



# GDSN Package Measurement Rules Implementation Guide

*Issue 5, Mar-2011*



## Document Summary

Document Item	Current Value
Document Title	GDSN Package Measurement Rules Implementation Guide
Date Last Modified	Mar-2011
Current Document Issue	Issue 5
Status	Approved
Document Description	The purpose of this manual is to share with the GDSN trading partner community a recommended set of best practices and guidelines to aid the user in implementing the GDSN Package Measurement Rules in their facility. It is important to note that this document in no way takes the place of or supersedes the GDSN Package Measurement Rules. The GDSN Package Measurement Rules should always be your first source for Package Measurement information.

## Contributors

Name	Organization
Rich Richardson	GS1 US
Ray Delnicki	GS1 US
Peter Zaepfel	Kraft
Gabriel Sobrino	GS1 Netherlands

## Log of Changes in Issue 5

Issue No.	Date of Change	Changed By	Summary of Change
1	Oct-2006	Data Accuracy BRG	Initial Version
2	Feb-2008	Data Accuracy BRG	Revised for Flexible, Soft Paper and Transitions
3	Jun-2008	Data Accuracy BRG	Reorganization of content, re-title and update
4	Aug-2010	Data Accuracy BRG	Added content to the sentence in section 4.2
5	Mar-21-2011	Data Accuracy BRG	<p>A. Added section 4.1.1 flow Chart and wording on determining default front on Trade Items that are not easy to determine default front on based on CR 10-100.</p> <p>B. Added section 5.3.1 on Tolerance Pilot table and notes on Minimum Participation levels from both sides of the trading partner relationship and minimum amount Trade Item measurements.</p>

## Detailed Changes in Issue 5

The GDSN Package Measurement Rules Implementation Guideline replaces the Former Best Practices for GDSN Package Measurement Rules & Tolerances.

#	Summary of Change
1	Three chapters were removed because they pertained to GDSN Trade Item Implementation rather than GDSN Package Measurement Rules (Those 3 chapters will be reviewed by the GDSN Trade Item Implementation Guideline Work group to see where they bring value to their guideline.
2	The chapter number s in the new GDSN Package Measurement Rules Implementation Guideline now directly corresponds to the Chapter numbers in the GDSN Package Measurement Rules Standard.
3	Other enhancements were made throughout the document so the entire guideline should be reviewed.

## Disclaimer

Whilst every effort has been made to ensure that the guidelines to use the GS1 standards contained in the document are correct, GS1 and any other party involved in the creation of the document HEREBY STATE that the document is provided without warranty, either expressed or implied, of accuracy or fitness for purpose, AND HEREBY DISCLAIM any liability, direct or indirect, for damages or loss relating to the use of the document. The document may be modified, subject to developments in technology, changes to the standards, or new legal requirements. Several products and company names mentioned herein may be trademarks and/or registered trademarks of their respective companies.

# Table of Contents

<b>1. Purpose</b>	<b>5</b>
<b>2. Before You Begin</b>	<b>5</b>
2.1. Measurement Tools	5
2.1.1. Appropriate Tools	5
2.1.2. Calibration and Certification	6
2.2. Measurement Process	6
2.2.1. Sample Size	6
2.2.2. Environmental Considerations	7
2.2.3. Product Specific Considerations	7
2.2.4. Recording and Comparing Measurement Results	7
2.2.5. Communication of Findings	7
2.3. Education and Training	7
<b>3. Metric and Imperial Dimensions</b>	<b>8</b>
<b>4. Consumer Trade Items</b>	<b>8</b>
4.1. Default Front	8
4.1.1. Identifying the applicable measurement rules for your products	8
4.2. Hanging Items	15
4.3. Flexible Packages	15
4.4. Soft Paper Packages	15
<b>5. Non-Consumer Trade Items</b>	<b>15</b>
5.1. Natural Base	15
5.2. Floor Ready Displays	15
5.2.1. Pallet Level Shipping Platform	16
5.3. Standard Tolerances	16
5.3.1. Tolerance Pilot Sample Size- Minimum	17
<b>6. Application of Standard Tolerances</b>	<b>17</b>
<b>A. Appendix A: Sample Spreadsheet</b>	<b>18</b>

# 1. Purpose

The purpose of this document is to provide guidance and support to the person(s) responsible for implementation of the Package Measurement Rules within their company. It supports the recommendations identified in the [GS1 Data Quality Framework](#) which is published in 2005. This manual is not intended to be a technical manual, nor does it intend to provide rules for publication of data through GDSN. The information is based on the real world experiences of users. You will find helpful hints, tips, pitfalls to avoid and suggestions for the development of the measurement and reporting process in your company.

**!** **Important:** It is important to note that this document in no way takes the place of or supersedes the GDSN Package Measurement Rules. The GDSN Package Measurement Rules should always be your first source for Package Measurement information.

This document also provides guidance for the proper use and application of standard tolerances, as defined in the Package Measurement Rules. The section numbering of this document adheres closely to that of the Package Measurement Rules, making it easy to reference back and forth between the two documents.

Adherence to the practices identified in this document is a first step to establishing and maintaining a data quality management system, as referenced in the [GS1 Data Quality Framework](#).

## 2. Before You Begin

Some organizations begin the process of package measurement as a result of customer requirements. Regardless of the reason, however, it is important to remember that accurate dimensional data will bring significant benefits to your organization, including the following:

- Costs savings in Logistics by improving truck capacity and accurately stating freight
- Reduced reconciliation time, based on having the data right the first time
- Improvements in the new product introduction process, resulting in reduced 'speed-to-market' times
- More satisfied customers and improved customer relationships

### 2.1. Measurement Tools

#### 2.1.1. Appropriate Tools

**!** **Important:** While trading partners are entitled to use any tool that fits their business model in order to meet the standard tolerances, digital technology is generally considered the most accurate means of measuring.

**Consider the following when selecting measurement tools:**

- Consider the types of products that your organization will need to measure, including the largest and smallest packages. Both linear and weight data attributes should be considered.
- Consider the degree of accuracy required. Refer to the GDSN Package Measurement Rules for determining the number of decimal places recommended for trade item measurements. Organizations will typically have multiple degrees of accuracy required, and equipment should be obtained to support this requirement.

- As a best practice, the use of digital callipers and digital scales is recommended for performing measurements. There are also non-contact measurement devices for case and consumer units that use various optic or laser-based methods to capture dimensions and weight. These devices are commonly used and are acceptable measurement tools. In addition, these systems often come with their own database software that allows the input of serial data directly from the equipment into a PC application.
- In general, the ability to directly input data from a measurement device will eliminate potential data entry errors based on keying the data into an application.

### 2.1.2. Calibration and Certification

It is the organization's responsibility to make sure that all equipment provided and used for data gathering is well maintained and calibrated prior to use.

- Measurement equipment should be certified against measurement standards traceable to international or national measurement standards at least annually.
- The measurement equipment should enable the calibration status to be determined, and should be safeguarded from adjustments that would invalidate the measurement result.

## 2.2. Measurement Process

Developing a standardized methodology for taking measurements is the first step before undertaking the task of measuring.

- Schedule periodic audits of measurements. It is not unusual for product changes to occur (packaging material, product, packaging size) without an adjustment to the recorded measurements.
- Do not measure crushed or damaged product. Product should be measured in a condition that you expect your customer to receive it.
- Dedicate an area for measurement that is isolated and away from other interferences.
- Some of the recommended materials required for taking consistent methods include:
  - A secure flat surface, such as a table 6' to 8' long
  - Available power supply with 4 outlets
  - A computer with connection to your company's network
  - One or more digital callipers appropriate to your product sizes that report data to 2-3 decimal places with data link (this enables direct input to data base from the calliper without keystrokes- see the calliper manufacturer for details)
  - A digital scale that reports data to 2-3 decimal places with data link capabilities (usually the print function- see manufacturer of scale for details). There is the possibility you will need 2 scales if your products range from very small to very heavy floor style displays.
  - A box cutting tool, markers and assorted office supplies.

### 2.2.1. Sample Size


Multiple random samples will help to reduce errors caused by equipment, inconsistent techniques or product abnormalities. The use of multiple samples is particularly important for flexible packages, as these will often result in greater variability due to the nature of the packaging and measurement techniques. The appropriate number of randomly selected samples is described in more detail in the [GS1 Data Quality Framework](#).

### 2.2.2. Environmental Considerations

If environmental conditions have a significant impact upon measurements, these conditions should be captured in the sample selection process. For example, soft paper products affected by temperature or humidity during normal shipping and handling should be selected towards the end of the manufacturer supply chain, just prior to customer delivery.

### 2.2.3. Product Specific Considerations

Those packages that have greater variability in size require more samples and measurements prior to determining an average values.

 **Note:** For additional tips related to specific types of products, refer to examples listed in sections [4](#) and [5](#).

### 2.2.4. Recording and Comparing Measurement Results

Recording of measurement results can be done using a collection worksheet such as the GS1 KPI Scorecard (included in the GS1 Data Quality Framework), or a spreadsheet similar to the example identified in Appendix [A](#) of this document. The example contains all the relevant fields that are required for data collection.

Once all sample measurements have been recorded, these measurements should be compared to the published data. If the difference between the published and new data is outside the allowable tolerance for that type of product, you should take additional measurements and/ or make changes/corrections to published data to ensure accuracy.


### 2.2.5. Communication of Findings

The findings resulting from the above comparisons should be summarized and communicated to internal or external partners accordingly.

As a general practice, it is helpful for trading partners to use these communications as reminders to assess their internal processes and ensure that accurate data is being generated and maintained on a regular basis.

## 2.3. Education and Training

Ensure that all personnel involved in measurement activities are properly trained in the use of the measuring equipment, and that they understand the **GDSN Package Measurement Rules**. You should also review this document in its entirety prior to measurement activity.

 **Note:** The **GDSN Package Measurement Rules** change frequently based on ongoing development and improvements. You can reference the latest version on the GS1 website at: [www.gs1.org/services/gsm/kc/gdsn/index.html](http://www.gs1.org/services/gsm/kc/gdsn/index.html)

GS1 Member Organizations provide excellent training and information on interpreting and applying the package measurement rules, which form the foundation for accuracy of physical dimensional data. In addition, many GS1 Member Organizations provide services to audit product data and communicate the results between trading partners. Additional details regarding the rules for package measurement can be found in the GDSN Package Measurement Rules

## 3. Metric and Imperial Dimensions

The appropriate number of decimal places for measurements and rules for rounding should be adhered as stated in the GDSN Package Measurement Rules standard.

## 4. Consumer Trade Items

### 4.1. Default Front

Identifying Default Front is pivotal to accurate Consumer Trade Item Measurement. Be aware of the following “exceptions” to the general rule:

- When there are two equally sized surfaces that can be used for Default Front, the taller orientation is used
- The default front for Soft Paper products on rolls (e.g. paper towels) is based on the package being oriented with the rolls in the vertical position.

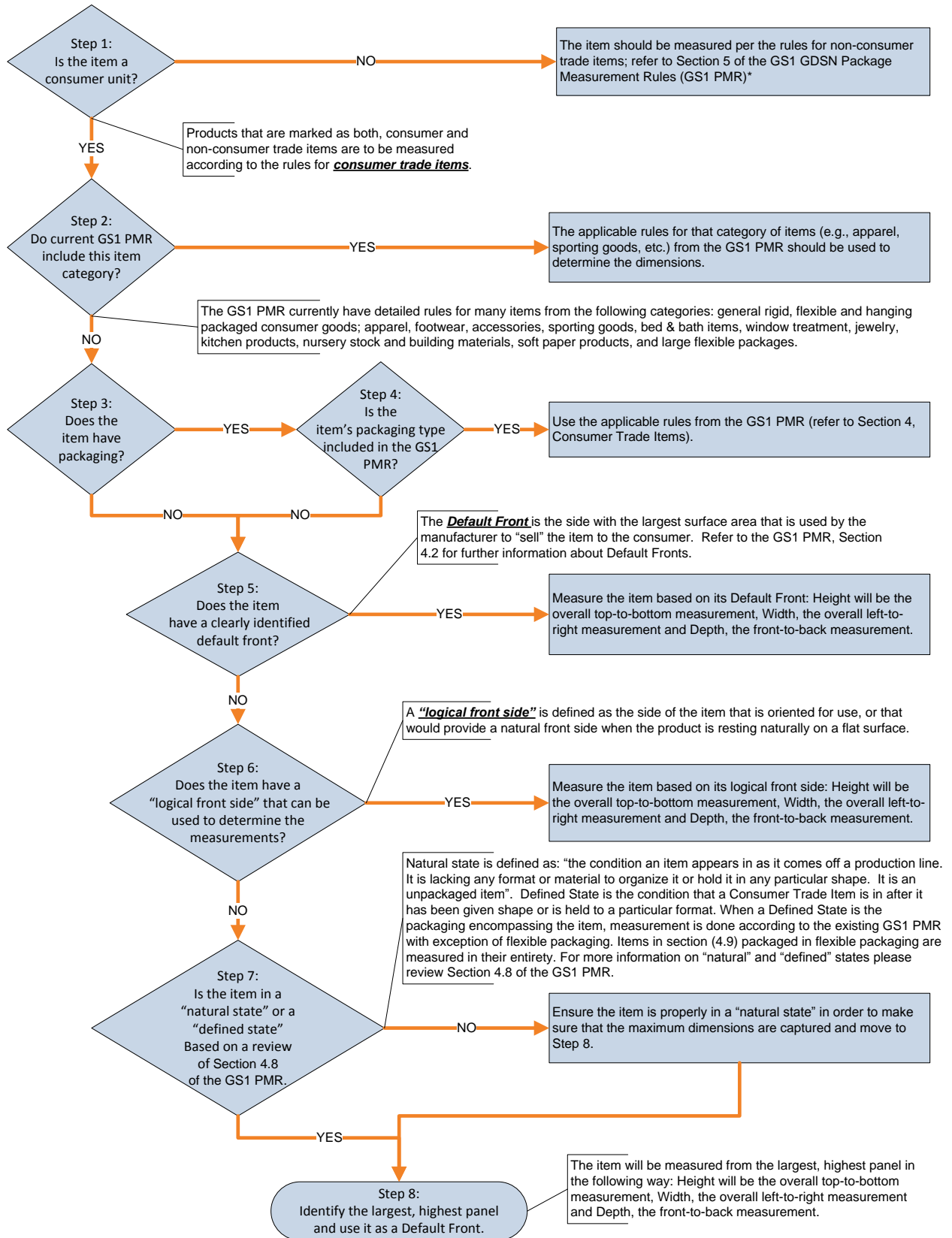
The following sections describe some reminders for various package types that are helpful to ensure proper and consistent dimensional measurements.

#### 4.1.1. Identifying the applicable measurement rules for your products

In this section we explain how to use a “decision tree” approach to identify the rules that should be used to measure a product. This decision tree is especially useful when trying to apply the GS1 Package Measurement Rules to products whose characteristics (such as shape, form, lack of packaging or identifiable markings, etc.) prevent users from finding an “evident” way to measure. The decision tree below brings a number of elements from the GS1 Package Measurement Rules which have to be used in combination in order to provide a framework for products to be measured.

Using this methodology is simple; users should answer the questions from the steps listed below and follow the advice given for each one of the answer possibilities. Determining the answer of these questions will either point to a section of the package measurement rules where the appropriate/applicable rules for a product can be found or will lead to further decision points/advice for the usage of rules on a particular product.

Figure 4-1 Measure Difficult Products



NOTE: The term "GS1 PMR" is used in the flowchart to represent the GS1 GDSN Package Measurement Rules for the sake of brevity

### 4.1.1.1. Decision Tree Examples

#### Example 1: Bicycle bag, unpacked, no defined state

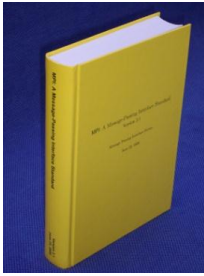


Step 1: Is the product a consumer unit	
<b>Yes</b> Go to step 2	<b>No</b> The product should be measured then according to rules for non-consumer trade items; refer to section 5 of the <a href="#">GS1 PMR</a> .
Step 2: Is the category of product included in the GS1 Package Measurement Rules?	
<b>Yes</b> Applicable rules for that category of items (apparel, sporting goods, etc.) from <a href="#">GS1 PMR</a> should be used to determine dimensions.	<b>No</b> Go to step 3
Step 3: Does the product have packaging?	
<b>Yes</b> Go to step 4	<b>No</b> Go to step 5
Step 4: Is the product's packaging type included in the GS1 Package Measurement Rules?	
<b>Yes</b> Use the applicable rules from the <a href="#">GS1 Packaging Measurement Rules</a> (refer to section 4, consumer trade items).	<b>No</b> Go to step 5
Step 5: Does the product have a clearly identifiable default front?	
<b>Yes</b> Measure the product based on its default front: <ul style="list-style-type: none"> <li>■ Height - overall top to bottom measurement</li> <li>■ Width - overall left to right measurement</li> <li>■ Depth - front to back measurement</li> </ul>	<b>No</b> Go to step 6
Step 6: Does the product have a "logical front side" that can be used to determine the measurements?	
<b>Yes</b> Measure the product based on its logical front side: <ul style="list-style-type: none"> <li>■ Height - overall top to bottom measurement,</li> <li>■ Width - overall left to right measurement</li> <li>■ Depth - front to back measurement</li> </ul>	<b>No</b> Go to step 7
Step 7: Is the product in "natural state" or "defined state" that cannot be modified without breaking down the product's configuration?	
<b>Yes</b> Go to step 8	<b>No</b> Ensure the product is properly in "natural state" in order to ensure that the full extent of the dimensions is measured and move to step 8.
Step 8: Identify the largest, highest panel and use it as a default front	

The bag is to be measured in its entirety in natural state in this orientation, using the largest and highest panel as the front:

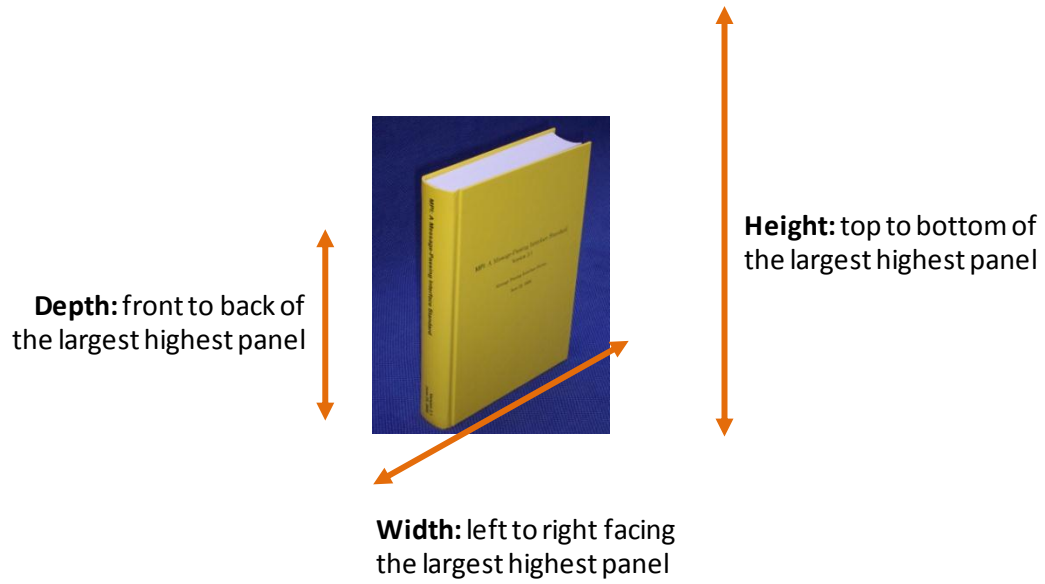


## Example 2: Books or Magazines



Step 1: Is the product a consumer unit	
<b>Yes</b> Go to step 2	<b>No</b> The product should be measured then according to rules for non-consumer trade items; refer to section 5 of the <a href="#">GS1 PMR</a> .
Step 2: Is the category of product included in the GS1 Package Measurement Rules?	
<b>Yes</b> The applicable rules for that category of items (e.g. apparel, sporting goods, etc.) from the <a href="#">GS1 PMR</a> should be used to determine the dimensions.	<b>No</b> Go to step 3
Step 3: Does the product have packaging?	
<b>Yes</b> Go to step 4	<b>No</b> Go to step 5
Step 4: Is the product's packaging type included in the GS1 Package Measurement Rules?	
<b>Yes</b> Use the applicable rules from the <a href="#">GS1 Packaging Measurement Rules</a> (to section 4, consumer trade items).	<b>No</b> Go to step 5
Step 5: Does the product have a clearly identifiable default front?	
<b>Yes</b> Measure the product based on its default front: <ul style="list-style-type: none"> <li>■ Height - overall top to bottom measurement</li> <li>■ Width - overall left to right measurement</li> <li>■ Depth - front to back measurement</li> </ul>	<b>No</b> Go to step 6
Step 6: Does the product have a "logical front side" that can be used to determine the measurements?	
<b>Yes</b> Measure the product based on its logical front side: <ul style="list-style-type: none"> <li>■ Height - overall top to bottom measurement</li> <li>■ Width - overall left to right measurement</li> <li>■ Depth - front to back measurement</li> </ul>	<b>No</b> Go to step 7
Step 7: Is the product in "natural state" or a "defined state" that cannot be modified without breaking down the product's configuration?	
<b>Yes</b> Go to step 8	<b>No</b> Ensure the product is properly in "natural state" in order to ensure that the full extent of the dimensions is measured and move to step 8.
Step 8: Identify the largest, highest panel and use it as a default front	

The book's cover fits the definition of a default front and therefore it's to be used as the base for the measurements:



### Example 3: Toy Plane



Step 1: Is the product a consumer unit	
<b>Yes</b> Go to step 2	<b>No</b> The product should be measured then according to rules for non-consumer trade items; refer to section 5 of the <a href="#">GS1 PMR</a> .
Step 2: Is the category of product included in the GS1 Package Measurement Rules?	
<b>Yes</b> The applicable rules for that category of items (e.g. apparel, sporting goods, etc.) from the <a href="#">GS1 PMR</a> should be used to determine the dimensions.	<b>No</b> Go to step 3
Step 3: Does the product have packaging?	
<b>Yes</b> Go to step 4	<b>No</b> Go to step 5
Step 4: Is the product's packaging type included in the GS1 Package Measurement Rules?	
<b>Yes</b> Use the applicable rules from the <a href="#">GS1 Packaging Measurement Rules</a> (refer to section 4, consumer trade items).	<b>No</b> Go to step 5
Step 5: Does the product have a clearly identifiable default front?	
<b>Yes</b> Measure the product based on its default front: <ul style="list-style-type: none"> <li>■ Height - overall top to bottom measurement</li> <li>■ Width - overall left to right measurement</li> <li>■ Depth - front to back measurement</li> </ul>	<b>No</b> Go to step 6
Step 6: Does the product have a "logical front side" that can be used to determine the measurements?	
<b>Yes</b> Measure the product based on its logical front side: <ul style="list-style-type: none"> <li>■ Height - overall top to bottom measurement</li> <li>■ Width - overall left to right measurement</li> <li>■ Depth - front to back measurement</li> </ul>	<b>No</b> Go to step 7
Step 7: Is the product in "natural state" or a "defined state" that cannot be modified without breaking down the product's configuration?	
<b>Yes</b> Go to step 8	<b>No</b> Ensure the product is properly in "natural state" in order to ensure that the full extent of the dimensions is measured and move to step 8.
Step 8: Identify the largest, highest panel and use it as a default front	

## 4.2. Hanging Items

Hanging Consumer Trade Items should be measured as if they were hanging. Flexible hanging items are an exception to this rule. For more information refer to the latest version of the *GDSN Package Measurement Rules* at: [www.gs1.org/services/gsm/kc/gdsn/index.html](http://www.gs1.org/services/gsm/kc/gdsn/index.html).

## 4.3. Flexible Packages

- Measurements of flexible packages that are taken edge to edge (according to Package Measurement Rules) should have the flaps extended and released prior to measurement.
- Measurements of gusseted bags, which may easily change shape due to settling of contents, should be performed multiple times.
- Measurements of flexible packages that are taken as product only (according to Package Measurement Rules), may vary due to product shifting caused during handling. Multiple measurements should be taken to minimize the potential variability.

## 4.4. Soft Paper Packages

- Measurements of soft paper packages are taken more easily with the package placed against a firm surface or corner, measuring from the surface to the outer edge of the package.
- Measurements of soft paper packages with soft (i.e., non-rigid) flat handles should be taken with the handles folded flat against the package (e.g., diaper bags). Because handles have minimal impact and can be folded during shelving, measurements should exclude the dimensions of unfolded handles.

# 5. Non-Consumer Trade Items

## 5.1. Natural Base

Remember that finding Natural Base for Non-Consumer Trade Items is pivotal to accurate measurement. Refer to the *GDSN Package Measurement Rules* for defining Natural Base.

- ✔ **Note:** The *GDSN Package Measurement Rules* change frequently based on ongoing development and improvements. You can reference the latest version on the GS1 website at: [www.gs1.org/services/gsm/kc/gdsn/index.html](http://www.gs1.org/services/gsm/kc/gdsn/index.html)

When measuring Non-Consumer Trade items, the item depth (or length) is the longer side of the base, and the item width is the shorter side of the base. This means that the depth (or length) is always greater than or equal to the width.

- ! **Important:** Note that a Non-Consumer Trade Item that is also shipped or sold as Consumer Trade item must be measured according to the rules for Consumer Trade items. Refer to the Package Measurement Rules for additional details. If additional measurements are required to support handling of the item as a Non-Consumer trade item, then these must be coordinated and communicated by the supplier.

## 5.2. Floor Ready Displays

The Package Measurement Rules apply only to the shipping container for Floor Ready Displays, not the actual assembled display unit. These are measured as any other Non-Consumer Trade Item.

More specific information on attributes and their use for display packages are documented in the ***GDSN Trade Item Implementation Guide***.


 **Note:** The ***GDSN Trade Item Implementation Guide*** can be found on the GS1 website at: [www.gs1.org/services/gsm/kc/gdsn/index.html](http://www.gs1.org/services/gsm/kc/gdsn/index.html)

### 5.2.1. Pallet Level Shipping Platform

For pallet level non-consumer trade items, the shipping platform refers to the type of base that is used for assembling, handling and shipping a unitized load of product (unit load).

The Natural Base of a full unit load is the shipping platform. However, the shipping platform is not always included in dimension information (depth/length, width, height) of the unit load. If the dimensions of the shipping platform are excluded when this data is passed through data synchronization, then the proper indicators must be set accordingly in the GDS transaction set. See the ***GDSN Trade Item Implementation Guide*** for details.


## 5.3. Standard Tolerances

 **Important:** The tolerances referred to in this document do not replace the need for trading partners to have the most accurate data available in order to minimize disruptions.

Physical products identified by the same GTIN have some inherent variability in gross weights and linear dimensions. This may be due to manufacturing variability, handling methods, environment (e.g. humidity) or other factors. It is expected that published physical dimensions of a trade item, therefore, may not coincide exactly with measured physical dimensions of that trade item.

For the purpose of this document, a standard tolerance is defined as follows:

***Standard Tolerance:*** *An allowable variation between the stated (or synchronized) physical dimensions of a trade item and the measured (or actual) physical dimensions of a trade item, used to determine the accuracy of the stated dimensions of that trade item.*

 **Important:** The addition of standard tolerances does not impact the GTIN Allocation rule parameters identified in the General Specification. Tolerances and GTIN allocation rules are different concepts that must be treated independently. Standard tolerances are only used to determine the accuracy of physical dimensions of a particular trade item, while GTIN allocation rules focus on standard practices for establishing a new GTIN.

In order to facilitate the use of standard tolerances in the industry, a section has been added to the ***GDSN Package Measurement Rules***, including the following:

- Approved standard tolerances for linear dimensions and weights, for both consumer trade items and non-consumer trade items.
- List of predefined package types to which the standard tolerances can be applied.

### 5.3.1. Tolerance Pilot Sample Size- Minimum

Participant Type	No. Participants	No. GTINs per Participant	Percent of Available GTINs	No. Sample Measurements p/GTIN	Total No. Samples	Comments
Supplier Manufacturer	5	10	100%	7	350	A minimum of 7 measurements ensures that Pilot captures more variability in package sizes.
Retailer	3	25	50%	5	375	Assume each Retailer only has limited No. of GTINs in stock for each Mfr
TOTAL	8				725	

**Notes:**

- Participation of at least 5 suppliers and 3 retailers is critical to overall success of Pilot.
- Team recommends a minimum of 10 GTINs per Manufacturer to ensure sufficient variety in Pilot scope.
- Availability of GTINs at the Retailers may vary significantly. This chart estimates 50% availability.
- Team recommends a minimum of 7 measurements per GTIN (for Suppliers) and 5 measurements per GTIN for (Retailers) to capture package size variability.

Sample sizes above do not include segregation by Package Type, which may require additional samples.

## 6. Application of Standard Tolerances

Standard tolerances should be applied based on the predefined package type to which a GTIN is assigned. The approved standard tolerances have been deemed acceptable by retailers and attainable by manufacturers for the groups of consumer and non-consumer package types identified within the *Standard Tolerances for Data Accuracy* section of the [GDSN Package Measurement Rules](#). Dimensions of consumer and non-consumer trade items that are within the standard tolerances for their respective package types will be considered accurate.

- Note:** For additional information regarding the empirical basis for establishing these tolerances, please contact a member of the GDSN Data Accuracy BRG.

