and the errors, if any, in relation to the net quantity declared on the package.

Provided that, where it is necessary to use the weights and measures, owned or controlled by the manufacturer, packer or wholesale dealer as the case may be such weights and measures, shall be used unless the maximum permissible error of such weights and measures is twenty percent or less of the maximum error permitted in relation to the net quantity of the commodity contained in the packages.

(2) It shall be the duty of every manufacturer, packer or wholesale dealer to render such assistance the Director, Controller or any Legal Metrology Officer as the Director or other authorized person may require in order carrying out his duties expeditiously and efficiently.

(3) Where any weight, measure or other equipment, owned or controlled by the manufacturer, packer or wholesale dealer is used by the Director, Controller or any Legal Metrology Officer for the determination of the net quantity contained in any package, such weight, measure or other equipment shall not be released by the Director or other authorized person until his work is completed.

Part-II - Instructions with regard to the determination of quantity and error at manufacturer's or packer's premises.

3. (1) If empty tare packages are available, one such package shall be taken and tare package weight determined. If the tare package weight is equal to or less than three-tenths of the maximum permissible error for the concerned commodity of that quantity, it shall be assumed that the tare package weight so determined is valid for all the other packages in the sample, and the sample packages shall then be weighed for gross weight, and thereafter the net weight of commodity contained in each package shall be obtained by subtracting the tare package weight from the gross package weight. If the tare package weight so determined is more than three tenths of the maximum permissible error in relation to the commodity for that quantity, weight of four emptier tare packages shall be determined. If the difference between the maximum tare package weight and the minimum tare package weight of the five samples is equal to or less than four tenths of the maximum permissible error allowed for that commodity for that quantity, the tare weight of the package shall be taken as equal to the average of the five tare package weights. The gross weight of the package in the sample shall then be determined and the average tare package weight shall be subtracted from the gross package weight to obtain the net contents of the commodity in each package, in the sample. However, when the difference in the five individual tare weights of the packages exceeds the limit of four tenths of the maximum permissible error specified above, the procedure specified in sub-paragraph (4) or sub-paragraph (5), as the case may be, shall be adopted for determining the net quantity of individual packages.

(2) In the absence of empty tare packages, one package from the sample shall be opened and the net weight of the commodity and the tare weight of the package determined. If the tare weight of the package is equal to or less than three-tenth of the maximum permissible error for that concerned commodity of that quantity, it shall be assumed that the tare weight of one package so determined is valid for all the other packages in the sample, and the remaining packages shall then be weighed for gross weight, and thereafter the net weight of commodity contained in each package shall be obtained by subtracting the tare weight from the gross weight.

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(3) If the tare weight of the package specified in sub-paragraph (2) is more than three-tenths of the maximum permissible error in relation to that commodity, four more packages in the samples shall be opened and the net weight of the commodity in each package, as well as the tare weight of each package, shall be determined. If the difference between the maximum tare weight and the minimum tare weight of five samples is equal to or less than four-tenths of the maximum permissible error for that commodity of that quantity, the tare weight of the package shall be taken as equal to the arithmetic mean of the five tare weights. The gross weight of the packages in the sample shall then be determined to the requisite accuracy and the average tare weight of the container shall be subtracted from the gross weight to obtain the net contents of the commodity in each package in the sample.

(4) Where it is found on examining the first package, as described in sub-paragraph (2) that the tare weight of the container exceeds the limits specified in sub-paragraph (2) and sub-paragraph (3) and the determination of net contents, cannot be carried out without opening the remaining packages, or it is not possible to use the procedure described in sub-paragraph (5) the size of the sample to be examined shall be restricted to that indicated in column (2), in accordance with the batch indicated in column (1) of Table of the Ninth Schedule and the determination of net quantity shall be carried out by opening all the packages in the sample.

(5) Where it is likely that the process of determination of the actual net quantity may be destructive and it is possible to feed empty package into the packing process without affecting the results, the following procedure shall be used:

- the number of empty packages, depending upon the size of the batch, in accordance with columns (1) and (2) of Table of the Fifth Schedule shall be selected;
- the empty package shall be marked suitably to identify them from the other packages;
- the weight of each empty package, with its other parts which are to be fitted on it after it is filled shall be determined and the weight suitably recorded on the empty package and also on the Form specified in the Seventh Schedule;
- the empty package shall then be filled by introducing them in a random manner in the packing process, and such introduction shall be adequately spread over the duration in accordance with which the size of the batch is determined;
- the marked packages shall be taken out after completion of the filling and sealing operations and each such filled package shall be weighed again to the requisite accuracy;
- the net quantity shall be obtained by deducting the tare weight determined in accordance with clause (c) from the gross weight.

(6) The Director, Controller or any Legal Metrology Officer shall enter results of this examination of gross weight, net weight and tare weight in the Form specified in the Eleventh Schedule along with such other observation as he may wish to make on the basis of his examination.

**4. Determination of liquid contents by volume.**-(1) If the specific gravity of the liquid commodity filled in packages remains sufficiently constant for a batch and it is possible to determine accurately its specific gravity the method of determination of net contents by weight, described in paragraph 3 may be used.

(2) If the method described in sub-paragraph (1) is not feasible the containers shall be opened and the contents of each package poured out carefully into the appropriate volume measure.

(3) The reading of the actual net volume of the commodity in every package shall be noted carefully and recorded in the Form specified in the Seventh Schedule.

**5. Verification of length of commodities.**-(1) The sample shall be selected in the manner specified in the Fifth Schedule.

(2) If it is not possible to measure the dimensions without opening the package, the package shall be opened.

(3) The length of the commodity shall be measured by means of a calibrated steel tape of suitable length.

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(4) If the actual length of the commodity is so great that it is not possible to measure it with the tape measure and a suitable length measuring instrument is available on the premises, that instrument shall be used, after duly calibrating it by suitable means, with the steel tape serving as a working standard of length.

(5) The reading of the actual length of the commodity in every package shall be noted carefully and recorded in the Form specified in the Seventh Schedule.

(6) **Verification of commodities packed by number.**- The Director, Controller or any Legal Metrology Officer shall take packages from the sample drawn by him in the manner specified in the Fifth Schedule and determine the extent of error, by actual counting in each such package and may, for that purpose open all packages.

7. **Checking of other declarations.**-(1) The declarations made on the package or on the label affixed thereto, shall be examined with a view to ascertaining whether such declarations conform to these rules and may be ensured either at the factory level or at the depot of the factory .

(2) The additional declarations made on the package or on the label affixed thereto in respect of item (g) and (h) of sub-rule (1) of rule 6 shall also be examined to ascertain whether they are adequate.

8. **Determination of mean or average net quantity or net volume.**- After determining the individual values of net quantity or net volume or length or number of the commodity contained in the package, as per the procedure outlined in item numbers 3 to 6 of this Part, the mean or average value shall be calculated by summing up the individual values ( $x_i$ ) and dividing it by the number of sample packages ( $n$ ) taken for testing, by the formula-

$$\text{Average Net value } (\bar{x}) = \sum x_i / n$$

9. **Determination of Standard deviation of values.**- The standard deviation ( $\sigma$ ) of individual values [ $x_i$ ] is determined by the formula -

$$\sigma = \sqrt{\frac{1}{n-1} \sum (x_i - \bar{x})^2}; \text{ where ,}$$

$x_i$  = individual values of net quantity or net volume or length or number ,

$\bar{x}$  = average or mean value of net quantity or net volume or length or number.

10. **Corrected average net quantity or net volume.**-

The corrected average net quantity  $X_c$  is determined from the value of average net quantity [ $\bar{x}$ ] by using the formula -

$$X_c = \bar{x} + (\sigma \times C), \quad \text{where } C \text{ is the correction factor.}''$$

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THE SEVENTH SCHEDULE  
Form A  
Weight Checking - Data Sheet

A Particulars of Package		Name of Manufacturer/ Packer			
		Address	Price	Month	Year
B Commodity Classification		Lot Size:		Sample Size:	
		Maximum permissible error in percentage			
C	Sample No.	Gross Weight	Tare Weight	Net Weight/ error	Remarks
Weight Checking Data	1	200			
D Results	Declared Wt.		Avg. Wt.		
E GENERAL COMMENTS WITH REGARD TO THE COMPLIANCE WITH THE ACT AND THE RULES MADE THEREUNDER					
F Signature and name of the authorized person		Signature and name of manufacturer/ packer authorized by manufacturer or any competent witness			
Place:					
Designation:					
Name:					
Time:					

Note: If the data sheet runs into more pages than one, the each continuation sheet shall bear the signatures specified in Part F.

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Form B  
Volume/ Length Checking - Data Sheet

A Particulars of Package		Name of Manufacturer/ Packer				
		Address	Price	Month	Year	
B Commodity Classification		Lot Size:		Sample Size:		
		Maximum permissible error in percentage				
C		Sample No.	Gross Weight	Tare Weight	Net Weight/ error	Remarks
Volume/ Length Checking Data		1 200				
D Results		Declared Volume/ Length Avg. Volume/ Length				
E GENERAL COMMENTS WITH REGARD TO THE COMPLIANCE WITH THE ACT AND THE RULES MADE THEREUNDER						
F Signature and name of the authorized person		Signature and name of manufacturer/ packer authorized by manufacturer or any competent witness				
Place:						
Designation:						
Name:						
Time:						

Note: If the data sheet runs into more pages than one, the each continuation sheet shall bear the signatures specified in Part F.

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### Determination of the Net Quantity of Commodities in Packages

#### Inspection Etiquette:

Average Quantity System inspections may require a variety of specialised equipment to assist the LMO to carry out their visit efficiently and effectively

- Remember the 5 P's:  
-Perfect Planning Prevents Poor Performance

#### Pre-inspection

- Contact the manufacturer / packer and advise notify them of your intentions
- Ask a few questions to determine what equipment is required
- Determine if there are any site specific health and safety requirements
  - Personal Protective Equipment (PPE)
  - Hygiene requirements - equipment
  - Site inductions
  - Permits for work
- When contacting the manufacturer
  - Introduce yourself
  - Be clear about what it is you want / require
  - Explain the purpose of your visit
  - You will most likely be causing some disruption therefore it is important the company understands what is to happen
- Determine the method of production and packaging
- Package nominal quantity
- Production times
- Maximum hourly output of production line

#### Manner of Selection of Sample Packages

- For determination of the net quantity for any commodity contained in a package, select sample size
- Selection of sample size against the lot size specified in Table of Fifth Schedule:

'Sample size' means: the number of packages to be selected as sample.

Serial number	Inspection lot size (1)	Sample size (n) (2)	Correction factor (C) (3)	Number of packages showing an error more than the maximum permissible error but less than twice the maximum permissible error (4)
1	100 to 500	50	0.379	3
2	501 to 3200	80	0.295	5
3	More than 3200	125	0.234	7

#### Why a step wise sampling plan?

- Decreases the burden on packers by requiring fewer samples to be taken for control inspections.

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- Saves time and costs for inspectors as well as packers since fewer prepackages have to be opened and destroyed for control purposes
- Particularly beneficial for inspectors in checking high volume production of prepacked goods

#### Typical Application:



- For producers with high hourly production rate of prepackages (eg. Chocolate manufacturer)
- Manufacturer with low risk of underfilling prepackages
- Checks of prepackages at stock or warehouses by legal metrology officials

#### Sampling Plan::

- 1) Select sample at random as specified
- 2) take samples of packages stored by the manufacture or packer in a ware house, go-down or at any other place,
- 3) sample at random, from lot of packages

#### Random sampling

Selecting packages at random either by:

- **Number**; from stock, or
- **Time**; direct from the production line

Determining sample size (n)

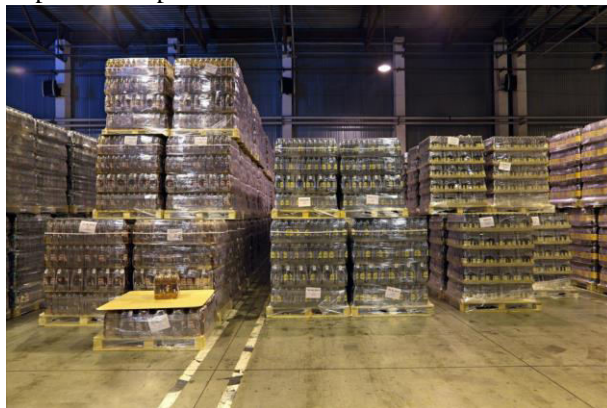
- First, we need to know the **inspection lot size**
- Consult Table of Fifth Schedule to determine **sample size**
- This allows us to prepare an appropriate random sampling plan

#### Method I: Storage Point

- picked out from the top, bottom, center, right, left, front and rear of the stocks
- ensure samples represent adequately in the lot.

#### Choosing a random sample not collected from the production line:

- Pallets and pallets of product



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### Mechanical' method

- Start by allocating a reference number to each prepackage in the inspection lot
  1. **Drawing cards from a hat**
    - Record the numbers allocated to the individual prepackages in some physical way i.e. on cards, slips of paper etc
    - After thoroughly mixing, choose as many cards etc. as there are prepackages needed for the sample
    - The corresponding prepackages of the inspection lot will then make up the sample
  2. **Random number tables**
    - Any position in the table has a probability of 0.1 of being occupied by any particular digit
    - Select a starting point by using a random procedure
      - For example, use Table 1 on a Monday, Table 2 on a Tuesday etc
      - Then stab the page with a pin to begin
    - Start taking random digits top to bottom & left to right or vice versa
    - For a lot containing up to 999 pre-packages use 001, 002, ....999
    - Ignore any triplet outside the sample size range
    - Similarly for lot sizes between 1000 and 9999 use four digit numbers
  3. **Random number generation using excel:**

An excel spreadsheet can generate random numbers by using function “=RANDBETWEEN (low, high)”

    - low being 0, and
    - **high** being the number of prepackages in the inspection lot
  4. **Random number generation using a calculator**

Many calculators can generate random numbers between 0.000 and 0.999 inclusive

### Worked example:

- To choose a random sample of 49 prepackages from a lot size of 100
- **Allocate** each of the 100 packages in the lot their own reference number i.e. 1, 2....100
- Generate a random sequence of numbers (as per previous slides)

**Worked example:**49 randomly generated numbers from 1 to 100



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1	7	13	22	30	41	50	68	80	92
2	8	14	24	32	43	52	69	84	95
4	9	18	25	33	45	55	72	86	97
5	10	19	26	37	47	61	77	89	99
6	11	21	29	38	49	67	79	91	
5	6	99	1	68	91	84	89	61	79
86	69	26	49	11	22	72	50	80	97
92	77	10	24	8	95	32	25	29	18
67	55	4	19	9	37	2	41	33	52
45	38	30	47	13	7	14	21	43	

- Select your samples starting from 1, 2, 4, 5, 6...
- Now you can conduct your reference test to determine the individual error on each prepackage

#### Method II: Filling Point

- If it is necessary to take samples from filled,
- select from the already filled, or

#### Method III: Production Line

- alternatively, requisite number of empty containers taken and each of them adequately marked for proper identification
- tare weight of each container accurately noted
- marked containers introduced at random in the packing process
- after the packages are filled, determine the net quantity

#### Choosing a random sample from the production line:

- Reference test completed using samples taken from 1 hour of production
- Lot size will equal the total hourly output of the production line
- Each sample to be taken is given a random time
- Take the samples after the point of final checks by the packer from the production line
- Remember to stop the clock when production stops

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- Divide the hour into 3600 seconds
- Choose the random times in the range from 0001 to 3600 for the required sample size
- Use one of the 4 methods explained previously:
  - Drawing cards from a hat-Random number tables
  - Generate from excel-Generate from a calculator
- The following sequence of numbers would produce the corresponding times throughout the hour:
  - 1287 = 21 min 27 sec
  - 1936 = 32 min 16 sec
  - 1677 = 27 min 57 sec List

your times into chronological order and begin taking the required samples

Fortunately the excel R 87 template has an inbuilt random number and time generator

**Quantity of product in prepackages - OIML R87:2004**

**Reference Test Spread Sheet** V 01.5.2016

Fill in the green and blue panels only. Press Tab after each data entry. **Licensed to Ministry of Business, Innovation & Employment**

**Numbers and characters can be used in the green sections**

**Use numbers only in blue (or if required white) sections**

**Instructions and error messages are in red** (Note: when correct entry made instruction deletes)

It is important to complete all sections on each page.

Cells with a red triangle in the top right contain tips. Rest the mouse pointer over these cells to read.

To **print** ensure the page you want to print is displayed  
Select File, Print, All, Active Sheet(s), OK.

**Note: Do NOT select workbook.** Contact: srinivas.bobbala@mbie.govt.nz

**START TEST**

Random Time      Random Number Tables

© TRADING STANDARDS

### Good Measurement Practices

The procedures in this handbook require to follow the good measurement practices.

For the guidance of all stake holders a model Test Report is presented. This model test report incorporates calculation of standards deviation, to determine the corrected net quantity in the package under test.

**First requirement for a good measuring practice is Traceability of weighing and measuring standards and equipment.**

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All test equipment and standards such as weighing machines, weights, volumetric, and linear measures are traceable to the International System of Units (SI).

**Second requirement for a good measuring practice is certification of calibration of weighing and measuring standards and equipment.**

All test equipment and standards such as weighing machines, weights, volumetric, and linear measures are calibrated periodically from a laboratory having valid certified standards from the appropriate laboratory, under the legislation.

### Equipment

#### 1. Equipments required:-

- 1) To determine the net quantity; of commodity contained in any package, adequate equipments and facilities are required to be provided to the Director, Controller or any Legal Metrology Officer
- 2) adequate equipments and facilities are required to be provided by Government
- 3) to carry out the test work to the required degree of accuracy in an Expedient and efficient manner
- 4) The equipments, ordinarily consist of:
  - a) working standard weights and balances, or
  - b) any other weight or measure declared by the Director to be suitable for determining the net quantity contained
- 5) before determining the net quantity contained in any package, ensure that the working standards and other equipments are functioning properly.

#### 2. Working standards to be ordinarily used.-

- 1) Ordinarily, working standards and other weights and measures, duly verified are to be used
- 2) If it is necessary to use the weights and measures, owned or controlled by the manufacturer, packer or wholesale dealer:
  - a) such weights and measures, used
  - b) maximum permissible error of such weights and measures is 20 % or less of the maximum error permitted in relation to the net quantity of the commodity
- 3) It is the duty of every manufacturer, packer or wholesale dealer to render such assistance may require to carrying out expeditiously and efficiently.
- 4) any weight, measure or other equipment, owned or controlled by the manufacturer, packer or wholesale dealer is used
- 5) such weight, measure or other equipment shall not be released until the work is completed.

### Suitable Weighing Equipment

#### Weighing equipment:



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### Weighing equipment –Guidelines on scale interval size

Gross Weight (g) of Pre-package	Scale interval (d) in g
<25	0.01
≥25 to <1000	0.1
≥1000 to <5000	1.0
≥5000	2.0

In general a weighing instrument is considered appropriate if it is verified and the maximum permissible error in service is no more than  $0.2 T$  of the prepackage to be tested

For example, prepackage with nominal quantity of 500 g

$$T = 15 \text{ g and}$$

$$0.2 T = 3 \text{ g}$$

The accuracy of the weighing machine if it is  $< 3 \text{ g}$  allowed.

The accuracy of the weighing machine supplied is 0.1 g.

Hence, the supplied weighing machine is allowed to used for testing.

### Weighing equipment –Setting up equipment on site

- Find a suitable location
- Convenient to inspection lot / production line
- Safe area; away from moving vehicles etc
- A good working height
- On a stable and level surface
- Plenty of room for storing sample packages
- Dry, with minimal environmental disturbances
- Test your weighing equipment on site prior to undertaking the inspection of any prepackage
- If errors are found in your weighing equipment, note the errors and determine if the equipment is suitable

### Weighing equipment –Masses

- To verify the accuracy of the weighing instrument
- Appropriate class (M1 or better)
- Suitably accurate
- Traceable to national standards



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### Measuring equipment –Length

- Flexible tape measure
- Rigid length measure



### Measuring equipment –Temperature

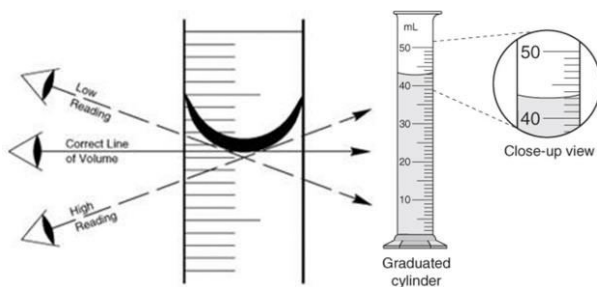
#### Thermometer

- Measuring the temperature of air or liquid
- Ideally resolution of 0.1 C
- Calibrated and traceable



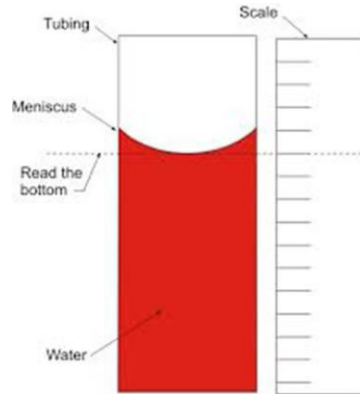
### Measuring equipment –Graduated cylinder

- To measure density or
- Direct volume comparison



**Measuring equipment –Graduated cylinder**

- Reading a meniscus
- A meniscus is the curved surface at the top of a column of liquid
- The volume should be read from the bottom of the meniscus.

**Measuring equipment –Hydrometer**

- The function of the hydrometer is based on Archimedes principle that a body suspended in liquid will be buoyed up by a force equal to the weight of the liquid displaced

Thus, the lower the density of the substance, the lower the hydrometer will sink

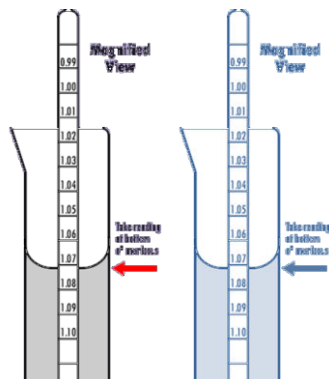


- Used by filling a cylinder with enough product to allow the hydrometer to float
- Carefully lower the hydrometer into the cylinder and gently spin while releasing



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- When reading the density from a hydrometer always take the reading at the bottom of the meniscus



#### Measuring equipment –Density cup

- Used for determining the density of a liquid
- Used with a weighing instrument and traceable masses



#### Measuring equipment –Pycnometer

- Glass Pycnometer
  - Used for determining density of a liquid
  - Used with a weighing instrument
  -



#### Measuring equipment –Electronic density meter

- These instruments calculate the density and display it on the digital read out
- Easy to use

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- Require only a small amount of product
- Easy to clean



### Displacement Sphere or Plunger

- This piece of test equipment comprises of a spherical ball on the end of a rod.
- There is an annular mark on the rod to indicate the depth of immersion.
- The correct volume of the plunger is known. (V)
- This device is used to determine the density of paints and lacquers.



### Equipment

#### Sieve & Drip tray

For use in determining the net contents of prepackages with a drained weight, frozen or glazed goods



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### Other equipment

- Tablet
- Laptop
- Stopwatch
- Calculator
- Camera
- Suitable Personal Protective Equipment (PPE)
- Identification
- Reference Material
  - Rule Book
  - Advice documents for trader
  - Random number tables



### Your equipment

Make sure the weighing / measuring equipment you take with you is;

- Suitable for the type of goods you are inspecting, and
- Suitably accurate

### Special Procedures for Determining Tare:

#### (a) Aerosols and Other Pre-Pressurized Containers:

Aerosol and other pre-pressurized containers (aerosols) are handled differently. These packages are designed so that they deliver the product under pressure. Hence, as the quantity goes out from the container, the pressure comes down and ultimately some quantity remains in it.

So great care is required while determining the net quantity of these products.

Usually destructive method is preferred to know the exact quantity that a consumer gets.

To do the destructive test, one has to exhaust the content into the air.

The container should not be either punctured or opened.

Any attempt to puncture or open there is likely accidents may occur.

When determining the tare weight of the container, ensure there is little trace of product.

For determining tare weight, exhaust the product in a well-ventilated area usually under an exhaust hood or outdoors in an at least 15 m (50 ft) from fire or heat or spark source.

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While expulsion of the product, shake the container five times with a brisk wrist twisting motion. If the container has a ball agitator, continue the shaking procedure for one minute after the ball has shaken loose.

### (b) Vacuum Packed Coffee

Gross weight of vacuum packed less than the gross weight of a opened container. So the weight the product affects, when opened.

Hence, the weight difference between before opening and after opening is calculated and deducted from the average tare weight added to the net quantity declared on the package.

- 1) Determine the average Tare weight Use the initial tare sample packages,
- 2) Determine the average Gross weight difference
  - a) Weigh and record the gross weight of the product-filled cans before breaking the vacuum seal.
  - b) Weigh and record the gross weight of the product-filled cans after breaking the vacuum seal.
  - c) Compute :
 
$$\text{gross weight difference} = \text{gross weight after seal break} - \text{gross weight Before seal break}$$
  - d) Compute average gross weight difference = total gross weight difference / no. of packages opened
- 3) Determine the nominal Gross weight
 
$$\text{nominal gross weight} = \text{average tare weight} - \text{average difference gross weights} + \text{Net weight declared on the label}$$
- 4) Determine the package error = gross weight - nominal gross weight
- 5) Compare the package error with the allowed MPE
- 6) if it is below the allowed MPE, the lot passes other fails

**Or deduct average gross weight difference from the net quantity arrived, gives actual net quantity**

Determination of quantity and error at manufacturer's or packer's premises by **Non-destructive testing**  
**Non-destructive testing:**

**Non-destructive testing is achieved at the packers' premises by pre-weighing the packaging material before it is filled**

- A Legal Metrology Official should always look to avoid destroying the manufacturers' product, especially if it is high value.
- In some instance destructive testing may be unavoidable
- Non-destructive testing may be achieved at the packers premises by pre-weighing the packaging material before it is filled
- Pre-weighed packing material must be easily identifiable, consider using colour coding
  - A sequence of coloured ribbon or elastic bands
  - The unique tare weight of each packing material must be recorded before it is filled
  - Consider using adhesive labels and recording the tare on the package itself
- Place each pre-weighed packing material on the production line at randomly generated time intervals

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- This method generally involves additional personnel
- It is advisable to include additional samples on the production line just in case some are missed
- This may be desirable in the case of small necked bottles with dense products in them. Emptying the product from these type bottles, then washing and drying them can be very awkward and time consuming.

#### Determination of Tare weight:

**Tare weight:** means weight of the packing material

There are two methods to determine tare weight:

- If empty tare packages are available (**Unused dry tare**)
- In the absence of empty tare packages (**Used dry tare**)

#### Unused dry tare

Weight of unused packing material of one prepackage.

Empty packing materials are provided by manufacturer or packer

**It is always preferred.**

#### Used dry tare

Packing material that has been used as part of a prepackage and that has been separated from the product and cleaned using normal household procedures used by consumers of the product (e.g. the material should not be dried in an oven).

Packing material that has been used as part of a prepackage and that has been separated from the product and cleaned using normal household procedures used by consumers of the product (e.g. the material should not be dried in an oven).

In practice quite difficult to achieve, requires used equipment to be left overnight to allow enough time to dry

In practice packaging material used for wet products such as chicken and other meats can be difficult to dry. With these products it is often best to wash the packaging material and dry with a cloth then allow it to dry overnight.



**Net Quantity = Gross Weight of Package – Average Tare Weight of packing material**

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Nominal quantity of product ( $Q_n$ ) in g or ml	Tolerable Deficiency (T) <sup>a</sup> Percent of $Q_n$	Tolerable Deficiency (T) <sup>a</sup> g or ml
0 to 50	9	-
50 to 100	-	4.5
100 to 200	4.5	-
200 to 300	-	9
300 to 500	3	-
500 to 1000	-	15
100 to 10 000	1.5	-
10 000 to 15 000	-	150
15 000 to 50 000	1	-

<sup>a</sup> T values are to be rounded up to the next 1/10 of a g or mL for  $Q_n \leq 1000$  g or mL and to the next whole g or mL for  $Q_n > 1000$  g or mL.

**If empty tare packages are available (Unused dry tare)**

- 1) Take one package and determine tare weight
- 2) If the tare package weight is equal to or less than three-tenths of the maximum permissible error for the concerned commodity of that quantity,
- 3) it is assumed that tare package weight so determined is valid for all the other packages in the sample,
- 4) then all packages are weighed for gross weight,
- 5) net weight of commodity is obtained by subtracting the tare package weight from the gross weight.
- 6) If the tare package weight is more than three tenths of the maximum permissible error in relation to the commodity for that quantity,
- 7) weight of four emptier tare packages be determined.
- 8) If the difference between the maximum tare weight and the minimum tare weight of the five samples is equal to or less than four tenths of the maximum permissible error allowed for that commodity for that quantity,
- 9) the tare weight of the package shall be taken as equal to the average of the five tare package weights
- 10) gross weight of the packages in the sample be determined
- 11) subtract average tare weight from the gross package weight and obtain the net contents
- 12) If difference in the five individual tare weights of the packages exceeds the four tenths of the maximum permissible error specified above,
- 13) net quantity shall be carried out by opening all the packages in the sample

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If	Then	Example
tare package weight is $\leq 3/10$ of MPE of commodity for that quantity	Use the tare weight so determined to fine net quantity.	Net Weight = 500g declared on package MPE is 3 % (from First Schedule - Table I) MPE of Net Weight 500 g = 15 g ATW = 4 g $3/10$ of 15 g is 4.5 g 4 is $\leq 3/10$ of 15 g Hence <b>Use Tare Weight</b>
tare package weight is $> 3/10$ of MPE of the commodity for that quantity	weight of four emptier tare packages be determined.	Net Weight = 500g declared on package MPE is 3 % (from First Schedule - Table I) MPE of Net Weight 500 g = 15 g ATW = 5 g $3/10$ of 15 g is 4.5 g 5 is $> 3/10$ of 15 g Hence <b>Take 4 more packages</b>
difference between the maximum tare package weight and the minimum tare package weight of the five samples is $\leq 4/10$ of MPE of commodity for that quantity,	the tare weight of the package is = average of the five tare weights.	Tare weight of four other packages is 4g, 4g 5g, 4 g Max Tare weight 5 g Min Tare weight 4 g Difference = 5-g - 4g = 1 g $4/10$ of MPE = $4/10$ of 15 = 6 g Difference 1 g < 6 g Hence Average Tare Weight: (5+4+4+5+4)/5= 22/5= 4.4 g <b>Average Tare Weight: 4.4 g</b>
difference in the five individual tare weights of the packages $> 4/10$ of MPE specified above	net quantity shall be carried out by opening all the packages in the sample	Tare weight of Five packages are 25, 24 g, 31 g, 27 g, 29 g, Max Tare weight 31 g Min Tare weight 24 g Difference = 31-g - 24g = 7 g $4/10$ of MPE = $4/10$ of 15 = 6 g Difference 7 g $> 6$ g Hence use opening of All packages <b>Use Destructive Method</b>

#### In the absence of empty tare packages (Used dry tare)

- 1) take one package from the sample
- 2) open and
- 3) net weight and tare weight of the package determine
- 4) If the tare weight of the package is equal to or less than three-tenth of the maximum permissible error for that concerned commodity of that quantity,
- 5) assumed the tare weight of one package is valid for all the other packages in the sample,
- 6) then weigh remaining packages for gross weight,
- 7) net weight of commodity contained is obtained by subtracting the tare weight from the gross weight.
- 8) If the tare weight of the package is more than three-tenths of the maximum permissible error in relation to that commodity,
- 9) Open four more packages in the samples
- 10) the net weight of each package and tare weight of each package determine

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- 11) If the difference between the maximum tare weight and the minimum tare weight of five samples is equal to or less than four-tenths of the maximum permissible error for that commodity of that quantity,
- 12) the tare weight is equal to the arithmetic mean of the five tare weights.
- 13) Take gross weight of all other the packages in the sample
- 14) Obtain net weight of commodity by subtracting average tare weight of the container from the gross weight of each package in the sample.
- 15) If difference in the five individual tare weights of the packages exceeds the four tenths of the maximum permissible error specified above,
- 16) net quantity shall be carried out by opening all the packages in the sample

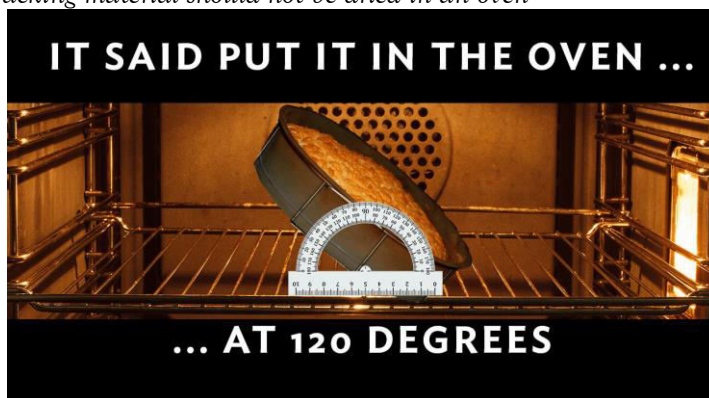
If	Then	Example
tare package weight is $\leq 3/10$ of MPE of commodity for that quantity	assumed the tare weight of one package is valid for all the other packages in the sample	Net Weight = 500g declared on package MPE is 3 % (from First Schedule - Table I) MPE of Net Weight 500 g = 15 g ATW = 4 g 3/10 of 15 g is 4.5 g 4 is $\leq 3/10$ of 15 g Hence <b>Use Tare Weight</b>
tare package weight is $> 3/10$ of MPE of the commodity for that quantity	Open and weigh four emptier and find net weight and tare weight of packages	Net Weight = 500g declared on package MPE is 3 % (from First Schedule - Table I) MPE of Net Weight 500 g = 15 g ATW = 5 g 3/10 of 15 g is 4.5 g 5 is $> 3/10$ of 15 g Hence <b>Take 4 more packages</b>
difference between the maximum tare package weight and the minimum tare package weight of the five samples is $\leq 4/10$ of MPE of commodity for that quantity,	the tare weight of the package is = average of the five tare weights.	Tare weight of four other packages is 4g, 4g 5g, 4 g Max Tare weight 5 g Min Tare weight 4 g Difference = 5-g - 4g = 1 g 4/10 of MPE = 4/10 of 15 = 6 g Difference 1 g $< 6$ g Hence Average Tare Weight: (5+4+4+5+4)/5= 22/5= 4.4 g <b>Average Tare Weight: 4.4 g</b>
difference in the five individual tare weights of the packages $> 4/10$ of MPE specified above	net quantity shall be carried out by opening all the packages in the sample	Tare weight of Five packages are 25, 24 g, 31 g, 27 g, 29 g, Max Tare weight 31 g Min Tare weight 24 g Difference = 31-g - 24g = 7 g 4/10 of MPE = 4/10 of 15 = 6 g Difference 7 g $> 6$ g Hence use opening of All packages <b>Use Destructive Method</b>



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### Notes on used dry tare:

1. Determine the gross mass of the prepackage before opening the packing material; as this may effect the integrity of the sample, and
2. Clean the packing material by using normal household procedures used by consumers of the product; the packing material should not be dried in an oven



### Goods sold by weight

#### Examination Procedures

When examining a lot of goods that are sold by weight:

- Gravimetric (non-destructive) testing is completed
  - i. Assuming the tare weights satisfy either scenario 1 or 2 of the tare procedure
  - ii. A practical exercise will be completed to demonstrate this method

#### Determination of quantity and error at manufacturer's or packer's premises by Destructive Testing:

##### Destructive testing:

##### Destructive Testing

Pre-packages have to be opened to determine compliance.

Often involves handling of the product which may render it unsalable

May be the only option for some types of goods

e.g. Frozen food goods

Packaging material for the tare test may be obtained by:

Co-operation of the packer or importer

Seizing goods if satisfied on reasonable grounds that an offence has been committed

Arranging to purchase from the packer



### Testing by Weight

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**Process of determining the net weight by destructing or opening of filled packages of samples:**

- 1) select sample size from the lot
- 2) number of packages, depending upon the size of Lot or batch, as specified in the Fifth Schedule
- 3) each package is marked suitably to identify them from the other packages;
- 4) gross weight of each package, is noted
- 5) empty the package into a container,
- 6) make sure that commodity is drained completely.
- 7) No trace of commodity left in the drained package
- 8) Each empty package is weigh
- 9) Record or note tare weight on each package for proper identification
- 10) Complete weighing, empty and tare weight process till the all the samples exhausts
- 11) determine and record quantity on the Form specified in the Seventh Schedule;
- 12) net quantity is obtained by deducting the tare weight from the gross weight.

**Net Quantity = Gross Weight of Package – Average Tare Weight of packing material**

**Process of determining the net weight by feeding empty containers into Packing Process:**

- 1) select sample size empty packages to feed into the packing process without affecting the results,
- 2) number of empty packages, depending upon the size of Lot or batch, as specified in the Fifth Schedule
- 3) empty package are marked suitably to identify them from the other packages;
- 4) weight of each empty package, is also noted before put into the packing process.
- 5) empty package to be filled introduced in random manner in the packing process,
- 6) introduction is to be adequately spread over the duration of size of the lot or batch
- 7) Fill the empty with the commodity in quantity specified for the package
- 8) Ensure filling and sealing operations of each such filled package
- 9) Weigh the filled packages
- 10) determine and record quantity on the Form specified in the Seventh Schedule;
- 11) net quantity is obtained by deducting the tare weight from the gross weight.

**Net Quantity = Gross Weight of Package – Average Tare Weight of packing material**

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## THE SEVENTH SCHEDULE

## Form A

## Weight Checking - Data Sheet

A Particulars of Package		Name of Manufacturer/ Packer				
		Address	Price	Month	Year	
B Commodity Classification		Lot Size:		Sample Size:		
		Maximum permissible error in percentage				
C		Sample No.	Gross Weight	Tare Weight	Net Weight/ error	Remarks
Weight Checking Data		1 200				
D Results		Declared Wt.			Avg. Wt.	
E GENERAL COMMENTS WITH REGARD TO THE COMPLIANCE WITH THE ACT AND THE RULES MADE THEREUNDER						
F Signature and name of the authorized person		Signature and name of manufacturer/ packer authorized by manufacturer or any competent witness				
Place:						
Designation:						
Name:						
Time:						

Note: If the data sheet runs into more pages than one, the each continuation sheet shall bear the signatures specified in Part F.

**Determination of drained weight**

**General:** The drained quantity requirements apply to food products packed in the following liquid mediums, either singly or in combination, which are regarded as packing material and shall not be included as part of the nominal quantity of the product:

*Note: Before use of any test method referred in this document, requires appropriate acceptance of authorities and parties in involved in the inspection, testing or auditing etc*

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Liquids are defined in accordance with Codex Alimentarius (OIML R87)

- water;
- aqueous solutions of salt (brine);
- aqueous solutions of sugars or other sweetening substances;
- fruit or vegetable juices in canned fruit or vegetables only;
- vinegar.

The following labelling can be found:



In the EU the net weight (including the liquid) and the drained weight has to be declared, independ whether the liquid is consumable or not

To determine the net quantity:

- it require to open every package
- no need to carryout tareweight
- no need to find the gross weight

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### Test Equipment:



Use a flat sieve with a square mesh of 2.5 mm and wire thickness of 1.0 mm.

- a) For prepackages up to 850 ml or 1.30 kg capacity use a sieve with a diameter of 20 cm.
- b) For prepackages exceeding capacity of 850 ml or 1.3 kg use a sieve with a diameter of 30 cm.

### Procedure



- 1) Select a sample of prepackages in accordance with the sampling procedures.  
*Please note: A tare sample is not needed because all the packages in the sample will be opened and measured.*
- 2) Store the samples for a period of 12 hours before testing within the temperature range specified by the packer or between 20 °C and 24 °C.
- 3) Weigh the sieve and drip pan and record the weight. ( $Me_1$ )
- 4) Open the prepackage and pour the product and liquid medium across the sieve.
- 5) Distribute the product including the liquid medium over the surface of the sieve.
- 6) Do not shake the material on the sieve.
- 7) If the nominal quantity is 2.5 kg or more, weigh the whole amount, then divide it among several sieves.
- 8) Tilt the sieve to an angle of 17° to 20° from the horizontal to facilitate draining.
- 9) Carefully invert by hand all solid product, or parts thereof, which have hollows or cavities if they fall on the sieve with the hollows or cavities facing upwards.
- 10) Drain for 2 minutes.
- 11) Place the sieve on the drip pan and reweigh the sieve, drip pan and contents. ( $Me_2$ )

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12) Calculate the drained mass (quantity) as follows:

$$M = Me_2 - Me_1$$

Where:

M = drained mass of the product

Me<sub>1</sub> = mass of the clean sieve and drip pan

Me<sub>2</sub> = mass of the sieve and drip pan plus product after draining

### Test procedures for determining the actual quantity of frozen products

#### General

*Metrological requirements for prepackages* are applicable to the inspection lots of prepackages measured after removing excess ice (packing material).

*Note:* It is not the intention to thaw the product but only to remove excess ice; the product itself should remain frozen to prevent the loss of moisture naturally contained in the product.

When a product is enclosed in a layer of ice or has any excess ice within it or on its surface, the procedures may be suitably adapted or methods used to remove the excess ice which will achieve an equivalent result and are acceptable in national legislation, may be used.

Examples of products:

Seafood, Meat, Poultry, frozen fruits, vegetables or Similar Products

#### Test apparatus

- 20 cm and 30 cm diameter sieves with 2.5 mm square wire mesh size and wire thickness of 1.0 mm and drip pans.

*Note:* For standardized sieves see ISO 3310-1 *Test Sieves - Technical Requirements and Testing - Part 1: Test sieves of metal wire cloth.*

- For determination of quantity, a weighing instrument shall meet the expanded uncertainties (at the  $k=2$  level of confidence) associated with measuring instruments and test methods used for determining quantities shall not exceed 0.2 %.
- Water bath of a size suitable to immerse the prepackage or a wire mesh basket containing the ice glazed product and capable of maintaining water temperature of 20 °C and 26 °C within an accuracy of  $\pm 1$  °C.
- Cold water spray.
- Wire mesh basket large enough to hold the content of an ice glazed product and with mesh size small enough to retain the product.
- Stop watch
- Means to determine 17° to 20° angle
- Pans to weigh thawed and drained product
- Weighing machine and standard weights

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**Test procedures:****Frozen fruits and vegetables**

- Determine the mass of the sieve and the drip pan to be used.  
For prepackages with a nominal quantity up to and including 1.4 kg use a 20 cm diameter sieve, or use a 30 cm diameter sieve for prepackages with a nominal quantity greater than 1.4 kg.
- Immerse the prepackage in a water bath maintained at  $20\text{ }^{\circ}\text{C} \pm 1\text{ }^{\circ}\text{C}$ .  
If the prepackage is not water-tight, place it in a plastic bag and remove any excess air using a vacuum and then seal it securely.
- When all of the excess ice has melted, remove it from the water bath and wipe it dry.
- Open the prepackage with care and a minimum of agitation.
- Transfer the product to the pre-weighed sieve. With the sieve tilted approximately  $17^{\circ}$  to  $20^{\circ}$  from the horizontal to facilitate drainage, distribute the product evenly over the sieve in one sweeping motion.
- Drain for 2 minutes then transfer the sieve containing the product to the preweighed drip pan and determine the actual mass of the product on a suitable weighing instrument
- Repeat for each prepackage in the sample.

**Glazed seafood and glazed poultry (product that is covered with a film of ice to preserve its quality) and blocks of frozen fish (see CODEX STAN 165 - 1989)**

- Determine the mass of the sieve and the drip pan to be used.  
For prepackages with a nominal quantity up to and including 900 g use a 20 cm diameter sieve, or use a 30 cm diameter sieve for prepackages with a nominal quantity greater than 900 g.
- Remove the product from the packing material.
- Place it in a wire mesh basket large enough to hold the contents of the prepackage and with openings small enough to retain the product.
- Place the wire mesh basket containing the product under a gentle spray of cold water until the ice glaze is removed.
- Agitate the product with care to avoid damage.
- Transfer the product to the pre-weighed sieve.
- Incline the sieve to approximately  $17^{\circ}$  to  $20^{\circ}$  from the horizontal to facilitate drainage without shifting the product.
- Drain for 2 minutes and then transfer the sieve with the product to the pre-weighed drip pan.
- Determine the actual mass of product on a suitable weighing instrument
- Repeat for each prepackage in the sample.

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### Frozen shrimp and crabmeat

- Determine the mass of the sieve and the drip pan to be used.  
For prepackages with a nominal quantity up to and including 450 g use a 20 cm diameter sieve, or use a 30 cm diameter sieve for prepackages with a nominal quantity greater than 450 g.
- Remove the product from the packing material and place in a wire mesh basket large enough to hold the contents of the prepackage and with openings small enough to retain the product.
- Immerse the basket containing the product in a water bath maintained at  $26\text{ }^{\circ}\text{C} \pm 1\text{ }^{\circ}\text{C}$  with a continuous water flow so that the top of the basket extends above water level.
- When all of the excess ice has melted, remove it from the water bath.
- Transfer the product to the pre-weighed sieve.
- Incline the sieve to approximately  $17^{\circ}$  to  $20^{\circ}$  from the horizontal to facilitate drainage without shifting the product.
- Drain for 2 minutes and then transfer the sieve with the product to the pre-weighed drip pan.
- Determine the actual mass of product on a suitable weighing instrument.
- Repeat for each prepackage in the sample.

### Net Weight of Encased-in-Ice and Frozen Block Product

#### Test Equipment

- Partial immersion thermometer or equivalent with  $1\text{ }^{\circ}\text{C}$  able to read from  $-35\text{ }^{\circ}\text{C}$  to  $+50\text{ }^{\circ}\text{C}$  with an accurate to  $\pm 1\text{ }^{\circ}\text{C}$
- Water supply for thawing blocks and other products
- Water Jet flow rate of 4 L to 15 L per minute for thawing blocks and other products
- Sink or other receptacle or bucket of 15 L capacity.
- A wire mesh basket or a container that is large enough to hold the contents of one package (e.g., 2.5 kg [box of shrimp and has openings small enough to retain all pieces of the product (e.g.16-mesh screen)
- Sieve of 20 cm or 30 cm of 8 number mesh
- Means to determine a  $30^{\circ}$  angle
- Pan for weighing the thawed and drained product
- Stopwatch
- Weighing machine and standard weights

#### Test Procedure

- Place the unwrapped frozen seafood, meat, poultry, or similar products in the wire mesh basket or an open container to thaw
- immerse in a 15 L or larger container of fresh water at a temperature between  $23\text{ }^{\circ}\text{C}$  to  $29\text{ }^{\circ}\text{C}$

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- Submerge the basket so that the top of the basket extends above the water level.
- Maintain a continuous flow of water into the bottom of the container
- keep the temperature within the specified range.
- accomplished it by maintaining a constant flow of warm water into the container holding the product
- As soon as the product thaws, determined by loss of rigidity, transfer all material to a sieve
- A sieve 20 cm for packages 450 g or less
- A sieve 30 cm for packages weighing above 450 g
- distribute it evenly over the sieve.
- Tilt the sieve about 30° incline from the horizontal position to facilitate drainage,
- drain for two minutes.
- Keep weighing machine ready for weighing
- After draining, immediately transfer the product to the tared pan
- determine the net weight of the product

#### Frozen Chitterlings

##### Test Equipment

- Weighing machine and standard weights
- Partial immersion thermometer of 1 °C graduations and able to read - 35 °C to + 50 °C having accurate to  $\pm 1$  °C
- Sink (e.g., water bath, ice chest) or other receptacle of suitable size to hold the packages for thawing, water source,
- A water jet with fresh water to maintained a temperature between 23 °C to 29 °C for thawing plastic bags or buckets of chitterlings
- Or a refrigerator for storing sample packages for several days to thaw.
- Stainless Steel Sieve with number 8 mesh, 20 cm or 30 cm
- Stainless Steel Drain Pan suitable to hold the product unde
- Stopwatch to measure drain period
- Knife or box cutter to open packages
- Waterproof marking pen for numbering the packages
- Disposable non-latex gloves
- Paper towels for drying sieve drain pan, packages and work area
- Large plastic bags to hold product emptied from packages
- Plastic rod to insert into buckets of chitterlings to test whether the product is thawed
- to ensure there are no chunks of ice traces

#### Test Procedure for Net Weight and Purge Determination for Fresh and Frozen Chitterlings:

- to determine: (a) net weight and (b) the purge in packages of fresh and frozen chitterlings.
- This is a destructive method
- testing of all the sample packages, Select the random sample of packages.
- Dry the sample packages
- number each sample 1 to 12 using a waterproof marker.

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- Record the Product Brand, Inspector Name, Labeled Net Weight, Packer Identity, Lot Code, MPE, and the Unit of Measure of the weighing scale used for weight determinations on the Chitterlings Worksheet.
- Transfer to an official inspection report at the conclusion of the inspection.
- The worksheet should be added to the official record of the inspection.

**The Test Procedure involves to:**

- determine the Gross Weight of each sample package
- determine the tare weight of the sieve drain pan

**Frozen Chitterlings**

- Fully immerse the unopened package of frozen chitterlings in a water bath
- Maintained at a temperature between 23 °C to 29 °C

**Notes:**

- Alternative to thawing large frozen packages say 5 kg plastic pails and place them in a refrigerator for partial thawing over several days, and then carrying out the final thawing using the water bath technique.*
- If the products are to be placed in refrigerated storage for several days for partial thawing, segregate them from other product inventory and mark each container to allow the inspector to ensure that they were the samples selected for testing Also, mark the packages with a conspicuous notice that they are being held for inspection.*

- Maintain a continuous flow of water into the bath to keep the temperature within range
- Thawing of the chitterlings is determined by touch
- If the chitterlings are not rigid and no ice crystals are observed or felt within or on the surface.
- For buckets, insert a plastic rod into the chitterlings to determine if the product is thawed
- ensure there are no chunks of ice remaining.

**Fresh and Frozen Chitterlings**

- Draining the Chitterlings – Depending on the availability of a sink, work space, and the inspector's preference, use the procedures in either Method A or Method B to drain the chitterlings.

**Method A:**

- Place a sieve over a sink or waste collection container.
- Pour the chitterlings into the sieve and distribute them over the surface of the sieve with a minimum of handling.
- Hold the sieve firmly and incline it 30 degrees
- facilitate drainage,
- start the stop watch and drain for exactly two minutes.
- At the end of the drain time, immediately transfer the chitterlings to a drain pan for weighing.
- Determine the purged net weight of the chitterlings using the following formula and record in the worksheet.

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*Drained Chitterlings and Drain Pan – Drain Pan Tare = Purged Net Weight*

**Method B:**

- a) Place a sieve on its drain pan.
- b) Pour the chitterlings into the sieve and distribute them over the surface of the sieve with a minimum of handling.
- c) Hold the sieve firmly and incline it 30 degrees to facilitate drainage,
- d) start the stop watch
- e) drain for exactly two minutes.
- f) At the end of the drain time, immediately transfer the drain pan with the purged liquid to the scale for weighing.
- g) Dry the empty package to determine its tare weight
- h) Determine the purged net weight of the chitterlings using the following formula and record in the worksheet.

*(Gross Weight of Package – Package Tare Weight) – (Weight of Purged Liquid & Drain Pan – Drain Pan Tare) = Purged Net Weight*



- Calculate Purge using the formula shown below
  - record the result in the Worksheet.
- $Purge\ in\ \% = (Labeled\ Weight - Purged\ Net\ Weight) \div Labeled\ Weight \times 100$
- Example:  
The labeled net weight is 500 g and the Purged Net Weight is 4.19 g

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$$5 \text{ g} - 4.19 \text{ g} = 0.81 \text{ g} \div 5 \text{ g} = 0.162 \times 100\% = 16.2 \% \text{ purge}$$

- Dry the empty package
- determine its tare weight
- Subtract the individual Package Tare Weight from the individual Package Gross Weight
- obtain the Actual Package Net Weight. Use the formula:

$$\text{Actual Package Net Weight} = \text{Gross Weight} - \text{Tare Weight}$$

- 9. Subtract the Actual Package Net Weight from the Labeled Net Weight. Use the formula:  
 $\text{Package Error} = \text{Labeled Net Weight} - \text{Actual Package Net Weight}$

- Repeat for all packages in the sample.

## Evaluations of Results – Compliance Determinations

### 1. Net Weight

#### Individual Package requirement:

- If there are negative package errors,
- determine if any of the values exceed the Maximum Permissible Error (MPE)
- If a package error exceeds the MPE, mark it as “Failed”
- If a package error exceeds the 2 MPE, mark it as “Failed”
- Count the number of packages that exceed the MPE but below 2 MPE
- Count the number of packages that exceed the 2 MPE
- If the number of packages that exceed the number allowed
- Mark the sample as “Failed” in the Net Weight worksheet.
- If the sample passes the Individual Package Requirement,
- apply the Average Error Requirement.

#### Average Error Requirement:

- determine average net quantity
- determine the standard deviation
- apply correction factor. Use

$$\text{corrected average net quantity} = \text{average Net Quantity} + \text{Standard Deviation} \times \text{Correction Factor}$$

- If the corrected Average Net Quantity is a positive number, the sample passes.
- mark the sample as “Passed.”
- If the corrected Average Net Quantity is a negative number,
- Mark it “Failed” in the worksheet,

### 2. Purge

- Follow these procedures to determine the amount of purge from the chitterlings.
- Apply the Average Requirement to determine if the sample passes or fails the requirement.
- The Average Adjusted Purge (AAP) for the sample shall not exceed 20 % of the labeled weight.
- If the Average Purge is less than or equal to 20 %, the sample passes.
- If the Average Purge is greater than 20 %, calculate the Sample Standard Deviation
- □ Use the Sample Correction Factor

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- Subtract the from the Average Purge
- to obtain an Adjusted Average Purge
- Pass or Fail
  - If the AAP greater than 20 %, the sample fails.
  - mark the sample as “Failed.”
- or
- if the AAP is 20 % or less, the sample passes.
- mark the sample as “Passed.”

### Goods sold by volume

#### Examination Procedures

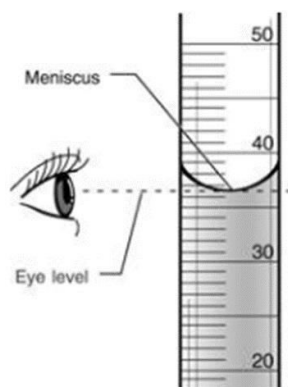
There are four methods commonly used for examining a lot of goods that are sold by volume:

- Direct comparison -Volumetric (destructive)
- Direct comparison -Template (non-destructive)
- Displacement bath (destructive)
- Gravimetric volume (non-destructive)

#### Method 1 -Volumetric

Individually opening each sample and empty all the contents into a graduated cylinder

- Read error -bottom of meniscus to the top of the line



#### Example test sheet

Actual Quantity (mL) -	Stated Quantity (mL)	= Individual Package error (mL)
512	500	+ 12
510	500	+ 10
507	500	+ 7
506	500	+ 6
493	500	- 7
470	500	- 30

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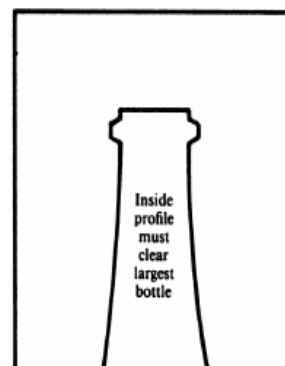
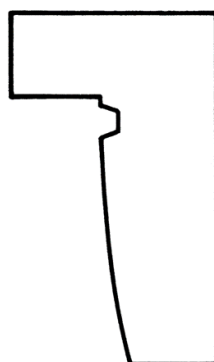
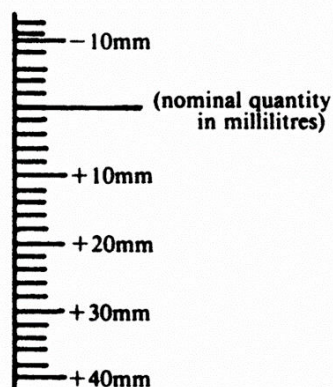


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- This method normally involves destroying the product as each sample package is opened and transferred to a graduated standard
- Method has limitations in extracting product that adheres to the internal surfaces
- Suitable for transparent liquids, as the bottom of the meniscus is used as a datum point.
- This method normally involves destroying the product as each sample package is opened and transferred to a graduated standard
- Method has limitations in extracting product that adheres to the internal surfaces
- Suitable for transparent liquids, as the bottom of the meniscus is used as a datum point.

### Method 2 –Template

- Templates are used to determine the quantity contained in a prepackages
- The individual package error is determined directly from a template associated with that packaging
- Variability in the packing material has to be controlled



- This method is used to measure the distance between the top of the contents in the prepackage and the upper edge of the package (the empty space) without the package having to be opened
- A controlled method of a visual fill height check

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- The template is usually marked with a graduated scale from which a direct reading from the top of the contents to the top of the container can be made
- This scale is in units of volume so the volume of the fill can be directly read

#### Packaging requirements:

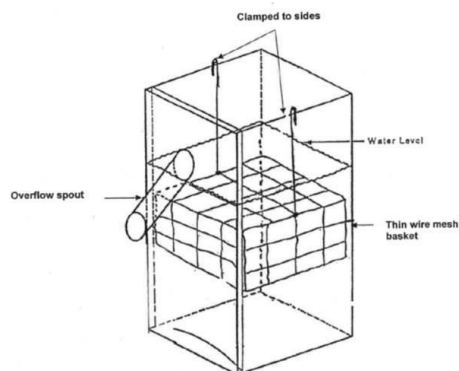
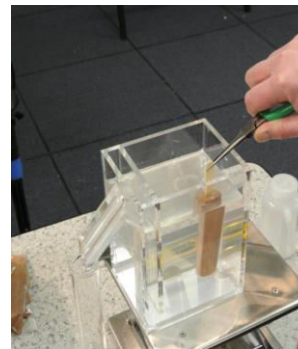
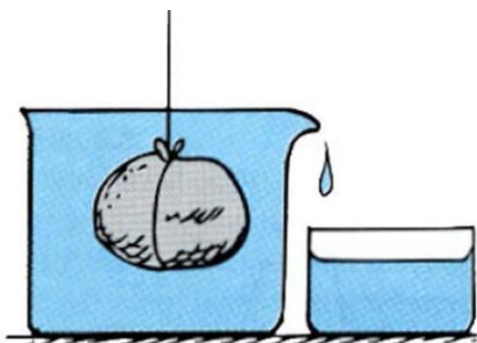
- The packaging must be transparent
- The packaging must be made of a stable material that holds its shape
- The internal and external dimensions of the container must be sufficiently constant
- Glass bottles are the usual containers that meet these requirements
- The type of cap (i.e. screw on or press on) approved for use with the bottle should be marked on the template
- The template must be easily identifiable with the bottle it is approved for use with

#### Using a template:

- The bottle being tested must be placed vertically on a level surface
- The template is placed over the top of the bottle
- Read error -bottom of meniscus to the top of the line

#### Method 3 -Displacement bath

- Based upon **Archimedes'** principle
- The volume of displaced fluid is the volume of the object
- Commonly this method used to determine the volume of ice cream



**Equipment required:**

- Displacement bath; appropriate size for the product under test
- Ice water maintained at 1 °C to 3 °C
- Freezer
- Graduated volumetric measure
- Thermometer

**Procedure:**

- 1) Products sampled are stored in a manner to ensure product integrity is maintained
- 2) Place displacement bath in freezer overnight
- 3) Place water in freezer until 1 °C to 3 °C is reached
- 4) Set up displacement bath and graduated cylinder on a stable level surface
- 5) Fill displacement bath with water until it overflows from the spout. Wait for all visible flow to cease from the spout on the displacement bath into a tub
- 6) Wait for all visible flow to cease from the spout on the displacement bath into a tub
- 7) Check water temperature is within 1 °C to 3 °C
- 8) Place graduated cylinder under spout
- 9) Remove a single sample of the product from the freezer and open
- 10) Remove wire mesh cage and hold above displacement bath. Place sample in cage and slowly submerge
- 11) Once all visible flow has ceased from the spout on the displacement bath to graduated measure, read and record actual volume
- 12) Recheck temperature to ensure within 1 °C to 3 °C. if not, disregard result
- 13) Repeat for each sample; complete steps 6 -12

*This method is not full proof and many variable make it difficult to attain consistent and reliable results*

**Method 4 –Gravimetric volume**

Determining a volume gravimetrically:

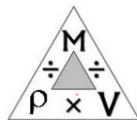
- This method requires an accurate **density** figure to be determined
- The volume is determined by the following calculation:

$$\text{Volume} = \text{Mass} \div \text{Density}$$

$$\text{Density} = \rho$$

$$\text{Mass} = M$$

$$\text{Volume} = V$$

**Density measurement**

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Example density figures:

Material	Density
Rubbing Alcohol	.79
Lamp Oil	.80
Baby Oil	.83
Vegetable Oil	.92
Ice Cube	.92
Water	1.00
Milk	1.03
Dawn Dish Soap	1.06
Light Corn Syrup	1.33
Maple Syrup	1.37
Honey	1.42

Gravimetric testing –example reference test

Gross Weight (g)	-	ATW (g)	=	Actual Quantity (g)	÷	Density P (g/mL)	=	Actual Quantity (mL)	-	Nominal Quantity (mL)	=	Individual package error (mL)
748		225		523		1.025		510		500		+ 10
745		225		520		1.025		507		500		+ 7
744		225		519		1.025		506		500		+ 6
730		225		505		1.025		493		500		- 7
707		225		482		1.025		470		500		- 30

OIML guide G 14 [Edition 2011] details a variety of methods and procedures to determine density R87 suggests a reference temperature of 20°C

This training session will focus on four methods:

1. Hydrometer
2. Pycnomter
3. Electronic density meter
4. Container filled with water to the brim

### Hydrometer

A device used to directly determine the density of a liquid

- It usually consists of a thin glass tube closed at both ends, with one end enlarged into a bulb that contains fine lead shot to cause the instrument to float upright in a liquid.
- In the glass tube is a scale so calibrated that when floating in a liquid, for which it is in the density range for, it will indicate the number of times heavier than liquid it is when read at the liquid surface

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The function of the hydrometer is based on Archimedes principle that a body suspended in a liquid will be buoyed up by a force equal to the weight of the liquid displaced

Thus, the lower the density of the substance, the lower the hydrometer will sink

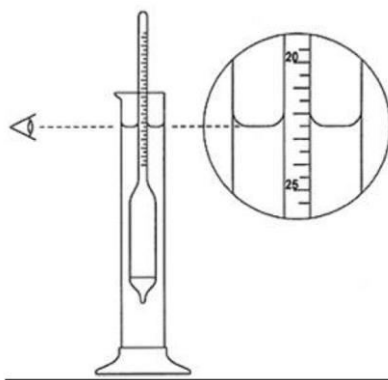
#### Hydrometer procedure:

1. To use the hydrometer, a glass cylinder with an inside diameter of at least 50 mm is required
2. The glass cylinder is filled with the sample under test
3. The hydrometer is lowered carefully into the sample until it floats under its own weight
4. After the hydrometer has settled the density is read; the reading is taken on the line determined by the meniscus

#### Calculate the density of the product:

$\rho = \text{reading} + \text{any correction factor.}$

\* The correction factor will be stated individually on the calibration certificate for each hydrometer

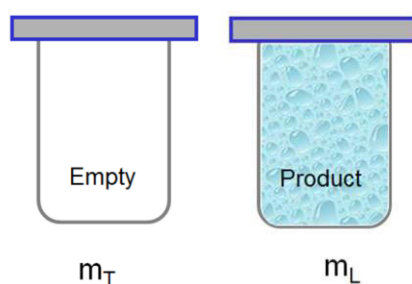


#### Pycnometer

Pycnometer, also known as a density cup, are glass or metal containers with a precisely determined volume that are used to determine the density of a liquid

**Pycnometer procedure:**

1. Weigh the empty density cup with a known volume (V) and glass/metal strike (m<sub>T</sub>)
2. Record the result
3. Brim fill the density cup with product
4. Slide the glass strike across the brim
  - Ensure no air is trapped
  - Top up through the hole in the glass strike.
5. Carefully clean any overflowed product from the density cup and dry thoroughly
6. Weigh the density cup, glass strike and product to find the product weight (m<sub>L</sub>) and record the result.
7. Calculate the density (ρ)
 
$$\rho = (m_L - m_T) \div V$$

**Electronic density meter**

- These instruments calculate the density and display it on the digital readout
- The advantages of using these instruments are:
  - Only a small amount of product is required to measure the density
  - They are easy to clean
  - The time taken to determine the density is very short





### Electronic density meter

To use:

- Calibrate the instrument using distilled water
- Insert the tube into the product and suck product into the vibrating tube
- Read the density from the display

### Container filled to the brim with water

This method uses the product container as a pycnometer but with a strike glass as the lid  
Not suitable for porous products as requires test liquid to be added to the empty space



Requirements of the container:

- Not be deformable
- Have a flat edge

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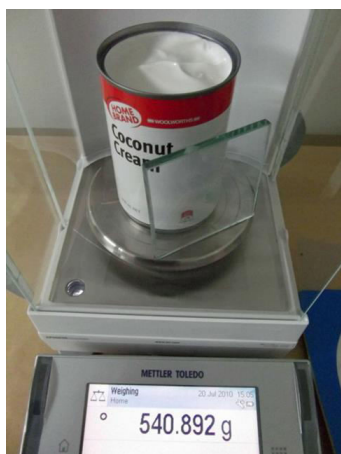
- Be so designed that air cannot be entrapped after complete filling

Required equipment:

- Suitable weighing instrument
- Strike for the top of container
- Distilled water; with an assumed density of 1 g/mL

**Container filled to the brim with water procedure:**

1. Allow the prepackages to stand to settle the product
2. Remove the lid and ensure any product that has adhered to the lid is removed and placed in the prepackage
3. Lightly grease the edge of container with Vaseline
4. Ensure the weighing instrument reads zero
5. Weigh the prepackage and the strike plate and record the result on the test report (MP)



6. Deliver the distilled water into the top of the product until it is almost level with the brim
7. Use a strike plate to ensure the prepackage is filled to the brim
8. Record the weight on the test report (MS)
9. Note: If the container overfills, the test is void
10. Determine the weight of the test liquid by subtracting the weight determined in step 8 from the weight determined in step 5
 
$$M_S - M_P = M_{SP}$$
11. Remove all product from the prepackage and thoroughly clean and dry the empty package
12. Zero the weighing instrument and weigh the packing material (empty package) and the strike plate
13. Record the tare weight on the test report ( $M_T$ )
14. Fill the package to the brim with the distilled water using the strike plate.
15. Record the gross weight of the prepackage and test liquid ( $M_W$ )
16. Determine the net weight of the test liquid by subtracting the tare weight (step 13) from the gross weight (step 15)

$$M_W - M_T = M_{WT}$$

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17. Determine the weight of the test liquid, which substituted for the product being tested, by subtracting the weight determined in step 16 from the weight determined in step 10

$$\text{Weight of test liquid} = M_{TW} - M_{SP}$$

18. Determine the volume of product being tested by dividing the weight of test liquid determined in step 17 with the density of the test liquid used in step 8 & 15 (distilled water has a density of 1)
19. Determine mass of product
20. Determine the density of the product by dividing mass (step 19) with the volume (step 18)

$$\text{density} = \text{mass} \div \text{volume}$$

When you have calculated the density of the product this can then be applied to the actual weight (mass) of the product to determine the volume

$$\text{volume} = \text{mass} \div \text{density}$$

#### Determination of liquid contents by volume.-

- (1) If the specific gravity of the liquid commodity filled in packages remains sufficiently constant for a batch and it is possible to determine accurately its specific gravity the method of determination of net contents by weight, may be used.
- (2) If the method described is not feasible the containers are opened and the contents of each package poured out carefully into the appropriate volume measure.
- (3) The reading of the actual net volume of the commodity in every package shall be noted carefully and recorded in the Form specified in the Seventh Schedule.



Testing for Volume

#### Volumetric Test Procedure for Non-Viscous Liquids

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- If the densities of the liquids vary beyond the specified limit, use the volumetric test procedure

### Test Equipment

- A partial immersion thermometer (or equivalent) with a range of  $-35\text{ }^{\circ}\text{C}$  to  $+50\text{ }^{\circ}\text{C}$  with  $1\text{ }^{\circ}\text{C}$  graduations, accuracy of  $\pm 1\text{ }^{\circ}\text{C}$
- Volumetric measures and flask sizes of 100 mL, 200 mL, 500 mL, 1 L, 2 L, 4 L, and 5 L and a 50 mL cylindrical graduate with 1 mL divisions .
- Defoaming agents for testing liquids such as beer and soft drinks that effervesce or are carbonated.
- Two such products are Hexanol or Octanol (Capryl Alcohol or similar products).
- Bubble level at least 152 mm in length
- Stopwatch

### Test Procedure

1. Define the Inspection Lot and sampling plan in the inspection. Select a random sample.
2. Bring the sample packages and their contents to the reference temperature.
- 3- **Reference Temperatures for Liquids.**

Reference Temperatures for Liquids	
If the liquid commodity is:	Volume is determined at the reference temperature of:
Malt (Beer)	$4\text{ }^{\circ}\text{C}$
Distilled Spirits	$15.56\text{ }^{\circ}\text{C}$
Frozen food - sold and consumed in the frozen state	At the frozen temperature
Petroleum	$15.6\text{ }^{\circ}\text{C}$
Refrigerated food (e.g., milk and other dairy products labeled "KEEP REFRIGERATED")	$4\text{ }^{\circ}\text{C}$
Other liquids and wine (e.g., includes liquids sold in a refrigerated state for immediate customer consumption such as soft-drinks, bottled water and others that do not require refrigeration)	$20\text{ }^{\circ}\text{C}$

4. if the liquid is at its reference temperature,
5. immerse the thermometer in the liquid before starting the test.
6. Verify the temperature again immediately after the flask and liquid is weighed.
7. If the product requires mixing for uniformity,
8. mix it before opening
9. Shaking liquids, such as flavored milk,
10. often entrapped air that will affect volume measurements,
11. so use caution when testing the products.

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12. Often, less air is entrapped if the package is gently rolled to mix the contents.
13. For milk, select a volumetric measure equal to or one size smaller than the label declaration.
14. For all other products, select a volumetric measure that is one size smaller than the label declaration.

**Example:**

*If testing a 1 L bottle of juice or a soft drink, select a 500 mL volumetric measure.*

**Note:** When determining the density of milk, if the product does not fill the volumetric measure to the nominal capacity graduation, product may be added from another container to maintain integrity (i.e., brand, identity, lot code, and temperature).

15. Prepare a clean volumetric measure to use according to the following procedure:

- a) flasks are ordinarily calibrated on a “to deliver”
- b) wet down flasks before using, with water
- c) The water should be at the reference temperature of the product being tested.
- d) Fill the flask(s) with water to a point slightly below the top graduation on the neck.
- e) The flask should be emptied in 30 seconds ( $\pm 5$  seconds).
- f) Tilt the flask gradually so the flask walls are splashed as little as possible as the flask is emptied.
- g) When the main flow stops, the flask should be nearly inverted.
- h) Hold the flask in this position for 10 seconds more
- i) touch off the drop of water that adheres to the tip.
- j) If necessary, dry the outside of the flask.
- k) This is called the “wet down” condition.
- l) The flask or graduate is then ready to fill with liquid from a package.

**Note:** When using a volumetric measure that is calibrated “to contain,” the measure must be dry before each measurement.

16. If the liquid effervesces or foams when opened or poured (such as carbonated beverages),
17. add two drops of a defoaming agent to the bottom of the flask before filling with the liquid.
18. If working with a carbonated beverage, make all density determinations immediately upon placing the product into the standard.
19. This reduces the chance of volume changes occurring from the loss of carbonization.
20. If the flask capacity is equal to the labeled volume,
21. pour the liquid into the volumetric measure tilting the package to a nearly vertical position.
22. If the flask capacity is smaller than the package’s labeled volume, fill the flask to its nominal capacity graduation.
23. Position the flask on a level surface at eye level.
24. For clear liquids, place a material of some dark colour outside the flask immediately below the level of the meniscus.
25. Read the volume from the lowest point of the meniscus.
26. For opaque liquids, read volume from the center top rim of the liquid surface.
27. while draining the container into the flask for 1 minute after the stream of liquid breaks into drops.
28. Read the package errors directly from the graduations on the measure.
29. The reference temperature must be maintained within  $\pm 2$  °C for the entire sample.

**30. Evaluation of Results**

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### Volumetric Test Procedures for Viscous Fluids – Headspace

- Depending on the surface level of the commodity
- use one of two headspace test procedures.
- Use the headspace test procedure: where the liquid has a level surface (e.g., oils, syrups, and other viscous liquids).
- Use the procedure where the commodity does not have a level surface (e.g., mayonnaise and salad dressing).
- Before conducting test, Define the Inspection Lot, sampling plan, select a random sample,
- .

### Test Equipment

- Micrometer depth gage (ends of rods fully rounded) 0 mm to 225 mm or longer
- Level at least 150 mm in length
- Laboratory pipets of deliver type
- Laboratory buret of 10 mL
- Volumetric measures
- Water
- Rubber bulb syringe
- Plastic disks that are 3 mm thick with diameters equal to the seat diameter or larger than the brim diameter of each container to be tested.
- diameter tolerance for the disks is  $50 \mu\text{m} \pm 0.05 \text{ mm}$
- outer edge should be smooth and beveled at a  $30^\circ$  angle with the horizontal to  $800 \mu\text{m}$  (0.8 mm) thick at the edge.
- Each disk must have a 20 mm diameter hole through its center and a series of 1.5 mm diameter holes 25 mm apart around the periphery of the disk and 3 mm from the outer edge.
- All edges must be smooth.
- Stopwatch
- Partial immersion thermometer (or equivalent) with  $1^\circ\text{C}$  graduations having a range of  $-35^\circ\text{C}$  to  $+50^\circ\text{C}$  with accuracy  $\pm 1^\circ\text{C}$

### Test Procedures

#### Test procedure for testing Oil, Syrups, and other viscous liquids, with a smooth and level surface:

- 1) Use the volumetric headspace procedure described to determine volume when the commodity has a level surface.
- 2) Open every package in the sample.  
**Note:** Make all measurements on a level surface.
- 3) Bring the temperature of both the liquid and the water to be used to measure the volume of the liquid to the reference temperature specified
- 4) Verify with a thermometer that the product has maintained the reference temperature.
- 5) Measure the headspace of the package at the point of contact with the liquid using a depth gage with a fully rounded, rather than a pointed, rod end.
- 6) If necessary, support the package to prevent the bottom of the container from distorting.
- 7) Empty, clean, and dry the package.
- 8) Refill the container with water measured from a volumetric standard to the original liquid headspace level measured as above, until the water touches the depth gage.

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- 9) Determine the amount of water used in this procedure to obtain the volume of the liquid
- 10) calculate the “package error” based on that volume.  
*Package Error = Labeled Value – Measured Volume*

**(b) Test procedures to Mayonnaise, Salad dressing, water immiscible, products with no smooth and level surface;**

- 1) Use the following volumetric headspace procedure to determine volume when the commodity does not have a level surface (e.g., mayonnaise, salad dressing, and other water immiscible products without a level liquid surface).
- 2) The procedure guides the inspector to determine the amount of headspace above the product in the package and the volume of the container.
- 3) Determine the product volume by subtracting the headspace volume from the container volume.
- 4) Open and test every package in the sample.
- 5) **Note:** Make all measurements on a level surface.
- 6) Bring the temperature of both the commodity and the water used to measure the volume to the appropriate temperature
- 7) Open the first package and place a disk larger than the package container opening over the opening.
- 8) 3. Measurement Procedure:
  - a) Deliver water from a flask (or flasks), graduate, or buret,
  - b) Deliver through the central hole in the disk onto the top of the product until the container is filled.
  - c) If it appears that the contents of the flask may overflow the container,
  - d) do not empty the flask,
  - e) Add water until all of the air in the container has been displaced
  - f) Then water begins to rise in the center hole of the disk.
  - g) Stop the filling , when the water fills the center disk hole and domes up slightly
  - h) Do not add additional water after the level of the water dome has dropped.
  - i) If the water dome breaks on the surface of the disk, the container has been overfilled
  - j) the test is void; dry the container
  - k) start over.
- 9) To obtain the headspace capacity, record the volume of water used to fill the container and subtract 1 mL which is the amount of water held in the hole in the disk specified.
- 10) Empty, clean, and dry the package container.
- 11) Repeat the procedure, refill the package container with water measured from a volumetric measure to the maximum capacity of the package, subtract 1 mL
- 12) record the amount of water used as the container volume;
- 13) From the container volume determined, subtract the headspace capacity , to obtain the measured volume of the product.
- 14) Calculate the package error.

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## Goods Labeled by Capacity – Volumetric Test Procedure

### Test Equipment

- Micrometer depth gage (ends of rods fully rounded) 0 mm to 225 mm or longer
- Level at least 150 mm in length
- Laboratory pipets of deliver type
- Laboratory buret of 10 mL
- Volumetric measures
- Water
- Rubber bulb syringe
- Plastic disks that are 3 mm thick with diameters equal to the seat diameter or larger than the brim diameter of each container to be tested.
- diameter tolerance for the disks is  $50 \mu\text{m} \pm 0.05 \text{ mm}$
- outer edge should be smooth and beveled at a  $30^\circ$  angle with the horizontal to  $800 \mu\text{m}$  (0.8 mm) thick at the edge.
- Each disk must have a 20 mm diameter hole through its center and a series of 1.5 mm diameter holes 25 mm apart around the periphery of the disk and 3 mm from the outer edge.
- All edges must be smooth.
- Stopwatch
- Partial immersion thermometer (or equivalent) with  $1^\circ\text{C}$  graduations having a range of  $-35^\circ\text{C}$  to  $+50^\circ\text{C}$  with accuracy  $\pm 1^\circ\text{C}$

### Test Procedure

**Note:** ensure all measurements on a level surface.

- 1) Before conducting test, Define the Inspection Lot, sampling plan, select a random sample.
- 2) When testing use water at a reference temperature of  $20^\circ\text{C} \pm 2^\circ\text{C}$
- 3) Select a sample container
- 4) place a disk larger than the container opening over the opening.
- 5) Measurement Procedure:
  - a. Add water to the container using flask (or flasks), graduate, or buret corresponding to labeled capacity of the container.
  - b. If flask over fill the container, do not empty the flask.
  - c. Add water until all of the air in the container is displaced
  - d. water begins to rise in the center hole of the disk.
  - e. Stop filling the container when the water fills the center disk hole and domes up slightly
  - f. If the water dome breaks on the surface of the disk, the container has been overfilled
  - g. the test is void; dry the container
  - h. start over.
  - i. Record the amount of water used to fill the container

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- j. subtract 1 mL of water held in the hole in the disk
  - k. obtain the total container volume.
- 6) Repeat the Test the other containers in the sample
  - 7) determine package errors,

### Pressed and Blown Glass Tumblers and Stemware

It provides maximum tolerance to the labeled capacity of glass tumblers and stemware.

The average requirement does not apply to these products, namely Pressed and Blown Glass Tumblers and Stemware.”

#### Test Equipment

##### Test Equipment

- Micrometer depth gage (ends of rods fully rounded) 0 mm to 225 mm or longer
- Level at least 150 mm in length
- Laboratory pipets of deliver type
- Laboratory buret of 10 mL
- Volumetric measures
- Water
- Rubber bulb syringe
- Plastic disks that are 3 mm thick with diameters equal to the seat diameter or larger than the brim diameter of each container to be tested.
- diameter tolerance for the disks is  $50 \mu\text{m} \pm 0.05 \text{ mm}$
- outer edge should be smooth and beveled at a  $30^\circ$  angle with the horizontal to  $800 \mu\text{m}$  (0.8 mm) thick at the edge.
- Each disk must have a 20 mm diameter hole through its center and a series of 1.5 mm diameter holes 25 mm apart around the periphery of the disk and 3 mm from the outer edge.
- All edges must be smooth.
- Stopwatch
- Partial immersion thermometer (or equivalent) with  $1^\circ\text{C}$  graduations having a range of  $-35^\circ\text{C}$  to  $+50^\circ\text{C}$  with accuracy  $\pm 1^\circ\text{C}$

#### Test Procedure

**Note:** ensure all measurements on a level surface.

- 8) Before conducting test, Define the Inspection Lot, sampling plan, select a random sample.
- 9) When testing use water at a reference temperature of  $20^\circ\text{C} \pm 2^\circ\text{C}$
- 10) Select a sample container
- 11) place a disk larger than the container opening over the opening.
- 12) Measurement Procedure:
  - a. Add water to the container using flask (or flasks), graduate, or buret corresponding to labeled capacity of the container.
  - b. If flask over fill the container, do not empty the flask.
  - c. Add water until all of the air in the container is displaced
  - d. water begins to rise in the center hole of the disk.

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- e. Stop filling the container when the water fills the center disk hole and domes up slightly
  - f. If the water dome breaks on the surface of the disk, the container has been overfilled
  - g. the test is void; dry the container
  - h. start over.
  - i. Record the amount of water used to fill the container
  - j. subtract 1 mL of water held in the hole in the disk
  - k. obtain the total container volume.
- 13) Repeat the Test the other containers in the sample
- 14) determine package errors,

**Compare the individual container error with the allowable difference :**

- Compare the individual container error with the allowable difference
- The allowable differences that applies for Pressed and Blown Glass Tumblers and Stemware., specified below in the Table.
- If a package contains more than one container, all of the containers in the package must meet the allowable difference requirements in order for the package to pass.

Allowable Differences for Pressed and Blown Glass Tumblers and Stemware	
Make sure these values in use:	
Unit of Measure	
If the capacity in metric units is:	The allowable difference is:
200 mL or less	± 10 mL
More than 200 mL	± 5 % of the labeled capacity

**Volumetric Test Procedure for Paint, Varnish, and Lacquers – Non-Aerosol**

- Use one of three different test methods
- Select depending upon degree of accuracy and the location of the inspection required.
- The procedures include both retail and in-plant audits, and for laboratory or in plant
- It is used because of cleanup and product collection requirements.
- The procedures are suitable to use with products labeled by volume , and
- packaged in cylindrical containers with separate lids that can be resealed.

**Test Equipment**

- A suitable weighing machine
- Volumetric measures
- Micrometer depth gage (ends of rods fully rounded), 0 mm to 225 mm
- Diameter (Pi) tape measure, 50 mm to 304 mm
- Spanning bar, 25.4 mm × 25.4 mm × 304 mm
- Ruler, 304 mm
- Paint solvent or other solvent suitable for the product being tested
- Cloth, 304 mm square
- Wood, 50 mm thick × 150 mm wide × 300 mm long

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- Rubber mallet
- Metal disk, 6.4 mm thick and slightly smaller than the diameter of package container bottom
- Rubber spatula
- Level at least 152 mm in length
- Micrometer (optional)
- Stopwatch

### Test Procedures

#### Field (Retail) Audit Test Procedure:

- Conduct a retail audit suitable for checking cylindrical containers up to 4 L in capacity.
  - Use the field (retail) auditing test procedure with any size container except 4 L
  - used for containers with capacities of 4 L
  - The method determines the volume of a single can in the sample selected as most likely to contain the smallest volume of product.
  - Do not empty any containers since only their critical dimensions are being measured.
  - The configuration of the:
    - bottom of the can,
    - paint clinging to the lid, and
    - slight variations in the wall and
    - label thicknesses of the paint container
 may produce an uncertainty estimated to be at least 0.6% in this auditing procedure.
- 1) this method is recommended solely to eliminate from more rigorous testing those packages that appear to be full measure.
  - 2) Use the violation procedures when the volume determined is less than the labeled volume or in any case where short measure is suspected.
    - 1) Select a random sample.
    - 2) A tare sample is not needed.
    - 3) For containers less than 4 L
    - 4) Measure the outside diameter of each container near its middle to the closest 0.02 mm using a diameter tape.
    - 5) Record the measurements
    - 6) Place the containers on a level surface
    - 7) using the micrometer depth gage, record their heights in the worksheet.
  - 3) If the range of outside diameters exceeds 0.125 mm or the range in heights exceeds 1.58 mm,
  - 4) do not use this procedure.
  - 5) If the ranges are within the specified limits,
  - 6) weigh all cans in the sample,
  - 7) select the container with the lightest gross weight,
  - 8) remove its lid.
  - 9) Use a direct reading diameter tape measure
  - 10) measure the outside diameter of the selected container near its top, middle, and bottom to the closest 0.02 mm
  - 11) Record these measurements in worksheet
  - 12) Add the three diameter values and divide by three to obtain the average diameter
  - 13) record this value in worksheet.
  - 14) If a micrometer is available, measure the wall and the paper label thickness of the container;
  - 15) otherwise, assume the wall and label thicknesses given in Table “Thickness of Paint Can Walls and Labels” below:

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- 16) Subtract twice the thickness of the wall of the can and paper label from the average can diameter
- 17) obtain the average liquid diameter.
- 18) Record the liquid diameter in worksheet
- 19) On a level surface, place the container on the circular metal disk that is slightly smaller in diameter than the lower rim of the can
- 20) the bottom of the container nests on the disk
- 21) eliminate any "sag" in the bottom of the container.
- 22) Place the spanning bar and depth gage across the top of the paint can
- 23) mark the location of the spanning bar on the rim of the paint container.
- 24) Measure the distance to the liquid level, to the nearest 20  $\mu\text{m}$  (0.02 mm), at three points in a straight line.
- 25) Take measurements at points approximately 1 cm from the inner rim for cans 12.5 cm in diameter or less
- 26) at 1.5 cm from the rim for cans exceeding 12.5 cm in diameter and at the center of the can.
- 27) Add the three readings and divide by three to obtain the average distance to the liquid level in the container.
- 28) Record the average distance to the liquid level in worksheet.
- 29) Measure the distance to the bottom of the container at three points in a straight line in the same manner as outlined above
- 30) Add the three readings and divide by three to obtain the average height of the container and record it
- 31) Subtract the average distance to the liquid level from the average height of the container to obtain the average height of the liquid column and record it
- 32) Determine the volume of paint in the container by using the following formula:  

$$\text{Volume} = 0.7854 D^2 H$$
- 33) Where D = average liquid diameter and
- 34) H = average liquid height
- 35) Record this value
- 36) If the calculated volume is less than labeled volume,
- 37) go to the "Violation Procedure."

Thickness of Paint Can Walls and Labels	
Can Size	Wall Thickness
4 L	250 $\mu\text{m}$ (0.25 mm)
2 L	
1 L	230 $\mu\text{m}$ (0.23 mm)
500 mL	
250 mL	200 $\mu\text{m}$ (0.20 mm)
Label Thickness* for all can sizes: 100 $\mu\text{m}$ (0.10 mm) [0.004 in] (*Paper only - ignore labels lithographed directly onto the container)	



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Example: Audit Worksheet for Checking Paint (add additional rows as needed)										
Can Diameter										
1. Can Height	2. Top	3. Middle	4. Bottom	5. Average	6. Avg. Liquid Diameter (D)	7. Avg. Liquid Level	8. Avg. Container Depth	9. Avg. Liquid Depth (H)	10. Volume (0.7854D <sup>2</sup> H)	

Volume = 0.7854 × D × D × H

**In Plant Test Procedures:****Audit Test Procedures:**

- 1) Use the following procedure to conduct an in-plant inspection.
- 2) This method applies to a container that contains the smallest volume of product.
- 3) Duplicate the level of fill with water in a can of the same dimensions as the one under test.
- 4) Use this method to check any size of package if the liquid level is within the measuring range of the depth gage.
- 5) If any paint is clinging to the sidewall or lid, carefully scrape the paint into the container using a rubber spatula.
  - a) Select a random sample.
  - b) A tare sample is not needed.
  - c) For containers less than 4 L
  - d) Measure the outside diameter of each container near its middle to the closest 0.02 mm using a diameter tape.
  - e) Record the measurements
  - f) Place the containers on a level surface
  - g) using the micrometer depth gage, record their heights in the worksheet.
- 6) If the range of outside diameters exceeds 0.125 mm or the range in heights exceeds 1.58 mm,
- 7) do not use this procedure.
- 8) If the ranges are within the specified limits,
- 9) weigh all cans in the sample,
- 10) select the container with the lightest gross weight,
- 11) remove its lid.
- 12) Use a direct reading diameter tape measure
- 13) measure the outside diameter of the selected container near its top, middle, and bottom to the closest 0.02 mm
- 14) Record these measurements in worksheet
- 15) Add the three diameter values and divide by three to obtain the average diameter
- 16) record this value in worksheet.
- 17) If a micrometer is available, measure the wall and the paper label thickness of the container;

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- 18) otherwise, assume the wall and label thicknesses given in Table “Thickness of Paint Can Walls and Labels” below:
- 19) Subtract twice the thickness of the wall of the can and paper label from the average can diameter
- 20) obtain the average liquid diameter.
- 21) Record the liquid diameter in worksheet
- 22) On a level surface, place the container on the circular metal disk that is slightly smaller in diameter than the lower rim of the can
- 23) the bottom of the container nests on the disk
- 24) eliminate any “sag” in the bottom of the container.
- 25) Place the spanning bar and depth gage across the top of the paint can.
- 26) Measure the liquid level at the center of the surface and record the level
- 27) Select an empty can with the same bottom configuration as the container under test
- 28) The diameter and height equal to that of the container under test within plus or minus the following tolerances:
  - For 500 mL cans - within 25  $\mu\text{m}$  (0.025 mm)
  - For 1 L cans - within 50  $\mu\text{m}$  (0.05 mm)
  - For 2 L cans - within 75  $\mu\text{m}$  (0.075 mm)
  - For 4 L cans - within 100  $\mu\text{m}$  (0.1 mm)
- 29) Set the empty can on a level work surface with a circular metal disk
- 30) that is slightly smaller in diameter than the bottom can rim underneath the can
- 31) eliminate sag.
- 32) Set up the spanning bar and depth gage
- 33) Fill the container with water from a volumetric measure of the same volume as the labeled volume.
- 34) Measure the distance to the liquid level at the center of the container and record this level
- 35) If this distance is equal to or greater than the distance determined
- 36) assume that the package is satisfactory.
- 37) If the distance is less than the distance determined
- 38) the product may be short measure.
- 39) When the test indicates that short measure, use the “Violation Procedure”

### Violation Procedure:

**Note:** Do not shake or invert the containers selected as the sample.

- 1) Define the Inspection Lot, sampling plan to use; select a random sample.
- 2) if there is paint adhering to the lid and it cannot be removed by scraping into the can.
- 3) Determine the gross weight of these packages and record
- 4) Record the labeled volume of the first tare sample package in the worksheet.
- 5) Use a circular metal disk to eliminate can “sag”
- 6) remove the lid.
- 7) If paint clings to the lid of the container, scrape it off with a spatula.
- 8) If paint that adheres to the lid cannot be completely removed by scraping the paint into the can,
- 9) determine the weight of the lid plus any adhering paint.
- 10) Clean (dry) the paint lid with solvent and weigh again.
- 11) Subtract the clean (dry) lid weight from the lid weight with paint (wet)

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- 12) determine the weight of the paint adhering to the lid. Record this weight
- 13) Place the spanning bar and depth gage across the top of the paint can.
- 14) Mark the location of the spanning bar on the rim of the paint container.
- 15) Measure the distance to the liquid level at the center of the container to the nearest 20  $\mu\text{m}$  (0.02 mm). Record the distance
- 16) Empty and clean the sample container and lid with solvent; dry and weigh the container and lid. Record the tare weight
- 17) Set up the container in the same manner specified above
- 18) Place the spanning bar at the same location on the rim of the paint container as marked
- 19) With the depth gage set, deliver water into the container in known amounts until the water reaches the same level occupied by the paint as indicated by the depth gage.
- 20) Record this volume of water (in mL) in the worksheet.
- 21) This is the volume occupied by the paint in the container.
- 22) Repeat the procedure, if scraping does not remove the paint from the lid.
- 23) Use gravimetric testing to test the other packages in the sample, follow only, when no paint adheres to the lid.
- 24) Subtract the weight of the container from the gross weigh
- 25) arrive at the net weight of paint in the selected container.
- 26) Record the net weigh in the worksheet.
- 27) Subtract the weight of the container and the weight of product on the lid from the gross weight
- 28) arrive at the net weight of paint in the container.
- 29) Record excluding the weight of the paint on the lid
- 30) Calculate the weight of the labeled volume of paint (for the first package opened for tare).  
net weight  $\times$  labeled volume  $\div$  volume of paint in can
- 31) Calculate the package volume = volume in can + (lid weight  $\times$  volume in can net weight )
- 32) Record it in the worksheet.
- 33) Calculate the package error.
- 34) When paint does not adhere to the lid.
- 40) When paint does adhere to the lid and will not come off by scraping.
- 41) Repeat for the second package chosen for tare.

Use the following method if the liquid level is within the measuring range of the micrometer.

Example Worksheet for Possible Violation in Checking Paint (add additional rows as needed)								
1. Labeled Volume	2. Gross Weight	3. Lid Weight (Wet - Dry)	4. Liquid Level	5. Tare	6. Water Volume	7. Net Wt. = 2 - 5	8. Weight of Labeled Volume = $7 \times 1 \div$ 6	9. Package Volume = $6 + [(3 \div$ $7) \times 6]$

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**Note:** A gravimetric procedure can be used if the weights of the labeled volume for the first two packages do not differ from each other by more than one division on the scale

**Note:** weight of a given volume of paint often varies considerably from container to container; therefore, volumetric measurements may prove necessary for the entire sample.

### Evaluation of Results

Evaluate for Compliance to determine lot conformance.

### Testing Viscous Materials – Such As Caulking Compounds and Pastes

- Use the following procedure for any package of viscous material labeled by volume.
- It is suitable for very viscous materials such as cartridge-packed caulking compounds, glues, pastes, and other similar products.
- It is best to conduct this procedure in a laboratory using a hood to ventilate solvent fumes.
- If used in the field, perform the test in a well-ventilated area.

### Test Equipment

- A weighing machine and a standard weights
- Pycnometer (pik·nām´ ət ər), a vessel of known volume used for weighing semi fluids.
  - Pycnometer can be bought or made.
  - Making of Pycnometer: it is a “density cup.”
  - To make a 150 mL density cup,
  - cut off the lip of a 150 mL beaker with an abrasive saw
  - grind the lip flat on a lap wheel. The slicker plate is available commercially.
  - calibrate the density cup gravimetrically with respect to the contained volume using the procedure as defined in the ASTM E542, “Standard Practice for Calibration of Laboratory Volumetric Apparatus.”
- Appropriate solvents (water, Stoddard solvent, kerosene, alcohol, etc.)
- Caulking gun (for cartridge packed products)

### Test Procedure:

- 1) Define the Inspection Lot, sampling plan, and select a random sample.
- 2) Weigh a calibrated pycnometer and slicker plate and record as “pycnometer weight” and record the volume of the pycnometer.
- 3) Determine the gross weight of the first package and record the weight value.
- 4) Open the package and transfer the product to the pycnometer by filling it to excess.
- 5) Use a caulking gun to transfer product from the caulking cartridges.
- 6) If using a pycnometer, cover it with a lid and screw the cap down tightly.
- 7) Excess material will be forced out through the hole in the lid, so the lid must be clean.
- 8) If using a density cup, place the slicker plate over  $\frac{3}{4}$  of the cup mouth,
- 9) press down and slowly move the plate across the remainder of the opening.
- 10) With the slicker plate in place, clean all the exterior surfaces with solvent and dry.
- 11) remove the product from the package container completely
- 12) clean the package container with solvent; dry and weigh it
- 13) determine the tare weight.
- 14) Weigh the filled pycnometer or filled density cup with slicker plate and record this weight.

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- 15) Subtract the weight of the empty pycnometer from the filled weight
- 16) determine the net weight of the product contained in the pycnometer and record this weight.
- 17) Clean the pycnometer and repeat for the second package in the tare sample.
- 18) Determine acceptability of the density variation on the two packages selected for tare.
- 19) If the difference between the densities of the two packages exceeds one division of the scale,
- 20) Not use gravimetric procedure to determine the net quantity of contents.  
*Weight of Product in Pycnometer ÷ Pycnometer Volume = Product Density*
- 21) **Note:** If the gravimetric procedure can be used, perform test for each package in the sample, as under.
- 22) Calculate the weight of product corresponding to the labeled volume of product
- 23) Use the following formula:

$$\text{Product Density} \times \text{Labeled Volume} = \text{Labeled Weight}$$

- 24) Test each package individually by determining the product density in each package using the pycnometer
- 25) record the gross, tare, and net weight of each package.
- 26) Subtract the weight of the labeled volume (determined for each package) from the net weight of product to arrive at each individual package error in units of weight.
- 27) Convert the package errors to units of volume using the following formula:  
Package Error (volume) =  
(Package Error [weight] × Pycnometer Volume) ÷ (Weight of Product in Pycnometer)
- 28) Record the package errors on the report form, using an appropriate unit of measure.

### Ice Cream:

**Note:** The following procedure can be used to test packaged products that are solid or semisolid and that will not dissolve in, mix with, absorb, or be absorbed by the fluid into which the product will be immersed.

For example, ice cream labeled by volume can be tested using ice water or kerosene as the immersion fluid.

The following volume displacement procedure uses a displacement vessel specifically designed for ice cream such as ice cream bars, ice cream sandwiches, or cones. The procedure determines the volume of the product by measuring the amount of water displaced when the product is immersed in the vessel.

Two displacements per sample are required to subtract the volume of sticks or cups.

If the densities of the product are the same in the same lot, a gravimetric test can be used, to verify the labeled volume.

If a gravimetric procedure is used, compute an average weight for the declared volume from the first two packages and weigh the remainder of the sample.

If the gravimetric procedure cannot be used, use the volume displacement procedure for all of the packages in the sample.

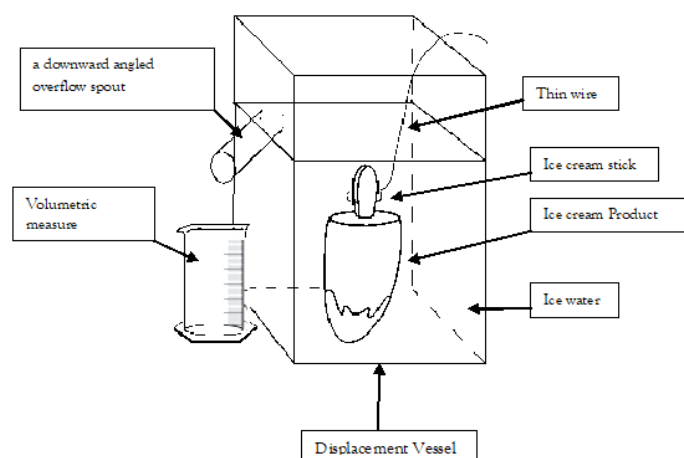
### Test Equipment

- A weighing machine and a standard weights

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- Volumetric measures
- Displacement vessel with dimensions appropriate for the size of products
- The Displacement vessel includes an interior baffle that reduces wave action when the product is placed and a downward angled overflow spout to reduce dripping. Other designs may be used.



Example of a Displacement Vessel.

- Thin wire, clamp, or tongs
- Freezer or ice chest and dry ice
- Single-edged razor or sharp knife (for sandwiches only)
- Ice water/kerosene maintained at 1 °C (33 °F) or below
- Indelible marker (for ice pops only)
- Level, at least 152 mm (6 in) in length
- A partial immersion thermometer (or equivalent) with a range of - 1 °C to + 50 °C having at least 1 °C graduations, and with a tolerance of ± 1 °C
- A table top, laboratory-type jack of sufficient size to hold the displacement vessel
- Stopwatch

### Test Procedure

- 1) Define the Inspection Lot, sampling plan in the inspection; and select a random sample.
- 2) Maintain the samples at the reference temperature for frozen products that is specified in the Table of "Reference Temperatures for Liquids."
- 3) Place the samples in the freezer or ice chest until they are ready to be tested,
- 4) then remove packages from the freezer one at a time.
- 5) prepare the sample products, According to the type of product as follows:
  - a) **Ice-pop.** Mark on the stick(s) with the indelible marker the point to which the pop will be submerged in the ice water. After the ice-pop contents have been submerged, determine the volume of the stick
  - b) **Cone.** Make a small hole in the cone below the ice cream portion to allow air to escape.
  - c) **Sandwich:** (i) the total volume of the product (including the cookie portion) or (ii) the volume of the ice-cream-like portion only. If the declared volume is the volume of only the ice-cream-like portion, shave off the cookie with a razor or knife, leaving some remnants of

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cookie to ensure that no ice cream is accidentally shaved off. Work quickly, and return the product to the freezer before the sandwich softens.

- d) **Cup.** Remove the cap from the cup.
- 6) Fill the displacement vessel with ice water until it overflows the spout.
- 7) Allow it to sit until dripping stops.
- 8) Raise the displacement vessel
- 9) place the graduate beneath the spout.
- 10) Remove a package from the freezer, determine its gross weight, and record it.
- 11) Immerse the product until it is below the surface level of the water.
- 12) Ice-pop. Use a clamp, tongs, or your fingers to hold the stick(s). the pop to the level marked
- 13) Cone. Shape the wire into a loop, and use it to push the cone, headfirst (ice cream portion first) into the ice water. Do not completely immerse the cone immediately: let water fill the cone through the hole made in it, before completely submerging
- 14) Sandwich or cup. Skewer the product with the thin wire or form a loop on the end of the wire to push the sandwich or ice cream portion or cup completely below the liquid level.
- 15) Record the total water volume in the graduate.
- 16) For a cone or sandwich, record the water volume as the net volume
- 17) For ice-pops or cups, record the water volume in the graduate as the gross volume
- 18) Refill the displacement vessel with water to overflowing and reposition the empty graduate under the spout. After the cup and product contents are immersed, remove the product from the cup to determine the volume of the cup.
- 19) **Ice-pop.** Melt the ice-pop off the stick or sticks.
- 20) Submerge the stick or sticks to the line marked
- 21) Record the volume of tare material (i.e., stick) by measuring the water displaced into the graduate.
- 22) The net volume for the ice-pop is the gross volume recorded minus the volume of the tare materials
- 23) Record this volume as the "volume of product"
- 24) To determine the error in the package, subtract the labeled quantity from the volume of product
- 25) **Cup.** Remove the novelty from the cup. Rinse the cup, and then immerse it in the displacement vessel. Small pinholes in the base of the cup can be made to make immersing easier. Record the volume of water displaced into the graduate by the cup as the volume of tare material. The net volume for the product is the gross volume determined minus the volume of the tare materials determined. Record this as the net volume of the product. To determine the error in the package, subtract the labeled quantity from the volume of Product.
- 26) **Clean and air-dry** the tare materials (sticks, wrappers, cup, lid, etc.). Weigh and record the weight of these materials for the package.
- 27) Subtract the tare weight from the gross weight to obtain the net weight and record this value.
- 28) Compute the weight of the labeled volume for the package using the following formula and then record the weight:
 
$$\text{Product Density} = (\text{product net weight}) \div (\text{the total water volume} - \text{volume of tare material})$$

$$\text{Weight of labeled volume} = (\text{labeled volume}) \times (\text{Product Density})$$
- 29) Repeat for a second package.
- 30) If the weight of the labeled volumes for the two packages differs from each other by more than one division on the scale, the gravimetric test procedure cannot be used to test the sample for compliance.

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- 31) If this is the case, use for each of the remaining packages in the sample to determine their net volumes and package errors.
- 32) Then evaluation of results.
- 33) If the weights of the labeled volumes agree within one division, continue using the gravimetric test procedure.
- 34) determine the Average Used Dry tare Weight of the sample.
- 35) Find the Average Product Density by adding the densities of the product from the two packages and dividing the sum by two.
- 36) Using the weight of labeled volume determined, calculate the Average Product Weight by multiplying the weight of the labeled volume by the average product density.  
Average Product Weight = Labeled Volume × Average Product Density
- 37) Calculate the “nominal gross weight” using the formula:  
Nominal Gross Weight = Average Product Weight + Average Used Dry Tare Weight
- 38) Weigh the remaining packages in the sample.
- 39) Subtract the nominal gross weight from the gross weight of each package to obtain package errors in terms of weight.
- 40) Note: Compare the sample packages to the nominal gross weight.
- 41) Determine the average package error by totaling all package errors and dividing by the number of packages in the sample.
- 42) To convert the average error or package error from weight to volume, use the following formula:  
Package Error in Volume = (Package Error in Weight) ÷ (Average Product Density)

### Fresh Oysters Labeled by Volume

fresh oysters removed from the shell labeled by volume.

#### Test Equipment

- A weighing machine and a standard weights
- Volumetric measures
- Micrometer depth gage (ends of rods fully rounded), 0 mm to 228 mm
- Strainer for determining the amount of drained liquid from shucked oysters.
- Use a strainer and a slightly smaller bottom receiving pan or tray having size: 50 mm Sides, 1935 cm<sup>2</sup> Area, or more for each 4 L of oysters, 6 mm dia, locate at 3 cm apart in a square pattern, or perforations.
- Spanning bar, 25.4 mm × 25.4 mm × 304 mm
- Rubber spatula
- Partial immersion thermometer, 1 °C graduations and a range of - 35 °C to + 50 °C having accuracy of ±1 °C
- Level, at least 152 mm (6 in) in length
- Stopwatch

#### Test Procedure

**Note:** Test the oysters at a temperature of 7 °C (± 1 °C)

1. Define the Inspection Lot, sampling plan in the inspection; and select a random sample.

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2. Determine and record the gross weight of a sample package.
3. Set the container on a level surface and open it.
4. Use a depth gage to determine the level of fill.
5. Lock the depth gage.
6. Mark the location of the gage on the package.
7. Weigh a dry receiving pan and record the weight.
8. Set strainer over the receiving pan.
9. Pour the contents from the container onto the strainer without shaking it.
10. Drain for two minutes.
11. Remove strainer with oysters.
12. Allow the mucous (which is part of the product) to stay with the product
13. do not force the mucous to pass through.
14. Weigh the receiving pan and liquid and record the weight.
15. Subtract the weight of the dry receiving pan from the weight of pan and liquid
16. obtain the weight of free liquid and record the value.
17. Clean, dry, and weigh the container and record the tare weight.
18. Subtract the tare weight from the gross weight to obtain the total weight of the oysters and liquid
19. record this value.
20. Determine and record the percent of free liquid by weight as follows:

*Percent of free liquid by weight = [(weight of free liquid) ÷ (weight of oysters + liquid)] × 100*

*or*

$(W_L \div W_{OL}) \times 100 = \text{Percentage of Free Liquid by Weights}$

*Where:*

$W_L = \text{Weight of Free Liquid}$

$W_{OL} = (\text{Net Weight of Oysters} + \text{Liquid})$

21. Set up the depth gage on the dry package container
22. Pour water from the flasks and graduate to re-establish the level of fill
23. Add the volumes delivered as the actual net volume for the container and record the value.

#### **Determining the Net Contents of Compressed Gas in Cylinders**

- The test procedure is meant for industrial compressed gas. Compressed gas may be labeled by weight (for example: LPG, Carbon dioxide) or by volume. Acetylene, liquid oxygen, nitrogen, nitrous oxide, and argon are all filled by weight. Acetylene is sold by liters. Helium, gaseous oxygen, nitrogen, air, and argon are filled according to pressure and temperature tables.
- Checking the net contents of compressed gas cylinders depends on the method of labeling; those labeled by weight are generally checked by weight.
- Cylinders filled by using pressure and temperature charts must be tested using a pressure gage that is connected to the cylinder.
- The volume is determined using the pressure and temperature of the cylinder.

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**Safety Precautions:**

- Be aware of the hazards of the high pressure found in cylinders of compressed gas.
- An inspector should handle compressed gas only if the inspector has been trained
- If the Inspector is knowledgeable about the product, cylinder, fittings, and proper procedures
- Take all Additional precautions that are necessary for personal safety.
- All personnel testing compressed gases should have this manual for reference and be familiar with its contents.
- It is essential that the inspector be certain of the contents before connecting to the cylinder.
- Discharging a gas or cryogenic liquid through a system for which the material is not intended could result in a fire and/or explosion or property damage due to the incompatibility of the system and the product.
- Before connecting a cylinder to anything, be certain of the following:
  - 1) Always wear safety glasses.
  - 2) The cylinder is clearly marked or labeled with the correct name of the contents and that no conflicting marks or labels are present.
  - 3) Do not rely on the color of the cylinder to identify the contents of a cylinder.
  - 4) Be extremely careful with all gases because some react violently when mixed or when coming in contact with other substances. For example, oxygen reacts violently when it comes in contact with hydrocarbons.
  - 5) The cylinder is provided with the correct connection(s) for the product.
  - 6) A proper connection will go together smoothly; so excessive force should not be used.
  - 7) Do not use an adapter to connect oxygen to non-oxygen cleaned equipment.
  - 8) When a cylinder valve is opened to measure the internal pressure, position the body away from the pressure gage blowout plug or in front of the gage if the gage has a solid cast front case.
  - 9) If the bourdon tube should rupture, do not be in a position to suffer serious injuries from gas pressure or fragments of metal.
  - 10) **Note:** The acetone in acetylene cylinders is included in the tare weight of the cylinder. Therefore, as acetylene is withdrawn from the cylinder, some acetone will also be withdrawn, changing the tare weight.
  - 11) Thoroughly know the procedure and place emphasis on safety precautions before attempting any tests.
  - 12) Do not use charts referred to in the procedure until the necessary training has been completed.
  - 13) When moving a cylinder, always place the protective cap on the cylinder.
  - 14) Do not leave spaces between cylinders when moving them.
  - 15) This can lead to a “domino” effect if one cylinder is pushed over.
  - 16) Open all valves slowly.
  - 17) A failure of the gage or other ancillary equipment can result in injuries to nearby persons.
  - 18) Remember that high gas pressure can propel objects with great force.
  - 19) Gas ejected under pressure can also cause serious bodily injuries if someone is too close during release of pressure.
  - 20) One of the gages will be reserved for testing oxygen only and will be prominently labeled ‘**For Oxygen Use Only.**’
  - 21) The gage must be cleaned for oxygen service and maintained in that ‘**clean**’ condition.
  - 22) The other gage(s) may be used for testing a variety of gases if they are compatible with one another.

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- 23) Observe special precautions with flammable gas in cylinders in addition to the several precautions necessary for the safe handling of any compressed gas in cylinders.
- 24) Do not 'crack' cylinder valves of flammable gas before connecting them to a regulator or test gage.
- 25) This is extremely important for hydrogen or acetylene

### Test Equipment

- A weighing Machine and a standard weights
- a wooden or non-sparking metal ramp to roll the cylinders on the scale to reduce shock loading.
- Two calibrated precision bourdon tube gages or any other approved laboratory-type pressure-measuring device that can be accurately read within plus or minus 40 kPa
- A gage having scale increments of 200 kPa or smaller shall be considered as satisfactory for reading within plus or minus 40 kPa
- The range of both gages shall be a minimum of 0 kPa to 23 MPa when testing cylinders using standard industrial cylinder valve connections.
- These standardized connections are for testing cylinders with cylinder valve connections rated for over 21 MPa
- the test gage and its inlet connection must be rated at 14 MPa over the maximum pressure that the connection is rated

### Notes:

- 1) There are standard high-pressure industrial connections on the market that are being used up to their maximum pressure of 52 MPa
- 2) Any gage or connectors used with oxygen cylinders must be cleaned for oxygen service,
- 3) transported in a manner which will keep them clean and never used for any other gas including air or oxygen mixtures.
- 4) Oxygen will react with hydrocarbons and many foreign materials that may cause a fire or explosion.
- 5) Use a separate gage and fitting for each gas to be tested.
- 6) If adapters must be used, do not use on oxygen systems.
- 7) An approved and calibrated electronic temperature measuring device or three calibrated liquid-in-glass thermometers having either a digital readout or scale division of not more than 0.5 °C.
- 8) The electronic device equipped with a surface temperature sensor is preferred over a liquid-in-glass thermometer because of its shorter response time.
- 9) Two box-end wrenches of 29 mm for oxygen, nitrogen, carbon dioxide, argon, helium, and hydrogen and 22 mm for some sizes of propane.
- 10) All industrial connections are limited to these two hex sizes.
- 11) Avoid using an adjustable wrench because of the tendency to round the edges of the fittings, which can lead to connections not being tightened properly.

### Test Procedures for Cylinder Labelled by Weight:

- 1) Define the Inspection Lot. sampling plan in the inspection; select a random sample.
- 2) The cylinder should be marked or stenciled with a tare weight.

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- 3) The marked value may or may not be used by the filling plant when determining the net weight of those cylinders sold or filled by weight.
- 4) If there is a tare weight marked on the net contents tag or directly on the cylinder, then an actual tare weight was determined at the time of fill.
- 5) If there is no tare weight marked on a tag or on the cylinder, then the stamped or stenciled tare weight is presumed to have been used to determine the net contents.
- 6) **Note:** Check the accuracy of the stamped tare weights on empty cylinders whenever possible. The actual tare weight must be within (a) 0.5 % of the stamped tare weight for 9 tare weights or less or (b) 0.25 % of the stamped tare weight for greater than 9.kg tare weights.
- 7) Place cylinder on weighing machine and remove protective cap.
- 8) The cap is not included in the tare weight.
- 9) Weigh the cylinder and determine net weight, using either the stamped or stenciled tare weight, or the tare weight marked on the tag.
- 10) Compare actual net weight with labeled net weight, or use the actual net weight to look up the correct volume declaration (for Acetylene Gas), and compare that with the labeled volume.
- 11) **Note:** Most producers will replace acetone in the cylinder before the cylinder is refilled, filling the cylinder with acetone to the stamped tare weight. Other producers, although not following recommended procedures, do not replace the acetone until it drops to a predetermined weight. In the latter situation, the refilling plant must note the actual tare weight of the cylinder and show it on the tag containing the net content statement or on the cylinder itself. Refer to tables for acetylene if necessary (if the acetylene is labeled by volume).

#### Test procedure for Cylinder Labelled by Volume

- 1) Define the Inspection Lot, sampling plan in the inspection; select a random sample.
- 2) Determine the temperature of the cylinders in the sample.
- 3) Place the thermometer approximately halfway up a cylinder in contact with the outside surface.
- 4) Take the temperature of three cylinders selected at random and use the average temperature of the three values.
- 5) Using the appropriate pressure gage, measure the pressure of each cylinder in the sample.
- 6) Determine the cylinder nominal capacity from cylinder data tables or from the manufacturer. (These tables must be obtained in advance of testing.)
- 7) The SCF/CF volume of compressed gases (e.g., oxygen, argon, nitrogen, helium, or hydrogen) shall be determined
- 8) Multiply the cylinder nominal capacity by the value (SCF/CF) obtained from the content tables. This is the actual net quantity of gas.
- 9) Subtract the labeled net quantity from the actual net quantity to determine the error.

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### Evaluation of Results

determine lot conformance.

### Goods packed to length, area or count

- Each of have their own unique tolerable deficiency, as stated in Table 2 of First Schedule
- Sampling plans for goods sold by length, area or count are derived from Table of Fifth Schedule
- Remember these are goods packed to a predetermined constant nominal quantity

### Goods packed to length, area or count

- Consider the equipment required to inspect each prepackage
- Conduct AQS inspection by determining the error for all individual prepackages within the sample
- Determine if sample meets the requirements of AQS (three packers rules)
- Determine if inspection lot passes or fails

### Goods packed to length



### 5. Verification of length of commodities.-

- (1) select the sample in the manner specified in the Fifth Schedule.
- (2) If it is not possible to measure the dimensions without opening the package, the package opened.
- (3) The length of the commodity is measured by means of a calibrated steel tape of suitable length.
- (4) If the actual length of the commodity is so great that it is not possible to measure it with the tape measure and
- (5) use a suitable length measuring instrument is available on the premises,
- (6) make sure that the instrument is calibrating it by suitable means, with the steel tape serving as a working standard of length.
- (7) take reading of the actual length of the commodity in every package
- (8) recorded in the Form specified in the Seventh Schedule.

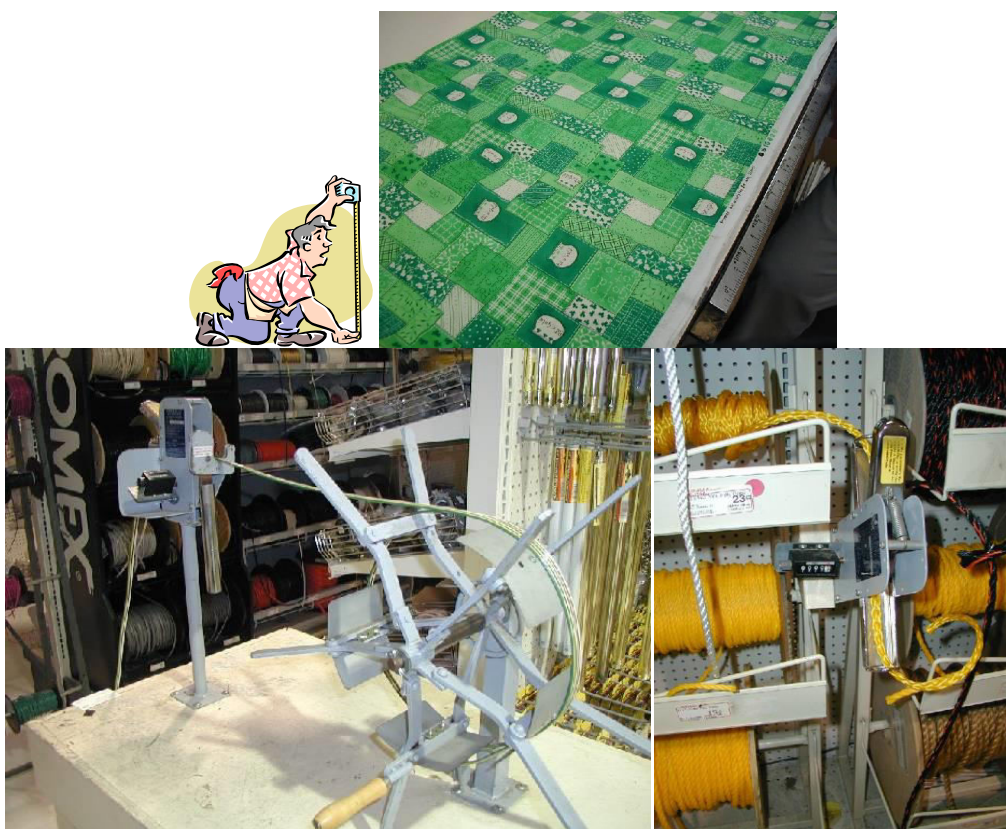
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Sl. No.	Quantity Declared	Maximum permissible error in excess or in deficiency
(i)	in units of length	2% of declared quantity up to 10 metre and thereafter 1% of declared quantity.
(ii)	in units of area	4% of declared quantity up to 10 sq. metre and thereafter 1% of declared quantity.
(iii)	by number	2% of declared quantity.

### Testing By Measure (Dimension)



### Baler Twine – Test Procedure for Length

#### Test Equipment

- A weighing machine and a standard weights  
**Note:** A weighing machine with 0.1 g increments must be used for weighing twine samples.
- Steel tapes and rulers – Determine measurements of length to the nearest division of the appropriate tape or ruler.
- For labeled dimensions 400 mm or less, linear measure: 300 mm in length, 1 mm divisions; or a 1 m ruler with 0.1 mm divisions, overall length tolerance of 0.4 mm.
- For labeled dimensions greater than 400 mm, 30 m tape with 1 mm divisions.
- A hand-held straight-face spring balance of at least 5 kg capacity or a cordage-testing device that applies the specified tension to the twine being measured.

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- When measuring twine samples or total roll length, apply 1.0 kg of tension to the twine.

### Test Procedure

- 1) Define the Inspection Lot, sampling plan in the inspection; select a random sample.
- 2) Select packages for tare samples.
- 3) Determine gross weights of the initial tare sample and record.
- 4) Open the tare samples. Use the procedures for tare determination Determination of Tare Sample and Average Tare Weight to compute the average tare weight and record this value.
- 5) Randomly select four balls of twine from the packages that were opened for tare.

### From each of the four balls of twine:

- Measure and discard the first 10.05 m of twine from each roll.
  - Accurate measurement requires applying tension to the ends of the twine before measuring in order to straighten the product.
  - Take two 30 m lengths of twine from inside each roll.
  - Weigh and record the weight of each piece separately and record the values.
  - Compare the weight values to determine the variability of the samples.
  - If the individual weights of the eight twine samples vary by more than one division on the scale, use one of the following steps:
    - if the lot is short, determine the actual length of the lightest-weight roll found in the lightest-weight package of the lot to confirm that the weight shortages reflect the shortages in the length of the rolls; or
    - determine the average weight-per-unit of measure by taking ten 30 m lengths from inside the lightest weight package. Use this value to recalculate its length and determine lot compliance
- 6) Weigh all of the sample lengths together and record the total value.
  - 7) Determine the total length of the samples, unless more than eight sample-lengths were taken and record the value.
  - 8) Compute the average weight-per-unit-of-length by dividing the total weight by the total length of the pieces.
  - 9) Determine the MPE for a package
  - 10) Record the total declared package length.
  - 11) Multiply the MPE with the total package length
  - 12) obtain the MPE for length and record this value.

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- 13) Multiply the weight per unit of length with the MPE for the total declared package length
- 14) obtain the MPE by weight and record this value.
- 15) Calculate the nominal gross weight and record.
- 16) Determine package errors using the following formula:

$$\text{Package error (weight)} = (\text{package gross weight}) - (\text{nominal gross weight})$$

### Goods packed to area

Sl. No.	Quantity Declared	Maximum permissible error in excess or in deficiency
(i)	in units of length	2% of declared quantity up to 10 metre and thereafter 1% of declared quantity.
(ii)	in units of area	4% of declared quantity up to 10 sq. metre and thereafter 1% of declared quantity.
(iii)	by number	2% of declared quantity.

### Polyethylene Sheeting, Bags, and Liners

Most polyethylene products are sold by length, width, thickness, area, and net weight. Accordingly, this procedure includes steps to test for each of these measurements.

### Test Equipment

- a weighing machine and a standard weights
- Steel tapes and rulers.
- determine measurements of length to the nearest division of the appropriate tape or ruler.
- For labeled dimensions 400 mm or less, linear measure: 300 mm in length, 1 mm divisions; or a 1 m ruler with 0.1 mm divisions, overall length tolerance of 0.4 mm.
- For labeled dimensions greater than 400 mm, 30 m tape with 1 mm divisions.
- Deadweight dial micrometer (or equal) equipped with a flat anvil, 6.35 mm diameter or larger,
- A 4.75 mm diameter flat surface on the head of the spindle.
- The anvil and spindle head surfaces ground and lapped, parallel to within 0.002 mm and should move on an axis perpendicular to their surfaces.
- The dial spindle should be vertical, and the dial should be at least 50.8 mm in diameter.
  - The dial indicator should be continuously graduated to read directly to 0.002 mm and should be capable of making more than one revolution.
  - It must be equipped with a separate indicator to indicate the number of complete revolutions.
- The dial indicator mechanism should be fully jeweled.
  - The frame should be of sufficient rigidity that a load of 1.36 kg applied to the dial housing, exclusive of the weight or spindle presser foot, will not cause a change in indication on the dial of more than 0.02 mm.
  - The indicator reading must be repeatable to 0.001 2 mm at zero.
  - The mass of the probe head (total of anvil, weight 102 g, spindle, etc. must be 113.4 g.

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- The micrometer should be operated in an atmosphere free from drafts and fluctuating temperature and should be stabilized at ambient room temperature before use.
- Gage blocks covering the range of thicknesses to be tested should be used to check the accuracy of the micrometer
- T-square

### Test Procedure

#### Test Procedure for Polyethylene sheeting's:

- 1) Define the Inspection Lot, sampling plan in the inspection; select a random sample.
- 2) Be sure the product is not mislabeled.
- 3) Check the label declaration to confirm that all of the declared dimensions are consistent with the required.
- 4) The declaration on sheeting, film, and bags shall be equal to or greater than the weight calculated by using the formulas below.
  - For values less than 450 kg, the final value shall be calculated to at least four digits and declared to three digits, truncating the final digits as calculated
  - **Example:**
    - a calculated value of 943.1 g is truncated to 943 g ,
    - a calculated value of 14.92 kg is truncated to 14.9 kg,
    - a calculated value of 124.4. kg is truncated to 124 kg .
  - For values of 453.6 kg or more, the final value shall be calculated to at least five digits and declared to four digits, truncating the final digits as calculated
  - Example :
    - a calculated value of 570.44 kg is truncated to 570.4 kg .
- 5) Use the following formulas to compute a target net weight.
- 6) The labeled weight is to be equal or exceed the target net weight or the package is not in compliance
  - SI Dimensions:

$$\text{Target Mass in Kilograms} = (T \times A \times D) \div 1\,000$$

Where:

*T* = nominal thickness in centimeters

*A* = nominal length in centimeters × nominal width

the nominal width for bags is twice the labeled width in centimeters

*D* = minimum density in grams per cubic centimeter

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### Check the label for a density declaration and type of polyethylene.

If the density (D) value is not declared, use the following as appropriate:

- For linear low density polyethylene plastics (LLPDE), the minimum density (D) shall be  $0.92 \text{ g/cm}^3$  (when D is not known).
- For linear medium density polyethylene plastics (LMDPE), the minimum density (D) shall be  $0.93 \text{ g/cm}^3$  (when D is not known).
- For high density polyethylene plastics (HDPE), the minimum density (D) shall be  $0.94 \text{ g/cm}^3$  (when D is not known).

Determined by using latest versions of

Perform the calculations as shown in the following example. If the product complies with the label declaration:

#### Example:

$(0.010 \text{ 16 cm} \times [(1.82 \text{ m} \times 100 \text{ cm/m}) \times (30.48 \text{ m} \times 100 \text{ cm/m})] \times 0.92 \text{ g/cm}^3) \div 1000 \text{ g/kg} = \text{a target weight of } 5.18 \text{ kg}$

*the labeled net mass of 5.03 kg does not meet the target net mass, so the product is not in compliance.*

- 7) Select packages for tare samples according to Determination of Tare Sample and Average Tare Weight
- 8) Determine and record the gross weights of the initial tare sample.
- 9) Extend the product in the sample packages to their full dimensions and remove by hand all creases and folds.
- 10) Measure the length and width of the product to the closest 3 mm
- 11) Make all measurements at intervals uniformly distributed along the length and width of the sample and record the results.
- 12) Compute the average length and width, and record.
  - With rolls of product:
    - measure the length of the roll at three points along the width of each roll and
    - measure the width at a minimum of 10 points along the length of each roll.
  - For folded products, such as drop cloths or tarpaulins:
    - make three length measurements along the width of the sample and
    - three width measurements along the length of the sample.
- 13) Determine and record the average tare weight according to Determination of Tare Sample and Average Tare Weight
- 14) Follow the procedures, determine the lot conformance requirements for length, width, and weight.
- 15) If the sample failed to meet the package requirements for any of these declarations, no further measurements are necessary. The lot fails to conform.

**Note:** If the sample meets the package requirements for the declarations of length, width, and weight proceed to verifying the thickness declaration.

- 16) Measure the thickness of the plastic sheet with a micrometer using the following guide.
  - a. Place the micrometer on a solid level surface.

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- b. If the dial does not read zero with nothing between the anvil and the spindle head, set it at zero.
  - c. Raise and lower the spindle head or probe several times; it should indicate zero each time.
  - d. If it does not, find and correct the cause before proceeding.
- 17) Take measurements at five uniformly distributed locations across the width at each end and
  - a. five locations along each side of each roll in the sample.
  - b. If this is not possible, take measurements at five uniformly distributed locations across the width of the product for each package in the sample.
- 18) When measuring the thickness,
  - a. place the sample between the micrometer surfaces and lower the spindle head or probe near, but outside, the area where the measurement will be made.
  - b. Raise the spindle head or probe a distance of 0.008 mm to 0.01 mm
  - c. move the sheet to the measurement position.
  - d. Drop the spindle head onto the test area of the sheet.
- 19) Read the dial thickness two seconds or more after the drop, or
  - a. when the dial hand or digital readout becomes stationary.
  - b. It minimizes small errors that may occur when the spindle head or probe is lowered slowly onto the test area.
- 20) For succeeding measurements:
  - a. raise the spindle head 0.008 mm to 0.01 mm
  - b. above the rest position on the test surface, move to the next measurement location
  - c. drop the spindle head onto the test area.
  - d. Do not raise the spindle head more than 0.01 mm above its rest position on the test area.
  - e. Take measurements at least 6 mm or more from the edge of the sheet.
- 21) Repeat Steps above on the remaining packages in the sample and record all thickness measurements.
- 22) Compute and record the average thickness for the individual package and apply the following MPE requirements.

### Test procedures for Polyethylene bags and Liners

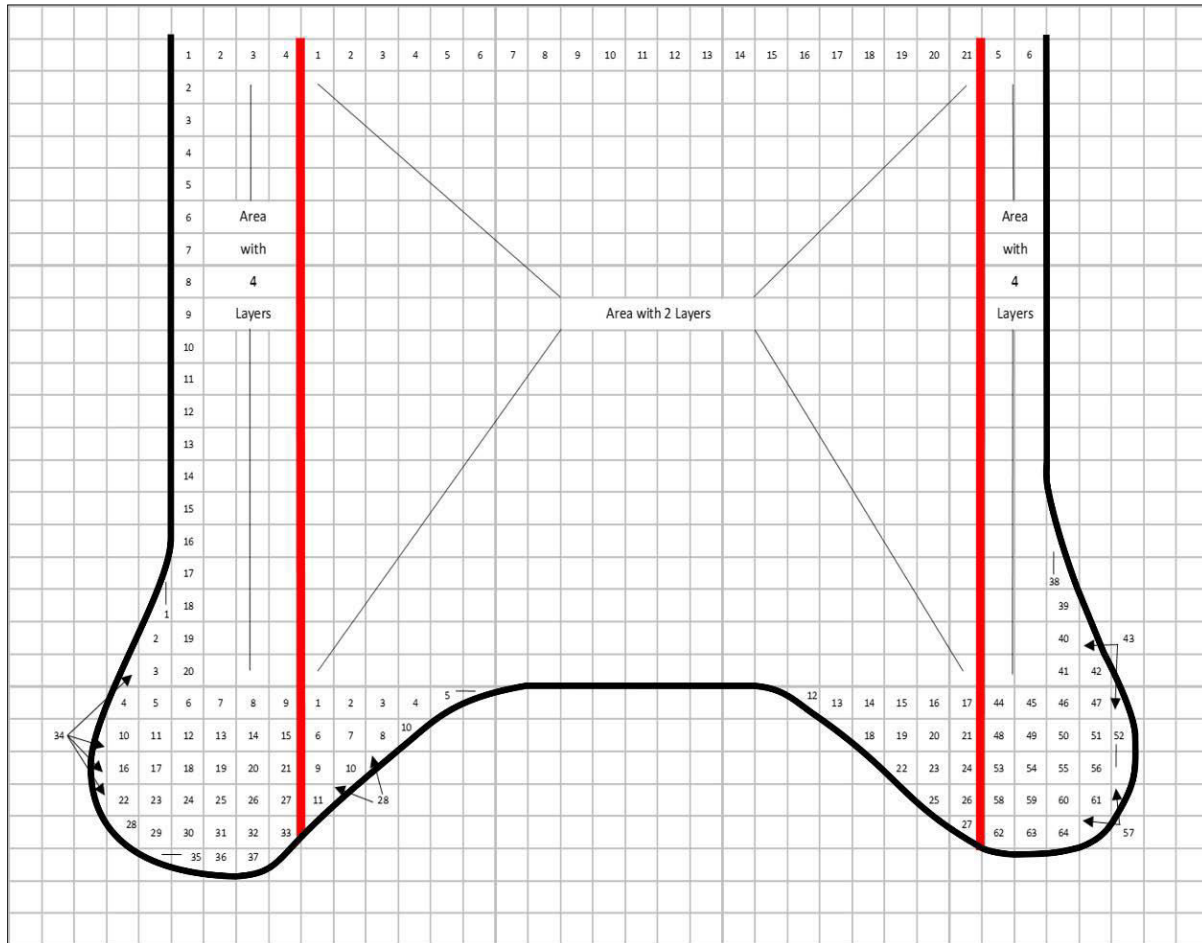
- 1) Define the Inspection Lot, sampling plan in the inspection; select a random sample.
- 2) Follow the procedure of Test Procedure for Polyethylene Sheeting, for calculating the weight of polyethylene sheeting.
- 3) Multiply the weight of polyethylene with number of of bags or liners)
- 4) multiply by two as the each bag or liner have two layers
- 5) obtain net weight of the bag or liner.
- 6) To determine the net weight of T-shirt type bags or any special type of bags),
  - Subtract weight of the T-shirt cutout from the net weight.
- 7) Use the following method to calculate the weight of the cutout:
  - a. Trace the cutout on ruled graph paper with 10 mm or 5 mm squares as shown in the diagram that follows. (See Figure is a T-Shirt Bag.)
  - b. For T-shirt bags with a fold or gusset, you will need to draw an extra line up from the gusset to the edge of the graph paper.

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- c. It helps for the additional plastic layers within the bag. (See shaded area in Figure T-Shirt Bag.)
- d. Count the squares to determine the total area of the cutout.
- e. Adjust your total area by taking into account the number of layers for each region counted. ( see Polyethylene Bag Outline on Graph)
- f. Divide the total area of the cutout by the total area of the bag to calculate the percentage of the cutout.
- g. Compute and record the weight of the bag without the cutout by subtracting the calculated net weight of the cutout from the total net weight of the bags
- h. net weight of the cutout is determined by multiplying the total net weight of the bag by the percentage of the area of the cutout.



**Example:**

- To find the total area of the cutout, determine the area for the four-layer region and the area for the two-layer region and add them together.

Four-Layer Area:  $4 [(6 \times 20) + 64 \text{ additional boxes}] = 736 \text{ sq cm}$

Two-Layer Area:  $2 [(21 \times 20) + 28 \text{ additional boxes}] = 896 \text{ sq cm}$

The area of the cutout =  $736 \text{ sq cm} + 896 \text{ sq unit} = 1632 \text{ sq cm}$

- If the total area for the bags prior to cutout is 1981 sq cmt, then the percentage of the cutout is 12.2 %,  $(1632 \text{ sq cmt} \div 1951 \text{ sq cmt} = 0.1220 \times 100)$
- Multiply the theoretical weight by 12.2 % to determine the weight of the cutout for the bags, then subtract this from the target net weight to determine the weight of the bags.
- If the calculated target net weight for a box of bags is 5.20 kgt, then 12.2 % would weigh 634.4 g  $(5.2 \text{ kg} \times 12.2 \% = 634.4 \text{ g})$ .
- Therefore, the target net weight of the product is:  $5.2 \text{ kg} - 0.6344 = 4.57 \text{ kg}$   
Each unit is 456 g



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## Evaluation of Results

### Individual thickness

- If the declared thickness is  $> 25 \mu\text{m}$ , then individual thickness could be to 20 % less than the declared thickness.
- If the declared thickness is  $< 25 \mu\text{m}$ , then individual thickness could be to 35 % less than the declared thickness
- Count the number of values that are smaller than specified MPE
- If the number of values that fail to meet the thickness requirement exceeds the number of MPEs permitted for the sample size, the lot fails to conform to requirements.
- No further testing of the lot is necessary.
- If the number of MPEs for thickness measurements is less than or equal to the number permitted for the sample size,
- Evaluation of Results – Average Thickness.

### Average thickness:

- The average corrected thickness for any single package is to be at least the labeled thickness.
- Circle and count the number of package average thickness values that are smaller than labeled thickness.
- If the number of package average thicknesses circled exceeds the number of MPEs allowed for the sample size, the lot fails to conform to requirements.
- No further testing of the lot is necessary.
- If the number of MPEs for package average thickness is less than or equal to the number of MPEs permitted for the sample size,
- Evaluate for Compliance, to determine if the lot meets the package requirements for average thickness.

## Packages Labeled by Linear or Square (Area) Measure

### Test Equipment

- A weighing machine and a standard weights
- Steel tapes and rulers □ Metric units:
- To measure dimensions 400 mm or less, linear measure: 300 mm in length, 1 mm divisions; or a 1m ruler with 0.1 mm divisions, overall length tolerance of 0.4 mm.
- To measure dimensions greater than 400 mm, 30 m tape with 1 mm divisions.

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- T-square

### Test Procedure

- 1) Define the Inspection Lot, sampling plan in the inspection; select a random sample.
- 2) Select an initial tare sample according to Determination of Tare Sample and Average Tare Weight
- 3) Gross weigh the first package in the tare sample and record this weight.
- 4) Determine and record the measurements (to the nearest division of the appropriate tape or ruler) of the packaged goods (length, width, area; depending upon the label) and
- 5) weigh the goods from the first package opened for tare determination.
- 6) Calculate and record the weight of the labeled measurements using the following formula:

$$\text{Weight of the labeled measurement} = \frac{(\text{labeled measurement}) \times (\text{contents weight})}{(\text{contents measurement})}$$

- 7) Calculate and record the MPE in units of length or area measure
  - 8) Determine and record the tare weight of the first package opened.
  - 9) Determine and record the measurements (length, width, area; depending upon on the label) of the product in the second package chosen for tare determination (to the nearest division of the appropriate tape or ruler).
  - 10) Determine and record the tare weight of this package.
  - 11) Calculate and record the weight of the labeled measurement for the second package using the following formula:
- $$\text{Weight of the labeled measurement} = \frac{(\text{labeled measurement}) \times (\text{contents weight})}{(\text{contents measurement})}$$
- 12) The weights of the labeled measurement for two packages must not differ by more than one division on the scale.
  - 13) If more than one division, open all packages in the sample, measure individually, and compare them against the labeled measure
  - 14) determine the package errors.
  - 15) If the criterion is meets the requirements, continue.
  - 16) Calculate the average weight of the labeled measurement and record.
  - 17) Determine and record the average tare weight according to Determination of Tare Sample and Average Tare Weight
  - 18) Compute and record the nominal gross weight by adding the average weight of the labeled measurements to the average tare weight.
  - 19) Compute package errors according to the following formula:

$$\text{Package error (weight)} =$$

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(actual package gross weight) – (nominal gross weight)

20) Convert the MPE to units of weight using the following formula:

$$MPE \text{ (weight)} = \frac{\text{Avg. Wt. of label measurements} \times MPE \text{ [length]}}{\text{labeled measurements}}$$

### Procedure for Checking the Area Measurement of Chamois

Chamois is natural leather made from skins of sheep and lambs that have been oil-tanned.

#### Characteristics of Chamois:

- Chamois is irregular in shaped,
- Hence difficult to measure area
- By using an internationally recognized method area is measured accurately by conditioning (rehydrating)
- Chamois is produced by wet manufacturing process,
- it has high moisture content.
- It is hygroscopic;
- dimensions and total area change depending on the absorption or loss of moisture.
- It is wrinkling.
- variation in thickness and density,
- gravimetric method cannot be used

#### Standard Test Conditions:

- As it is hygroscopic, a reasonable variations in measure is allowed
- International standards specify procedures to restore the moisture content of chamois, to verify dimensions and area.
- Environmental Conditions:
  - 50 ± 4 % relative humidity
  - 23 ± 2 °C temperature
- the difference in two successive weighings, made at 1 hr intervals, is not greater than 0.25 %
- (e.g., the maximum change in weight for a 100 g sample in two successive weighings is ,0.25 g (250 mg).

#### The area of chamois is verified using a two-stage test procedure.

The first stage is a field audit using the template test procedure. This test is used for field audits because it is simpler to perform and does not require the chamois to be conditioned. The field audit is used to identify chamois that are potentially under measure.

The second stage is a compliance testing. The gravimetric procedure should be used for compliance testing because it includes conditioning (rehydrating) the chamois.

#### Template Test Method (for field audits)

Chamois is typically labeled in uniform sizes in terms of square

#### Test Equipment

Use a transparent, flexible template that is graduated in square centimeters or square inches and that has been verified for accuracy. The template must be large enough to completely cover the chamois under test.

#### Test Procedure

- 1) Separate the chamois into different sizes

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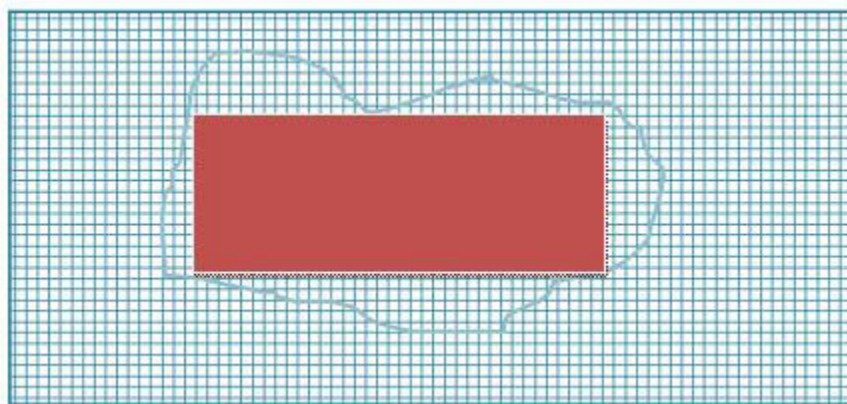
- 2) define the inspection lot by specific sizes.
- 3) Select a random sample of chamois.
- 4) Place the template over the chamois specimen on a smooth surface.
- 5) Draw outline along the edges of the chamois
- 6) Determine the area by counting the number of squares that cover the surface of the chamois.
- 7) Estimate parts of the template that do not completely cover the chamois by adding the number of partially covered blocks.

#### First Stage – Decision Criteria

If the average minus error exceeds 4 % of the labeled area, the chamois may not be labeled accurately.

#### Template for Checking the Area of Chamois.

To confirm the finding, the sample must be taken to a laboratory for conditioning and testing using the gravimetric test procedure.



#### Gravimetric Procedure for Area Measurement

- This test cannot be performed in the field because the samples must be conditioned with water before testing.
- This method is intended for use in checking full or cut skins, or pattern shapes.
- Open and condition all of the packages in the sample before determining their area on the recommended paper.
- Conditioning and verifying chamois can be accomplished without destroying the product.
- When successful tests are completed, the chamois may be repackaged for sale,
- so do not destroy the packaging material.

#### Test Equipment

- weighing machine of 1 kg capacity with an accuracy of at least  $\pm 0.01$  g and having a load receptor of suitable size to keep the chamois
- Atomizer or trigger-type sprayer and sealable, airtight polyethylene bags
- Medium weight drawing paper (e.g., drawing paper, medium weight (50 kg), regular surface or comparable)
- Household Iron box, with temperature settings 30 °C to 40 °C

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- Ruler or tape that is graduated in centimeters or inches
- Instrument for cutting paper (razor blade, scissors, or cutting board)

### Sample Conditioning

- 1) Remove each sample from its package
- 2) weigh and record each weight.
- 3) Using an atomizer-type sprayer, spray water in the amount of 25 % of the weight of each skin uniformly over its area.
- 4) Place wetted chamois in an airtight polyethylene bag; seal the bag, and leave it in this condition at room temperature for 24 hours.
- 5) Open the bag, remove the chamois, and reweigh the chamois to confirm it retained maximum moisture. ( not exceeding 0.25 %.)
- 6) Place the chamois flat on a continuous piece of drawing paper.
- 7) To remove wrinkles and make the chamois lie flat, use a domestic Iron Box heated to a maximum of 30 °C to 40 °C .
- 8) Place the iron on the bottom of the skin, and iron the skin up from the center to the top
- 9) Then, iron the skin from the center out to each side.
- 10) Iron until the skin is fully extended and perfectly flat.

### Test Procedure

- 1) Immediately after ironing, carefully draw around the outline of the skin on the paper.
- 2) Remove the skin; carefully cut along the outline of the skin;
- 3) weigh the cutout pattern, and record to the nearest 0.1 g, Sample Weight<sub>1</sub> (W<sub>1</sub>).
- 4) Lay out the pattern and cut an accurately measured rectangle of a size not less than one-half the area of the pattern.
- 5) Weigh the cutout rectangle and record the weight to the nearest 0.1 g Sample Weight<sub>2</sub> (W<sub>2</sub>).
- 6) Calculate the area of the rectangle cut from the patterns by multiplying length by width and record as Area (A) in centimeters .

*the area of the original skin being checked =*

$$W_1/W_2 \times A = \text{Skin Area in cm}^2/100 = \text{Area in dm}^2$$

### Evaluation of Results

Compute the average error for the sample and determine lot conformance.

### Goods packed to count

The maximum permissible errors on net quantities declared by length, area or number

Sl. No.	Quantity Declared	Maximum permissible error in excess or in deficiency
(i)	in units of length	2% of declared quantity up to 10 metre and thereafter 1% of declared quantity.
(ii)	in units of area	4% of declared quantity up to 10 sq. metre and thereafter 1% of declared quantity.
(iii)	by number	2% of declared quantity.

Verification of commodities packed by number.-

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The Director, Controller or any Legal Metrology Officer:

- take packages from the sample
- draw sample as per specified in the Fifth Schedule
- determine the extent of error,
- by actual counting in each such package and may, for that purpose open all packages.



Testing By Number

### Test Procedures – Packages Labeled by Count, Linear Measure, Area, Thickness, and Combinations of Quantities Scope

- The following test procedures are used to determine the net contents of products sold by count, area, thickness, and linear measure.
- If a package includes more than one declaration of quantity, each declaration must meet the package mandatory requirements.
- A gravimetric procedure may be used to test products sold by measure or count if the density of the product does not vary excessively from one package to another.
- If the gravimetric procedure cannot be used, each package in the sample must be opened to measure or count the contents.

### Packages Labeled by Number or Count

#### If the number or count is 50 items or less:

If the labeled count is such as seeds of corn, soybeans, field beans, and wheat, white paper etc

#### Test Equipment

None.

#### Test Procedure

- 1) Define the Inspection Lot., sampling plans, select a random sample.
- 2) Open the packages and count the number of items in each. Record the number of packages that contain fewer than the labeled count.
- 3) Maximum Permissible Error:
- 4) Individual packages that are undercount by more than the MAV are considered defective. Even if the sample passes, these should be repacked, relabeled, or otherwise handled.

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**Example:**

If testing a lot of 160 packages of pencils labeled “50 peas,” choose a random sample of 12 packages from the lot. If the weighing machine cannot discriminate between differences in number or count, open every package and count the peas. For example, assume the 12 package counts are: 50, 52, 50, 50, 51, 53, 52, 50, 50, 50, 48, and 50.

Because only one package contains fewer than 50 peas, the sample passes the test. However, the package containing 48 peas should not be introduced into commerce even though the lot complies with the package requirements because it is undercount by more than the MPE (1 item) permitted.

**Packages Labeled by Count of More than 50 Items**

- There are two procedures to determine count without opening all packages in the sample.
- The first is an audit procedure and
- the second is for determining compliance and taking legal action.
- Both use the weight of a counted number of items in the package.
- If the weight of discrete items or numbers of items in a package varies excessively, the packaged items must be counted rather than weighed.

**To determine if a gravimetric procedure can be used to inspect packages labeled by count, follow the steps below.**

**Test Equipment**

Weighing Machine having accuracy specified meets the requirements

- 1) For packages labeled with a count of 84 or higher, calculate the weight equivalent for the MPE for the labeled count of the package.
- 2) MPE must be at least equal to one-half scale division on a mechanical scale or one division on a digital scale.

**Example:**

According to “Maximum Permissible Error for packages Labeled by Count,” the MPE is 3 for a package labeled with a count of 250 items. The scale should be capable of measuring differences corresponding to MPE or, in this example, the weight of one item.

- If the scale meets the appropriate requirement, gravimetric testing can be used to determine package count or,
- If the scale does not meet the criteria, count the content in each package in the sample.

**Test Procedures****Audit Procedure**

- audit lots of packages labeled by count of more than 50 items
- but not for determining lot compliance.
- Determine the lot compliance based on actual count or by using the “Violation Procedure”.

**Note:** The precision of this procedure is only  $\pm 1\%$ .

- 1) Define the Inspection Lot, sampling plan in the inspection; and select a random sample.
- 2) Select an initial tare sample according to determination of Tare Sample and Average Tare Weight.
- 3) Gross weigh the first package in the tare sample and record this weight.
- 4) Select the number of items from the first tare package that weighs the greater:

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- 10 % of the labeled count; or
- a quantity equal to at least 50 minimum divisions on the scale.

**Example:**

Using a scale with 1 g divisions, the selected count must weigh at least 50 grams. If a scale with 0.001 g divisions is used, the selected count must weigh at least 0.05 g. Record the count and weight.

- 5) Calculate the weight of the labeled count using the following formula:

$$\text{Weight of the Labeled Count} = \frac{(\text{labeled count} \times \text{weight of items})}{(\text{Count of items})}$$

Record the result as "labeled count weight."

- 6) Gross weigh the remaining packages of the tare sample and
- 7) keep contents of opened packages separated in case all of the items must be counted.
- 8) Determine the Average Used Dry Tare Weight of the sample
- 9) Record the nominal gross weight by adding the weight of the labeled count and the average tare weight.
- 10) Subtract the nominal gross weight from the gross weight of the individual packages and record the errors.
- $$(\text{Package error [weight]}) = (\text{actual package gross weight}) - (\text{nominal gross weight})$$

- 11) Convert the package errors in units of weight to count using the following formula:

$$\text{Package error (count)} = \frac{(\text{Package error [weight]} \times \text{labeled count})}{(\text{labeled count weight})}$$

- 12) Round any fractional counts up to whole items in favor of the packager.
- 13) Record the package error in units of count.
- 14) Compute the average error.

- If the average error is minus, go to the "Violation Procedure" below.
- If the average error is zero or positive, the sample is presumed to conform to the package requirements.

**Violation Procedure:**

- If possible, use the gravimetric procedure to determine compliance, to minimize the number of packages to be opened.
  - This procedure combines the measurement of the weight of the number of units in the package with the determination of tare.
  - it will not be necessary to open more packages than the tare sample.
  - If the audit procedure has been used, this procedure can be followed with the same sample if package contents have been kept separate and can still be counted.
  - Use the following procedure to determine if the sample passes or fails.
- 1) Define the Inspection Lot, sampling plan in the inspection; select a random sample.

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- 2) Select an initial tare sample according to Determination of Tare Sample and Average Tare Weight
- 3) Gross weigh the packages selected for the tare sample and record these weights.
- 4) Open these packages and determine the tare and net weights of the contents, and count the exact number of items in the packages. Record this information.
- 5) Calculate and record the weights of the labeled counts for the first two packages using the formula:

$$\text{Weight of labeled count} = (\text{labeled count}) \times (\text{contents weight} \div \text{contents count})$$

- To avoid round off errors, carry at least two extra decimal places in the calculation until the weight of the labeled count is obtained.
  - To use the gravimetric procedure, the difference in weights of the labeled counts of the two packages must not exceed one scale division.
  - If the difference in weights exceeds this criterion, determine the actual count per package for every package in the sample recording plus and minus errors.
  - Then, "Evaluate for Compliance" to determine lot conformance.
- 6) If the difference is within the criterion, average the weights of the labeled count
  - 7) Determine the Average Used Dry Tare Weight
  - 8) Determine and record the nominal gross weight by adding the average weight of the labeled count of items in the package to the average tare weight
  - 9) Weigh the remaining packages in the sample, subtract the nominal gross weight from the gross weight of the individual packages, and record the errors.

$$\text{Package Error (weight)} = (\text{Actual Package Gross Weight}) - (\text{Nominal Gross Weight})$$

- 10) Look up the MMPE for the package size and convert it to weight using the formula:

$$\text{MPE (weight)} = (\text{MPE (count)} \times \text{Average Weight of Labeled Count} \div (\text{Labeled Count}))$$

- 11) Convert the MPE to dimensionless units by dividing the MPE (weight) by the unit of measure and record.

### Evaluation of Results

determine lot conformance.

Convert back to count when completing the report form, using the following formula:

$$\begin{aligned} \text{Average Package Error (count)} = \\ (\text{Avg. Pkg. Error [dimensionless units]} \times (\text{Unit of Measure}) \times \\ (\text{Labeled Count}) \div (\text{Average Weight of Labeled Count})) \end{aligned}$$

### Paper Plates and Sanitary Paper Products

- The following procedure is used to verify the size of paper plates and other sanitary paper products.
- It may also be used to verify the size declarations of other disposable dinnerware.

**Note:** Do not distort the item's shape during measurement.

- The count of sanitary paper products cannot be adequately determined by weighing.
- Variability in sheet weight and core weight, makes to conducted by actual count.

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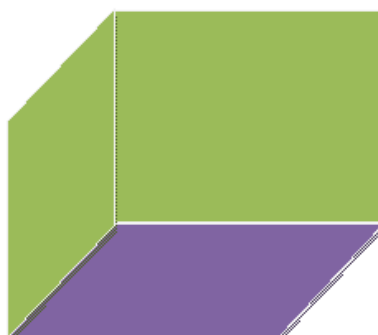
- However, weighing can be a useful audit method.
- These products often declare total area (GSM), as well as unit count and sheet size.
- If the actual sheet size measurements and the actual count comply with the average requirements, the total area declaration is assumed correct.

### Test Equipment

- Steel tapes and rulers.
- Determine measurements of length to the nearest division of the appropriate tape or ruler.
- For labeled dimensions 400 mm or less, linear measure: 300 mm in length, 1 mm divisions; or
- a 1 m ruler with 0.1 mm divisions, overall length tolerance of 0.4 mm.
- For labeled dimensions greater than 400 mm, 30 m tape with 1 mm divisions.
- Measuring Base

### Note:

- A measuring base may be made of any flat, sturdy material approximately 40 cm square.
- Two vertical side pieces approximately 30 mm high and the same length as the sides of the measuring base are attached along two adjoining edges of the measuring base to form a 90° corner.
- Trim all white borders from two or more sheets of graph paper (at least 400 mm, 10 divisions per centimetre).
- Place one sheet on the measuring base and position it so that one corner of graph paper is snug in the corner of the measuring base and vertical sides.
- Tape the sheet to the measuring base.
- Overlap other sheets on the first sheet so that the lines of top and bottom sheet coincide, expanding the graph area to a size bigger than plates to be measured; tape these sheets to the measuring base.
- Number each line from the top and left side of base plates: 1, 2, 3, etc.



A measuring base

### Test Procedure

- 1) Define the Inspection Lot, sampling plan in the inspection; select a random sample.
- 2) Select an initial tare sample according to Determination of Tare Sample and Average Tare Weight.
- 3) Open each package and select one item from each.

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**Notes:**

(1) Some packages of plates contain a combination of different-sized plates.

- take a plate of each declared size from the package to represent all the plates of that size in the package.

**Example:**

if three sizes are declared, select three different plates from each package.

(2) Sometimes, packages of plates declared to be one size contain plates, but contains of different sizes in the same package.

- select the smallest plate and use the methods to determine the package error.
- If the smallest plate is not short measure by more than the MPE, measure each size of plate in the package and calculate the average dimensions.

**Example:**

If five plates measure 21.41 cm and 15 measure 21.74 cm, the average dimension for this package of 20 plates is 21.66 cm.

- 4) **For paper plates:** Place each item on the measuring base plate (or use the linear measure) with the eating surface down so two sides of the plate touch the sides of the measuring base.
- 5) **For other products:** Use either the measuring base or a linear measure to determine actual labeled dimensions (e.g., packages of napkins, rolls of paper towels).
- 6) If testing folded products, be sure that the folds are pressed flat so that the measurement is accurate.
- 7) If the measurements reveal that the dimensions of the individual items vary,
- 8) select at least 10 items from each package.
- 9) Measure and average these dimensions.
- 10) Use the average dimensions to determine package error
- 11) The package error equals the actual dimensions minus the labeled dimensions.

**Evaluation of Results**

determine lot conformance

**Some products have multiple quantity statements****Special Test Requirements for Packages Labeled by Linear or Square Measure (Area)**

Products labeled by length (such as yarn) or area, often require the application of tension to the ends of the product in order to straighten the product before measuring. When testing yarn and thread, apply tension and use the specialized equipment as defined in the latest version of ASTM

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1) Candles are labeled by:  
Number, Length and Width

2) Tortillas are labeled by:  
Number and net weight

### The maximum permissible errors on net quantities declared by length, area or number

Sl. No.	Quantity Declared	Maximum permissible error in excess or in deficiency
(i)	in units of length	2% of declared quantity up to 10 metre and thereafter 1% of declared quantity.
(ii)	in units of area	4% of declared quantity up to 10 sq. metre and thereafter 1% of declared quantity.
(iii)	by number	2% of declared quantity.

### Procedure for Checking the Contents of Specific Agriculture Seed Packages Labeled by Count

The following method is used to determine the number of seeds contained in a sample such as soybean, corn, wheat, and bean etc

#### Test Equipment

- Mechanical seed counter
- Moisture proof container

#### Test Procedure

- 1) Testing samples keep in a moisture proof containers until the weight of the sample prepared for purity analysis
- 2) a sample of at least 500 grams for soybean, corn, field beans, and 100 grams for wheat, is required to test by mechanical means
- 3) make sure the seed counter is calibrated prior to use.
- 4) Prepare a calibration sample by counting 10 sets of 100 seeds each.
- 5) Visually examine each set to insure that it contains whole seeds.
- 6) Combine the 10 sets of seeds to make a 1000 seed calibration sample.
- 7) The seeds of the calibration sample are approximately of the same size and shape
- 8) **Note:** If the seeds in a sample being tested are noticeably different in size or shape  
Then, prepare another calibration sample with seeds of the appropriate size and shape.  
Periodically re-examine the calibration samples to insure that no seeds have been lost or added.
  - Carefully pour the 1000 seed calibration sample into the seed counter.
  - Start the counter and run it until all the seeds have been counted.
  - **Note:** The seeds should not touch as they run through the counter.

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- Record the number of seeds as displayed on the counter read out.
  - The seed count tolerance is  $\pm 2$  seeds from 1000.
  - If the count is not within this tolerance, clean the mirrors, adjust the feed rate and/or reading sensitivity.
  - Rerun the calibration sample until it is within the  $\pm 2$  seed tolerance.
  - **Note:** If the seed counter fails the calibration procedure and sample has been checked to ensure that it contains 1000 seeds, do not use the counter until it has been repaired.
- 9) Immediately after opening the container, mix and divide the sample to obtain a sample for purity analysis
- 10) Record the weight of this sample in grams to the appropriate number of decimal places.
- 11) Conduct the purity analysis to obtain pure seed for the seed count test.
- 12) After the seed counter has been calibrated, test the pure seed portion from the purity test and record the number of seeds in the sample.
- 13) Calculation of results.

Calculate the number of seeds per gram to the nearest whole number using the following formula:

Number of seeds per gram = no. of seeds counted divided by weight (g) of sample analyzed for purity

- 14) Determine the Maximum Permissible Error (MPE).

### Evaluation of Results

determine lot compliance.

**Checking of other declarations.**-(1) The declarations made on the package or on the label affixed are :

- examined with a view to ascertaining whether such declarations conform to these rules and
- ensured either at the factory level or at the depot of the factory .

(2)The additional declarations made on the package or on the label affixed are:

- such as referred in clause (g) and (h) of sub-rule (1) of rule 6 examined to ascertain whether they are adequate.

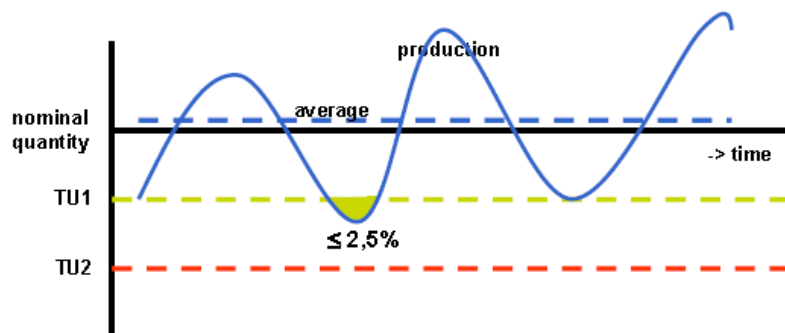


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### Statistical Methods:

The so called '3-packers rules':

- In average, the quantity of product in prepackages shall not be less than the declared nominal quantity,  $Q_{nom}$
- Only a small amount of prepackages (typ. 2.5 %) are allowed to show deficiencies between  $T_1$  and  $T_2$ .
- No prepackage shall have a quantity less than  $Q_{nom}-2T$ (referred to as  $T_2$  error)



- The average quantity in a batch (1 h production) shall not be less than  $Q_{nom}$ .
- $TU_1$  (or  $T_1$ ): only few prepackages (typ.  $\leq 2.5\%$ ) shall exceed a  $T_1$  error (1 MPE)
- $TU_2$  (or  $T_2$ ): no prepackages allowed to exceed the  $TU_2$  (or  $T_2$ ) error. (2 MPE)

(1) **Average requirements:** On average, the quantity in prepackages shall at least be equal to the nominal quantity  $Q_{nom}$

(2) **Individual requirements:** Only a small percentage of the prepackages (typ. 2.5 %) are allowed to have a quantity between  $(Q_{nom}-2T)$  and  $(Q_{nom}-T)$ , called  $T_1$  error.

(3) **No prepackage** shall have a quantity less than  $Q_{nom}-2T$  (referred to as  $T_2$  error).

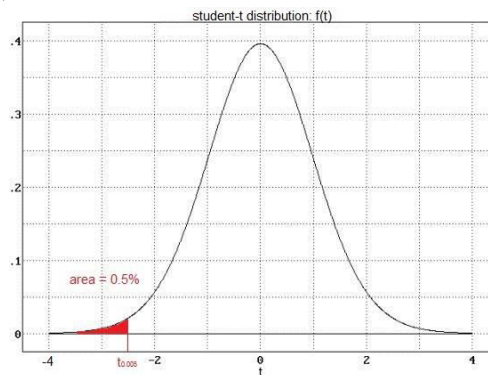
Example of  $T_1$  and  $T_2$ , where  $T$  is 4.5 g for Nominal Quantity is 100 g



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	100 g	Nominal quantity ( $Q_{nom}$ )	
Individual package errors ( $E_i$ ) (inadequate prepackage)	$-T \leq E_i < 0$ $-4.5 \text{ g} \leq E_i < 0$	Individual package quantities $Q_i$ less than $Q_{nom}$ but equal to or greater than $(Q_{nom} - T)$ are acceptable variations.	
	$-2T \leq E_i < -T$ $-9 \text{ g} \leq E_i < -4.5 \text{ g}$	$\uparrow$ $T1$ Error $\downarrow$	Individual package errors less than $-T$ but equal to or greater than $-2T$ are called $T1$ errors.
	$E_i < -2T$ $E_i < -9 \text{ g}$	$\uparrow$ $T2$ Error $\downarrow$	Individual package errors less than $-2T$ are called $T2$ errors.

The tests are carried out by statistical means, based on random sampling of an hourly lot of production with lot size N and sample size n.



**Individual requirements for sampled lots:**

- The probability of incorrectly rejecting a lot with 2.5 % of the prepackages having  $T_1$  or  $T_2$  errors shall be smaller than 0.5 % (PR).
- The probability of correctly rejecting an inspection lot with 9% of the prepackages having  $T_1$  or  $T_2$  errors shall be at least 90% (CR).

**Average requirements for sampled lots:**

- The probability of incorrectly rejecting an inspection lot satisfying equation  $\mu \geq Q_{nom}$  shall be no more than 0.5 % (Producer's risk, PR).
- The probability of correctly rejection an inspection lot shall be at least 90 % (Consumer's risk, CR)

**What is the Average Quantity System?**

'AQS' is an internationally agreed statistical sampling method, that allows for a random selection of prepackages to be selected from a lot (or batch), for the purposes of determining the average quantity and any deficiencies of prepacked products with a 'constant nominal content'.

These products can be sold by measure (weight, volume, length or area) or count (number of items)

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### Why was AQS developed?

#### Introduced to provide:

- Single system
- Reduce barriers to trade
- Fair for manufacturers; introduction of random sampling
- To replace the minimum system; advances in the weighing & measuring instruments used to pack goods

#### covered

- Other information, claims and declarations made in relation to health, safety, tax, ingredients, nutrition,
- dates limits, storage
- specifically include exceptions to the Rules

#### not covered:

- Non prepackaged goods, i.e. goods packed in front of the consumer

#### Determination of mean or average net quantity or net volume.-

- ✚ After determining the individual values of net quantity or net volume or length or number of the commodity contained in the package
- ✚ Determine the mean or average value using the following formula:
  - summing up the individual values ( $x_i$ ) and
  - dividing it by the number of sample packages ( $n$ ) taken for testing,

$$\text{Average Net value } (\bar{x}) = \sum x_i / n$$

#### Determination of Standard deviation of values.-

The standard deviation ( $\sigma$ ) of individual values [ $x_i$ ] is determined by the formula -

$$\sigma = \sqrt{\frac{1}{n-1} \sum (x_i - \bar{x})^2};$$

where ,

$x_i$  = individual values of net quantity or net volume or length or number ,

$\bar{x}$  = average or mean value of net quantity or net volume or length or number.

#### Corrected average net quantity or net volume.-

The corrected average net quantity  $X_c$  is determined from the value of average net quantity [ $\bar{x}$ ] by using the formula -

$$X_c = \bar{x} + (\sigma \times C), \quad \text{where } C \text{ is the correction factor.}$$

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## Advice

“Reasonable care and due diligence do not mean superhuman efforts. They mean a high standard of awareness and decisive, prompt, and continuing action. To demand more, would, in my view, move a strict liability offence dangerously close to one of absolute liability.”

*Justice Fitzpatrick (1992)*  
R. v. Courtaulds Fibres Canada

### Examples of good advice for manufacturers & packers;

- Pack so that all packages contain **no less** than the nominal quantity
  - For example, an end of line check weigher is set to reject all underweight packages
- Have a **sampling plan**, e.g. manually check prepackages on a suitable basis that provides a sufficient level of confidence
  - A packer may want to seek independent statistical advice on a appropriate sampling plan
- Manual checks on prepackages may include:
  - Gravimetric testing (non destructive)
  - Gravimetric testing (destructive)
  - Volumetric testing (destructive)
  - Visual checks (fill height)
- Regularly check weighing equipment:
  - Check the zero & tare functions to ensure they are still accurate
  - Check the equipment is level
  - Encourage the manufacturer to purchase and use calibrated test masses to test for accuracy at nominal quantity
- Regularly check weighing equipment:
  - Use dummy packages to test rejection limits of automatic equipment
  - Assess the affect of environmental conditions on equipment
- Keep records of quantity checks
  - Have regular quantity checks carried out by dedicated personnel and document the results
- Staff training
  - Make staff aware of their responsibilities and the potential implications

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- Storage Conditions
  - Ensure storage conditions at the warehouse and retail sites are suitable
  - Manufacturer should advise retailer on storage requirements
- Customer Feedback
  - Proactive; send out **feedback forms** to customers
  - Reactive; follow up on all **consumer complaints**



### Advice to the Enforcement Officials:

A Legal Metrology Officer may be required to take enforcement action against a manufacturer / packer when a non-compliance with legislation is discovered.

### What to do about non-complying prepackages:

- Non-compliance may be in relation to;
  - Labelling of goods , or
  - Short weight, measure or number , or
  - Both labelling & short quantity

### What to do about non-complying prepackages:

Precedence should be given to your economies legislation regarding offences for non-complying prepackagegoods

### What to do about non-complying prepackages:

- Where packages have been labelled incorrectly;
  - Identify and isolate the affected batch
  - Repackage or relabel the affected prepackages

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### What to do about short quantity prepackages:

#### The manufacturer / packer should:

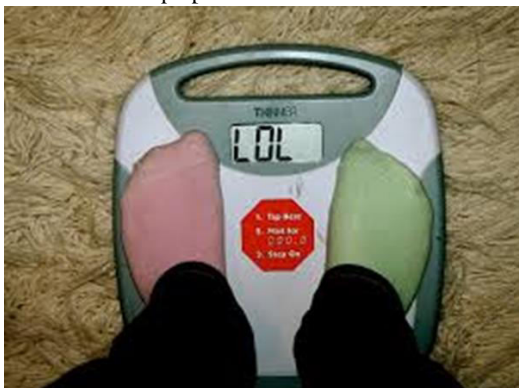
- Identify the affected goods
- Take action to quarantine the goods
- Investigate to determine the cause of the errors
- Rectify the problem
- Ensure prepackaged goods meet the requirements of AQS

### What to do about short quantity prepackages:

- Identify the root cause(s) and determine the solution(s):
  - Unsuitable equipment
  - Operator behaviour

### What to do about short quantity pre-packages:

- Unsuitable Equipment
  - Accurate?
  - Being used correctly?
  - Division size appropriate?
  - Environmental disturbances?
- Unsuitable Equipment



- Suitable equipment:

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Gross Weight (g) of Pre-package	Scale interval (d) in g
< 25	0.01
≥ 25 to < 1000	0.1
≥ 1000 to < 5000	1.0
≥ 5000	2.0

#### What to do about short quantity prepackages:

- Operator Behaviour:
  - Insufficient training or understanding
  - Inadequate or insufficient **knowledge**
  - Oversight
  - Lack of regulatory presence
- Equipment
- Procedure
- Legislative requirements
- Sorting quarantined packages
  - Identifying and isolating** an affected batch
  - Removing **excessively deficient** packages
  - Re-checking** a sample
- **Re-labelling** the prepackages with the correct nominal quantity
  - This may be most appropriate for **importers**
  - Prepackages already distributed into the marketplace
  - When repacking is not an option
- Repacking or topping up
  - Deficient prepackages can be **repackaged** or **topped up**
  - A sample of the altered batch should be checked to ensure it meets all the **requirements**
- If the investigation into the short quantity packages goods has identified that short quantity prepackages are already in the marketplace then the manufacturer or packer is required to contact their customers and advise them to check their stock

**It is often useful to develop your own factsheets, websites and resources for manufacturers and packers to provide them with consistent guidance on how to comply with the relevant legislation**

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### Certain guidelines for Legal Metrology Officers:

#### Scope

This Recommendation specifies:

- Legal metrology requirements for prepackaged products (also called prepackaged commodities or prepackaged goods) labelled in predetermined constant nominal quantities of mass, volume, linear measure, area, or count, and
- Sampling plans and procedures for use by legal metrology officials (LMO) in verifying the quantity of product in prepackages

#### Preparing for the onsite visit

- Announced or unannounced visit
- Equipment
- Resources
- Assistance
- **Announced visit**
  - Contact manufacturer / packer (have a SPOC –single point of contact)
  - Gather information regarding the site and products packed
  - Agree a suitable day / time
  - Health and safety considerations
- **Unannounced visit (surprise visit)**
  - Everything done on day of the visit
- Health & Safety



- **Announced visit**
  - Pros: May make visit more efficient
  - Cons: Manufacturer has time to prepare
- **Unannounced visit**
  - Pros: Realistic snapshot of manufacturers' behaviour
  - Cons: May take longer
- **5 P's:**
  - Perfect Planning Prevents Poor Performance
- **Never make assumptions:**
  - Packer may have never had a visit from LMO before
- **General pre visit information:**
  - Types of products
  - Methods of production / packing
  - Annual production rates

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- Production location(s) and time(s)
- **Product specific information:**
  - Net quantity of package(s)
  - Hourly rate of production
  - Calculate Tolerable Deficiency
  - Calculate T1 error of product under test
  - Calculate T2 error of product under test
  - Calculate No. samples to select
  - No. of T1 permitted in inspection lot
  - Generate random times / numbers
- **Equipment:**
  - Appropriate weighing / measuring instruments and masses
  - Other equipment for testing volume, density etc
  - Computer or hard copy of data capture sheet
  - Protective equipment
- **Assigning tasks:**
  - Lead officer
  - Sample collector
  - Time keeper
  - Perform weighing / measuring
  - Data entry; computer / manual

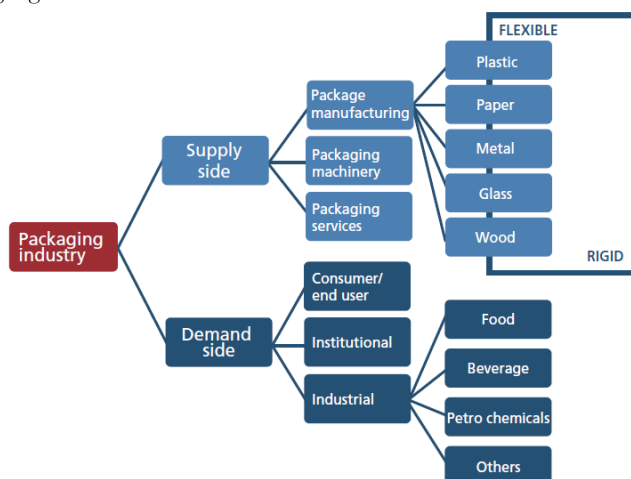
**\*All may be performed by one individual\***
- **Resources:**
  - Relevant legislation (Packaged Commodities Rule latest and Legal Metrology Act)
  - OIML R 79, R 87 & G 14
  - Identification / Warrant / Authority
  - Guidance documents
  - Laptop
  - Stopwatch
  - Random number tables
  - Notebook & pen
- **When onsite**
  - Be professional
  - Introduce yourself
  - Clearly explain how you intend to execute your inspection
  - Plan the inspection (agreed with SPOC)
  - Expect there to be disruptions
  - Advise the SPOC that their assistance may be required
  - Respect the premises and products being handled

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### Packing Industry:

Packaging plays a key role in the retail and distribution of products. Not only does packaging contain the product, protect it and ensure its safety, but facilitates its portability and transportability, enhances its promotional value, and generates an emotional response from the consumer

Packaging, has the ability to define and project the life and personality of a product – a once obscure product can be given its 'ready to market' image through the shape, size, colour, pattern or texture and message on its packaging



#### What drives Packaging technology?

incomes of consumer  
 ready-to-go  
 easy-to-open  
 prolonged shelf-life packages  
 preoccupied with activities outside of the home  
 time for food preparation  
 both husband & wife working

*“Packaging must contain what it sells and sell what it contains.”*

#### General objectives of packages:

- Harmonising requirements for labelling and indication of quantity of products.
- Same rules and efficiency of control of prepackages by authorities.
- Confidence in indication of quantity of prepackages.
- Enhances marketing of products among participating countries.
- Establishing rules and procedures for fostering confidence that labelling and quantity of prepackages comply with defined legal requirements
- Promoting the efficiency of control of prepackages whilst maintaining confidence in products and facilitating trade of prepacked products
- Promoting the harmonization and uniform interpretation of laid down legal metrology requirements.

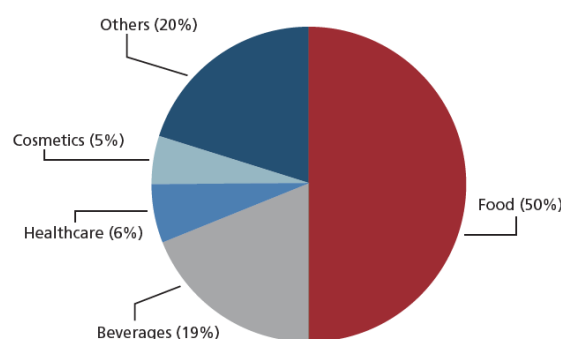
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### Volumes of trade

The packaging industry of developing countries is a market with a value of US\$ 15.4 billion t This represents around 27% of the packaging materials that have been exported worldwide in the past five years (2005-2009) and includes glass, paper, plastic, and wood. Import of plastic materials is the highest in terms of value (\$ 9.5 billion), followed by paper (\$ 4.0 billion), then by glass (\$ 1.6 billion), and last is wood materials for packaging at a comparatively low level (\$ 0.3 billion).

Figure 2. The global consumer packaging industry, by end use, 2009



Source: PIRA International, 2009

### Attributes or Characteristics of Packages:

Attributes of products that are important to the consumer:

- **Authentic:** products those are natural, homemade, or handmade
- **Social value:** contribute to advancing social causes including income generation
- **Shelf life:**
- **Keepsake value:** products that can provide a tangible symbol
- **Easily transported:** portable and easy to carry, unbroken and usable
- **Unique to the place:** products that reflect the uniqueness
- **Good quality:** high quality
- **Competitively priced:** priced at the point where consumer can readily buy on impulse.
- **Easily available:** Locating products near attractions as it caters to buy at impulse
- **Appropriate size:** lightweight, compact
- **Well packaged:** convey an image of quality, provide information about their contents and the product identified with the place of packing. Packaged in a manner, that will prevent them from breaking once purchased.
- **Attractively displayed:** attractively displayed in an appealing environment

### Types of packaging:

packaging is often, a composite of two types of packaging, primary and secondary packaging

**Primary packaging:** that part of the packaging that comes in direct contact with the product itself, it may be liquid, solid, gel, paste, etc. Its function is to contain, to protect and to preserve the product.

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Eg.

**Primary packaging materials:**

flexible and rigid plastics, glass, paper, board and metals in the form of cans.

Polyethylene bags are most commonly used for dried snacks and spices given their widespread availability and low cost,

glass jars are used for many fruit preserves and spices.

**Type of filling machines and method of filling:**

**Gravimetric filling machines:**

Weight based filling machines do not require downstream check weighing as the filling is done On the basis of true weight

Each filling head is independently adjusted and continuously self-optimizing, compared to a central volume adjustment in Rotary volumetric systems.

Filling can be done in Net weight as well as Gross weight – Variations due to weights of empty containers, labels and Caps are eliminated

On line for individual containers due to provision of auto-taring feature.

The advantage of a load cell based (gravimetric) filling system over all volumetric filling systems is that the system is independent of density and temperature change and thus maintain high levels of accuracy on a continuous basis without any manual adjustments

Weight based fillers can do auto correction of weight of the product in flight ensuring better accuracy

Less contact with machine parts as the product comes directly from tank to the nozzles

The accuracy is as high as 0.1% making give-away for the product almost nil. Material balance calculation is always realistic without requirement of manual adjustment in figures between quantity transferred and quantity filled.

The data for the filled weight can be transferred to PC for stock accounting calculations online

**Volumetric filling machine:**

Containers filled by volumetric method have to be Check weighed as the volume is affected by conditions such as heat, viscosity etc.

In rotary volumetric machines there is a common cam to calibrate or set volumes for filling. Hence all the nozzles are adjusted at the same time and it is difficult to set volumes in individual nozzles

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Filling is done only in net volume. It can be verified randomly by external weighing device. Unless the containers are auto-tared there is no online possibility to check exact net weight content.

Variations in weight of packaging material cannot be eliminated for individual containers during filling

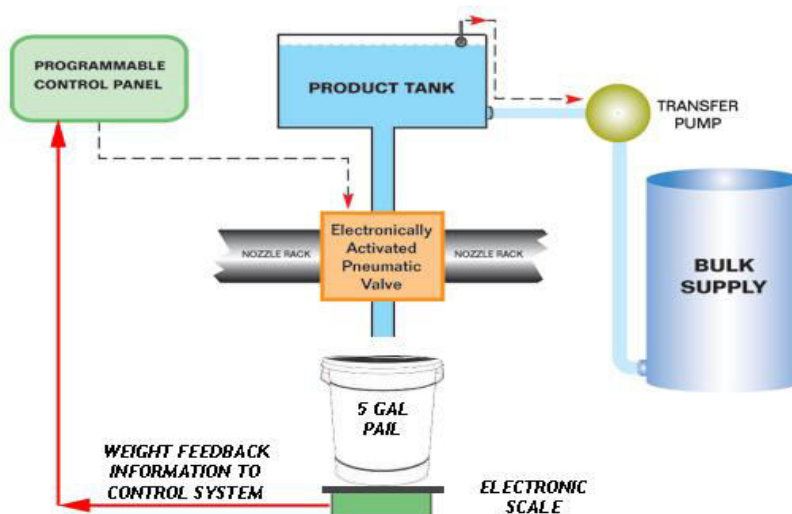
The volume is subject to continuous change due to variation in density and temperature of product during filling. The accuracy is therefore varies continuously and uniform net weight in individual containers is not possible

Volumetric correction is not possible as the feedback of actual volume or weight is not possible in the system

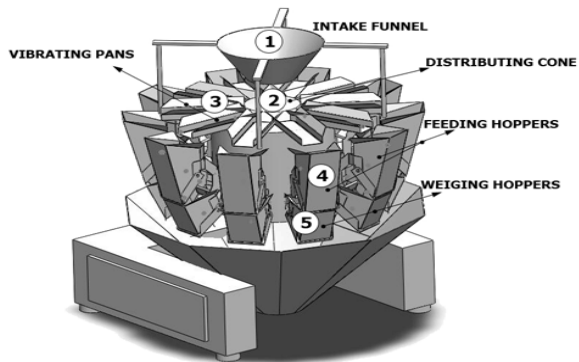
The product to be filled passes through measuring devices like piston, flowmeters, pumps etc and thereby leaves some product with these parts

The accuracy is as low as 0.5% and hence give-away for the product is very high. Material balance calculation is unrealistic requiring manual adjustment in figures.

Even though the volume recorded by the machine is possible to be transferred to the PC, realistic stock accounting is not possible as the feedback may not be real content.



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The future of Packing:



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**Packaging with a Mind of Its Own**

Internet-of-Things (IoT) technology is more than just smart home appliances, it is also smart packaging. By adding an advanced barcode, such as Digimarc Barcode, brands and retailers can digitize packaging, turning products into interactive assets. These connected packages become more than just new channels for consumer engagement, but ways to make supply chains smarter by accessing data on real-time location, manufacturing history and logistics performance.

In 2017, Frito-Lay demonstrated how IoT packaging expands the consumer engagement playbook. It created a limited-edition "Party Safe" Tostitos bag. The bag came with a sensor connected to a microcontroller that detected traces of alcohol on a person's breath. If alcohol was detected, the green symbol on the packaging turned red and reformed into the shape of a steering wheel with the warning: "Don't Drink and Drive." The bag also automatically connected users with an Uber ride home.

**"IoT technology is more than just smart home appliances."**





**Dr.M.Kantha Rao, IPS**

### ***About the Author:***

*Dr.M.Kantha Rao, IPS, is an Veterinarian, joined Police Service, after working for a brief stint as Vet. As a Police Officer, he has investigated several sensitive cases and solved mysteries. Resulted to take a decision in resolving contentious issues. There are several accolades at his credit.*

*Though a Police Officer, but always kind and benevolent to his subordinates and of course a loyal, devoted and subordinate to his Superiors.*

*Presently, Dr.Rao is working as a Controller of Legal Metrology, Andhra Pradesh, India. After assuming charge a State Head of Legal Metrology of Andhra Pradesh, introduced a 4 A's Concept in enforcement of legal metrology regulations in the state.*

*The 4 A's Concept envisages: Awareness , Advice, Admonish and Action. In other words, the enforcement officer should prefer to advice and admonish to taking a penal action, after enlightenment of Legal Metrology regulations. He popularized 'No Less - No More - Just Exact' slogan, which means a fair deal in transactions.*

*Present work is his effort to bring a Hand Book on packaged commodities. In the Hand Book 1, incorporated all regulations which were amended, since its inception that is update upto March 31st, 2020.*

*With a view make available in Enforcement Rule on Packaged Commodities, showing current status as date of release of the Hand Book. The Hand Book will be edited every year and made available.*

