Structured Product Labeling (SPL) Implementation Guide with Validation Procedures

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1 Introduction

Structured Product Labeling (SPL) is a Health Level Seven (HL7) standard based on Clinical Document Architecture and HL7 Reference Information Model (RIM) accredited by the American National Standards Institute (ANSI) for the exchange of product information. Structured Product Labeling documents include a header and body. The header includes information about the document such as the type of product, author and versioning. The body of the document includes product information in both structured text and data element formats. The United States Food and Drug Administration (FDA) uses SPL documents to exchange information covering a growing number of product related topics.

This document provides technical conformance criteria for SPL documents used by FDA. This combines the information previously covered in separate implementation guide and validation procedures documents.[1] A link to the latest SPL schema and controlled terminology used in SPL and other technical documents may be found on the FDA Data Standards Council web site at: http://www.fda.gov/ForIndustry/DataStandards/StructuredProductLabeling.

1.1 Organization

This document is divided into three parts. The first part of this document describes the technical conformance criteria that are applicable to header and body of the SPL document independent of the information being exchanged. The second part of the document describes product related technical conformance criteria. The third part describes the technical conformance criteria applicable to the type of information being exchanged.

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[1] Instead of 2 documents that both contain details on the structure of SPL files for various purposes with examples, explanations and conformance criteria at varying degree of detailing, the combined document is a systematic compilation of all such technical information in a new topical organization. As SPL is used for an increasing number of different types of products or aspects about products, the old organization became difficult to read and to maintain consistently. The new unified implementation guide with topical organization combines the discussion of consideration and detailed technical conformance rules for each aspect or use of SPL in one place.

1.2 Validation Procedures

Detailed validation procedures are presented at the end of most sub-sections and are clearly marked with the heading "Validation Procedures." These procedures can be used by humans as check-lists to verify if their submission is correct. The validation procedures are written specific and operational so that they may be checked by systems processing SPL documents. Each validation procedure has a unique paragraph number. These paragraph numbers are generally stable over time, but they may change between versions of the document when – rarely – a validation procedure is inserted between existing ones; normally, however, new validation procedures are appended to the end of their respective sub-sections.

1.4.2.1 [Reserved]

1.4.2.2 There are two ids (except for an initial labeler code request, which should be submitted with only one id.) [See 5.1.2.3.]

1.4.2.3 [Reserved]

1.4.2.4 [Reserved]

1.4.2.5 [Reserved]

1.4.2.6 One id has the root 2.16.840.1.113883.6.69 and an extension (except for an initial labeler code request, which should be submitted without this id.) [5.1.2.4]

2 SPL Documents in General

2.1 SPL Header

2.1.1 General

Validation Procedures

2.1.1.1 XML is well formed and valid against the schema

2.1.1.2 There are no data elements and attributes in addition to those described in this document

2.1.1.3 There are no spaces in codes

2.1.1.4 Codes do not have a codeSystemName attribute

2.1.1.5 Display names are case insensitive

2.1.1.6 There are no spaces in id extensions

2.1.1.7 Letters in Globally Unique Identifiers (GUID) are lower case

2.1.1.8 There are no empty or incomplete elements except, in certain circumstances, code, title, text, and time (an id has a root, a code has a code system).

2.1.1.9 Characteristics have a class code of "OBS" or no class code at all.

2.1.1.10 There is no confidentiality code on anything but inactive ingredients, registrant, and assigned establishments outside establishment registrations.

2.1.1.11 If there is a confidentiality code, then the code is "B" and the codeSystem is "2.16.840.1.113883.5.25"

2.1.2 XML references

This information includes the location of the current stylesheet for the FDA view of the SPL and the location of the current schema. The start of the SPL file is the same for every SPL document and is as follows:

```
<?xml version="1.0" encoding="UTF-8"?>
<?xml-stylesheet
   href="http://www.accessdata.fda.gov/spl/stylesheet/spl.xsl"
   type="text/xsl"?>
<document xmlns="urn:hl7-org:v3"
   xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
   xsi:schemaLocation="urn:hl7-org:v3
   http://www.accessdata.fda.gov/spl/schema/spl.xsd">
```

Validation Procedures

2.1.2.1 XML reference is for version 1.0 and encoding "UTF-8".

2.1.2.2 There is an xml-stylesheet reference to http://www.accessdata.fda.gov/spl/stylesheet/spl.xsl

2.1.2.3 The schemaLocation of the urn:hl7-org:v3 namespace is provided as "http://www.accessdata.fda.gov/spl/schema/spl.xsd"

2.1.2.4 There are no processing instructions other than the xml and xml-stylesheet declarations.

2.1.2.5 SPL file name is the id root followed by ".xml"

2.1.2.6 A submission contains only the SPL file whose name ends in '.xml' and associated image files whose names end in '.jpg'.

2.1.2.7 All image files associated with the SPL document must be actually referenced from that SPL document.

2.1.3 Document information

This provides basic information for the identity of the particular document, its type, title, date and versioning as a member of a document set.

Terminology: The SPL document types are from LOINC. This code provides information about the subject matter of the document e.g., prescription animal drug.

```
<document>
  <id root="50606941-3e5d-465c-b4e0-0f5a19eb41d4"/>
  <code code="51725-0" codeSystem="2.16.840.1.113883.6.1"
        displayName="Establishment registration"/>
  <title>Establishment Registration</title>
  <effectiveTime value="20070424"/>
  <setId root="a30accef-f437-4136-808c-9ed4ada5fcf8"/>
  <versionNumber value="1"/>
```

- The <id root> is a Globally Unique Identifier (GUID) and is unique for each version of the document. Letters used in a GUID are lower case.

- The <code> is the LOINC code which provides information on the document type.

- The <title> data element is used for the title for the document, if necessary. Images are not included in the title. Multiple lines may be used in the title with each line separated by the line break
 tag. (note: all titles can also be as follows: <title mediaType="text/x-hl7-title+xml">).

- The <effectiveTime> provides a date reference to the SPL version including the year, month and day as yyyymmdd.

- The <setId> is a GUID and is a unique identifier for the document that remains constant through all versions/revisions of the document.

- The <versionNumber> is an integer greater than zero that provides a sequence to the versions of the document.

Validation Procedures

2.1.3.1 There is an id

2.1.3.2 id root is a Globally Unique Identifier (GUID).

2.1.3.3 id does not have an extension.

2.1.3.4 id does not match any other id in the document.

2.1.3.5 id is unique across all documents, sections and any other ids

2.1.3.6 There is a code

2.1.3.7 Code system is 2.16.840.1.113883.6.1

2.1.3.8 Code comes from the *Document type* list

2.1.3.9 Display name matches the code

2.1.3.10 There are no figures in the title.

2.1.3.11 There is an effective time with at least the precision of day in the format YYYYMMDD

2.1.3.12 There is a setId

2.1.3.13 setId is a GUID

2.1.3.14 There is a version number

2.1.3.15 Value of version number is a whole number > 0

2.1.3.16 Value of version number is greater than the value of any previously submitted version for the same setId

2.1.4 Author Information

The author information is represented as follows:

```
<document>
  <author>
    <assignedEntity>
      <representedOrganization>
```

Many times the author information is used to represent details on the businesses responsible for the products. This includes the labeler and registrant and establishments involved in manufacturing:

```
<author>
  <assignedEntity>
    <representedOrganization><!-- labeler -->
      <assignedEntity>
        <assignedOrganization> <!-- registrant -->
          <assignedEntity>
            <assignedOrganization> <!-- establishment -->
              <assignedEntity>
                <assignedOrganization><!-- US agent and importers -->
```

The following is a representative coding of the common structures in the header:

```
<document>
  <author>
    <time/>
    <assignedEntity>
      <representedOrganization><!-- labeler -->
        <id extension="DUNS Number" root="1.3.6.1.4.1.519.1"/>
        <id extension="NDC Labeler Code" root=”2.16.840.1.113883.6.69”/>
        <name>business name</name>

        <contactParty>
          <addr>
            <streetAddressLine>address</streetAddressLine>
            <city>city</city>
            <state>state</state>
            <postalCode>postal code</postalCode>
            <country code="country code">country name</country>
          </addr>
          <telecom value="tel:telephone number"/>
          <telecom value="mailto:email address"/>
          <contactPerson>
            <name>contact person name for labeler</name>
          </contactPerson>
        </contactParty>

        <assignedEntity>
          <assignedOrganization><!-- registrant -->
            <id extension="DUNS number” root="1.3.6.1.4.1.519.1"/>
            <name>business name</name>

            <contactParty><!-- same structure as above --></contactParty>

            <assignedEntity>
              <assignedOrganization><!-- establishment -->
                <id extension="DUNS number" root="1.3.6.1.4.1.519.1"/>
                <id extension="FDA establishment identifier"
                    root=”2.16.840.1.113883.4.82”/>
                <name>Establishment name</name>
                <addr><!-- as above --></addr>
                <contactParty><!-- as above --></contactParty>

                <assignedEntity>
                  <assignedOrganization><!-- U.S. agent -->
                    <id extension="DUNS Number" root="1.3.6.1.4.1.519.1"/>
                    <name>business name</name>
                    <telecom value="tel: telephone number"/>
                    <telecom value="mailto: email address"/>
                  </assignedOrganization>
```

```
                  <performance>
                    <actDefinition>
                      <code code="C73330"
                            codeSystem="2.16.840.1.113883.3.26.1.1"
                            displayName="display name"/>
                    </actDefinition>
                  </performance>
                </assignedEntity>
              </assignedOrganization>

              <performance>
                <actDefinition>
                  <code code="establishment business operation code"
                        codeSystem="2.16.840.1.113883.3.26.1.1"
                        displayName="display name"/>
                </actDefinition>
              </performance>
            </assignedEntity>
          </assignedOrganization>
        </assignedEntity>
      </representedOrganization>
    </assignedEntity>
  </author>
</document>
```

2.1.5 Identified Organizations

Most organizations are identified using Dun and Bradstreet identifiers (DUNS numbers). These are identifiers with the root 2.16.840.1.113883.6.69 and an extension.

```
<representedOrganization>
  <id extension="DUNS Number" root="1.3.6.1.4.1.519.1"/>
```

The only reason for an organization not being identified is if the organization remains anonymous but has sub-organizations (e.g., a listing file may not contain any registrant information)

```
<representedOrganization>
  <id extension="DUNS Number" root="1.3.6.1.4.1.519.1"/>
  <name>buiness name</name>
  <assignedEntity>
    <assignedOrganization>
      <!-- pass-through organization without ids or name -->
      <assignedEntity>
        <assignedOrganization>
          <id extension="DUNS Number" root="1.3.6.1.4.1.519.1"/>
          <name>buiness name</name>
```

Validation Procedures

2.1.5.1 One id is a DUNS number with the root 1.3.6.1.4.1.519.1

2.1.5.2 The id with the root 1.3.6.1.4.1.519.1 (DUNS number) has a 9-digit extension

2.1.5.3 There is a name.

2.1.6 Address

For addresses (addr) the following rules apply

```
<addr>
   <streetAddressLine>1625 29th street</streetAddressLine>
   <city>Camden</city>
   <state>NJ</state> <postalCode>08101</postalCode>
   <country code="USA" codeSystem="1.0.3166.1.2.3">USA</country>
</addr>
```

Validation Procedures

2.1.6.1 An address has street address line, city, and country

2.1.6.2 If there is a country code, then it is is an ISO 3-letter country code (code system “1.0.3166.1.2.3”).

2.1.6.3 If there is no code attribute, then the country name may be the code, otherwise country is a full country name matching the code.

2.1.6.4 If the country is “USA”, then the contact party has a state (2 letters) and postal code

2.1.6.5 If the country is “USA”, then the postal code is 5 digits with optionally a dash followed by 4 numbers

2.1.6.6 If the country is **not** in the *postal code validation* list, then there is a postal code

2.1.7 Telecommunication Addresses

Some elements may have telecommunication addresses. If an element has telecommunication addresses it usually allows for a telephone number and an email address.

```
<contactParty>
   <telecom value="tel:+1-800-555-1213;ext=112"/>
   <telecom value="mailto:Bob.Jones@acme.com"/>
</contactParty>
```

Validation Procedures

2.1.7.1 There are two <telecom> elements

2.1.7.2 One telecom value begins with “tel:” and is a telephone number

2.1.7.3 For telephone numbers, the following general rules apply:

2.1.7.4 telephone numbers are global telephone numbers;

2.1.7.5 telephone numbers contain no letters or spaces;

2.1.7.6 telephone numbers begin with “+”;

2.1.7.7 include hyphens to separate the country code, area codes and subscriber number;

2.1.7.8 have any extensions separated by “;ext=” (see Uniform Resource Identifier (URI) for Telephone Numbers RFC 3966).

2.1.7.9 One telecom value begins with “mailto:” and encodes an email address.

2.1.7.10 an email address is of the simple form <username>@<dns-name>

2.1.8 Contact Party

For most organizations, a contact party may be specified with a contact party as in the following example:

```
<contactParty>
   <addr>
      <streetAddressLine>1625 29th street</streetAddressLine>
      <city>Camden</city>
      <state>NJ</state> <postalCode>08101</postalCode>
      <country code="USA" codeSystem="1.0.3166.1.2.3">USA</country>
   </addr>
   <telecom value="tel:+1-800-555-1213;ext=112"/>
   <telecom value="mailto:Bob.Jones@acme.com"/>
   <contactPerson>
      <name>Bob Jones</name>
   </contactPerson>
</contactParty>
```

Validation Procedures

2.1.8.1 The contactParty has an addr

2.1.8.2 The contactParty has telephone number and email addresses.

2.1.8.3 There is one contact person name

2.1.9 Core Document Reference

For some SPL documents it is permitted to specify a “core document” reference. A document with a core document reference “inherits” all the sections from the referenced core document and may override certain top-level sections with its own sections. A core document reference is specified as follows:

```
<document>
  ...
  <author .../>
  <relatedDocument typeCode="APND">
    <relatedDocument>
      <setId root="20d9b74e-e3d8-4511-9df9-cec2087372fc"/>
      <versionNumber value="1"/>
    </relatedDocument>
  </relatedDocument>
  <component .../>
</document>
```

The reference contains the setId of the referenced core-document. The document and the core-document can develop independently. The core-document may be updated, but the reference remains to the latest core-document with the same setId. The version number in the reference may be provided to indicate which version of the core-document was used when at the time the referencing document was created or modified.

Validation Procedures

2.1.9.1 Type code attribute is as above.

2.1.9.2 There is no document id

2.1.9.3 There is a setId

2.1.9.4 setId is a GUID

2.1.9.5 Document setId is the set id of a core-document.

2.1.9.6 If there is a version number, then it is a whole number > 0.

2.1.9.7 If there is a version number, then it is less or equal than the version of the current core document with that setId.

2.1.10 Predecessor Document

Other documents may be merged into this document by providing a reference to the other predecessor documents that are replaced by this document. Do not provide a

reference to the predecessor document under the same set id as the document being submitted, as this is implicitly given by the set id and incremented version number of this document. Only provide references to documents of different set ids. The reference contains only the id of the other predecessor document, the setId and the version number. All these ids must match the ids of that other documents that had previously been submitted.

```
<document>
  ...
  <author .../>
  <relatedDocument typeCode="RPLC">
    <relatedDocument>
      <id root="464239de-45c7-4d2f-a89a-45d303f428bd"/>
      <setId root="9ea75e1e-84ef-4605-89ff-dd08a4c94f40"/>
      <versionNumber value="3"/>
    </relatedDocument>
  </relatedDocument>
  <component .../>
</document>
```

Validation Procedures

2.1.10.1 Type code attribute is as above.

2.1.10.2 There is an id

2.1.10.3 id is a GUID

2.1.10.4 There is a setId

2.1.10.5 setId is a GUID

2.1.10.6 setId is different from the present document's setId.

2.1.10.7 There is a version number, which is a whole number > 0.

2.1.10.8 Document id, type, and versionNumber match the latest document previously submitted under that setId.

2.2 SPL Body

The body of the SPL document includes structured text such as product labeling and specific data elements such as ingredients.

```
<document> <!-- SPL header material -->
  <component>
    <structuredBody> <!-- SPL bodyt material -->
      <component>
        <section>
```

2.2.1 Sections and subsections

```
<component>
  <section>
     <id root="62abedf9-6bde-4787-beb0-abd214307427"/>
     <code  code="34067-9"
            codeSystem="2.16.840.1.113883.6.1"
            displayName="Indications and Usage"/>
        <title>Indications and Usage</title>
        <text>labeling text</text>
        <effectiveTime value="20070822"/>
        <component/>
```

Sections and subsections have id, title, and code. LOINC codes are used for sections and subsections codes.

The <title>, if necessary, of the sections and subsections and order of the sections and subsections in the SPL are used to render the labeling contents. The numbering for the sections and subsections are included in the <title> text.

In the SPL schema, the <structuredBody> element contains multiple <component>s, and each <component> contains a <section>.

Sections are used to aggregate paragraphs into logical groupings. The order in which sections appear in an SPL document is the order the sections will appear when displayed (rendered) using the standard stylesheet. Major sections defined by the appropriate labeling regulations (e.g., 21 CRF 201.56 and 57 for human prescription drugs and 201.66 for human over the counter drugs) such as Indications and Usage are assigned LOINC codes. Sections that have not been assigned a LOINC code are assigned the LOINC code for "SPL Unclassified Section". Major sections may also be defined by parts of a container or carton label (e.g., Principal Display panel).

```
<section>
  <!-- this section's id, codes -->
  <text>
    <!-- actual text content in "narrative block" markup -->
  </text>
```

Each section has a unique identifier (<id>), an <effectiveTime>, and a LOINC code (i.e., the <code> element). A section may or may not contain a <title>.

The human readable content of labeling is contained within the <text> element in the <section>. The <section> can be nested to form sub-sections. The schema for subsections in SPL requires that the nested <section> tag first be nested inside a <component> tag. Use nested sections to relate paragraphs. The section tag applies to all of the nested sections. By nesting sections, computer systems can use the section tags in SPL to display information useful for the care of patients. If information is not associated with the tag, it will not be displayed.

```
<section>
  <!-- this section's id, codes -->
  <text>
    <!-- actual text content in "narrative block" markup -->
  </text>
  <component>
    <section>
      <!-- subsection content -->
    </section>
  </component>
  <component>
    <section>
      <!-- subsection content -->
    </section>
  </component>
</section>
```

Using the following principles for markup of text information improves access to information in labeling:

- Capture the section heading using the <title> element rather than placing the text of the title within the <text> element. This allows computer systems to use and display this information properly.

- Capture the section heading even when the printed label does not include a heading. For example, tagging a pregnancy statement as a section in a label that does not have a heading for pregnancy is useful. Computer systems will be able to use the tag to capture the pregnancy use statement. Omitting the <title> would prevent the heading from appearing when the SPL is rendered.

- Link different parts of the labeling using the ID attribute to the <section> element. For example, <section ID="Clin_Pharm_Section"> serves as the target of a <linkHtml> element. Linking to the ID attribute of a section allows the link to 'reference' the section entirely, e.g., for retrieval of a whole section in a non-browser interface.

- For container or carton labels, when capturing text and figures outside the Drug Facts or equivalent sections, separate the text and figures for each concept using <paragraph> tags.

- The order of the placement of information is the content of the package insert, the content of the patient information and the carton and container labels with images.

Validation Procedures

2.2.1.1 Each section has zero to many subsections

2.2.1.2 Each section and subsection has an id root and no extension

2.2.1.3 id root is a GUID

2.2.1.4 id does not match any other id in the document

2.2.1.5 id does not match any other id across all sections, documents, or any id other than the id of the same section previously submitted

2.2.1.6 Each section and subsection has a code

2.2.1.7 Code system is 2.16.840.1.113883.6.1

2.2.1.8 Display name matches the code

2.2.1.9 Each section has an effective time with at least the precision of day in the format YYYYMMDD.

2.2.1.10 There are no figures in the title for a section or subsection.

2.2.1.11 Section for Medication Guide (42231-1) and Patient Package Insert (42230-3) is not a subsection.

2.2.2 Text

```
<section>
  <text>
    <paragraph>Lorem ipsum dolor sit amet, consectetur adipisicing elit,
sed do eiusmod tempor incididunt ut labore et dolore magna aliqua. Ut enim
ad minim veniam, quis nostrud exercitation ullamco laboris nisi ut aliquip
ex ea commodo consequat. Duis aute irure dolor in reprehenderit in
voluptate velit esse cillum dolore eu fugiat nulla pariatur. Excepteur sint
occaecat cupidatat non proident, sunt in culpa qui officia deserunt mollit
anim id est laborum.</paragraph>
    <paragraph>At vero eos et accusamus et iusto odio dignissimos ducimus
qui blanditiis praesentium voluptatum deleniti atque corrupti quos dolores
et quas molestias excepturi sint occaecati cupiditate non provident,
similique sunt in culpa qui officia deserunt mollitia animi, id est laborum
et dolorum fuga.</paragraph>
  </text>
</section>
```

The human readable text content of SPL documents is contained within the <text> element. The actual content is contained within a <paragraph>, <table>, and/or <list>. If a section consists only of nested sections, the <text> tag is not included. Elements that can be used within the <text> element to capture the human readable content of SPL include paragraphs (<paragraph>), lists (<list>), tables (<table>) and images (<renderMultimedia>). Elements permitted as children of the <text> element, used as children of the <paragraph> element or within <table> and <list> include superscripts (<sup>), subscripts (<sub>), links (<linkHtml>), line breaks (
), footnotes (<footnote>), footnote references (<footnoteRef>). Images may be included in the content of labeling using the <renderMultiMedia> tag. This tag may be used as a

direct child of <text> for ‘block’ images or as a child of <paragraph> for inline images.

2.2.2.1 Font effects

There are certain aspects of the rendering of SPL that must be specified in the SPL source to insure that the content of labeling is formatted correctly when rendered. For example:

```
<text>
  <paragraph>The next snippet <content styleCode="bold italics">will appear
as bold italics</content> in the rendering.</paragraph>
```

Will be rendered as:

The next snippet ***will appear as bold italics*** in the rendering.

The <content styleCode=””> can also be nested, for example:

```
<text>
  <paragraph>
     <content styleCode="bold italics"> will appear as bold
italics</content>
```

Can also be represented as:

```
<text>
  <paragraph>
     <content styleCode="bold”><content styleCode="italics”> will appear as
bold italics.</content></content>
```

The values for <styleCode> for font effect are bold, italics and underline. To assist people who are visually impaired, the <styleCode=”emphasis”> is used to prompt computer screen reader programs to emphasize text such as text in a box warning. The bold, italics and underline font effects may be used together with each other and the emphasis styleCode. For example, <content styleCode=”bold”><content styleCode=”emphasis”> </content></content> will appear as bold and will be emphasized by the screen reader programs.

A special styleCode is used for recent major changes (see below).

2.2.2.2 Symbols and special characters

Special characters can be included in the text. Superscripts and subscripts are accomplished using the <sup> and <sub> tags. Unicode character references are used for special characters. Unicode characters in SPL XML are inserted as either &#dddd; where dddd is the Unicode value for decimal values or &#xdddd; where dddd is the Unicode value for hexadecimal values. The font used in the standard stylesheet is a

Unicode font assuring that Unicode values in SPL content will be rendered correctly if viewed by a browser supporting this font. Because SPL XML tags begin with the less than symbol (<), use of this symbol in text content must be replaced by the XML entity &lt. For example, "<paragraph>The mean for group 1 was < 13. </paragraph>" will render as "The mean for group 1 was <13."

2.2.2.3 Footnotes

The SPL schema includes a specific footnote element <footnote>. Footnotes are rendered automatically by the standard SPL stylesheet. <footnoteRef> is used to refer to another (usually earlier) footnote. For example, "<footnote ID="testNote">This is the footnote content</footnote>" will generate the following footnote at the appropriate end of a section. "[6] This is footnote content"

The <footnoteRef> element with the appropriate IDREF attribute, e.g., <footnoteRef IDREF="testNote"/> will display the footnote reference in the text corresponding to the footnote with the same ID, e.g., in this example footnote 6.

Footnotes are rendered by the default stylesheet using Arabic numbers (e.g., 1,2 3,). Within tables, footnotes are rendered using footnote marks in the series: * † ‡ § ¶ # ♠ ♥ ♦ ♣, effectively separating numbered footnotes within general text and footnotes within tables. Footnotes within tables are rendered at the bottom of the table.

2.2.2.4 Lists

All lists are marked up using the <list> tag, and each item in a list is marked with an <item> tag. The 'listType' attribute identifies the list as ordered (numbered) or unordered (bulleted). The default numbering and bulleting are controlled by the stylesheet.

```
<text>
  <paragraph>Lorem ipsum dolor sit amet, consectetur adipisicing elit, sed
do eiusmod tempor incididunt ut labore et ...</paragraph>
  <list listType="ordered" styleCode="BigRoman">
    <item>Lorem ipsum dolor sit amet,</item>
    <item>consectetur adipisicing slit</item>
  </list>
  <paragraph>At vero eos et accusamus et iusto ...</paragraph>
</text>
```

Lists featuring a standard set of specialized markers (standard specialized lists) can be created using the styleCode attribute with the <list> element. Options available for ordered lists are:

- Arabic (List is ordered using Arabic numerals: 1, 2, 3)
- LittleRoman (List is ordered using little Roman numerals: i, ii, iii)

- BigRoman (List is ordered using big Roman numerals: I, II, III)
- LittleAlpha (List is order using little alpha characters: a, b, c)
- BigAlpha (List is ordered using big alpha characters: A, B, C)

For example: <list listType="ordered" styleCode="LittleRoman">

For unordered lists the following options exist:

- Disc (List bullets are simple solid discs: ●)
- Circle (List bullets are hollow discs: ○)
- Square (List bullets are solid squares: ■)

For example: <list listType=”unordered” styleCode=”Disc”>

In addition to the standard specialized lists, user-defined characters are also permitted as markers by nesting <caption> within the <item> tag. Note that any character, XML entity, or Unicode symbol, may be used in the <caption>, and that the <caption> for each <item> are not restricted to the same character.

For example: <item><caption>*</caption> the asterisk is used as item marker here.<item>

2.2.2.5 Tables

Tables can be created with the full structure (header (e.g., for column names), body (e.g. for the rows of the table) and footer e.g. for table footnotes)). The element <tbody> is required for an SPL table while the elements <thead> and <tfoot> are optional in the SPL schema. The structure will display a standard typographical table with rules between the caption (table title) and head, the head and body, and the body and <tfoot>. If a <tfoot> element is included and footnotes are present in a table, then footnotes are rendered after the existing content of the <tfoot> element.

It is recommended to always start with a standard table (i.e., <thead> and <tbody> elements) and test to see whether the rendering is unambiguous and interpretable. It is important that the table communicate labeling content not that it duplicates the presentation in word processed or typeset versions of the package insert. In the unusual situation where additional formatting is needed, the rule styleCode specified or certain attributes may be used to modify the table.

The rule codes are as follows (note that the control names are case sensitive).

- Rule on left side of cell is Lrule

- Rule on right side of cell is Rrule
- Rule on top of cell is Toprule
- Rule on bottom of cell is Botrule

Note: More than one rule control may be used in a cell, e.g., <td styleCode code=”Botrule Lrule”>Cell content </td>.

Rule control codes should be used only when necessary for the interpretability of the table. Use of these codes may result in overriding the default rules for tables. Rather than setting the rule for each cell, table rules may also be controlled according to entire rows or columns by use of the styleCode attributes with <col>, <colgroup>, <thead>, <tfoot>, <tbody> and <tr> elements.

To make rowgroups appear with horizontal rules, use the styleCode attribute "Botrule" with the appropriate <tr> element. The Botrule value is rarely needed on the <td> element.

The preferred method for using vertical rules is to define colgroup with styleCode="Lrule” or “Rrule" (or both). Only if this does not yield the desired vertical rule should the Lrule or Rrule code value with styleCode attributes on the <td> or <th> element itself be used. Note: In general, vertical rules should not be used. Good typography for tables means using few vertical rules.

To merge cells vertically and horizontally, the rowspan and colspan attributes should be used on the <td>element.

To determine the width of a table, the width attribute may be used on the <table> element and to determine the width of a table column, the width attribute may be used on the <col> and <colgroup> elements.

For horizontal alignment, the preferred method for aligning cell content within the margins is to use <col align=”.. ”/> in the <colgroup> element, though this can be used in the <colgroup> element as well. Valid values for align are “left”, “center”, “right”, “justify” (for full justification of contents within the cells), and “char” (for character alignment within the cells). Using the <col align=”.. ”/> markup ensures that the contents for all cells in the column share the same alignment.

For vertical alignment, the valign attribute can be used within cells. For cases in which the cell alignment must be different from other cells in the column, align is also available as an attribute on the other table elements, including <td>.

Markup for table footnote is rendered in the <tfoot> tag. This element does not need to be included in SPL; the standard stylesheet will include a <tfoot> tag if a <footnote> element is present within either the <thead> or <tbody> sections. A

<tfoot> section should be included in SPL only if there is additional information other than footnotes that needs to be rendered in this section.

For table text spacing, in some instances, the use of a “tab” or text indentation is desirable in a given table cell. In an SPL document, this effect is achieved by using the nonbreaking space ( ) as if it were a “tab” space. As the following snippet of XML shows, two nonbreaking spaces were used to offset the word “Male” from the margin: <td> Male</td>. The nonbreaking space can also be used to keep text in a table from breaking inappropriately due to browser resizing.

2.2.2.6 Hypertext links

SPL offers hypertext linking capabilities generally similar to those found in the HTML specification.

Links are specified by the <linkHtml> construct, where the value for the href attribute of <linkHtml> (the target of the link) is the ID attribute value of a <section>, <paragraph>, <table>, <list>, <content>,<renderMultimedia> element. The stylesheet does not support the styleCode attribute of the <linkHtml> element; if a styleCode is needed for a link, this should be coded via the <content> element within the link as with other text.

2.2.2.7 Recent major changes in labeling text

SPL offers a notation to identify recent major changes in the labeling text including table elements <table> and table data <td>. The recent major text is tagged using the <content styleCode=“xmChange”>. For example,

```
<text>This is an example of text that is not changed.<content
styleCode=“xmChange”>This is an example of text that is a recent major
change</content>This is an example of changed text that is not considered a
recent major change</text>
```

2.2.3 Images

The SPL schema uses <observationMedia> elements to identify graphic files to be rendered at the locations where they are referenced by <renderMultiMedia> elements in the <section>. In other words, an image in an SPL will be rendered wherever it is referenced by the renderMultimedia markup, no matter where the observationMedia markup appears. The referencedObject attribute of the renderMultiMedia element identifies the corresponding observationMedia instance by means of its ID identifier such as <renderMultiMedia referencedObject="MM1"/>

```
<section>
  <text>
    <paragraph>...</paragraph>
    <renderMultiMedia referencedObject="MM1"/>
    <paragraph>...</paragraph>
  </text>

  <component>
    <observationMedia ID="MM1">
      <text>descriptive text</text>
      <value xsi:type="ED" mediaType="image/jpeg">
        <reference value="drug-01.jpg"/>
      </value>
    </observationMedia>
  </component>
</section>
```

The <observationMedia> element does not contain the graphics file, but instead points at the file. The <reference> value is the file name. The file name should not include spaces. The observationMedia identifies the graphic media type (i.e., JPEG). In addition, the observationMedia element includes the text description of the image used by screen reader software for visually impaired users. This is included in the <text> child of <observationMedia>. Note also that observationMedia is always contained within a <component> element as illustrated.

For image placement, if an image is a block image (i.e., should appear in its own space), insert the renderMultimedia tag between <paragraph> elements. If an image is inline (i.e., should appear alongside text), insert the renderMultimedia tag in the text of a <paragraph> as appropriate. Inline images are expected to be uncommon and basically represent symbols that cannot be represented by Unicode characters. In addition, <caption> are not applicable for inline images since these are not offset from the surrounding text.

The SPL schema does not allow for resizing graphics or changing the resolution of graphics files. Thus, all images are rendered in the browser as-is, with all characteristics of the actual graphic file itself. To ensure that a graphic will appear as desired, it is very important that the graphic file is edited to a dimension appropriate for its presentation within the browser. If this is not done, the appearance of the graphic may not be consistent with the narrative content reducing the readability of the file. JPEG image file type using appropriate pixels per inch for images for viewing in a browser using the standard stylesheet.

Validation Procedures

2.2.3.1 There is text

2.2.3.2 Value xsi:type is as above

2.2.3.3 Media type is image/jpeg

2.2.3.4 Reference value is the file name for the image

2.2.3.5 Size of image file is less than 1 MB

2.2.3.6 File is a JPEG image and the name has the extension ".jpg"

2.2.3.7 Image components are referenced at least once in the text of any section.

2.2.3.8 Image reference in text has an image "observationMedia" element with a matching ID in the same document.

2.2.4 Highlights

The actual Highlights of a rendered SPL are constructed from four sources: "boilerplate" text rendered directly from the stylesheet, information from data elements inserted into the boilerplate text, <title> in the header which includes the drug names, dosage form, route of administration, controlled substance symbol and year of initial US approval, and text blocks corresponding to each major highlights part (Highlights text). Highlights section titles are derived from the FPI section LOINC codes. The Highlights text is captured for the following sections: Microbiology, Boxed Warning, Recent Major Changes, Indications and Usage, Dosage and Administration, Dosage Forms and Strengths, Contraindications, Warnings and Precautions, Adverse Reactions, Drug Interactions and Use in Specific Populations.

The text blocks for Highlights are coded with the <excerpt> <highlight> elements of the major section of labeling in which they are contained.

```
<section>
  <excerpt>
    <highlight>
      <text>...</text>
```

For example, the Highlights for Indications and Usage are located with the Indications and Usage section of the labeling. The Highlights text is placed under the main section and not under subsections. The following is an example:

```
<component>
  <section>
    <id root="47ef84cd-8314-48c3-8ee2-bdff3087f83f"/>
    <code code="43685-7" codeSystem="2.16.840.1.113883.6.1"
          displayName="warnings and precautions section"/>
    <title>5 WARNINGS AND PRECAUTIONS</title>
```

```
    <excerpt>
      <highlight>
        <text>
          <list listType="unordered">
            <item>Aplastic anemia has been observed in 8% of recipients and
is irreversible in the majority of patients who experience this. (<linkHtml
href="#Section_5.1">5.1</linkHtml>)</item>
            <item>Monitor for hematological adverse reactions every 2 weeks
through the second month of treatment (<linkHtml
href="#Section_5.2">5.2</linkHtml>)</item>
          </list>
        </text>
      </highlight>
    </excerpt>

    <component>
      <section ID="Section_5.1">
        <id root="a857689e-9563-43c0-a244-8a6d5a25966a"/>
        <title>5.1 Aplastic anemia</title>
        <text>
          <paragraph>Aplastic anemia has been observed in…..</paragraph>
        </text>
      </section>
    </component>
  </section>
</component>
```

This example illustrates the following principles:

a. The <text> block for the Highlights is included as the <excerpt> <highlight> <text> children of the respective section. In the example above, the text block rendered in the highlights section is the child of the "Warnings and Precautions" section.

b. The coding of the highlights text block is not in a subsection.

c. The text block is rendered similar to any other text block, although in a location separate from its actual position in the rendered SPL document.

d. Links to the section or subsection where the primary content exists are explicitly entered in the Highlights text block.

e. Section numbering is included in the title of sections and subsections (e.g., '5' and '5.1', above).

Highlights and labeling boilerplate items include:

- Statement -"Highlights of Prescribing Information"
- Highlights section titles
- Patient counseling statement with information taken from FPI section LOINC codes for patient information sections, specifically information for patient

section (34076-0), SPL Medguide section (42231-1), SPL patient package insert section (42230-3) and SPL supplemental patient material (38056-8)

- Revision date is taken from the effective time
- Full Prescribing Information: Contents
- Statement – “Full Prescribing Information”

Validation Procedures

2.2.4.1 There may be excerpts.

2.2.4.2 Excerpts occur only in sections with the following codes: 34066-1 (Boxed Warning), 43683-2 (Recent Major Changes), 34067-9 (Indications and Usage), 34068-7 (Dosage and Administration), 43678-2 (Dosage Forms and Strengths), 34070-3 (Contraindications), 43685-7 (Warnings and Precautions), 34084-4 (Adverse Reactions), 34073-7 (Drug Interactions), 43684-0 (Use in Specific Populations), 49489-8 (Microbiology)

2.2.4.3 If there is an excerpt, then it only has highlight text.

2.2.4.4 An excerpt in the adverse reactions section (34084-4) includes the statement: "to report suspected adverse reactions" and "1-800-FDA-1088" (different telephone number for documents of type 53404-0 – “Vaccine Label”).

2.2.4.5 If there are highlights excerpts, then the title for the SPL file includes the text string (without the quotation marks): “These highlights do not include all the information needed to use” “see full prescribing information for” and “Initial U.S. Approval”

2.2.5 Product Data Elements Section

Currently most of the time the product data elements are in a separate section of their own followed by the content of labeling sections that contain only text and no data elements. Product data element section and other special data elements sections are described in 3 below; this section describes the features used from the free text (so called “narrative”) part of the SPL documents.

```
<document>          <!-- SPL header material here -->
  <component>
    <structuredBody><!-- SPL body material here -->

      <component>
        <section>   <!-- Product data element section -->
          <code code="48780-1" codeSystem="2.16.840.1.113883.6.1"
                displayName="SPL listing data elements section"/>
```

```
          <subject>
            <manufacturedProduct>
              <!-- product data elements -->
            </manufacturedProduct>
          </subject>
        </section>
      </component>
                    <!-- Other content of labeling material -->
      <component>
        <!-- ... -->
```

The beginning of the product data elements is as follows

```
<component>
  <section>
    <id root="e13a985b-f706-a5c8-e8ef-73891eb1c697"/>
      <code code="48780-1"
            codeSystem="2.16.840.1.113883.6.1"
            displayName="SPL listing data elements section"/>
      <effectiveTime value="20070424"/>
      <subject>
        <manufacturedProduct>
```

Validation Procedures

2.2.5.1 Code, code system and display name are as above

2.2.5.2 There is one or more product

2.2.5.3 There is an effective time with at least the precision of day in the format YYYMMDD

3 Product Data Elements

This section describes with examples in general the capabilities of the product data elements that are currently implemented in the scope of this Implementation Guide. More specific sections follow with more detail and more specific guidelines and validation procedures. These subsequent sections may constrain and detail what is described here, but may also introduce details not described here in general. In case of discrepancies, the later specific ruling preempts the general description given here.

Terminology:

- FDA terminology is used for the proprietary, non proprietary and ingredient name.
- National Drug Codes (NDC) System is used for
  - NDC Labeler Code (4 or 5 digit code (e.g., 0001 or 11111)), to register the labeler prefix,
  - NDC Product Code (8 or 9 characters beginning with the NDC Labeler Code separated by a hyphen from the product segment of the code

(e.g., 0001-0001 or 11111-001 or 11111-0001)) for products independent of packaging, and
    - NDC Package Code (10 characters beginning with the NDC Product Code separated by a hyphen from the package segment of the code (e.g., 0001-0001-01, 11111-001-01 or 11111-0001-1)) for packaged products.
- NDC System is also used for identifiers for the National Health Related Item Code (NHRIC)
    - NHRIC Labeler Code (4 or 5 digit code),
    - NHRIC Product Code (8, 9 or 10 digits beginning with the NHRIC Labeler Code separated by a hyphen from the product segment of the code and
    - NHRIC Package Code (10 digits beginning with the NDC Product Code separated by a hyphen from the package segment of the code).
- ISBT-128 site and product codes are for licensed minimally manipulated cell products.
- GS1 GTIN and HIBCC codes are used for device item codes.
- FDA Substance Registration System (SRS) is used for the ingredient and active moiety Unique Ingredient Identifier (UNII).
- The FDA submission tracking system is used for application numbers.
- Codes derived from section references to the Code of Federal Regulations are used for monograph citations.
- The National Cancer Institute Thesaurus (NCIt) is used for dosage form, product characteristics, DEA schedule, unit of presentation, route of administration and equivalent codes.
- The Unified Codes for Units of Measure (UCUM) is used for the unit of measure.
- HL7 confidentiality code “B” is for business confidential information.
- FDA Product Classification codes are for device and cosmetic products.

3.1 Product in General

Among the product data elements that are always used are item code and name. These are children of <manufacturedProduct>.

Item Code is a unique identification of this product description whether or not the item code is printed on the product itself. Item codes must conform to the ISO 15459 system of codes. National Drug Code (NDC), National Health Related Item Code (NHRIC), GS1 GTIN, HIBCC all conform to ISO 15459. All these have in common that they are composed of a company prefix (e.g. NDC labeler segment) followed by the item reference that is assigned by the owner of the company prefix to create a unique item code. As long as the item code is unique, the digits (and letters) in it need not convey any other information.

Names: When specific manufactured or marketed products are described, the name is the proprietary name as it appears on the label divided between <name> and <suffix>.

The <name> is the initial portion of the proprietary name describing the ingredients without any other descriptors including trademarks and dosage forms. If necessary, <suffix> is used for descriptors such as “extended release”. When using the <suffix>, a space after the proprietary name is added as necessary. Non-proprietary or generic names of drugs are found in the <genericMedicine><name> element. Device type codes and descriptions use <asSpecializedKind>.

A brief description is added in the <desc> element that states succinctly the kind of device. This text should be brief to be able to list it in short summary listings. While the text can be up to 512 characters in length, it should normally be much shorter so that it will be useful for listing in tables. A device also has a device-nomenclature code in the <asSpecializedKind> element. This code comes from the FDA Product Classification terminology.

Marketing category and product type: The type of product is indicated by the “Marketing Category”.

Table 1: Marketing Category and Product Type

Code	Type	Display Name
C73583	Drug	ANADA
C73584	Drug	ANDA
C73585	Drug	BLA
C73588	Drug	Conditional NADA
C73590	Drug	Export only
C73593	Drug	NADA
C73594	Drug	NDA
C73603	Drug	OTC monograph final
C73604	Drug	OTC monograph not final
C73605	Drug	NDA authorized generic
C73613	Drug	unapproved medical gas
C73614	Drug	unapproved homeopathic
C73626	Drug	bulk ingredient
C73627	Drug	unapproved drug other
C75302	Drug	IND
C80438	Device	Exempt device
C80440	Device	Humanitarian Device Exemption
C80441	Device	Premarket Application
C80442	Device	Premarket Notification
C86964	Medical Food	Medical Food
C86952	Dietary Supplement	Dietary Supplement
C86965	Cosmetic	Cosmetic
C92556	Drug	Legally Marketed Unapproved New Animal Drugs for Minor Species
C94795	Drug	Drug for Further Processing

C95600	Drug	Approved drug product manufactured exclusively for private label distributor
C95601	Drug	OTC monograph drug product manufactured exclusively for private label distributor
C95602	Drug	Unapproved drug product manufactured exclusively for private label distributor
C96793	Drug	Bulk Ingredient for Human Prescription Compounding
C98252	Drug	Bulk Ingredient for Animal Drug Compounding

The following is an example for a drug product:

```
<subject>
  <manufacturedProduct>
    <manufacturedProduct>
      <code code="NDC Product Code" codeSystem="2.16.840.1.113883.6.69"/>
      <name>proprietary name <suffix>suffix to name</suffix></name>
      <formCode code="dose form code"
                codeSystem="2.16.840.1.113883.3.26.1.1"
                displayName="display name"/>

      <asEntityWithGeneric>
        <genericMedicine>
          <name>non proprietary name</name>
        </genericMedicine>
      </asEntityWithGeneric>
    </manufacturedProduct>

    <subjectOf>
      <approval>
        <!-- possibly approval number -->
        <code code="C73594" displayName="NDA"
              codeSystem="2.16.840.1.113883.3.26.1.1" />
        <!-- possibly other attributes in the marketing category -->
      </approval>
    </subjectOf>
  </manufacturedProduct>
</subject>
```

The following is an example for a device:

```
<subject>
  <manufacturedProduct>
    <manufacturedProduct>
      <code code="Device Item Code" codeSystem="Item Code System"/>
      <name>proprietary name <suffix>suffix to name</suffix></name>
      <desc>Brief description of product (up to 512 characters)</desc>

      <asSpecializedKind>
        <generalizedMaterialKind>
          <code code="product classification code"
                codeSystem="2.16.840.1.113883.6.303"
                displayName="display name"/>
        </generalizedMaterialKind>
      </asSpecializedKind>
    </manufacturedProduct>
```

```
    <subjectOf>
      <approval>
        <!-- possibly approval number -->
        <code code="C80441" displayName="Premarket Application"
              codeSystem="2.16.840.1.113883.3.26.1.1" />
        <!-- possibly other attributes in the marketing category -->
      </approval>
    </subjectOf>
  </manufacturedProduct>
</subject>
```

Validation Procedures

3.1.1.1 There is an Item Code, except for part products not requiring an Item Code.

3.1.1.2 General rules about the Item Code are:

3.1.1.3 Code system is 2.16.840.1.113883.6.69 (NDC, NHRIC), 1.3.160 (GS1), or 2.16.840.1.113883.6.40 (HIBCC).

3.1.1.4 Code is compliant with the code system's allocation rules.

3.1.1.5 There is a name, i.e., proprietary name of the product as used in product labeling or in the catalog

3.1.2 Equivalence to other Products, Product Source

The following is for referencing information already submitted for a source drug:

```
<subject>
  <manufacturedProduct>
    <manufacturedProduct>
      <code code="NDC Product Code" codeSystem="2.16.840.1.113883.6.69"/>
      <name>proprietary name <suffix>suffix to name</suffix></name>


      <asEquivalentEntity classCode="EQUIV">
        <code code="C64637" codeSystem="2.16.840.1.113883.3.26.1.1"/>
        <definingMaterialKind>
          <code code="source NDC Product Code"
                codeSystem="2.16.840.1.113883.6.69"/>
        </definingMaterialKind>
      </asEquivalentEntity>
```

This is a special case of referencing other products for various purposes. Another purpose is for products that are updated with improvement, where it may be useful to indicate a succession to a previous version of the product identified by the item code of the predecessor product. This can be done using the equivalence relationship with <asEquivalentEntity> with a different Role code as in Table 2:

```
<manufacturedProduct>
   <manufacturedProduct>
      ...
<asEquivalentEntity classCode="EQUIV">
   <code code="C?????" codeSystem="2.16.840.1.113883.3.26.1.1"/>
   <definingMaterialKind>
      <code code="81234567890008" codeSystem="1.3.160"/>
```

The following equivalence codes are defined:

Table 2:Equivalence Codes

Equivalence	Code
Same	C64637
Predecessor Product	*pending*

Product source may be specified under a product

```
<subject>
   <manufacturedProduct>
      <manufacturedProduct>
         <asEquivalentEntity>
```

or under parts

```
<part>
   <partProduct>
      <asEquivalentEntity>
```

Validation Procedures

3.1.2.1 As equivalent entity class code is as above

3.1.2.2 If there is a classCode, it is “EQUIV”.

3.1.2.3 Code and code system are as above

3.1.2.4 Defining material kind code matches an Item Code in an SPL file with a different setId

3.1.2.5 Item Code for the source is not the same as the Item Code for the product

3.1.3 Additional Identifiers for this Product

A multitude of other identifiers may be assigned to some products by various parties, manufacturers, distributors, wholesalers, regulators. These identifiers are of a varying quality in terms of control for uniqueness and meaning. They may be unique item codes from other ISO 15459 item code systems, or they may be less well defined codes such as “model number” or “catalog number” etc. While those “model

numbers" or "catalog numbers" are often not safe for referencing, such identifiers are customer facing and may encode minor product variants, which would be recognized by customers and hence listing such identifier cross references can aid in finding the correct item code.

```
<manufacturedProduct>
   <manufacturedProduct>
       ...
<asIdentifiedEntity classCode="IDENT">
  <id extension="other identifier" root="other identifier root"/>
  <code code="other identifier type code"
        codeSystem="2.16.840.1.113883.3.26.1.1"
        displayName="model number"/>
```

HL7 requires any identifier to be made globally unique, therefore submitters must acquire an OID of their own through any of several sources (e.g. HL7 provides a free OID assignment service). Submitters must not allow conflicting assignments of model numbers among their own products. Submitters can still create unique identifiers from these model numbers by giving different root OIDs for each kind of identifiers that may be in conflict. Once a company has acquired a root OID this root OID can be freely sub-divided. For example, ACME Fine Devices Inc. may have acquired the OID 2.16.840.1.113883.3.98765 from the HL7 registry. ACME then decided to use a sub-branch .2 under their OID to manage model numbers for the models from models release before 2007 and sub-branch .5 for models released after 2007. There is no specific rule that must be obeyed when sub-dividing OIDs as long as it results in the concatenation of model number code and codeSystem OID to be a unique identifier.

Different types of such identifications may be assigned different codes from the NCI Thesaurus for Model Number, Catalog Number and possibly other "types" of numbers:

Table 3:Miscellaneous Identifier Types

Identifier Type	Code	Description
Model Number	C99286	the exact model number found on the device label or accompanying packaging.
Catalog Number	C99285	the exact number as it appears in the manufacturer's catalog, device labeling, or accompanying packaging
Reference Number	C99287	any secondary product identifier

3.1.4 Ingredient

Ingredients may be specified for products

```
<subject>
   <manufacturedProduct>
      <manufacturedProduct>
         <ingredient/>
```

and parts.

```
<part>
   <partProduct>
      <ingredient/>
```

Ingredient information includes the class code specifying the type of ingredient (e.g., active, inactive), code, name, and strength, and possibly active moiety name(s) and identifier and a reference ingredient name and identifier.

```
<ingredient classCode=”class code including basis of strength”>
  <quantity>
    <numerator value="value" unit="UCUM code"/>
    <denominator value="value" unit=" UCUM code"/>
  </quantity>
  <ingredientSubstance>
    <code code="UNII" codeSystem="2.16.840.1.113883.4.9"/>
    <name>active ingredient name</name>
    <activeMoiety>
      <activeMoiety>
        <code code="UNII" codeSystem="2.16.840.1.113883.4.9"/>
        <name>active moiety name</name>
      </activeMoiety>
    </activeMoiety>
    <asEquivalentSubstance>
      <definingSubstance>
        <code code="UNII" codeSystem="2.16.840.1.113883.4.9"/>
        <name>reference substance name</name>
      </definingSubstance>
    </asEquivalentSubstance>
  </ingredientSubstance>
</ingredient>
```

Devices too may have active ingredients as discussed above (device with embedded ingredient.)

Validation Procedures

3.1.4.1 There is a class code.

3.1.4.2 There may be a strength with a numerator and denominator

3.1.4.3 Numerator and denominator have a value greater than zero and a unit

3.1.4.4 Unit comes from the *UCUM units of measures* list

3.1.4.5 For percentages numerator unit is not 1, instead use a volume unit for volume fractions and a mass unit for mass fractions.

3.1.4.6 The denominators values and units for all ingredients in this product are the same.

3.1.4.7 There is an ingredient code with code and code system

3.1.4.8 Code system is 2.16.840.1.113883.4.9

3.1.4.9 The same ingredient substance code is not used more than once per product.

3.1.4.10 There is an ingredient name

3.1.4.11 Name matches the code

3.1.5 Packaging

The packaging includes the quantity of product in the package and the package type and Package Item Code (such as NDC Package Code or other Item Code for the package).

Packaging may be specified for the product,

```
<manufacturedProduct>
   <manufacturedProduct>
      <asContent/>
```

for parts,

```
<part>
   <partProduct>
      <asContent/>
```

and for packages.

```
<asContent>
   <containerPackagedProduct>
      <asContent/>
```

The format for packaging specification is:

For example,

```
<asContent>
  <quantity>
    <numerator value="value" unit="UCUM code"/>
    <denominator value="1"/>
  </quantity>
```

```
  <containerPackagedProduct>
    <code code="Package Item Code" codeSystem="2.16.840.1.113883.6.69"/>
    <formCode code="value" codeSystem="2.16.840.1.113883.3.26.1.1"
              displayName="display name"/>
  </containerPackagedProduct>
</asContent>
```

Validation Procedures

3.1.5.1 A product may have an “as content” element (optional for parts)

3.1.5.2 Quantity includes a numerator and denominator

3.1.5.3 Numerator has a value greater than zero and a unit

3.1.5.4 If the product has parts, then the initial numerator value and unit is “1”

3.1.5.5 Unit of the numerator of the initial package is the same as the units for the denominators of all the ingredient quantities (strengths)

3.1.5.6 Unit of the numerator of an outer package is the same as the unit for the denominator of the quantity of the inner package

3.1.5.7 Denominator has value 1 and either no unit or unit “1”

3.1.5.8 There is a form code and display name

3.1.5.9 Code system for form code is 2.16.840.1.113883.3.26.1.1

3.1.5.10 Display name matches form code

3.1.5.11 There is a Package Item Code with code and code system for outermost package except for parts.

3.1.5.12 If document type is 60684-8 (Cellular Therapy), 60683-0 (Plasma Derivative) and 53404-0 (Vaccine Label), then there is a package item code with code and code system for the inner, unit of use package.

3.1.5.13 If the Package Item Code has been previously submitted, then the package form code and quantity value and unit are the same as in the most recent submission for this item code.

3.1.5.14 If the Package Item Code is mentioned elsewhere in the document, then the package form code and quantity value and unit are the same and the content of both packages have an Item Code that is the same.

3.1.5.15 Package Item Code does not match any other Package Item Code in the same package hierarchy.

3.1.6 Kits, Parts, Components and Accessories

Products may be combined in various ways such as:

- Drug kit with a device part
- Device kit with a drug part
- Device with an embedded drug
- Drug in a delivery device
- Products sold separately but meant to be used together

Kits and Parts: When products have more than one part, each part is described under <partProduct>. The total amount of the part in the product is included as follows:

```
<part>
  <quantity>
    <numerator value="total amount of part in product" unit="UCUM code"/>
    <denominator value="1"/>
  </quantity>
  <partProduct>
     <!-- same as above for drug or device. -->
```

Currently, when a drug product has parts, it is considered a Kit indicated by the formCode for KIT:

```
<manufacturedProduct>
   <manufacturedProduct>
      <code code="11234560012349" codeSystem="1.3.160"/>
      <name>Easy-Go PreciFuse PorterPump Kit</name>
      <formCode code=" C47916" displayName="KIT"
                codeSystem="2.16.840.1.113883.3.26.1.1"/>

      <part><!-- ... -->
```

Device products may also be kits (in this case a device with FDA product classification code but also with formCode specifying KIT. However, devices themselves may also be specified with parts, such as distinguishing component options or field replaceable parts, in this case the top-level device need not have a formCode for KIT:

```
<manufacturedProduct>
   <manufacturedProduct>
      <code code="item code of device" codeSystem="code system OID"/>
      <name>name of device</name>
      <descr>brief description of device</descr>

      <asSpecializedKind ... product classification for device ... />
```

```
      <part>
         <quantity>
            <numerator value="1"/>
            <denominator value="1"/>
         </quantity>

         <partProduct>
            <code code="item code of part" codeSystem="code system OID"/>
            <name>name of part</name>
            <descr>brief description of device part</descr>
```

Drug Kit with a Device Part: This sort of kit has been known from SPL R4 as well, examples being drugs sold as a kit with an applicator device.

```
<manufacturedProduct>
  <manufacturedProduct>
      <code code="NDC code of kit" codeSystem="2.16.840.1.113883.6.69"/>
      <name>name of kit</name>
      <formCode code="C47916" displayName="KIT"
                codeSystem="2.16.840.1.113883.3.26.1.1"/>
      <asEntityWithGeneric .../>

      <part>
         <quantity>
            <numerator value="amount of this part's content in one kit"
                       unit="unit for amount"/>
            <denominator value="1"/>
         </quantity>

         <partProduct>
            <code code="NDC code of drug part"
                  codeSystem="2.16.840.1.113883.6.69"/>
            <name>name of drug part</name>
            <formCode code="form code of drug part"
                      displayName="form name of drug part"
                      codeSystem="2.16.840.1.113883.3.26.1.1"/>

            <ingredient ... />

            <asContent>
               <quantity>
                  <numerator value="amount of this part in its package"
                             unit="unit of amount"/>
                  <denominator value="1"/>
               </quantity>

               <containerPackagedProduct>
                  <code code="NDC code of part's package"
                        codeSystem="2.16.840.1.113883.6.69"/>
                  <formCode code="package type"
                            displayName="package type name"
                            codeSystem="2.16.840.1.113883.3.26.1.1"/>
               </containerPackagedProduct>
            </asContent>
         </partProduct>
      </part>

      <part>
         <quantity>
            <numerator value="amount of this device part in one kit"/>
            <denominator value="1"/>
         </quantity>
```

```
         <partProduct>
            <code code="item code of this device part"
                 codeSystem="item code system OID"/>
            <name>name of device part</name>
            <descr>description of device part</descr>

            <asSpecializedKind>
               <generalizedMaterialKind>
                  <code code="product classification code of device part"
                        codeSystem="2.16.840.1.113883.6.303"
                        displayName="display name of device part"/>
               </generalizedMaterialKind>
            </asSpecializedKind>
         </partProduct>
      </part>
```

Device Kit with a Drug Part:

```
<manufacturedProduct>
   <manufacturedProduct>
      <code code="item code of device kit"
           codeSystem="item code system OID"/>
      <name>name of kit</name>
      <descr>brief description of kit</descr>
      <formCode code="C47916" displayName="KIT"
                codeSystem="2.16.840.1.113883.3.26.1.1"/>

      <asSpecializedKind>
        <generalizedMaterialKind>
          <code code="product classification code of kit"
                displayName="display name of kit"
                codeSystem="2.16.840.1.113883.6.303"/>
        </generalizedMaterialKind>
      </asSpecializedKind>

      <part>
         same as device part above
      </part>

      <part>
         same as drug part above
      </part>
```

Device with an embedded drug: For example, a drug eluting stent with an embedded active ingredient. Notice that such products do not involve kits and parts:

```
<manufacturedProduct>
   <manufacturedProduct>
      <code code="device item code"
            codeSystem="device item code system OID"/>
      <name>device name</name>
      <descr>brief description</descr>

      <asSpecializedKind>
        <generalizedMaterialKind>
          <code code="product classification code of device"
                displayName="display name of device"
                codeSystem="2.16.840.1.113883.6.303"/>
        </generalizedMaterialKind>
      </asSpecializedKind>
```

```
      <ingredient classCode="ACTIB">
         <quantity .../>
         <ingredientSubstance>
            <code code="UNII code of active ingredient"
                  codeSystem="2.16.840.1.113883.4.9"/>
            <name>paclitaxel</name>
```

Drug in a delivery device: For example, drug in pre-filled syringe. Note that the syringe filled with the drug is a different product than the empty syringe. Hence it would not be correct to put the item code for the empty syringe on the one filled with the drug. In fact, since the pre-filled syringe already has (or should have) an NDC code, there is no need for another item code for it. However, one may want to refer to the item code for the empty syringe as a generalization of the filled syringe:

```
<manufacturedProduct>
  <manufacturedProduct>
    <code code="NDC code drug"
          codeSystem="2.16.840.1.113883.6.69"/>
    <name>name of drug</name>
    <formCode code="form code of drug"
              displayName="form display name of drug"
              codeSystem="2.16.840.1.113883.3.26.1.1"/>

    <ingredient classCode="ACTIB">
      <!-- active ingredient -->
    </ingredient>

    <asContent>
      <quantity>
        <numerator value="amount of drug in prefilled device"
                   unit="unit of amount"/>
        <denominator value="1"/>
      </quantity>

      <containerPackagedProduct>
        <code code="NDC code for prefilled device"
              codeSystem="2.16.840.1.113883.6.69"/>
        <formCode code="form code of prefilled device"
                  displayName="form display name of prefilled device"
                  codeSystem="2.16.840.1.113883.3.26.1.1"/>

        <asSpecializedKind>
          <generalizedMaterialKind>
            <code code="item code of empty device"
                  codeSystem="item code system of empty device"/>
            <desc>brief description of empty device</desc>

            <asSpecializedKind>
              <generalizedMaterialKind>
                <code code="product classification code of device"
                      displayName="display name of device"
                      codeSystem="2.16.840.1.113883.6.303"/>
              </generalizedMaterialKind>
            </asSpecializedKind>
```

Products sold separately but meant to be used together: when products are used together but packaged separately, the data element <asPartOfAssembly> is used to identify the other product. The products could be drugs or devices.

```
<manufacturedProduct>
  <manufacturedProduct>
    <code code="item code of device" codeSystem="code system OID"/>
    <name>name of device</name>
    <descr>brief description of device</descr>

    <asSpecializedKind ... product classification for device .../>

    <asPartOfAssembly>
      <quantity>
        <numerator value="1"/>
        <denominator value="1"/>
      </quantity>

      <wholeProduct><!-- this is the assembly, but has no identifier -->
        <part>
          <quantity>
            <numerator value="1"/>
            <denominator value="1"/>
          </quantity>
          <partProduct>
            <code code="item code of accessory component"
                  codeSystem="code system OID"/>
            <name>name of accessory component</name>
            <descr>brief description of accessory component</descr>

            <asSpecializedKind ... product classification for device .../>
```

Parts may be specified for the product,

```
<manufacturedProduct>
  <manufacturedProduct>
     <part/>
```

and for part products.

```
<part>
  <partProduct>
     <part/>
```

Validation Procedures

3.1.6.1 If the product form code is ‘C47916’ (KIT), then there must be one or more parts

3.1.6.2 Each part has an overall quantity

3.1.6.3 If there is an “as content” data element in the part, then the numerator unit is the same as the numerator unit for the “as content” data element

3.1.6.4 If there is no “as content” data element in the part, then the numerator unit is 1

3.1.6.5 If there is a code, then the general rules for product code apply (see 3.1.1.2ff).

3.1.6.6 There is a name

3.1.6.7 Procedures for source, ingredients, characteristics and packaging are the same as for products without parts

3.1.7 Marketing Category and Application Number

The approval structure specifies in the <code> the marketing category under which the product is approved for marketing. Products marketed under an approved application have an application number in the <id extension> and application tracking system under <id root>. Products marketed under a monograph provide the regulatory citation for the monograph <id extension> and the Code of Federal Regulations under <id root>. If there is no application number or monograph citation, the id element is omitted.

```
<subjectOf>
  <approval>
    <id extension="application or monograph number"
        root="FDA document tracking system OID or CFR OID"/>
    <code code="code for marketing category"
          codeSystem="2.16.840.1.113883.3.26.1.1"
          displayName="display name"/>
    <author>
      <territorialAuthority>
        <territory>
          <code code="USA" codeSystem="2.16.840.1.113883.5.28"/>
        </territory>
      </territorialAuthority>
    </author>
  </approval>
</subjectOf>
```

Marketing category is connected through the <subjectOf> element which may appear on the main product:

```
<subject>
   <manufacturedProduct>
      <manufacturedProduct/>
      <subjectOf/>
```

or on parts:

```
<part>
   <partProduct/>
   <subjectOf/>
```

Example:

```
<subjectOf>
  <approval>
     <id extension="NDA123456" root="2.16.840.1.113883.3.150"/>
     <code  code="C73594"
            codeSystem="2.16.840.1.113883.3.26.1.1"
            displayName="NDA"/>
     <author>
        <territorialAuthority>
           <territory>
              <code code="USA" codeSystem="2.16.840.1.113883.5.28"/>
```

Validation Procedures

3.1.7.1 There is one marketing category for every product and product part

3.1.7.2 There is a marketing category code.

3.1.7.3 Code comes from the *Marketing category* list.

3.1.7.4 Display name matches the code

3.1.7.5 Code system is 2.16.840.1.113883.3.26.1.1

3.1.7.6 Territorial authority is as above

Marketing Category vs. Application Number

The following are validation procedures relating marketing category to application numbers:

3.1.7.7 If the code is C73583 (ANADA), C73584 (ANDA), C73585 (BLA), C73588 (conditional NADA), C73593 (NADA), C73594 (NDA), C73605 (NDA authorized generic), C75302 (IND), C80438 (Exempt device), C80440 (Humanitarian Device Exemption), C80441 (Premarket Application), or C80442 (Premarket Notification) or C92556 (Legally Marketed Unapproved New Animal Drugs for Minor Species), then the id root is 2.16.840.1.113883.3.150 (FDA application tracking system).

3.1.7.8 If the code is C73603 (OTC monograph final) or C73604 (OTC monograph not final), then the id root is 2.16.840.1.113883.3.149 (Code of Federal Regulations)

3.1.7.9 If the code is C73583 (ANADA), then the id extension has the prefix “ANADA” followed by 6 digits

3.1.7.10 If the code is C73584 (ANDA), then the id extension has the prefix “ANDA” or “BA” followed by 6 digits

3.1.7.11 If the code is C73585 (BLA), then the id extension has the prefix “BLA” followed by 6 digits

3.1.7.12 If the code is C73593 (NADA) or C73588 (Conditional NADA), then the id extension has the prefix “NADA” followed by 6 digits

3.1.7.13 If the code is C73594 (NDA) or C73605 NDA authorized generic), then the id extension has the prefix “NDA” or “BN” followed by 6 digits

3.1.7.14 If the code is C75302 (IND), then the id extension has the prefix “IND” followed by 6 digits

3.1.7.15 If the code is C73603 (OTC monograph final) or C73604 (OTC monograph not final), then the id extension and active ingredient code (if any) matches the codes in the *OTC validation-final* list or the *OTC validation-not final* list respectively.

3.1.7.16 If the code is C92556 (Legally Marketed Unapproved New Animal Drugs for Minor Species), then the id extension has the prefix “MIF” followed by 6 digits.

3.1.7.17 If the code is C80438 (Exempt device), then the id extension consists of 3 letters

3.1.7.18 If the code is C80440 (Humanitarian Device Exemption), then the id extension has a prefix “H” followed by 6 digits

3.1.7.19 If the code is C80441 (Premarket Application), then the id extension has a prefix “P” or “BP” followed by 6 digits

3.1.7.20 If the code is C80442 (Premarket Notification), then the id extension has a prefix “K” or “BK” followed by 6 digits.

3.1.7.21 If the code is not C73583 (ANADA), C73584 (ANDA), C73585 (BLA), C73588 (Conditional NADA), C73593 (NADA), C73594 (NDA), C73603 (OTC monograph final), C73604 (OTC monograph not final), C73605 (NDA authorized generic), C75302 (IND), C80438 (Exempt device), C80440 (Humanitarian Device Exemption), C80441 (Premarket Application), C80442 (Premarket Notification), C95600 (Approved drug product manufactured exclusively for private label distributor), or C92556 (Legally Marketed Unapproved New Animal Drugs for Minor Species), then there is no id.

3.1.7.22 If the marketing category is C95600 (Approved drug product manufactured exclusively for private label distributor), then there is an id.

Application Number Consistency

3.1.7.23 If the code is C73584 (ANDA), C73585 (BLA), or C73594 (NDA) and the application number was already submitted, then the active ingredient UNIIs are the same as in any previous submission of a product with the same application number.

3.1.8 Marketing status

The marketing status provides information on when the product is on or off the market.

```
<subject>
   <manufacturedProduct>

<subjectOf>
   <marketingAct>
      <code code="C53292" codeSystem="2.16.840.1.113883.3.26.1.1"/>
      <statusCode code="active"/>
      <effectiveTime>
         <low value="20040120"/>
```

The <code> indicates the activity of “marketing”. The status of the product is described in the <statusCode> as either “active” for being on the market or “completed” when marketing is done the product is no longer going to be available on the market. The date when the product is on or off the market is included in the <effectiveTime>. The date when the product is on the market is characterized by the <low value>.

Example of a currently marketed product:

```
<subjectOf>
  <marketingAct>
    <code code="C53292" codeSystem="2.16.840.1.112883.3.26.1.1"/>
    <statusCode code="active"/>
    <effectiveTime>
      <low value="date when on the market"/>
    </effectiveTime>
  </marketingAct>
</subjectOf>
```

The date off the market such as the expiration date of the last lot released to the market is characterized by the <high value>.

Example of a product that is off the market:

```
<subjectOf>
  <marketingAct>
    <code code=”C53292” codeSystem=”2.16.840.1.112883.3.26.1.1”/>
    <statusCode code="completed"/>
    <effectiveTime>
      <low value="date when the product is on the market"/>
      <high value="date when the product is going to be off the market"/>
    </effectiveTime>
  </marketingAct>
</subjectOf>
```

Validation Procedures

3.1.8.1 There is one marketing status code for each top-level product (part products do not need this)

3.1.8.2 Code is C53292 and code system is 2.16.840.1.113883.3.26.1.1.

3.1.8.3 Status code is *active* or *completed*

3.1.8.4 If the status code is *active*, then there is a low value and no high value

3.1.8.5 If the code is *completed*, then there is a low and high value

3.1.8.6 The effective time low and high boundary have at least the precision of day in the format YYYYMMDD

3.1.8.7 If there is a high value, then it is not less than the low value.

3.1.9 Characteristics

Many characteristics may be specified for products as specified later for specific product types. In general, the characteristic structure allows specifying any properties of the product in a code-value pair, the code saying which property is being specified, the value saying what the property is for the given product. The characteristics structure connects to the product Role through the subjectOf element.

```
<manufacturedProduct>
  <manufacturedProduct>
      ...
  </manufacturedProduct>
  <subjectOf>
    <characteristic>
      <code code="characteristic code"
            codeSystem="characteristic code system"/>
      <value xsi:type="characteristic value type" ...>
```

Characteristics listed in Table 7 use one of a number of different data types. Each data type uses slightly different XML elements and attributes as shown in the templates below:

Characteristic of type physical quantity (PQ):

```
<subjectOf>
   <characteristic>
     <code code="characteristic code"
           codeSystem="characteristic code system"/>
     <value xsi:type="PQ" value="quantity value" unit="quantity unit">
```

Characteristic of type number (REAL):

```
<subjectOf>
   <characteristic>
     <code code="characteristic code"
           codeSystem="characteristic code system"/>
     <value xsi:type="REAL" value="quantity value"/>
```

Characteristic of type integer number (INT):

```
<subjectOf>
   <characteristic>
     <code code="characteristic code"
           codeSystem="characteristic code system"/>
     <value xsi:type="INT" value="quantity value"/>
```

Characteristic of coded type (CV):

```
<subjectOf>
  <characteristic>
    <code code="characteristic code"
          codeSystem="characteristic code system"/>
    <value xsi:type="CV" code="value code"
           codeSystem="value code system OID"
           displayName="value code display name">
```

Characteristic of type character string (ST):

```
<subjectOf>
  <characteristic>
    <code code="characteristic code"
          codeSystem="characteristic code system"/>
    <value xsi:type="ST">value string</value>
```

Characteristic of type interval of physical quantity (IVL<PQ>):

```
<subjectOf>
  <characteristic>
    <code code="characteristic code"
          codeSystem="characteristic code system"/>
    <value xsi:type="IVL_PQ">
      <low value="quantity value low boundary" unit="quantity unit"/>
      <high value="quantity value high boundary" unit="quantity unit"/>
    </value>
```

Characteristic of type Boolean (true/false value)

```
<subjectOf>
  <characteristic>
    <code code="characteristic code"
          codeSystem="characteristic code system"/>
    <value xsi:type="BL" value="true or false"/>
```

Table 4: Characteristic codes and code systems.

Name	Code System OID / Code	Data Type	Description
SPL Characteristics	2.16.840.1.113883.1.11.19255		Used early on with Existing SPL for drugs characteristics codes that are possibly applicable for devices:
	SPLSIZE	PQ	Greatest dimension in millimeter
	SPLCOLOR	CV	color code from NCI Thesaurus
	SPLCONTAINS	CV	A code specifying the presence (even in traces) of a substance which may be a concern to some users.
	SPLIMAGE	ED	Photographic image of the product for the purpose of identification, taken under standardized conditions.
LOINC	2.16.840.1.113883.6.1		Used for metrologically well defined properties.
NCI Thesaurus	2.16.840.1.113883.3.26.1.1		Used rarely (if at all) for characteristic codes.

Validation Procedures

3.1.9.1 There is a characteristic property code with code and code system

3.1.9.2 Characteristic property code system is 2.16.840.1.113883.1.11.19255, 2.16.840.1.113883.6.1, or 2.16.840.1.113883.3.26.1.1.

3.1.9.3 There is a characteristic value with specified type appropriate for the characteristic property.

3.1.9.4 Value type is PQ, INT, IVL_PQ, CV, ST, ED, or BL

3.2 Drug, Dietary Supplement and Medical Food Products

The drug, dietary supplement and medical food product data elements includes the product codes, proprietary and non proprietary name, dosage form, ingredient and active moiety name, ingredient identifier, ingredient strength, package quantity, type and code, marketing category, marketing status, dosage form appearance, DEA schedule, and route of administration.

Drug products are those products with the appropriate marketing categories listed in Table 1. Dietary supplement are those products that are associated with the dietary supplement (C86952) marketing category. Medical foods are associated with the medical food marketing category (C86964).

The drug product consists of a product item code (NDC for drugs and NHRIC for dietary supplements or medical foods), proprietary and non proprietary name, and dosage form. These are children of <manufacturedProduct>. The proprietary name is the name as it appears on the label divided between <name> and <suffix>. The <name> is the initial portion of the proprietary name describing the ingredients without any other descriptors including trademarks and dosage forms. If necessary, <suffix> is used for descriptors such as “extended release”. When using the <suffix>, a space after the proprietary name is added as necessary. If there is no proprietary name, the non proprietary name is used without any descriptors. The dosage form is described in <formCode>. The <genericMedicine><name> is the non proprietary name of the product.

3.2.1 Code and Name

```
<section>
  <subject>
    <manufacturedProduct>
      <manufacturedProduct>
        <code code="0001-0001" codeSystem="2.16.840.1.113883.6.69"/>
        <name>Tazmin <suffix>XR</suffix></name>
        <formCode code="C42998"
                  codeSystem="2.16.840.1.113883.3.26.1.1"
                  displayName="tablet"/>
        <asEntityWithGeneric>
          <genericMedicine>
            <name>tazminate hydrochloride</name>
          </genericMedicine>
```

Validation Procedures

3.2.1.1 Code system is 2.16.840.1.113883.6.69

3.2.1.2 Code has two segments separated by a hyphen

3.2.1.3 The first segment is numeric.

3.2.1.4 Segments follow the pattern of 4-4, 5-4 or 5-3

3.2.1.5 The second segment is alpha-numeric (letters must be upper-case).

3.2.1.6 First segment matches a Labeler Code associated with the Labeler id, except for parts.

3.2.1.7 Code has the same labeler segment as the NDC product/item code of all top-level products in this document, except under parts

3.2.1.8 Code has the same length as all other NDC product/item codes with the same labeler segment in this document (i.e., all NDC product/item codes from one

labeler have the same consistent length and hence all package item codes have the same consistent configuration.)

3.2.1.9 Code has the same length as any other NDC product/item codes of the same labeler (i.e., all NDC product/item codes by the same labeler have the same consistent length and hence all package item codes have the same consistent configuration.)

3.2.1.10 There is only one product element for each NDC product/item code, i.e., the same product is not described more than once except under parts.

3.2.1.11 If the NDC product/item code is mentioned elsewhere in the document, then the product and generic name, dosage form, UNII and strength of all ingredients are the same.

3.2.1.12 There is a name

3.2.1.13 Name contains no special symbols (e.g., no "®" or "™" etc) and no "USP" or dosage forms.

3.2.1.14 There is a form code

3.2.1.15 Form code has the code system 2.16.840.1.113883.3.26.1.1

3.2.1.16 If the product has parts, then the form code is C47916

3.2.1.17 Display name matches the code

3.2.1.18 There is a generic medicine name

3.2.1.19 Generic medicine name contains no special symbols (e.g., no "®" or "™" etc) and no "USP" " or dosage forms.

3.2.1.20 Generic medicine name contains no suffix.

3.2.1.21 Generic medicine name contains no more than 512 characters.

3.2.1.22 If the NDC product/item code was previously submitted, then the product and generic name, source, active ingredient UNII, dosage form, active ingredient strength, product characteristics of size, shape, color and imprint code are the same as in the most recent submission for this NDC product/item code.

3.2.2 Product source

```
<asEquivalentEntity classCode="EQUIV">
  <code code="C64637" codeSystem="2.16.840.1.113883.3.26.1.1"/>
  <definingMaterialKind>
     <code  code="source product item code"
            codeSystem="2.16.840.1.113883.6.69"/>
```

Validation Procedures

3.2.2.1 As equivalent entity class code, code and code system are as above

3.2.2.2 If there is a classCode, it is "EQUIV".

3.2.2.3 Defining material kind code matches a NDC product/item code in a SPL file with a different setId

3.2.2.4 NDC product/item code for the source is not the same as the NDC product/item code for the product

3.2.3 Active ingredient

Active ingredients are specified as follows:

```
<ingredient classCode="ACTIM, ACTIB, or ACTIR">
  <quantity>
     <numerator value="10" unit="mg"/>
     <denominator value="1" unit="1"/>
  </quantity>
  <ingredientSubstance>
     <code code="1234567890" codeSystem="2.16.840.1.113883.4.9"/>
     <name>tazminate malate</name>
```

The class code for active ingredient is dependent on the basis of the strength. If the basis of strength is the active ingredient, the class code is "ACTIB". If the basis of strength is the active moiety, the class code is "ACTIM". If the basis of strength is a reference drug, the class code is "ACTIR". The strength is represented as a numerator and denominator. The UCUM code is used for the unit of measure. The UCUM code for a unit that is an "each" is "1" Examples of "each" is in the table below.

In most cases, the strength used is that for a single dose following the conventions in Table 5. In the table, an example of "mass" is milligrams, an example of "volume" is

Table 5: Conventions for expressing strength

Product	Numerator unit	Denominator unit
Oral solid	Mass	Each
Oral liquid	Mass	Volume
Oral powder for reconstitution with a known volume	Mass	Volume

Oral powder for reconstitution with a variable volume	Mass	Each
Suppository	Mass	Each
Injection liquid	Mass	Volume
Injection powder for reconstitution with a known volume	Mass	Volume
Injection powder for reconstitution with a variable volume	Mass	Each
Inhaler powder	Mass	Each
Inhaler liquid	Volume	Each
Inhaler blister	Mass	Each
Topical cream or ointment	Mass	Mass
Topical gel or lotion	Mass	Volume
Transdermal patch	Mass	Time
Bulk liquid	Mass	Volume
Bulk solid	Mass	Mass

Validation Procedures

3.2.3.1 Class code for active ingredients are ACTIB, ACTIM or ACTIR

3.2.3.2 If the document type is for 'bulk ingredient' (53409-9) with a marketing category of 'bulk ingredient' (C73626), then there is one and only one active ingredient.

3.2.3.3 If the product has no parts and is not a part, then there are one or more active ingredients.

3.2.3.4 If the product has parts, then the active ingredients are under parts

3.2.3.5 There is a strength with a numerator and denominator

3.2.3.6 If the document type is for 'bulk ingredient' (53409-9) with a marketing category of 'bulk ingredient' (C73626), then numerator and denominator are the same.

3.2.3.7 If active ingredient code are on the list of active ingredients approved for vaccines, then the document type code is 53404-0 (Vaccine Label).

3.2.4 Active moiety

```
<ingredient classCode="ACTIR">
      <ingredientSubstance>

<activeMoiety>
  <activeMoiety>
      <code code="0987654321" codeSystem="2.16.840.1.113883.4.9"/>
      <name>tazminic acid</name>
```

Validation Procedures

3.2.4.1 There are one or two active moieties

3.2.4.2 There is an active moiety code

3.2.4.3 Code system is 2.16.840.1.113883.4.9

3.2.4.4 There is an active moiety name for each active moiety

3.2.4.5 Active moiety name does not include any of the names in the *Active moiety validation* (counter ion) list except if the word appears by itself optionally followed by “(ester)”, “cation” or “anion” or “ion”.

3.2.4.6 Active moiety name matches the code

3.2.5 Reference Ingredient for Strength

```
<ingredient classCode=“ACTIR”>
  <ingredientSubstance>
     <asEquivalentSubstance>
        <definingSubstance>
           <code code="A123455678" codeSystem="2.16.840.1.113883.4.9"/>
           <name>tazemate formate</name>
```

Validation Procedures

3.2.5.1 If the class code is ACTIR, then there is an asEquivalentSubstance element with a defining substance

3.2.5.2 If the class code is not ACTIR, then there is no asEquivalentSubstance element

3.2.5.3 There is a reference ingredient code

3.2.5.4 Code system is 2.16.840.1.113883.4.9

3.2.5.5 There is a name

3.2.5.6 The name matches the code

3.2.5.7 If the document type code is 53404-0 (Vaccine Label), then there must be at least one active ingredient code on the list of active ingredients approved for vaccines.

3.2.6 Inactive ingredient

The inactive ingredient includes the inactive ingredient class code, ingredient name, identifier, and strength. The element <ingredient> is a child of <manufacturedProduct>. The class code for inactive ingredient is "IACT". The strength, if needed, is represented as a numerator and denominator and is described using UCUM units of measure. If the inactive ingredient is confidential, the element <ingredient> includes <confidentialityCode code="B" codeSystem="2.16.840.1.113883.5.25"/>.

```
<ingredient classCode="IACT">
  <confidentialityCode code="B" codeSystem="2.16.840.1.113883.5.25"/>
  <quantity>
    <numerator value="value" unit="UCUM code"/>
    <denominator value="value" unit="UCUM code"/>
  </quantity>
  <ingredientSubstance>
    <code code="UNII" codeSystem="2.16.840.1.113883.4.9"/>
    <name>inactive ingredient name</name>
  </ingredientSubstance>
</ingredient>
```

Validation Procedures

3.2.6.1 There are zero to many inactive ingredients.

3.2.6.2 If the document type is *human OTC drug label* (34390-5), then there is at least one inactive ingredient.

3.2.6.3 Class code is IACT

3.2.6.4 If the product has parts, then the inactive ingredients are under parts

3.2.6.5 If the document type is *human OTC drug label* (34390-5), then there is no confidentiality code.

3.2.6.6 There is no ingredient other than active ingredient (having class code ACTIM, ACTIR, ACTIB), and inactive ingredient (having class code IACT).

3.2.7 Packaging

The format for packaging specification is:

```
<asContent>
   <quantity>
      <numerator value="100" unit="1"/>
      <denominator value="1"/>
   </quantity>
```

```
<containerPackagedProduct>
   <code code="0001-0001-05" codeSystem="2.16.840.1.113883.6.69"/>
   <formCode code="C43169"
             codeSystem="2.16.840.1.113883.3.26.1.1"
             displayName="bottle"/>
```

Validation Procedures

3.2.7.1 Every top-level product has an “as content” element (optional for parts)

3.2.7.2 If the quantity numerator unit is not “1”, then there is no translation

3.2.7.3 If there is a translation, then code is from the *unit of presentation* list

3.2.7.4 If there is a translation, then code system for the translation code is 2.16.840.1.113883.3.26.1.1

3.2.7.5 If there is a translation, then display name matches the translation code

3.2.7.6 If there is a translation, then code agrees with the form code of the contained item. For example, if the form code is “blister pack” (C43168) the translation code is also “blister pack” (C61569) and not “blister”

3.2.7.7 Container packaged product code is 10 digits (excluding any hyphens).

3.2.7.8 Code system for package item code is 2.16.840.1.113883.6.69

3.2.7.9 Package item code contains three segments divided by hyphens.

3.2.7.10 The first two segments of the package item code matches the NDC product/item code

3.2.7.11 The outer package item code is not associated with another set id except under parts.

3.2.7.12 If the package item code has been previously submitted, then the package form code and quantity value and unit are the same as in the most recent submission for this package item code.

3.2.8 Parts

Products with one or more parts

```
<part>
   <quantity>
      <numerator value="1" unit="1"/>
      <denominator value="1"/>
   </quantity>
   <partProduct>
      <code code="0001-0001" codeSystem="2.16.840.1.113883.6.69"/>
      <name>Tazmin <suffix>XR</suffix></name>
      <formCode code="C42916"
                codeSystem="2.16.840.1.113883.3.26.1.1"
                displayName="capsule, extended release"/>
      <asEntityWithGeneric>
         <genericMedicine>
            <name>tazminate hydrochloride</name>
```

Validation Procedures

3.2.8.1 If the product form code is ‘C47916’ (KIT), then there must be one or more parts

3.2.8.2 If the product has parts, then at least one part has one or more active ingredients.

3.2.8.3 Procedures for code, name, dosage form code, source, ingredients, characteristics and packaging are the same as for the main products (see 0ff)

3.2.9 Marketing Category

Example:

```
<subjectOf>
   <approval>
      <id extension="NDA123456" root="2.16.840.1.113883.3.150"/>
      <code  code="C73594"
             codeSystem="2.16.840.1.113883.3.26.1.1"
             displayName="NDA"/>
      <author>
         <territorialAuthority>
            <territory>
               <code code="USA" codeSystem="2.16.840.1.113883.5.28"/>
```

Validation Procedures

3.2.9.1 If the code is C80438 (Exempt device), C80440 (Humanitarian Device Exemption), C80441 (Premarket Application), or C80442 (Premarket Notification), then there is at least one part.

3.2.9.2 If the document type code is: 50577-6 (OTC animal drug), 50576-8 (OTC type A), 50574-3 (OTC type B), 50573-5 (OTC type C), 50578-4 (prescription animal drug), 50575-0 (VFD type A), 50572-7 (VFD type B) or 50571-9 (VFD

type C), then the marketing category is: C73583 (ANADA), C73588 (Conditional NADA), C73593 (NADA), C92556 (legally marketed unapproved new animal drugs for minor species), C73614 (unapproved homeopathic), C73613 (unapproved medical gas) or C73627 (unapproved drug other).

3.2.9.3 If the marketing category is C73583 (ANADA), C73588 (Conditional NADA), C73593 (NADA), then the document type code is: 50577-6 (OTC animal drug), 50576-8 (OTC type A), 50574-3 (OTC type B), 50573-5 (OTC type C), 50578-4 (prescription animal drug), 50575-0 (VFD type A), 50572-7 (VFD type B) or 50571-9 (VFD type C)

3.2.9.4 If the marketing category is C73626 (bulk ingredient), C94795 (drug for further processing), C96793 (bulk ingredient for human prescription compounding), or C98252 (bulk ingredient for animal drug compounding) then the document type is 53409-9 (bulk ingredient).

3.2.9.5 If the document type is 53409-9 (bulk ingredient), then the marketing category is C73626 (bulk ingredient), C94795 (drug for further processing), C96793 (bulk ingredient for human prescription compounding), or C98252 (bulk ingredient for animal drug compounding).

3.2.9.6 If the code is C73584 (ANDA), C73585 (BLA), or C73594 (NDA), then there exists a record of an application for the application number.

3.2.9.7 If the code is C73584 (ANDA), C73585 (BLA), or C73594 (NDA) and the marketing is active with a start date on or before the current date, then there exists a record of an approved application for the application number.

3.2.9.8 If the code is C73584 (ANDA), C73585 (BLA), or C73594 (NDA) and the marketing status is completed, then there exists a record of an approved or withdrawn application for the application number.

3.2.9.9 If the marketing category is C95600 (Approved drug product manufactured exclusively for private label distributor), C95601 (OTC monograph drug product manufactured exclusively for private label distributor), C95602 (Unapproved drug product manufactured exclusively for private label distributor), then the document type must be 34391-3 (Human prescription drug label) or 34390-5 (Human OTC drug label)

3.2.9.10 If the marketing category is C86964 (Medical Food), then the document type is 58475-5 (Medical Food), except under parts.

3.2.9.11 If the document type is 58475-5 (Medical Food), then the marketing category is C86964 (Medical Food).

3.2.9.12 If the marketing category is C86952 (Dietary Supplement), then the document type is 58476-3 (Dietary Supplement), except under parts.

3.2.9.13 If the document type is 58476-3 (Dietary Supplement), then the marketing category is C86952 (Dietary Supplement).

3.2.10 Marketing Status and Date

The procedures for marketing status and date (if any) are the same for all products and described in Section 3.1.8.

Validation Procedures

3.2.10.1 There is one marketing status code for each top-level product (part products do not need this)

3.2.11 DEA schedule

The DEA schedule, when applicable, is described under <policy> which is a child of <subjectOf> which is a child of <manufacturedProduct> as illustrated in the following example of a drug that is schedule II.

```
<subjectOf>
  <policy classCode="DEADrugSchedule">
     <code  code="C48675"
        codeSystem="2.16.840.1.113883.3.26.1.1"
        displayName="CII"/>
```

Validation Procedures

3.2.11.1 If there is a DEA schedule, then the code system is 2.16.840.1.113883.3.26.1.1

3.2.11.2 Display name matches the code

3.2.11.3 The policy element has a class code of ‘DEADrugSchedule’.

3.2.12 Solid Oral Drug Product characteristics

Product characteristics include dosage form appearance. Dosage form characteristics are used to describe the appearance of the drug product and include the color, score, shape, size, imprint code and image. These are all under <subjectOf> which is a child of <manufacturedProduct>. Product characteristics also include product flavor and what the product contains.

```
<subjectOf>
  <characteristic classCode="OBS">
    <code code="SPLCOLOR" codeSystem="2.16.840.1.113883.1.11.19255"/>
    <value code="code for color" codeSystem="2.16.840.1.113883.3.26.1.1"
           displayName="display name for color" xsi:type="CE">
      <originalText>optional original color description text</originalText>
    </value>
  </characteristic>
</subjectOf>

<subjectOf>
  <characteristic classCode="OBS">
    <code code="SPLSCORE" codeSystem="2.16.840.1.113883.1.11.19255"/>
    <value value="value for score" xsi:type="INT"/>
  </characteristic>
</subjectOf>

<subjectOf>
  <characteristic classCode="OBS">
    <code code="SPLSHAPE" codeSystem="2.16.840.1.113883.1.11.19255"/>
    <value code="code for shape" codeSystem="2.16.840.1.113883.3.26.1.1"
           displayName="display name for shape" xsi:type="CE">
      <originalText>optional original shape description text</originalText>
    </value>
  </characteristic>
</subjectOf>

<subjectOf>
  <characteristic classCode="OBS">
    <code code="SPLSIZE" codeSystem="2.16.840.1.113883.1.11.19255"/>
    <value unit="mm" value="value for size in mm" xsi:type="PQ"/>
  </characteristic>
</subjectOf>

<subjectOf>
  <characteristic classCode="OBS">
    <code code="SPLIMPRINT" codeSystem="2.16.840.1.113883.1.11.19255"/>
    <value xsi:type="ST">imprint separated by semicolon</value>
  </characteristic>
</subjectOf>

<subjectOf>
  <characteristic classCode="OBS">
    <code code="SPLFLAVOR" codeSystem="2.16.840.1.113883.1.11.19255"/>
    <value code="code for flavor" codeSystem="2.16.840.1.113883.3.26.1.1"
           displayName="display name for flavor" xsi:type="CE">
      <originalText>optional flavor description text</originalText>
    </value>
  </characteristic>
</subjectOf>

<subjectOf>
  <characteristic classCode="OBS">
    <code code="SPLCONTAINS" codeSystem="2.16.840.1.113883.1.11.19255"/>
    <value code="code for contains" codeSystem="2.16.840.1.113883.3.26.1.1"
           displayName="display name for contains" xsi:type="CE">
      <originalText>optional original description text</originalText>
    </value>
  </characteristic>
</subjectOf>
```

```
<subjectOf>
  <characteristic classCode="OBS">
    <code code="SPLIMAGE" codeSystem="2.16.840.1.113883.1.11.19255"/>
    <value xsi:type="ED" mediaType="image/jpeg">
      <reference value="file name.jpg"/>
    </value>
  </characteristic>
</subjectOf>
```

3.2.13 Color

```
<subjectOf>
   <characteristic>

      <code code="SPLCOLOR" codeSystem="2.16.840.1.113883.1.11.19255"/>
      <value code="C48333"
             codeSystem="2.16.840.1.113883.3.26.1.1"
             displayName="blue" xsi:type="CE">
         <originalText>LIGHT BLUE</originalText>
```

Validation Procedures

3.2.13.1 If the dosage form is on the *solid oral dosage form* list, then there is a color.

3.2.13.2 Code and code system is as above

3.2.13.3 Value code system is 2.16.840.1.113883.3.26.1.1

3.2.13.4 Display name matches the value code

3.2.14 Shape

```
<subjectOf>
   <characteristic>

      <code code="SPLSHAPE" codeSystem="2.16.840.1.113883.1.11.19255"/>
      <value code="C48336"
             codeSystem="2.16.840.1.113883.3.26.1.1"
             displayName="capsule" xsi:type="CE"/>
         <originalText>capsule like</originalText>
```

Validation Procedures

3.2.14.1 If the dosage form is on the *solid oral dosage form* list, then there is a shape

3.2.14.2 Code and code system is as above

3.2.14.3 Value code system is 2.16.840.1.113883.3.26.1.1

3.2.14.4 Display name matches the value code

3.2.14.5 There is only one shape element

3.2.15 Size

```
<subjectOf>
  <characteristic>
     <code code="SPLSIZE" codeSystem="2.16.840.1.113883.1.11.19255"/>
     <value unit="mm" value="18" xsi:type="PQ"/>
```

Validation Procedures

3.2.15.1 If the dosage form is on the *solid oral dosage form* list, then there is a size

3.2.15.2 Code and code system is as above

3.2.15.3 There is a unit and value

3.2.15.4 Value units is mm

3.2.15.5 Value is a whole number greater than zero

3.2.15.6 There is only one size element

3.2.16 Scoring

```
<subjectOf>
  <characteristic>
     <code code="SPLSCORE" codeSystem="2.16.840.1.113883.1.11.19255"/>
     <value value="1" xsi:type="INT"/>
```

Validation Procedures

3.2.16.1 If the dosage form is on the *solid oral dosage form* list, then there is scoring

3.2.16.2 Code and code system is as above

3.2.16.3 The value is 1, 2, 3, 4 or nullFlavor=”OTH”

```
  <characteristic>
     <code code="SPLSCORE" codeSystem="2.16.840.1.113883.1.11.19255"/>
     <value nullFlavor=“OTH” xsi:type="INT"/>
```

3.2.16.4 There is only one score element

3.2.17 Imprint code

```
<subjectOf>
  <characteristic>
     <code code="SPLIMPRINT" codeSystem="2.16.840.1.113883.1.11.19255"/>
     <value xsi:type="ST">05</value>
```

Validation Procedures

3.2.17.1 Code and code system is as above

3.2.17.2 Value has only letters and numbers separated by semicolon without spaces

3.2.17.3 There is only one imprint code element

3.2.18 Flavor

```
<subjectOf>
  <characteristic>
     <code code="SPLFLAVOR" codeSystem="2.16.840.1.113883.1.11.19255"/>
     <value code="C73391"
           codeSystem="2.16.840.1.113883.3.26.1.1"
           displayName="grape" xsi:type="CE">
        <originalText>wild grape</originalText>
```

Validation Procedures

3.2.18.1 If there is a flavor, then code and code system is as above

3.2.18.2 Value code system is 2.16.840.1.113883.3.26.1.1

3.2.18.3 Display name matches the value code

3.2.19 “Contains” characteristic

```
<subjectOf>
  <characteristic>
     <code code="SPLCONTAINS" codeSystem="2.16.840.1.113883.1.11.19255"/>
     <value code="C00000"
           codeSystem="2.16.840.1.113883.3.26.1.1"
           displayName="example" xsi:type="CE">
        <originalText>contains peanuts</originalText>
```

Validation Procedures

3.2.19.1 If there is a “contains” characteristic, then code and code system is as above

3.2.19.2 Value code system is 2.16.840.1.113883.3.26.1.1

3.2.19.3 Display name matches the value code

NOTE: The code list for the “contains” characteristic is pending

3.2.20 Image

```
<subjectOf>
  <characteristic>
     <code code="SPLIMAGE" codeSystem="2.16.840.1.113883.1.11.19255"/>
     <value xsi:type="ED" mediaType="image/jpeg">
        <reference value="8837a946-1912-4c1f-8035-e313fdd11ef2.jpg"/>
```

Validation Procedures

3.2.20.1 If there is SPL image, then code and code system are as above

3.2.20.2 Value xsi:type is as above

3.2.20.3 mediaType is “image/jpeg”

3.2.20.4 Reference value is the file name for the image

3.2.20.5 Image file obtained from FDA has the file name assigned by FDA.

3.2.20.6 The image file is submitted together with the SPL file.

3.2.20.7 There are no characteristics other than the ones mentioned above.

3.2.21 Route of administration

Route of administration may be specified for products

```
<subject>
  <manufacturedProduct>
     <consumedIn/>
```

and their parts:

```
<part>
  <consumedIn/>
```

Route of administration is specified as follows:

```
<consumedIn>
  <substanceAdministration>
    <routeCode code="C38288"
               codeSystem="2.16.840.1.113883.3.26.1.1"
               displayName="oral"/>
```

Validation Procedures

3.2.21.1 If the document type is not for ‘bulk ingredient’ (53409-9) and product is not a top-level product whose form code is C47916, then there is one or more “consumed in” substance administration with route code.

3.2.21.2 Route code system is 2.16.840.1.113883.3.26.1.1

3.2.21.3 There is a display name that matches the code

3.2.21.4 If the document type is for ‘bulk ingredient’ (53409-9), then route code is “not applicable” or not present at all.

```
      <routeCode nullFlavor="NA"/>
```

3.2.21.5 The route code cannot be “not applicable” (C48623) for document types other than bulk ingredient (53409-9).

3.3 Device Product

```
<manufacturedProduct>
  <code code="91234561234569" codeSystem="1.3.160"/>
    <name>SuperTape 2000</name>
    <desc>Adhesive tape for orthopedic use.</desc>
    <asSpecializedKind classCode="GEN">
      <generalizedMaterialKind>
        <code code="MCA" displayName="Tape, Surgical, Internal"
              codeSystem="2.16.840.1.113883.6.303"/>
      </generalizedMaterialKind>
    </asSpecializedKind>
```

Device products are those products with the appropriate marketing categories listed in Table 1.

3.3.1 Item Code and Name

Validation Procedures

3.3.1.1 There may be a NDC product/item code

3.3.1.2 If there is a NDC product/item code, the following general procedures apply:

3.3.1.3 Code system is 2.16.840.1.113883.6.69 (NHRIC), 1.3.160 (GS1), or 2.16.840.1.113883.6.40 (HIBCC).

3.3.1.4 Code is compliant with the code system’s allocation rules.

3.3.1.5 There is a name, i.e., the trade or proprietary name of the medical device as used in product labeling or in the catalog

3.3.1.6 Markings such as ®, or ™ should not be included

3.3.1.7 There is a device type (asSpecializedKind element) with a code.

3.3.1.8 code system is 2.16.840.1.113883.6.303 for FDA Product Classification System

3.3.1.9 there is a valid medical device product classification code

3.3.1.10 there is a displayName which matches the code

3.3.2 Additional Device Identifiers

```
<document>
  <section>
    <subject>
      <manufacturedProduct>
        <manufacturedProduct>
          <asIdentifiedEntity classCode="IDENT">
            <id extension="ST2000/A" root="1.2.3.99.1"/>
            <code code="C99286" displayName="model number"
                  codeSystem="2.16.840.1.113883.3.26.1.1"/>
          </asIdentifiedEntity>
```

These additional identifiers may also appear under device parts:

```
<part>
  <partProduct>
     <asIdentifiedEntity>
```

3.3.2.1 There may be one or more additional identifiers, including model number (C99286), catalog number (C99285), and reference number (C99287).

3.3.2.2 There is a code with code system 2.16.840.1.113883.3.26.1.1.

3.3.2.3 Code is from the identifier type list

Table 6:Additional Identifier Types

Identifier Type	Code	Description
Model Number	C99286	the exact model number found on the device label or accompanying packaging.
Catalog Number	C99285	the exact number as it appears in the manufacturer's catalog, device labeling, or accompanying packaging
Reference Number	C99287	any secondary product identifier

3.3.2.4 There is one id

3.3.2.5 Id has a root OID

3.3.2.6 The actual identifier is in the extension.

3.3.2.7 There is at most one Model Number reference (C99286)

3.3.2.8 The id root can be any root OID over which the labeler has authority. If the labeler has no such root OID of its own, then the root is constructed by concatenating the DUNS number to the fixed string “1.3.6.1.4.1.32366.3.”

3.3.2.9 There is at most one Catalog Number (C99285)

3.3.2.10 The id root can be any root OID over which the labeler has authority. If the labeler has no such root OID of its own, then the root is constructed by concatenating the DUNS number to the fixed string “1.3.6.1.4.1.32366.3.”

3.3.2.11 The product may have multiple reference numbers (i.e., secondary identifiers, C99287).

3.3.2.12 The id root is 2.16.840.1.113883.6.69 (NHRIC), 1.3.160 (GS1), or 2.16.840.1.113883.6.40 (HIBCC).

3.3.2.13 Id extension is compliant with the code system’s allocation rules.

3.3.3 Device Ingredient

Ingredients included in devices that are not identified as active ingredients include the ingredient class code, ingredient name, identifier, and strength. The element <ingredient> is a child of <manufacturedProduct>. The class code for ingredient is “INGR”. The strength, if needed, is represented as a numerator and denominator and is described using UCUM units of measure.

```
<ingredient classCode="INGR">
  <quantity>
    <numerator value="value" unit="UCUM code"/>
    <denominator value="value" unit="UCUM code"/>
  </quantity>
  <ingredientSubstance>
    <code code="UNII" codeSystem="2.16.840.1.113883.4.9"/>
    <name>ingredient name</name>
  </ingredientSubstance>
</ingredient>
```

This structure is also used to indicate that a product contains latex (UNII code for latex).

Note that devices may have active ingredients as well, such as in a medicated stent, i.e., where the device serves in part the function of releasing a built-in drug. This is to be distinguished from devices such as syringes which are delivery devices for a drug product that they contain.

3.3.4 Device Parts

Device parts may be specified for the product in the same way as for other product kits (see Section 3.1.6 Kits, Parts, Components and Accessories above),

```
<partProduct>
   <code code="91234561234569" codeSystem="1.3.160"/>
   <name>SuperTape 2000</name>
   <asSpecializedKind classCode="GEN">
      <generalizedMaterialKind>
         <code code="MCA"
               codeSystem="2.16.840.1.113883.6.303"/>
         </generalizedMaterialKind>
      </asSpecializedKind>
```

Validation Procedures

3.3.4.1 There is a name, i.e., the trade or proprietary name of the medical device as used in product labeling or in the catalog

3.3.4.2 Markings such as ®, or ™ should not be included

3.3.5 Part of Assembly

When products are used together but packaged separately, the data element <asPartOfAssembly> is used to identify the other product. The products could be drugs or devices.

```
<asPartOfAssembly>
  <wholeProduct><!-- this is the assembly, but has no identifier -->
    <part>
      <partProduct>
        <code code="item code of accessory component"
              codeSystem="code system OID"/>
```

3.3.6 Regulatory Identifiers

Regulatory identifiers, marketing status and characteristics are all connected through the <subjectOf> element which may appear on the main product:

```
<subject>
   <manufacturedProduct>
      <manufacturedProduct/>
      <subjectOf/>
```

The regulatory identifier:

```
<subjectOf>
  <approval>
     <id extension="K123456" root="2.16.840.1.113883.3.150"/>
     <code  code="C80442"
            codeSystem="2.16.840.1.113883.3.26.1.1"
            displayName="Premarket Notification"/>
     <author>
        <territorialAuthority>
           <territory>
              <code code="USA" codeSystem="2.16.840.1.113883.5.28"/>
```

Validation Procedures

3.3.6.1 There is one regulatory identifier for each product

3.3.6.2 Code comes from Table 1 for product type “device”.

3.3.6.3 Display name matches the code

3.3.6.4 Code system is 2.16.840.1.113883.3.26.1.1

3.3.6.5 If the code is PMA (C80441), 510(k) (C80442), Exempt device (C80438), or Humanitarian Device Exemption (C80440), then the id root is 2.16.840.1.113883.3.150.

3.3.6.6 If the code is C80441 (Premarket Application), then the id extension has a prefix “P” or “BP” followed by 6 digits

3.3.6.7 If the code is C80442 (Premarket Notification), then the id extension has a prefix “K” or “BK” followed by 6 digits.

3.3.6.8 If the code is C80438 (Exempt device), then the id extension consists of 3 letters

3.3.6.9 If the code is C80440 (Humanitarian Device Exemption), then the id extension has a prefix “H” followed by 6 digits

3.3.6.10 Territorial authority is as above

3.3.7 Marketing status and date

The procedures for marketing status and date (if any) are the same for all products and described in Section 3.1.8.

Validation Procedures

3.3.7.1 There is one marketing status code for each top-level product (part products do not need this)

3.3.8 Device Characteristics

Many characteristics exist for devices and are listed here in tabular form. The characteristic structure allows specifying any properties of the product in a code-value pair, the code saying which property is being specified, the value saying what the property is for the given product. The characteristics structure connects to the product Role through the subjectOf element.

```
<manufacturedProduct>
  <manufacturedProduct>
      ...
  </manufacturedProduct>
  <subjectOf>
    <characteristic>
      <code code="characteristic code"
            codeSystem="characteristic code system"/>
      <value xsi:type="characteristic value type" ...>
```

Characteristics listed in Table 7 use one of a number of different data types. Each data type uses slightly different XML elements and attributes as shown in the templates in Section 3.1.9 Characteristics3.1.9.

Table 7: Characteristic codes and code systems.

Name	Code / Code System OID	Data Type	Description
Number of times useable.	SPLUSE 2.16.840.1.113883.1.11.19255	INT	Specifies how often a product may be re-used. While a number could be specified, the common distinction is between single disposable and multiple use products. A product that has unlimited reuses uses the <value nullFlavor=”PINF” xsi:type=”INT”/>.
Sterile Use	SPLSTERILEUSE 2.16.840.1.113883.1.11.19255	BL	Specifies whether the device is intended or not intended to be used where sterile conditions are necessary (e.g., pens).
Contains	SPLCONTAINS 2.16.840.1.113883.1.11.19255	CV	A code specifying the presence (even in traces) of a substance which may be a concern to some users.
MRI Safety	SPLMRISAFE 2.16.840.1.113883.1.11.19255	BL	Yes (MRI Safe), No (MRI unsafe)

3.3.9 Reusability

```
<subjectOf>
   <characteristic>
      <code code="SPLUSE" codeSystem="2.16.840.1.113883.1.11.19255"/>
      <value value="1" xsi:type="INT"/>
```

Validation Procedures

3.3.9.1 Code and code system is as above

3.3.9.2 The value is an integer number greater or equal 1 (1 meaning single use, and number greater than 1 meaning reusable up to this many times.)

3.3.9.3 There is only one reusability element

3.3.10 Sterile Use

```
<subjectOf>
   <characteristic>
      <code code="SPLSTERILEUSE"
            codeSystem="2.16.840.1.113883.1.11.19255"/>
      <value xsi:type=“BL” value="true"/>
```

Validation Procedures

3.3.10.1 Code and code system are as above

3.3.10.2 Value type is “BL” (Boolean)

3.3.10.3 Value is “true” or “false”

3.4 Cosmetic Product

```
<manufacturedProduct>
  <code code="91234561234569" codeSystem="1.3.160"/>
    <name>Juvenia Soft</name>
    <asSpecializedKind classCode="GEN">
      <generalizedMaterialKind>
        <code code="01B" displayName="lotions, oils, powders, and creams"
              codeSystem="2.16.840.1.113883.6.303"/>
      </generalizedMaterialKind>
    </asSpecializedKind>
```

Cosmetic products are those products with marketing category C86965 (cosmetic).

3.4.1 Item Code and Name

Validation Procedures

3.4.1.1 There is a name, i.e., the trade or proprietary name of the cosmeti as used in product labeling or in the catalog

3.4.1.2 Markings such as ®, or ™ should not be included

3.4.1.3 There is a cosmetic type (asSpecializedKind element) with a code.

3.4.1.4 code system is is 2.16.840.1.113883.6.303 for FDA Product Classification System

3.4.1.5 there is a valid cosmetic product classification code

3.4.1.6 there is a displayName which matches the code

3.4.2 Cosmetic Ingredient

Cosmetic ingredients use the class code INGR. The ingredients are included in decending order of predominant weight as in the label.

```
<ingredient classCode="INGR">
  <ingredientSubstance>
    <code code="UNII" codeSystem="2.16.840.1.113883.4.9"/>
    <name>ingredient name</name>
  </ingredientSubstance>
</ingredient>
```

Validation Procedures

3.4.2.1 Class code for cosmetic ingredients is INGR

3.4.2.2 If the product has no parts and is not a part, then there are one or more ingredients.

3.4.2.3 If the product has parts, then the ingredients are under parts

3.4.3 Cosmetic Parts

Cosmetic parts may be specified for the product in the same way as for other product kits (see Section 3.1.6 Kits, Parts, Components and Accessories above),

```
<partProduct>
   <code code="91234561234569" codeSystem="1.3.160"/>
   <name>Juvenia Soft</name>
   <asSpecializedKind classCode="GEN">
      <generalizedMaterialKind>
         <code code="MCA"
               codeSystem="2.16.840.1.113883.6.303"/>
         </generalizedMaterialKind>
      </asSpecializedKind>
```

Validation Procedures

3.4.3.1 There is a name, i.e., the trade or proprietary name of the cosmetic as used in product labeling or in the catalog

3.4.3.2 Markings such as ®, or ™ should not be included

3.4.4 Marketing status and date

The procedures for marketing status and date (if any) are the same for all products and described in Section 3.1.8.

Validation Procedures

3.4.4.1 There is one marketing status code for each top-level product (part products do not need this)

3.5 Summary of Product Data Elements

This concludes the specific data elements recognized about various types of products. The following sections describe specific business processes which may or may not contain the above product data element structures.

4 Drug Labeling and Drug Listing

Drug labeling provides a description of the product and information for its use. Drug listing links registered establishments to specific products.

4.1 Header

4.1.1 Document Type

4.1.1.1 Document types for drug labeling and listing are in the following Table 8:

Table 8: Document Types for Drug Labeling and Listing

Code	Display Name
53409-9	BULK INGREDIENT
60684-8	CELLULAR THERAPY
34390-5	HUMAN OTC DRUG LABEL
34391-3	HUMAN PRESCRIPTION DRUG LABEL
53407-3	LICENSE BLOOD INTERMEDIATES/PASTE LABEL
53406-5	LICENSED VACCINE BULK INTERMEDIATE LABEL
55439-4	MEDICAL DEVICE
53405-7	NON-STANDARDIZED ALLERGENIC LABEL
50577-6	OTC ANIMAL DRUG LABEL
50576-8	OTC TYPE A MEDICATED ARTICLE ANIMAL DRUG LABEL
50574-3	OTC TYPE B MEDICATED FEED ANIMAL DRUG LABEL
50573-5	OTC TYPE C MEDICATED FEED ANIMAL DRUG LABEL
53411-5	OUT OF BUSINESS NOTIFICATION
60683-0	PLASMA DERIVATIVE
50578-4	PRESCRIPTION ANIMAL DRUG LABEL
60682-2	STANDARDIZED ALLERGENIC

53404-0	VACCINE LABEL
50575-0	VFD TYPE A MEDICATED ARTICLE ANIMAL DRUG LABEL
50572-7	VFD TYPE B MEDICATED FEED ANIMAL DRUG LABEL
50571-9	VFD TYPE C MEDICATED FEED ANIMAL DRUG LABEL

4.1.1.2 If a document with the same set id has been previously submitted, then it is of the same type.

4.1.2 Labeler information

```
<document>
   <code  code="..." codeSystem="2.16.840.1.113883.6.1"
          displayName="..."/>

<author>

<assignedEntity>
  <representedOrganization>
    <id extension="100000007" root="1.3.6.1.4.1.519.1"/>
    <name>Acme drug company</name>
```

Validation Procedures

4.1.2.1 There is one labeler

4.1.2.2 There is one id, the DUNS number, and name is as in Section 2.1.5.

4.1.2.3 The setId is not associated with any top level product with a different NDC Labeler Prefix

4.1.2.4 There is no other element besides id, name and registrant.

4.1.3 Registrant information

```
<document>
  <author>
    <assignedEntity>
      <representedOrganization>

<assignedEntity>
  <confidentialityCode code="B" codeSystem="2.16.840.1.113883.5.25"/>

  <assignedOrganization>
    <id extension="100000008" root="1.3.6.1.4.1.519.1"/>
    <name>Acme drug company</name>
```

Validation Procedures

4.1.3.1 There may be registrant information

4.1.3.2 If there is a registrant, then there is one id, (the DUNS number) and a name as in Section 2.1.5.

4.1.3.3 There is no other element besides id, name and establishments.

4.1.4 Establishment information

```
<document>
  <author>
     <assignedEntity>
        <representedOrganization> <!-- Labeler -->
           <assignedEntity>
              <assignedOrganization> <!-- Registrant -->

<assignedEntity>
  <confidentialityCode code="B" codeSystem="2.16.840.1.113883.5.25"/>

  <assignedOrganization>  <!-- Establishment -->
     <id extension="1000000019" root="1.3.6.1.4.1.519.1"/>
     <name>Middleton Manufacturing company</name>
  </assignedOrganization>

  <performance>
     <actDefinition>
        <code  code="C43360"
               codeSystem="2.16.840.1.113883.3.26.1.1"
               displayName="manufacture"/>
```

Validation Procedures

4.1.4.1 If the marketing status code for any of the products is **not** *completed*, then there are one or more establishments.

4.1.4.2 There is one id (the DUNS number) and name is as in Section 2.1.5.

4.1.4.3 id is not used for other establishments in the file

4.1.4.4 Establishment ("assignedOrganization") has no other element besides id and name.

4.1.4.5 The establishment id matches an establishment with same id submitted in documents of type "establishment registration" in the same or previous calendar year

4.1.4.6 There are one or more business operations.

4.1.4.7 Act definition display name matches code

4.1.4.8 The code comes from the business operations list except for C73599 (import) and C73330 (united states agent)

4.1.4.9 Act definition code matches code for an establishment with same id previously submitted in documents of type "establishment registration" in the same or previous calendar year

4.1.4.10 If any of the products without a marketing completion date in this listing has no product source, then at least one establishment with a manufacture operation is included such as API manufacture (C82401), manufacture (C43360), or positron emission tomography drug production (C91403)

4.1.4.11 If any of the products without a marketing completion date in a Prescription Animal Drug (50578-4), OTC Animal Drug (50577-6) or Animal Medicated Article or Medicated Feed (50576-8, 50574-3, 50573-5, 50575-0, 50572-7, 50571-9) listing has no product source, then establishments with operation of API manufacture (C82401) are included.

4.1.5 Business Operation Product

The following example shows how the business operations are specified for particular products. It is done by replicating the business operation (actDefinition) elements, and connecting each with one product as shown below:

```
<document>
  <author>
    <assignedEntity><representedOrganization>      <!-- Labeler -->
       <assignedEntity><assignedOrganization>      <!-- Registrant -->
          <assignedEntity><assignedOrganization/>  <!-- Establishment -->

<performance><actDefinition>
  <code code="C43360" codeSystem="2.16.840.1.113883.3.26.1.1"
        displayName="manufacture"/>

  <product><manufacturedProduct classCode="MANU"><manufacturedMaterialKind>
    <code code="0123-12345" codeSystem="2.16.840.1.113883.6.69"/>
  </manufacturedMaterialKind></manufacturedProduct></product>
</actDefinition></performance>

<performance><actDefinition>
  <code code="C43360" codeSystem="2.16.840.1.113883.3.26.1.1"
        displayName="manufacture"/>
  <product><manufacturedProduct classCode="MANU"><manufacturedMaterialKind>
    <code code="0123-12348" codeSystem="2.16.840.1.113883.6.69"/>
```

Validation Procedures

4.1.5.1 There is zero or one operation-product links for each business operation (actDefinition) and those act definition elements are replicated for each products to which that such business operation applies.

4.1.5.2 Each product link has a code referencing a product code in the document.

4.1.5.3 If the document type code is: 50577-6 (OTC animal drug), 50576-8 (OTC type A), 50574-3 (OTC type B), 50573-5 (OTC type C), 50578-4 (prescription animal drug), 50575-0 (VFD type A), 50572-7 (VFD type B) or 50571-9 (VFD type C), then there is no operation-product link.

4.2 Body

4.2.1 Required Sections

Validation Procedures

4.2.1.1 The document body contains two or more sections

4.2.1.2 One section contains the product data elements

4.2.1.3 There is a section with the code 51945-4 (principal display panel) with an image of the carton/container label, except for files with only one establishment and this establishment having business operation ‘C91403’.

4.2.1.4 If the marketing category code is not C73626 (bulk ingredient), C94795 (drug for further processing), C73613 (unapproved medical gas), C95600 (approved drug product manufactured exclusively for private label distributor), C95601 (OTC monograph drug product manufactured exclusively for private label distributor), C95602 (unapproved drug product manufactured exclusively for private label distributor), C96793 (bulk ingredient for human prescription compounding) or C98252 (bulk ingredient for animal drug compounding), then there is at least one other content of labeling section besides those with the codes 48780-1 and 51945-4.

4.2.1.5 If the approval number is in the medication guide validation list and the marketing category is not C95600 (Approved drug product manufactured exclusively for private label distributor), then there must be such a Medication Guide section (42231-1).

4.2.1.6 If the document type is 34390-5 (Human OTC drug label) and the marketing category code is not C95601 or C95600 (OTC monograph or approved drug product manufactured exclusively for private label distributor) and the citation is not part352 (sunscreens), then there must be the following sections: 55106-9 (OTC- active ingredient section), 55105-1 (OTC – Purpose section), 50565-1 (OTC – keep out of reach of children section), 34067-9 (Indications & usage section), 34071-1 (Warnings section), 34068-7 (Dosage & administration section), and 51727-6 (Inactive ingredient section).

5 NDC Labeler Code Request

5.1 Header

5.1.1 Document type

```
<document>
      <code  code="51726-8"
         codeSystem="2.16.840.1.113883.6.1"
         displayName="NDC Labeler Code request"/>
```

Validation Procedures

5.1.1.1 Document code is as above

5.1.1.2 There is no title

5.1.1.3 If a document with the same set id has been previously submitted, then it is of the same type.

5.1.2 Labeler information

```
<document>
   <author>
      <time/>
      <assignedEntity>
         <representedOrganization>
            <id extension="100000002" root="1.3.6.1.4.1.519.1"/>
            <id extension=”0001” root=”2.16.840.1.113883.6.69”/>
            <name>Mann's drug Store</name>
            <contactParty>
```

Validation Procedures

5.1.2.1 There is a labeler organization.

5.1.2.2 One id, the DUNS number, and name are as in Section 2.1.5.

5.1.2.3 There are two ids (except for an initial labeler code request, which should be submitted with only one id.)

5.1.2.4 One id has the root 2.16.840.1.113883.6.69 and an extension (except for an initial labeler code request, which should be submitted without this id)

5.1.2.5 There is no id root besides 1.3.6.1.4.1.519.1 and 2.16.840.1.113883.6.69

5.1.2.6 The id with the root 2.16.840.1.113883.6.69 is not associated with any other document of type “NDC Labeler Code request” with a different setId

5.1.2.7 The set id is not associated with any other id with root 2.16.840.1.113883.6.69

5.1.2.8 The id extension with the root 2.16.840.1.113883.6.69 has 4 or 5 digits

5.1.2.9 The id extension with the root 2.16.840.1.113883.6.69 with 5 digits does not have a leading zero

5.1.2.10 The labeler code (id extension with the root 2.16.840.1.113883.6.69) is not (0)0000, (0)0001, (0)1500, (0)1800 or (0)1900.

5.1.2.11 There is one contact party

5.1.2.12 A labeler code request has no registrant or establishment information

5.2 Body - Empty

Use an empty document body:

```
<document>
  <component>
     <structuredBody/>
```

or

```
<document>
  <component>
     <nonXMLBody>
        <text/>
```

5.2.1.1 The document body is empty

6 Establishment registration

Establishment registrations have only header information with a single registrant organization and one or more registered establishments. Aside from the proper *Establishment Registration* document type, two other document types can be used for establishment registration submissions, i.e., the *No Change Notification*.

6.1 Header

6.1.1 Document type

```
<document>
  <code  code="51725-0"
         codeSystem="2.16.840.1.113883.6.1"
         displayName="Establishment registration"/>
```

Validation Procedures

6.1.1.1 Document type is “Establishment registration” (51725-0), “No change notification” (53410-7)

6.1.1.2 The effective time year matches the current year.

6.1.1.3 There is no title

6.1.1.4 For a No change notification (53410-7) an Establishment Registration (51725-0) with the same set id has been previously submitted.

6.1.1.5 If a document with the same set id has been previously submitted, then it is an Establishment Registration (51725-0), No change notification (53410-7), or Out of Business Notification (53411-5).

6.1.2 Registrant information

```
<document>
  <author>
    <assignedEntity>
      <representedOrganization>
        <!-- manufacturer, may be pass-through -->
        <assignedEntity>

<assignedOrganization> <!-- registrant -->
  <id extension="100000001" root="1.3.6.1.4.1.519.1"/>
  <name>Acme drug company</name>
  <contactParty>
```

Validation Procedures

6.1.2.1 If the document type is “No change notification”, then there is no registrant information.

6.1.2.2 If the document type is “Establishment registration”, then there is registrant information.

6.1.2.3 There is one id, the DUNS number and name are as in Section 2.1.5.

6.1.2.4 id is not associated with any other set id and set id is not associated with any other id for document type “Establishment registration”

6.1.2.5 set id is not associated with any other id

6.1.2.6 There is one contact party as in 2.1.8.

6.1.2.7 Establishment registration has no labeler information (no validation rules defined for it.)

6.1.3 Establishment Information

```
<document>
  <author>
    <assignedEntity>
      <representedOrganization>
        <!-- manufacturer, may be pass-through -->
          <assignedEntity>
            <assignedOrganization> <!-- registrant -->
              <assignedEntity>

<assignedOrganization> <!-- establishment -->
  <id extension="100000001" root="1.3.6.1.4.1.519.1"/>
  <id extension="123456" root="2.16.840.1.113883.4.82"/>

  <name>Middleton Manufacturing company</name>

  <addr>
    <streetAddressLine>123 Burl Road</streetAddressLine>
    <city>Dublin</city>
    <country code="IRL" codeSystem="1.0.3166.1.2.3">Ireland</country>
  </addr>

  <contactParty>
```

Validation Procedures

6.1.3.1 If the document type is "No change notification", then there is no establishment information.

6.1.3.2 If the document type is "establishment registration", then there are one or more establishments.

6.1.3.3 Establishment has one or two id elements, one id, the DUNS number, and name are as in Section 2.1.5.

6.1.3.4 DUNS number is not associated with another establishment in the same SPL file.

6.1.3.5 DUNS number is not associated with any other set id for document type "Establishment registration"

6.1.3.6 The DUNS number along with the establishment name and address information match the DUNS number record in the Dun and Bradstreet database

6.1.3.7 If there is a second id, then its root is 2.16.840.1.113883.4.82 and the extension is 7 or 10 digits

6.1.3.8 Each establishment has an address as in Section 2.1.6.

6.1.3.9 There is one contact party as in Section 2.1.8.

6.1.3.10 There is no assigned entity other than for US Agent or Import business.

6.1.4 Establishment US agent

```
<document>
  <author>
    <assignedEntity>
      <representedOrganization>
        <!-- manufacturer, may be pass-through -->
          <assignedEntity>
            <assignedOrganization> <!-- registrant -->
              <assignedEntity>

<assignedOrganization> <!-- establishment -->
  <addr>
    <country code="IRL" codeSystem="1.0.3166.1.2.3">Ireland</country>
  </addr>

  <assignedEntity>
    <assignedOrganization> <!-- establishment US agent -->
      <id extension="100000001" root="1.3.6.1.4.1.519.1"/>

      <name>Simmons Reps Company</name>

      <telecom value="tel:+1-800-555-1212"/>
      <telecom value="mailto:contact@USagent.com"/>

    </assignedOrganization>

    <performance>
      <actDefinition>
        <code code="C73330" codeSystem="2.16.840.1.113883.3.26.1.1"
              displayName="United States agent"/>
```

Validation Procedures

6.1.4.1 If the country for the establishment is not “USA”, then there is one US agent

6.1.4.2 US agent element has code, code system and display name are as above

6.1.4.3 If the country for the establishment is “USA”, then there is no US agent

6.1.4.4 There is one id, the DUNS number, and name are as in Section 2.1.5.

6.1.4.5 There is a telephone number and email addresses.

6.1.5 Import business

```
<document>
  <author>
    <assignedEntity>
      <representedOrganization>
        <!-- manufacturer, may be pass-through -->
          <assignedEntity>
            <assignedOrganization>
              <assignedEntity> <!-- registrant -->
```

```
<assignedOrganization> <!-- establishment -->
  <addr>
    <country code="IRL" codeSystem="1.0.3166.1.2.3">Ireland</country>
  </addr>
  <assignedEntity>
    <assignedOrganization> <!-- establishment's importer -->
      <id extension="100000005" root="1.3.6.1.4.1.519.1"/>
      <name>Waytogo importers</name>
      <telecom value="tel:+1-800-555-1214"/>
      <telecom value="mailto:contact@waytogo.com"/>
    </assignedOrganization>
    <performance>
      <actDefinition>
        <code code="C73599" codeSystem="2.16.840.1.113883.3.26.1.1"
              displayName="import"/>
```

Validation Procedures

6.1.5.1 If the country code for the establishment is not "USA", then there may be one or more import businesses.

6.1.5.2 Each business has code, code system and display name are as above.

6.1.5.3 If the country code for the establishment is USA, then there are no import businesses

6.1.5.4 There is one id, the DUNS number, and name are as in Section 2.1.5.

6.1.5.5 There is telephone number and email addresses.

6.1.6 Establishment operation

```
<document>
  <author>
    <assignedEntity>
      <representedOrganization>
        <!-- manufacturer, may be pass-through -->
          <assignedEntity>
            <assignedOrganization> <!-- registrant -->
<assignedEntity>
  <assignedOrganization>
    <!-- establishment -->
  </assignedOrganization>
  <performance>
     <actDefinition>
       <code code="C43360" codeSystem="2.16.840.1.113883.3.26.1.1"
             displayName="manufacture"/>
```

Validation Procedures

6.1.6.1 There are one or more establishment operation details (performance act definitions).

6.1.6.2 Each performance act definition has one code.

6.1.6.3 Code system is 2.16.840.1.113883.3.26.1.1

6.1.6.4 Display name matches the code

6.1.6.5 The code comes from the business operations list except for C73599 (import) and C73330 (united states agent)

6.2 Body - Empty

Use an empty document body:

```
<document>
   <component>
      <structuredBody/>
```

or

```
<document>
   <component>
      <nonXMLBody>
         <text/>
```

6.2.1.1 The document body is empty

7 Out of Business Notification

The Out of Business Notification allows de-listing of a NDC Labeler Code assignment or all the establishments of an Establishment registration.

7.1 Header

7.1.1 Document type

```
<document>
   <code  code="53411-5"
          codeSystem="2.16.840.1.113883.6.1"
          displayName="Out of business notification"/>
```

Validation Procedures

7.1.1.1 Document type is “Out of business notification” (53411-5)

7.1.1.2 The effective time year matches the current year.

7.1.1.3 There is no title

7.1.1.4 An Establishment Registration (51725-0) or Labeler Code Request (51726-8) with the same set id has been previously submitted.

7.1.1.5 If a document with the same set id has been previously submitted, then it is an Establishment Registration (51725-0), No change notification (53410-7), or Labeler Code Request (51726-8)

7.1.1.6 There is no labeler, registrant, or establishment information.

7.2 Body - Empty

Use an empty document body:

```
<document>
  <component>
     <structuredBody/>
```

or

```
<document>
  <component>
     <nonXMLBody>
        <text/>
```

7.2.1.1 The document body is empty

8 Pharmacologic Class Indexing

8.1 Header

8.1.1 Document type

```
<document>
   <code code="60685-5" codeSystem="2.16.840.1.113883.6.1"
         displayName="Indexing - Pharmacologic Class"/>
```

Validation Procedures

8.1.1.1 Document code is as above

8.1.1.2 If a document with the same set id has been previously submitted then it is of the same type.

8.1.2 Author information

Pharmacologic class indexing is maintained by FDA:

```
<author>
  <time/>
  <assignedEntity>
    <representedOrganization>
      <id root="1.3.6.1.4.1.519.1" extension="927645523"/>
      <name>Food and Drug Administration</name>
```

Pharmacologic classes and their hierarchy are maintained by NDF-RT:

```
<author>
  <time/>
  <assignedEntity>
    <representedOrganization>
      <id root="1.3.6.1.4.1.519.1" extension="926891516"/>
      <name>Department of Veterans Affairs</name>
```

8.1.2.1 Author information for pharmacologic class indexing is as one of the above

8.2 Body

```
<section>
  <id root="ffabedf9-6bde-4787-beb0-abd214307427"/>
  <code code="48779-3" codeSystem="2.16.840.1.113883.6.1"
        displayName="SPL Indexing Data Elements Section"/>
    <title/>
    <text/>
    <effectiveTime value="20101007"/>
    <subject>
```

Validation Procedures

8.2.1 Pharmacologic Class Indexing Section

8.2.1.1 If the document type is 60685-5, then the document contains one SPL Indexing Data Elements section as above.

8.2.1.2 Value of effective time is same as value of effective time in document information.

8.2.2 Pharmacologic Class Indexing

```
<section>
  <subject>

<identifiedSubstance>
  <id root="0987654321" extension="2.16.840.1.113883.4.9"/>
  <identifiedSubstance>
    <code code="0987654321" codeSystem="2.16.840.1.113883.4.9"/>
    <name>tazminic acid</name>
```

```
    <asSpecializedKind>
```

8.2.2.1 There is one active moiety.

8.2.2.2 There is one active moiety code.

8.2.2.3 Code system is 2.16.840.1.113883.4.9

8.2.2.4 Code and code system are the same as the parent element id's extension and root respectively.

8.2.2.5 There is one active moiety name

8.2.2.6 Active moiety name matches code

8.2.2.7 The same active moiety is not described in a pharmacologic class indexing document with a different set id.

8.2.2.8 There is no document with the same set id but a different active moiety.

8.2.2.9 There are one or more pharmacologic class components

```
<asSpecializedKind>
  <generalizedMaterialKind>
    <code code="N0000012345" codeSystem="2.16.840.1.113883.3.26.1.5"
          displayName="melhoridizing tazminate [EPC]"/>
    <name>melhoridizing tazminate (MTZ)</name>
```

8.2.2.10 Under each pharmacologic class component, there is a code

8.2.2.11 Code starts with a uppercase N, followed by 10 digits

8.2.2.12 Code system is 2.16.840.1.113883.3.26.1.5

8.2.2.13 This is one display name

8.2.2.14 Display name matches code and is the formal NDF-RT name with the bracket indicating the kind of concept [EPC, MoA, PE, Chemical/Ingredient]

8.2.2.15 If the concept is an External Pharmacologic Class [EPC], there is a name with the preferred FDA name.

8.2.3 Pharmacologic Class Definition

```
<section>
  <subject>
```

```
<identifiedSubstance>
  <id root="N0000012345" extension="2.16.840.1.113883.3.26.1.5"/>
  <identifiedSubstance>
    <code code="N0000012345" codeSystem="2.16.840.1.113883.3.26.1.5"
          displayName="melhoridizing tazminate [EPC]"/>
    <name use="L">melhoridizing tazminate (MTZ)</name>
    <name use="A">melhoridizing tazminate [EPC]</name>
    <name use="A">tazminic melhoridizer</name>

    <asSpecializedKind>
```

8.2.3.1 There are one or more pharmacologic classes.

8.2.3.2 There is one code.

8.2.3.3 The rules for the pharmacologic class code, code system and displayName are as in the respective procedures 8.2.2.11ff

8.2.3.4 Code and code system are the same as the parent element id's extension and root respectively.

8.2.3.5 There are one or more names

8.2.3.6 One name has the use attribute "L" indicating the preferred name.

8.2.3.7 If the concept is not an External Pharmacologic Class [EPC], then the name with the use attribute "L" is the same as the displayName.

8.2.3.8 There are zero, one or more defining super-classes

```
<asSpecializedKind>
  <generalizedMaterialKind>
    <code code="N0000012345" codeSystem="2.16.840.1.113883.3.26.1.5"
          displayName="melhoridizing tazminate [EPC]"/>
```

8.2.3.9 Under each defining super-class there is a code

8.2.3.10 The rules for the defining super-class code, code system and displayName are as in the respective procedures 8.2.2.11ff

8.2.3.11 There is no other name element.

9 Dietary Supplement Labeling

Dietary supplement labeling provides a description of the product.

9.1 Header

9.1.1 Document Type

9.1.1.1 Document types for dietary supplement labeling is 58476-3 FDA product label Dietary supplement.

9.1.1.2 If a document with the same set id has been previously submitted, then it is of the same type.

9.1.2 Labeler information

```
<document>
   <code  code="58476-3" codeSystem="2.16.840.1.113883.6.1"
          displayName="Dietary Supplement"/>
<author>
<assignedEntity>
  <representedOrganization>
    <id extension="100000007" root="1.3.6.1.4.1.519.1"/>
    <name>Acme drug company</name>
```

Validation Procedures

9.1.2.1 There is one labeler

9.1.2.2 There is one id, the DUNS number, and name is as in Section 2.1.5.

9.1.2.3 The setId is not associated with any top level product with a different Labeler Prefix

9.1.2.4 There is no other element besides id, name and registrant.

9.1.3 Registrant information

```
<document>
  <author>
    <assignedEntity>
      <representedOrganization>
<assignedEntity>
  <confidentialityCode code="B" codeSystem="2.16.840.1.113883.5.25"/>
  <assignedOrganization>
    <id extension="100000008" root="1.3.6.1.4.1.519.1"/>
    <name>Acme drug company</name>
```

Validation Procedures

9.1.3.1 There may be registrant information

9.1.3.2 If there is a registrant, then there is one id, (the DUNS number) and a name as in Section 2.1.5.

9.1.3.3 There is no other element besides id, name and establishments.

9.2 Body

9.2.1 Required Sections

Validation Procedures

9.2.1.1 The document body contains three or more sections

9.2.1.2 One section contains the product data elements

9.2.1.3 There is a section with the code 51945-4 (principal display panel) with an image of the carton/container label including the Supplement Facts.

9.2.1.4 There is one section with the code 69718-5 (Statement of Identity section).

9.2.1.5 Aside from product data elements (48780-1), principal display panel (51945-4) and Statement of Identity (69718-5) sections, there are only sections with the code 69719-3 (Health Claim section), 34071-1 (Warning section) for the warning statement, 42232-9 (Precaution section) for the notice statement, 50741-8 (Safe Handling Warning Section) for the safe handling statement and 34068-7 (Dosage & Administration section).

10 Medical Food Labeling

Medical Food labeling provides a description of the product.

10.1 Header

10.1.1 Document Type

10.1.1.1 Document types for Medical Food labeling is 58475-5 FDA product label Medical Food.

10.1.1.2 If a document with the same set id has been previously submitted, then it is of the same type.

10.1.2 Labeler information

```
<document>
  <code  code="58475-5" codeSystem="2.16.840.1.113883.6.1"
         displayName="Medical Food"/>
```

```
<author>

<assignedEntity>
  <representedOrganization>
    <id extension="100000007" root="1.3.6.1.4.1.519.1"/>
    <name>Acme drug company</name>
```

Validation Procedures

10.1.2.1 There is one labeler

10.1.2.2 There is one id, the DUNS number, and name is as in Section 2.1.5.

10.1.2.3 The setId is not associated with any top level product with a different Labeler Prefix

10.1.2.4 There is no other element besides id, name and registrant.

10.1.3 Registrant information

```
<document>
  <author>
    <assignedEntity>
      <representedOrganization>

<assignedEntity>
  <confidentialityCode code="B" codeSystem="2.16.840.1.113883.5.25"/>

  <assignedOrganization>
    <id extension="100000008" root="1.3.6.1.4.1.519.1"/>
    <name>Acme drug company</name>
```

Validation Procedures

10.1.3.1 There may be registrant information

10.1.3.2 If there is a registrant, then there is one id, (the DUNS number) and a name as in Section 2.1.5.

10.1.3.3 There is no other element besides id, name and establishments.

10.1.4 Establishment information

```
<document>
  <author>
     <assignedEntity>
        <representedOrganization> <!-- Labeler -->
            <assignedEntity>
                <assignedOrganization> <!-- Registrant -->

<assignedEntity>
  <confidentialityCode code="B" codeSystem="2.16.840.1.113883.5.25"/>
```

```
<assignedOrganization>  <!-- Establishment -->
   <id extension="1000000019" root="1.3.6.1.4.1.519.1"/>
   <name>Middleton Manufacturing company</name>
</assignedOrganization>

<performance>
   <actDefinition>
      <code  code="C43360"
             codeSystem="2.16.840.1.113883.3.26.1.1"
             displayName="manufacture"/>
```

Validation Procedures

10.1.4.1 If the marketing status code for any of the products is **not** *completed*, then there are one or more establishments.

10.1.4.2 There is one id (the DUNS number) and name is as in Section 2.1.5.

10.1.4.3 id is not used for other establishments in the file

10.1.4.4 The establishment id matches an establishment with same id submitted in documents of type “establishment registration” in the same or previous calendar year.

10.1.4.5 Establishment (“assignedOrganization”) has no other element besides id and name.

10.1.4.6 There are one or more business operations.

10.1.4.7 Act definition display name matches code

10.1.4.8 The code comes from the business operations list except for C73599 (import) and C73330 (united states agent)

10.1.4.9 Act definition code matches code for an establishment with same id previously submitted in documents of type “establishment registration”

10.2 Body

10.2.1 Required Sections

Validation Procedures

10.2.1.1 The document body contains two or more sections

10.2.1.2 One section contains the product data elements

10.2.1.3 There is a section with the code 51945-4 (principal display panel) with an image of the carton/container label.

11 Medical Device Labeling

Medical Device labeling provides a description of the product.

11.1 Header

11.1.1 Document Type

11.1.1.1 Document types is 69403-4 FDA product label OTC Medical Device or 69404-2 FDA product label Prescription Medical Device.

11.1.1.2 If a document with the same set id has been previously submitted, then it is of the same type.

11.1.2 Labeler information

```
<document>
   <code  code="..." codeSystem="2.16.840.1.113883.6.1"
          displayName="..."/>

<author>

<assignedEntity>
  <representedOrganization>
    <id extension="100000007" root="1.3.6.1.4.1.519.1"/>
    <name>Acme drug company</name>

    <contactParty>
      <addr>
        <streetAddressLine>1625 29th street</streetAddressLine>
        <city>Camden</city>
        <state>NJ</state> <postalCode>08101</postalCode>
        <country>USA</country>
      </addr>

      <telecom value="tel:+1-800-555-1213;ext=112"/>
      <telecom value="mailto:Bob.Jones@acme.com"/>

      <contactPerson>
        <name>Bob Jones</name>
      </contactPerson>
    </contactParty>
```

Validation Procedures

11.1.2.1 There is one labeler

11.1.2.2 There is one DUNS number and name.

11.1.2.3 There is one contact party with telephone number and email address for the labeler

11.1.2.4 There is no other elements.

11.2 Body

11.2.1 Required Sections

Validation Procedures

11.2.1.1 The document body contains three or more sections

11.2.1.2 One section contains the product data elements

11.2.1.3 There is a section with the code 51945-4 (principal display panel) with an image of the carton/container label.

12 Lot Distribution Report

The following is the regulatory basis for the collected data elements:

21 CFR § 600.81 Distribution reports The licensed manufacturer shall submit to the Center for Biologics Evaluation and Research or the Center for Drug Evaluation and Research (see mailing addresses in § 600.2), information about the **quantity of the product distributed** under the biologics license, including the quantity distributed to distributors. The interval between distribution reports shall be 6 months. Upon written notice, FDA may require that the licensed manufacturer submit distribution reports under this section at times other than every 6 months. The distribution report shall consist of the **bulk lot number** (from which the final container was filled), the **fill lot numbers** for the total number of dosage units of each strength or potency distributed (e.g., fifty thousand per 10-milliliter vials), the **label lot number** (if different from fill lot number), **labeled date of expiration**, **number of doses in fill lot/label lot**, **date of release** of fill lot/label lot for distribution at that time. If any significant amount of a **fill lot/label lot is returned**, include this information. Disclosure of financial or pricing data is not required. As needed, FDA may require submission of more detailed product distribution information. Upon written notice, FDA may require that the licensed manufacturer submit reports under this section at times other than those stated. Requests by a licensed manufacturer to submit reports at times other than those stated should be made as a request for a waiver under § 600.90. [59 FR 54042, Oct. 27, 1994, as amended at 64 FR 56449, Oct. 20, 1999; 70 FR 14983, Mar. 24, 2005]

Lot distribution data submissions include required information defined in 21 CFR 600.81 and portions of the suggested format provided in the guidance for industry

entitled Post marketing Safety Reporting for Human Drug and Biological Products Including Vaccines (March 2001).

In the existing system, two files are been sent to FDA for Lot Distribution Data:

1. Lot Distribution Report (provides data for each final container lot)

2. National Distribution Code (NDC) data for all submitted products (provides details of each NDC code)

Each pair of submitted electronic files contain records for distributed product under a single license. If a firm distributes products under three licenses, for example, it would submit three different files.

Table 9: Data Elements for Lot Distribution Report

Field Name	Field Description	SPL Mapping
Manufacturer License/Name (required)	FDA-assigned license number for the manufacturer of the product being reported in this row. Lot Distribution Data must be reported by the company that manufactures the product. If a licensed manufacturer sells a product to a second manufacturer and the latter conducts further manufacturing steps under its own license, such as packaging with a diluent or another primary product or modifying the package labeling, then the second manufacturer has the reporting obligation. Alternatively, if the second simply distributes the unchanged product to wholesalers, retailers, doctors' offices, and other parties, then the second is a distributor, and the first retains the reporting obligation. By understanding this difference, we can avoid receiving duplicate reports for the same product. CBER may grant waivers to allow alternative reporting arrangements on a case by case basis. If a company conducts further manufacturing steps on a product form another manufacturer, then would the new product be distributed under a different BLA number? If not, we would receive duplicate LDD reports for this product.	Labeler with name and 2 ids, DUNS and License Number.
Reporting Start Date (required)	Beginning of the reporting interval	Document effectiveTime low value
Reporting End Date (required)	End of the reporting interval	Document effectiveTime high value
Folder ID (Primary STN) (required)	FDA assigns a Submission Tracking Number for each licensed product. This STN is also known as a “Folder ID.”	6 digits of the application number (approval id) after the BLA prefix
Product Name and Trade Name (required)	Provides the product name and trade name that are stored in the manufacturer’s database. This information will be used for verification of consistency between STN and the identified product	Manufactured material name
National Drug Code (NDC) (required)	The FDA National Drug Code (NDC), which is used in product marketing and distribution to describe the product presentation and formulation, is a required 10-digit, 3-segment number separated by hyphens. This field identifies the labeler, product, and trade package size	Code of container reference form Label Lot; a listed NDC package code must exist.

Field Name	Field Description	SPL Mapping
Doses per Container (required)	Doses per final container in which the product is distributed. The FDA will use the data to calculate total number of doses.	Container volume divided by dose quantity specification.
Final Container Type (required)	Type of final container in which the product was distributed (e.g., vials or syringes).	Form code of container reference from Label Lot; must match the listed container's form code.
Final Container Product Amount and Unit (required)	Final container product amount number.	Quantity value and unit of container reference from Label Lot; must match the listed container's quantity.
Product Dosage (required)	Amount (number and unit) of medication in one dose. Product Dosage refers to reconstituted product ready for administration. Field can contain ">", "<", "≤", or "≥" symbols if product dosage varies. Field can be used to describe in detail dosage tiers that can be used for this product.	Dose quantity of substance administration from manufactured product.
Active ingredient amount number and unit (required)	Number and units for the amount of active ingredient (e.g., international units, grams, micrograms, plaque forming units, 50% Tissue Culture Infective Dose).	Ingredient quantity; must match the listed strengths.
Presentation (required)	Text Description of final container (examples: >312 IU/mL single dose vial 400 mg/vial single dose vial	All data is coded in container form and content quantity, no text field required.
Formulation (required)	Specific product subtype (e.g., dialysis vs. pediatric vs. adult formulations for hepatitis B vaccine); use a place-holding comma or space for products with only one formulation.	Not required
Label URL (optional)	Web link (if available) to professional package insert ("label")	Not required
Package Lot ID (If applicable)	Unique package lot identification for two separately licensed products, which are packaged together and distributed with a package lot identification code. Although diluent's vials for reconstitution of some biological products bear separate label lot codes from those of the primary vaccine or other product, the diluent's lot data should not be submitted for lot distribution reports.	See 12.2.11.
Bulk Lot ID (optional)	The identification code associated with the largest manufacturing quantity. The reporting of bulk and fill lots is required per CFR § 600.81	See Bulk Lot below.
Ingredient (required)	Name of ingredient in bulk lot.	Instance of kind from Bulk Lot.
Fill Lot ID (required)	The identification code associated with an intermediate size manufacturing unit	See Fill Lot below; this is the main entry point to Lot Distribution Data from manufactured product description.
Label Lot (required)	The identification code associated with the smallest manufacturing quantity	See Label Lot below.
Final Containers Distributed	The total number of final product containers (e.g., vials, syringes, etc.) distributed during the reporting period. If products are distributed in cartons or other packages, then the final container total should be pre-calculated. For instance, if products are packaged in a 5-dose carton pack of single vials, the final containers total should be presented as number of cartons 5 "Distributed" refers to shipment from a manufacturer to an	Distribution product events under container under Label Lot.

Field Name	Field Description	SPL Mapping
	independent consignee who assumes control over the product, typically a wholesaler, retailer, health care facility, or physician. Any product retained by a manufacturer, which is available for distribution but has not yet been shipped from the firm's own facilities, should not be included in "distributed" amounts.	
Final Containers Returned	This field corresponds to the total number of final product containers/units (e.g., vials, syringes, etc.) that were returned during the reporting period	Return product events under container under Label Lot.
Initial Distribution Date	Represents the initial distribution date for each final container lot	Effective time low boundary of distribution product event.
Expiration Date	Represents the expiration date for each final container lot distributed	Label Lot expiration time value.
Foreign/Domestic Distributions Flag (required)	Represents domestic or international product distribution. Do not include country codes. FDA requires lot distribution reports only for distribution within the U.S. or to U.S. military bases abroad. This field is retained for consistency with a previously required file format.	Not required
Distribution Type (required)	Represents the kind of data reported for this final container lot. FDA accepts interval distribution only.	Implicit in distribution event code.
Distribution Indicator (optional)	FDA should know whether more products from the same lot will be distributed in the future, or whether this a final distribution.	(Distributin product event with moodCode INT – scheduled for CPM update.)

12.1 SPL Header

12.1.1 Document type

```
<document>
  <id root="50606941-3e5d-465c-b4e0-0f5a19eb41d4"/>
  <code code="X0685-5" codeSystem="2.16.840.1.113883.6.1"
        displayName="Lot Distribution Report"/>
  <effectiveTime>
     <low value="20100101" p:de="Reporting Start Date"/>
     <high value="2010701" p:de="Reporting End Date" closed="false"/>
  </effectiveTime>
  <setId root="a30accef-f437-4136-808c-9ed4ada5fcf8"/>
  <versionNumber value="1"/>
```

Validation Procedures

12.1.1.1 Document code is as above

12.1.1.2 If a document with the same set id has been previously submitted, then it is of the same type.

12.1.2 Author information

```
<author>
  <representedOrganization>
    <id extension="" root="1.3.6.1.4.1.519.1"/>
    <id extension="" root="1.9.99.999.9999"/>
    <name>Zwerg Pharma, Inc.</name>

    <contactParty>
      <addr>
        <streetAddressLine>1625 29th street</streetAddressLine>
        <city>Camden</city>
        <state>NJ</state> <postalCode>08101</postalCode>
        <country>USA</country>
      </addr>

      <telecom value="tel:+1-800-555-1213;ext=112"/>
      <telecom value="mailto:Bob.Jones@acme.com"/>

      <contactPerson>
        <name>Bob Jones</name>
      </contactPerson>
   </contactParty>
```

12.1.2.1 There is one author (labeler)

12.1.2.2 There are two ids

12.1.2.3 One id is the DUNS number with the root 1.3.6.1.4.1.519.1 with a 9-digit extension

12.1.2.4 One id is the manufacturer license number with the root 1.9.99.999.9999 with a 4-digit extension

12.1.2.5 There is one name

12.1.2.6 There may be one contact party (see the Procedures for contact party above)

12.2 SPL Body

```
<component>
   <section>
      <id root="e13a985b-f706-a5c8-e8ef-73891eb1c697"/>
      <code  code="48780-1"
             codeSystem="2.16.840.1.113883.6.1"
             displayName="SPL listing data elements section"/>
      <effectiveTime>
        <low value="20100101"/>
        <high value="20100701" closed=“false”/>
      </effectiveTime>
```

Validation Procedures

12.2.1.1 There is a document body

12.2.2 Data Elements Section

12.2.2.1 There is an SPL Data Elements section

12.2.2.2 Effective time has low and high boundaries indicating the reporting period of the lot distribution data (reporting start date, reporting end date).

12.2.2.3 Reporting start date has at least the precision of day in the format YYYYMMDD

12.2.2.4 Reporting end date has at least the precision of day in the format YYYYMMDD

12.2.2.5 Reporting start date is before reporting end date.

12.2.2.6 Reporting end date is the same as value of effective time in document information.

12.2.3 Product Data – Single Licensed Product

```
<section>
  <subject>

    <manufacturedProduct>
      <manufacturedProduct>
        <code code="1234-5678" codeSystem="2.16.840.1.113883.6.69"/>
        <name>Multivax</name>

        <instanceOfKind>
          <!-- DISTRIBUTION DATA, SEE BELOW -->
        </instanceOfKind>
      </manufacturedProduct>
      <consumedIn><!-- DOSING SPECIFICATION --></consumedIn>
    </manufacturedProduct>
  </subject>
</section>
```

12.2.3.1 There is one or more subject manufactured products:

12.2.3.2 There is an NDC product code

12.2.3.3 The general rules about the product code apply as per 0.

12.2.3.4 There is a trade name

12.2.3.5 Name contains no special symbols (e.g., no “®” or “™” etc) and no “USP” or dosage forms.

12.2.3.6 Name matches the NDC code submitted in drug listings.

12.2.3.7 There are no other product data elements, such as generic name, product source, etc.

12.2.3.8 The same product is not described in a lot distribution report with a different set id.

12.2.3.9 There is no lot distribution report with the same set id but a different product.

12.2.4 Dosing Specification

The dosing specification is used to compute the *number of doses* in any lot, or container, such as to comply with the *number of doses in fill lot/label lot* requirement specified by the regulation.

```
<section>
  <subject>
    <manufacturedProduct>
      <manufacturedProduct><!-- NDC AND NAME --></manufacturedProduct>
      <consumedIn>
        <substanceAdministration1 classCode="SBADM" moodCode="DEF">
          <routeCode  code="C38288" displayName="oral"
                      codeSystem="2.16.840.1.113883.3.26.1.1"/>
          <doseQuantity value="1" unit="mL"/>
        </substanceAdministration1>
      </consumedIn>
```

Validation Procedures

12.2.4.1 There is a dosing specification element

12.2.4.2 There is a route code, and the rules for route of administration code apply (3.2.21.2f).

12.2.4.3 There is a dose quantity specification with a single value and unit

12.2.4.4 Value is a number

12.2.4.5 Unit comes from the *UCUM units of measures* list

12.2.5 Fill Lot

The fill lot is the lot of product which conforms to the specification of the product regardless of packaging, i.e., it has the form and the strength specified by the listing data for the package-independent NDC of the product. As such the fill lot is an instance of the product regardless of packaging.

```
<manufacturedProduct>
  <instanceOfKind>
    <productInstance><!-- FILL LOT -->
      <id root="{Fill Lot ID root OID}" extension="{Fill Lot ID}"/>
```

Validation Procedures

12.2.5.1 There is a fill lot element

12.2.5.2 The lot has an id with the following general rules for lot numbers:

12.2.5.3 There is an id extension with the reported alphanumeric lot number string

12.2.5.4 Lot number string can contain digits, upper case letters and the characters "-" and "/".

12.2.5.5 There is a globally unique root OID

12.2.5.6 The globally unique root OID is formed by using the fixed prefix "1.3.6.1.4.1.32366.1.2.10." followed by the NDC product code without dashes and without leading zeroes.

12.2.6 Bulk Lot(s)

Bulk lot is the instance of raw material that goes into one or more fill lots at possibly different strengths. As such the bulk lot represents one or more ingredient instances.

```
<manufacturedProduct>
  <instanceOfKind>
    <productInstance><!-- FILL LOT -->

<ingredient><!-- BULK LOT(S) -->
  <ingredientProductInstance>
    <id root="{Bulk Lot ID root OID}" extension="{Bulk Lot ID}"/>
    <asInstanceOfKind>
      <kindOfMaterialKind>
        <code code="XYZ123ABC" codeSystem="2.16.840.1.113883.4.9"/>
        <name>Mucinella Bobadis Antigen</name>
      </kindOfMaterialKind>
    </asInstanceOfKind>
  </ingredientProductInstance>

  <subjectOf>
    <productEvent>
      <code code="C43360" displayName="manufacture"
            codeSystem="2.16.840.1.113883.3.26.1.1"/>
      <performer>
        <assignedEntity>
          <representedOrganization>
            <id root="1.3.6.1.4.1.519.1" extension="DUNS number"/>
```

Validation Procedures

12.2.6.1 There is one or more bulk lot elements

12.2.6.2 The lot has an id, and the general rules for lot numbers apply.

12.2.6.3 The globally unique root OID is formed by using the fixed prefix "1.3.6.1.4.1.32366.1.2.10." followed by the NDC Labeler Code without leading zeroes.

12.2.6.4 The bulk lot references an active ingredient

12.2.6.5 Code system is 2.16.840.1.113883.4.9

12.2.6.6 There is one ingredient name

12.2.6.7 Ingredient name matches the code

12.2.6.8 The ingredient is actually listed as an ingredient of the product

12.2.6.9 The bulk lot references one manufacturer

12.2.6.10 There is one id

12.2.6.11 id is the DUNS number of the bulk lot manufacturing establishment with the root 1.3.6.1.4.1.519.1 and a 9-digit extension

12.2.6.12 Establishment ("representedOrganization") has no other element besides id.

12.2.6.13 The establishment id matches an establishment with same id submitted in documents of type "establishment registration" in the same or previous calendar year

12.2.6.14 The establishment id matches an establishment previously submitted in documents of type "establishment registration" in the same or previous calendar year with business operation *manufacture* (C43360)

12.2.6.15 The bulk lot references no other product activity

12.2.7 Label Lot(s) (Final Container Lot)

The label lot, or final container lot is the instance of the product, a portion of the fill lot that is portioned out into individual containers.

```
<manufacturedProduct>
  <instanceOfKind>
    <productInstance><!-- FILL LOT -->
      <ingredient><!-- BULK LOT(S) --></ingredient>
      <member><!-- LABEL LOT -->
        <memberProductInstance>
          <id root="{Label Lot ID root OID}" extension="{Label Lot ID}"/>
          <expirationTime>
            <high value="20110417"/>
          </expirationTime>
```

Validation Procedures

12.2.7.1 There is one or more label lot elements

12.2.7.2 The lot has an id, and the general rules for lot numbers apply.

12.2.7.3 The globally unique root OID is formed by using the fixed prefix "1.3.6.1.4.1.32366.1.2.10." followed by the full 10-digit NDC code without dashes or leading zeroes.

12.2.7.4 There is an expiration time with a high boundary.

12.2.7.5 Expiration time has at least the precision of month in the format YYYYMM

12.2.8 Container Data Elements

```
<manufacturedProduct>
  <instanceOfKind>
    <productInstance><!-- FILL LOT -->
      <ingredient><!-- BULK LOT(S) --></ingredient>
      <member><!-- LABEL LOT -->
        <memberProductInstance>

<asContent>
  <quantity>
    <numerator value="2" unit="mL"/>
    <denominator value="1" unit="1"/>
  </quantity>
  <container>
    <code code="1234-5678-01" codeSystem="2.16.840.1.113883.6.69"/>
    <formCode code="C43169" displayName="bottle"
              codeSystem="2.16.840.1.113883.3.26.1.1"/>
  </container>
```

Validation Procedures

12.2.8.1 There is a container reference

12.2.8.2 There is a quantity with a numerator and denominator

12.2.8.3 Numerator has a value greater than zero and a unit

12.2.8.4 Denominator has value 1 and either no unit or unit “1”

12.2.8.5 Quantity is the same as the package quantity of the product as described in the listing for the package NDC.

12.2.8.6 There is a container packaged product code

12.2.8.7 Container packaged product code is 10 digits (excluding any hyphens).

12.2.8.8 Code system for NDC Package Code is 2.16.840.1.113883.6.69

12.2.8.9 NDC Package Code contains three segments divided by hyphens.

12.2.8.10 The first two segments of the NDC Package Code matches the NDC Product Code

12.2.8.11 There is a form code and display name

12.2.8.12 Code system for form code is 2.16.840.1.113883.3.26.1.1

12.2.8.13 Display name matches form code

12.2.8.14 The container form code matches the form code specified for the container in the listing data.

12.2.9 Containers Distributed

```
<manufacturedProduct>
  <instanceOfKind>
    <productInstance><!-- FILL LOT -->
      <ingredient><!-- BULK LOT(S) --></ingredient>
      <member><!-- LABEL LOT -->
        <memberProductInstance>
          <asContent>
            <container><!-- container reference --></container>

<subjectOf>
  <quantity value="1000" unit="1"/>
  <productEvent>
    <code code="C99998"
          displayName="distributed - interval"
          codeSystem="2.16.840.1.113883.3.26.1.1"/>

<!-- code code="C99996" codeSystem="" displayName="distributed -
anticipated total for final container lot"/-->

    <effectiveTime>
      <low value="20100101"/>
    </effectiveTime>
  </productEvent>
</subjectOf>
```

Validation Procedures

12.2.9.1 There are one or more product events

12.2.9.2 There is one quantity (Final Containers Distributed)

12.2.9.3 Quantity value is the integer number of final containers distributed.

12.2.9.4 Quantity unit is "1" or there is no unit.

12.2.9.5 There is a product event code

12.2.9.6 Code system is 2.16.840.1.113883.3.26.1.1

12.2.9.7 Display name matches the code

12.2.9.8 The code is either C99998 or C99997

Table 10: Product Event Act Codes

Code	Display Name
C99998	distributed – interval
C99997	distributed – anticipated total for final container lot
C99996	returned

12.2.9.9 There is one distribution product event

12.2.9.10 Container distribution event has an effective time with low boundary specifying the Initial Distribution Date.

12.2.9.11 Initial distribution date has at least the precision of day in the format YYYYMMDD

12.2.10 Containers Returned Data

```
<manufacturedProduct>
  <instanceOfKind>
    <productInstance><!-- FILL LOT -->
      <ingredient><!-- BULK LOT(S) --></ingredient>
      <member><!-- LABEL LOT -->
        <memberProductInstance>
          <asContent>
            <container><!-- container reference --></container>

<subjectOf>
  <quantity value="1000" unit="1"/>
  <productEvent>
    <code code="C99998"
          displayName="distributed - interval"
          codeSystem="2.16.840.1.113883.3.26.1.1"/>
  </productEvent>
</subjectOf>
```

12.2.10.1 There may be one returned product event

12.2.10.2 Returned product event has no effective time

12.2.10.3 There is no other product event

12.2.11 Product Data – Kit with Multiple Licensed Products

When the licensed product is only part of a kit, but the kit itself is not tracked as a "package lot", the lot data is specified under the appropriate part of the kit, and all the validation procedures specified for fill lot, bulk lot and label lot apply as above.

```
<subject>
  <manufacturedProduct>
    <manufacturedProduct>
      <code code="1234-5679" codeSystem="2.16.840.1.113883.6.69"/>
      <name p:de="Trade Name">Multivax (MixKit)</name>
      <part>
        <partProduct>
          <instanceOfKind>
            <productInstance>
```

If in addition the kit itself is tracked as a "package lot", then the package lot data is specified for the entire kit as follows:

```
<subject>
  <manufacturedProduct>
    <manufacturedProduct>
      <code code="1234-5679" codeSystem="2.16.840.1.113883.6.69"/>
      <name p:de="Trade Name">Multivax (MixKit)</name>
      <instanceOfKind>
        <productInstance><!-- PACKAGE LOT -->
          <id root="{Package Lot root OID}" extension="{Package Lot ID}"/>
          <part><!-- LABEL LOT -->
            <partProductInstance>
               <id root="{Label Lot root OID}" extension="{Label Lot ID}"/>
            </partProductInstance>
          </part>
        </productInstance>
        <subjectOf><!-- product events --></subjectOf>
      </instanceOfKind>
```

Validation Procedures

12.2.11.1 The rules for product code and name are as for simple products

12.2.11.2 There is one or more parts, referencing label lots of these parts.

12.2.11.3 There is a label lot specified elsewhere in the lot distribution report.

12.2.11.4 There are one or more product events

12.2.11.5 There general rules for product events apply

12.2.11.6 There is one distribution product event

12.2.11.7 There may be one returned product event

12.2.11.8 There is no other product event