

**October 1999**

**ACCURACY REQUIREMENTS  
FOR NET QUANTITY  
DECLARATIONS**

**CONSUMER PACKAGING AND  
LABELLING ACT AND  
REGULATIONS**

# TABLE OF CONTENTS

<b>SUBJECT</b>	<b>PAGE</b>
<b>Accuracy Requirements for Net Quantity Declarations</b>	
Background .....	1
Accuracy Requirement Principles .....	2
<b>Appendix I</b>	
Relevant Excerpts from Section 7 of the <i>Consumer Packaging and Labelling Act</i> .....	4
<b>Appendix II</b>	
Relevant Excerpts from Section 38 of the <i>Consumer Packaging and Labelling Regulations</i> .....	5
<b>Appendix III</b>	
Relevant Excerpts from Section 39 of the <i>Consumer Packaging and Labelling Regulations</i> .....	6
<b>Appendix IV</b>	
Schedule I of the <i>Consumer Packaging and Labelling Regulations</i> .....	8
<b>Appendix V</b>	
Schedule II of the <i>Consumer Packaging and Labelling Regulations</i> .....	14
<b>Appendix VI</b>	
Example of a Lot Inspection .....	18

# ACCURACY REQUIREMENTS FOR NET QUANTITY DECLARATIONS

The Fair Business Practices Branch, Competition Bureau, Industry Canada, administers the *Consumer Packaging and Labelling Act* and *Regulations* which establish the accuracy requirements for net quantity declarations for most prepacked consumer products. Amendments to the Regulations, in effect since December 20, 1989, define the procedure for verifying the accuracy of net quantity declarations. Briefly, the requirements specify that:

- C sample results are used as the basis for determining lot compliance.
- C individual samples may vary from the declared net quantity within the range of the allowable tolerance.
- the number of units in the sample which do not meet the accuracy requirements is limited.
- C the weighted average net quantity of the samples must meet or exceed the stated quantity.

These requirements benefit both consumers and packers. Consumers are assured that over the long term, they will receive at least the quantity paid for. Packers benefit from having reasonable tolerances within which to operate and some assurance that these requirements meet most international standards for accuracy.

## BACKGROUND

In developing the regulations, the primary source document was the Organisation Internationale de Métrologie Légale (OIML) recommendation "Net Contents in Packages". This document was modified to allow for differences of application within Canada as the OIML recommendation is designed to apply only to prepackaged commodities that are to be traded internationally. The *Consumer Packaging and Labelling Regulations*, however, apply solely to commodities intended for sale in Canada.

In the OIML document the inspection methods, compliance criteria and sampling procedures, commonly known as the Average System, were developed through referencing existing standards that had already received widespread international acceptance. These standards were developed primarily by an international standards writing organization and others such as U.S. Military Specifications (MILSPEC).

The ISO standards from which test methods for the Canadian regulations were derived are:

- ISO 2854      Statistical interpretation of data - Techniques of estimation and tests relating to means and variances.  
ISO 2859      Sampling procedures and tables for inspection by attributes.

Copies of these standards may be purchased through:

Standards Council of Canada  
Suite 1200, 45 O'Connor  
Ottawa, Ontario, K1P 6N7  
Telephone: (613) 238-3222, 1-800-267-8220  
Fax: (613) 995-4564  
Internet: info@scc.ca

## **ACCURACY REQUIREMENT PRINCIPLES**

There are three principles that must be met to comply with the accuracy requirements of the *Consumer Packaging and Labelling Act and Regulations*:

**1. The declared quantity on a package should accurately reflect the quantity being supplied, so the average net contents of the packages in a lot may not be less than the declared quantity.**

Knowing that production techniques are neither perfect nor ideal, it is sufficient to ensure that on average the packages contain the declared quantity. The average requirement provides protection to consumers who purchase more than one package of a particular product. Generally, a deficiently filled package will be compensated for by an overfilled one.

**2. The control over production should be such that the individual packages are within allowable tolerances. No more than 2.5% of the lot may have a negative error larger than the tolerance.**

A lot will not meet the requirements of the *Consumer Packaging and Labelling Act and Regulations* if in a sample the number of units containing less than the declared net quantity, by more than the prescribed tolerance, exceeds the number permitted by the Regulations.

**3. The number of packages which may have excessive negative errors is limited. Not more than one package may contain less than twice the permitted tolerance.**

In recognition of an occasional mishap in the packing process, the presence of one significantly defective package in the sample will not jeopardize the results of the inspection.

The pass/fail criteria are related to an Acceptable Quality Level (AQL) rather than the performance of individual packages.

**APPENDIX I** to **APPENDIX V** highlight excerpts from the *Consumer Packaging and Labelling Act* and *Regulations* relating to net quantity. Explanatory notes are provided under the “Guide” heading. This document is not provided to instruct on the precise method whereby a packer may comply with the regulatory requirements, but only to advise on what those requirements are.

**APPENDIX VI** is an example of a lot inspection to assist in understanding how compliance is assessed.

For additional information on the application and interpretation of the requirements of the *Consumer Packaging and Labelling Act* and the *Consumer Packaging and Labelling Regulations*, please contact the Competition Bureau:

Information Centre  
Competition Bureau, Industry Canada  
Phase 1, Place du Portage  
50 Victoria Street  
Hull, Quebec, K1A 0C9  
Telephone: 1-800-348-5358  
Fax: (819) 997-0324  
E-mail: [competition@ic.gc.ca](mailto:competition@ic.gc.ca)  
Website: <http://competition.ic.gc.ca>

For information on industrial, commercial and institutional packages, which are subject to the *Weights and Measures Act*, contact Measurement Canada.

Marketing and Business Operations Directorate  
Measurement Canada  
11 Holland Avenue, Suite 513  
Ottawa, Ontario  
K1A 0C9  
Telephone: (613) 952-2631  
Fax: (613) 952-1736  
Website: <http://mc.ic.gc.ca/>

## **APPENDIX I**

### **RELEVANT EXCERPTS FROM SECTION 7 OF THE CONSUMER PACKAGING AND LABELLING ACT**

Section 7 of the *Consumer Packaging and Labelling Act* states:

7. (1) No dealer shall apply to any prepackaged product or sell, import into Canada or advertise any prepackaged product that has applied to it a label containing any false or misleading representation that relates to or may reasonably be regarded as relating to that product.
- (2) For the purposes of this section, “false or misleading representation” includes:
  - (a) any representation in which expressions, words, figures, depictions or symbols are used, arranged or shown in a manner that may reasonably be regarded as qualifying the declared net quantity of a prepackaged product or as likely to deceive a consumer with respect to the net quantity of a prepackaged product;
- (3) Where a declaration of net quantity shows the purported net quantity of the prepackaged product to which it is applied, that declaration shall be deemed not to be a false or misleading representation if the net quantity of the prepackaged product is, subject to the prescribed tolerance, not less than the declared net quantity of the prepackaged product and the declaration otherwise meets the requirements of this Act and the regulations.

## APPENDIX II

### RELEVANT EXCERPTS FROM SECTION 38 OF THE *CONSUMER PACKAGING AND LABELLING REGULATIONS*

Section 38 of the *Consumer Packaging and Labelling Regulations* states:

38. (1) For the purposes of Schedule I, “catch weight product” means a prepackaged product that because of its nature cannot normally be portioned to a predetermined quantity and is, as a result, usually sold in varying quantities.
- (2) The prescribed tolerance for the purposes of subsection 7(3) of the Act is that set out in column II of an item of the appropriate Part of Schedule I for the declared net quantity set out in column I of that item.

GUIDE:

The tolerances correspond to those accepted internationally.

## APPENDIX III

### RELEVANT EXCERPTS FROM SECTION 39 OF THE *CONSUMER PACKAGING AND LABELLING REGULATIONS*

Section 39 of the *Consumer Packaging and Labelling Regulations* states:

#### Examination

39. (1) The examination of any quantity of prepackaged products that are owned by a dealer, hereinafter referred to as a lot, each unit of which purports to contain the same net quantity of product, that an inspector undertakes to determine whether the lot meets the requirements of the Act and these Regulations respecting the declaration of net quantity, shall be made by selecting and examining a sample from the lot.

GUIDE:

Section 39, in its separate paragraphs, defines how a lot is to be inspected. This subsection makes it mandatory to test a "lot" of products by drawing a sample and applying the tests of the subsequent subsections to the sample to determine if the lot is acceptable.

39. (2) Subject to subsection (3), where a lot contains the number of units set out in column I of an item of Part I of Schedule II, an inspector shall select from the lot a number of units not less than the number set out in column II of that item and the number of units selected shall constitute the sample referred to in subsection (1).

GUIDE:

Minimum sample sizes are set out in Schedule II. All testing will be carried out on the sample to determine compliance of the lot. Inspectors have the authority, and may use larger samples if it is felt necessary, but additional sampling will rarely be required.

39. (3) Where, for the purpose of determining the net quantity, other than for establishing the weight of the container, it is necessary to destroy a certain number of units in the lot, an inspector shall select, for destruction, not more than 10 per cent of the total number of units in the lot and not less than one unit and the number of units selected shall constitute the sample referred to in subsection (1).



GUIDE:

In some cases it will be necessary to destroy the product in order to verify the contents of a package. This section restricts the number of packages that will be destroyed.

- 39. (4) The lot from which a sample was taken and examined by an inspector does not meet the requirements of the Act and these Regulations respecting the declaration of net quantity where the inspector determines that**

**(a) the weighted average quantity of the units in the sample, as determined by the formula set out in Part II of Schedule II, is less than the declared net quantity;**

GUIDE:

On average, a lot must contain the declared quantity. The formula referred to uses the sample mean to which a weighting factor is applied to determine if the lot average meets this requirement. There is no tolerance on the weighted lot average, so the value calculated by the formula must be equal to or greater than the declared quantity.

- 39. (4) (b) the number of units in the sample that contain less than the declared net quantity by more than the prescribed tolerance set out in Schedule I for that quantity is equal to or greater than the number set out in column II of Part IV of Schedule II for the sample size set out in column I thereof; or**

GUIDE:

Some packages are allowed to be below the tolerance, but the total number allowed is dependant on the sample size. The number of units shown in the table indicates when a lot will fail.

- 39. (4) (c) two or more units in the sample contain less than the declared net quantity by more than twice the prescribed tolerance set out in Schedule I for that quantity**

GUIDE:

Only one package in the sample can be deficient by more than twice the tolerance, regardless of lot size.

**NOTE:** The above tests are designed to give an overall picture of the lot. The requirements of the three subsections must all be met in order for the lot to pass.

## APPENDIX IV

### SCHEDULE I OF THE CONSUMER PACKAGING AND LABELLING REGULATIONS

#### SCHEDULE I (Section 38)

#### PART I

#### TOLERANCES FOR NET QUANTITIES DECLARED IN METRIC UNITS OF MASS FOR CATCH WEIGHT PRODUCTS

Item	Column I Declared Net Quantity	Column II Tolerance	
		%	grams
1.	<u>grams</u> more than 0 to not more than 60	10	--
2.	more than 60 to not more than 600	--	6
3.	more than 600 to not more than 1 000	1	--
	<u>kilograms</u>		
4.	more than 1 to not more than 1.5	--	10
5.	more than 1.5 to not more than 3	0.66	--
6.	more than 3 to not more than 4	--	20
7.	more than 4 to not more than 10	0.5	--
8.	more than 10 to not more than 15	--	50
9.	more than 15 to not more than 250	0.33	--
10.	more than 250 to not more than 500	--	750
11.	more than 500	0.15	--

GUIDE:

The tables in Schedule I, set out the tolerances for individual packages. The table that is referenced is dependant upon the commodity and the net quantity declared on its label.

**PART II**

**TOLERANCES FOR NET QUANTITIES DECLARED IN CANADIAN UNITS OF MASS OR WEIGHT FOR CATCH WEIGHT PRODUCTS**

Item	Column I Declared Net Quantity	Column II Tolerance	
		%	ounces
	<u>ounces</u>		
1.	more than 0 to not more than 2	10	--
2.	more than 2 to not more than 20	--	0.2
	<u>pounds</u>		
3.	more than 1.25 to not more than 2.2	1	--
4.	more than 2.2 to not more than 3.3	--	0.35
5.	more than 3.3 to not more than 6.6	0.66	--
6.	more than 6.6 to not more than 8.8	--	0.71
7.	more than 8.8 to not more than 22	0.5	--
8.	more than 22 to not more than 33	--	1.76
9.	more than 33 to not more than 550	0.33	--
10.	more than 550 to not more than 1 100	--	26.4
11.	more than 1 100	0.15	--

**PART III**

**TOLERANCES FOR NET QUANTITIES DECLARED IN METRIC UNITS OF MASS OR VOLUME FOR PREPACKAGED PRODUCTS OTHER THAN CATCH WEIGHT PRODUCTS**

Item	Column I Declared Net Quantity	Column II Tolerance	
		%	grams or millilitres
	<u>grams or millilitres</u>		
1.	more than 0 to not more than 50	9	--
2.	more than 50 to not more than 100	--	4.5
3.	more than 100 to not more than 200	4.5	--
4.	more than 200 to not more than 300	--	9
5.	more than 300 to not more than 500	3	--
6.	more than 500 to not more than 1 kilogram or litre	--	15
	<u>kilograms or litres</u>		
7.	more than 1 to not more than 10	1.5	--
8.	more than 10 to not more than 15	--	150
9.	more than 15	1	--

**PART IV**

**TOLERANCES FOR NET QUANTITIES DECLARED IN CANADIAN  
UNITS OF MASS OR WEIGHT FOR PREPACKAGED PRODUCTS  
OTHER THAN CATCH WEIGHT PRODUCTS**

Item	Column I Declared Net Quantity	Column II Tolerance	
		%	ounces
	<u>ounces</u>		
1.	more than 0 to not more than 1.75	9	--
2.	more than 1.75 to not more than 3.5	--	0.16
3.	more than 3.5 to not more than 7	4.5	--
4.	more than 7 to not more than 10.6	--	0.32
5.	more than 10.6 to not more than 17.6	3	--
	<u>pounds</u>		
6.	more than 1.1 to not more than 2.2	--	0.53
7.	more than 2.2 to not more than 22	1.5	--
8.	more than 22 to not more than 33	--	5.28
9.	more than 33	1	--

**PART V**

**TOLERANCES FOR NET QUANTITIES DECLARED IN CANADIAN  
UNITS OF VOLUME FOR PREPACKAGED PRODUCTS OTHER  
THAN CATCH WEIGHT PRODUCTS**

Item	Column I Declared Net Quantity	Column II Tolerance	
		%	fluid ounces
	<u>fluid ounces</u>		
1.	more than 0 to not more than 1.75	9	--
2.	more than 1.75 to not more than 3.5	--	0.16
3.	more than 3.5 to not more than 7	4.5	--
4.	more than 7 to not more than 10.6	--	0.32
5.	more than 10.6 to not more than 17.6	3	--
6.	more than 17.6 to not more than 35.2	--	0.53
7.	more than 35.2 to not more than 2.2 gallons	1.5	--
	<u>gallons</u>		
8.	more than 2.2 to not more than 3.3	--	5.28
9.	more than 3.3	1	--

**PART VI**

**TOLERANCES FOR NET QUANTITIES OF SOLID PREPACKAGED  
PRODUCTS DECLARED IN METRIC UNITS OF VOLUME**

<b>Item</b>	<b>Column I Declared Net Quantity</b>	<b>Column II Tolerance</b>
	<u>cubic metres</u>	
1.	less than 1	3% of declared net quantity
2.	from 1 to 2	0.03 cubic metres
3.	more than 2	1.5% of declared net quantity

**PART VII**

**TOLERANCES FOR NET QUANTITIES OF SOLID PREPACKAGED  
PRODUCTS DECLARED IN CANADIAN UNITS OF VOLUME**

<b>Item</b>	<b>Column I Declared Net Quantity</b>	<b>Column II Tolerance</b>
	<u>cubic yards</u>	
1.	less than 1	3% of declared net quantity
2.	from 1 to 2	0.03 cubic yards
3.	more than 2	1.5% of declared net quantity

**PART VIII**

**TOLERANCES FOR NET QUANTITIES OF PREPACKAGED  
PRODUCTS DECLARED IN METRIC UNITS OF LENGTH**

<b>Item</b>	<b>Column I Declared Net Quantity</b>	<b>Column II Tolerance</b>
	<u>metres</u>	
1.	less than 3	2% of declared net quantity
2.	from 3 to 6	60 millimetres
3.	more than 6	1% of declared net quantity

**PART IX**

**TOLERANCES FOR NET QUANTITIES OF PREPACKAGED PRODUCTS  
DECLARED IN CANADIAN UNITS OF LENGTH**

<b>Item</b>	<b>Column I Declared Net Quantity</b>	<b>Column II Tolerance</b>
1.	<u>feet</u> less than 10	2% of declared net quantity
2.	from 10 to 20	2.4 inches
3.	more than 20	1% of declared net quantity

**PART X**

**TOLERANCES FOR NET QUANTITIES OF PREPACKAGED PRODUCTS  
DECLARED IN METRIC UNITS OF AREA**

<b>Item</b>	<b>Column I Declared Net Quantity</b>	<b>Column II Tolerance</b>
1.	<u>square metres</u> less than 10	2% of declared net quantity
2.	from 10 to 20	20 square decimetres
3.	more than 20	1% of declared net quantity

**PART XI**

**TOLERANCES FOR NET QUANTITIES OF PREPACKAGED  
PRODUCTS DECLARED IN CANADIAN UNITS OF AREA**

<b>Item</b>	<b>Column I Declared Net Quantity</b>	<b>Column II Tolerance</b>
1.	<u>square feet</u> less than 100	2% of declared net quantity
2.	from 100 to 200	2 square feet
3.	more than 200	1% of declared net quantity

**PART XII**

**TOLERANCES FOR NET QUANTITIES OF PREPACKAGED  
PRODUCTS DECLARED BY NUMBER**

<b>Item</b>	<b>Column I Declared Net Quantity</b>	<b>Column II Tolerance</b>
	<u>number of articles</u>	
1.	less than 50	0 article
2.	from 50 to 100	1 article
3.	More than 100 with an individual weight of 14 grams or less, or ½ ounce or less	0.75% of declared net quantity rounded up to the next whole number
4.	More than 100 with an individual weight of more than 14 grams, or more than ½ ounce	0.5% of declared quantity rounded up to the next whole number

## APPENDIX V

### SCHEDULE II OF THE *CONSUMER PACKAGING AND LABELLING REGULATIONS*

#### SCHEDULE II (Section 39)

#### PART I

#### SAMPLES

<b>Item</b>	<b>Column I Number of Units in the Lot</b>	<b>Column II Minimum Number of Units in the Sample</b>
1.	from 2 to 10	All the units in the lot
2.	from 11 to 128	25% of the units in the lot, rounded up to the next whole number, but not less than 10
3.	from 129 to 4 000	32
4.	from 4 001 to 8 000	64
5.	from 8 001 to 12 000	96
6.	more than 12 000	125

#### GUIDE:

Schedule II provides the statistical basis for determining compliance of lots against the requirements of section 39. Part I gives minimum sample sizes, Part II provides the necessary formulas for calculating the lot average from the sample mean, and Part III lists the values for "t" which are the weighting factors that are used in Part II.



**PART II**

**FORMULA FOR DETERMINING THE WEIGHTED AVERAGE QUANTITY OF THE UNITS IN A SAMPLE**

For the purposes of paragraph 39(4)(a), the formula for adjusting the sample mean to determine the weighted average quantity of the units in the sample is as follows:

$$X_a = \bar{x} + s(t \div h)^*$$

In the formula above:

$X_a$  is the weighted average quantity of the units in the sample

$\bar{x}$  is the sample mean calculated as follows:

$$\bar{x} = \frac{\sum x}{n}$$

$\sum x$  is the sum of the net quantities of all units in the sample

$t$  is the value determined in accordance with Part III for the selected sample size

$n$  is the number of units in the sample

$s$  is the standard deviation of the sample, calculated as follows:

$$s = \sqrt{\frac{\sum (x - \bar{x})^2}{(n-1)}}$$

$\sum (x - \bar{x})^2$  is the sum of the squared differences between the sample mean and the net quantity of each unit in the sample

\*The value of  $(t \div h)$  may, instead of being calculated in accordance with this Part, be determined using the applicable value set out in column III of the table to Part III.

GUIDE:

These formulas provide a statistical method that eliminates any bias which may be introduced by the selection of the sample. The mean (average) of the sample is adjusted by a factor that is related to the demonstrated packaging accuracy (standard deviation). Relating the sample mean to the weighted lot average in this way provides a confidence level of 99.5% that good lots will not be failed in error.

PART III

Table for values of t and (t ÷ / h)

Column I Sample Size	Column II t*	Column III (t ÷ / h)*
2	63.657	45.01
3	9.925	5.73
4	5.841	2.92
5	4.604	2.06
6	4.032	1.65
7	3.707	1.40
8	3.499	1.24
9	3.355	1.12
10	3.250	1.03
11	3.169	0.955
12	3.106	0.897
13	3.055	0.847
14	3.012	0.805
15	2.977	0.769
16	2.947	0.737
17	2.921	0.708
18	2.898	0.683
19	2.878	0.660
20	2.861	0.640
21	2.845	0.621
22	2.831	0.604
23	2.819	0.588
24	2.807	0.573
25	2.797	0.559
26	2.787	0.547
27	2.779	0.535
28	2.771	0.524
29	2.763	0.513
30	2.756	0.503
31	2.750	0.494
32	2.746	0.485
64	2.657	0.332
96	2.634	0.269
125	2.615	0.234

Linear Interpolation of Values

Where a sample size is selected that is not listed in column I of this table and lies between 32 and 125, the value of t will be determined by linear interpolation as follows:

$$t = a + \frac{(c \& e)(a \& b)}{(c \& d)}$$

where:

- a is the value of t for closest sample size below the selected sample size
- b is the value of t for the closest sample size above the selected sample size
- c is the result of 120 divided by the closest sample size below the selected sample size
- d is the result of 120 divided by the closest sample size above the selected sample size
- e is the result of 120 divided by the selected sample size

\*Where all units in a lot are selected to constitute a sample, zero shall be used as the value of t and (t ÷ / h).

GUIDE:

Because the “t” values are used to calculate the lot average from the sample mean, this weighting factor is not required in those cases where every package in the lot is tested. Therefore, as the footnote above shows, the value of “t” is equal to zero for those cases.

**PART IV**  
**MINIMUM NUMBER OF UNITS FOR THE PURPOSES OF**  
**PARAGRAPH 39**

Item	Column I	Column II
	Sample Size	Minimum Number of Units*
1.	from 2 to 8	1
2.	from 9 to 20	2
3.	from 21 to 32	3
4.	from 33 to 50	4
5.	from 51 to 65	5
6.	from 66 to 80	6
7.	from 81 to 102	7
8.	from 103 to 125	8

**\* Minimum number of units in the sample that results in the lot *not meeting the requirements* of the Act and these Regulations respecting the declaration of net quantity.**

GUIDE:

For any sample size listed above, the number in Column II represents the minimum number of defective packages in the sample which would fail the lot. If the total number of defective packages equals or exceeds the number in Column II, the lot fails regardless of any other test results.

## APPENDIX VI

### EXAMPLE OF A LOT INSPECTION

The following example illustrates how an inspection is conducted for a lot of prepackaged products to determine if it meets the requirements under the *Consumer Packaging and Labelling Act* and *Regulations*. It is important to understand that this is the required procedure for the Fair Business Practices Branch when conducting inspections, however, it is not an appropriate method for a packer to use for ensuring compliance.

Assuming a lot of 3000 packages, each labelled as containing 50 grams:

#### **Step 1**

The required number of packages that form the sample is randomly selected.

*See notes on Section 39(2) and refer to the table in Schedule II, Part I.*

A sample of 32 units is, therefore, required for a lot size of 3000 units.

#### **Step 2**

The tolerance is determined for each package labelled as containing 50 grams.

*See notes on Section 38(2) and refer to table in Schedule I, Part III.*

For a net quantity declaration of 50 grams, the tolerance is 9%, or 4.5 grams.

#### **Step 3**

Each package in the sample is weighed. The following net weights are examples:

- |           |            |            |             |            |            |
|-----------|------------|------------|-------------|------------|------------|
| 1) 49.7 g | 7) 49.9 g  | 13) 50.1 g | 18) 50.0 g  | 23) 49.6 g | 28) 49.9 g |
| 2) 50.2 g | 8) 50.3 g  | 14) 40.2 g | 19) 50.1 g  | 24) 50.5 g | 29) 49.9 g |
| 3) 49.9 g | 9) 50.2 g  | 15) 50.0 g | 20) 49.8 g  | 25) 49.7 g | 30) 49.5 g |
| 4) 45.4 g | 10) 50.0 g | 16) 50.1 g | 21) 49.9 g  | 26) 50.1 g | 31) 50.2 g |
| 5) 50.0 g | 11) 49.8 g | 17) 49.8 g | 22) 50.1. g | 27) 51.5 g | 32) 49.9 g |
| 6) 50.1 g | 12) 50.0 g |            |             |            |            |

**Step 4**

The number of packages which are deficient by more than the allowable tolerance of 9% (4.5 grams) are counted, i.e., those packages weighing less than 45.5 grams. Two such deficient packages are found: 45.4 g and 40.2 g (items # 4 and #14).

*See notes on section 39(4)(b) and refer to the table in Schedule II, Part IV.*

From this table you will note that three or more deficient units will result in lot failure. Therefore in this example, the criteria stated in Section 39(4)(b) has been met as the lot sample contains two deficient units.

**Step 5**

The number of packages which are deficient by more than twice the allowable tolerance are counted, i.e., those packages weighing less than 41 grams (4.5 grams X 2 = 9 grams).

One such deficient package is found: 40.2 g (item # 14)

*See notes on Section 39(4)(c) which allows only one package to be deficient by more than twice the tolerance.*

Therefore, in this example, the criteria stated in Section 39(4)(c) has also been met.

**Step 6**

The weighted average of the sample is determined.

*See notes on Section 39(4)(a) and refer to Schedule II, Parts II and III.*

a) The average weight or mean ( $\bar{x}$ ) of the sample is calculated by adding the total weight of the sample packages and dividing by 32 (the number of units in the sample).  $\bar{x} = 49.58$  g

b) The Standard Deviation (s) is calculated.  $s = 1.926$  g  $s' = \sqrt{\frac{\sum (x - \bar{x})^2}{(n-1)}}$

c) For a sample size of 32 the value for (t/h) is obtained from Schedule II, Part III, column III. (t/h) = 0.485

d) The weighted average  $X_a$  is calculated by using the formula

$$\begin{aligned} X_a &= \bar{x} + s(t\div/h) \\ &= 49.58 \text{ g} + (1.926 \text{ g} \times 0.485) \end{aligned}$$

$$X_a = 50.51 \text{ grams}$$

As the weighted average is greater than the declared quantity of 50 g, the criterium prescribed in 39(4)(a) of the Regulations has been met.

This example shows that the requirements of paragraphs 39(4)(a), (b) and (c) have all been met, therefore, the lot of 3000 packages is acceptable.