

# Lenovo Packaging Specification 41A0613

## Recyclable Packaging Materials

### *Selection and Identification*

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**REVISION HISTORY**

Rev	Revision Description	Date	Approved by
R0	Creation	24MAY2006	Mo Shayesteh
R1	Add EU waste bin symbol regulation	15MAY2010	Sarah Yu
R2	Update Korean Discharge Marks for Packaging New Marks are mandatory from 1JUNLY2012	28APR2012	Karen Lee
R3	<a href="#">Add 2.4 Marking of Patents on page 14</a>	21JAN2013	Royal Bai/Karen Lee

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## 1.0 Introduction

### 1.1 Abstract

Lenovo uses a comprehensive waste management system to reduce the impact of our waste materials on the solid waste stream. This integrated system emphasizes source reduction and recycling programs prior to investigating alternatives for disposal.

Material recycling strategies will focus upon the use of:

1. Recycled material(s) in our packaging.
2. Other materials which provide a resource for secondary applications (e.g., recyclable materials).

### 1.2 Purpose

- To establish parameters for the recycled content to be included in corrugated and plastic packaging.
- To reduce and/or eliminate the use of non-recyclable materials or materials compositions that prevents or hinders the recycling of Lenovo packaging after use.
- To promote recycling by providing information (in the form of markings), which will increase the likelihood that our packaging materials will be recycled.

### 1.3 Compliance

Compliance with the requirements herein will be enforced as a condition of purchase per Lenovo purchase contracts. When the requirements of this specification conflict with applicable governmental regulations, the more stringent shall take precedence.

Related international standards include ISO 11469, DIN 6120 (Germany), ISO 1043, the Japanese "Law for Promotion of Effective Utilization of Resources" (4/2001) and the Korean "Extended Producer Responsibility" law (1/2003) and the Chinese "Packaging Recycling Marks Standard (GB 18455-2001). This specification aims to comply with all of these; routinely applied to all subject materials.

### 1.4 Scope

This specification considers two ways recycling may be used to reduce our contribution to municipal solid waste.

- It redirects material which would otherwise be sent to a landfill.
- It may conserve natural resources or reduce the amount of waste material generated from processes which utilize raw or virgin materials.

### 1.5 Application

1. This specification applies to all primary, secondary, and tertiary packaging for products, devices, parts, subassemblies, materials, and supplies purchased by Lenovo for use in its manufacturing and distribution operations.
2. This specification applies to all packaging used in protecting, handling, or marketing of Lenovo products, parts and supplies including those manufactured by an OEM.

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3. This specification is to include, but is not limited to, the following packaging materials and packaging components:
- Thermoplastic cushion (RLDPE/RHDPE)
  - Molded cushions (of any resin)
  - Fabricated cushions (of any resin)
  - Corrugated fiberboard
  - Paperboard
  - Rigid and flexible plastics

### 1.6 Referenced Documents

The following represent the regulatory force behind these requirements in the various countries that are affected or an internationally recognized standard (ISO, DIN, etc.).

<b>Table 1: External Documents and Standards</b>		
<b>Country</b>	<b>Document Title / Description</b>	<b>Date</b>
<b>Japan</b>	"Law for Promotion of Effective Utilization of Resources"	4/26/1991
	Japanese Ordinance No.1 of the Ministry of Environment and the Ministry of Economy, Trade and Industry"	3/28/2001
<b>Korea</b>	Extended Producer Responsibility ( <a href="http://www.epr.or.kr">http://www.epr.or.kr</a> )	1/2003
	Korea Environment and Resources Corporation ( <a href="http://www.envico.or.kr">http://www.envico.or.kr</a> )	1/2003
<b>ISO 11469</b>	"Plastics -- Generic identification and marking of plastics products"	5/11/2000
<b>ISO 1043</b>	Plastics -- Symbol and abbreviated terms (4 parts):	
	Part 1: Basic polymers and their special characteristics	/2000
	Part 2: Fillers and reinforcing materials	/2000
	Part 3: Plasticizers	/1996
	Part 4: Flame Retardants	/1998
<b>FTC</b>	Part 260 - "Guides for the Use of Environmental Marketing Claims"	/1998
<b>Germany</b>	<b>DIN 6120-1:</b> Marking of Packaging and Packing Material for the Purpose of Recovery - Plastics Packaging and Packing Material - Part 1: Artwork / Graphics	12/1996
	<b>DIN 6120-2:</b> Marking of Packaging and Packing Material for the Purpose of Recovery - Plastics Packaging and Packing Material - Part 2: Additional Marking	12/1996
<b>China</b>	<b>GB 18455-2001:</b> Packaging Recycling Marks	12/2001
	Restrictions of Hazardous Substances, MII Order Number 39	3/2006
<b>EU</b>	<a href="#">EU only directive</a>	/2006

<b>Table 2: Lenovo Internal Documents</b>		
<b>Part No.</b>	<b>Document Title / Description</b>	<b>Date</b>
<b>41A0681</b>	Artwork for Japanese Symbols for PLASTIC materials	5/19/2006
<b>41A0682</b>	Artwork for Japanese Symbols for PAPER materials	5/19/2006
<b>41A0683</b>	Artwork for Korean Recycle Symbols	5/22/2006

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## 2.0 Requirements

Japanese, Korean, & Chinese marking requirements are now a part of this specification. In short, this means that packaging materials subject to identification marking requirements will bear the traditional symbols included herein and in addition will bear the Japanese, Korean, & Chinese symbol(s) if required. **Not all marks in this document are mandatory.** A lot of the information in this document is meant to provide you with background and guidelines for usage of any markings or marketing claims you choose to use on packaging. This specification also includes general performance requirements and recycled material content guidelines. If only looking for marking requirements, refer to sections 2.4, 3.0, 4.0, & 5.0 of this document for convenient summary tables of these mandatory symbols.

The European waste bin symbol intended to prevent discarding batteries into the trash is now part of this specification. Reference: European Union Battery Directive: 2006/66/EC

[http://eur-lex.europa.eu/LexUriServ/site/en/oj/2006/l\\_266/l\\_26620060926en00010014.pdf](http://eur-lex.europa.eu/LexUriServ/site/en/oj/2006/l_266/l_26620060926en00010014.pdf)

General rule for recycling: Packaging parts should be separable for the purpose of recycling without requiring special tools or treatment .

### 2.1 Cellulosic Materials

#### 2.1.1 Performance of Recycled Paper Products

The following principles should be adopted to achieve maximum performance from recycled paper products:

- Use a recycled fiber source of premium grade (long fiber length).
- Use a recycled fiber source that is free of contaminants.
- Use of recycled fiber should not result in poor performance.

High-performance corrugated packaging is best achieved through the specification of performance properties (e.g., compression strength) and not necessarily the material burst strength.

##### 2.1.1.1 Guidelines for Recycled Fiber Content

Corrugated fiberboard packaging should be manufactured using a **minimum of 50%** recycled fiber content using the maximum available post consumer material where adequate supplies exist without compromising needed performance.

##### 2.1.1.2 Calculating Recycled Fiber Content

Because corrugated mediums travel in the vertical as well as horizontal direction, take-up factors must be used when calculating a material's combined basis weight to compensate for the additional material. Industry approximations for the take-up factors are shown below:

Flute	Take-up Factor	Typical Example:	
A	1.55	Board Type:	Double wall
B	1.35	Flute:	B/C

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<b>C</b>	<b>1.43</b>	Test: Liner Combination: Combined Basis Weight:	350 psi /26/44/26/42 200 lbs/msf
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Sample Calculation: The combination of 100% recycled mediums and interior liners with near-virgin outside liners produces a high-performance, corrugated product with a proportionately large amount of recycled fiber. An example of a high-performance board with a similarly high contribution from reclaimed material is illustrated in [Table 3](#).

Component	Basis Weight (lbs/msf)	(times) Recycled Content (%)	(equals) Recycled Content (lbs/msf)	(times) Take-up Factor	(times) Quantity	(equals) Total Recycled Content (lbs/msf)
Liner board	42	25%	10.5	--	2	21.0
Liner board	44	100%	44.0	--	1	44.0
Medium	26	100%	26.0	1.43	1	37.2
Medium	26	100%	26.0	1.35	1	35.1
Total	200					137

$$\text{Recycled Content (\%)} = \frac{137 \text{ lbs/msf}}{200 \text{ lbs/msf}} = 68.5\%$$

**2.1.2 Recycling Aids for Second-Generation Cellulosic Materials**

Lenovo wishes to reduce or eliminate the use of non-recyclable packaging materials and packaging materials compositions that hinder recycling. The performance of any recycled paper products may be enhanced by incorporating any or all of these Lenovo required practices that apply:

- Eliminate the use of free-rise foam-in-place where feasible.
- Eliminate the use of adhesives to commingle materials (e.g., foam cushions glued to a corrugated pad).
- Minimize the use of bleached white corrugated board or oyster white board.
- Use water/soy-based inks when printing packaging materials. Ink components that have been FDA/USDA approved are the only acceptable alternatives.
- Use only functional coatings or impregnating that does not adversely affect material recycling. Some coatings that aid resistance to water, grease, or scuffing may be used with no adverse effect on material recycling. Avoid wax based coatings.
- Avoid the use of film laminations and/or cross-linked resins such as urea formaldehyde or polyethylene coated paperboard or solid bleached sulfate (SBS). Exceptions may apply for packaging designed for reuse.

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- Unless specifically instructed otherwise, use paper or plastic tape or starch glues in place of staples and hot-melt adhesives on the container's manufacturer joint and/or closures.

**2.1.3 Recycling Symbols and General Usage Guidelines for Paper Packaging**

The symbols shown below are consistent with the original recycling symbol promulgated by the [American Forest and Paper Association](#) (AFPA) and its predecessors, including the American Paper Institute and the Container Corporation of America. These symbols are typically used on paper & paperboard products. On these products you will usually see the recycled symbol with an explanation denoting the percentage of recycled content. However, even paper and paperboard products already made from recycled materials can be considered recyclable. It's important for consumers to keep in mind, that recovered paper fibers can not be recycled indefinitely. Paper fiber eventually breaks down into short, weak fibers that are not strong enough to be recycled into new paper products. For this reason, it's necessary for the paper industry to harvest new fiber that can be infused into the recycled paper manufacturing process.

The following guidelines are intended to encourage consistent usage of the recycling symbol throughout the paper industry and by its customers. The guidelines were developed by the association's membership and conform with the Federal Trade Commission's (FTC) *Guides for the Use of Environmental Marketing Claims*. "To the maximum extent feasible, the AF&PA and its member companies will urge proper use of the paper recycling symbols by its customers."

**The following excerpts are from the AFPAs Paper Recycling Symbol Guidelines Brochure:**

*"Used alone, the recycling symbol communicates that a paper product or package is both recyclable and made entirely from recycled material. As few products or packages can make both claims, use of the symbol alone is limited. In most cases, the recycling symbol must be accompanied by qualifying statements to clarify the intended claims."*

*"Using the recycling symbol to make a claim that a product or package is "recyclable" requires recycling collection programs to be available in a substantial majority of communities for that product or package. Making a "recyclable" claim is generally not recommended, as it is difficult to meet these criteria. If a "recyclable" claim is made, a qualifying statement should accompany the recycling symbol. Consider the following:*

**ACCEPTABLE:**

*"This package may not be recyclable in your area."*

**UNACCEPTABLE:**

*"Recyclable where facilities exist." This statement is not acceptable because it may lead consumers to believe that recycling facilities exist in their area."*

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For more information about the use of the recycling symbol or to view a copy of the FTC's *Guides for the Use of Environmental Marketing Claims*, you can visit the AFPA's website. The **AFPA's Paper Recycling Symbol Guidelines** brochure can also be found there.

**Additional Background**

The original Mobius loop design with the three chasing arrows twisting & turning among themselves has transformed over the years. **The symbols are often used interchangeably as their use is not regulated, nor required (when first developed the symbols lost the case for a trademark and fell into the public domain).** With this in mind, the new China RoHS requirements have adopted the use of this symbol as a way of identifying the material (Paper based). Its use is not required, but rather an acceptable alternative to the China paper based markings. Its usage is defined in Table 4 and Section 5 of this document.

**Print Location Guidelines**

If part-specific artwork has not been included with the purchase order, the symbol used should be printed near the box maker's certificate in approximately the same size or in accordance with the Chinese requirements in Section 5 of this document. Markings should appear on bottom major flaps of RSC or HSC type containers and the width panels of tubes/sleeves (Example: double-cover containers).

**Recyclable Content Symbols**



These symbols represent two variations of the original recycling symbol. The upper symbol in outline form is accepted as the universal recycling symbol, while the lower one was a modification. Paper products typically display the outline form, often with lettering such as - Recyclable. When identified with one of the symbols, packaging materials are referred to as recyclable or able to be recycled. Although the symbols are used on packaging distributed nationwide, the laws governing collection of these products for the purpose of recycling are determined locally and can vary widely.



**Recycled Content Symbols**

100% Recycled Content



Packaging marked with this symbol was manufactured with 100% recycled materials. Typically, additional information is included with the symbol such as - 'Printed on recycled paper' or '100% recycled material' or simply 'Recycled'. The text is usually located to the right of or below the symbol. See example below.

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**100%**  
**RECYCLED PAPERBOARD**  
 YY% SUBSIDIARY CLAIM

The AFPA promotes the use of the 100% recycled symbol on all paper products that are manufactured with 100% **recovered** paper fiber. Containers that are free of contaminants (e.g., corrugated coatings) should be marked with a symbol.



When a percentage is indicated within this symbol, that percentage of the product has been made from recycled post consumer materials.

Partial Recycled Content



This symbol differs from the others by having solid black arrows within an outer black circle. The circle denotes that at least some content came from recycled material. As with the 100% Recycled Content symbol, additional information is typically included, such as – 50% Total Recovered Fiber/25% Post Consumer Content or 50% Recycled Content. The text is usually located to the right of or below the symbol. See example below.



**XX%**  
**TOTAL RECOVERED FIBER**  
 YY% SUBSIDIARY CLAIM

The AFPA recycled content symbol may be used to identify any paper based packaging that's manufactured from **less than 100%** recycled paper fibers. The term "total recycled fiber" or "total recycled paper" may be used in place of "total recovered fiber". This symbol must state recycled content within 5% (by weight).

**Subsidiary Content Claim**

A statement of subsidiary content information may be included directly below the primary claim as shown in the above tables. The subsidiary claim should be used to clarify the percentage of recovered paper fibers obtained from post consumer sources. Example: Substitute 40% POST CONSUMER for YY% SUBSIDIARY CLAIM.

**Additional Symbols for Paper Products (May Require License Agreement)**

CARTON MADE WITH  
  
 MINIMUM 25% POST  
 CONSUMER CONTENT

This symbol is specific to the use of recycled paperboard. The graphical portion is a registered trademark and is controlled by the [100% Recycled Paperboard Alliance](#), an association of paperboard manufacturers. This symbol may be used provided a licensing agreement is in place. The registered trademark is in green for illustration purposes. The symbol and explanation can be interpreted as follows: The paperboard material of the carton has been made from 100% recycled content. Of that recycled content, at least 25% came from post consumer content. In other words, at least 25% of the paperboard used to make the carton came from recycled

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products that passed through the hands of consumers.



The [Corrugated Packaging Council](#) (CPC) has developed a recyclable symbol for use on corrugated packaging. The symbol may be used without specific permission on all corrugated products that are readily recyclable. If a corrugated product is coated with a material that is not convertible to pulp, then it is not readily recyclable. A wax or asphalt coating, for example, prevents a corrugated product from being readily recyclable. The symbol is merely a general statement that the corrugated product on which it appears can be recycled. It is not meant to imply that any content was already recycled or a product of recycling. The CPC is a non-profit organization that develops and coordinates industry-wide programs to address corrugated packaging issues. It is sponsored by the [Association of Independent Corrugated Converters \(AICC\)](#), and the [Fibre Box Association \(FBA\)](#). This mark is only applicable in the United States.



This symbol shown in the table below is only used in Europe, specifically for the German market. It is a symbol that indicates compliance to requirements which guarantee that the material bearing this symbol is recyclable. It obligates German recycling companies to collect and recycle the material. Use of the symbol must be applied for and a fee assessed. Application can be made through local European paper or corrugated manufacturers or directly through RESY GmbH, PO Box 101541, 64295 Darmstadt, Germany (Email: [resy@vdw-da.de](mailto:resy@vdw-da.de)). For detailed information see the RESY GmbH website <http://www.resy.de>. In this figure, 10330 represents a unique identifier assigned to a specific corrugated manufacturer or user.

## 2.2 Polymeric Material

### 2.2.1 Guidelines for Recycled Resin Content

In addition to specifying the use of easily recyclable materials, Lenovo Corporation promotes recycling through its purchase of products that contain recycled materials. To assist in achieving this objective, Lenovo requires that plastic packaging must be manufactured using the maximum possible post consumer recycled resin. This requirement is contingent upon several factors, including the existence of processes that produce equivalent performing materials. The percentage of post consumer content technically achievable depends on the chemistry of the material utilized, the performance requirements of its end use application, and the availability of usable post consumer recycled feed stocks. Due to these variables, this requirement will be measured on an individual application basis. For example, polyurethane foams are currently produced using a process that does not permit recycled resin to supplement prime material while some high density polyethylene (HDPE) materials can achieve up to 100% recycled content. It is Lenovo’s intention for suppliers to assess the use of post consumer recycled resin for Lenovo applications, and utilize the maximum percentage content practicable.

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SPI Resin Identification Code - Guide to Correct Usage:

<http://www.plasticsindustry.org/outreach/recycling/2124.htm>

Note: Rigid plastic packaging containers (RPPCs) with a minimum capacity of 0.236 liters (eight ounces) or its equivalent volume and a maximum capacity of 19 liters (five gallons) or its equivalent volume must be manufactured with at least 25% post consumer recycled content material or be reused a minimum of five times, in order to be sold in the states of California or Oregon. Certification for the above two options is required within 60 days of receiving notification via certified mail. For the 25% post consumer recycled content option, certification should be obtained from the container manufacturer. The five time reuse option must be certified by the product manufacturer.

<http://www.ciwmb.ca.gov/Publications/Plastics/43205002.pdf>

**2.2.2 Plastic Coding System (applicable to Rigid Plastic Packaging Containers)**

The Society of Plastics Industry (SPI) has developed a coding system that identifies the commonly used plastic resins for the purpose of recycling. Although originally designed to assist plastic bottle manufacturers, some industrial plastic manufacturers and users of plastic packaging have adopted use of the system to assist them with resin sortation for recycling. In [Figure 1](#), "A" and "B" indicate the percent of recycled content of the material in the form: post consumer/total recycled material. This presents a straightforward means of identifying the recycled content of the material, yet eliminates the potential for misleading marketing claims. The recycled composition of a packaging part may be described as follows:

(A) 25% Post consumer waste recycled content  
15% Industrial waste recycled content

(B) 40% Total recycled content  
60% Material

-----  
100% Total

(C) = the figure outline; an isosceles triangle comprised of chasing arrows.

(D) = the numerical identification for the material and has been taken from the SPI standard.

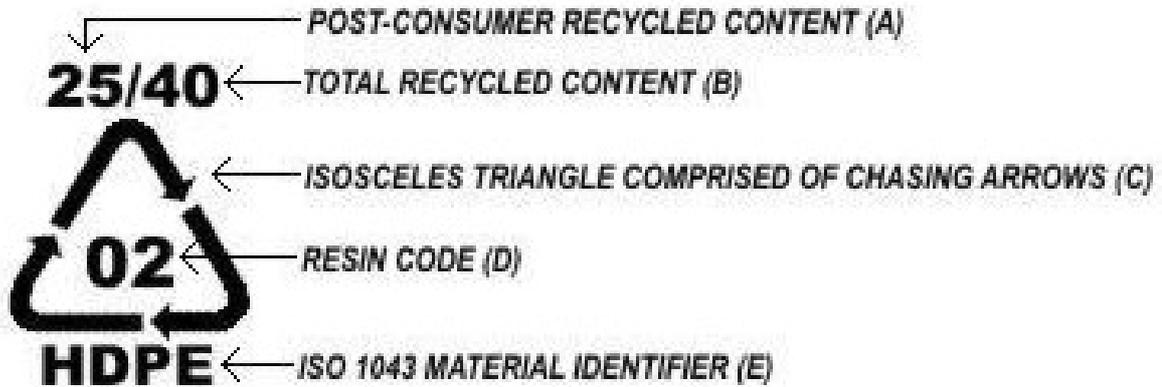
Refer to [Table 4](#) for a list of selectable SPI resin numbers. Use of the SPI resin number "07" is in conjunction with the ISO 1043 acronym. If the plastic is not a pure resin, it should bear the mark "Other" in place of the ISO 1043 acronym.

(E) = the acronym identifying the material. The ISO 1043 acronyms are identified in [Table 4](#). It is essential that the SPI resin number "07" be accompanied by the ISO 1043 acronym, if appropriate.

**Figure 1. The Resin Identifier**

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**Note:** “A” & “B” are not required, but this guideline eliminates the potential for misleading marketing claims.

Application of the resin identifier requires that resins be 99% pure to avoid contamination during subsequent recycling.

If the plastic part is **not** manufactured from **100%** post consumer recycled materials, a qualification must be made which clearly identifies the minimum percentage of recycled plastic in the package. This qualifier must state recycled content within 5% (by weight). Suppliers of plastic packaging having knowledge that their materials contain or have been in contact with contaminants, including hazardous materials must consider the effects of these elements and may best serve the recycling effort by intentionally omitting the resin identifier.

**2.2.3 Marking of the Resin Identifier**

**Molded Parts**

When marking a molded plastic piece with the resin identifier, it is recommended that the identifier be embossed on the part ejection pins. Because the pins are not an integral part of the mold, the molder selects the appropriately marked pin whenever new parts are molded. This method of imprinting is preferred as this process allows flexibility in resin recycled content identification. It also adds little expense to tool development or the piece price of molded cushion parts. Each time a cushion is molded, the resin identifier (e.g., six for EPS) and recycled content will be permanently displayed on the molded part.

**Fabricated Parts**

It is recommended that fabricated parts including those made of polyurethane or polyethylene similarly apply the resin identifier using either hot wire imprinting or a stamp which prints the appropriate mark using permanent ink. Caution must be used when selecting the ink and location to ensure it does not smear or transfer to the machine covers. Each individual component must be marked. The marking may be applied with a small permanent label if that is the only way to achieve compliance.

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### 2.3 Miscellaneous Symbols (May Require License Agreement)



A generic form of the plastic resin identification code is also being utilized to designate recyclability of other packaging materials. Usually there's descriptive text designating the particular content. This is apparent with the new China RoHS requirements.



The 'green dot' was originally developed by a privately owned non-profit German company, in 1991. It has since been adopted by other countries of the European Union. The presence of this symbol on packaging denotes that the manufacturer of the package has purchased a license for the right to use the 'green dot' trademark. The cumulative license fees fund a system of not only recovering & recycling packaging materials, but also of minimizing the use of packaging material, and of creating packaging that is easier to recycle (It is NOT a recycling mark). This mark is **mandatory** in some European countries and should be applied to all Lenovo primary packs, most likely a corrugated carton, but could also be placed on a paperboard insert used in a retail blister pack.

### 2.4 Marking of Patents

All Thermoplastic cushions (RLDPE/RHDPE) must be marked with the following phrase: "Pat. [www.lenovo.com/legal/patents.html](http://www.lenovo.com/legal/patents.html)". No patent numbers should be listed on the thermoplastic cushions (RLDPE/RHDPE).

### 2.5 Summarized Mandatory Requirements for Packaging Material Coding System

*Note: This summary section does not include usage of Japanese & Korean Markings. Nor does it include some additional specifics for the Chinese Markings. Please see Sections 3.0, 4.0, & 5.0 for additional requirements.*

**Guidance:** For items highlighted in **GREEN**, mark these routinely even if not specifically mandated by China. For those items highlighted in **GRAY**, marking is optional, but encouraged. Specifically, if the item is already being printed or labeled with other information (i.e.: Part Numbers) add the material code markings. When marking, apply them regardless of origin or destination. **Priority for markings is on external primary and secondary packaging.** Markings listed as optional and highlighted in gray are based on the example given and Lenovo usage. If the primary exterior packaging was made of these materials then the marking would be mandatory. Marks may be applied by printing, labeling, embossing or molding in. Colors may match existing package printing colors. Pay special attention to the leading zero now included in the summary table for plastics. This is the specified format in Chinese Standard GB 18455 and should be followed. However, do not scrap materials that are marked with the single digit number as shown in the table below. Interpretations and guidance for China RoHS requirements are subject to change at any time based on practical experience.

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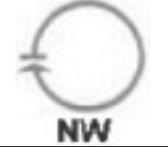
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Although codes have been assigned for various materials in the EU, aside from plastics, they are not commonly used. Therefore, if there is a conflict between the EU code and the China code, apply the China code. Also, if there is no code for China for a given material, then existing markings may be used. For instance, the code "OTHER" for plastic group #07 may be used. The Chinese standard GB 18455-2001 aims to harmonize with global industry practice, so changes are possible that would improve commonality.

Table 4: Summary of Packaging Material Categories and their respective Identification Codes							
Yellow Highlighting indicates apparent conflict between EU codes and Chinese codes							
Material Category	Packaging Material Description	ISO 1043-1 Code	EU/ SPI Code	EU Initials SPI #	China Code	China Initials	Specific Examples used in EIP Packaging for Clarity (not all are necessarily used by Lenovo)
 	Polyethylene Terephthalate (1)	PET	PETE	01	PET	01	Retail molded blisters and trays
	High Density Polyethylene	PE-HD	HDPE	02	HDPE	02	Blow Molded Conts., Cushions, bottles Flexible Packaging made from HDPE
	Polyvinyl Chloride (2)	PVC	V	03	PVC	03	Retail molded blisters and trays Skin wrap, shrink wrap, stretch wrap
	Low Density Polyethylene	PE-LD	LDPE	04	LDPE	04	Molded & Fabricated Cushions Stretch Wrap, Poly Bags, Bubble wrap
	Polypropylene	PP	PP	05	PP	05	Molded containers, Cushions, Bottles Carton Sealing Tape
	Polystyrene (includes Arcel™)	PS	PS	06	PS	06	Molded Cushions, trays
	Polyurethane (Ester Type)	PURS	Other	07	-	-	Fabricated Polyurethane Cushions
	Polyurethane (Ether Type)	PEUR	Other	07	-	-	
	Commingled/Mixed Resin	-	Other	07	-	-	Carton Sealing Tape, Polyester or Nylon banding
	Plastic / Aluminum (4)		-	-	-	11	ESD shielded bags & ESD barrier bags
	Plastic / Tin		-	-	-	12	No known application in EIP packaging
	Plastic / Mixed Metals		-	-	-	13	No known application in EIP packaging
	Plastic / Glass		-	-	-	14	No known application in EIP packaging
	Glass / Aluminum		-	-	-	21	No known application in EIP packaging
	Glass / Tin		-	-	-	22	No known application in EIP packaging
	Glass / Mixed Metals		-	-	-	23	No known application in EIP packaging
	Paper or Fibreboard / Plastic		-	-	-	31	Bubble lined Jiffy bags - External pkg'g Bubble lined Jiffy bags - Internal pkg'g
	Paper or Fibreboard / Aluminum		-	-	-	32	Aluminum Foil Lined insulated cartons
	Paper or Fibreboard / Tin		-	-	-	33	No known application in EIP packaging
Paper or Fibreboard / Mixed Metals		-	-	-	34	No known application in EIP packaging	
Paper or Fibreboard / Plastics / Metals		-	-	-	41	Armaceal Conts. w/ metal attachments Primary & secondary shipping cartons Layer pads, dividers, & Inserts	
	Note (5)	Note (6)	Corrugated Cardboard (7)	PAP	20	CB	-
			Non-Corrugated Solid Fibreboard	PAP	21	NCFB	-
			Paper	PAP	22	WPP	-
			Paperboard	PAP	-	PB	-
			Corrugated Fibreboard (7)	PAP	-	CFB (8)	-
Metals	Steel		FE	40	FE	-	Pallet/Ramp reinforcements, hardware

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						(nuts, bolts, screws, nails). Steel Banding
	Aluminum	ALU	41	ALU	-	No known application in EIP packaging
<b>Wood (9)</b> 	Wood	FOR	50	NW	-	Plywood, solid wood, oriented strandboard (OSB), particle board.
	Cork	FOR	51	-	-	No known application in EIP packaging
<b>Fabrics</b>	Cotton	TEX	60	-	-	No known application in EIP packaging
	Jute	TEX	61	-	-	No known application in EIP packaging
<b>Glass (10)</b> 	Colorless/Clear Glass	GL	70	GL1	-	No known application in EIP packaging
	Green Glass	GL	71	GL3	-	No known application in EIP packaging
	Brown Glass	GL	72	GL2	-	No known application in EIP packaging

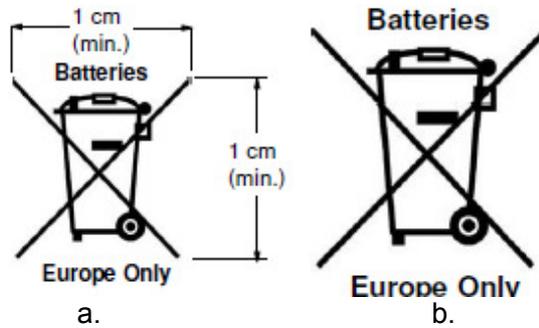
- (1) In the scientific community they call polyethylene terephthalate, "PET", but the recycling code is PETE. Although the acronym PETE was adopted by manufacturers to identify packaging made from PET, primarily in response to a potential trademark dispute, a recycling symbol that includes the designation PET rather than PETE has been identified on packages of products imported from outside of the US.
- (2) Reminder: Lenovo prohibits the use of PVC (polyvinyl chloride) for packaging applications.
- (3) Identifying the major components under the symbol of the composite material, as shown in the chart, is highly encouraged.
- (4) ESD Shielding bags and moisture barrier bags could be considered code "11". However, industry convention has used "07" for these in the past. Lenovo's opinion is that these should be marked as "11"; however, we will defer to industry convention to avoid trouble if consensus settles on "07" for these materials.
- (5) The normal chasing arrows symbol commonly used for corrugated board may be used without any initials (example: PAP or CB). Do Not rework items that contain the twisting arrows symbol. Use both symbols in future packaging development.
- (6) The "Green Dot" is mandatory in multiple European countries. In today's supply chain product can ship from anywhere, to anywhere, therefore the mark should be placed on all Lenovo packaging, regardless of origin or destination. The symbol is to be placed on the packaging itself or on the label and is compulsory to display it on primary packaging, with the exception of specific, duly justified cases in which there is a degree of flexibility, as provided by law. Placing it on the secondary or tertiary packaging is optional. It is listed in the chart under Paper, but it could also be placed on other materials based on the product's primary package or on the label itself.
- (7) The layman term "corrugated cardboard" is widely used as meaning for the typical corrugated fiberboard box. In the packaging industry this is not a technical term (cardboard) to describe material; however, Lenovo must use the markings how they are intended for China RoHS. The term "corrugated fiberboard" is the standard technical term used by the packaging field to describe a standard corrugated box, but in the GB 18455 specification it is meant to describe corrugated combined board like Corrupad™.
- (8) The code FB, which is in the translated version of GB 18455 is a mistake and was never a code in the original Chinese version. The code CFB is the original term and should be used for Lenovo packaging if applicable.
- (9) It is not necessary to add the "FOR" or an "NW" marking for wood since it is easily identified. Despite the provision for a wood marking (NW), it is not necessary for us to include this on pallets, crates, & so on even if it is the primary packaging.
- (10) Since glass isn't used in EIP packaging there should be no applicability; however, if by some chance glass was included, it must be marked.

**European Battery Recycling, Waste Bin Symbol**

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A modified European waste bin symbol, intended to prevent discarding batteries into the trash, is now also part of this specification. It is included in this specification as an alternative for shipping locations to have this symbol preprinted on the packaging in lieu of printing on the product package labels in case that capability does not exist at any given location.



- a. Symbol showing minimum dimensional size (ref.) for packaging applications
- b. Updated symbol as it would appear on packaging or labels applied to packaging.

Note: The appearance of the waste bin symbol on the packaging is not intended to suggest that the packaging itself can not be discarded. The regulation requires that the waste bin symbol appear on packaging if the battery is too small to have the symbol on the battery itself, such as in the case of button cell batteries. The additional of the words “Batteries – Europe Only” is intended to qualify this scope and prevent misinterpretation outside of Europe.

The waste bin symbol must appear on all systems packagings, since virtually all systems include parts which contain batteries.

- Method 1 (preferred): The waste bin symbol may be printed on demand as part of the product packaging label, or
- Method 2 (acceptable): alternatively, the waste bin symbol may be preprinted on the packaging as artwork, or
- Method 3 (last resort): The waste bin symbol may be printed as a separate marking or sticker placed on the outside packaging.

**2.6 Responsibilities of Lenovo’s Suppliers**

1. These requirements apply to all packaging materials used to make shipments to Lenovo or to customers on Lenovo’s behalf. They also apply to all packaging materials purchased by Lenovo, and subsequently used by Lenovo for its products, parts and supplies shipments.
2. Suppliers of packaging material products have the sole responsibility to accurately identify and mark the post consumer recycled content in their products so as to comply with any international, federal, state and local laws. These laws may require specific levels of recycled content and/or labeling in accordance with environmental labeling and truth in advertising regulations.

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3. Suppliers who design packages for shipment of parts, options, supplies or products **must ensure** that they utilize materials and methods which are conducive to recycling. Examples that introduce contaminants which would preclude the subsequent recycling of packaging materials are:

- The use of free-rise foam-in-place where foam is dispensed directly into the corrugated container, or
- The use of adhesives to commingle materials (e.g., polyethylene foam glued to a corrugated pad).
- In addition, avoid the specification of colors which may inhibit recycling.

4. Suppliers who use packaging materials for shipments to Lenovo or sell packaging materials to Lenovo, but do not manufacture and monitor all phases of the material production, shall verify that their supplier of cellulosic material conforms to the requirements identified above.

5. Suppliers should contact Lenovo Purchasing at a manufacturing or distribution location if they are in need of assistance in understanding these responsibilities.

## 2.7 Local Lenovo Responsibilities

It is recommended that local Purchasing and Packaging Engineering groups establish site audit programs to assure packaging materials entering the manufacturing or distribution process are recyclable (Example: not permanently commingled) and properly identified with the correct resin identifier (in the case of plastics) or properly marked using the chasing arrow symbols and codes (refer to Table 4). These programs may vary depending upon number of suppliers, number of parts received, etc.

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## 3.0 Japanese Symbols- Paper & Plastic Package Materials

All containers and packaging made of plastic or paper such as carton box, molded cushion, bag/envelope and film/sheet are applicable, but corrugated fibreboard material and fabricated plastic cushion are not applicable. Material initials are derived from ISO 11469.

In summary, the preference is for the markings to appear on each article so that they can be easily identified. However, there are many exceptions including situations where markings of any type are not normally done. In this case, a combination marking on the shipping container to identify all materials contained within the package assembly must be applied whether the materials are marked individually or not. The purpose of the combination marking is to communicate to consumers in Japan prior to purchase and to identify materials that are not or cannot be marked individually. All subject items should be marked regardless of origin or destination since redeployment of inventory to Japan is possible. The regulation that requires this is applicable only to Japan but the markings may appear on goods sold outside of Japan. Unless specifically exempted herein, all packaging materials are within scope of this rule.

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The package engineer shall obtain (written) acceptance from the responsible Japanese Brand Planner for the application artwork.

**Step by Step Instructions:**

1. Find the corresponding “part name” from the first column of the following table.
2. Then determine which material type accurately describes the item.
3. Specify that the marking(s) indicated be printed or embossed on the article itself where feasible and/or within the combination marking on the outer shipping container.
4. In case the direct marking is omitted (on the article), the combined indication on the carton or other readable location is required.
5. Plastic cases and paper cases such as plastic-CD-case and paper-CD-case are not applicable for the indication, because these cases will be stored together with CDs and will not be disposed.
6. Containers and Packaging being otherwise free from printing, stamping or embossing are exempted from the marking but the combined indication on the external container is required in this case.
7. All containers and packaging with insufficient marking space (less than 50 square centimeters) are exempted from marking but the combined indication on the external container is required.
8. The size of the identifying mark shall be more than 6 mm high for printing, and more than 8 mm high for stamping and embossing. No maximum size is given.
9. Lenovo Reference: The artwork files are available on ERE or EGI-Net for P/N 41A0681 (for plastics) and P/N 41A0682 (for paper).

<b>Table 5: Japanese Symbols Summary</b>		
<b>Part Name</b>	<b>Material/Process</b>	<b>Japanese Mark</b>
<b>Carton Box</b>	<b>Corrugated Fiberboard</b>	N/A
	<b>Paper/Paperboard</b>	
	<b>Plastic (Example: made of Polyethylene (PE))</b>	
<b>Cushion</b>	<b>Corrugated Fiberboard</b>	N/A
	<b>Paper/Paperboard (including molded paper pulp)</b>	

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	Molded Plastic Cushion (Example: made of PE)	 >PE<
	Fabricated Plastic Cushion	N/A
Bag/Envelope	Plastic (Example: made of PE)	 >PE<
	(Example: made of paper)	
Film/Sheet	Plastic (Example: made of PE)	 >PE<
	Paper	
General Identification Marks	Plastics	
	Paper	
Composites	<b>Mixed Material Types:</b> Use the appropriate general identification mark of the most predominant item and then underline the most predominant item. In this example, a composite of predominantly polyethylene plastic (PE) combined with some metal (M).	 > <u>PE</u> , M <
	<b>Mixed Plastics:</b> Use the appropriate general identification mark and then underline the most predominant item. In this example, a composite of predominantly polypropylene plastic (PP) combined with polyethylene terephthalate (PET).	 > <u>PP</u> , PET <
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<b>Notes:</b>		
1. Lenovo Reference: The artwork files are available on ERE or EGI-Net for P/N 41A0681 (for plastics) and P/N 41A0682 (for paper).		
2. Plastic cases and paper cases such as plastic-CD-case and paper-CD-case are not applicable for the indication, because these cases will be stored together with CDs and will not be disposed.		
3. Containers and Packaging being otherwise free from printing, stamping or embossing are exempted from the marking but the combined indication on the external container is required in this case.		
4. All containers and packaging with insufficient marking space (less than 50 square centimeters) are exempted from marking but the combined indication on the external container is required.		
5. The size of the identifying mark shall be more than 6 mm high for printing, and more than 8 mm high for stamping and embossing.		

<b>Examples of Markings for Exterior Containers and Individual Items</b>
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<p><b>Example 1:</b> English translation (ref) of illustration shown in example 2. Provided for understanding.</p> <p>Important: Print the Japanese version, not the English version where applicable.</p>	<p>Please dispose the packaging materials according to the below information.</p> <div style="border: 1px solid black; padding: 5px;"> <p style="text-align: center;"><b>Material information for containers and packaging made of plastics</b></p> <div style="display: flex; justify-content: space-between; align-items: center;">  <p>All plastic bags</p> </div> <div style="display: flex; justify-content: space-between; align-items: center;">  <p>All shrink films</p> </div> </div>
<p><b>Example 2:</b> Japanese marking showing how multiple materials would be identified on the outer container. Same meaning as that shown in example 1.</p> <p>Important: Where applicable, this would be what is printed (not the English version shown in example 1).</p>	<p>包装材料を廃棄する際に分別の参考にして下さい。</p> <div style="border: 1px solid black; padding: 5px;"> <p style="text-align: center;"><b>本製品に使用されるプラスチック製包装材の材質表示</b></p> <div style="display: flex; justify-content: space-between; align-items: center;">  <p>すべてのポリ袋</p> </div> <div style="display: flex; justify-content: space-between; align-items: center;">  <p>すべてのシュリンク・フィルム</p> </div> </div>
<p><b>Example 3:</b> English translation (ref) of message shown in example 4.</p> <p>Important: Print the Japanese version, not the English version if applicable.</p>	<p>Please dispose the packaging materials according to the below information.</p> <div style="border: 1px solid black; padding: 5px;"> <p style="text-align: center;"><b>Material information for containers and packaging made of plastics</b></p> <div style="display: flex; justify-content: space-between; align-items: center;">  <p>Cushion : &gt;PS&lt;</p> </div> <div style="display: flex; justify-content: space-between; align-items: center;">  <p>All Plastic Bags : &gt;PE&lt;</p> </div> <div style="display: flex; justify-content: space-between; align-items: center;">  <p>Protection Sheet for TFT Panel : &gt;PET&lt;</p> </div> </div>

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<p><b>Example 4:</b> Japanese marking showing how multiple materials would be identified on the outer container if applicable.</p> <p>Important: Japanese version shall be used; English translation (ex. 3) is for reference only.</p>	<p>包装材料を廃棄する際に分別の参考にして下さい。</p> <div style="border: 1px solid black; padding: 10px;"> <p style="text-align: center;">本製品に使用される プラスチック製包装材の材質表示</p> <div style="display: flex; align-items: center; margin-top: 20px;">  <p>種 衝 材 : &gt;PS&lt;</p> <p>すべてのポリ袋 : &gt;PE&lt;</p> <p>画面保護シート : &gt;PET&lt;</p> </div> </div>
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## 4.0 Korean Discharge Marks for Packaging

The scope of this law that affects Lenovo products is all packaging materials of plastic resin, in particular that used for expanded foam cushions (“buffers”) are applicable. Material initials are derived from ISO 11469. These marks are mandatory as of 1/1/2003 for almost all electronic and electrical products sold in Korea that are handled directly by end consumers. Markings must be as large as practical but must be at least **8mm x 8mm or larger**. Direct printing or embossing (molded in) is preferred, but an attached label may also be used if necessary. Additional details can be found by navigating through these web sites - <http://www.epr.or.kr> & <http://envico.or.kr>.  
 Direct link: [http://www.envico.or.kr/language/Eng/epr/separate/Eng\\_Separate\\_Design\\_View.htm](http://www.envico.or.kr/language/Eng/epr/separate/Eng_Separate_Design_View.htm).  
 Artwork files can be downloaded. Many sizes are available. If the direct link is broken, you can navigate through main websites listed above. **The updated (new version) Korean Discharge Marks are mandatory effective since July 1<sup>st</sup>, 2012.**

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Labeling by Item

Item	Design	Item	Design
Pet		CAN	
Plastic		Paper Pack	
Vinyl		Paper	
		Glass	

Executive Summary for all Electronic / Electrical Items:

**DO Mark:** Molded and Fabricated Foam Cushions, Padded Envelopes and other cushioned plastic wraps or bags, **ESD Bags**, including micro foam and Bubble Wrap used for Finished Goods (Systems) and Options. Options are believed to be in scope because they are SOLD to end consumers.

**Exceptions:**

- Blank Vinyl and it's film or sheet (no any label or printing)
- If Plastic or Vinyl area is less than 50 cm<sup>2</sup>
- Stuff inside the packing is less than 30ml or 30g.
- Under structure situation or under material situation, it's impossible to print label or impossible to attach label
- If it's a wrap film and the thick is less than 20 micrometer

**Optional:** Corrugated boxes or inserts, tape, banding, Vacuum formed materials, Molded Pulp, paper cushions (i.e. Pad Pak & similar). Any packaging for **FRU's** (field replacement units), Spare Parts or components are out of scope because they are not SOLD.

Table 6: Korean Packaging Material Symbols Summary	
<p><b>Material Description:</b> Shown only are those that are likely to exist in Lenovo.</p>	<p><b>Korean Discharge Marks:</b> The color is <b>NOT</b> mandatory for the marking and just recommended for clearly classified. But if you choose blue or purple color for printing, you should comply with the below rule strictly.</p>

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	 <p>- the symbol in blue is Solid plastic (expanded foam)</p>  <p>-the symbol in purple is sheet plastic (Vinyl, PE Bag, film)</p>
<p><b>Expanded Polystyrene (EPS or PS)</b></p> <p>Ref: #6 on the SPI scale</p> <p>Notes:</p> <p>ARCEL should qualify for this symbol since it is also marked as #6 on the SPI scale.</p>	 
<p><b>Expanded HIGH Density Polyethylene (HDPE)</b></p> <p>Ref: #2 on the SPI system.</p>	 

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<p>Expanded LOW Density Polyethylene (LDPE)</p> <p>Ref: #4 on the SPI system.</p>	
<p>Expanded Polypropylene (EPP or PP)</p> <p>Ref: #5 on the SPI scale</p>	
<p>OTHER: May include the following:</p> <p>Polyurethane (PU)</p> <ul style="list-style-type: none"> <li>• Composite or Commingled Materials</li> </ul> <p>Ref: #7 on the SPI scale</p>	
<p><b>Note:</b> Korean markings also exist for PET, PVC, Paper, Aluminum, Steel, Glass and other specialty items which should not apply to Lenovo packaging subject to this regulation. Refer to: <a href="http://www.epr.or.kr">http://www.epr.or.kr</a> or <a href="http://envico.or.kr">http://envico.or.kr</a> for all available symbols.</p>	

## 5.0 Chinese Markings for Packaging

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National Standard of the People’s Republic of China (GB 18455-2001) is hereby a part of this specification. It applies to all types of packaging except inner packaging utilized for hazardous materials. See also Table 4. Key elements of the standard are copied here for convenience.

- 1. Marking Sizes:** Selection and use of mark sizes must be in proportion to the size of the packaging piece. 20x20mm, 40x40mm, 60x60mm and 80x80mm are offered as standard sizes. Smaller sizes may be used as necessary for smaller items.
- 2. Colors:** Markings should be printed monochromatically; generally, bright green printing is used. If the color used for the packaging piece makes the green graphic mark appear unclear, other suitable contrasting colors may be used also (Note: The shade of green is bright green, GSB G51001-94 G 03). Guidance Note: If all other markings are black or approved Lenovo color scheme, use that color.
- 3. Positioning of Marks:** Marks should be positioned in places easily visible to consumers; they must not conceal the packaged products.
- 4. Number of Marks:** Each packaging piece is generally to have only one mark (ref. Table 7), the most commonly used being the recyclable/renewable mark. Guidance Note: If a package assembly has four individual pieces of foam, all four should be marked since they would become separated in the waste stream.
- 5. Method of Using Marks:** Recycling marks should be selected and used correctly in accordance with the packaging material. Labeling of marks may be accomplished by printing, affixing of adhesive labels or spray application. Marks should be clear, and it must be ensured that they do not come off within the recyclable life.

**Table 7: Chinese Packaging Usage Markings (refer to Table 4 for identification marks)**

<p><b>1. Reusable:</b></p> <p><i>Guidance Note: Use only for defined closed loop systems. Not for standard pallets, and so on.</i></p>	
<p><b>2. Recyclable, Renewable:</b></p> <p><i>Guidance Note: Use for all packaging materials even if not actually recyclable. The purpose is to identify ALL packaging materials so that suitability for recycling can be determined locally when the material enters the waste stream.</i></p>	
<p><b>3. Contains Renewable Materials:</b></p> <p><i>Guidance Note: Do not use now, it is lacking legal definition of what is technically considered “renewable”. However, it is listed here since it is shown in the referenced GB 18455-2001 document.</i></p>	
<p><b>4. Green Dot Mark:</b></p> <p><i>Guidance Note: This symbol should be applied globally if license is purchased, but it is only meaningful in countries with 3rd party waste recovery programs (such as Europe).</i></p>	

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## 6.0 Definitions and Key Words

<b>Buffer</b>	Another word for “foam cushion” in South Korea. Specifically, packing materials that are made from foam-like single synthetic resins, which are made of beads containing hydrocarbons such as butane, hexane, pentane, etc., puffed by applying heat, or by other means. Examples of "buffer" materials: expanded polystyrene (EPS), expanded polyethylene (EPE) and expanded polypropylene (EPP).
<b>Cellulosic</b>	A substance made of plant parts including wood, paper
<b>Commingle</b>	To intermix dissimilar materials.
<b>Discharge Mark (Korea)</b>	A marking placed on the packaging materials to support recycling efforts.
<b>Expanded Foam</b>	Expanded resinous material with a cellular structure, manufactured by the dispersion of a gas in the liquid resin, and the subsequent setting of the expanded mass.
<b>Fabricated Foam</b>	Foam, usually expanded and extruded in plank form, that is cut and/or bonded into its final useful form.
<b>Flexible Container</b>	A plastic container that can be flexed and twisted, without the aid of tools, without damaging the container.
<b>Foam-In-Place</b>	Two liquid components combined under heat to produce polyurethane foam which is cast and formed around a particular shape. This process may be performed in either of two ways:  A. Using a mold, as with pre molding where finished cushions will be sent to the packager.  B. Using only the item to be packaged and the shipping carton, as with free-rise foam-in-place.
<b>Industrial Waste</b>	Material discarded from industrial operations or manufacturing processes. Such material can only be counted as recycled content if it would otherwise have not been recovered.
<b>Molded Foam</b>	Foam that has been cast into a particular form and allowed to expand and form its cellular, bubble-like structure. Note: all molded foams are expanded but not all expanded foams are molded, some are extruded.
<b>Options</b>	Items that are purchased by consumers for the purpose of upgrading their computer systems. Examples: Monitors, hard disk drives, mice, keyboards, speakers, etc. These are “in scope” for Korean markings.
<b>Polymeric</b>	A substance made of plastic.
<b>Post consumer Waste</b>	Materials which have been diverted, sorted for recycling after they have performed their designed purpose.
<b>Primary Package</b>	The first layer of packaging in contact with the part.
<b>Recyclable</b>	Waste material which is capable of being processed for subsequent use. Materials are only recyclable if there is a widely available economically viable collection, processing, and marketing system for the material.

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<b>Recycled</b>	Material which has already been reclaimed from a waste product and processed in order to regain material.
<b>Recycling</b>	The conversion of an item or material from its existing state for reuse as a similar or different item or material.
<b>Reusable</b>	When applied to packaging, reusable means a container, package, or component of the container or package (e.g., a foam cushion, plastic bag, etc.) is capable of being used more than one time, without being significantly changed (i.e., used in its same physical form, requiring only minor repair or cleaning). Reusable is not to be confused with recycling (which reprocesses the material).
<b>Rigid Plastic Packaging Container (RPPC)</b>	According to California legislation: "A plastic container which is not a flexible container, holds between 0.236 liters (eight ounces) and 19 liters (five gallons), and has essentially the same shape empty as full." Such packages are subject to mandatory minimum recycled content levels.
<b>Secondary Material</b>	Resultant material of a processed recyclable material.
<b>Secondary Package</b>	The second layer contains primary package(s).
<b>Source Reduction</b>	The design and manufacture of products and packaging with minimum volume of material and/or a longer useful life.
<b>Suppliers</b>	Organizations that provide parts, products, and components to an Lenovo site. This can include other Lenovo sites as well as independent vendors.
<b>Tertiary Package</b>	This includes the shipping container and all additional internal dunnage materials, if any.

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