Asia-Pacific
Economic Cooperation

Asia-Pacific
Legal Metrology Forum

Handbook on Practical Application of OIML Recommendation R87 on Pre-packaged Goods

APEC/APLMF Training Courses in Legal Metrology
(CTI 09/2009T)

July 6 – 10, 2009

Singapore

APEC Secretariat

35 Heng Mui Keng Terrace
Singapore 119616
Tel: +65-6891-9600
Fax: +65-6891-9690
E-mail: info@apec.org
Website: www.apec.org

APLMF Secretariat

Department of Metrology, AQSIQ
No. 9 Madiandonglu, Haidian District, Beijing, 100088, P. R. China
Tel: +86-10-8226-0335
Fax: +86-10-8226-0131
E-mail: sec@aplmf.org
Website: www.aplmf.org

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Group photo

Photos taken during the training course

Contents

Foreword

This booklet is one of outcomes of the APEC/APLMF Seminars and Training Courses in Legal Metrology (CTI-09/2009T) titled "Practical Application of OIML Recommendation R87 on Pre-packaged Goods" which was held on July 6 – 10, 2009 at the Holiday Inn Atrium, Singapore.

This training course was organized by APLMF secretariat and arranged as one of the APEC TILF projects, CTI-09/2009T. It was supported by SPRING Singapore and Ministry of Consumer Affairs, New Zealand. I would like to extend my sincere gratitude to colleagues of SPRING Singapore for their outstanding preparation and two trainers, Mr. John Carter and Mr. Brian Waltham from Ministry of Consumer Affairs, New Zealand. Also, special thanks should be extended to the Program Director Toni Widhiastono and Program Executive, Ms. Joyce Yong form APEC Secretariat for their tremendous supports.

The objective of this training course was to demonstrate and develop the practical application of the average quantity system (AQS) to determine the quantity of pre-packaged goods with the deep understand of OIML Recommendations R79 *Labeling requirements for pre-packaged products* and R87 *Quantity of product in pre-packages*, and thus help meet the APEC and APLMF objective to harmonize metrology legislation on OIML international recommendations.

This course focused on the practical applications of both OIML R79 and R87. The host economy generously provided a range of goods and equipment so that participants who worked in small group enable have to opportunity to gain practical experience following the each demonstration module. The talks on how they could be capable of imparting knowledge what they've learned to others within their economies and the near future plan were also given by each economy on the final day.

The host economy also arranged for a visit to a bread factory where the participants were able to carry out an inspection on pre-packages of bread. This enabled participants to have a better understanding of the collection of a sample and carrying out testing in a factory environment and fully understanding the principles underlining OIML R87.

Due to the great contributions from the trainers, participants as well as the effective collaboration between SPRING Singapore and APLMF Secretariat, I would like to say that this training course is certainly a fruitful activity!

Finally, I would like to express my deeply appreciate again to the APEC Secretariat's generosity in contributing to the development in legal metrology among the APLMF member economies.

Oct. 12, 2009

Mr. Pu Changcheng

APLMF President

Summary Report

The Training Course on Practical Application of OIML R87 on Pre-packaged Goods was held from 6 to 10 July 2009 at the Holiday Inn Atrium, Singapore. It was hosted by SPRING, Singapore.

The course was attended by:

- 19 Legal Metrology participants from the following economies: Cambodia, Chile, People's Republic of China, Indonesia, Democratic People's Republic of Korea, Malaysia, Mongolia, Papua New Guinea, Peru, Philippines, Singapore, Thailand and Viet Nam.
- 11 local participants from Industry.
- Mr Willem Kool, Assistant Director, BIML, attended as an observer.

Trainers from the Ministry of Consumer Affairs, New Zealand provided the training. The APLMF secretariat and seven staff members from the host economy also supported the course. The host economy provided the venue and meals.

Having confidence that goods traded are the correct weight or measure plays an important part in every day commercial transactions. As part of the process of ensuring continued confidence internationally in trade of pre-packaged goods OIML member economies are encouraged to implement OIML R79 and R87.

OIML R79 and OIML R87 formed the basis of the course material for the training course.

The course objective was:

To demonstrate and develop the practical application of the average quantity system (AQS) to determine the quantity of pre-packaged goods. OIML Recommendations R79, "Labelling Requirements for Pre-packaged Products" and R87, "Quantity of Product in Pre-packages" were used to outline and demonstrate good metrology regulatory practice when conducting AQS reference tests. Also practical applications and demonstrations of conducting onsite reference tests formed part of the course curriculum. The aim of the course was to help meet the APEC/APLMF objective to "harmonise metrology legislation on OIML international recommendations."

The training course has provided guidelines that will assist participating economies with the information necessary for them to implement R87 in a consistent manner within the Asia Pacific region.

Hard copies of the training material were provided for each participant and in addition an

electronic copy of the presentations and a spreadsheet were also provided.

The course started with welcoming addresses from the Director (Program) APEC Secretariat, the host economy and the APLMF Secretariat. The official group photograph was then taken. Following the formal opening addresses each economy gave a brief presentation outlining how they perform inspections on pre-packaged products and the level at which they currently implement OIML R79 and R87 in their own economies. They also outlined differences in their own economies legislation compared to the OIML R79 and R87 recommendations. Also outlined were any current problems encountered with imported and/or exported pre-packaged goods.

The emphasis of this course was on the practical applications of both OIML R79 and R87. The presentations outlined the following:

- Labelling requirements of OIML R79
- Procedures for determining, compliance with both R79 and R87
- The tare procedures
- Drained quantity of goods packed in a liquid medium
- The quantity of frozen goods
- Random sampling techniques
- Outlining different types of density measuring equipment that may be used
- How to determine the density of non-carbonated and carbonated liquids
- Practical demonstrations on inspecting and determining compliance of pre-packaged goods sold by weight and by volume
- Practical demonstration for determining drained weight and how to determine the average quantity and average tare weight.

Following each demonstration the trainees worked in small groups to gain practical experience. The host economy provided a range of goods and equipment so that each group of trainees could determine if those goods complied with the requirements of OIML R87. The host economy also arranged for a visit to a bread factory where the trainees were able to carryout an inspection on pre-packages of bread. This enabled a better understanding of the collection of a sample and carrying out testing in a factory environment. The trainees participated enthusiastically in these group exercises.

On the morning of the final day of the course each economy gave a talk to the group on how they would carry out a reference test. This was an excellent opportunity for the APEC Secretariat to observe the knowledge that each economy had gained and for the trainers to establish that each trainee had fully understood the principles underlining OIML R87, and would be capable of imparting that knowledge to others within their economies.

The training was presented by Mr. John Carter with assistance from Mr. Brian Waltham. Mr. Carter has been a Weights and Measures Inspector in New Zealand for over 30 years. In 1999 he attended a workshop on checking the net content in pre-packages at the Deutche Akademie Für Metrologie in Munich.

He was involved in the implementation of the Average Quantity System (Quantity of Product in Pre-Packages) in New Zealand.

Mr. Waltham has been a Weights and Measures Inspector in New Zealand and currently holds the position of Senior Advisor, Legal Metrology.

During the closing ceremony, certificates were presented to all the trainees.

APLMF Secretariat

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APEC/APLMF Seminars and Training Courses in Legal Metrology

(CTI 09/2009T)

Practical Application of OIML Recommendation R87 on Pre-packaged Goods

July 6 – 10, 2009

at the Holiday Inn Atrium, Singapore

Program

Organizers:

1. Asia-Pacific Economic Cooperation (APEC)
2. Asia-Pacific Legal Metrology Forum (APLMF)

Supporting Organizations:

1. SPRING Singapore
2. Ministry of Consumer Affairs, New Zealand

Trainers:

Mr. John Carter, Team Leader, Ministry of Consumer Affairs, New Zealand

Main Objective of the Training Course:

This training course intends to demonstrate and develop the practical application of the average quantity system (AQS) to determine the quantity of pre-packaged goods. In this regard the organizers propose to look at OIML Recommendations R79 Labeling requirements for pre-packaged products and R87 Quantity of product in pre-packages, good regulatory practice, issues to be considered when conducting a reference test, on site demonstration of conducting a reference test, and thus help meet the APEC and APLMF objective to harmonise metrology legislation on OIML international recommendations.

Venue and Accommodation:

Accommodation for the participants will be prepared in the Holiday Inn Atrium, Singapore with a rate of about 130 US dollars. Please complete the hotel reservation form to make the reservation.


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Travel Support:

- **APEC travel support**, composed of a roundtrip airfare in a discount economy class and per diem including accommodation, would be prepared for the participants from **Chile**, **P. R. China**, **Indonesia**, **Malaysia**, **Mexico**, **Papua New Guinea**, **Philippines**, **Peru**, **Russian Federation and Thailand.**
- **APLMF travel support** would be complementary prepared for the non-APEC and full-APLMF member economies: **Cambodia**, **DPR Korea and Mongolia.**
- The maximum number of supported participants is limited to **ONE** for each economy. The final eligible participants will be decided after an approval by the APEC/APLMF secretariat. All supported participants are required to prepare a presentation with a document during the course. The English proficiency of your selected participant will very much affect the training accomplishments, so we hope you can recommend the right participant for the right training course.
- The candidates of the **APEC support** will be **requested to submit an airfare quotation and itinerary in advance and have to wait to buy air ticket until it is approved by the APEC secretariat**. Basically, all payment will be reimbursed directly from APEC after the **travel is finished**. The supported participants have to pay their airfare and accommodation temporarily by themselves until the reimbursement.

Presentation from each economy:

- At least one trainee from each economy will be requested to provide a brief presentation about the legal metrology system on pre-packed goods in his/her economy. The recommended topics of the presentation are given below.

1 Self introduction

1.1 Explain about your organization and department.

1.2 Explain your professional experience in your organization.

2 Pre-packed goods in your economy

2.1 Do you use a statistical based average quantity system?

2.2 Do you use OIML R87 procedures?

2.3 If not explain what procedure you use for checking pre-packaged goods?

2.4 Do you have any plans for implementing R87?

2.5 Do you have any issues in determining the net quantity of pre-packaged goods?

2.6 Do you have any issues with imported pre-packaged goods?

2.7 Do you have any issues with export pre-packaged goods?

3 Legal metrology system in your economy

4 Explain current situation in your economy about the compliance to the international standards/recommendations for pre-packed goods

5 Are there any other requirements from your economy? Do you have any problems in order to implement the legal metrology system (budget, human resources, etc.)?

Stationery:

A scientific calculator is required during the training course. It should be able to perform a standard deviation function and mean function.

Registration:

Please complete the attached "Registration Form" and send it to the APLMF Secretariat by **June 5, 2009**.


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General information:

General information about Singapore can be found in the attached file.


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Contact Persons about the Seminar:

- **APLMF Secretariat** (registration and travel support)
  Dr. ZHANG Chao & Mr. GUO Su
  APLMF Secretariat
  AQSIQ No. 9, Madiandonglu, Haidian District, Beijing 100088, P. R. China
  Tel: +86-10-8226-0335
  Fax: +86-10-8226-0131
  E-mail: sec@ aplmf. org aplmf@ aqsiq. gov. cn

- **Host in Singapore** (visa assistance, accommodation, venue and access information)
  Mr. Lim Yong Seng
  Inspector, Weights and Measures Office, SPRING Singapore
  No. 2 Bukit Merah Central Singapore 159835
  Tel: +65-6279-1884 Fax: +65-6458-1441
  E-mail: lim_ yong_ seng@ spring. gov. sg

Program

Day 1 July 6 Monday	09 : 00-09 : 30	**Opening Ceremony:** • Welcome address by the host • Opening address by the APLMF Secretary • Take an assembled photo
	09 : 30-10 : 00	*Coffee Break*
	10 : 00-10 : 15	Programme outline by the trainers
	10 : 15-12 : 00	**Presentation by each Economy covering the following issues:** • Are you using AQS? • Does it differ from R87? If so how? • If they use a different system, what is it? • Exported goods, any issues with weight or measure including examples. • How you deal with imported goods including examples? • Local goods, any issues with weight or measure including examples. *Note: Number of presentations depends on number of economies.*
	12 : 00-13 : 30	*Lunch*
	13 : 30-15 : 00	**OIML Recommendation R79** • Labelling requirements for pre-packaged goods
	15 : 00-15 : 30	*Coffee Break*
	15 : 30-17 : 00	**OIML Recommendation R87** • Scope • Terminology • Metrological requirements for a pre-package • Reference test for metrological requirements
	18 : 30-21 : 30	Welcome dinner invited by SPRING Singapore (*Singapore Flyer-Ride & Dinner*)
Day 2 July 7 * Tuesday	09 : 00-10 : 00	**OIML Recommendation R87 (Continue)** • Tare procedures • Group exercises
	10 : 00-10 : 30	*Coffee Break*
	10 : 30-12 : 00	**OIML Recommendation R87 (Continue)** • Outline of examination procedure • Group exercises (goods sold by weight)
	12 : 00-13 : 30	*Lunch*
	13 : 30-15 : 00	**OIML Recommendation R87 (Continue)** • Group exercises (goods sold by volume, length, area and count)
	15 : 00-15 : 30	*Coffee Break*
	15 : 30-17 : 00	Random Sampling

* Note: A scientific calculator is required.

Day 3 July 8 * Wednesday	09：00-10：00	**Demonstration of the** • Reference test for goods sold by weight • Group Practical exercises
	10：00-10：30	*Coffee Break*
	10：30-11：30	Group Practical exercises
	11：30-12：00	Equipment, Density measurement
	12：00-13：30	*Lunch*
	13：30-15：00	**Demonstration of the Reference test for goods (non-carbonated liquid) sold by volume** • Group Practical exercises
	15：00-15：30	*Coffee Break*
	15：30-16：00	**Group Practical exercises** • Carbonated water
	16：00-17：30	Visit preparation
Day 4 July 9 * Thursday	09：00-12：00	Visit to manufacturer or packer (arranged by the host)
	12：00-13：00	*Lunch*
	13：00-14：30	Debrief (including software demonstration)
	14：30-15：00	**Drained quantity of products packed in a liquid medium** • Group Practical exercises
	15：00-15：30	*Coffee Break*
	15：30-17：00	**Test procedures for determining the actual quantity of frozen products** • Frozen fruit and vegetables • Glazed seafood • Frozen shrimp and crab meat Issues
		Preparation
	20：00-22：00	Farewell dinner invited by APLMF (*Sakura restaurant in Orchard*)
Day 5 July 10 * Friday	09：00-10：30	Each economy will give a practical demonstration of the reference test to the rest of the group
	10：30-11：00	*Coffee Break*
	11：00-12：00	**Closing Ceremony** • Presentation of certificates to all trainees • Closing address by the APLMF Executive Secretary • Closing address by the host
	12：00-13：30	*Lunch*

Participants List

APEC/APLMF Seminar and Training Courses in Legal Metrology (CTI-09/2009T)

Practical Application of OIML Recommendation R87 Pre-packaged Goods

No.	Category	Economy	Name	Organization
1	APEC	APEC Secretariat	Mr. Toni Widhiastono	Director (Program) APEC Secretariat
2	APLMF	P. R. China	Dr. ZHANG Chao	APLMF Secretary, Department of Metrology, AQSIQ
3	APLMF	P. R. China	Mr. GUO Su	APLMF Secretary, Department of Metrology, AQSIQ
4	Trainer	New Zealand	Mr. Thomas John CARTER	Measurement and Product Safety Service Ministry of Consumer Affairs
5	Trainer	New Zealand	Mr. Brian Nicholas WALTHAM	Measurement and Product Safety Service Ministry of Consumer Affairs
6	Participant	Indonesia	Mr. NOVIAN Darajat Kuswanto	Directorate of Metrology
7	Participant	Philippines	Mr. Rolly C. MEDIALDEA	National Metrology Laboratory - Philippines (NMLPhil)
8	Participant	Thailand	Ms. Pattaraporn SURASIT	Bureau of Weights and Measures
9	Participant	PNG	Mr. Cholai Richard TAU	National Institute of Standards and Industrial Technology (NISIT)
10	Participant	Chile	Ms. Maria Cristina LEIVA BALICH	Servicio Nacional del Consumidor

11	Participant	P. R. China	Mr. ZHAO Wei	SHANGHAI INSTITUTE OF MEASUREMENT AND TESTING TECHNOLOGY
12	Participant	Viet Nam	Mr. TRAN Quy Giau	Directorate for Standards, Metrology and Quality (STAMEQ)
13	Participant	Cambodia	Mr. KIM Chandara	Department of Metrology, Ministry of Industry, Mines and Energy
14	Participant	DPRK	Mr. PAK Jin	Mass Measurement Department, Central Institute of Metrology of SAQM
15	Participant	Mongolia	Ms. Gandolgor TSEDENBALJIR	MONGOLIAN AGENCY FOR STANDARDIZATION AND METROLOGY
16	Participant	Singapore	Ms. KOH Swee Moi, Jessie	SPRING Singapore
17	Participant	Singapore	Mr. PHANG Long Hwa	SPRING Singapore
18	Participant	DPRK	Mr. RI Jae Chol	Department of Export and Import Commodity Inspection, State Administration for Quality Management (SAQM)
19	Participant	Indonesia	Ms. LITA Annita Fajarani	Metrological Training Centre
20	Participant	Indonesia	Mr. H. BUDIARTO	Regional Verification office of East Kalimantan
21	Participant	Indonesia	Ms. ANGGIA Anggraeni	Directorate of Metrology
22	Participant	Malaysia	Mr. Mohd. Zawawi HUSSIN	Ministry Of Domestic Trade & Consumer Affairs

23	Participant	Malaysia	Mr. Rosley ABDULLAH	Ministry Of Domestic Trade & Consumer Affairs
24	Observer	OIML	Mr. Willem KOOL	OIML
25	Host	Singapore	Mr. Teo Nam Kuan	SPRING Singapore
26	Host	Singapore	Mr. Michael Ong	SPRING Singapore
27	Host	Singapore	Ms. Lena Soh	SPRING Singapore
28	Host	Singapore	Mr. Adrian Ang	SPRING Singapore
29	Host	Singapore	Mr. Lim Yong Seng	SPRING Singapore
30	Host	Singapore	Ms. Pang Si Ying	SPRING Singapore
31	Host	Singapore	Ms. Vivien Soosaynathan	SPRING Singapore
32	Local participant	Singapore	Mr. Kriegsman Tan Teck Chye	SPRING Singapore
33	Local participant	Singapore	Mr. Poh Sen Kah	NTUC FairPrice Co-operative Ltd.
34	Local participant	Singapore	Mr. Ho Heng Choy	Gardenia Foods (S) Pte Ltd.
35	Local participant	Singapore	Ms. Jessie Lew	Sheng Sheng F&B Industries Pte Ltd.
36	Local participant	Singapore	Mr. Tang Hwee Min	Mettler-Toledo (S) Pte Ltd.
37	Local participant	Singapore	Ms. Jenny Quek	Tai Sun (Lim Kee) Food Industries Pte Ltd.

38	Local participant	Singapore	Mr. Cheng Chee Seng	Agri-Food & Veterinary Authority of Singapore (AVA)
39	Local participant	Singapore	Ms. Leow Rou Shuang	H W Agri-Food Trading Pte Ltd.
40	Local participant	Singapore	Ms. Lee Yi Wen	H W Birdnest Trading Pte Ltd.
41	Local participant	Singapore	Ms. Su Zhi Zhuang	Asia Pacific Breweries (S) Pte Ltd.
42	Local participant	Singapore	Mr. Tang Weng Ang	Extra Excellence Manufacturing (S) Pte Ltd.

OIML Recommendation R79

LABELING REQUIREMENTS FOR PRE-PACKAGED PRODUCTS

Scope

Labelling of pre-packaged products

- the identity of the product
- the name and place of business of the manufacturer, packer, distributor, importer or retailer
- the net quantity of the product

Scope

There are two Annexes

Scope

Annex A
Units of measurement and symbols
(mandatory)

Scope

Annex B

Type size of letters and numerals for statements of net quantity on consumer pre-packages

(informative)

Scope

This Recommendation does not cover

- existing national regulations

Scope

This Recommendation does not cover

- declarations of ingredients or nutritional information

Scope

does not cover nutritional information

Scope

This Recommendation does not cover

- pre-packages made up in variable quantities

Terminology

Pre-packaged product

Any commodity that is

- enclosed in a container or wrapped in any manner; and is
- marked with its quantity on its label prior to being offered for sale

Pre-packaged product

- wrapped in any manner
- quantity marked on the label

Terminology

Net quantity

The quantity of product in the pre-package exclusive of any packaging material.

Relates to quantity statement on package and not to the actual contents of an individual pre-package.

Terminology

Label

Includes any:

- written
- printed
- or graphic matter

Terminology

Label

- Affixed to
- Applied to
- Attached to
- Blown onto
- Embossed on

Terminology

Label

- Or appearing upon a package containing any product for purposes of:
- Branding
- Identifying, or
- giving any information about the product, or
- the contents of the package

Terminology

- An inspector's tag
- other non-promotional text appearing on a product

shall not be deemed to be a label requiring the prescribed label information.

Terminology

Principle display panel

The part of a pre-package that is most likely to be displayed.

Terminology

Person

singular and plural including:

- individuals
- partnerships
- corporations
- companies
- societies
- associations

Terminology

Consumer pre-package

A pre-package that is

- customarily produced or distributed for sale to final purchasers

Terminology

Non-consumer pre-package

Any package intended solely for

- industrial
- institutional
- wholesale distribution

Information required on pre-package

To summarise

- identity of the product
- name and place of business
- net quantity

Identity of the product

- must be conspicuously marked on the principle display panel
- be easily read and understood

Exemption (name only)

If the product can be

- easily identified because it is inside transparent wrapping
- the identity does not need to be marked on the principle display panel

Information required on pre-package

Identity of the product

- name required by law
- the common, or usual name of the product
- the generic name or other appropriately descriptive term

Identity required by law

Hazardous Substances (Identification) Regulations 2001

- requires a technical or trade name to be marked on the pre-package which unequivocally identifies the substance

Identity required by law

For example "Domestic bleach".
The word "bleach" must appear on the label in addition to the words "sodium hypochlorite".
Additional warning labels etc must also appear on the label.

Identity of the product

Usual name of the product

Identity of the product

Generic name

Information required on pre-package

Name and place of business

The label shall specify conspicuously the name and place of business of the person responsible for any of the following…

Information required on pre-package

Name and place of business

- manufacturing
- packing
- distributing
- importing
- retailing

Information required on pre-package

Name and place of business

When the product is

- not manufactured or pre-packaged by that person but that person's name appears on the label
- the name may be qualified to reveal that persons connection with the product

Information required on pre-package

Name and place of business

For example

- "manufactured for ..."
- "distributed by ..."
- "marketed by ..."
- "imported by ..."
- "sold by ..."

Information required on pre-package

Name and place of business may be qualified to reveal the connection.... "manufactured for"

Information required on pre-package

"imported by"

Information required on pre-package

"packed by"

Information required on pre-package

Name and place of business

The name of the manufacturer or packer may be added as a code if permitted by national regulations.

Identity of manufacturer/packer (PF11) added as a code

Information required on pre-package

Name and place of business

The place of business with complete mailing address shall be in accordance with national laws and postal usage.

It may be represented as a code if allowed by national regulations.

Satisfaction Guaranteed or your purchase price refunded. Write or call our Freephone 0800 245 114.

MARKETED BY:
PAM'S PRODUCTS LTD, 60 ROMA ROAD,
P.O. BOX 27-480, MT. ROSKILL, AUCKLAND.

MADE IN NEW ZEALAND FROM LOCAL AND/OR IMPORTED INGREDIENTS.

Information required on pre-package

- **Declared Net quantity**
  - —marked on the principle display panel
  - —at any one of the following locations
    - ➢ at initial place of packaging
    - ➢ at importation
    - ➢ at place where offered for sale

Information required on pre-package

Net quantity

The metrological requirements for net quantity in pre-packages are covered in OIML Recommendation R 87.

Net quantity

Some products may require the labelling of a drained mass under national regulations.

Information required on pre-package

Net quantity

Requirements for small and mixed pre-packages are set out in national regulations.

Information required on pre-package

Net quantity

Small pre-packages include

- individual packets of salt
- pepper
- sugar
- individually wrapped pieces of confectionary

Information required on pre-package

Net quantity

Mixed pre-packages:

- two or more individual packages
- units of dissimilar commodities

Mixed pre-packages

Mixed pre-packages

Units of dissimilar commodities

90g Tuna Sensations 17g Crackers
107g NET

Information required on pre-package

Net quantity

Expressed in terms of the largest whole unit of one or more of the following

- mass
- volume
- length
- area

Net quantity—volume

Net quantity

- Count
- Weight

Net quantity—length & width

Information required on pre-package

Net quantity

Depending on national regulations and customs the net quantity statement for a specific product may be expressed in the following manner:

Information required on pre-package

Volume may be expressed

- at a specified reference temperature if the product is liquid or viscous
- reference temperature would not normally appear on the label

Information required on pre-package

Mass may be expressed

if the product is

- solid, semi-solid or viscous, a mixture of solid and liquid

or

- the solid part of a mixture of a solid and liquid

Information required on pre-package

Length may be expressed

in micro metres for the thickness of products less than 1mm

Information required on pre-package

Net quantity

- quantities based firmly on established general consumer usage and trade custom

  must provide accurate and adequate information to the purchaser

Information required on pre-package

For example

- liquid declared by mass
- solid, semi-solid, or viscous product by volume
- solid, semi-solid, or viscous product by count

Quantities based firmly on established general consumer usage and trade custom

- liquid declared by mass
- semi-solid, product by volume

Quantities based firmly on established general consumer usage and trade custom

- semi-solid product declared by mass
- semi-solid product declared by volume

Quantities based firmly on established general consumer usage and trade custom

Ice cream

Sold by volume

Net quantity

Aerosol dispensers

- mass that will be expelled ——propellant is included
- in kilograms, grams or milligrams

Information required on pre-package

Net quantity

Statements of a quantity in terms of count shall be expressed in whole numbers.

Net quantity

- count in whole numbers

Presentation of information

Statements of a quantity less than a whole number may contain decimal fractions to a maximum of three places, provided that the declaration complies with Table 2 in Annex A.

Presentation of information

- 1.255 L —— quantity statement is acceptable
- 1.2554 L —— quantity statement is not acceptable

Presentation of information

This may become an issue for economies changing measurement systems. For example an imperial pound is equal to 0.45359 kg in the metric system, or where goods are packed using the metric system and dual marked for export e.g. 1 kg is equal to 2.204 62 lb.

Presentation of information

Net quantity statements

- be easily legible
- contrast with the background
- contrast with other information

Presentation of information

If the net quantity statement is

- blown, embossed or moulded on the surface of the pre-package
- all other required label information shall be provided elsewhere on the surface or on a label

Presentation of information

Net quantity

Minimum type size may depend on either

- the area of the principle display panel (See Table 3 in Annex B)
- the quantity (See Table 4 in Annex B)

Table 3 Minimum height of numbers and letters in USA

Area of principle display panel in square centimetres *(A)*	Minimum height of numbers and letters in millimetres	Minimum height: label information blown, formed or moulded on surface of container in millimetres
$A \leqslant 32$	1.6	3.2
$32 < A \leqslant 161$	3.2	4.8
$161 < A \leqslant 645$	4.8	6.4
$645 < A \leqslant 2581$	6.4	7.9
$2581 < A$	12.7	14.3

Table 4 Minimum height of numbers and letters in the European Union

Net contents (*C*)	Minimum height of numbers and letters in millimetres
$C \leqslant 50$ g (or mL)	2
50 g (or mL) $< C \leqslant 200$ g (or mL)	3
200 g (or mL) $< C \leqslant 1$ kg (or L)	4
1 kg (or L) $< C$	6

Presentation of information

Net quantity

Significance of numbers on labels.

In general, the number used on a label shall be shown to three figures in the decimal system.

Significance of numbers on labels

Shown to three figures in the decimal system.

Presentation of information

Net quantity

Significance of numbers on labels.

Three exceptions are permitted:

1. Any final zeros to the right of the decimal mark need not be expressed.

Significance of numbers on labels

2. Quantities below 100 g, 100 mL, etc., may be shown to two figures.

Significance of numbers on labels

3. If the quantity is less than one, it shall be shown in the decimal system with the figure zero preceding the decimal point.

Information required on pre-package

Net quantity

Statements such as “half a kilogram” are not acceptable.

Misleading practices

Also refer to Annex E Recommendation 87 Quantity of product in pre-packages in relation to “Prohibition of misleading pre-packages”.

Misleading practices

Fill level, design and display

Purchaser may not reasonably be misled as to

- quantity
- identity

of the product contained within the package.

However consideration must be given to slack fill as discussed in R87.

Misleading practices

Misleading Quantity Statement.

0.5 oz = 14.175 g

Misleading practices

The information on all labels on the pre-package shall be equivalent.

Exemptions

Exemptions

Made on the basis of national practice shall be explicitly stated in national regulations.

Annex A
Units of measurement and symbols (Mandatory)

Table 1 Units of measurement

Unit	Symbol[a]
milligram	mg
gram	g
kilogram	kg
tonne	t
litre[b]	L or l
millilitre	mL or ml
micrometre	µm
millimetre	mm
centimetre	cm
decimetre	dm
metre	m
square millimetre	mm^2
square centimetre	cm^2
square metre	m^2
cubic centimetre	cm^3
cubic decimetre	dm^3
cubic metre	m^3

Annex A

- Neither a full stop nor the letter "s" should be used after any of the symbols.
- The alternative symbol for the litre, L is used in order to avoid the risk of confusion of the letter l and the number 1.
- The script letter ℓ is not an approved symbol for litre.

Annex A

- A single space between the number and the unit of measurement must be used.
- Phrases such as "net", "net mass", "net contents" or "net quantity" may be used before or after but **only** in conjunction with the net quantity declaration.

Table 2 Choice of units

Type of measure	Net quantity of product (q)	Units
Volume (liquids)	q < 1000 mL 1000 mL ⩽ q	mL (ml) L (l)
volume - cubic (solids)	q ⩽ 1000 cm^3 (1 dm^3) 1 dm^3 < q < 1000 dm^3 1000 dm^3 ⩽ q	cm^3, mL (ml) dm^3, L (l) m^3
mass	q < 1 g 1 g ⩽ q < 1000 g 1000 g ⩽ q	mg g kg

Table 2 Choice of units

Type of measure	Net quantity of product (q)	Units
length	q < 1 mm 1 mm ⩽ q < 100 cm 100 cm ⩽ q	mm mm or cm m
area	q < 100 cm^2 (1 dm^2) 1 dm^2 ⩽ q < 100 dm^2 (1 m^2) 1 m^2 ⩽ q	mm^2 or cm^2 dm^2 m^2

Annex B

Type size of letters and numerals for statements of net quantity on consumer pre-packages (Informative)

Annex B

A consensus has not been reached on minimum type size for the lettering required for labelling of pre-packaged products. This annex gives the current requirements in the USA and the EU as examples only.

Table 3 Minimum height of numbers and letters in USA

Area of principle display panel in square centimetres *(A)*	Minimum height of numbers and letters in millimetres	Minimum height: label information blown, formed or moulded on surface of container in millimetres
$A \leqslant 32$	1.6	3.2
$32 < A \leqslant 161$	3.2	4.8
$161 < A \leqslant 645$	4.8	6.4
$645 < A \leqslant 2581$	6.4	7.9
$2581 < A$	12.7	14.3

Annex B——Table 3

The area of principle display panel does not include

- tops
- bottoms
- flanges at tops and bottoms of cans
- shoulders and necks of bottles and jars

Annex B——Table 3

The area is determined as follows:

- rectangular pre-package——the height × the width of principle display panel
- cylindrical pre-package, 40% the height of the pre-package × the circumference

Annex B——Table 3

- Any other shaped pre-package, 40% of the total surface of the pre-package, or an area considered to be a principle display panel of the pre-package

Table 4 Minimum height of numbers and letters in the European Union

Net contents (C)	Minimum height of numbers and letters in millimetres
$C \leqslant 50$ g (or mL)	2
50 g (or mL) < $C \leqslant 200$ g (or mL)	3
200 g (or mL) < $C \leqslant 1$ kg (or L)	4
1 kg (or L) < C	6

R79 Labelling

Questions


READY SALTED
APPROX. NO. OF PACKS
12 X READY SALTED
FLAVOURED POTATO CHIPS 216G NET


NETT MASS
410 g
DRAINED MASS
275 g


NET WT.


FIVE STARS
ELEPHANT
PRODUCT OF THAILAND
ING 100% RICE
NET WT. 10 KGS.

OIML Recommendation 87

Quantity of Product in
Pre-packages

Scope

Pre-packaged goods labelled in predetermined constant nominal quantities of

- weight
- volume
- linear measure
- area
- count

Scope

- Sampling plans
- Sampling procedures
- For use by legal metrology officials to verify the quantity of product in pre-packages.

Scope

These sampling plans and procedures are **not** for use by packers.

Scope

Informative Annexes

- Examination procedure outline
- Tare procedures
- Drained products
- Frozen products

Mandatory Annex

- Misleading pre-packages

Terminology

Nominal quantity (Q_n)

- manufacturer's declared quantity as labelled by the packer
- requirements are to be found in OIML Recommendation 79 *Labelling requirements for pre-packaged products*.

Nominal quantity

Declared quantity as labelled by the packer

Terminology

Packing material

Also known as individual package, tare, packaging, or packaging material.

Terminology

Packing material

- the material left over after the product has been used

Terminology

Packing material

- does not include items naturally in the product

Terminology

Pre-package

Combination of the product and the packaging material.

Terminology

Pre-packaged product

Any single item offered for sale to a consumer that is:

- enclosed in a container or wrapper in any manner such that the contents cannot be altered without the packing material being opened or noticeably modified
- made up in a pre-determined constant nominal quantity
- the quantity is indicated on its label prior to sale

Terminology

Pre-packaged product

Also known as pre-packaged goods or pre-packaged commodities.

Pre-packaged product

Terminology

Actual quantity

This is the quantity of product that the pre-package in fact contains as determined by measurements made by legal metrology officials.

Terminology

Content of a pre-package

This is the quantity of product in a pre-package.

Terminology

gross weight: weight of the pre-package
tare weight: weight of packaging material
net weight: is the actual quantity product

Gross weight = tare weight + net weight

Terminology

Inspection lot or batch

Pre-packaged goods that are of the

- same kind
- same stated quantity
- produced (available) at one time
- packed in the same place
- under conditions presumed to be uniform

Terminology

The test sample is taken from an inspection lot or batch.

Terminology

Tolerable Deficiency (T)

The deficiency allowed in the contents of a pre-package.

The amounts are specified in Table 2.

Also called tolerable negative error TNE.

Table 2 Tolerable deficiencies in actual content for pre-packages

Nominal quantity of product (Q_n) in g or mL	Tolerable deficiency (T)[a]	
	Percent of Q_n	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 1 000	-	15
1 000 to 10 000	1.5	-
10 000 to 15 000	-	150
15 000 to 50 000	1	-

[a] T values are to be rounded up to the next 1/10 of a g or mL for $Q_n \leq 1\,000$ g or mL and to the next whole g or mL for $Q_n > 1\,000$ g or mL.

Table 2 cont'd

Nominal quantity of product (Q_n) in length	Percent of Q_n
$Q_n \leq 5$ m	No tolerable deficiency allowed
$Q_n > 5$ m	2
Nominal quantity of product (Q_n) in area	**Percent of Q_n**
All Q_n	3
Nominal quantity of product (Q_n) in count	**Percent of Q_n**
$Q_n \leq 50$ items	No tolerable deficiency allowed
$Q_n > 50$ items	1[b]

[b] Compute the value of T by multiplying the nominal quantity by 1 % and rounding the result up to the next whole number. The value may be larger than 1 % due to the rounding but this is accepted because the products are whole items and cannot be divided.

Terminology

Individual pre-package error

Difference between the actual quantity of product in a pre-package and its nominal quantity.

Terminology

Average error (**AE**)

This if the sum of individual pre-package errors, considering their arithmetic sign, divided by the number of pre-packages in the sample.

Terminology

Inadequate pre-package

Pre-package with an individual pre-package error less than the nominal quantity.

Also called a **non-conforming pre-package.**

Terminology

T1 error

An inadequate pre-package found to contain an actual quantity of product less than the nominal quantity minus the tolerable deficiency.

T1 error: Actual contents < ($Q_n - T$)

Terminology

T2 error

An inadequate pre-package found to contain an actual quantity of product less than the nominal quantity minus twice the tolerable deficiency.

T2 error: Actual contents < (Q_n – *T2*)

Terminology

Random Sampling

- specified number of pre-packages
- chosen randomly from an inspection lot
- each pre-package has same probability of being chosen

Terminology

Sample Size (***n***)

See column 2 Table 1

Pre-packages taken from an inspection lot.

Provides information for the decision to accept or reject the inspection lot.

Table 1 Sampling plans for pre-packages

Inspection lot size	Sample size *(n)*	**Sample correction factor** $(t_{1-a}) \times \frac{1}{\sqrt{n}}$	Number of pre-packages in a sample allowed to exceed the tolerable deficiencies in 4.2.3 (see also 2.4.1)
100 to 500	50	0.379	3
501 to 3200	80	0.295	5
> 3 200	125	0.234	7

Metrological requirements for a pre-package

These must be met at any level in the distribution chain:

- point of pack
- import
- distribution
- wholesale
- retail

Metrological requirements for a pre-package

Average requirement

The average actual quantity of product in a pre-package in an inspection lot shall be at least equal to the nominal quantity.

Metrological requirements for a pre-package

Average requirement

The criteria shall be met if the average actual quantity of product in a pre-package in an inspection lot is estimated by sampling.

Metrological requirements for a pre-package

Individual pre-package requirement

An inspection lot shall be rejected if it contains

- more pre-packages that exceed the tolerable deficiencies than allowed in column 4 of Table 1
- one or more inadequate pre-packages that are *T2* errors

Table 1 Sampling plans for pre-packages

Inspection lot size	Sample size *(n)*	**Sample correction factor** $(t_{1-\alpha}) \times \frac{1}{\sqrt{n}}$	Number of pre-packages in a sample allowed to exceed the tolerable deficiencies in 4.2.3 (see also 2.4.1)
100 to 500	50	0.379	3
501 to 3200	80	0.295	5
> 3 200	125	0.234	7

Metrological requirements for a pre-package

Failure to comply with either the average or individual pre-package requirements will cause the inspection lot to be rejected.

Reference test

Tests carried out by legal metrology officials to check compliance with

- R87
- R79

Reference test

Expanded uncertainties at the 95% confidence level shall not exceed *0.2T*.

Reference test

Examples of the source of uncertainty include

- MPE and repeatability on weighing and measuring instruments
- Variability in the tare weight
- Variability in density determinations

Reference test

Additional tests are permitted.

Reference test

Reasonable deviations may be permitted in the case of hygroscopic goods.

Statistical and general principle of control

There are three rules which the inspection lot must pass.

The inspection lot is rejected if it fails one or more of these rules.

Statistical and general principle of control

Rule 1

The actual quantity of the product in the pre-package must not be less, on average, than the nominal quantity (Q_n).

Statistical and general principle of control

i.e.

The contents of packages must not on average be less than the amount marked on the label.

Statistical and general principle of control

Rule 2

Less than 2.5% of pre-packages in a sample shall contain a quantity of product less than ($Q_n - T$). (*T1* error)

Column 4 of Table 1 states the maximum number of pre-packages allowed to exceed the prescribed tolerable deficiencies.

Statistical and general principle of control

i.e.

Not more than one pre-package in forty may contain less than the stated quantity by more than a tolerable negative error.

Table 1 Sampling plans for pre-packages

Inspection lot size	Sample size *(n)*	**Sample correction factor** $(t_{1-\alpha}) \times \frac{1}{\sqrt{n}}$	Number of pre-packages in a sample allowed to exceed the tolerable deficiencies in 4.2.3 (see also 2.4.1)
100 to 500	50	0.379	3
501 to 3200	80	0.295	5
> 3 200	125	0.234	7

Statistical and general principle of control

Rule 3

The inspection lot must be rejected if one or more pre-packages contain a quantity of product that is less than (Q_n – *T2*). (*T2* error)

Statistical and general principle of control

i.e.

No package may contain less than the stated quantity by more than twice the tolerable negative error.

Statistical and general principle of control

Significance level of the tests for the Type I Risk

A Type I Risk: the inspection lot is rejected when it was correctly filled.

Statistical and general principle of control

Test on the **average** of the quantity of product in a pre-package in the sample.

The significance level is 0.5%.

This means there is a 1 in 200 chance of wrongly rejecting a lot where the mean is equal to or greater than the nominal quantity.

Statistical and general principle of control

Test on the **number** of inadequate pre-packages in the sample.

The significance level is 5%.

There is a 1 in 20 chance of wrongly rejecting an inspection lot containing 2.5% of inadequate pre-packages.

Statistical and general principle of control

Significance level of the tests for Type II Risks

A Type II Risk is that the inspection lot is accepted when it should have been rejected.

Statistical and general principle of control

At least 90% of reference tests shall detect inspection lots:

- For which the average fill is less than $(Q_n - 0.74\sigma)$ where σ is the sample standard deviation of the quantity of the product in the pre-packages of the inspection lot; and
- Which contain 9% of pre-packages that exceed the tolerable deficiency.

Sampling plans

- Inspection lots are assumed to be uniform.
- Random sampling techniques are used.
- Sample selection after final point of checking by packer.

Sampling plans

Sampling from

- production line
- at the packer's premises but not from the production line
- at any other point in the distribution chain

Sampling plans

Sample pre-packages chosen from the production line

size of the inspection lot = maximum hourly output of production line

There is no restriction on the size of the inspection lot.

Sampling plans

Sample pre-packages chosen at the premises of the packer but are not taken from the production line.

There are two scenarios:

Sampling plans

1. If the production line output **exceeds** 10 000 pre-packages per hour.

size of the inspection lot	=	maximum hourly output of production line

There is no restriction on the size of the inspection lot.

Sampling plans

2. If the production line output is 10 000 or fewer pre-packages per hour:

   the inspection lot size shall not exceed 10 000 pre-packages

Sampling plans

- Inspection lot and sampling characteristics are shown in Table 1.
- Table 2 specifies the tolerable deficiencies (*T*).
- No pre-package is allowed to have a negative error greater than twice the tolerable deficiency (*T2*).

Annex E

Prohibition of misleading pre-packages (Mandatory)

Misleading pre-packages

Pre-packages must not have a false

- bottom
- sidewalls
- lid or covering

Nor be constructed or filled in such a way that may deceive a consumer.

Misleading pre-packages

Slack fill

Difference between the actual capacity of the packaging material and the volume of product it contains.

Misleading pre-packages

Reasons for slack fill

- protection
- requirements of machines used for enclosing the contents of the pre-package
- unavoidable product settling during shipping and handling

Misleading pre-packages

Reasons for slack fill cont'd

- specific function
  - e.g. the packaging plays a role in the preparation of food

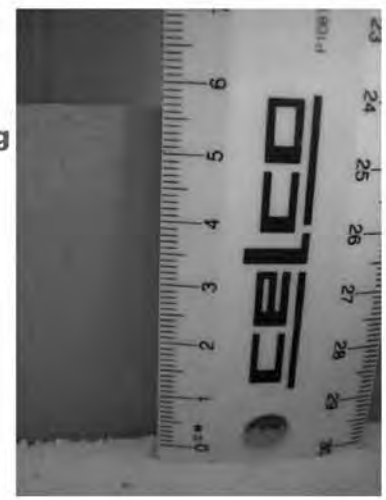

Cadbury
CONTINENTAL
A Quality Assortment of Fine Chocolates

Protection

Slack fill is approximately 50%

Unavoidable product settling during shipping and handling

Slack fill is approximately 37%



Unavoidable product settling during shipping and handling

This is a box of breakfast Cereal.

Specific function

The slack fill is approximately 25%.

Misleading pre-packages

Non-functional slack fill

- empty space in a pre-package when it is filled to less than it's capacity
- Opaque containers are considered to be filled

A pre-package with excessive non-functional slack fill is considered to be misleading.

Misleading pre-packages

Aerosol dispensers

The percentage (grade) of fill by volume of aerosol dispensers shall be as required in Annex III of European Directive 80/232/EEC of 15 January 1980.

(This Annex is reproduced as Table E1)

Further information on misleading pre-packages is covered in OIML R79.

Table E1 Capacities of aerosol dispensers

Volume of the liquid phase in mL	Container capacities in mL for	
	Products propelled by liquid gas	(a) Products propelled by compressed gas alone. (b) Products propelled by nitrous oxide or carbon dioxide alone or by mixtures of the two alone when the product has a Bunsen Coefficient of 1.2 or less.
25	40	47
50	75	89
75	110	140
100	140	175
125	175	210
150	210	270

Table E1 Capacities of aerosol dispensers

Volume of the liquid phase in mL	Container capacities in mL for	
	Products propelled by liquid gas	(a) Products propelled by compressed gas alone. (b) Products propelled by nitrous oxide or carbon dioxide alone or by mixtures of the two alone when the product has a Bunsen Coefficient of 1.2 or less.
200	270	335
250	335	405
300	405	520
400	520	650
500	650	800
600	800	1 000
750	1 000	

Tare Procedures

Annex B OIML R87

Annex B of R87 gives procedures for determining tare weights.

—— This annex is informative and not mandatory.

Procedures permit the use of:

- Unused dry tare
  —— the weight of unused packing material of one pre-package
- Used dry tare
  ——packing material that has been used as part of a pre-package

Determine the actual quantity of product in the pre-package as follows:

Actual quantity of product =

Weight of the pre-package – Average weight of the packing material

The average weight of the packing material is referred to as the **average tare weight** (ATW).

Unused dry tare

- Empty packaging material supplied by the packer.

Used Dry Tare

- Packing material that has been used as part of a pre-package 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 practise we have found that 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.

Tare

Includes all the packing material

Tare

Includes all the packing material

Table B.1 Tare	
If	Then
The ATW is≤ 10 % of the nominal quantity of product	Use the ATW to determine the actual quantity of product in the pre-packages according to A.2 step 7.
The ATW is > 10 % of the nominal quantity and $s < 0.25 \times T$	Use a total of 25 packages to compute the ATW and determine the actual quantity of product in the pre-packages according to A.2 step 7.
The ATW is > 10 % of the nominal quantity and $s > 0.25 \times T$	An ATW cannot be used. It is necessary to determine and to consider every individual tare weight. Determine the actual quantity of product in each pre-package according to A.2 step 7.

Procedure to establish the tare.

Determine the unused dry tare or the used dry tare.

1. Randomly select an initial sample of 10 packing materials.
   - —— These can be taken from an inspection lot (used dry tare) or from a lot of packing materials at the point of pack (unused dry tare)
   - —— Note: in practise it is recommended to use unused dry tare if at all possible

Procedure to establish the tare.

2. Determine the individual weight of each of the 10 packing materials.

Procedure to establish the tare.

3. Determine the average tare weight (ATW)and the standard deviation (s)
   - ——If the average tare weight is less than or equal to 10% of the nominal quantity of the product, then the average tare weight of the 10 samples is used to determine the actual quantity of the product

- Because the variation in tare is small in relation to the nominal capacity then the mean tare is used. (The spread of tare is ignored)

Tare sample	Tare weight (g)
1	1.5
2	1.0
3	1.0
4	0.5
5	1.0
6	1.5
7	1.0
8	1.5
9	0.5
10	1.0
Mean	1.05
s	0.369

- Nominal weight = 500 g
- T = 15 g
- 10% of Nominal weight = 50 g
- ATW = 1.05 g
- ⩽10% of 500 g

Table B.1 Tare

If	Then
The ATW is ⩽10 % of the nominal quantity of product	Use the ATW to determine the actual quantity of product in the pre-packages according to A.2 step 7.
The ATW is > 10 % of the nominal quantity and $s < 0.25 \times T$	Use a total of 25 packages to compute the ATW and determine the actual quantity of product in the pre-packages according to A.2 step 7.
The ATW is > 10 % of the nominal quantity and $s > 0.25 \times T$	An ATW cannot be used. It is necessary to determine and to consider every individual tare weight. Determine the actual quantity of product in each pre-package according to A.2 step 7

Procedure to establish the tare.

- If the average tare weight of the initial tare sample is greater than 10% of the nominal quantity
  and
- the standard deviation is less than 0.25 x T

The average tare weight of 25 sample must be used to determine the actual quantity of the product.

Tare sample	Tare weight (g)
1	3.0
2	3.1
3	3.2
4	3.3
5	3.0
6	3.2
7	3.3
8	3.0
9	3.2
10	3.1
Mean	3.14
s	0.117

- Nominal weight = 10 g
- T = 0.9 g
- 10% of Nominal weight = 1 g
- Average tare = 3.14 g
- s = 0.117
- ATW > 10% of Nominal weight (3.14 > 1 g)
- $s < 0.25 \times T$
  (0.25 x 0.9 = 22.5)

Table B.1 Tare	
If	Then
The ATW is ≤ 10 % of the nominal quantity of product	Use the ATW to determine the actual quantity of product in the pre-packages according to A.2 step 7.
The ATW is > 10 % of the nominal quantity and $s < 0.25 \times T$	Use a total of 25 packages to compute the ATW and determine the actual quantity of product in the pre-packages according to A.2 step 7.
The ATW is > 10 % of the nominal quantity and $s > 0.25 \times T$	An ATW cannot be used. It is necessary to determine and to consider every individual tare weight. Determine the actual quantity of product in each pre-package according to A.2 step 7

Procedure to establish the tare.

The sample number is increased to 25.

- Use the original sample of 10 packages and select a further 15
- Use the ATW of the 25 packages
- Consider whether such action is common sense
  - —— e.g. where the weight of the packaging is greater than it's contents, such as with small tubes of ointment, but the tare weight is very constant, there is nothing to be gained from checking a further 15

Procedure to establish the tare.

- If the average tare weight of the initial tare sample is greater than10% of the nominal quantity
  and
- the standard deviation is greater than 0.25 x T
  an ATW cannot be used.
  - ——In this case it is necessary to determine every individual tare weight

Tare sample	Tare weight (g)
1	7.5
2	6.0
3	5.0
4	6.5
5	7.0
6	6.5
7	5.0
8	4.5
9	4.5
10	8.0
Mean	6.05
s	1.26

- Nominal weight = 50 g
- T = 4.5 g
- 10% of Nominal weight = 5 g
- Average tare = 6.05 g
- s = 1.26
- ATW > 10% of Nominal weight (6.05 > 5 g)
- $s > 0.25 \times T$
  (0.25 x 4.5 = 1.125)

Table B.1 Tare	
If	Then
The ATW is ⩽ 10 % of the nominal quantity of product	Use the ATW to determine the actual quantity of product in the pre-packages according to A.2 step 7.
The ATW is > 10 % of the nominal quantity and $s < 0.25 \times T$	Use a total of 25 packages to compute the ATW and determine the actual quantity of product in the pre-packages according to A.2 step 7.
The ATW is > 10 % of the nominal quantity and $s > 0.25 \times T$	An ATW cannot be used. It is necessary to determine and to consider every individual tare weight. Determine the actual quantity of product in each pre-package according to A.2 step 7

Procedure to establish the tare.

- Referred to as destructive testing

Procedure to establish the tare.

- This method may not have to involve destructive testing in all cases.
- E.g. it may be possible to weigh and mark with a number, empty packages and then place them randomly in the packaging line and then when filled check weigh them. 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.

Destructive Testing

- Pre-packages have to be opened to determine compliance.
- 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
  - —— Purchase

Tare 1

Nominal quantity of product (g) =	70	
T =	4.5	
	Individual tare weights (g)	
1	4	
2	4	
3	4	
4	3	
5	3	
6	3	
7	4	
8	4	
9	4	
10	3	
ATW		
s		
ATW =		
Nominal quantity of product (g) =	70	
T =	4.5	
	Individual tare weights (g)	
1	8	
2	8	
3	8	
4	8	
5	8	
6	8	
7	8	
8	8	
9	8	
10	8	
ATW		
s		
ATW =		
Nominal quantity of product (g) =	250	
T =	9	
	Individual tare weights (g)	
1	29	
2	22	
3	30	
4	24	
5	28	
6	28	
7	26	
8	21	
9	26	
10	27	
ATW		
s		
ATW =		

Tare 2

Nominal quantity (g) =	70
T =	4.5
	Individual tare weights (g)
1	8
2	9
3	9
4	9
5	8
6	8
7	8
8	8
9	9
10	8
ATW	
s	
ATW =	
Nominal quantity of product =	1000
T =	15
	Individual tare weights (g)
1	12
2	12
3	13
4	13
5	13
6	12
7	15
8	11
9	11
10	15
ATW	
s	
ATW =	
Nominal quantity of product =	5000
T =	75
	Individual tare weights (g)
1	21
2	29
3	21
4	20
5	29
6	25
7	27
8	26
9	24
10	29
ATW	
s	
ATW =	

Product:			Lot Size				Sample Size				Q_n =		mL	*T1*=		*T2*=						
		ATW =																				
	Gross	Net	ρ	*AQ*	Error		Gross	Net	ρ	*AQ*	Error		Gross	Net	ρ	*AQ*	Error		Gross	Net	ρ	*AQ*	Error
1						41						81						121	532				
2						42						82						122	537				
3						43						83						123	532				
4						44						84						124	530				
5						45						85						125	531				
6						46						86											
7						47						87											
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9						49						89											
10						50						90							TPE =				
11						51						91											
12						52						92							AE =				
13						53						93											
14						54						94							SCF=				
15						55						95											
16						56						96							*s* =				
17						57						97											
18						58						98							SEL =				
19						59						99											
20						60						100							SEL + AE=				
21						61						101											
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37						77						117											
38						78						118											
39						79						119											
40						80						120											

Product:			Lot Size				Sample Size				Q_n =		mL	*T1*=		*T2*=						
		ATW =																				
	Gross	Net	ρ	*AQ*	Error		Gross	Net	ρ	*AQ*	Error		Gross	Net	ρ	*AQ*	Error		Gross	Net	ρ	*AQ*	Error
1						41						81						121	532				
2						42						82						122	537				
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19						59						99											
20						60						100							SEL + AE=				
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39						79						119											
40						80						120											

Product:				Lot Size			Sample Size					Q_n =		mL	*T1*=		*T2*=						
		ATW =																					
	Gross	Net	ρ	*AQ*	Error		Gross	Net	ρ	*AQ*	Error		Gross	Net	ρ	*AQ*	Error		Gross	Net	ρ	*AQ*	Error
1						41						81						121	532				
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Product:			Lot Size				Sample Size				Q_n =		mL	*T1*=		*T2*=						
		ATW =																				
	Gross	Net	ρ	*AQ*	Error		Gross	Net	ρ	*AQ*	Error		Gross	Net	ρ	*AQ*	Error		Gross	Net	ρ	*AQ*	Error
1						41						81						121	532				
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38						78						118											
39						79						119											
40						80						120											

Product:			Lot Size				Sample Size				Q_n =		g	*T1*=		*T2*=					
	Gross	ATW	Net	Q_n	Error		Gross	ATW	Net	Q_n	Error		Gross	ATW	Net	Q_n	Error		Gross	ATW	Net	Q_n	Error
1						41						81						121					
2						42						82						122					
3						43						83						123					
4						44						84						124					
5						45						85						125					
6						46						86											
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Product:			Lot Size				Sample Size				Q_n =		g	$T1$ =		$T2$ =						
	Gross	ATW	Net	Q_n	Error		Gross	ATW	Net	Q_n	Error		Gross	ATW	Net	Q_n	Error		Gross	ATW	Net	Q_n	Error
1						41						81						121					
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Product:			Lot Size			Sample Size					Q_n =	g	*T1*=		*T2*=						
	Gross	ATW	Net	Q_n	Error		Gross	ATW	Net	Q_n	Error		Gross	ATW	Net	Q_n	Error		Gross	ATW	Net	Q_n	Error
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Product:			Lot Size				Sample Size				Q_n =		g	*T1*=		*T2*=					
	Gross	ATW	Net	Q_n	Error		Gross	ATW	Net	Q_n	Error		Gross	ATW	Net	Q_n	Error		Gross	ATW	Net	Q_n	Error
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39						79						119											
40						80						120											

Random Sampling

Random sampling

- Every combination of pre-packages is equally likely to be chosen
- Not always easy to achieve
- Removes bias
- Gives the best estimate
- Makes inferences valid

Sampling Methods

- Choosing a random sample
- Choosing a random sample over time

Choosing a random sample

'Mechanical' methods

- allocate a reference number to each item in the inspection lot
- record these numbers in some physical way, on cards, slips of paper etc.
- after thoroughly mixing choose as many cards etc. as there are pre-packages needed for the sample
- the corresponding pre-packages of the inspection lot will then make up the sample

Choosing a random sample

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 some random procedure.

Choosing a random sample

Random number tables

Stab a page of the table with a pin

- the page number
- the row number
- the column number

to start taking random digits.

Choosing a random sample

Random number tables

For a lot containing up to 999 pre-packages

- 001, 002, …,999
- ignore any triplet outside the range
- similarly for lot sizes between 1 000 and 9 999 use four digit numbers

Choosing a random sample

Many calculators can generate random numbers between 0.000 and 0.999 inclusive.

Choosing a random sample

Example

- Choose a random sample of 12 pre-packages from a lot size of 35.
- The 35 packages in the lot are allocated the reference numbers 1, 2, ···, 35
- A random sequence of individual digits is produced

Choosing a random sample

88 45 41 59 69 03 70 29 67 53 25 96 24
62 33 71 39 17 05 33 80 48 16 19 41 53
19 48 17 03 73 97 52 96 11 66 27 42 77
91 96 27 43 05 22 06

03 29 25 24 33 17 05 16 19 11 27

22 would be selected as the sample

Choosing a random sample

29280 69764 52803 92482 61707 82420 98159
05194 87336 32654 41342 06722 11960 90880
23010 03923 76611 02692 93013 90465 76579
47474 37746 49561 59740 76023 99943 01609
57771 19951 62837 12188 16770 20201 26261
89534 72766 87738 44801 89230 26639 70488
55322 92594 22664 17469 55973 44868 13300
93807 78491 16036 68269 65287 69894 98813
15038 97488 34482 61403 43849 57907 65963

Random sample over time

- Reference test of 1 hour's production
- Random numbers to give random times
- to take sample pre-packages from the end of the production line

Random sample over time

- Divide the hour into 3600 seconds
- Take the digits in groups of four
- Choose the random times in the range from 0001 to 3600
- for the required sample size

Random sample over time

The following sequence of numbers would produce the corresponding times throughout the hour.

1287 pack being chosen after 21 min 27 sec
1936 pack being chosen after 32 min 16 sec
1677 pack being chosen after 27 min 57 sec
0328 pack being chosen after 5 min 28 sec
etc.

Random sample over time

Arrange the times in chronological order and with a stop watch select the pre-packages.

Random sample over time

5 min 28 sec
21 min 27 sec
27 min 57 sec
32 min 16 sec
etc.

RANDOM NUMBERS

29280	69764	52803	92482	61707	82420	98159	83782	65774	99617
37773	78924	38120	05194	87334	32654	41342	06722	11960	90880
23010	03923	76611	02692	93013	90465	76579	65905	60181	20136
47474	37746	49561	59740	76023	99943	01609	89843	51147	10761
57771	19951	62837	12188	16770	20201	26261	24280	25818	41611
89534	72766	87738	44801	89230	26639	70488	59368	47377	53226
55322	92594	22664	17469	55973	44868	13300	35744	95996	95126
93807	78491	16036	68269	65287	69894	98813	71193	33221	35097
15038	97488	34482	61403	43849	57907	65963	03642	94852	39900
74240	25545	21220	32383	08832	13266	19064	36800	36515	62399
15221	94730	65236	77496	74123	40905	72267	56425	69901	49653
57042	15348	01057	23703	63282	59322	30602	08052	36848	65388
67519	64847	63502	10349	48221	69709	22910	30584	11517	28559
92470	85884	75264	84794	87878	10276	53582	04820	46580	17686
79787	81866	97210	59532	34369	63010	31180	51534	50688	06698
02856	34207	10127	57118	47550	81722	07123	43775	53081	80146
76542	03694	78380	23564	44231	67049	79916	28273	84514	74482
18861	12872	67843	01924	96461	72253	17799	73059	78567	95068
77120	94070	49839	73196	20901	75898	21904	14591	98873	59806
19924	73226	01649	30010	73654	70195	64922	63422	42653	67202
89667	57900	80713	01408	49968	05895	68848	53500	35728	83900
11887	24329	49109	08558	38209	24012	33136	80756	64421	32417
39933	10010	76009	02382	70071	19628	82427	77413	72930	51839
00457	87987	50189	78394	15341	91544	46035	14351	10223	15429
56737	10419	84939	26136	09037	06537	85553	85047	05332	80130
06586	49626	69493	25399	96185	23145	34738	88218	02419	37608
19570	49870	08655	50959	54845	36267	53852	65491	88828	08541
14479	49732	05323	11247	08810	30503	72191	43424	85201	53342
92365	34392	20958	33152	62204	37838	34143	16281	50851	31338
83627	85492	34972	19615	60380	37529	92356	02821	17830	12318
24127	89180	60963	24012	99721	21893	04503	78495	47845	78135
23033	91407	92334	14504	86652	46700	42004	58989	30100	76348
92103	20868	62687	39891	92606	45600	97263	46952	38926	87528
10279	93826	32795	93871	24537	88205	93584	99460	86401	31232
59108	48189	44154	26522	26406	81048	59978	32323	29869	31538
19598	09797	71824	02503	99447	61729	71128	21217	30671	93034
46063	42029	77202	78423	73280	99061	52410	42720	11404	98701
80324	01359	18051	59359	08024	33426	14630	31821	83399	54511
71823	39317	46034	91593	55419	12478	69483	62097	94002	95127
00780	69879	13527	85001	14419	17308	24701	73265	12959	26245
48256	39426	49498	02386	89907	96434	06225	42930	75276	62252
38821	95208	90794	59569	51559	94736	45908	99515	95993	28675
25039	06874	99930	83214	54817	48727	67989	05568	58997	58093
42416	82266	93184	08895	98426	48618	83707	79575	30432	75293
72705	10093	05196	34881	40264	92615	08318	06931	40727	53475
07157	58522	93539	89168	01886	54179	26391	34220	85317	77162
63683	38874	38406	62728	58069	40225	84991	49799	92818	45865
59439	44682	99692	40871	11250	39381	01241	53423	75798	27232
33817	19074	80169	88960	99731	27439	80982	25278	26029	66331
33614	20625	78978	85231	81534	61187	77652	62894	32784	43844

RANDOM NUMBERS

26414	01058	08815	82134	75590	42682	40265	98943	76557	01319
46956	70971	53478	61194	78364	37643	63073	40385	99147	31511
32183	24787	16933	57590	47513	50501	87227	07751	30283	87112
69595	60102	23474	89719	53710	81415	49246	11314	64972	89887
79943	69764	76635	94009	09276	22393	79939	57309	87501	79002
49191	39154	29389	21829	59515	49922	80469	85703	14236	55043
45956	65825	05786	78560	87576	22742	97678	34245	13052	13978
54924	19164	02707	12362	90098	87412	30549	38457	86556	43302
86445	34056	17237	48277	65740	21028	21225	07697	54818	54868
43667	23032	38606	46875	35623	39088	12334	85774	83717	41059
31018	50882	93686	67658	63608	02218	21061	53484	51657	35402
63201	54024	36754	91839	48897	62468	73118	01771	00564	44240
69145	91080	08849	53531	82226	73773	62599	45511	22640	64288
78340	79399	60224	19560	80059	29495	33301	18348	49215	70557
51927	25413	16101	92501	75169	39972	38424	90625	18871	02543
66560	48070	00189	29075	66843	80075	50345	31312	68117	66905
42354	56120	53839	85350	97901	62780	98120	62981	20312	04958
06609	57383	16124	30284	67805	97984	12700	41564	54623	56204
62199	34925	12035	14276	79217	14542	82479	80311	55112	56770
48138	82036	20934	77655	60758	72198	59132	00597	21832	01848
49361	60382	23023	78493	08758	17393	95775	40285	33701	25206
97127	84766	24769	80814	98595	83673	82057	00717	26053	32536
75320	78355	94901	55435	46445	51838	95202	40710	93954	22209
33297	74221	41923	84426	78483	87898	92378	73447	24158	06305
07371	01673	66919	93112	45907	15931	24918	49197	00547	77777
51132	70448	17019	09106	44784	59318	65508	70461	84477	13702
27304	86602	83435	76267	16903	20886	07305	55489	78765	88124
65852	50372	70370	74026	34810	94081	91779	26520	45367	77821
28083	88018	18329	22818	84150	22641	93804	19728	90116	33025
77346	03303	09804	06073	99427	02424	58834	30907	11831	69250
05117	43023	91404	10235	66081	60933	52764	44782	84514	63609
78466	15345	65129	06255	44826	52244	15219	32960	12562	95225
38982	15494	87250	48697	20231	53100	58947	80782	28847	06462
60979	81444	65748	36139	10555	16037	41253	13340	60589	52712
37162	02869	71519	86001	27967	02362	24236	59060	44707	11903
43931	40276	18166	10517	84096	61975	38764	89660	16719	54107
40465	79819	01720	63284	04564	83220	74426	76495	25303	56658
47806	80370	27961	12491	87312	76018	04040	07598	18927	19616
00871	87272	36388	69813	69010	82030	56285	48315	02592	33042
42198	80853	68377	80562	83118	25959	36824	65293	61051	73653
91740	09949	44119	68315	97251	48092	21198	76722	43120	98850
22812	58640	71089	94659	46500	22933	61890	36820	36978	90975
35915	97743	92321	32805	59503	77710	73769	82408	05352	24501
68615	16688	08149	13409	52864	19313	62921	58100	94095	40099
29676	47060	30811	00678	51723	79254	09962	34122	12999	22799
53874	83846	27584	49493	02534	22562	28231	58612	73826	65989
71650	52652	67681	60747	96593	99930	44719	39846	26108	38173
42050	86248	32774	63265	35263	62013	14996	11891	01444	73584
75409	53813	86878	66514	17799	09913	06148	37324	34283	80003
17244	27935	77136	60585	22872	77557	51403	31432	84837	98484

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81980	56638	14940	25225	47889	83015	63800	18137	81641	37232
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89413	14009	04541	50557	49084	28763	08708	42556	72621	55521
46063	40185	10386	11718	66435	17674	43978	10947	65918	87624
56814	11138	85788	35639	35135	35764	73235	75252	34721	41752
15741	87924	16770	07039	68803	11646	68241	87444	09746	55384
99257	71986	33932	03224	92458	83291	01594	90384	63587	34532
02041	28672	22748	49313	93825	08182	43183	81055	08797	05461
95353	48669	71181	13355	69503	25089	20176	19815	01844	72406
57063	07336	88275	15394	84749	29254	65478	65471	20603	86438
24075	58607	94180	18404	97500	76185	66683	61167	43495	23004
68449	95604	42979	39925	21910	75673	28503	80894	04137	16533
21900	32367	56667	32010	99950	25079	64932	48794	61417	10719
75179	28049	37603	39082	45257	48636	47393	10635	64041	90319
23278	29758	54346	53416	72975	44849	47259	64854	76400	15079
73336	90999	33858	37696	61165	18473	89187	51756	23837	45077
67210	19112	54977	94385	14172	78462	95573	63938	08613	90431
92366	40383	44202	49012	21621	06238	92020	68532	76231	50493
03952	06143	46506	76655	98956	35570	62378	45685	58262	80401
04094	75427	80454	04585	52061	25768	45772	87417	59593	08049
93765	19723	50037	23562	58968	17131	20793	31572	99231	40254
10048	91273	89651	32035	36699	71438	36585	81383	46909	43121
23102	34924	11233	73522	37547	06148	44028	23986	06801	74064
05622	03033	03877	09066	96342	94916	17542	03812	06901	80623
69359	56888	90045	33735	09271	63839	63566	65363	27342	29515
58148	95409	33511	40197	92199	60158	97391	86189	79229	03646
44526	91620	11674	63685	15906	39523	08313	95094	65348	58582
25145	48614	67350	31776	01588	61313	27600	62626	13259	25503
94118	66027	80979	10038	13472	89189	13915	51679	62774	60981
36154	93493	83160	53114	04179	43775	32915	68191	25771	50427
20270	14152	88188	07537	23336	20136	12814	98941	45993	96662
08713	81072	13033	24564	39541	84784	64520	30087	29830	99711
09074	68897	46441	30534	76438	82867	85749	81112	56193	08057
01261	85016	02937	74687	60657	87402	51681	08854	75318	51000
56627	62406	17365	49178	01233	34670	78725	20640	13196	41162
39796	97140	50705	58244	04149	20144	64415	44769	96592	92105
75528	90915	53521	17258	56973	41818	26551	05038	43487	26729
23401	01270	84777	18287	56670	90759	95225	57646	27240	44944
95201	61097	71059	09167	96070	62784	52719	68874	89963	31607
56984	71052	81803	03884	99859	67418	24424	00434	50963	29670
59385	96267	49475	66060	99889	84147	38813	70308	12203	69882
18466	85549	51782	62245	47441	08138	60600	00964	57733	64570
48616	44487	12766	23102	11624	36414	41022	47863	30625	08800
44150	34949	50612	04541	98025	14570	55927	29806	99094	71413
52623	17939	46671	75968	78479	38241	67134	72438	46540	71187
11475	72176	79802	08899	97152	73289	22478	54952	59789	23328
82863	51324	50703	99041	98265	33921	99773	66199	60289	65929
97765	72819	09312	39222	87605	30009	76017	55573	62374	72673
83156	45227	09316	03854	99335	52004	21286	10293	09361	61932
86765	00517	05971	07764	67355	37861	44689	90284	98290	73142

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81961	57219	51868	09869	62149	69826	45132	83451	12410	29077
73341	11324	18256	59086	33806	77831	44267	38584	33117	41955
95471	42460	73076	43256	79975	90560	73704	97162	41119	54607
50471	71871	09805	39792	81442	07930	97486	95745	14645	11461
26295	20137	13325	65575	30407	24121	14253	77561	08545	98865
63526	65773	82062	16236	31671	16194	30351	63931	65648	40014
69122	07360	71238	10521	61737	72474	92630	11259	69595	34245
95268	82975	10168	49465	54798	40203	10289	73706	48645	09221
97446	87448	77384	27250	91744	44161	10916	60307	25850	75129
09772	84517	11470	93395	74338	34148	37004	49838	37594	81160
07728	67026	93187	45551	75806	46345	40509	65543	41717	31156
33801	14982	79225	88094	89777	73482	39209	92899	66027	78742
12081	78351	99715	76339	37760	01474	07407	28814	50713	06691
23101	70790	87850	17695	26482	60360	78437	85225	15185	51341
37855	29886	43204	10816	65797	01500	82771	85103	83120	61923
72951	62836	64669	89812	00937	52454	20482	82555	62065	96593
88740	79218	01688	82427	36918	88140	85272	58044	95858	42607
64832	18022	62419	29712	93904	00202	44217	17561	33274	19837
21946	66457	13815	80406	44863	09363	88186	74947	75876	43291
26041	42851	39955	94114	36448	06142	96578	06167	04524	16541
67805	03337	54863	73981	80147	39723	61345	06818	21355	47867
01056	54316	28791	77537	90442	88927	05472	64610	05938	57740
88895	09868	91935	58962	63465	64076	83789	14204	89171	18193
32523	76738	05461	06556	80823	98362	31147	53464	19102	37990
78707	46300	05633	74523	56405	52508	64958	07858	81674	75075
21671	49268	45947	75578	47555	82715	57645	09992	09901	84877
95390	04352	33014	10705	22312	70154	21472	49438	46344	41999
24777	47547	37543	22428	60551	40862	90960	98835	22598	37972
68919	86475	69974	16659	47140	43200	26289	43856	37521	74474
87997	08013	55716	95034	39779	65736	77027	78182	58080	60732
53418	09832	78882	66019	90436	59968	02538	29346	87341	00616
86902	20301	95222	48831	72656	44664	78233	12213	92263	77873
34734	82812	91230	83354	72707	83065	97822	47376	56210	98984
94829	32029	80424	06829	68860	72058	61377	66178	73681	85974
95834	62349	13317	66526	78572	24453	29151	06989	49029	65051
82727	90216	56074	29998	74381	40860	08104	75722	63191	21693
84349	79898	51697	02770	66587	86542	11410	25950	68438	08816
81642	81730	76219	23678	46600	37495	84177	89137	96193	53863
15171	82577	29333	53156	98730	55783	25867	84201	77557	84830
67216	73070	56612	68644	15002	91882	75840	16659	40973	41683
05875	28647	51947	81072	77323	24229	65476	25743	18608	41000
61620	50024	30569	96719	73996	62427	63347	78686	49817	29555
76057	20867	19327	09957	35760	42608	13254	19526	96218	80457
03533	34464	70959	79860	74135	41058	02162	79469	63180	58115
99019	77395	97359	96658	91422	47578	49093	59248	84029	12190
06541	99644	42192	51970	21650	38870	76408	47724	95395	63460
63451	22790	10512	25731	36546	98494	47160	02178	21725	51216
87879	97565	35102	12152	22849	86750	04071	48727	33040	75797
89732	16439	99927	08258	51752	61138	05343	28356	03277	33994
81005	11612	62342	34816	04452	98051	70455	39768	70878	14595

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52879	49151	33339	31955	03343	06355	27425	60618	81064	67248
44126	61190	02536	69364	28017	07348	88649	22472	63485	98038
91603	28285	60517	01614	37596	88435	29017	72472	13426	86816
05299	29560	50730	10391	49788	28691	46399	72587	00600	37315
54312	17796	17018	63098	15717	57776	12696	34149	99421	93106
23458	10520	94084	11999	40475	44470	95272	76950	18065	06307
21811	41896	39742	74216	54392	86335	61235	53965	41799	89244
60512	17056	99922	21659	24017	39487	65140	20859	44206	96224
68001	96469	23787	58396	71983	33808	95144	65227	36612	94444
74150	50840	93956	25137	53160	80807	74958	33319	95138	05565
20389	43615	01050	54223	15944	16881	10579	40367	22239	09095
68166	70753	26771	53558	22006	80506	99099	64436	46536	45151
01780	47615	93626	89088	60707	80025	46075	62010	99130	23311
87551	27362	52305	49724	44770	96782	78418	24406	12062	01590
88385	41429	04593	54978	16857	33664	86115	33840	79391	48000
64726	22535	90895	42364	70933	44448	48571	61225	99812	30127
93607	75624	73714	95605	60054	64700	90461	96547	56426	57403
63622	53633	90639	52631	07354	07776	46975	92667	50542	75202
08156	47308	46054	09232	60133	17098	23409	59633	56185	63870
40851	94330	31193	43231	46555	78842	66768	59083	45147	09479
61986	39858	90338	56503	72333	28958	87457	78115	51341	92535
72995	43892	83923	38055	73032	48948	78449	87072	15976	22582
09163	16229	52367	83789	51471	98074	28853	25221	31433	85537
49203	70189	36743	73604	35676	11115	41178	10936	38522	24494
43361	24197	40796	38138	56072	00452	00699	04989	43702	07947
39437	25990	73314	74150	29003	94216	58164	05515	01380	82794
04380	14572	35137	79522	87037	06112	42284	76987	54003	07639
75227	12647	30044	08776	85006	70611	78937	20613	38067	33917
79014	19359	14805	98102	40712	51653	28885	31829	90374	87090
63364	93000	62429	10323	00045	97500	66249	48229	13595	84123
19982	10254	28627	85333	51081	35318	90389	63455	09980	11540
76688	73145	08936	07173	69531	21918	90977	06924	49938	67550
88656	99568	11805	16121	75573	95025	97663	52534	87867	98646
41719	91197	97228	81453	32301	10252	38824	02737	92973	62044
03366	85848	23235	66673	02210	03606	75189	33989	81837	71624
82474	78763	39626	41451	36826	33089	00636	27710	18736	89045
97337	00939	63615	51603	52128	53604	59231	53065	71864	79683
90345	12448	78235	48285	14917	87748	22372	10159	58179	61619
24166	28240	99150	46313	56426	29153	27571	36110	37986	94804
21995	76191	24256	52280	78827	96495	61778	21803	77053	24867
73206	37629	27406	66954	14108	86511	94127	68852	17085	22295
20480	17599	37929	20801	87468	91041	10407	01289	37342	23735
00682	95423	13449	21404	35688	57812	75323	15631	32444	05916
09925	62783	75487	01099	59313	06580	68826	58177	66968	50388
05908	00178	18695	10327	60474	61014	98011	94168	18205	37469
26907	95149	45609	48704	98918	01562	94996	60529	75107	78432
96022	34884	28551	59608	87242	78123	59387	49207	13870	48720
47254	50264	31898	75004	30294	14418	11521	71234	52063	06163
66086	32928	02933	03218	08019	85145	98443	16169	28766	31544
85969	07182	90877	77221	38810	77767	30327	84370	25981	00878

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10967	31592	33221	08717	85221	84117	90057	68362	79197	26137
47981	53283	61772	92057	11295	18358	28739	52582	92277	10257
44999	64236	76815	49556	83689	18737	14913	40331	75816	83252
61130	37663	12981	48298	08720	47030	70171	28797	79808	79904
55735	42704	47453	49982	92418	89472	00641	74625	30482	94516
15943	72163	22742	95281	36510	18122	32622	33711	22545	27115
37440	54964	95941	77558	78875	73413	11174	15068	57881	10639
71528	11396	82448	20061	70463	86658	38334	87455	67991	08391
19108	38479	44854	98547	12428	06931	90833	04103	95664	12798
28042	76502	81744	57342	74720	15605	02851	70933	13841	65297
85174	35941	30566	08771	23819	98248	49505	49931	13774	57392
26465	87727	73228	53742	17915	42089	11122	42389	52380	41351
44635	02107	23350	35128	71115	88529	88868	00074	69818	16614
75056	01802	51970	04697	27401	50401	75898	07121	32983	67564
82117	27125	79689	69391	38592	74867	80539	40683	62223	00878
95358	66571	57967	38995	70890	51551	15412	28522	57164	60601
38490	10555	47674	43288	41081	23538	03605	35814	40240	20309
37423	90879	12607	29943	00541	94206	02043	04914	99065	29263
71746	65018	87714	88163	60734	30944	22616	94781	42216	24315
57791	93699	14313	91704	96486	53521	73646	61465	51404	96662
95230	75308	47527	96204	24524	32925	26369	56900	11148	65338
22478	92586	37131	28013	99354	83784	02830	21164	24409	16192
16157	27315	21695	11244	20795	33637	07236	27756	69512	05814
40637	88072	19148	01543	78548	63042	76999	03873	28519	98330
09451	98279	46559	96797	13212	92710	48242	29225	94640	14967
40194	26959	82549	99251	65433	21879	28614	89680	74023	42183
56635	27284	50450	42249	21486	91231	27326	83483	09292	10352
03397	13385	45070	87572	41180	77301	26319	40471	28743	67074
79826	98478	81477	39468	09774	05245	15730	35841	65010	81475
54663	50155	55963	14904	84467	90776	46477	92372	55178	66703
94440	59458	49984	95308	56402	89540	23130	22245	13042	66186
17981	69875	84703	10343	99801	11379	00023	43611	99246	76073
53426	99828	34065	42588	33230	90367	53372	56855	18471	50767
33329	99861	49094	29020	94414	56907	72877	30324	55680	87609
65584	48918	49627	41625	67640	33687	74568	36164	78003	25317
29166	22601	35160	90154	67518	16008	27553	46062	64903	51605
22491	88611	87469	74492	28390	65399	45186	25357	06426	79269
52194	75182	48126	30348	54105	78348	64910	46700	15728	60436
49884	95595	10254	05437	69909	70511	85889	78007	82411	16972
68466	34365	76096	26164	55053	78014	08808	24036	79788	29797
71197	66605	73567	96843	28884	54912	99147	88541	55303	55005
72443	40201	07824	55849	44057	86463	20895	50206	38113	00762
08288	57343	95530	34599	48506	33738	57930	43398	78937	36844
24647	45004	96991	06032	15324	96260	73557	39351	79640	90911
34339	86077	92939	90245	04675	63293	38786	21358	33586	86959
10522	51990	76141	01744	09723	58363	96779	15443	18647	09572
11889	32257	48239	29284	60952	85499	33802	90985	93007	25116
66503	65207	76181	50246	65885	27487	66390	03553	25399	67909
68595	12845	33303	48831	80634	07474	48556	47152	44708	61677
23795	96966	60827	18391	51384	43760	14735	18496	84189	29966

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01597	26873	98972	49715	69207	98155	87207	89554	70792	30741
57134	46320	69963	33195	22797	48794	43702	34081	33671	15970
37248	94877	34153	00086	26398	90651	47584	23886	12951	35284
47562	68420	44366	94715	34509	16851	67310	31643	74636	96863
21039	04829	62123	38006	92302	26467	37070	19186	62139	17682
63816	72837	50268	98334	25522	19619	83250	05461	01511	71879
93559	11331	06563	58878	22735	89137	02967	34095	04553	19249
78556	57108	33167	55556	28938	30319	26444	69510	85395	78561
04718	74982	04712	91917	64073	15084	68014	67797	26249	71927
78417	25305	91328	90531	34014	39058	56964	72666	93798	89810
64596	01175	93837	28620	83161	38026	67021	14228	64363	49056
99549	71224	77690	75702	13412	65384	42626	73171	93163	85496
49609	65515	73257	50676	79978	98022	40367	32788	53891	89413
21770	66420	52252	19238	70415	13406	39740	37613	83643	96983
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34662	44563	29229	65281	36849	82546	23879	44448	59030	69238
92318	87783	21657	32453	68788	97348	76802	46087	28544	36251
04520	36270	21901	05805	03021	49908	81525	31534	93569	05232
78537	83682	20269	72847	37905	73097	04586	24417	91876	59289
34132	70685	85180	42129	33341	66192	44839	42630	86355	08949
70413	45327	17058	07310	55228	33742	05998	80999	08893	21924
95112	39424	83852	22822	10253	31939	56024	11346	67883	60085
75304	44692	00965	19154	82273	21084	25811	46352	51331	70567
21721	67928	30205	94681	41364	75599	97392	95588	04716	88991
30213	15045	69679	63369	29851	70186	70438	32569	09898	19452
69144	93776	51397	58065	82099	90675	33979	25458	17052	42891
86740	05407	14901	99209	14153	97403	00082	20484	76092	58430
41843	45348	74328	53215	73383	88290	66073	17291	33822	74328
10735	63591	09863	80009	92267	81994	08343	01640	13622	31401
13558	36723	17575	29935	97698	76448	50958	32127	45858	44195
17196	48737	61080	09361	58897	42400	34886	62896	43193	63630
82557	01431	52402	26669	71580	36837	02271	31010	26906	67442
64780	91396	15119	68121	21624	92268	18631	40921	94264	16299
77111	91861	03999	72400	31958	05951	21245	02238	98127	81244
38383	29441	05219	93361	80619	80047	77563	17534	31064	81119
44969	99159	02880	57957	11830	15777	38551	64806	32567	44001
47123	85780	96364	37869	15359	60795	88232	83242	35618	25718
68135	64064	38406	28933	10250	52588	20285	04729	72272	34533
97092	78219	07547	27650	62956	08621	71508	05518	09706	06626
37583	00247	06290	06938	82910	68212	81535	05187	82564	65882
70556	69669	15548	82523	09738	80111	02679	14847	66414	71435
77205	31619	71695	24730	26185	08441	91010	40380	16203	87751
87254	45840	39591	23381	82207	54991	62393	05892	45117	08006
71165	03418	87041	12520	92771	97037	23338	52351	85612	31310
87324	46758	20395	51093	19197	03049	99725	66108	37277	91209
92678	66984	48906	66353	01208	61488	63557	89693	72073	72531
61933	47167	07775	71993	83170	58578	65426	88480	94337	65672
42768	12097	03191	69887	74547	08612	79926	23242	75233	60959
26337	36761	66936	34746	40507	12369	74848	80801	00335	15968
03171	94935	45478	34271	47292	83815	38000	68251	03492	50499

RANDOM NUMBERS

54473	24675	04678	15488	24254	53507	43180	82357	39309	46064
73154	39460	21101	91810	14228	17581	74066	10339	53157	05755
17445	60854	77611	65360	45535	81187	77105	88743	93802	66297
89137	55469	78327	46185	83720	10894	88071	74654	02141	36071
31741	61645	07399	33028	52351	55094	47913	46039	05287	16116
55233	81674	91088	87154	53510	91320	40250	49668	22584	06844
61339	43787	02965	02084	79567	20183	73377	00025	17311	10131
33664	85523	63473	75874	24237	91186	33415	84440	57282	85922
99683	60114	61487	25741	37793	11932	29733	83662	53559	62169
29400	69902	11419	39354	44941	49390	31419	44212	45867	70364
59221	92384	33217	85006	27640	15644	08644	31047	15506	22472
49579	74927	85646	84557	45698	71798	61440	45442	91040	83783
50886	32267	94804	71933	21899	89929	46924	45857	31832	62169
07930	10475	13975	72407	58982	29722	84087	26349	00512	96408
48102	77085	38924	84616	28252	81779	60183	29976	01082	21620
88004	63293	36886	99824	24780	50031	13424	96532	69883	15256
47237	33845	22991	74053	01548	77037	29847	10521	22649	38301
81150	58194	55282	56200	61209	16572	47340	54107	86681	16889
48840	03119	36856	79899	37095	92918	85902	51526	15793	02907
25863	91211	56585	90931	32088	97593	41143	79019	21868	80324
42233	63259	48446	39429	90883	95514	81419	08914	50546	87202
79239	50467	93207	27246	89984	97318	20947	10638	12123	64758
67321	31629	31595	20723	13251	96523	45492	77606	16870	95774
43749	01054	00720	12830	54340	91049	52247	83367	16235	77112
15299	96156	81815	05532	27900	30104	35581	73582	29687	13193
01399	79069	08156	31144	60037	74418	89573	70013	41708	36379
82392	37687	39922	28876	03965	10061	49526	75902	53103	81763
03299	01122	65589	14989	37391	46348	53005	70394	06922	65281
35801	59472	28039	84805	36356	77201	38181	69009	30659	77646
72726	88939	94112	71058	41528	27219	86606	04692	61695	51490
72107	19756	48340	70420	59145	80291	50718	22363	97527	92289
43297	38009	90612	31039	94001	74226	19989	84974	44512	26523
41304	32019	00898	89352	71797	33901	12448	33424	28654	99447
80300	13283	61714	63903	25126	02129	32947	95097	68658	80747
93752	75713	66023	82009	49466	72546	57131	98330	62641	66989
57238	28045	99180	02157	39666	54994	80453	60093	99411	19273
50406	61050	07499	18376	03144	38104	49304	19367	69781	78240
07013	59791	44453	66069	61607	22490	55994	13386	88245	14126
98960	47109	50300	88746	82630	34996	75765	06180	24411	49805
39077	45486	22596	22497	55301	50987	54051	14211	10418	30117
85478	37153	75543	94935	65190	58811	81634	46863	81301	00327
99248	56944	23779	51304	94993	82413	66355	07312	56256	61244
65080	49472	09172	49564	72601	20733	51824	26408	19680	22986
38037	51552	52515	77574	10760	83957	29985	61791	57593	91860
43437	48225	93933	84024	05034	75868	76738	09654	16718	67801
14517	91506	52924	19503	74495	66306	01791	35563	36409	04905
17888	51709	34226	43382	99675	78974	64424	01051	94892	14164
27878	43516	66339	06277	73093	10610	71354	79983	83808	21779
92425	77300	65313	04118	47314	85455	95532	80532	38619	56415
23284	50737	67849	22862	56059	79102	43258	78546	21977	84073

Examination Procedures

Annex 1 OIML R87

Examination Procedures

Pre-inspection.

- Determine method of production and packaging
- Pre-package nominal quantity
- Production times
- Special equipment
- Special clothing

Examination Procedures

Inspection Visit

- A proper introduction should be made
- Produce certificate of appointment
- Explain purpose of the visit

——The visit will be causing some disruption so it is important the company understand what is to happen.

Examination Procedures

Test Equipment

- Find a suitable location to set up the test equipment
- Make sure that there is enough room to stack pre-packages
- Ensure any weighing instrument being used is suitable

Examination Procedures

Test the weighing instrument using standard weights

- at the weight of the goods being inspected
- at the tare weight of the packaging material

Examination Procedures

Net quantity statement

- Confirm that the goods are correctly marked with the stated net quantity (OIML R79)

Examination Procedures

Procedure

At the packers premises

1. Determine the inspection lot size.

- If the inspection lot is taken from the production line:
  - The lot size is equal to the hourly output of the production line, without any restriction as to the inspection lot size
  - Sample pre-packages must be collected after the point of final checking by the packer

Examination Procedures

- An inspection lot taken from the production line must consist of all pre-packages not rejected by a checking system
- Ensure that no changes other than normal operating adjustments or other corrective actions are made during the pre-package filling process

Examination Procedures

- **When the inspection lot is not taken from the production line.**

——E.g. pre-packages are checked in the packer's warehouse

- If the production line output exceeds 10 000 pre-packages per hour

——The lot size is equal to the maximum hourly output of the production line, without any restriction as to the inspection lot size

Examination Procedures

- If the production line output is 10 000 or fewer packages per hour:

——the inspection lot size must not exceed 10 000 pre-packages

Examination Procedures

At the distributors or importers

The inspection lot size can be determined by:

- number of pre-packages belonging to one delivery or
- any other reasonable method determined by the inspector

Examination Procedures

2. Determine the sample size appropriate for the inspection lot in accordance with Table 1.

Table 1 Sampling plans for pre-packages

Inspection lot size	Sample size (*n*)	Sample correction factor $(t_{1-\alpha}) \times \frac{1}{\sqrt{n}}$	Number of pre-packages in a sample allowed to exceed the tolerable deficiencies in 4.2.3 (see also 2.4.1)
100 to 500	50	0.379	3
501 to 3 200	80	0.295	5
> 3 200	125	0.234	7

Examination Procedures

3. Randomly select the sample.

   — In practise it is often difficult or impossible to take the sample randomly

   — If this is the case the sample should be taken unsystematically

Examination Procedures

4. Determine the tolerable deficiency *(T)* appropriate for the nominal quantity (Q_n) of the pre-packages in accordance with Table 2.

   Example 1.

   nominal quantity = 500 g

Nominal quantity of product (Q_n) in g or mL	Tolerable deficiency *(T)*[a]	
	Percent of Q_n	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 1 000	-	15
1 000 to 10 000	1.5	-
10 000 to 15 000	-	150
15 000 to 50 000	1	-

[a] *T* values are to be rounded up to the next 1/10 of a g or mL for $Q_n \leq 1\,000$ g or mL and to the next whole g or mL for $Q_n > 1\,000$ g or mL.

Table 2 Tolerable deficiencies in actual content for pre-packages

Examination Procedures

Example 2.

nominal quantity = 1.5 L

Nominal quantity of product (Q_n) in g or mL	Tolerable deficiency (T)[a]	
	Percent of Q_n	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 1 000	-	15
1 000 to 10 000	1.5	-
10 000 to 15 000	-	150
15 000 to 50 000	1	-

[a] T values are to be rounded up to the next 1/10 of a g or mL for $Q_n \leq 1\,000$ g or mL and to the next whole g or mL for $Q_n > 1\,000$ g or mL.

Table 2 Tolerable deficiencies in actual content for pre-packages

Examination Procedures

Example 2.

nominal quantity = 1.5 L

1 500 mL x 1.5% = 22.5 mL

Nominal quantity of product (Q_n) in g or mL	Tolerable deficiency (T)[a]	
	Percent of Q_n	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 1 000	-	15
1 000 to 10 000	1.5	-
10 000 to 15 000	-	150
15 000 to 50 000	1	-

[a] T values are to be rounded up to the next 1/10 of a g or mL for $Q_n \leq 1\,000$ g or mL and **to the next whole g or mL for $Q_n > 1\,000$ g or mL.**

Table 2 Tolerable deficiencies in actual content for pre-packages

Examination Procedures

Example 2

nominal quantity = 1.5 L
1 500 mL x 1.5% = 22.5 mL

- Q_n greater than 1 000 mL round up to nearest mL

- Therefore:

T = 23 mL

Examination Procedures

5. Determine the number of pre-packages allowed to exceed the tolerable deficiency from column 4 of Table 1.

Table 1 Sampling plans for pre-packages

Inspection lot size	Sample size *(n)*	Sample correction factor $(t_{1-\alpha}) \times \frac{1}{\sqrt{n}}$	Number of pre-packages in a sample allowed to exceed the tolerable deficiencies in 4.2.3 (see also 2.4.1)
~~100 to 500~~	50	0.379	3
501 to 3 200	80	0.295	5
> 3 200	125	0.234	7

Examination Procedures

Goods sold by weight

6. Determine the average tare weight.
7. Determine the pre-package error for each individual pre-package.
   - —— Measure and record the weight for each pre-package
   - —— Pre-package is the combination of the product and the packaging material
   - —— The term gross weight is often used instead of the term pre-package

Examination Procedures

8. Subtract the average tare weight (ATW).
   - Tare is also called packaging material.

Pre-package or gross weight – ATW = Actual Quantity

9. Subtract the nominal quantity (Q_n).
   (The quantity declared on the label)

Actual Quantity – Q_n = individual pre-package error

Examination Procedures

Example

Pre-package or gross weight	–	Average tare weight (ATW)	=	Actual Quantity	–	Q_n	=	Individual Pre-package Error
510 g		8 g		502 g		500 g		+ 2 g
500 g		8 g		492 g		500 g		–8 g

Examination Procedures

10. Determine compliance.

- There are 3 **rules** that the test sample must meet in order for the inspection lot to pass

Examination Procedures

Rule 1

The actual contents of the pre-packages in an inspection lot must not be less, on average, than the nominal quantity.

Examination Procedures

Rule 2

Less than 2.5% (1 in 40) of all pre-packages shall contain a quantity of product less than $(Q_n - T)$.

Examination Procedures

Rule 3

The inspection lot must be rejected if one or more pre-packages contain a quantity of product that is less than $(Q_n - T2)$.

Examination Procedures

To determine if the test results comply with Rule 1:

- Sum the individual pre-package errors to calculate the total pre-package error (TPE)
- Divide the TPE by the sample size to calculate the average error (AE)
- If the AE is a positive number the inspection lot passes rule 1
- If the AE is a negative number we need to calculate the sample error limit (SEL)

Examination Procedures

To calculate the SEL

- Determine the sample standard deviation (s)
- Multiply the standard deviation by the sample correction factor (SCF) shown in column 3 of table 1 for the sample size in column 2

$$SEL = s \times SCF$$

Examination Procedures

- Add the SEL to the AE
- If the sum is a positive number, the sample (and inspection lot) passes
- If the sum is a negative number, the sample (and inspection lot) fails

Examination Procedures

Example

- Product: Dried Pasta
- Inspection lot size: 2,450
- Nominal quantity: 500 g

Table 1 Sampling plans for pre-packages

Inspection lot size	Sample size *(n)*	Sample correction factor $(t_{1-\alpha}) \times \frac{1}{\sqrt{n}}$	Number of pre-packages in a sample allowed to exceed the tolerable deficiencies in 4.2.3 (see also 2.4.1)
100 to 500	50	0.379	3
501 to 3 200	80	0.295	5
> 3 200	125	0.234	7

Examination Procedures

From Table 1:

- Sample size: 80
- Maximum number of inadequate pre-packages: 5

Nominal quantity of product (Q_n) in g or mL	Tolerable deficiency (T)[a]	
	Percent of Q_n	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 1 000	-	15
1 000 to 10 000	1.5	-
10 000 to 15 000	-	150
15 000 to 50 000	1	-

[a] T values are to be rounded up to the next 1/10 of a g or mL for $Q_n \leq 1\,000$ g or mL and to the next whole g or mL for $Q_n > 1\,000$ g or mL.

Table 2 Tolerable deficiencies in actual content for pre-packages

Examination Procedures

- Product: Dried Pasta
- Inspection lot size: 2,450
- Nominal quantity: 500 g
- Sample size: 80
- Maximum number of inadequate pre-packages: 5
- Tolerable deficiency (*T1*) = **15 g**

Examination Procedures

Determine Average Tare Weight

- The average of 10 tares is 5 g

Table B.1 Tare	
If	**Then**
The ATW is ≤ 10 % of the nominal quantity of product	Use the ATW to determine the actual quantity of product in the pre-packages according to A.2 step 7.
The ATW is > 10 % of the nominal quantity and $s < 0.25 \times T$	Use a total of 25 packages to compute the ATW and determine the actual quantity of product in the pre-packages according to A.2 step 7.
The ATW is > 10 % of the nominal quantity and $s > 0.25 \times T$	An ATW cannot be used. It is necessary to determine and to consider every individual tare weight. Determine the actual quantity of product in each pre-package according to A.2 step 7

Examination Procedures

- Product: Dried Pasta
- Inspection lot size: 2,450
- Nominal quantity: 500 g
- Sample size: 80
- Maximum number of inadequate pre-packages: 5
- Tolerable deficiency (*T1*) = 15 g
- The average tare weight is: **5 g**

Examination Procedures
Example

4 x pre-packages weighed 510 g
7 x pre-packages weighed 509 g
10 x pre-packages weighed 508 g
5 x pre-packages weighed 505 g
6 x pre-packages weighed 504 g
13 x pre-packages weighed 501 g
19 x pre-packages weighed 500 g
2 x pre-packages weighed 495 g
6 x pre-packages weighed 494 g
3 x pre-packages weighed 493 g
5 x pre-packages weighed 490 g

Examination Procedures

Determine individual package error

Pre-package or gross weight – ATW = Actual Quantity

Actual Quantity – Q_n = individual pre-package error

	Pre-package weight	– (ATW) =	Actual Quantity	– Q_n =	Pre-package Error
4	510 g	5 g	505 g	500 g	+ 5 g
7	509 g	5 g	504 g	500 g	+ 4 g
10	508 g	5 g	503 g	500 g	+ 3 g
5	505 g	5 g	500 g	500 g	0 g
6	504 g	5 g	499 g	500 g	- 1 g
13	501 g	5 g	496 g	500 g	- 4 g
19	500 g	5 g	495 g	500 g	- 5 g
2	495 g	5 g	490 g	500 g	- 10 g
6	494 g	5 g	489 g	500 g	- 11 g
3	493 g	5 g	488 g	500 g	-12 g
5	490 g	5 g	485 g	500 g	-15 g

Examination Procedures

Sum the individual pre-package errors (TPE)

TPE = ∑(4x5)+(7x4)+(10x3)+(5x0)+(6x-1)+
(13x-4)+(19x-5)+(2x-10)+(6x-11)+(3x-12)+(5x-15)

TPE = - 272 g

average error (AE) = TPE ÷ sample size

AE = - 272 ÷ 80

AE = - 3.4 g

Examination Procedures

Since AE has a negative value, the sample error limit (SEL) must be calculated.

- Calculate the standard deviation (*s*)

(*s*) = 5.681

- Multiply *s* by the sample correction factor (SCF)
  In Column 3 of table 1 for a sample size of 80

Table 1 Sampling plans for pre-packages

Inspection lot size	Sample size *(n)*	Sample correction factor $(t_{1-\alpha}) \times \frac{1}{\sqrt{n}}$	Number of pre-packages in a sample allowed to exceed the tolerable deficiencies in 4.2.3 (see also 2.4.1)
100 to 500	50	0.379	3
501 to 3 200	80	0.295	5
> 3 200	125	0.234	7

Examination Procedures

SEL = s x SCF

SEL = 5.681 x 0.295

SEL = 1.676

- Add SEL to the AE

1.676 + (- 3.4) = **-1.724**

- Result is a negative value therefore the sample and the inspection lot **fails** Rule 1

Examination Procedures

Rule 2

- The tolerable deficiency (*T*) for a 500 g pre-package is 15 g
- There is no individual pre-package that has a pre-package error that exceeds 15 g. The sample passes Rule 2

Examination Procedures

Rule 3

- There is no pre-package that has an individual pre-package error that exceeds twice the tolerable deficiency (*T*2) i.e. 30g
- The sample passes Rule 3

Examination Procedures

- An inspection sample must pass all three rules
- If it does not pass any one of the three rules the sample and therefore the lot fails
- This lot **fails** because the inspection sample failed rule 1

Examination Procedures
Goods Sold by Volume

1. Determine the inspection lot size
2. Determine the sample size appropriate for the inspection lot in accordance with Table 1
3. Randomly select the sample
4. Determine the tolerable deficiency *(T)* appropriate for the nominal quantity of the pre-packages in accordance with Table 2

Examination Procedures
Goods Sold by Volume

5. Determine the number of pre-packages allowed to exceed the tolerable deficiency from column 4 of Table 1
6. Determine the pre-package error for each individual pre-package

Examination Procedures
Goods Sold by Volume

There are two methods commonly used:

- **Direct comparison**
  - This method requires destructive testing

Examination Procedures
Goods Sold by Volume

- R87 does not have a sampling plan for destructive testing
- Some countries have included a sampling plan in their legislation
- The following plan is one used Europe, the UK and is also in the ASEAN Common Requirements

Examination Procedures
Goods Sold by Volume

Sampling plan for destructive tests

Lot size (L)	Sample Size (n)	Sample Correction Factor	Number of pre-packages in a sample allowed to exceed the tolerable deficiencies
Equal to or more than 100	20	0.640	1

Examination Procedures

ASEAN sampling plan for destructive tests

Lot size (L)	Sample Size (n)	Acceptance number (c)	k-factor (k)
Equal to or more than 100	20	1	0.640

Examination Procedures
Goods Sold by Volume

- Open each individual pre-package
- Measure the contents using a graduated cylinder to determine the actual quantity

Examination Procedures
Goods Sold by Volume

- Subtract the nominal quantity (Q_n)
  - the quantity declared on the label

Actual Quantity – Q_n = individual pre-package error

Examination Procedures
Goods Sold by Volume

➢ **Gravimetrically**

- Measure and record the weight for each pre-package
- Subtract the average tare weight (ATW) to find the actual weight of the product

Pre-package or gross weight – ATW = Actual Weight

Examination Procedures
Goods Sold by Volume

- Determine the density of a reference volume

Density = product weight ÷ volume

Examination Procedures
Goods Sold by Volume

- Divide the actual weight by the density to find the Actual Quantity

Actual weight ÷ density = Actual Quantity

- Subtract the nominal quantity (Q_n)
  - the quantity declared on the label

Actual Quantity – Q_n = individual pre-package error

Gravimetric Procedure Example

- Product: Fruit drink
- Nominal quantity: 500 mL
- Inspection lot size: 4600

1. Determine the sample size.
2. Determine the number of pre-packages allowed to exceed the tolerable deficiency.

Table 1 Sampling plans for pre-packages

Inspection lot size	Sample size (*n*)	Sample correction factor $(t_{1-\alpha}) \times \frac{1}{\sqrt{n}}$	Number of pre-packages in a sample allowed to exceed the tolerable deficiencies in 4.2.3 (see also 2.4.1)
100 to 500	50	0.379	3
501 to 3 200	80	0.295	5
> 3 200	125	0.234	7

Gravimetric Procedure

- Product: Fruit drink
- Nominal quantity: 500 mL
- Inspection lot size: 4600
- Sample size: **125**
- Maximum number of inadequate pre-packages: **7**

3. Determine the tolerable deficiency *(T)*

Nominal quantity of product (Q_n) in g or mL	Tolerable deficiency *(T)*[a]	
	Percent of Q_n	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 1 000	-	15
1 000 to 10 000	1.5	-
10 000 to 15 000	-	150
15 000 to 50 000	1	-

[a] *T* values are to be rounded up to the next 1/10 of a g or mL for $Q_n \leq 1\,000$ g or mL and to the next whole g or mL for $Q_n > 1\,000$ g or mL.

Table 2 Tolerable deficiencies in actual content for pre-packages

Gravimetric Procedure

- Product: Fruit drink
- Nominal quantity (*Qn*): 500 mL
- Inspection lot size: 4600
- Sample size: 125
- Maximum number of inadequate pre-packages: 7
- Tolerable deficiency (*T*): **15 mL**

Gravimetric Procedure Example

Determine Average Tare Weight

- The average of 10 tares is 224g with a standard deviation of 3.051

Table B.1 Tare	
If	Then
The ATW is ≤ 10 % of the nominal quantity of product	Use the ATW to determine the actual quantity of product in the pre-packages according to A.2 step 7.
The ATW is > 10 % of the nominal quantity and $s < 0.25 \times T$	Use a total of 25 packages to compute the ATW and determine the actual quantity of product in the pre-packages according to A.2 step 7.
The ATW is > 10 % of the nominal quantity and $s > 0.25 \times T$	An ATW cannot be used. It is necessary to determine and to consider every individual tare weight. Determine the actual quantity of product in each pre-package according to A.2 step 7

Gravimetric Procedure Example

- Weigh a further 15 packages
- The average tare weight for 25 tares is 225g

Gravimetric Procedure Example

- Product: Fruit drink
- Nominal quantity (Q_n): 500 mL
- Inspection lot size: 4600
- Sample size: 125
- Maximum number of inadequate pre-packages: 7
- Tolerable deficiency (T): 15 mL
- ATW= **225 g**

Gravimetric Procedure Example

125 pre-packages weighed gave these results

- 37 x pre-packages weighed 750 g
- 29 x pre-packages weighed 748 g
- 20 x pre-packages weighed 745 g
- 10 x pre-packages weighed 744 g
- 11 x pre-packages weighed 730 g
- 8 x pre-packages weighed 728 g
- 10 x pre-packages weighed 720 g

Gravimetric Procedure Example

- Determine the density of the fruit juice.

Density = product weight ÷ volume

$\rho = 512.5 \div 500$

$\rho = \mathbf{1.025}$ (g/mL)

	gross weight (g)	− ATW (g)	= Actual Weight (g)	÷ ρ (g/mL)	= Actual Quantity (mL)	− Q_n (mL)	= error (mL)
37	750	225	525	1.025	512.20	500	+12.2
29	748	225	523	1.025	510.24	500	+10.2
20	745	225	520	1.025	507.32	500	+7.3
10	744	225	519	1.025	506.34	500	+ 6.3
11	730	225	505	1.025	492.68	500	−7.3
8	728	225	503	1.025	490.73	500	−9.3
10	720	225	495	1.025	482.93	500	−17.1

Gravimetric Procedure Example

Rule 3

- No individual pre-package is allowed to exceed twice the tolerable deficiency (*T*2)

*T*2 = 30 mL

	gross weight (g)	− ATW (g)	= Actual Weight (g)	÷ ρ (g/mL)	= Actual Quantity (mL)	− Q_n (mL)	= error (mL)
37	750	225	525	1.025	512.20	500	+12.2
29	748	225	523	1.025	510.24	500	+10.2
20	745	225	520	1.025	507.32	500	+7.3
10	744	225	519	1.025	506.34	500	+ 6.3
11	730	225	505	1.025	492.68	500	−7.3
8	728	225	503	1.025	490.73	500	−9.3
10	720	225	495	1.025	482.93	500	−17.1

Gravimetric Procedure Example

Rule 3

- No individual pre-package is allowed to exceed twice the tolerable deficiency (*T2*)
  - *T2* = 30 mL

The sample **passes Rule 3.**

Table 1 Sampling plans for pre-packages

Inspection lot size	Sample size (*n*)	Sample correction factor $(t_{1-\alpha}) \times \frac{1}{\sqrt{n}}$	Number of pre-packages in a sample allowed to exceed the tolerable deficiencies in 4.2.3 (see also 2.4.1)
100 to 500	50	0.379	3
501 to 3 200	80	0.295	5
> 3 200	125	0.234	7

Gravimetric Procedure Example

Rule 2

- No more than 7 pre-packages are allowed to exceed the tolerable deficiency (*T1*)

T1 = 15 mL

	gross weight (g)	– ATW (g)	= Actual Weight (g)	÷ ρ (g/mL)	= Actual Quantity (mL)	– Q_n (mL)	= error (mL)
37	750	225	525	1.025	512.20	500	+12.2
29	748	225	523	1.025	510.24	500	+10.2
20	745	225	520	1.025	507.32	500	+7.3
10	744	225	519	1.025	506.34	500	+ 6.3
11	730	225	505	1.025	492.68	500	– 7.3
8	728	225	503	1.025	490.73	500	–9.3
10	720	225	495	1.025	482.93	500	–17.1

Gravimetric Procedure Example

Rule 2

- No more than 7 pre-packages are allowed to exceed the tolerable deficiency (*T1*)

$$T1 = 15 \text{ mL}$$

- 10 pre-packages exceed *T1*

The sample and therefore the inspection lot fails Rule 2

Gravimetric Procedure Example

Rule 1

- The actual contents of the pre-packages in an inspection lot must not be less, on average, than the nominal quantity

Gravimetric Procedure Example

Sum the individual pre-package errors (TPE)

$$TPE = \sum(37x12.2)+(29x10.2)+(20x7.3)+(10x6.3+(11x-7.3)+(8x-9.3)+(10x-17.1)$$

TPE = 630.5 mL

The average error, (AE) = TPE ÷ sample size

$$AE = 630.5 \div 125$$

AE = 5.04 mL

Gravimetric Procedure Example

- Since the AE is a positive number, the sample and therefore the inspection lot passes Rule 1

But

- This lot has failed rule 2.

Therefore the lot fails

Product:	Apples		Lot Size		500	Sample Size				Q_n =	3000	g	*T1*=		*T2*=						
	Gross	ATW	net	Q_n	Error		Gross	ATW	Net	Q_n	Error		Gross	ATW	Net	Q_n	Error		Gross	ATW	Net	Q_n	Error
1	3011	5				41	2934					81	3012					121	2983				
2	2952					42	2922					82	3027					122	2921				
3	3013					43	2915					83	3008					123	2974				
4	3016					44	3001					84	3020					124	2984				
5	2987					45	3024					85	2983					125	2947				
6	2945					46	2975					86	3048										
7	2937					47	2961					87	2910										
8	2990					48	2984					88	3014										
9	2919					49	2926					89	2954										
10	2912					50	2928					90	2940						TPE =				
11	3021					51	2911					91	2948										
12	3000					52	2913					92	2977						AE =				
13	2954					53	2975					93	3000										
14	2923					54	2930					94	3035						SCF=				
15	2984					55	3005					95	2960										
16	3043					56	2943					96	2936						*s* =				
17	3003					57	2949					97	2988										
18	3018					58	2991					98	2928						SEL =				
19	3036					59	3012					99	2981										
20	3023					60	2971					100	2981						SEL + AE=				
21	2932					61	2956					101	2997										
22	2928					62	2954					102	2927										
23	3006					63	2951					103	3009										
24	2929					64	3001					104	2915										
25	2925					65	2990					105	3038										
26	2913					66	3000					106	3014										
27	3021					67	2943					107	3022										
28	2954					68	2962					108	3033										
29	3016					69	2980					109	2938										
30	3048					70	2958					110	2926										
31	2982					71	2920					111	3030										
32	3041					72	2948					112	2955										
33	2973					73	2930					113	2927										
34	2973					74	2910					114	2995										
35	2917					75	3035					115	2920										
36	3031					76	3028					116	3019										
37	3039					77	2967					117	2931										
38	2954					78	3024					118	2981										
39	2997					79	2919					119	2989										
40	3000					80	2926					120	2945										

Product:		Milk		Lot Size		3000	Sample Size				Q_n =	500	mL	*T1*=		*T2*=					
		ATW = 20 g																			
	Gross	Net	ρ	*AQ*	Error		Gross	Net	ρ	*AQ*	Error		Gross	Net	ρ	*AQ*	Error		Gross	Net	ρ	*AQ*	Error
1	533	513	1.03	498.1	-1.9	41	537					81	532					121	532				
2	530					42	535					82	539					122	537				
3	532					43	534					83	530					123	532				
4	534					44	536					84	531					124	530				
5	532					45	538					85	537					125	531				
6	531					46	531					86	539										
7	535					47	539					87	534										
8	531					48	539					88	539										
9	533					49	535					89	540										
10	536					50	537					90	535						TPE =				
11	537					51	534					91	536										
12	536					52	536					92	535						AE =				
13	536					53	532					93	537										
14	536					54	538					94	537						SCF=				
15	539					55	531					95	538										
16	536					56	532					96	531						*s* =				
17	535					57	534					97	531										
18	533					58	537					98	536						SEL =				
19	532					59	538					99	530										
20	535					60	538					100	537						SEL + AE=				
21	538					61	533					101	535										
22	539					62	531					102	538										
23	536					63	539					103	531										
24	531					64	535					104	532										
25	537					65	535					105	532										
26	536					66	537					106	539										
27	537					67	534					107	537										
28	537					68	538					108	532										
29	538					69	533					109	536										
30	533					70	531					110	533										
31	532					71	533					111	536										
32	531					72	539					112	531										
33	539					73	538					113	533										
34	536					74	531					114	532										
35	531					75	534					115	539										
36	531					76	539					116	536										
37	535					77	536					117	531										
38	531					78	531					118	535										
39	531					79	530					119	537										
40	531					80	534					120	531										

Product:		Butter		Lot Size			1000	Sample Size				Q_n =	500	g	*T1*=		*T2*=					
	Gross	ATW	net	Q_n	Error		Gross	ATW	Net	Q_n	Error		Gross	ATW	Net	Q_n	Error		Gross	ATW	Net	Q_n	Error
1	505	4	501	500	1	41	501					81	503					121	501				
2	505					42	504					82	505					122	505				
3	505					43	506					83	503					123	505				
4	504					44	503					84	500					124	506				
5	505					45	505					85	506					125	504				
6	501					46	503					86	500										
7	501					47	503					87	505										
8	501					48	505					88	502										
9	502					49	502					89	504										
10	502					50	506					90	503						TPE =				
11	500					51	504					91	502										
12	502					52	505					92	502						AE =				
13	505					53	504					93	500										
14	503					54	505					94	503						SCF=				
15	501					55	502					95	502										
16	504					56	500					96	503						*s* =				
17	504					57	504					97	505										
18	502					58	504					98	506						SEL =				
19	504					59	505					99	504										
20	500					60	502					100	502						SEL + AE=				
21	505					61	503					101	504										
22	505					62	502					102	503										
23	505					63	503					103	506										
24	501					64	501					104	502										
25	502					65	503					105	501										
26	501					66	502					106	504										
27	503					67	503					107	504										
28	505					68	500					108	502										
29	505					69	500					109	501										
30	503					70	504					110	505										
31	501					71	506					111	502										
32	501					72	504					112	504										
33	506					73	500					113	504										
34	506					74	503					114	505										
35	505					75	504					115	502										
36	506					76	505					116	500										
37	504					77	502					117	506										
38	501					78	503					118	504										
39	501					79	502					119	505										
40	502					80	504					120	504										

	Product: material		Lot Size	200		Sample Size		Q_n =	10	m	*T1*=		*T2*=					
	Length	(m)	Error	(m)		Length	(m)	Error	(m)		Length	(m)	Error	(m)			Length	(m)	Error	(m)
1	10.026				41	10.013				81	10.004				121	9.997			
2	10.022				42	10.022				82	10.009				122	10.009			
3	10.017				43	10.026				83	10.019				123	10.017			
4	10.003				44	10.009				84	10.010				124	10.020			
5	10.023				45	10.015				85	10.001				125	10.021			
6	10.005				46	10.015				86	10.018								
7	9.998				47	10.003				87	10.010								
8	10.019				48	10.023				88	10.028								
9	10.005				49	10.011				89	10.013								
10	10.024				50	9.997				90	10.021					TPE =			
11	10.021				51	10.020				91	10.021								
12	10.019				52	9.998				92	10.014					AE =			
13	10.018				53	10.011				93	10.019								
14	10.000				54	10.018				94	10.006					SCF=			
15	10.026				55	10.003				95	10.028								
16	10.029				56	10.009				96	10.000					*s* =			
17	9.998				57	10.004				97	10.004								
18	10.002				58	10.021				98	9.998					SEL =			
19	10.002				59	10.006				99	10.007								
20	10.030				60	10.018				100	10.027					SEL + AE=			(m)
21	10.008				61	10.007				101	10.029								
22	10.015				62	10.017				102	10.016								
23	10.000				63	10.005				103	10.000								
24	10.011				64	10.020				104	10.025								
25	10.013				65	10.009				105	10.017								
26	9.999				66	10.014				106	10.004								
27	10.002				67	10.026				107	10.013								
28	10.009				68	10.027				108	9.998								
29	10.030				69	10.027				109	10.024								
30	10.010				70	10.027				110	10.012								
31	10.030				71	10.014				111	10.004								
32	10.007				72	10.008				112	10.022								
33	10.003				73	10.030				113	10.005								
34	10.024				74	10.016				114	10.017								
35	10.011				75	10.018				115	10.011								
36	10.016				76	10.001				116	10.006								
37	10.014				77	9.999				117	10.020								
38	10.010				78	10.025				118	10.018								
39	10.005				79	10.006				119	9.998								
40	10.013				80	10.027				120	10.025								

	Product: Screws		Lot Size	1200	Sample Size	Q_n =	120 items	*T1*=	*T2*=		
	Count	Error		Count	Error	Count		Error		Count	Error
1	122			41 121		81	122			121 118	
2	119			42 120		82	120			122 118	
3	121			43 118		83	119			123 121	
4	118			44 121		84	120			124 122	
5	120			45 122		85	122			125 119	
6	120			46 119		86	122				
7	121			47 121		87	121				
8	119			48 122		88	118				
9	119			49 123		89	121				
10	122			50 121		90	119			TPE =	
11	119			51 122		91	122				
12	120			52 121		92	122			AE =	
13	123			53 118		93	123				
14	121			54 119		94	121			SCF=	
15	121			55 118		95	120				
16	119			56 119		96	120			*s* =	
17	120			57 121		97	121				
18	122			58 120		98	120			SEL =	
19	120			59 118		99	119				
20	122			60 121		100	119			SEL + AE=	
21	122			61 120		101	120				
22	121			62 120		102	118				
23	123			63 121		103	121				
24	119			64 122		104	121				
25	121			65 121		105	123				
26	119			66 122		106	122				
27	120			67 118		107	118				
28	120			68 120		108	119				
29	122			69 120		109	120				
30	123			70 119		110	121				
31	119			71 119		111	121				
32	121			72 121		112	120				
33	119			73 122		113	119				
34	122			74 122		114	119				
35	121			75 119		115	121				
36	118			76 122		116	123				
37	120			77 120		117	122				
38	118			78 122		118	120				
39	118			79 122		119	120				
40	123			80 121		120	121				

Test Equipment

Weighing Instrument

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 pre-package to be tested.

- E.g nominal content of the pre-package : 500 g
- *T* = 15 g

  The instrument shall have an error no greater than 15 g x 0.2

15 x 0.2 = 3 g

Weighing Instrument

ASEAN Common Requirements

Gross weight in g of pre-package	Scale interval (d) in g
Less than 25	0.01
From 25 to less than 1 000	0.1
From 1 000 to less than 5 000	1.0
5 000 and more	2.0

Density determination

- In the international system of units (SI) density (ρ) is a derived unit. It is defined as the quotient of the mass (m) of a substance and the volume (V) of the same substance

$$\rho = m \div V$$

- R87 suggests a reference temperature of 20°C

Density determination

When the density is known and the mass has been determined the volume is:

$$V = m \div \rho$$

Hydrometer

Device used to determine directly 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 the reading on it level with the surface of the liquid in which the hydrometer is floating indicates the number of times heavier or lighter the liquid is than water

Hydrometer

- 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

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.
3. The hydrometer is lowered carefully into the sample until it floats under its own weight.

Hydrometer

4. After the hydrometer has settled the density is read. The reading is taken on the line determined by the meniscus.
   - If the liquid is transparent the reading is taken on the line determined by the bottom of the meniscus. If the liquid is opaque the reading is taken at the top of the meniscus

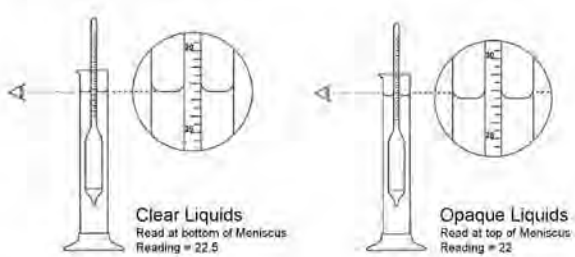
Hydrometer

- The density of the product is:

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

- The correction factor is stated individually on the calibration certificate for each hydrometer

Hydrometer



Hydrometer must float freely and be calibrated to be read at the top (opaque) or bottom (clear)

Pycnometers

Pycnometers are glass or metal containers with a precisely determined volume that are used to determine the density of liquids. They are closed by a stopper or lid.

Glass Pycnometers

Pycnometers

To determine the density of a product:

1. Clean the pycnometer with water and alcohol and dry thoroughly
2. Place the pycnometer and its lid on the weighing instrument and record the result (m_o)
3. Carefully fill the pycnometer ensuring that no air bubbles are trapped
4. Place the lid on the pycnometer

Pycnometer

5. Place it in a thermostatic bath at 20 ˚C ± 0.4 °C for 20 to 30 minutes
6. Dry the pycnometer thoroughly and weigh the filled pycnometer (m_p)
7. Use the following formula to determine the density:

$$\rho = 0.99985\ m \div V + 0.0012\ (\text{g/mL})$$

$m = m_p - m_o$

V = volume of the pycnometer at the temperature of measurement

Density determination using the pressure proof glass pycnometer

The "pressure proof pycnometer "is suitable for determining the density of aerosols.

It consists of a pressure proof glass pycnometer, surrounded by a cylinder of plastic material.

Density determination using the pressure proof glass pycnometer

To determine the density of a product:

1. Weigh the pycnometer including accessories (m_2)
2. Cool it in a refrigerator
3. Shake the aerosol can
4. Fill the pycnometer from the aerosol can

Density determination using the pressure proof glass pycnometer

5. Weigh the filled pycnometer (m_1)
6. Place in a thermostatic bath at 20 °C
7. Read the volume (V)after the graduation has become visible
8. Calculate the density

$$\rho = (m_1 - m_2) \div V$$

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

Density determination using the displacement sphere or plunger.

Test procedure:

1. Clean the sphere and the container
2. Fill the container with the product so that it is possible to immerse the sphere
3. Place the container and the sphere in a thermostatic bath at 20 °C for 20 to 30 minutes
4. Remove from the bath and dry the container and sphere

Density determination using the displacement sphere or plunger.

5. Place the container on a weighing instrument and record the weight (m_2)
6. Place the sphere into the product up to the annular mark on the rod (avoid contact with the walls or bottom of the container)
7. The buoyancy resulting during immersion can be read from the weighing instrument as additional load (m_1)

Density determination using the displacement sphere or plunger.

8. Use the following formula to determine the density

$\rho = (m_1 - m_2) \div V + 0.0012$ (g/mL)

- m_1 = Gross Weight + Plunger
- m_2 = Gross Weight
- V = Volume of Plunger

Density determination using the line marked bottle

This method uses the container of the product.

- It is used for drinks containing CO_2
- The principle is the same as that of the pycnometer but the volume of the container is unknown

Density determination using the line marked bottle

The container must:

- Not be deformable
- Be transparent at the location of the line mark
- Have a diameter at the location line mark of not more than 35mm

Density determination using the line marked bottle

To determine the density of the product:

1. Place the filled bottle in a thermostatic bath at 20° C
2. Place the bottle on a horizontal surface
3. Mark the fill height on both sides of the bottle
4. Weigh the bottle (and cap) and record result (m_T)
5. Empty the bottle

Density determination using the line marked bottle

6. Fill the bottle with distilled water (at 20 °C) up to the mark
7. Weigh the bottle and its cap and record result (m_w)
8. Empty the bottle and dry it completely
9. Weigh the empty bottle and its cap and record result (m_L)

Density determination using the line marked bottle

10. Use the following formula to determine the density

$$\rho = 0.9970 \times (m_T - m_L) \div (m_W - m_L) + 0.0012 \text{ (g/mL)}$$

Where: m_T = bottle, cap and product
m_w = bottle, cap and distilled water
m_L = empty bottle and cap

Establish the density using a graduated glass cylinder.

1. Weigh the dry empty cylinder and record the result (m_T)
2. Fill with a quantity of product to a graduation line (V)
3. Weigh the cylinder and product to find the product weight (m_L) and record the result
4. Calculate the density (ρ)

$$\rho = (m_L - m_T) \div V$$

Establish the density using a density cup.

A density cup is a container of known volume (V)

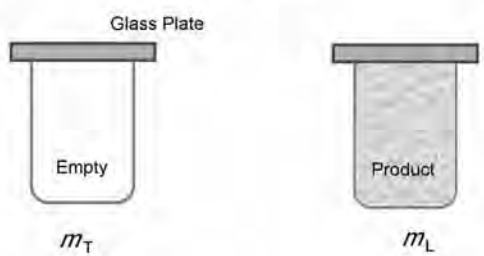
1. Weigh the empty density cup and glass strike (m_T) Record the result
2. Brim fill the density cup with product
3. Slide the glass strike across the brim
   ——Ensure no air is trapped
   ——Top up through the hole in the glass strike

Establish the density using a density cup.

4. Carefully clean any overflowed product from the density cup and dry thoroughly
5. Weigh the density cup, glass strike and product to find the product weight (m_L) and record the result
6. Calculate the density (ρ)

$$\rho = (m_L - m_T) \div V$$

Density Cup



Density Meters

These instruments calculate the density and display it on the digital readout.

Density Meters

The advantage of using these instruments is:

- 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

Density Meters

To use:

1. Calibrate the instrument using distilled water
2. Insert the tube into the product and suck product into the vibrating tube
3. Read the density from the display

Templates

Templates are used to determine the quantity contained in pre-packages.

Templates

Basic principle

- The measuring template does not directly determine the amount contained in a pre-package
- It is used to measure the distance between the top of the contents in the pre-package and the upper edge of the package (the empty space) without the package having to be opened

Templates

- 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

Templates

To ensure the accuracy of the template measurement the following requirements must be fulfilled:

1. The packaging must be transparent
2. The packaging must be made of a stable material that holds its shape. E.g. glass bottles
   ——Any material that changes shape if a light pressure is applied will cause the level of the contents to rise or fall, and thus affect the accuracy of any measurement

Templates

3. The volume of the container when filled to the brim must be known
4. The volume of each container must be sufficiently constant
   ——This can be controlled by the pattern approval process and checking of containers by the verification authority
5. Glass bottles are the usual containers that meet these requirements

Templates

Other considerations

- The type of cap the bottle has must be considered. Since the template is held over the cap when determining the measurement the thickness of any cap must be allowed for. The type of cap (e.g. 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

Templates

Using the template.

1. The sample is taken from the inspection lot in accordance with the requirements of OIML R87

   —— **Note**: If the sample is taken directly from the filling machine it is often difficult if not impossible to check products that "fizz" or foam using a template. These types of products are best tested from a lot in the warehouse.

Templates

2. The bottle being tested must be placed vertically on a level surface
3. The template is placed over the top of the bottle
4. The reading is taken where the meniscus touches the edge of the bottle

Templates

Drained Quantity of Products Packed in a Liquid Medium

OIML R87 Annex C

Drained Quantity of Products Packed in a Liquid Medium

General

When a pre-package contains solid goods in a liquid medium there are three possibilities:

1. The liquid medium is intended to be left over after use
2. The liquid medium is not intended to be left over after use
3. The liquid medium might or might not be left over after use

Drained Quantity of Products Packed in a Liquid Medium

1. The liquid medium **is** intended to be left over after use. (e.g. cucumbers in vinegar water)
   The term "content of the pre-package" (equals "quantity of the product") applies to the solid products
   - In this case the solid products are those contained in the pre-package **excluding** the packing material and the liquid medium
     - In this instance the "packing material" (everything that is intended to be left over after use) includes the liquid medium
   - The "content of a pre-package" is just the solid product

- Net Weight (385 g)
- Drained Weight (230 g)

- Net Weight (410 g)
- Drained Weight (275 g)

- Can Capacity (850 mL)
- Net Weight (820 g)
- Drained Weight (465 g)

Drained Quantity of Products Packed in a Liquid Medium

2. The liquid medium is **not** intended to be left over after use.
   (e.g. liquor with raisins, and also fruit juice with pulp)
- The term "content of the pre-package" (equals "quantity of the product") applies to the solid products **and** the liquid medium
- In this instance the "packing material" (everything that is intended to be left over after use) **does NOT** include the liquid medium
- The "content of a pre-package" is the solid product together with the liquid

Drained Quantity of Products Packed in a Liquid Medium

- The liquid is intended to be consumed along with the solid product
- This procedure does not apply to these products
- These products are inspected using the normal procedure

Drained Quantity of Products Packed in a Liquid Medium

The liquid (sauce) is intended to be consumed along with the solid product.

Drained weight procedure does not apply.

Drained Quantity of Products Packed in a Liquid Medium

3. The liquid medium **might or might not** be left over after use.

   (e.g. sweetened juice with fruits, or fish in oil)

- The definition of packing material does not distinguish between the liquid medium and the goods

Drained Quantity of Products Packed in a Liquid Medium

Sweetened syrup is intended to be eaten with the with fruit

Drained Quantity of Products Packed in a Liquid Medium

- A recipe on the label could clarify if the liquid medium "is meant to be left over after use" or not
- In this case the quantity of solids and the quantity of liquid medium could be on the label

Terminology

Actual contents

—— Quantity of product in a pre-package after equilibrium of solution process is established and the liquid medium is drained.

Terminology

Liquid medium

—— Means the following products, possibly in mixtures and also when frozen or quick-frozen, provided that the liquid is merely an adjunct to the essential elements of that preparation and is thus not a decisive factor for the purchase: water, aqueous solutions of salts, brine, aqueous solutions of food acids, vinegar, aqueous solutions of sugars, aqueous solutions of other sweetening substances, fruit or vegetable juices in the case of fruit or vegetables.

Terminology

Nominal quantity

—— Quantity of product in a pre-package less the liquid medium.

Test equipment

- Suitable weighing instrument and test weights
- Sieves
  - —— 20 cm diameter sieve with 2.5mm square mesh and a wire thickness of 1.12 mm
    - for use with pre-packages of 850mL or less
  - —— 30 cm diameter sieve with 2.5mm square mesh and a wire thickness of 1.12 mm
    - for use with pre-packages over 850 mL
- Drip pan
- Stopwatch

Procedure for determining the actual quantity of product

- Sampling periods are given in table C1
- If the product is not included in this table sampling is performed:
  - ——when the products are ready to be marketed according to the manufacturer, or
  - ——any time later than 30 days after sterilization, pasteurization or similar process

Product	Period of time for checking	
	From	To
Fruit, vegetable and other vegetable foodstuffs (except for strawberries, raspberries, blackberries, kiwis, loganberries)	30 days after sterilization	Tenability
Strawberries, raspberries, blackberries, kiwis, loganberries	30 days after sterilization	2 years after sterilization
Products out of salted fish, anchovies, marinades, stewed fish goods, preserved fish, mussels, shrimps, etc.	Immediately after pouring on	14 days after pouring on
Marinades of fried fish	48 hours after pouring on	14 days after pouring on
Small sausages and other meat products	5 days after sterilization	Tenability
Other products	14 days after pouring on	Tenability

Table C.1 Recommended periods of time for checking drained weight

Procedure for determining the actual quantity of product

1. Select a sample of pre-packages in accordance with the sampling procedures
   - —— 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

Procedure for determining the actual quantity of product

3. Weigh the sieve and drip pan and record the weight (Pe_1)
4. Open the pre-package and pour the product and liquid medium across the sieve.
   - Distribute the product and liquid medium over the surface of the sieve
   - **do not** shake the material on the sieve
   - If the nominal quantity is 2.5kg or more, weigh the whole amount, then divide it among several sieves

Procedure for determining the actual quantity of product

5. Tilt the sieve to an angle of 17° to 20° from the horizontal to facilitate draining
6. 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
   - Drain the hollows or cavities in soft products (e.g. sliced fruit) by tilting the sieve
7. Drain for 2 minutes

Procedure for determining the actual quantity of product

8. Place the sieve on the drip pan and reweigh the sieve, drip pan and contents (Pe_2)

Procedure for determining the actual quantity of product

9. Calculate the drained quantity as follows:

$$P = Pe_2 - Pe_1$$

Where:

P : drained quantity of the product

Pe_1 : weight of the clean sieve and drip pan

Pe_2 : weight of the sieve and drip pan plus product after draining

Procedure for determining the actual quantity of product

10. Subtract the drained quantity from the nominal drained quantity to determine the individual pre-package error.

Procedure for determining the actual quantity of product

11. Repeat steps 3 to 10 for the remaining pre-packages in the sample

——For subsequent weighing of the same sieve ensure that it is clean and free of product debris

——The sieve does not have to be dry as long as it is weighed accurately before being used

Procedure for determining the actual quantity of product

12. Determine inspection lot compliance.

Test Procedures for Determining the Actual Quantity of Frozen Foods

OIML R87 Annex D

Test Procedures for determining the actual quantity of frozen products.

This annex gives guidelines for testing of three different types of frozen products.

1. Frozen fruits and vegetables
2. Glazed seafood
3. Frozen shrimp and crab meat

Frozen fruits and vegetables

Frozen fruits and vegetables

Equipment used to determine the actual quantity:

1. Suitable weighing instrument and test weights
2. Thermometer with 1°C graduations and accurate to ±1 °C
3. Water source and hose
4. Sink or other receptacle

Frozen fruits and vegetables

5. Sieve
   - 20 cm diameter with 2.36 mm square openings
     - for pre-packages with a nominal quantity up to 1.4 kg
   - 30 cm sieve with 2.36 mm square openings
     - for pre-packages greater than 1.4 kg
6. A drip pan
7. Stop watch

Frozen fruits and vegetables

Procedure

1. Select sample in the normal manner
2. Weigh sieve and drip pan together and record weight (m_T)
3. Determine the gross weight of each individual pre-package

Frozen fruits and vegetables

4. Immerse the pre-package in water maintained at 20°C (± 1 °C) with a continuous flow
   - —— If the pre-package is not water-tight, place it in a plastic bag and remove any excess air using a vacuum and then seal it securely
   - —— Avoid agitating the pre-package while it is thawing

Frozen fruits and vegetables

5. When all of the ice has melted, remove pre-package from the water bath and wipe it dry
6. Open the pre-package with care and a minimum of agitation
7. Tilt sieve approximately 17° to 20° from the horizontal to facilitate drainage
8. Distribute the product evenly over the sieve in one sweeping motion
9. Drain for 2 minutes

Frozen fruits and vegetables

10. Transfer the sieve containing the product to the pre-weighed drip pan
11. Weigh sieve and drip pan (m_d) and deduct weight obtained in step 2 to determine the actual drained quantity of the product

    Actual drained contents = $m_d - m_t$

12. Repeat steps 2 to 11 for each pre-package

Glazed Seafood

Glazed seafood

(seafood that is covered with a film of water and then frozen to preserve its quality)

- The actual quantity of the seafood shall be exclusive of the glaze

Glazed Seafood

Glazed Seafood

Equipment required to determine actual quantity

1. Suitable weighing instrument and test weights
2. Water source, hose and spray head
3. Sink or other receptacle

Glazed Seafood

4. Sieve
   - ——20 cm diameter with 2.36 mm square openings
     - for pre-packages with a nominal quantity 900 g or less
   - ——30 cm diameter sieve with 2.36 mm square openings
     - for pre-packages greater than 900 g
5. A container large enough to hold the product
6. Stop watch

Glazed Seafood

Inspection Procedure

1. Select sample in the normal manner

Glazed Seafood

2. Weigh a container large enough to hold the product (m_T)

Glazed Seafood

3. Determine the gross weight of each individual pre-package

Glazed Seafood

4. Remove the product from the pre-package and place it under a gentle spray of cold water until the ice glaze is removed
   - —— Agitate the product with care to avoid damage

Glazed Seafood

Glazed Seafood

5. Transfer the product to the sieve.

Glazed Seafood

6. Tilt sieve approximately 17° to 20° from the horizontal to facilitate drainage without shifting the product.
7. Drain for 2 minutes.

Glazed Seafood

8. Transfer the product to the pre-weighed container.
9. Weigh product and container together and record result (m_d).

Glazed Seafood

10. Deduct weight of pre-weighed container from product and container weight to determine the actual drained quantity of the product.

Actual drained contents = $m_d - m_t$

Glazed Seafood

Actual drained contents = $m_d - m_t$

3 155.3 g – 2 907.3 g = 248 g

Actual drained contents – Q_n = Individual pre-package error

248 g – 250 g = – 2 g

11. Repeat steps 2 to 10 for each pre-package.

Glazed Seafood (Determine amount of glaze)

Gross weight – tare = net weight

303.5 g – 9.5 g = 294 g

Amount of glaze equals:

Net weight – Actual drained contents

294 g – 248 g = 46 g

15.65% of net weight was water

Frozen shrimp and crabmeat

Frozen shrimp and crabmeat

Test equipment required to determine the net weight of frozen shrimp and crabmeat.

1. Suitable weighing instrument and test weights.
2. Thermometer with 1 °C graduations and accurate to ± 1 °C.
3. Water source and hose with a 4L to 11L per minute flow rate.
4. Sink or other receptacle (e.g. 15 litre container).

Frozen shrimp and crabmeat

5. A wire mesh basket or other container that is large enough to hold the contents of 1 package and has openings small enough to retain all pieces of the product

Frozen shrimp and crabmeat

6. Sieve
   - —— 20 cm diameter with 2.36 mm square openings
     - for pre-packages with a nominal quantity up to 450g
   - —— 30 cm diameter sieve with 2.36 mm square openings
     - for pre-packages greater than 450g
7. A container large enough to hold the product
8. Stopwatch

Frozen shrimp and crabmeat

Procedure

1. Select sample in the normal manner
2. Weigh a container large enough to hold the product and record the result (M_1)
3. Determine the weight of each individual pre-package

Frozen shrimp and crabmeat

4. Unwrap the frozen shrimp or crabmeat and place it in the wire mesh basket
5. Immerse basket and product in a 15L or larger container of fresh water at a temperature of 26 °C (± 1 °C)
   - Submerge the basket so that the top of the basket extends above the water level

Frozen shrimp and crabmeat

6. Maintain a continuous flow of water into the bottom of the container to keep the temperature within the specified range
7. As soon as the product thaws, determined by loss of rigidity, transfer all material to a sieve
8. Without shifting the product on the sieve, incline the sieve approximately 30° from the horizontal position to facilitate drainage
9. Drain for 2 min

Frozen shrimp and crabmeat

10. At the end of the drain time, immediately transfer the product to the pre-weighed container
11. Weigh product and container together and record result (m_d)
12. Deduct weight of pre-weighed container from product and container weight to determine the actual drained quantity of the product

Actual drained contents = $m_d - m_t$

13. Repeat steps 2 to 12 for each pre-package

Desiccating Goods

Desiccating goods

Desiccating goods

- Are goods made up in a package that lose weight or volume solely through evaporation after the package is made up

  ➢ Not to be confused with hygroscopic goods that both hydrate and dehydrate with climatic conditions

Desiccating goods

Some countries have developed rules for desiccating goods:

- defining desiccating products
- exact nature of the rules
- providing that desiccating goods comply with the 3 rules under R87 for a period up to 7 days after packing.

Desiccating goods

- Desiccating goods must meet the three rules for 7 days beginning on the day they were packed.
- After this no package may be an inadequate *T2* package.

Desiccating goods

- It may be necessary to seek an expert opinion as to whether goods can be classed as desiccating.
- Alternatively, consult other international legal metrology authorities.

Desiccating goods

International consensus has not yet been reached on a common standard for desiccating goods.

R79 Labelling

Answers

Statements of a quantity less than a whole number may contain decimal fractions to a maximum of three places, provided that the declaration complies with Table 2 in Annex A.

Wrong choice of units (g)

(R79 does not cover pre-packages made up in variable quantities)

Table 2 - Choice of units

Type of measure	Net quantity of product (q)	Units
Volume (liquids)	q < 1000 mL 1000 mL ≤ q	mL (ml) L (l)
volume - cubic (solids)	$q \leq 1000$ cm^3 (1 dm^3) 1 dm^3 < q < 1000 dm^3 1000 dm^3 ≤ q	cm^3, mL (ml) dm^3, L (l) m^3
mass	q < 1 g 1 g ≤ q < 1000 g 1000 g ≤ q	mg g kg

KG should be kg

Unit	Symbol[a]
milligram	mg
gram	g
kilogram	kg
tonne	t
litre[b]	L or l
millilitre	mL or ml
micrometre	µm
millimetre	mm
centimetre	cm
decimetre	dm
metre	m
square millimetre	mm^2
square centimetre	cm^2
square metre	m^2
cubic centimetre	cm^3
cubic decimetre	dm^3
cubic metre	m^3

Table 1

Units of measurement

Net Weight does not include packaging material

- **APPROX not allowed**
- **No space between numbers and letters (216g)**
- **Wrong symbol (G)**

Correct

- No space between the number and the symbol
- Zeros to the right of the decimal mark not needed

- Wrong symbol
- The letter “s” should not be used after the symbol
- Wrong symbol (KG)

300g±3%

- No space between numbers and letters (300 g)
- ±3% not allowed

Tare 1

Q_n = 70 g
T = 4.5 g
ATW = **3.6 g**
s = **0.516**

10% of 70 g = 7 g
The ATW is ≤10 % of the nominal quantity of product use the ATW

Use the ATW of 3.6 g

Tare 1

Q_n = 70 g
T = 4.5 g
ATW = **8 g**
s = **0**

10% of 70 g = 7 g
8 g > 7 g
0.25 T = 1.125 g
0 (s) < 1.125 g
The ATW is > 10 % of the nominal quantity and s < 0.25 x T

Use the ATW of 25 packaging materials

Tare 1

Q_n = 250 g
T = 9 g
ATW = **26.1 g**
s = **2.961**

10% of 250 g = 25 g
26.1 g > 25 g
0.25 T = 2.25 g
2.961 > 2.25
The ATW is > 10 % of the nominal quantity and s > 0.25 x T

Use individual Tare weights

Tare 2

Q_n = 70 g
T = 4.5 g
ATW= **8.4 g**
s = **0.516**

10% of 70 g = 7 g
8.4 g > 7 g
0.25 T = 1.125 g
0.516 (s) < 1.125 g
The ATW is > 10 % of the nominal quantity and s < 0.25 x T

Use the ATW of 25 packaging materials

Tare 2

Q_n = 1 000 g
T = 15 g
ATW = **12.7 g**
s = **1.418**

10% of 1 000 g = 100 g
The ATW is ⩽10 % of the nominal quantity of product

Use the ATW **of 12.7 g**

Tare 2

Q_n = 5 000 g
T = 75 g
ATW = **25.1 g**
s = **3.510**

10% of 5 000 g = 500 g
The ATW is ⩽10 % of the nominal quantity of product

Use the ATW **of 25.1 g**

Butter

- Lot size = 1000
- Q_n = 500 g
- Sample size = **80**
- $T1$= **15 g**
- $T2$= **30 g**

TPE = **-69 g**
AE = TPE ÷ Sample size
AE = -69 ÷ 80 = **-0.863 g**
SCF = **0.295**
s = **1.777**
SEL = s x SCF
SEL = 1.777 x 0.295 = **0.524**
AE + SEL
= 0.524 + -0.863 = **-0.339 g**

0 Inadequate $T2$ pre – packages —— **Passes Rule 3**
0 Inadequate $T1$ pre – packages —— **Passes Rule 2**
The sum of AE + SEL is a negative number —— **Fails Rule 1**

Apples

- Lot size = 500
- Q_n = 3 000 g
- Sample size = **50**
- $T1$= **45 g**
- $T2$= **90 g**

TPE = **-1414 g**
AE = TPE ÷ Sample size
AE = -1414 ÷ 50 = **-28.28 g**
SCF = **0.379**
s = **42.75**
SEL = s x SCF
SEL = 42.75 x 0.379 = **16.2**
AE + SEL
= 16.2 + -28.28 = **-12.08 g**

2 Inadequate $T2$ pre-packages —— **Fails Rule 3**
20 Inadequate $T1$ pre-packages —— **Fails Rule 2**
The sum of AE + SEL is a negative number —— **Fails Rule 1**

Milk

- Lot size = 3 000
- Q_n = 500 mL
- Sample size = **80**
- *T1*= **15 g**
- *T2*= **30 g**

TPE = **-25.4 mL**
AE = TPE ÷ Sample size
AE = -25.4 ÷ 80 = **-0.318 mL**
SCF = **0.295**
s = **2.709**
SEL = *s* x SCF
SEL = 2.709 x 0.295 = **0.799**
AE + SEL
= 0.799 + -0.318 = **0.481 mL**

0 Inadequate *T2* pre-packages —— **Passes Rule 3**
0 Inadequate *T1* pre-packages —— **Passes Rule 2**
The sum of AE + SEL is a positive number —— **Passes Rule 1**

Screws

- Lot size = 1 200
- Q_n = 120 items
- Sample size = **80**
- *T1*= **2**
- *T2*= **4**

TPE = **35**
AE = TPE ÷ Sample size
AE = 35 ÷ 80 = **0.438**

SCF = 0.295
s = **1.457**
SEL = *s* x SCF
SEL = 1.457 x 0.295 = **0.43**
AE + SEL
= 0.43 + 0.438 = **0.868**

0 Inadequate *T2* pre-packages——**Passes Rule 3**
0 Inadequate *T1* pre-packages——**Passes Rule 2**
The AE is a positive number——**Passes Rule 1**

Material

- Lot size = 200
- Q_n = 10 m
- Sample size = **50**
- *T1*= **0.2**
- *T2*= **0.4**

TPE = **0.651**
AE = TPE ÷ Sample size
AE = 0.651 ÷ 50 = **0.013**

SCF = 0.379
s = **0.01**
SEL = *s* x SCF
SEL = 0.01 x 0.379 = **0.004**
AE + SEL
= 0.013 + 0.004 = **0.017 m**

0 Inadequate *T2* pre-packages——**Passes Rule 3**
0 Inadequate *T1* pre-packages——**Passes Rule 2**
The AE is a positive number——**Passes Rule 1**

SERNAC

Overview of the Legal Metrology System on Pre-packaged Goods

Chile

María Cristina Leiva

CTI 09 2009T APEC/APLMF Seminars and Training Courses in Legal Metrology

Singapore, July 6—10, 2009

About me....

- MARIA CRISTINA LEIVA BALICH
- **B.A. graduate from the University of Chile, Social Work (1972)**
- I have worked for Chile's Consumer Service since 1978.
- Since 1988, I have been working in consuming research. In this position I represent consumers' interests regarding standardization processes.
- I have also carried out research on products and services. My work has been published in the internet and in the *Consumer's Journal*, edited by SERNAC (Chile's Consumer Service).

Legal Metrology Experience

- **July 2002**: I attended the "Legal Metrology Seminar for the Americas", organized by the National Institute of Standards and Technology (NIST) Washington DC, U.S.A.
- **September 2002**: I published "Concepts of Legal metrology in the consumer's defense and protection perspective" in SERNAC's website
- **2004**: I helped as a technical consultant for the translation of NIST " Checking the Net Contents of Packaged Goods " . Fourth Edition NIST Handbook 133.
- **Research projects**
  - 2003 —— Net contents in Hair Shampoo
  - 2005 —— Pre-packaged ice cream quality assessment
  - 2005 —— Examination Procedure for Price Verification in Electronic registers
  - 2006 —— Diagnostic study on scales' accuracy measurement on bulk sales

My Agency....

- **SERNAC (**Chile's Consumer Service) is

  a governmental organization dependent on The Department of Economy. The main task is to ensure the enforcement of the Law N° 19.496, that guarantees consumers' rights protection and other related norms, in particular our goal is to:

  a) Provide training to consumers about their rights.
  b) Analyze through specialized laboratories products in the market to find out about their composition, net contents and other characteristics. Make this information available to the general public, detailing the procedures employed to obtain this information.
  c) Gather, process and spread information to the consumers in order to make the necessary information available to the general public.
  d) Carry out research in the consuming area.
  e) Make sure that the law that protects consumers is enforced.

Pre-packed goods in our economy

General requirements for pre-packed goods :

- Label information in Spanish (product identity and its manufacturer or importer)
- Net contents expressed in units of Decimal Metric System
- All the information in labels must be verifiable

Specific requirements:

a) Food products——Mandatory label

- Product name and identity
- Net content in SI or metric system
- Name an address of manufacturer, importer or retailer
- Country of origin
- Sanitary Authorization
- Date of manufacture and expiration date
- List of ingredients in descending order
- List of additives
- Storage and use instructions
- Authorization of local market import for imported foods (PI)
- Nutritional labeling
- Quality level, if applicable
- Nutritional facts

b) Non food pre-packed

- Only a few of non-nutritional packaged products have specific requirements related with weight and measure: e.g. flat weaves, clothes and footwear, fire extinguishers, toys, among others.

Usage of a statistical based average quantity system

- At industrial level, is used the OIML Recommendations R76-1 and 2 for non-automatic weighing instruments and other methodology based in EU estadistical standards.

Plans for implementing R87

- In the context of our quality management system, the technical staff wich I belong in SERNAC, are planning the definition of guidelines that establish criteria for the adoption of methodological options.

Procedure used for checking pre-packaged goods

- In 2004, SERNAC adopted the methodology NIST contained in Handbook N°133 "Checking the Nets Contents of Packaged Goods" as a methodological tool to approach activities of metrological surveillance in markets of final consumption.

Issues in determining the net quantity of pre-packaged goods

- **Current challenges**:
- High operative costs
- No legal authority to exercise market control: this means that we need to act only through a monitoring system that involves
  a) purchasing sample goods, and
  b) taking them to the laboratory for measurements

What do we need ?

1. to increase the number of diagnostic studies to assess the accuracy of nets contents in pre-packed goods prices accuracy, scales accuracy, among others
2. to present projects and apply to funds that will provide financial support

Use of OIML R87 procedures

SERNAC methodology:

- considers both level procedures, the NIST and OIML
- establishes the terms of reference in order to hire specialized laboratory services for monitoring net content in pre-packaged goods

Issues with imported pre-packaged goods

Some products do not meet the minimum requirements for information in Spanish while other products have no Spanish labelling whatsoever.

The product information comes in a language other than Spanish and since only part of this information is translated to Spanish, considerable valuable information is lost.

- Issues with exported pre-packaged goods

  We don't manage information of issues on this matter.

3. Legal metrology system in our economy

The metrology system in Chile is organized by:

- A national metrology authority: Chile's Economy Department
- A coordinating organism: INN (Natioal Standards Bureau)
- A national metrological board, formed by both private and public entities

Our goal is to launch a national metrological plan focused on different economic activities (e.g. energy, housing, transportation and others) attempting to cluster entities with common interests to obtain governmental financial support.

4. Situation in our economy about the compliance to the international standards / recommendations for pre-packed goods

- Chile's goal now is to align with current international recommendations and standards for global market

- Thank you very much

Legal Metrology System on pre-packed goods in China

Zhao Wei
Shanghai Institute of Measurement and Testing Technology
P.R.China

1.Self introduction

- A introduction of my organization and department

The Chinese government pays a great attention to the metrological supervision and administration of Pre-packaged goods and set up legal measurement verification agency in every province of China, for the measurement and check of Pre-packaged goods. Every year, the metrology and inspection of Pre-packaged goods is funded and conducted by the government.

Specifically in Shanghai, the metrology and inspection is conducted and organized by Shanghai Institute of Measurement and Testing Technology (SIMT), the only one legal institute in Shanghai, which is nonprofit and comprehensive and is authorized by the Chinese government.

- **A introduction of my work**

Personally, I am an administrator of measurement process, in charge of the metrological work Pre-packaged goods and the research of metrological technology.

Mobile testing laboratory

This detection machine is designed by our own department ,which can satisfy the rapid test on the spot.

Solid, liquid two-phase, frozen products net quantity inspection device

For the inspection work of partial adding water frozen storage goods (such as water fish, water shrimps) as well as canned food, solid, liquid two-phase product of the net quantity of the inspection work, we specifically develop the inspection device.

In accordance with the requirement of 87th international recommendation （***Quantity of Products in Prepackages***）（2004）of International organization of legal metrology, *SCEV* designs the special software, which is used for net quantity metrology inspection of Pre-packaged goods. Through this software's automatic operations and result estimation to import data, our software generates records and inspection reports , reduces the error caused by manual operations. Thus we can improve work efficiency , ensure the quality of work and provide advanced and reliable technical support for relevant government's departments.

2. Pre-packed goods in China

2.1 The adaptation of average quantity system

In China, regulations concerning metrology of pre-packed goods is based on average quantity system .

2.2 The adaptation of R87

In China, the formulation of metrology laws of pre-packed goods is ever conducted in accordance with international recommendations. According to OIML R87, ***Rules of Metrological Testing for Net Quantity of Products in Prepackages with Fixed Content,*** was formally implemented in 2006 and has been working till now . At the same time of overall adoption of R87, we present, according to the application of prepackages in China, some supplements to the terms of international recommendations.

For example, to adjust the misleading prepackages that are still not qualified for prepackaging; not to adopt, for the time being, Annex E prohibition of misleading prepackages (mandatory); to divide into 3 groups a prepackage order with the amount of less than 100 products (for details, see the following table).

Table Sampling plans for prepackages

Column I	Column2	Column 3		Column 4	
Inspection lot size	Sample size	sample average actual quantity correction value ($\lambda \cdot s$)		Number of pre-packages in a sample	Number of pre-packages in a sample
		sample correction factor $\lambda = t_{0.995} \times \frac{1}{\sqrt{n}}$	sample standard deviation		
1～10	N	\	\	0	0
11～50	10	1.028	s	0	0
51～99	13	0.848	s	1	0
100～500	50	0.379	s	3	0
501～3200	80	0.295	s	5	0
>3200	125	0.234	s	7	0

The red part, which is the supplement of R87, is based on the actual situation of China.

2.3 Problems in determining the net quantity of pre-packaged goods

- As to those products with changeable quantity caused by desiccation such as flour, soap and the like, SIMT is now working on the draft of the inspection of desiccating goods.
- In the inspection actual of nominal quantity of product in area, we only have a small amount of cases, and therefore we aspire to learn from other countries on this aspect.

2.4 Problems about import and export pre-packaged goods

- In the metrology and inspection of import and export goods, principle and standards adopted are totally agree with international recommendation (OIML R87).
- For exported goods, inspection is often conducted according to agreement, save for domestic sale.
- Yet, the point is that sometimes in spot check of imported goods, we have to handle the case of products that has less than 100 pieces. For this, we made a supplementary term regarding the principle and methods in inspection of the products that has less than 100 pieces.

3. Legal metrology system in China

The Chinese government has paid a great attention to metrology work. In 1985, the "Metrology Law of the People's Republic of China" was issued, which marked our steps on the track of legal administration. After that, related department for metrology administration have been set up in governments of all level in all over China, which helps hatch a further development of the undertaking of metrology.

To guarantee a sound development, Chinese government has formulated a series of compulsory verification for the measuring instruments used in settling trade accounts, safety protection, medical and health work, environmental monitoring. To improve the quality of measuring instrument, the government has set a system of type approval and license for the production of instruments, and popularized the certificate system issued by the International organization of legal metrology. In recent years our government strengthens the metrological supervision and administration of Pre-packaged goods .

4. About the compliance to the international standards/ recommendations for pre-packed goods

- As a member of WTO and OIML， our national regulation for pre-packed goods is basically equivalent to OIML R 87 except for some alterations. Therefore, a good implementation of these regulations will render a better link with international metrology system.

5. Potential problems in the implementation of legal metrology system

- Now in China, the implementation of legal metrology system is in good condition in terms of human resources and budget, for most compulsory verification in most areas are funded by government totally or partially.

The End

Thanks a lot!

Pre-packaged Goods in Indonesia

Presented at APEC/APLMF seminars and training courses in legal metrology: Practical application of OIML recommendation R87 on pre-packaged goods

Singapore, 6 – 10 July 2009

Introduction

- Name : Novian Darajat Kuswanto
- Organization : Directorate of Metrology, Directorate General of Domestic Trade, Ministry of trade, Republic of Indonesia
- Directorate of Metrology (DoM) is one of Government Institution that has a responsibility in conducting the Legal Metrology activities in the Republic of Indonesia.
- DoM's vision is to establish the effective and efficiency legal metrology system in aimed to support the competitiveness of goods and services in the global market and consumer and producer protection.

Legal Metrology System in Indonesia

- The conduction of legal metrology system is ruled under the Law No. 2 Year 1981 on Legal Metrology.
- Legal Metrology System in Indonesia faced the changing of government administration system from centralized to decentralized (regional autonomy). The metrological operational (e.g. re/verification and metrological inspection) is done by 54 regional verification offices.
- Generally, legal metrology system in Indonesia consist legal control of measuring instruments, legal control of pre-packaged goods, and metrological supervision.

Legal Control of Pre-packaged goods in Indonesia

- Pre-packaged goods in Indonesia were ruled by :
  - Article 22, 23, and 24 Law No.2 Year 1981 on Legal Metrology
  - Government Act No.69 Year 1999 on Labeling and Advertising of Food Product
  - Director General of Domestic Trade Decree No.31 Year 1999 on the guidance of Pre-packaged goods supervision
  - The technical regulation of pre-packaged goods is under Director General of Domestic Trade Decree No.31 Year 1999 on the guidance of pre-packaged goods supervision.
  - The decree consists
  - Labeling
  - Testing procedures for net quantity
  - Supervision procedure
- Generally, the technical regulation of pre-packaged goods was adopted from OIML R87 and OIML R79. Only some of them were regulated differently.

Legal Control of Pre-packaged goods in Indonesia

The differences between OIML R87 and National Regualation:

Item	Current National Regulation
Scope	Same with OIML R87
Terminology	Same with OIML R87
Metrological Requirements	Same with OIML R87
Reference Test	Different in sampling plan. National regulation : used double sampling
Outline of examination procedure	Same with OIML R87
Tare procedures	Different. National regulation : Average Tare Weight without standard deviation consideration
Drained quantity of products packed in a liquid medium	Not regulated
Test procedures for determining the actual quantity of frozen products	Not regulated
Prohibition of misleading prepackages	Not regulated

Issue of Implementing the Pre-packaged goods in Indonesia

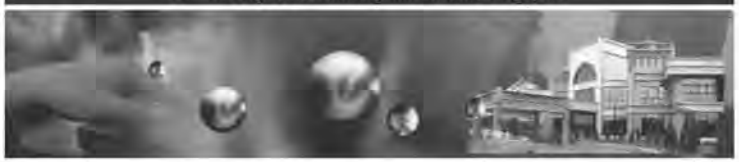
- Currently, the technical regulation on pre-packaged is still revising in particular to harmonize with ASEAN Common Requirement of Pre-packaged Products.
- The priority products inspected are:
  - Tea
  - Coffee
  - Rice
  - Instant Noodle
  - Edible Oil
  - Sugar
  - Milk
  - Fruit Juices and Dried Fruits
  - Sauces
- The major problems of the practical implementation of pre-packaged goods are:
  - Determine the net quantity of LPG. Technically, there were no assurance that there is no more gas on the tube after used.
  - Determine the net quantity of Ice Cream and other frozen products.
  - Checking pre-packaged goods in the market.

Thank You...

APEC/APLMF Seminars and Training Courses in Legal Metrology:

Practical Application of OIML Recommendation R87 on Pre-packaged Goods (CTI 09/2009T)

06 – 10 July 2009; Holiday Inn Atrium, Singapore



Dr. Wan Abd Malik Wan Mohamed
Senior Metrologist
National Metrology Laboratory
SIRIM Berhad, MALAYSIA

SIRIM

Organizational Structure Of SIRIM Berhad

ORGANISATION STRUCTURE 2008
STRUKTUR ORGANISASI 2008

BOARD OF DIRECTORS

Internal Audit

Company Secretary

PRESIDENT AND CHIEF EXECUTIVE

- President Office
- Malaysian Design Council Secretariat
- Group Legal & Company Secretariat Department
- WAITRO Secretariat
- Group Strategic Planning Department
- Group Quality & OSHE Department

Subsidiaries
- SIRIM QAS International Sdn Bhd
- SIRIM Training Services Sdn Bhd

Corporate Division
- Group Finance Department
- Group Human Resource & Administration Department
- Group Corporate Affairs Department
- Tender Contract And Procurement Department
- SIRIM State Office Management & Development Department

Engineering And Support Services Division
- SME & Govern Department
- Property Manag Department
- Printing & Pack Department

Standard & Quality Division
- Marketing Business Development & Sales Department
- National Metrology Laboratory

Marketing & Business Development Division

Research & Technology Division
- ...rting & Sales Centre
- ...ce-Economy And Commercialisation
- ...ce
- ...ional Centre For Machinery And ...g Technology
- ...ional Manufacturing Technology Centre
- ...ional Materials Research Centre
- ...sessment & Diagnostics Technology Centre

The NML-SIRIM was first established in 1976 to provide calibration and measurement services for all physical quantities and to embark on research activities on improving the national measurement standards

Organizational Structure of NML-SIRIM

SENIOR GENERAL MANAGER

SENIOR GENERAL MANAGER'S OFFICE
- Administration
- Finance
- Planning & Budgeting
- Human Resources Mgmt/Development
- International Relation/Cooperation
- Legal Metrology

TECHNICAL COORDINATION & QUALITY SECTION
- Quality Management
- Technical Coordination
- Customer Service Affair
- Promotion & Publication
- OSHE
- Asset

ELECTRICAL SECTION
- DC Voltage, Resistance & Current
- AC Voltage & Current
- AC-DC Transfer
- Power & Energy
- Capacitance, Inductance & AC Resistance
- Magnetics
- Voltage & Current Transformers
- Time & Frequency
- RF & Microwave
- Acoustics & Vibration
- Radiometry & Photometry

MECHANICAL SECTION
- Mass
- Density - Solid
- Wavelength Standards
- Dimension & Angle Standards
- Surface Texture & Form
- Engineering & Coordinate Measurements
- Pressure & Vacuum
- Force & Torque
- Hardness

THERMOPHYSICAL SECTION
- Resistance Thermometry
- Radiation Thermometry
- Thermocouple
- Thermometry
- Humidity
- Density - Liquid
- Viscosity

FLOW SECTION
- Low Pressure Gas
- Medium & High Pressure Gas
- Static Liquid
- Dynamic Liquid

CHEMISTRY SECTION
- Gas Standard Mixtures
- Metal and Non-Metal Analysis
- Electro-Chemistry
- Surface Analysis
- Characterization of Pure Organic Substance

NML's Core Activities

TO ESTABLISH, MAINTAIN AND UPGRADE THE NATIONAL PHYSICAL STANDARDS

TO DISSEMINATE AND PROMOTE MEASUREMENT PARAMETERS AND TECHNOLOGIES TO INDUSTRIES

TO PURSUE TECHNICAL COOPERATIONS WITH INTERNATIONAL STANDARD BODIES

TO CONDUCT RESEARCH & DEVELOPMENT IN PRECISION MEASUREMENT TECHNOLOGY AND STANDARDS

TO PROVIDE LEGAL METROLOGY SERVICES AS REQUIRED BY THE LAWS

2. Pre-packaged Goods in Malaysia

2.1 Do you use a statistical based average quantity system?

- No, we do not use a statistical based system. However, we use the minimum system either in weight, quantity, amount or capacity of the pre-packaged goods.

2.2 Do you use OIML R87 procedures?

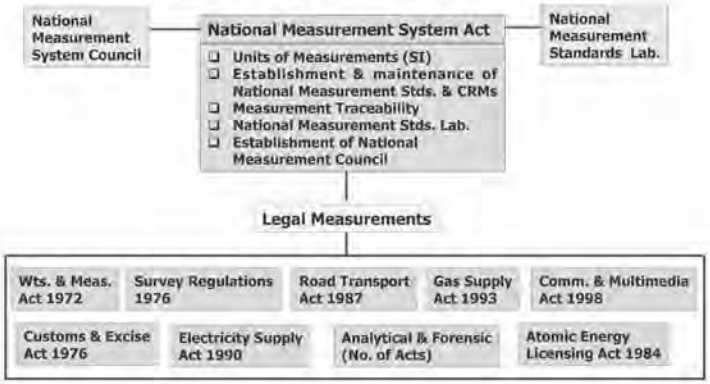
- No, we do not use OIML R87.

2.3 If not explain what procedure you use for checking pre-packaged goods?

- Pre-packaged goods are regulated via the Trade Description Act 1972 and the Price Control Act 1946. The Trade Description Act governs the pre-packaged content by minimum weight and the labelling via the Price Control Act.

3. Legal Metrology System in Malaysia

The National Measurement System Act 2007



4. Current Situation of Pre-packaged Goods in Malaysia

- **Enforcement Body:**

  Sale of pre-packaged goods in Malaysia is regulated and governed by the Ministry of Domestic Trade and Consumers Affairs (MDTCA) via:

  - Trade Description Act 1972
  - Price Control Act 1946

- **Definition of Terms Used in Pre-packaged Goods:**
  - "Goods" includes all chattels personal other than things in action and money
  - "Pre-packaged" means packaged or made up in advance ready for sale in a wrapper, bag or container

4. Current Situation of Pre-packed Goods in Malaysia

Price Control Act 1946

Marks or labels to be displayed are:

- Quality
- Grade
- Weight
- Price
- Place of origin
- Date manufactured

Price Control Order 1980

Pre-packaged goods and indications of particulars:

"No manufacturer, importer, producer or wholesaler shall sell any pre-packaged goods unless there is affixed to such goods, or its wrapper, bag or container, a label or mark containing the following particulars"

Price Control Order 1980

Particulars on Labeling:

- Name of the goods
- Minimum weight, quantity, amount or capacity of the goods (expressed in terms of unit, net weight or measure solely in metric, in the case of imported good solely in metric units)
- Name and address of the manufacturer, importer, producer or wholesaler

Price Control Order 1980

The criteria of label or mark shall be as follows:

- **Legible**
- **In clear words**
- **Such size and color**
  Must be solely in Bahasa Malaysia and any other
- **language (produced in Malaysia)**
- **Must be solely in Bahasa Malaysia and English for imported goods**

Offences

Price Control Order:

- **No label or mark for pre-packaged goods**
- **To remove, obliterate, delete or substitute any label or mark**

Trade description Act 1972:

- **Apply false trade descriptions to any goods**
- **Supply or offer to supply any goods to which a false trade description is applied**

Penalties under Price Control Act 1946

Any person other than corporate body:

- First offence
  ⇒ fine < RM 15,000.00 or imprisonment < 2 years or both
- Second or subsequence offence
  ⇒ fine < RM 25,000.00 or imprisonment < 5 years or both

Corporate body:

- First offence
  ⇒ fine < RM 25,000.00
- Second or subsequence offence
  ⇒ fine < RM 50,000.00

Penalties under Trade Description Act 1972

Any person other than corporate body:

- First offence
  ⇒ fine < RM 100,000.00 or imprisonment < 3 years or both
- Second or subsequence offence
  ⇒ fine < RM 200,000.00 or imprisonment < 6 years or both

Corporate body:

- First offence
  ⇒ fine < RM 250,000.00
- Second or subsequence offence
  ⇒ fine < RM 500,000.00

- Malaysia looks forward to more training opportunities to upgrade the technical competence and knowledge of legal metrology personnel.
- Funding support from donor countries and funding agencies is very much appreciated.

2.4 Do you have any plans for implementing R87?
- Yes, we have plans on it. We had drafted a new regulation which incorporates the OIML R87 into it. The draft had been forwarded to our stake holder for approval.

2.5 Do you have any issues in determining the net quantity of pre-packaged goods?
- No, we have no issues on determining the net quantity.

2.6 Do you have any issues with imported pre-packaged goods?
- No, we have no issues on it. All imported pre-packaged goods are required to comply with the Price Control Order 1980.

2.7 Do you have any issues with export pre-packaged goods?
- No, we have no issues with export pre-packaged goods.

Brief presentation on legal metrology system on pre-packaged goods in Papua New Guinea

By Cholai R.Tau

1.1 The National Institute of Standards and Industrial Technology (NISIT)

- Established under the NISIT Act 1993
- To:
  Safeguard PNG from dumping and supply of unsafe, unhealthy or substandard products and to assure PNG of quality products and services
  Establish the national Standardization system for PNG (Technical Standards)
  Establish the national certification system of conformity (PNGCS) with a view to overcoming trade barriers
  Recognize testing authorities, bodies and institutions having adequatefacilities and capacity t carry out testing functions in relation to standardsof measurement and technical standards (PNGLAS)
  Maintain and establish the national physical and legal metrology systemof PNG (Metrology)
  Provide technical/scientific support to industry so as to improve the quality of products

1.2 Professional Experience in Organisation

- I work for the Metrology Division in NISIT
- Our business name is Measurement Standards Laboratory (MSL)
- Measurement Officer (physical Metrology), responsible for temperature measurements, but carry out length, volume and mass measurements also
- Conduct field work (calibration/verfications) in weighing devices annually as demanded by industry

2 Pre-packaged Goods in Papua New Guinea

- 2.1 Do we use statistical based based average quantity system? Yes, we average 12 random samples
- 2.2 Do we use OIML R87 procedures? No
- 2.3 We go according to our Packaging Act and the Packaging Regulation 1976 but we do recognize OIML R87 in our economy
- 2.4 Do we have plans for implementing R87? The procedures outlined in R87 may be used to update our existing packaging regulations in subsequent USCC meetings and trade measurement meetings.

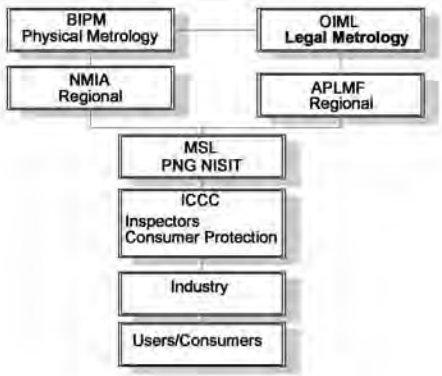
2 Pre-packaged goods in Papua New Guinea

- 2.5 Do we have issues in determining the quantity of prepackaged goods? Yes.
  - Currently this legal metrological function is carried out by ICCC under the consumer protection division (Policy/Political issues)
  - ICCC lacks the resources (standard weights, provers etc) and trained measurement officers (Resource issues)
  - Industry weighing machines (particularly checkweighers) give inconsistent measurements

2 Pre-packaged goods in Papua New Guinea

- 2.6 Do we have issues with imported prepackaged goods? Generally imported goods are not monitored by the ICCC. The ICCC responds to consumer complaints in relation to prepackaged goods
- 2.7 Do we have issues with export of prepackaged goods? Yes.
  - ——The industry need greater awareness about our packaging regulations, R87 etc.
  - ——Industry need to keep tighter monitoring of their packaged goods
  - ——Due to lack of resources, enforcement of the regulations is difficult.

3 Legal Metrology System in PNG



4 Compliance to Standards on Pre–packaged goods

- NISIT particularly MSL and ICCC (consumer protection) are aware of R 87 and R79
- While they are not mandatory in PNG they may be incorporated into the existing national laws in consultation with stake holders so as to update the prepackaging act and regulations, trade measurement act/regulations, bread act etc.
- NISIT and ICCC are working in close consultation with industry for greater awareness of these standards/regulations

5 Problems in implementing the system

- The major issues with implementing this system are
  - ——Unification of efforts in addressing measurement standards issues
  - ——Provision of resources
  - ——Adequate training of personnel
  - ——Industry awareness and involvement

The end

- Thank you for your attention.

ITDI

DOST

APEC / APLMF Seminar and Training Course in Legal Metrology on Practical Application of OIML Recommendation R87 on Pre-packaged Goods

6 – 10 July, 2009

Holiday Inn Atrium, Singapore

ECONOMY REPORT ON PRE-PACKAGED GOODS IN THE PHILIPPINES

THE PHILIPPINE ISLANDS:

- MANILA —— Capital City
- POPULATION —— 92 million people

1 - SELF INTRODUCTION

I am Mr. ROLLY C. MEDIALDEA, Science Research Specialist II working at the Mass, Force & Pressure Standards Section of the National Metrology Laboratory (NML) of the Industrial Technology Development Institute (ITDI) an agency under the Department of Science and Technology (DOST) .

I have already spent 25 years in government service, 17 years of which in Metrology and doing most of my job at the Mass, Force & Pressure Laboratory.

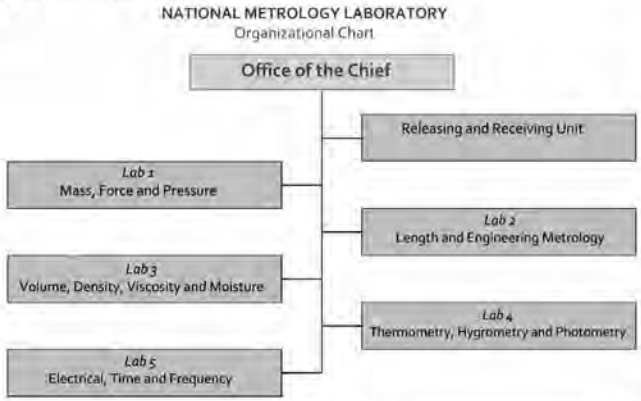
1.1 - EXPLAIN ABOUT YOUR ORGANIZATION AND DEPARTMENT

Brief History: ITDI

The Industrial Technology Development Institute (ITDI), a government organization under the Department of Science and Technology (DOST), is a multi-disciplinary research and technical service institute. It is mandated by virtue of Executive Order No. 128 to render variety of services to local industries. The Standards and Testing Division (STD) and the National Metrology Laboratory (NML), two major divisions are tasked to implement among others testing and calibration services. ITDI is mandated by Batas Pambansa Bilang 8 section 6 to establish and maintain the national standards for the SI units for quantities such as mass, length, temperature, electricity and luminous intensity and other derived units from them; and the Science Act of 1958, pertaining to the test and analyses of products and materials and the calibration of weights and measures. These standards are disseminated through calibration and/or verification services offered to industry, public as well as private organizations, academe and to the general public, etc.

National Metrology Laboratory – Philippines (NML-PHIL)

Organizational Structure



1.2 - EXPLAIN YOUR PROFESSIONAL EXPERIENCE IN YOUR ORGANIZATION

ITDI establish and disseminate national standards of units and measurements to calibration laboratories and other sectors to provide international traceability to measurements done in the economy. It is done by reliably conducting calibration and measurements at accuracy levels appropriate to the needs of the clients. As national custodian for weights and measures, ITDI's program on metrology responds to the call for accuracy and traceability in the units of measurement (e.g.mass, length, volume, etc.) for product standardization, higher quality and competitiveness of local products, and protection of the consumers.

1.2 - EXPLAIN YOUR PROFESSIONAL EXPERIENCE IN YOUR ORGANIZATION

As part of NML / ITDI Organizations, and as a Science Research Specialist my major tasks;

- Performs measurements and calibration/verification on samples submitted to the laboratory
  e.g. weighing scales, test weights, balances, testing machines, test gauges, etc.
- Conducts functional tests on instruments of the laboratory
- Prepares technical and progress reports on these activities
- Maintain traceability on standard instruments of the laboratory

2- PRE-PACKAGED GOODS IN YOUR ECONOMY

1.1. Do You Use a Statistical Based Average Quantity System?

- We are not using a statistical based Average Quantity System (AQS), but the PNS/BFAD 10: 2006, Annex C adopted FAO/WHO Alimentarius Sampling Plan for Pre-packaged Foods, (*AQL* = 6.5) CAC/RM 42-1969.

2- PRE-PACKAGED GOODS IN YOUR ECONOMY

1.2. Do you use OIML R87 procedures?
1.3.If not explain what procedure you use for checking pre-packaged goods?

- We are not using OIML R87 procedures, but instead we are using PHILIPPINE NATIONAL STANDARDS, PNS/BFAD 10:2006 "Recommended Code of Practice for Processing and Handling of Mango Beverage Products (and is applicable to all food products)." It is a harmonized regulation from all the Administrative Orders (AO's) of the Bureau of Food and Drugs for food products.
- Annex C of PNS/BFAD 10:2006 explains the procedures in checking pre-packaged goods in the Philippines.

QUESTIONS CONTINUED:

1.3. Do you have any plans for implementing R87?

The Bureau of Food and Drugs (BFAD) and the Department of Trade and Industry (DTI) are the lead agencies on regulations and control of pre-packaged products agreeable to the ASEAN Common Requirements of Pre-packaged Products and with proper coordination with other agencies like the Industrial Technology Development Institute (ITDI) and the National Metrology Laboratory (NML) who implements the standard weights and measures in the economy, harmonized regulations on pre-packaged goods and using OIML R87 can be implemented soon in our economy.

QUESTIONS CONTINUED:

1.4. **Do you have any issues in determining the net quantity of pre-packaged goods?**

No major issues, the common **notion or perception** of the consumers that all pre-packaged goods that are sold in the market passed trade regulations and passes through rigid **inspections** from the manufacturing itself or to the re-packer aside from the government agencies task to monitor of all products sold in the market.

QUESTIONS CONTINUED:

1.5. Do you have any issues of imported pre-packaged goods?
1.6. Do you have any issues with export pre-packaged goods?

BFAD ADMINISTRATIVE ORDER: No. 37 s. 1979
SUBJECT: REGISTRATION OF FOOD AND FOOD PRODUCTS INTENDED FOR IMPORT/EXPORT WITH THE FOOD AND DRUG ADMINISTRATION

In order to give meaning to the provisions of R.A. 3720, otherwise known as the "Food, Drug and Cosmetic Act", that food intended to be imported or for export, like those for domestic consumption, shall neither be adulterated nor misbranded, and in line with the policy of the State to safeguard the quality and safety of Philippine importable and exportable products, the following regulations are hereby promulgated for the information and compliance of all importers and exporters of food and food products.

QUESTIONS CONTINUED:

SECTION 1. Any person desiring to import or export food and food products shall file an application for the registration of each and every food items to be imported or exported with the Food and Drug Administration, stating therein the following:

a) the name, address, and citizenship of the exporter/importer
b) the class of food or food products to be imported or exported
c) full list of all the ingredients used as component of the finished product
d) technical specification of ingredients used
e) description of finished product
f) three labels or specimens of proposed label and other labeling material such as insertand brochures, if any
g) two market or commercial presentation of the product
h) sufficient samples for laboratory analysis, if necessary

QUESTIONS CONTINUED:

SECTION 2. A Certificate of Product Registration (CPR) shall be issued by the Food and Drug Administration after it has been carefully examined and evaluated that the food and food products sought to be registered are neither misbranded nor adulterated.

SECTION 3. The CPR shall be valid only for a period of one year from the date of issue. Said CPR shall be revalidated every year.

SECTION 4. Commodity clearance or certification for export or import shall be issued by the Food and Drug Administration only to holders of valid CPR.

3- Legal metrology system in your economy

Republic Act No. 9236 —— An Act Establishing a National Measurement Infrastructure System (NMIS) for Standards and Measurements, and for Other Purposes.

Its declared policy to facilitate the development of scientific and technical knowledge and progress in the national economy by encouraging the standardization and modernization of units and standards of measurements to adapt to the needs of the times, thereby complying with international standards and protecting the health, interest and safety of every consumer and his environment from harmful effects of inaccurate or false measurements.

3- Legal metrology system in your economy

Creation of the **National Metrology Board (NMB)** chaired by the Secretary of the **Department of Science and Technology (DOST).** It shall be composed of the Secretaries of the following agencies or the duly authorized representative with the rank of Undersecretary, as ex officio members.

1.7 Department of Trade and Industry (DTI)
1.8 Department of Transportation and Communication (DOTC)
1.9 Department of Health (DOH)
1.10 Department of the Interior and Local Government (DILG)
1.11 Department of Justice (DOJ)
1.12 Department of Environment and Natural Resources (DENR) and
1.13 Department of Agriculture (DA)

3- Legal metrology system in your economy

The **Industrial Technology and Development Institute (ITDI)** is mandated to serve as the Boards Secretariat. The **National Metrology Laboratory** presently existing as the laboratory arm of ITDI tasks to carry out the technical, calibration and laboratory functions to effectively implement the provisions of this Act. For the purpose of enforcing its mandate, the ITDI shall call upon the personnel of other departments and agencies of the government and private institutions to assist in the implementation of the Act.

3- Legal metrology system in your economy

NMB have the following duties and responsibilities:

a. To ensure the execution, up keeping and conservation of national primary and secondary standards in conformity with the board authorized units

b. To promote and coordinate the use in the economy of a uniform system of units and measurement standards of physical quantities

c. To issue and enforce the necessary guidelines on such areas of metrology but not limited to utilization of measuring equipment and devices, type approval on measuring equipment, verification, calibration, use of control marks and other metrological controls on measurement standards and measuring equipment

3- Legal metrology system in your economy

a. To ensure that the accuracy and application of quantities and similar metrological requirement are met in all commercial, economic, scientific, technical and similar endeavors

b. To carry out testing for type approval of measuring equipment

c. To supervise and to assure the execution and calibration of standards and verification equipment

d. To insure that persons or business entities regularly engaged in importing, manufacturing, repairing, or hiring certain measuring equipment comply with the guidelines of the board

4- Explain current situation in your economy about the compliance to the international standards / recommendations for pre-packaged goods

PNS/BFAD 10 : 2006 comply to the international standards / recommendations for pre-packaged goods to FAO/WHO, Codex Standards, GMP/HACCP, ISO/IEC Certifications, etc.

5- Are there any requirements from your economy? Do you have any problem in order to implement the legal metrology system (budget, human resources, etc.)?

For the past decade awareness of legal metrology system throughout the economy have take a step towards improvement and with the passage of Republic Act No. 9236 establishing NMIS and its declaration of policy to facilitate and develop metrology system in the economy, but full implementation of its drafted regulations take a hard time to implement due to lack budget, human resources, etc.

APEC/APLMF Training Course - Practical Application of OIML Recommendation R87 on Pre-packaged Goods

The AQS —— The Singapore Experience

Jessie Koh
6 Jul 2009

SPRiNG singapore

Outline

- Weights and Measures Programme
- Activities of WMO, SPRING Singapore
- The AQS —— The Singapore Experience
- Video on the Weights and Measures Programme

The Weights and Measures Programme

- Governed by the Weights and Measures Act and Regulations
  - ——regulates weighing and measuring instruments for trade use and net contents of pre-packaged goods
  - ——penalises suppliers on short weights and measures
- Ensures a uniform and accurate system of weights and measures so that buyers get what they paid for
- Ensures fair trade and correct excise tax computation

Activities of WMO

- **Manages Authorised Verifier (AV) Scheme**

- Weights and Measures Act and Regulations amended in Dec 2005, allowing SPRING Singapore to designate AVs
- AV Scheme took effect from 1 Jan 2006. From 1 Jan 2009, 100% verification work undertaken by AVs
- To date, 19 AVs designated
- The AV Scheme increases the pool of verifiers resulting in lower cost and reduced turnaround time for businesses

Activities of WMO

- **Registers patterns of new instruments for trade use**

All patterns of new weighing and measuring instruments for trade use have to be tested and certified to meet the applicable OIML Recommendation.

To date, over 230 patterns of weighing and measuring instruments have been registered with SPRING Singapore for trade use.

Activities of WMO

- **Administers the Accuracy Label**

- To further boost the confidence of consumers and businesses alike, Accuracy Labels (above) are affixed on all verified weighing and measuring instruments for trade use
- Contain AV's identification code, eg, "01", "02" and date of verification
- All 40,000 weighing and measuring instruments for trade use are affixed with the Accuracy Label

Activities of WMO

- **Conducts Post-market Surveillance and Audit Inspections**
  - Inspects weighing and measuring instruments for inaccuracies & tampering
  - Conducts audit reviews on Authorised Verifiers
  - Investigates complaints on short weights & measures

The AQS —— The Singapore Experience

- The Weights and Measures Act and the Regulations were amended in 2005 to replace the Minimum Quantity System (MQS) with the Average Quantity System (AQS).
- 95% of goods sold in major supermarkets are pre-packaged goods.
- Existing legislation covers pre-packed goods meant for direct sale to consumers or traders. Labeling of pre-packaged goods does not come under the purview of SPRING Singapore.
- Inspection/spot checks are conducted at the point of sale to consumers.
- Any short-weight of pre-packed goods based on the AQS is considered an infringement under the Weights and Measures Act and Regulations.

The AQS —— The Singapore Experience

Examples of short-weight pre-packed goods included:

- **Minced meat** —— pre-packed with a moisture absorber into styro-foam tray wrapped in plastic wrap. Declared weight inclusive of the packaging
- **Sandwich skin**——short-weight ranging from −4.5g to −0.8g
- **Mozafati dates**——short-weight ranging from −100g to -32g
- **White lotus paste** ——short weight ranging from −8 to −14g

The AQS —— The Singapore Experience

- Conducted five training courses for the industry on the requirements of OIML R87 to date
- Held a media briefing on AQS to educate the public
- Conduct regular post-market surveillance on pre-packed goods

The Legal Metrology System on Pre-packaged Goods in Thailand

By: Pattaraporn Surasit

1.Self Introduction

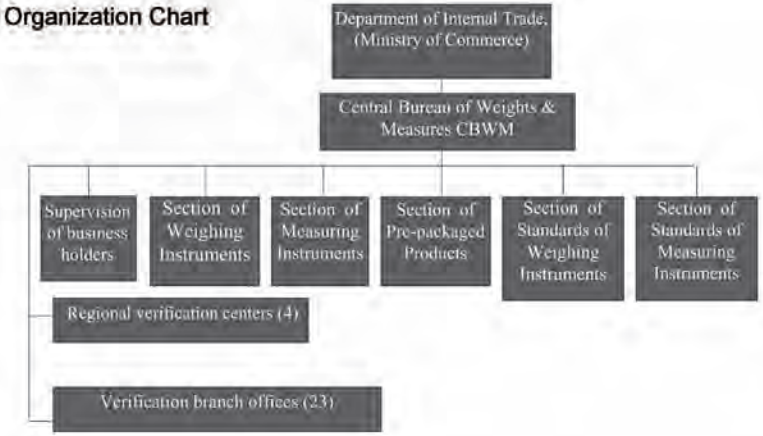
1.1 My organization and department.

I work for Central Bureau of Weights and Measures (CBWM) which under to Department of Internal Trade.

1.2 My professional experience in the organization.

I started at Section of Standards of Weighing Instruments around 11 years before working in Section of Pre-packaged Products.

Organization Chart



2. Pre-packaged goods in your country.

- Do you use a statistical average quantity system?

  Yes, we use a statistical average quantity system.
- Do you use OIML R87 Procedure?

  Yes, we use OIML R87 Procedure to be guideline for checking the pre packaged goods.
- Do you have any plan for implementing R87?

  No, we don't.

- Do you have any issues with import pre-packaged goods?

  No, checking the import pre-packaged goods we do as the packaged goods which packing in domestic.
- Do you have any issues with export pre-packaged goods?

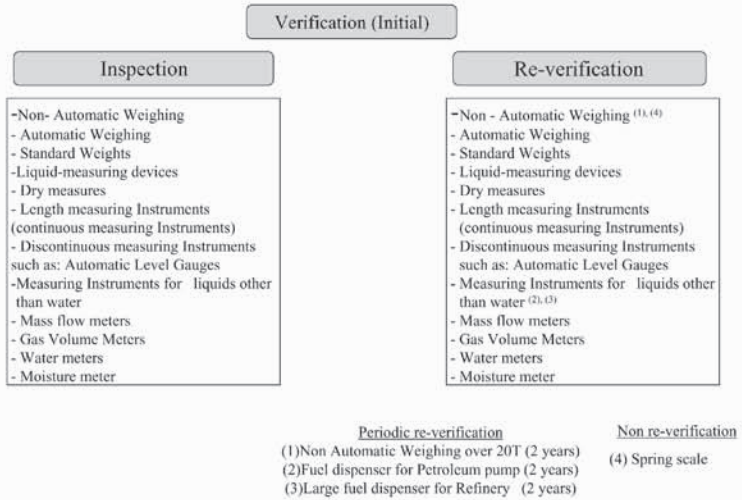
  No, the export pre-packaged goods is not under the command of the pre-package products regulation yet.

- I have an issue with checking a pre-package contains solid goods in a liquid medium but declaration in volume.

Example:

- A coconut can (small pieces of coconut mixed with coconut juice, packing in a can), the net content is 250 mL.
- Declaration the net content of pre-packaged goods is not under the command of pre-packaged regulation.
- How to check the net content of a coconut can without damage package?

3.Legal metrology system in Thailand



4. Current situation in Thailand about the compliance to the international standard/recommendation for pre-packed goods

- Checking the net content of pre-packed goods in Thailand follow to ASEAN Common Requirements which according to OIML R87.

5.Are there any other requirements from your country? Do you have any problems in order to implement the legal metrology system?

- There are not any requirements and don't have any problems to implement the legal metrology system.

Thank you for your attention

Pre-packaged goods in Viet Nam

Presented by : Tran Quy Giau, Eng. Msc.

DIRECTORATE FOR STANDARDS, METROLOGY AND QUALITY (STAMEQ)

Legal Metrology System in Viet Nam

1. Legal document system on metrology

- Ordinance on Measurement (1999) issued by Standing Committee of Assembly
- Decree on detailing implementation of Ordinance on measurement (2002) & the System of Legal Units of measurement in Viet Nam(2007) issued by Government
- A set of Decision promulgating regulations on legal metrology issued by Ministry of Science & Technology such as:

Legal Metrology System in Viet Nam

- Recognition of working standards used for verification
- List of measuring instruments subject to verification
- Pattern approval of measuring instruments
- Recognition of capability for verification of measuring instruments
- Certification and granted verified card for measuring verifiers
- Verification mark, stamp and granted verification certificate
- List of pre-packaged goods subject to state management over measurement
- Metrology control for prepackages by weight or volume or area or length or count
- Requirement for measuring in retail sale
- Verification fees, etc.

2. Organization Chart

Pre-packaged goods in Viet Nam

1. Legislation on pre-packaged goods

- Labeling requirement of pre-packaged goods (Decree 89/2007/ND-CP) in full compliance with Codex standard 1-1991
- List of pre-packaged goods subject to state management over measurement (Feb. 2008)
- Metrology control for pre-packages by weight or volume or area or length or count (July 2008)

Pre-packaged goods in Viet Nam

2. Organization responsible

- Directorate for Standards, Metrology and Quality (STAMEQ) is responsible for control and inspection of pre-package in Viet Nam
- Branches of STAMEQ in 63 provinces are in charge of control and inspection of pre-package in their localities

List of Pre-packaged Goods subject to state management over measurement

1. Agriculture products
2. Fertilizer
3. Pesticide
4. Animal feeds
5. Milk and milk products
6. Sea foods, sea foods products and frozen product
7. Assorted cake, jam, candy, sugar
8. Beer, alcoholic, refresher, water
9. Vegetable oil, Edible oil

List of Pre-packaged Goods subject to state management over measurement

10. Salt, seasoning
11. Assorted sauces, fish sauces
12. Detergent, cleanser
13. Lubricating oil
14. Liquid petroleum gas packed in tanks
15. Paint of different categories
16. Building steel
17. Cement
18. Electric cable, electric wire

Conformity of Viet Nam's legal document to R87

- Viet Nam applies AQS in normal practices, which is in full compliance with R87
- Measurement requirements complies with R87

—— In Viet Nam, tolerable deficiencies in actual content for pre-packages was stiplated like table 2 of R87

Conformity of Viet Nam's legal document to R87

- Procedure for checking, planning to choose samples are implemented fully in accordance with R87

—— In Viet Nam, sampling plans for pre-packages was stipulated like table 1 of R87

Having problems when implemented to R87

- How to choose suitable measuring instruments for checking the quantity of pre-packaged goods which is expressed in units of volume, length, area ? How about the packer?
- How to test procedure for determining the actual quantity of the thick liquid such as milk, painting, etc.? How to practice ?
- How about conformity mark of pre-packaged goods?

Thank you for your attention !

Kingdom of Cambodia

Presentation
on legal metrology system
of pre-packaged goods
July 06–10,2009
Singapore

Prepared by: Mr. KIM Chandara
Department of Metrology, MIME, Cambodia
kimchandara06@yahoo.com

Introduction

- Who am I ?
- My name is KIM Chandara. I worked for Metrology Department Since 1995. I am in charge of administration and metrological technology development office. I am also in charge of training activities for the provincials verification officers (PVOs) and assist my director in cooperation with the international agencies in metrology sector.

Brief History

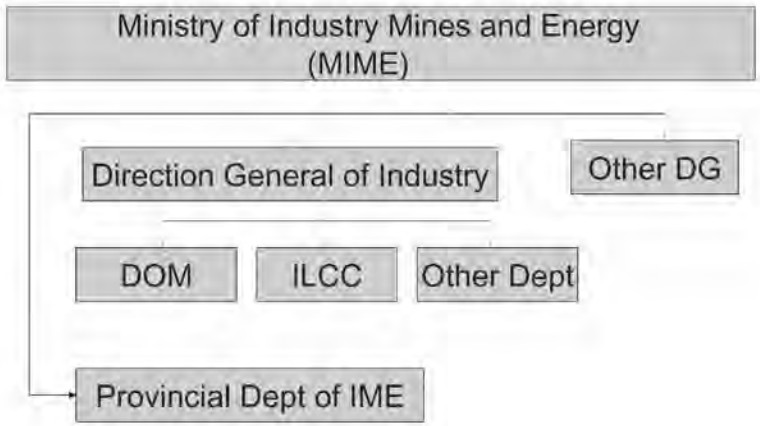
- 1995 We established the weight and measure unit under Ministry of Industry Mines and Energy (MIME).
- 1999 We upgraded the weight and measure unit to the Department of Metrology (DOM) under MIME.
- Cambodia jointed ASEAN in April 1999.
- Also Cambodia belongs to the ACCSQ WG3 member, the Corresponding member of OIML in 2000 and the full member of APLMF in 2002.

Structure of Metrology

- Recently, the Metrology of Cambodia is split between the Department of Metrology (DOM) and Industrial Laboratory Center of Cambodia (ILCC).
- DOM has the responsibility for all Legal Metrology Activities and keeps the Working Standards.
- ILCC keeps the Primary and Secondary Standard and also implements the Industrial and Scientific Metrology requested by DOM. Our structure is as below (See annex No. 1).

Organization Chart

Annex No 1.



Organization Chart (con't)

- *** Under DOM:**
  1——There are five offices
  a—— Admin. and Legislation
  b—— Control-Verification
  c—— Technological Development of Metrology
  d—— Provincial Management of Metrology
  e—— Tax-Accounting
- **2—— Practitioner facilities of DOM:**
  a—— PTB-DOM/MIME Metrology, Verification Room
  b—— MITTUTOYO-MIME Lab
  c—— Tank Verification Center (Cooperation with CAT)
- **3—— Regional Verification Centre**
- **4—— Provincial Metrology Offices**
- *Under ILCC:
  ——There are two laboratories
  a—— Food, Microbiology, Chemical Lab
  b—— Scientific Industrial Metrology Lab

Law and Regulation

- Presently, there is no Weights and Measures or National Metrology Law giving power to the Department of Metrology to carry out Legal Metrology Activities.
- For implementing of Legal Metrology activities , we have been applying some necessary regulation (Prakas) as below:
  - ——Ministerial Circular on Management of Weights and Measures
  - ——Ministerial Prakas of SI Unit
  - ——Ministerial Prakas of Pre-Packaged products
  - ——Ministerial Prakas of Management of Standards and Equipments of Liquid Volume

Legal Metrology Activities for packaging

- The Ministerial Prakas of the Pre-Packaged goods has been approved by the Minister since August 2005. This Prakas is based on the ASEAN Common Requirement of Pre-packaged goods.
- DOM staffs and provincial verification officers (PVOs) are legal competence personnel for implementing to conduct verification of weighing and measuring instruments for trade purposes and pre-packaged goods all over the Cambodia.
- All Pre-Packaged goods produced in Cambodia should be verified and must passed verification before being used or put in the maeket.
- For import-export products are under control of Direction General of CAMCONTROL of the Ministry of Commerce.

Legal Metrology Activities for packaging (con't)

- We are not implement OIML R 87 procedure yet because we have difficulties with collecting sample, we can collect sample only 06 pieces for each product.
- Therefore we use the formula:
  $\bar{X}_o = \bar{X}_i + ks$ (s standard deviation of X_i)
  $\bar{X}_o$: means the corrected mean
  $\bar{X}_i$: means the average value of X_i
  X_i : means observed values
  k : means sample correction factor
- We will try to conduct verification of drained weight product in the near future.

Acknowledgment

Finally, I would like to express my sincere thanks to APLMF Secretariat, presenters, organizers, SPRING staff members for facilitating and supporting me before and during the training course.

Thank you for your kind attention.

Legal Metrology system on pre-packaged goods in DPR Korea

Central Institute of Metrology of
DPR Korea

The State Administration for Quality Management of DPR of Korea (SAQM)

The State Administration for Quality Management of DPR of Korea (SAQM) is a governmental organization responsible for standardization, metrology, industrial art, production license, quality supervision and certification, entry-exit commodities inspection and quarantine, heat and pressure equipment supervision.

Responsibilities of SAQM in the field of metrology

——Administering and supervising metrology work in DPR of Korea

——Maintaining and operating national measurement and verification systems

——Organizing the development, approval and maintenance of national measurement standards and reference materials

——Organizing the preparation, revision and examination of law, regulations and guidelines for metrology

——Supervising of the implementation of law and regulations

Legal metrology

——Law of DPRKorea on metrology

——Pattern approval of measuring instrument

——Verification of mandatory instruments of required by low

Measuring instrument subject to legal metrology

——Standards and reference instruments reproducing the legal units of measurements

——Measuring instruments used for trade

——Measuring instruments used for scientific research, testing and analysis

——Measuring instruments used in production processes and products inspection

——Measuring instruments used in production processes and products inspection

——Measuring instruments used in public health, safety engineering and environmental protection

Use of a statistical based average quantity system

——average quantity system(AQS)based on the statistical

——inspection individual prepackage especially for expensive products inspection lots less than 100 are inspected 100%

Use of OIML R87 procedures

——similar to OIML R87 procedures

——A little different from those

· Sampling plan

· Inspection of tare weights

Inspection of quantities of domestic pre-packaged goods

"The law of DPR of Korea on the quality supervision"

There are many standards for inspection. For example:

·National Standard 648:1998 "Oil testing method-sampling"

·National Standard 2767:1985 " Sugar testing method- Sampling"

·National Standard 31355:2007 "Medicine-package,transport and storage"

·National Standard 10205-1:2005 " Sampling procedures for inspection by attributes"

·National Standard 10917:2002 " General requirements for the statistical method applicable to the requirements for quality control system"

Inspection of quantities of import and export pre-packaged goods

Law of DPRKorea on the export and import goods

· For exported goods, the inspection criteria is more strict than that for domestic ones

Conformity to OIML R87 and international standards

——We have a plan to draw up new guidelines for the inspection of pre-packaged goods in compliance to the international standards and OIML R87

Problem to be suggested

The difference between pre-packaged goods testing procedures OIML R87 and quantity control procedure concerning the six sigma qulaity control.

Thank for your attention

Practical application of OIML Recommendation R87 on Pre-packaged Goods

Singapore

July 6–10, 2009

Ts.Gandolgor (Mrs)

MONGOLIAN AGENCY FOR STANDARDIZATION AND METROLOGY

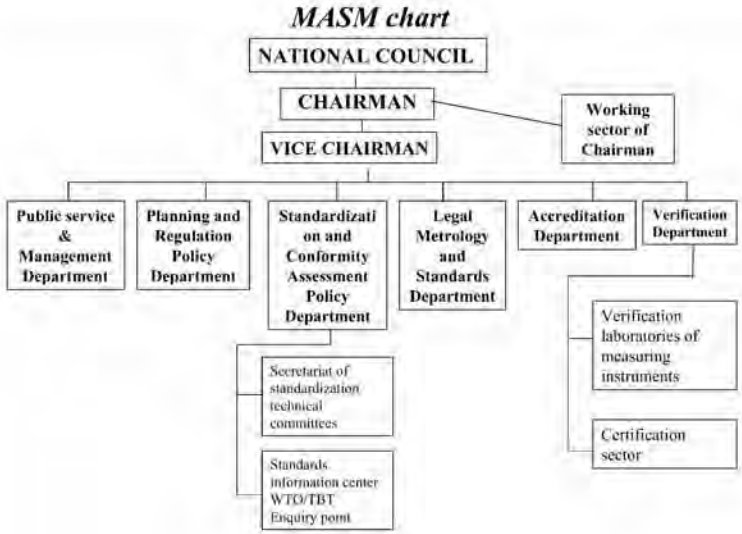
Ts.Gandolgor

- Head of mechanical measurements verification laboratory
- For 32 years experience as verification officer, inspection officer, head of ver.lab
- Overseas training course:

1/"Measurement techniques for developing countries" NIM, China (1996)

2/ "Length measurement" KRISS, Korea (1997)

3/APLMF "Train the trainers" course on mechanical weighing instruments in Vietnam (2007)



Verification laboratories

1. **mechanical** (weights and balances, taximeter, force and hardness)
2. flow and volume
3. pressure
4. electrical

Legal regulations related to pre-packaged goods

LAW ON GUARANTEE THE UNIFORMITY OF MEASUREMENT (adopted in 1994)

Article 7

- The guarantee on measurement uniformity shall implemented in following manners:

1/ pattern evaluation of measuring instrument
2/ verification of measuring instrument
3/ issuing license for manufacturing, installation, repair and sale of measurement instruments

- The State inspection and control shall be conducted in following manners:

1/ control of pre-packed products quantity
2/ inspection on enforcement of legislation on guarantee the uniformity of measurement

- The measuring instruments and measurement procedures used in following activities shall be subject to the State Inspection and Control:

1/ calculation in commercial transactions
2/ testing, treatment and diagnosis in human and animal health care
3/ environmental protection
4/ the State defense and ensuring the public security

Article 11 Control on packed products' quantity

- The packed products shall satisfy the following requirements:

1/ to be packed or wrapped up in a such manner when the contents thereof can not be changed without opening, unsealing or deformation

2/ to be noted down the mass, volume and other quantities on the label

- The average value of quantity of packed and wrapped up products and of products soled by retail shall confirm the nominal value declared in related standard and on the package or in accompanying documentation, the value of quantity of a definite packed and wrapped up product shall confirm the permissible limit of deviation of nominal value.

The procedure for metrological inspection on pre-packaged goods quantity

- Adopted in 1999

Content of this procedure:

1/Basic understanding

2/ Metrological requirements on pre-packaged goods quantity

3/ Rules for the inspection during the packaging and retail

OIML R87

- Adopted in 2008 as a national standard
- The procedure for metrological inspection on pre-packaged goods quantity to be replaced

Labeling requirements

1/MNS CAC 1: 2007 Labeling of pre-packaged foods —— in force

2/OIML R79 Labeling requirements for pre-packaged goods —— not adopted yet

Exported and imported goods

- 75% are imported pre-packaged goods mainly from China and Russia
- 25% are local goods which packed by retailers and producers
- There are few products which are exported (mostly in bulk)

Local goods

Common goods for the local consumers:

- Flour —— packed 1kg ~ 25 kg
- Sugar —— packed 1kg ~ 5 kg
- Rice —— packed 0.5 kg ~ 5 kg
- Frozen dumplings —— packed 0.5 kg ~ 1.0 kg
- Candy —— packed 0.1 kg ~ 1.0 kg
- Dairy product,milk —— 450 g,fruit yogurt 100 g, 1000 g

Problems

- Limited number of human resource to conduct pre-packaged goods inspection
- Due to the low density of Mongolian population (1.5 persons per sq.km) there are limited quantity of pre-packaged goods in storage so it causes the problem for sampling
- Labeling requirements are not followed by importers so there are imported goods with unknown language for domestic customers

End

Thank APEC, APLMF for this opportunity to attend this training course