The Global Language of Business

Apparel and General Merchandise

Best Practice Guideline for Exchanging Raw Material Attributes

Release 2.0, December 7, 2020

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Document Summary

Document Item	Current Value
Document Title	Best Practice Guideline for Exchanging Raw Material Attributes
Date Last Modified	December 2020
Document Description	This application guideline provides detailed guidance on how to define Raw Material attributes for use in sourcing applications.

Log of Changes

Release Number – Date	Changes
Release 1.0	Release/publication
Release 2.0 – December 2020	Defined attribute data for newly added categories of Thread, Printed Labels, and RFID inlays. Updated attribute data for previously defined categories of Knit, Woven, Leather and Synthetic material.

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About the GS1 Apparel and General Merchandise Initiative

The GS1 US Apparel and General Merchandise Initiative serves as a strategic effort in which retailers, marketplaces, brand owners, suppliers, manufacturers, industry trade associations, solution providers and academia voluntarily join to assist in helping the retail industry drive the adoption and use of the GS1 Standards.

To learn more about the initiative, visit:

www.gs1us.org/ApparelGM

Executive Summary

Digital Sourcing of raw materials offers the opportunity to increase buying decision speed and reduce product development cycle times, resulting in process efficiencies and competitive advantage. Digitizing raw material attributes also enables the potential post-sale use of known attributes for Circular Economy paradigms, such as item repair or material recovery. This type of digital sourcing requires a common language to specify raw material attribute values.

This document provides a common vocabulary to specify attribute values for raw materials. This second release updates the attributes and values for the four primary material types described in the first release: Knit Fabric, Woven Fabric, Leather, and Synthetic Material, and also adds the additional categories of Thread, Printed Labels, and RFID Inlays. It also defines a means of encoding an identifier based on the array of required attribute values that describe a given raw material. This provides a discrete means of identifying like-kind materials in order to streamline sourcing decisions and clarify purchasing specifications.

Standard attribute definitions increase efficiencies and minimize costs related to raw material sourcing and product information. For example:

- Harmonization of attribute definitions reduces individual (buyer) mapping from multiple sources to a single comparison structure, thus avoiding errors, duplication, and non-value-added activities.
- Providing clear definitions of attributes, as well as standardized codes that describe the same, enables trading partners to consistently exchange accurate and complete data.
- Clear attribute definitions allow business rules to be applied, for example, the selection of product label content or label data may vary based on the attributes of component materials.
- Attribute data could extend beyond the product development cycle and inform consumer product inquiries, such as searching for material allergies or like-kind product comparisons.
- Products that carry a persistent identifier (such as a luxury good with a woven QR code) could have component material data made available to repair or material reclamation entities, better enabling product circularity.
- By defining and digitizing attributes such as Fiber or Finish, this common language can then be applied to evaluate material sustainability. This may be leveraged, along with other data points, with sustainability assessment tools.

To address the lack of raw material attribute definitions among Apparel and General Merchandise trading partners, GS1 US® assembled industry stakeholders and experts to develop recommendations for how to apply GS1 Standards for raw material attributes associated with Apparel and General Merchandise products.

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1 Introduction

1.1 Overview

This application guideline was prepared by the *GS1 US Apparel and General Merchandise Initiative Raw Materials Workgroup* to assist trading partners with the use of GS1 Standards for Raw Material Attribute definitions and identifiers. It provides guidance on how to define, compare, and communicate Raw Material Attributes for use in commerce applications across retail operations. Trading partner relationships will determine the scope and timing of individual deployments.

Note: As with all GS1 Standards and solutions, this guideline is voluntary, not mandatory. It should be noted that use of the words "must" and "require" throughout this document relate exclusively to technical recommendations for the proper application of the standards to support the integrity of your implementation. The information contained herein is for informational purposes only, as a convenience, and is not legal advice or a substitute for legal counsel. GS1 US Inc. assumes no liability for the use or interpretation of the information contained herein.

1.2 Who Developed This Guideline?

This guideline was developed by the *GS1 US Apparel and General Merchandise Initiative Raw Materials Workgroup*. The workgroup includes representatives from leading North American general merchandise and apparel vendors and solution providers. This group of companies represents a broad spectrum of product categories within the retail industry and includes companies large and small.

1.3 Objectives

Attribute Definitions:

Develop and document standardized methods to describe Raw Material attributes for Apparel and General Merchandise brand owners, manufacturers, suppliers, retailers, e-tailers, marketplaces, and solution providers. This is composed of required and optional product attributes, grouped by material category.

Attribute Identifiers:

- Leverage attribute list value definitions to create an encoded value that describes a specific raw material based on its set of required product attribute values.
- Apply sound design principles regarding backward compatibility and accessibility.

1.4 Scope

The scope of this document is Raw Material attribute specifications for applications within Apparel, Footwear and General Merchandise categories. This includes a code-list for attribute values and description of the process used to encode and decode material identifiers. The guidance provided in this release includes Knit Fabric, Woven Fabric, Leather, Synthetic Material, Thread, Printed Labels, and RFID Inlays.

The authors have given careful consideration to the impact of their recommendations. For this reason, this document focuses on the core attributes deemed essential in order to describe a given raw material. The document serves as a starting point for all trading partners to analyze their current internal product attribute values and begin planning for the exchange of data leveraging these definitions.

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1.5 Audience

This document is designed to be used by raw material suppliers, brand owners, and retailers, as well as establishes a framework for third party providers that may service trading partners. The guidance provided is applicable to all companies trading materials in the Apparel, Footwear, and General Merchandise sectors. The primary audience is the material sourcing analyst who must determine which raw materials must be sourced, validated, and shared within the enterprise and between trading partners.

1.6 Document Purpose

The purpose of the attribute portion of this guideline is to define a vocabulary to help:

- Create a single set of attributes used to describe raw materials
- Define list values for attributes where possible
- Describe attributes and list values where not obvious

The purpose of the identifier portion of this guideline is to define an encoding mechanism that:

- Uses an algorithm to define a unique material ID based on key attribute selections
- Enables like-for-like comparison of raw materials
- Provides a self-describing code which clarifies material characteristics in B2B communication

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2 General Attribute Guidance

2.1 Definition of Terms

- **Material Category:** This indicates a specific raw material type (e.g. Leather) and its intended application (e.g. Footwear, Apparel, Accessories, and Automotive).
- **Required Attributes:** These are attribute values that must be populated when specifying a raw material within this material category.
- **Material Identifier:** Required attributes are often used in formulating Material Identifiers. A field that is marked as a "Material Identifier" is to be included in an algorithm that generates a unique code describing a material that matches a set of unique attribute values. A Material Identifier field must be a required field. It cannot include any attribute value that is free-form text.
- **Optional Attributes:** These attributes are not required to be populated when describing a raw material. These attributes cannot be a part of the Material Identifier.
- **Attribute Selection Type:** This indicates the nature of the attribute input field
    - **Single List:** Choose one entry from a set of pre-defined list value options
    - **Multi-Choice List:** Choose one or many entries from a set of pre-defined list value options
    - **Composite List:** Choose one or many entries from a set of pre-defined list value options and assign a percentage to each entry. The sum of entries will equal 100%.
    - **Integer:** Input a positive numeric integer value
    - **Float:** Input a positive numeric value with two decimal places (required, even if zero)
    - **Boolean:** Input a "Y" (Yes) or "N" (No) value
    - **Text:** Free form text, maximum of 255 characters. Note that material identifiers cannot include text fields.
- **Attribute List Values:** This is a list of possible values for a given attribute with either a Single List, Multi-Choice, or Composite List field type.

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3 Raw Material Identifier Guidance

3.1 Raw Material Identifier Code

This identifier code is an ancillary tool that may be used to compress key attribute values into an abbreviated value which is self-describing. It is constructed by concatenating the various code values corresponding to the Material Identifier fields. This construction uses the following design principles:

- Provides one algorithmically-derived string of characters that captures key attribute values
- Future guideline revisions must be backward compatible / scalable
- Leverage commonly-used characters on Latin-script keyboards
- Capability to describe multiple-choice list value selections
- Ability to expand attribute values in future releases while minimizing/retaining field size
- The code includes a header, or prefix, that describes the Material Type and Structure Version

The code is simply a more compact way to render the Identifier field values, instead of listing the field values separately. The identifier code is a means of simplifying the comparison of like-kind materials.

3.2 Attribute Selection Types and how they are encoded into a Material Identifier

The Material Identifier code is the set of component fields concatenated in the order in which they appear in this document. The following field types have the following encoding characteristics:

- **Single List:** A code corresponding to the (single) selected list value is encoded. This code is shown in the attribute table.
- **Multi-Choice List:** The corresponding two-character code value(s) are concatenated, with a tilde '~' terminating this field. The field length will vary proportionally with the number of selected attribute values.
- **Composite List:** This is a list of values and percentages that sum to 100%, and is used to describe the Fiber Content of a material (e.g. 80% Cotton, 20% Polyester). Each value has a corresponding two-character list code followed by a 2-digit percent indicator, which composes a set of 4 characters per composite material. (Note that a 2-digit percent indicator value of "00" will indicate 100 %.) This field value will vary by the number of composite materials that are defined. Details on how this unique field is encoded into an identifier is in the next section.
- **Integer:** Input a positive numeric integer value
- **Float:** Input a positive numeric value with two decimal places (include zeros)
- **Boolean:** Input a "Y" (Yes) or "N" (No) value
- **Text:** Free form text is excluded from Material Identifier fields

3.3 Construction of the Material Identifier

The Material Identifier code begins with a 5-digit prefix. The first 3 digits are an "R" followed by the Release rendered in 2-digit form (with a left-padded zero) that corresponds to this document Release. (E.G. version 2 will be rendered "R02" in the first 3 digits). The next 2 digits indicate the material type and material application (E.G. KN is the value for Knit Fabric). The remaining digits are the concatenated code values. For example:

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Required Field	Example Values	Reference Section	Code Value
Header	R02KN	4	R02KN
Construction Type	Fleece Knit (AH) Herringbone (AK) Mesh (AU)	4.3.1	AHAKAU~
Fiber Content	Alpaca (BD) 20% Azlon (BK) 40% Cotton (BQ) 35% Elastane (BV) 5%	4.3.2	BD20BK40BQ35BV05~
Ply	3	4.3.3	03
Denier Count	4	4.3.4	04.00
Weight UOM	Grams per Square Meter	4.3.5	G/M
Weight	32.1	4.3.6	32.10~
Yarn Type	Filament - Flat	4.3.7	FF

Resulting Code Value: R02KNAHAKAU~BD20BK40BQ35BV05~0304.00G/M32.10~FF

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4 Knit Fabric

Knit Fabric is a textile that is the product of knitting. It is more flexible than woven fabric. The attribute definitions that follow describe the use of Knit Fabric in Apparel, Footwear, Accessories, and Automotive. The two-digit header value for this is KN.

4.1 Knit Fabric Required Attributes

Attribute Name	Attribute Description	Material Identifier	Attribute Selection Type
Construction Type	This field denotes how the knitted fabric is constructed.	Y	Multi-Choice List
Fiber Content	The make-up of the yarn content of any given fabric (i.e. 80% Cotton, 20% Polyester).	Y	Composite List
Ply	Ply is how many yarns are twisted together to make a single thread.	Y	Integer (2-digit value zero padded)
Denier Count	A unit of measurement that is used to determine the fiber thickness of individual threads or filaments used in the creation of textiles and fabrics.	Y	Float (2-digit integer with 2-digit decimal zero padded)
Weight UOM	Unit of measure	Y	Single List
Weight	The mass of the product.	Y	Float
Yarn Type	The specific composite and spin method of the yarn.	Y	Single List
Material Name	The name of the material (given by the supplier).	N	Text
Material Identification	The supplier's identifier of the material.	N	Text
Width	How wide the fabric is.	N	Float
Width UOM	Unit of measure of Width value.	N	Single List
Country of Origin	The country where the material product is produced.	N	Single List

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4.2 Knit Value Optional Attributes

Attribute Name	Attribute Description	Attribute Selection Type
Material Description	A free-form text description of the Material - unique from the additional Material attributes.	Text
Cuttable Width	This is how wide across a fabric is, minus the selvedge on the side.	Float
Cuttable Width (UOM)	This is the Unit of Measure of the cuttable width (ex: 60 inches Cuttable Width).	Single List
Dye Class	This is the type of dye used.	Multi-Choice List
Dyeing Process	This is the process by which something is dyed.	Multi-Choice List
Filament Count	The number of individual filaments that make up an extruded yarn fiber.	Integer
Finishing	This describes the finish that goes on the finished product, or fiber, or fabric.	Multi-Choice List
Finishing Other	This is a free text field where user can input a finish that does not exist in the system.	Text
Function	This is a list of product characteristics/benefits.	Multi-Choice List
Gauge (Needles/Inch)	How many needles per inch.	Integer
Surface Process	This is a printed surface process where the print lies on top of the fabric.	Single List
Fiber Content Notes / Trademarks	Supplemental details and/or applicable trademarks.	Single List

4.3 Knit Fabric Material Identifier List Values and Identification Codes

This section describes the attribute values for required list values that are also used for like-kind material identification codes. Section 3.3 describes the process of encoding attribute values.

4.3.1 "Construction Type" Possible Values: (one or many values may be selected)

Value	Description	2-Digit Code
Bourrelet	A double knit fabric with a ribbed or corded look on its face.	AA
Birds Eye	A double knit fabric with a combination of tuck stitches along with knitting stitches. The tuck stitch creates an eyelet or hole effect on the fabric surface resembling a	A' (apostrophe

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	bird's eye. The fabric is usually made of multi-colored threads which creates a scrambling effect. The fabric may be made with designs having eyelets.	or single quote)
Cable	A double knit fabric made by the special loop transfer technique. The wales in the fabric have a rope-like appearance, where plaits are based on the transfer of loops with adjacent wales. The fabric has a braid-like surface texture as the loops cross each other	A((left parenthesis)
Cardigan Fabric - Full	Both sides of the fabric have the same stitch appearance.	AB
Cardigan Fabric - Half	The two sides of the fabric have different stitch appearance – one side is very even and flat, the other side appears to be coarser and has an uneven grained surface.	AC
Crepe Knit Fabric	A textured stretch fabric.	AD
Crinkle	A wrinkled or puckered effect in fabric produces by either construction or finishing.	AE
Eightlock	Two by two version of interlock that may be produced using an arrangement of two long and two short needles.	AF
Embroidery (EMB)	The craft of decorating fabric or other materials using a needle to apply thread or yarn.	AG
Fleece Knit	Refers to pile or napped fabric with a deep, soft, woolly-style surface.	AH
Fleece Knit - Sherpa	A variant of stretch knit polyester fleece fabric that has two distinct sides; one has a smooth knit side, and the other side has a texture intended to imitate the look and feel of a real sheep's fleece.	AI
Fleece - Polar	Polar fleece is a soft napped insulating fabric made from polyester.	AJ
Herringbone	A chevron or zig-zag pattern, knit into fabric alternating direction row by row.	AK
Intarsia	A flat knit fabric with patterns knitted in solid colors, so that both sides of the fabric are alike.	AL
Interlock	A fabric that has two plys knit simultaneously to form one thicker and heavier ply. It has more natural stretch than a jersey knit, a soft hand, and the same appearance and feel on both sides.	AM

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Interlock - Drop Needle	Compound fabric made by "inter-knitting," or interlocking, two simple ribbed fabrics, each made with single yarn. Has fine ribs running lengthwise. Fabric's face and reverse look same, making it reversible.	AN
Interlock - Variegated	A fabric that has two plys knit simultaneously to form one thicker and heavier ply. It has more natural stretch than a jersey knit, a soft hand, and the same appearance and feel on both sides.	AO
Interloop	A fabric that has yarn that is interloop with other yarn to form fabrics; the change in the path of interlooping the yarn produces the different structure with loops.	AP
Jacquard Knit	A fabric with an intricately variegated or raised pattern, distinct from other patterned materials because the pattern is woven into it rather than printed onto it.	AQ
Jacquard Knit - Double Jacquard	Double knit with a pattern on its face, achieved with jacquard controls on a knitting machine.	AR
Jacquard Knit - Single Jersey Jacquard	Single knit with a pattern on its face, achieved with jacquard controls on a knitting machine.	AS
Jersey	A basic stitch used in weft knitting, in which each loop formed in the knit is identical. Jersey Fabric is created through the consistent interlooping of yarns in the jersey stitch to produces a fabric with a smooth, flat face, and a more textured, but uniform back. Jersey fabrics may be produced on either circular or flat weft knitting machines.	AT
Jersey -Double Knit	A weft knitted fabric which is formed by two sets of needles.	AU
Jersey - Pointelle	Pointelle is a kind of drop needle fabric. It is constructed to control the degree of unlooping of certain stitches and to provide for opening needles latches when necessary.	AV
Jersey - Single Jersey	This fabric has a flat, smooth texture on the front and back.	AW

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Knit-Purl Transfer - Moss Stitch	Moss stitch is an elongated version of seed stitch. Instead of alternating the pattern every row (as you do for seed stitch), for moss stitch, you work two rows of the same sequence of knits and purls before you alternate them.	AX
Knit-Purl Transfer - Seed Stitch	Seed stitch consists of single knits and purls that alternate horizontally and vertically.	AY
Knit-Purl Transfer Double Seed Stich	Seed stitch consisting of double knit and purls that alternate horizontally and vertically.	AZ
Lacoste	Lacoste fabric is made of cotton fabric, but its knitted loop stitch is larger than normal cotton.	Aa
Links & Links	This knit fabric construction uses purl stitches and regular knit stitches on the same wale to create a rib-effect fabric that is usually thicker than jersey. The simplest form is a 1x1 1x1 purl, which incorporates one course of knit stitches and one course of purl stitches on the same wale. The links-and-links knit construction causes the greatest amount of stretch to be in the lengthwise direction.	Ab
Mesh	Similar to a pique knit, but with a more open texture for increased breathability. Larger knit than cool weave.	Ac
Mesh - Float Plated Fishnet	Supports a ladder-resist structure whereas alternate needles rise high enough to take the thicker yarn and are knitted in a plated relationship.	Ad
Mesh - Pointelle Rib	This variation on a rib knit construction utilizes the transference of loops within the knitting process to create a hole or opening in the lacy knitted pattern.	Ae
Milanese Knit	Made from two sets of yarns knitted diagonally.	Af
Milano - Full Milano (Double Knit)	A tucked rib knit stitch, which creates the same series of wales (lengthwise ridges/ribs) on both the face and the back of the fabric.	Ag
Milano - Half Milano (Semi Double Knit)	The two sides of the fabric have different stitch appearance – one side is very even and flat, the other side appears to be coarser and has an uneven grained surface.	Ah
Neoprene	This is a spun polyester with spandex or lycra double knit, meaning that two fabrics are knitted simultaneously together.	Ai

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Pique - Double	Double Pique Knit fabric has raised fibers from two types of threads that form a ribbed-like texture that can form various diamond-like shapes.	Aj
Pique - Single	Single Pique Knit fabric has raised fibers from one type of thread that forms a ribbed-like texture that can form various diamond-like shapes.	Ak
Plain	Denotes a fabric having a flat surface, with short, horizontal loops visible on the back.	Al
Pointelle	The fabric has patterned miss-stitches. The fabric has a look like lace, with holes made by these transferred stitches. The feminine look of the fabric makes it ideal for women's tops and kids wear.	A) (right parenthesis)
Ponte de Roma	This is a high quality stretch knit jersey fabric that is extremely soft and has a slight sheen when draped.	Am
Raschel	This is produced from spun or filament yarns of different weights and types. Most Raschel knits can be identified by their intricate designs, the open-space look of crochet or lace, and an almost three-dimensional surface effect design	A* (asterisk)
Rib Knit	The Rib-knit fabric is made by knitting yarn as alternate knit stitch and purl stitch in one course of the fabric.	An
Rib Knit 1x1	If a fabric is listed as a 1x1 rib knit, that means that one stitch was knitted and then one stitch was purled to achieve ribs that are the same width as the "valleys" between the ribs.	Ao
Rib Knit - 2x2	If a fabric is listed as a 2x2 rib knit, that means that two stitches were knitted and then two stitches were purled to achieve ribs that are the same width as the "valleys" between the ribs.	Ap
Rib Knit - 3x3	If a fabric is listed as a 3x3 rib knit, that means that three stitches were knitted and then three stitches were purled to achieve ribs that are the same width as the "valleys" between the ribs.	Aq
Rib - Drop Needle	A knitted Drop Needle fabric is made in such a way that during the knitting of the fabric, one or some needles are set to drop the stitch at regular intervals.	Ar
Rib - French / Flat Back	Welt knit fabric made on a flatbed-knitting frame as distinguished from tubular knit made on a circular frame.	As
Rib - Ottoman Rib	Ottoman is a fabric with a pronounced ribbed or corded effect, often made of silk or a mixture of cotton and other silk like yarns.	At

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Rib - Variegated	A stretchy fabric normally used for trim. This stitch is formed by two sets of needles at right angles to each other. The face of the fabric appears is different from the backside.	Au
Scuba	A lofty double knit fabric made of finely spun polyester fibers, with a smooth hand, a full-bodied drape, and a fantastic stretch (40% across the grain and 10% vertically).	Av
Sliver Knit	This is a Pile jersey fabric. Unlike Velour fabric, Sliver Knit fabric is characterized by a longer pile on the fabric surface. It is made of special circular knitting machines in which the surface fibers imitating fur are attached to the fabric, by means of knitting sliver along with base yarn making the fabric. Sliver knit fabrics have longer and denser piles on the fabric surface than other pile jerseys.	A+ (plus)
Stitch Fabric	A fabric that is constructed using either a horizontal or vertical repetition of loops.	Aw
Stitch Fabric - Vert	A warp knit fabric using vertical repetition interloops.	Ax
Stitch Fabric - Waffle	A waffle, or square pattern, knit or woven into a garment.	Ay
Terry - French	A variety of terry fabric, identified by an uncut looped pile on one side of the fabric; the other side is flat and smooth.	Az
Terry Knit	Features looping and piling of the fabric on one side only and has a flat unlooped back.	A! (exclamation point)
Tricot	Tricot knits are made almost exclusively from filament yarns because uniform diameter and high quality are essential yarn characteristics for use with the very high-speed tricot knitting machines. Fabrics constructed by the tricot knitting machine are usually plain or have a simple geometric design. The front surface of the fabric has clearly defined vertical wales, and the back surface has crosswise courses.	A" (quotation mark)
Velour Knit	Velour fabric is a velvety knit fabric with a short, clipped pile face, and a smooth back.	A# (number, pound, hash)
Waffle Stitch Fabric	A waffle, or square pattern, knit or woven into a garment.	A$ (dollar sign)
Other	Construction Type is not listed.	A% (percent)
N/A	Not Applicable	A& (ampersand)

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4.3.2 "Fiber Content" Possible Values: (one or many values may be selected)

Value	Description	2-Digit Code
Acetate	Acetate fabrics are made with spun filaments of cellulose taken from wood pulp. Classified as a chemical fiber textile or semi-synthetic.	BA
Acrylic	Acrylic is a synthetic man-made fabric that was originally developed to be an alternative to wool.	BB
Alginate	Alginate is a natural polymer that exists widely in many species of brown seaweed.	BC
Alpaca	Alpaca fleece is the natural fiber harvested from an alpaca.	BD
Alpaca Fine	This is a class of alpaca (fine wool).	BE
Angelina	Angelina Fiber is a very fine synthetic fiber that is incredibly luminescent.	BF
Angora - Goat	The natural fiber harvested from a goat.	BG
Angora - Dehaired	Dehair angora combines angora rabbit hair with angora goat hair.	BH
Angora - Rabbit	The natural fiber harvested from a rabbit.	BI
Anidex	A synthetic fiber with permanent stretch and recovery properties.	BJ
Aramid	Aramid fibers are a class of heat-resistant and strong synthetic fibers.	BK
Azlon	Azlon is a synthetic textile fiber composed of protein material derived from natural sources such as soy, peanut, milk or corn.	BL
Carbon	Carbon is an inert material that is very light and has excellent energy absorption qualities.	BM
Cashmere	Cashmere wool, usually simply known as cashmere, is a fiber obtained from cashmere goats or pashmina goats and other types of goat.	BO
Chlorofiber	Any synthetic fiber made from the polymerization of a chlorinated monomer.	BP
Cotton	Soft staple fiber from the seed of the cotton plant.	BQ
Cotton - Organic	Cotton fiber that is made from untreated seeds, and there is no use of pesticides or other harmful chemicals.	BR
Cotton - Recycled	Cotton fiber that is re-purposed, post-industrial or post-consumer cotton.	BS

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Cupro	Cellulose fiber derived from cotton linter (the ultrafine, silky fibers that stick to the seeds of the cotton plant after it's been ginned), dissolved in a solution of ammonia and copper oxide.	BT
Down	The down of birds is a layer of fine feathers found under the tougher exterior feathers.	BU
Duck Feathers	The feathers from a duck.	BV
Elastane (Spandex)	Synthetic fiber known for its exceptional elasticity.	BW
Elasterelle	An alternative to the generic term "polyester".	BX
Elastodiene	Elastofibre composed of natural or synthetic polyisoprene.	BY
Elastoester	Fiber similar to polyester.	BZ
Flax	Fiber extracted from the flax plant.	Ba
Fluoro	Fluorescent microfiber accent material.	Bb
Glass	A material consisting of numerous extremely fine fibers of glass.	Bc
Hair - Camel	Fiber produced from the fur from the body of a camel	Bd
Hair - Goat	A fiber made from the hair of goats.	Be
Hair - Horse	Fiber obtained from the manes and tails of horses	Bf
Hemp	A fiber extracted from the hemp plant.	Bg
Jute	Jute is a long, soft, shiny vegetable fiber that can be spun into coarse, strong threads.	Bh
Lastrile	Fibers formed from copolymers of acrylonitrile and a diene such as butadiene and contain 10%-50% acrylonitrile units.	Bi
Lastol	A synthetic elastic textile fiber.	Bj
Lenpur	A textile fiber from a renewable resource: cellulose carefully selected from the branches of special trees.	Bk
Linen	A textile made from the fibers of the flax plant.	Bl
Lurex	Lurex is the registered trademark name for a type of yarn with a metallic appearance. The yarn is made from synthetic film. Lurex fibers are basically metallic fibers covered with polyester film. This stops the metal from tarnishing and staining the fabric that it is incorporated in.	Bm
Metallic	Metallic fibers are manufactured fibers composed of metal, metallic alloys, plastic-coated metal, metal-coated plastic, or a core completely covered by metal.	Bo
Modacrylic	Modacrylic fibers are modified acrylic fibers.	Bp
Modal	Modal is a type of high tenacity rayon, a semi-synthetic cellulose fiber made by spinning reconstituted cellulose	Bq
Mohair	A fiber made from the hair of the Angora goat.	Br

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Mohair - Kid	Yarn made from the hair of young goats.	Bs
Nylon	Nylon is a man-made synthetic fiber that is strong while very light in weight.	Bt
Nylon - Recycled	Nylon fiber that is recycled that diverts waste from landfills. Its production uses much fewer resources than virgin nylon.	Bu
Olefin	Olefin fiber is a synthetic fiber made from a polyolefin, such as polypropylene or polyethylene.	Bv
Orlon	Synthetic acrylic fiber.	Bw
PLA	Stands for "polylactic acid fiber": a non-aromatic polyester derived 100% from renewable resources, from the fermentation of the starch amidon (like potatoes) into sugar.	B? (question mark)
Plastic	Fiber made from plastic.	Bx
PBI	Organic high performance fiber used to provide thermal stability.	By
PET - Recycled	Fiber that is produced from recycled Polyethylene Terephthalate (PET).	Bz
Polyamide/Nylon	Man-made synthetic fiber.	B! (exclamation point)
Polyester (PET)	Man-made synthetic fiber.	B" (quotation mark)
Polylactic Acid	Man-made synthetic fiber.	B$ (dollar sign)
Polylana	A trademarked, low-impact alternative to 100% acrylic fiber with less energy, water, waste, CO2 and microfiber release.	B% (percent)
Polyolefin/Polyethylene	A manufactured fiber made from ethylene.	B& (ampersand)
Polyolefin/Polypropylene	A manufactured fiber made from propylene.	B' (apostrophe or single quote)
Polyvinyl Alcohol	High-performance reinforcement fibers for concrete and mortar.	B((left parenthesis)
Ramie	Natural fiber from the ramie plant.	B) (right parenthesis)
Rayon	A manufactured fiber made from natural sources such as wood and agricultural products that are regenerated as cellulose fiber.	B* (asterisk)
Saran	Saran is now a commonly used name for films and fibers made from polyvinylidene chloride.	B+ (plus)
Silk	Silk is a natural protein fiber, some forms of which can be woven into textiles. The protein fiber of silk is composed mainly of fibroin and is produced by certain insect larvae to form cocoons.	B, (comma)
Soybean Protein	An advanced textile fiber. It is made from the Soybean cake.	B- (hyphen, minus, or dash)

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Sulfar	A manufactured fiber in which the fiber-forming substance is a long chain synthetic polysulfide in which at least 85% of the sulfide (—S—) linkages are attached directly to two (2) aromatic rings.	B. (period, dot)
Triacetate	A durable fiber that is resistant to wrinkles, stains, chemicals, sunlight, insects, and moisture	B/ (slash or divide)
Vinalon	A synthetic fiber produced from polyvinyl alcohol, using anthracite and limestone as raw materials.	B: (colon)
Vinyon	A synthetic fiber made from polyvinyl chloride.	B; (semicolon)
Viscose	A type of rayon that uses wood as a source of cellulose and is produced using the viscose process.	B@ (at symbol)
Wool	The textile fiber obtained from sheep and other animal.	B< (less than)
Wool - Lamb	Yarn made from the hair of lambs.	B= (equals)
Zylon	Synthetic polymer material.	B> (greater than)

4.3.3 "Ply"

This has an Integer attribute type with no pre-defined list values. The value is 2 digits with zero padding.

4.3.4 "Denier Count"

This has an Integer attribute type with no pre-defined list values. The value is 2 integer digits with 2 decimal digits (e.g. 01.20 is 1.2).

4.3.5 "Weight UOM" values

This is the Unit of Measure for the prior value. Valid options render 3-character codes and are either "G/M" (Grams per Square Meter) or "O/Y" (Ounces per Square Yard).

4.3.6 "Weight" value

This value is a number with a variable number of integer digits and two, zero padded, decimal places. This is terminated by a tilde (~)

4.3.7 "Yarn Type" value

This is a single list value. Select one of the following values:

Value	2-Digit Code
Filament – Flat	FF
Filament – Textured	FT
Mixed	MX
Spun – Carded	SC

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Spun – Combed	SM
Spun – Woolen	SW
Spun – Worsted	SR

4.4 Knit Fabric List Values for Required Fields that are not Material Identifiers

The following fields are required but not included in the Material Identifier algorithm.

4.4.1 "Material Name"

This is a text field describing the supplier's given name for the material.

4.4.2 "Material Identification"

This is a text field describing the supplier's identifier for the material.

4.4.3 "Width"

This is an integer representing the width of the fabric. The unit of measure is the following field.

4.4.4 "Width UOM"

This value represents the Unit of Measure for the prior "Width" field and is a single list field. Valid values are "CM" (Centimeter), "IN" (Inch), and "MM" (Millimeter).

4.4.5 "Country of Origin"

This is a single list indicating where the material is converted and finished. See section 11.1 for the list of possible 2-digit country code values

4.5 Knit Fabric List Values for Optional Fields

4.5.1 "Material Description"

This is a free-form text description of the Material - unique from the additional Material attributes.

4.5.2 "Cuttable Width"

This has a Float attribute type with no pre-defined list values. This is further described by the following field.

4.5.3 "Cuttable Width (UOM)"

This is a Single List attribute type with either "CM" (Centimeters) or "IN" (Inches). This describes the prior field.

4.5.4 "Dye Class"

This is a multi-choice attribute type with the following list values. (Zero, one, or many values may be selected)

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Value	Description
Acid	A dye that is typically applied to a textile at low pH.
Aniline	Dyes derived chemically from aniline or other coal tar derivatives.
Anthraquinone	Dyes that have anthraquinone as their base and the carbonyl group (>C=O) as the chromophore. Anthraquinone-based dyes are found in most of the synthetic dye classes.
Azo	Dyes characterized by the presence of an azo group (-N=N-) as the chromophore. Azo dyes are found in many of the synthetic dye classes.
Basic	Basic dyes are water-soluble and are mainly used to dye acrylic fibers. They are mostly used with a mordant. A mordant is a chemical agent which is used to set dyes on fabrics by forming an insoluble compound with the dye. With mordant, basic dyes are used for cotton, linen, acetate, nylon, polyesters, acrylics and modacrylics.
Developed	Dyes that are formed by using a developer. The substrate is first dyed in a neutral solution with a dye base, usually colorless. The dye is then diazotized with sodium nitrate and an acid and afterwards treated with a solution of B-naphthol, or a similar substance, which is the developer. Direct dyes are developed to produce a different shade or to improve wash fastness or light fastness.
Direct	Direct dyes color cellulose fibers directly without the use of mordants. They are used for dyeing wool, silk, nylon, cotton, rayon etc. These dyes are not very bright and have poor fastness to washing although they are fairly fast to light.
Disperse	The only water-insoluble dyes that dye polyester and acetate fibers.
Gel	Passing a wet-spun fiber that is in the gel state (not yet at full crystallinity or orientation) through a dyebath containing dye with affinity for the fiber. This process provides good accessibility of the dye sites.
Indigo	Dye with an indigo color.
Macromodecular	A group of inherently colored polymers. They are useful both as polymers and as dyes with high color yield. The chromophores fit the recognized CI classes, i.e., azo, anthraquinone, etc., although not all CI classes are represented. Used for mass dyeing, hair dyes, writing inks, etc.
Mordant	The mordant or chrome dyes are acidic in character. Sodium or potassium bichromate is used with them in the dyebath or after the process of dyeing is completed. This is done for getting the binding action of the chrome. They are mostly used for wool which gets a good color fastness after treatment with mordant dyes. They are also used for cotton, linen, silk, rayon and nylon but are less effective for them.
Pigment	Although pigments are not dyes in a true sense, they are extensively used for coloring fabrics like cotton, wool and other manmade fibers due to their excellent light fastness. They do not have any affinity to the fibers and are affixed to the fabric with the help of resins. After dyeing, the fabrics are subjected to high temperatures.
Premetallized	Acid dyes that are treated with coordinating metals such as chromium. This type of dye has much better wet fastness than regular acid dye. Premetallized dyes are used on nylon, silk, and wool.

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Reactive	Reactive dyes react with fiber molecules to form a chemical compound. These dyes, they are either applied from alkaline solution or from neutral solutions which are then alkalized in a separate process. Sometimes heat treatment is also used for developing different shades. After dyeing, the fabric is washed well with soap to remove any unfixed dye. Reactive dyes were originally used for cellulose fibers only but now their various types are used for wool, silk, nylon, acrylics and their blends as well.
Solution dyed	Reducing water and chemicals when dyeing fabrics.
Sulfur	Sulfur Dyes are insoluble and made soluble by the help of caustic soda and sodium sulfide. Dyeing is done at high temperature with large quantities of salt so that the color penetrates the fiber. After dyeing the fabric is oxidized for getting desired shades by exposure to air or by using chemicals. Excess dyes and chemicals are removed by thorough washing. These dyes are fast to light, washing and perspiration and are mostly used for cotton and linen.
Vat	Vat dyes are insoluble in water and cannot dye fibers directly. However, they can be made soluble by reduction in alkaline solution which allows them to affix to the textile fibers. Subsequent oxidation or exposure to air restore the dye to its insoluble form. Indigo is the original vat dye. These dyes are the fastest dyes for cotton, linen and rayon. They are used with mordants to dye other fabrics such as wool, nylon, polyesters, acrylics and modacrylics.

4.5.5 "Dyeing Process"

This is a multi-choice attribute type with the following list values. (Zero, one, or many values may be selected)

Value	Description
Continuous Dyed	Dyeing of Greige goods.
Fiber Dye	Dyeing individual fibers.
Greige	Dyeing greige goods (entire fabrics).
Heather / Marl	Dyeing individual fibers then marling or heathering/twisting them .
Jet Dyed	Jet dyeing is a process that can be used for batch dyeing operations.
Jigger Dyed	A Jig Dyeing machine processes fabric by holding it on rollers in open width to avoid creasing. The Jig Dyeing machine operates by transferring the fabric back and forth through the dye bath between two reels
Solution Dyed	Also known as Dope Dye. This is a one step process in which dyes in the form of color chips are added to the liquid chemical before it is extruded into long fibers.
Space Dyed	Dyeing of yarns in multiple colors along the entire strand length which gives a marbled effect on a fabric surface.
Yarn Dyed	Dyeing individual yarns.

4.5.6 "Filament Count"

This is defined as the number of individual filaments that make up an extruded yarn fiber. This has an Integer attribute type with no pre-defined list values.

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4.6 "Finishing"

This describes the finish that goes on the finished product, or fiber, or fabric. This is a multi-choice attribute type with the following list values

Value	Description
Antimicrobial	Antibacterial additives used to treat fabric.
Antistatic	Finish used to make fabric resistant to static cling.
Brushing	This process is usually applied by bristle-covered rollers. It is used to remove short fiber ends and loose threads from smooth fabrics. It is also used to raise the nap on woven and knit fabrics.
Calendering	Calendering is a final process in which heat and pressure are applied to a fabric by passing it between heated rollers, imparting a flat, glossy, smooth surface. Luster increases when the degree of heat and pressure is increased.
Crepe and Crinkled Effects	Process of creating a crinkled or wrinkled fabric effect.
Embossing	This provides a design that is raised in such a way as to stand out from the surrounding material. It is achieved by applying heated rollers with the desired design to the material.
Flame Retardants	Finish which makes fabric resistant to flame.
Mercerizing	A process that eliminates all of the small "hairs" of yarn, which adds to its luster. This yarn is then additionally run through a caustic solution, which further soothes and adds gloss to the yarn surface by burning off additional fabric hairs.
Mildewproof	A process which makes fabric resistant to mildew.
Moisture Management	A process which makes fabric moisture wicking or moisture resistant.
Mothproof	A process which makes fabric resistant to moths.
Nano Finishing	Umbrella term for finishing that uses nanotechnology.
Other	See Finishing Other for description.
Resin	Finish which makes fabric wrinkle resistant.
Scratch & Sniff	Finish which makes fabric scented upon scratching the surface.
Shearing	Shearing or singeing smooths the fabric by removing the fine protruding fibers on the surface of the fabric.
Singeing	Shearing or singeing smooths the fabric by removing the fine protruding fibers on the surface of the fabric.
Softening	Finish which makes the fabric hand feel softer.
Soil Release	The finish that allow stains to leave the fabric faster & makes fabric cleanable without significant loss of soil release properties.

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Sueding	The Suede finish is a matte texture with a uniquely soft touch that offers high-quality color consistency.
Wash & Wear	Wrinkle resistant finish.
Water & oil Repellency	Finish which makes fabric resistant to oils and water permeating the fabric.
Wrinkle Resistant	Finish which makes fabric resistant to wrinkles.

4.6.1 "Finishing Other"

This is a free-form text field where a user can input a finish that is not listed in the prior field.

4.6.2 "Function"

This is a multi-choice attribute type with the following list values

Value	Description
2 or 4 way stretch	This defines how many directions the fabric can stretch.
Anti-bacterial	Antibacterial additives used to treat fabric.
Breathable	Breathable fabrics will let air circulate through.
Cold Resistant	This will give fabric a more insulated property, making the wearer resistant to the cold temperature.
DWR	Durable water repellent, or DWR, is a coating added to fabrics at the factory to make them water-resistant (hydrophobic).
Fire Resistant	Makes fabric resistant to flame/fire.
Moisture-wicking	Draw moisture away from body.
Reflective	Fabric reflects light back to the source.
Waterproof	Fabric will not be permeated by water.
Windproof	Fabric is resistant to wind going through the fabric.

4.6.3 "Gauge (Needles/Inch)"

This has an Integer attribute type with no pre-defined list values.

4.6.4 "Surface Process"

This is a Single List attribute type with the following possible values:

Value	Description
Film Lamination	Process of bonding a thin, transparent film to the fabric.

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Foam Coating	Process of embedding a layer of discrete particles, such as a salt, into a previously formed liquid layer, gelling or curing the layer and dissolving the discrete particles to leave a textured or textured foamed surface.
Foil (Electroplate Colors)	Foil stamping, also known as foil printing, is a versatile printing technique that involves applying a metallic or pigmented foil to a surface in order to create a decorative finish.
Metallic	Metal prints are made by a process called dye sublimation.
Plate Emboss	Embossing is done by pressing a sheet of paper (or other substrate) into a female die that has a design engraved or etched into it. This is usually done with a male counterpart underneath the paper, so that the paper is sandwiched between the two and the design is transferred to the paper.
Release Paper	Release papers are papers coated with a release agent and are used in a wide range of applications such as for protection of adhesive surfaces of various adhesive products.
Roller Emboss	Embossing involves making reliefs, using a roller, on surfaces of paper, fabric etc., so that the image is imprinted in either a raised or lowered design.

4.6.5 **"Fiber Content Notes / Trademarks"**

This is a free form text field used to describe supplemental details and/or applicable trademarks.

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5 Woven Fabric

Woven Fabric is a textile that is the product of weaving many threads at right angles to one another. It is less flexible than knit fabric. The attribute definitions that follow describe the use of Woven Fabric in Apparel, Footwear, Accessories, and Automotive. The two-digit header value for this is WV.

5.1 Woven Fabric Required Attributes

Attribute Name	Attribute Description	Material Identifier	Attribute Selection Type
Construction Type	This field denotes how the woven fabric is constructed	Y	Single List
Fiber Content	The make-up of the yarn	Y	Composite List
Denier Count	Denier is a unit of measurement that is used to determine the fiber thickness of individual threads or filaments used in the creation of textiles and fabrics	Y	Float (xxx.yy format with zero padding)
Weight UOM	Unit of measure	Y	Single List
Weight	The mass of the product	Y	Float
# of Warp Yarn	This field identifies the # of yarns in the warp direction of the fabric per square inch	Y	Integer (3 digits zero padded)
# of Weft Yarn	This field identifies the # of yarns in the weft direction of the fabric per square inch	Y	Integer (3 digits zero padded)
Weaving Type	The method of interlacing of threads using various warp and weft systems.	Y	Single List
Material Name	The name of the Material.	N	Text
Material Identification	The supplier's alpha-numeric identification of the Material.	N	Text
Width	How wide the fabric is	N	Float
Width UOM	Width Unit of measure	N	Single List
Cuttable Width	This is how wide across a fabric is, minus the selvedge on the side.	N	Float
Cuttable Width UOM	This is the Unit of Measure of the Cuttable Width (e.g.: 60 inches Cuttable Width)	N	Single List
Country of Origin	This is where the raw material comes from (Country)	N	Single List

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5.2 Woven Fabric Optional Attributes

Attribute Name	Attribute Description	Attribute Selection Type
Material Description	A free-form text description of the Material - unique from the additional Material attributes.	Text
Filament Count	The number of individual filaments that make up an extruded yarn fiber, staple or tow	Integer
Finishing	This describes the finish that goes on the finished product, or fiber, or fabric	Multi-Choice List
Finishing Other	This is a free text field where user can input a finish that does not exist in the system	Text
Dye Class	This is the type of dye used	Multi-Choice List
Dyeing Process	This is the process by which something is dyed	Multi-Choice List
Function	This is a product characteristic/benefit	Multi-Choice List
Ply	Ply is how many yarns are twisted together to make a single thread.	Integer
Printing Method	This is the method by which a fabric is printed	Multi-Choice List
Printing Other	Option under Printing method above noted as Other	Text
Printing Process	This is the process by which a fabric is printed	Multi-Choice List
Printing Process Other	Option under Printing Process above noted as Other	Text
Roll Length	This is the length of the print roller	Float
Roll Length UOM	Unit of measure	Single List
Surface Process	This is a printed surface process where the print lies on top of the fabric	Single List
Fiber Content Notes / Trademarks	Supplemental details and/or applicable trademarks	Text

5.3 Woven Fabric Material Identifier List Values and Identification Codes

This section describes the attribute values for required list values that are also used for like-kind material identification codes. Section 3.3 describes the process of encoding attribute values.

5.3.1 "Construction Type" Possible Values: (one value must be selected)

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Value	Description	2-Digit Code
Basket Weave	The Warp yarn is anchored at both ends of where the fabric will be and the weft yarn is interwoven through these yarns. Like plain weave, Basket weave follows the same pattern of the Weft yarn going under one warp yarn and over the next, creating a checkerboard effect. The difference between basket weave and plain weave is that adjacent yarns are grouped together.	AA
Broadcloth	Broadcloth is a very popular type of dress shirt fabric. Broadcloth and Poplin are essentially the same type of fabric. Broadcloth is a very lightweight, smooth, flat looking fabric, with no pattern in the weave of the threads. It is similar in quality to pinpoint fabric but has less texture.	AB
Brushed Back Satin	Brushed-back satin is a fabric that is satin-smooth on the outside and brushed flannel on the inside.	AC
Burnout Velvet	Devore, aka Burnout, is a fabric technique that is used on velvet where a mixed-fiber material undergoes a chemical process to dissolve the cellulose fibers and create a semi-transparent pattern against a solidly woven background.	AD
Canvas	Canvas is an extremely durable plain-woven fabric.	AE
Chambray	Chambray is a cotton plain-weave fabric made with a dyed warp yarn and a white filling yarn.	AF
Charmeuse	Charmeuse is a lightweight fabric woven with a satin weave, in which the warp threads cross over four or more of the backing (weft) threads. These float threads give the front of the fabric a smooth, reflective finish, whereas the back has a dull finish.	AG
Chiffon	Chiffon is a lightweight plain-woven fabric with mesh like weave that gives it transparent appearance.	AH
Corduroy	Corduroy is a textile with a distinct pattern, a "cord" or wale. The fabric looks as if it is made from multiple cords laid parallel to each other and then stitched together.	AI
Crepe	Crepe is a silk, wool, or synthetic fiber fabric with a distinctively crisp, crimped appearance.	AJ
Crinkle	Crinkle Fabric is used in reference to any fabric that has been either woven or gathered into pleats.	AK
Denim	Denim is a sturdy cotton warp-faced textile in which the weft passes under two or more warp threads. This twill weaving produces a diagonal ribbing that distinguishes it from cotton duck. The most common denim is indigo denim, in which the warp thread is dyed, while the weft thread is left white.	AL
Dobby	Dobby is a woven fabric produced on the dobby loom, characterized by small geometric patterns and extra texture in the cloth.	AM

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Double Cloth	Double-faced fabrics are a form of double cloth made of one warp and two sets of wefts, or (less often) two warps and one weft. These fabrics have two right sides or faces and no wrong side.	AN
Eyelet	Eyelet fabric is a type of lace made by creating holes in a fabric medium. Each hole is edged using a buttonhole stitch. The holes are precisely sized and situated to create a pattern or patterns, often floral designs or abstract geometric arrangements.	AO
Faille	Faille Fabric has an elegantly ribbed crosswire design. The ribs are crafted from thicker or clustered weft yarns and thinner warp yarns that give the material a more pronounced texture.	AP
Flannel	A soft, slightly napped fabric.	AQ
Gabardine	Gabardine is woven as a warp-faced steep or regular twill, with a prominent diagonal rib on the face and smooth surface on the back. Gabardine always has many more warp than weft yarns.	AR
Gauze	Gauze is a loosely woven, almost translucent fabric.	AS
Georgette	Georgette fabric is a lightweight, semi-sheer cloth with a grainy feel.	AT
Glen Plaid	Glen Plaid is a woolen fabric with a woven twill design of small and large checks.	AU
Herringbone	A chevron or zig-zag pattern, woven into fabric alternating direction row by row.	AV
Jacquard	Jacquard fabric is a type of cloth featuring an intricate pattern woven into the warp on a special mechanical loom, rather than printed on the surface.	AW
Interlining	Material between the fabric on the outside of a piece of clothing and the regular lining.	AZ
Lace	Lace is a delicate fabric made of yarn or thread in an open web like pattern, made by machine or by hand.	AY
Mesh	Mesh is a fabric with an open texture, fine or coarse. A mesh is similar to fabric or a web in that it has many connected or weaved pieces.	AZ
Microfiber	Microfiber (or microfiber) is synthetic fiber finer than one denier or decitex/thread.	Aa
Moleskin	Moleskin is a heavy cotton fabric, woven and then sheared to create a short, soft pile on one side. The feel and appearance of its nap is similar to felt or chamois, but less plush than velour.	Ab
Oxford	The fabric is mainly used for making cotton dress shirts for both casual and formal occasions due to its versatility.	Ac

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Pinstripe	Pinstripes are a pattern of very thin stripes of any color running in parallel often found in cloth.	Ad
Pinpoint Oxford	Belongs to the oxford family of fabrics. These have a soft texture and a "basket-weave" appearance.	Ae
Pique	Piqué, or Marcella, refers to a weaving style, normally used with cotton yarn, which is characterized by raised parallel cords or geometric designs in the fabric.	Af
Batiste	A lightweight, plain weave fabric.	Ag
Poplin	Poplin is a fine but thick fabric with a horizontal warp and a vertical weft made with twice the yarns.	Ah
Satin	Satin is a weave that typically has a glossy surface and a dull back.	Ai
Seersucker	Seersucker or railroad stripe is a thin, puckered, all-cotton fabric, commonly striped or checkered, used to make clothing for spring and summer wear.	Aj
Shirting	Shirting Fabric is a broad term used to refer to a variety of fabrics, where the fabric is generally tightly woven and less sheer, making them an ideal shirt weight.	Ak
Taffetta	Taffetta is a crisp, smooth, plain woven fabric.	Al
Tulle	Tulle is a lightweight, very fine, stiff netting.	Am
Tweed	Tweed is a rough, woolen fabric, of a soft, open, flexible texture, resembling cheviot or homespun, but more closely woven. It is usually woven with a plain weave, twill or herringbone structure.	An
Twill	Twill is a type of textile weave with a pattern of diagonal parallel ribs. This is done by passing the weft thread over one or more warp threads then under two or more warp threads and so on, with a "step," or offset, between rows to create the characteristic diagonal pattern.	Ao
Velour	Velour or velours is a plush, knitted fabric or textile similar to velvet or velveteen.	Ap
Velvet	Velvet is a type of woven tufted fabric in which the cut threads are evenly distributed, with a short dense pile, giving it a distinctive soft feel.	Aq
Voile	Voile is a soft, sheer fabric.	Ar

5.3.2 **"Fiber Content" Possible Values: (one or many values may be selected)**

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Value	Description	2-Digit Code
Acetate	Acetate fabrics are made with spun filaments of cellulose taken from wood pulp. Classified as a chemical fiber textile or semi-synthetic.	BA
Acrylic	Acrylic is a synthetic man-made fabric that was originally developed to be an alternative to wool.	BB
Alignate	Alginate is a natural polymer that exists widely in many species of brown seaweed.	BC
Alpaca	Alpaca fleece is the natural fiber harvested from an alpaca.	BD
Alpaca Fine	This is a class of alpaca (fine wool).	BE
Angelina	Angelina Fiber is a very fine synthetic fiber that is incredibly luminescent.	BF
Angora - Dehaired	Dehair angora combines angora rabbit hair with angora goat hair.	BG
Angora Goat	The natural fiber harvested from a goat.	BH
Angora Rabbit	The natural fiber harvested from a rabbit.	BI
Anidex	A synthetic fiber with permanent stretch and recovery properties.	BJ
Aramid	Aramid fibers are a class of heat-resistant and strong synthetic fibers.	BK
Azion	Azlon is a synthetic textile fiber composed of protein material derived from natural sources such as soy, peanut, milk or corn.	BL
Carbon	Carbon is an inert material that is very light and has excellent energy absorption qualities.	BM
Cashmere	Cashmere wool, usually simply known as cashmere, is a fiber obtained from cashmere goats or pashmina goats and other types of goat.	BO
Chlorofiber	Any synthetic fiber made from the polymerization of a chlorinated monomer.	BP
Cotton	Soft staple fiber from the seed of the cotton plant.	BQ
Cotton - Organic	Cotton fiber that is made from untreated seeds, and there is no use of pesticides or other harmful chemicals.	BR
Cotton - Recycled	Cotton fiber that is re-purposed, post-industrial or post-consumer cotton	BS
Cupro	Cellulose fiber derived from cotton linter (the ultrafine, silky fibers that stick to the seeds of the cotton plant after it's been ginned), dissolved in a solution of ammonia and copper oxide.	BT
Dehaired Angora	Dehair angora combines angora rabbit hair with angora goat hair.	BU

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Down	The down of birds is a layer of fine feathers found under the tougher exterior feathers.	BV
Duck Feathers	The feathers from a duck.	BW
Elastane (Spandex)	Synthetic fiber known for its exceptional elasticity.	BX
Elasterelle	An alternative to the generic term "polyester".	BY
Elastodiene	Elastofiber composed of natural or synthetic polyisoprene.	BZ
Elastoester	Fiber similar to polyester.	Ba
Fiberglass	Glass fiber used to reinforce synthetic wovens	B[(open bracket)
Flax	Fiber extracted from the flax plant.	Bb
Fluorfiber	Fluorescent microfiber accent material.	Bc
Glass	A material consisting of numerous extremely fine fibers of glass.	Bd
Hair - Camel	Fiber produced from the fur from the body of a camel	Be
Hair - Goat	A fiber made from the hair of goats.	Bf
Hair - Horse	Fiber obtained from the manes and tails of horses.	Bg
Hemp	A fiber extracted from the hemp plant.	Bh
Jute	Jute is a long, soft, shiny vegetable fiber that can be spun into coarse, strong threads.	Bi
Lastol	A synthetic elastic textile fiber.	Bk
Lastrile	Fibers formed from copolymers of acrylonitrile and a diene such as butadiene and contain 10%-50% acrylonitrile units.	Bl
Lenpur	A textile fiber from a renewable resource: cellulose carefully selected from the branches of special trees.	Bm
Linen	A textile made from the fibers of the flax plant.	Bn
Lurex	Lurex is the registered trademark name for a type of yarn with a metallic appearance. The yarn is made from synthetic film. Lurex Manufacture. Lurex fibers are basically metallic fibers covered with polyester film. This stops the metal from tarnishing and staining the fabric that it is incorporated in.	Bo
Metallic	Metallic fibers are manufactured fibers composed of metal, metallic alloys, plastic-coated metal, metal-coated plastic, or a core completely covered by metal.	Bq
Modacrylic	Modacrylic fibers are modified acrylic fibers	Br
Modal	Modal is a type of high tenacity rayon, a semi-synthetic cellulose fiber made by spinning reconstituted cellulose	Bs
Mohair	A fiber made from the hair of the Angora goat.	Bt
Mohair - Kid	Yarn made from the hair of young goats.	Bu

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Nylon	Nylon is a man-made synthetic fiber that is strong while very light in weight.	Bv
Nylon - Recycled	Nylon fiber that is recycled that diverts waste from landfills and its production uses much fewer resources than virgin nylon.	Bw
Olefin	Olefin fiber is a synthetic fiber made from a polyolefin, such as polypropylene or polyethylene.	Bx
Orlon	Synthetic acrylic fiber.	Bz
PLA	Stands for "polylactic acid fiber": a non-aromatic polyester derived 100% from renewable resources, from the fermentation of the starch amidon (like potatoes) into sugar.	B] (closed bracket)
Plastic	Fiber made from plastic.	B! (exclamation point)
PBI	Organic high performance fiber used to provide thermal stability.	B" (quotation mark)
PET - Recycled	Fiber that is produced from recycled Polyethylene Terephthalate (PET).	B# (number, pound, hash)
Polyamide/Nylon	Man-made synthetic fiber.	B$ (dollar sign)
Polyester (PET)	Man-made synthetic fiber.	B% (percent)
Polylactic Acid	Man-made synthetic fiber.	B' (apostrophe or single quote)
Polylana	A trademarked, low-impact alternative to 100% acrylic fiber with less energy, water, waste, CO2 and microfiber release.	B((left parenthesis)
Polyolefin/Polyethylene	A manufactured fiber made from ethylene.	B) (right parenthesis)
Polyolefin/Polypropylene	A manufactured fiber made from propylene.	B* (asterisk)
Polyvinyl Alcohol	High-performance reinforcement fibers for concrete and mortar.	B+ (plus)
Ramie	Natural fiber from the ramie plant.	B, (comma)
Rayon	A manufactured fiber made from natural sources such as wood and agricultural products that are regenerated as cellulose fiber.	B- (hyphen, minus, or dash)
Saran	Saran is now a commonly used name for films and fibers made from polyvinylidene chloride.	B. (period, dot)
Silk	Silk is a natural protein fiber, some forms of which can be woven into textiles. The protein fiber of silk is composed mainly of fibroin and is produced by certain insect larvae to form cocoons.	B/ (slash or divide)
Soybean Protein	An advanced textile fiber. It is made from the Soybean cake.	B: (colon)

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Sulfar	A manufactured fiber in which the fiber-forming substance is a long chain synthetic polysulfide in which at least 85% of the sulfide (—S—) linkages are attached directly to two (2) aromatic rings.	B; (semicolon)
Triacetate	A durable fiber that is resistant to wrinkles, stains, chemicals, sunlight, insects, and moisture.	B< (less than)
Vinalon	A synthetic fiber produced from polyvinyl alcohol, using anthracite and limestone as raw materials.	B= (equals)
Vinyon	A synthetic fiber made from polyvinyl chloride.	B> (greater than)
Viscose	A type of rayon that uses wood as a source of cellulose and is produced using the viscose process.	B? (question mark)
Wool	The textile fiber obtained from sheep and other animal.	B@ (at symbol)
Wool - Lamb	Yarn made from the hair of lambs.	B{ (opening brace)
Wool - Recycled	Wool fiber that is re-purposed, post-industrial or post-consumer wool that would otherwise be deemed waste for the landfill	B| (vertical bar or pipe)
Zylon	Synthetic polymer material.	B} (closing brace)

5.3.3 "Denier Count"

This is a Float value with xxx.yy format (hundreds, tens, ones,. tenths, hundredths) places, padded with zeros. For example, a value of 12.5 will be rendered "012.50".

5.3.4 "Weight UOM" values

This is the Unit of Measure for the prior value. Valid options render 3-character codes and are either "G/M" (Grams per Square Meter) or "O/Y" (Ounces per Square Yard).

5.3.5 "Weight" value

This value is a number with a variable number of integer digits and two, zero padded, decimal places. This is terminated by a tilde (~).

5.3.6 "Number of Warp Yarn"

This is a 3-digit integer with left padded zeros.

5.3.7 "Number of Weft Yarn"

This is a 3-digit integer with left padded zeros.

5.3.8 "Weaving Type"

This is a single list describing the method of interlacing of threads using various warp and weft systems. Possible values are:

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Value	2-Digit Code
Amure	CA
Astrakhan	CB
Barathea	CC
Basket Weave	CD
Batiste	CE
Bayadere	CF
Beaver Cloth	CG
Bedford Cord	CH
Birdseye	CI
Bengaline	CJ
Blanket Cloth	CK
Bolivia (Elysian)	CL
Bombazine	CM
Broadcloth	CN
Broadcloth - Wool	CO
Brocade	CP
Brocatelle	CQ
Broken Twill	CR
Buckram	CS
Calico	CT
Cambric	CU
Candlewick Fabric	CV
Canton Flannel	CW
Canvas (Duck)	CX
Cavalry Twill	CY
Cendal	CZ
Challis	Ca
Chambray	Cb
Chamois Cloth	Cc

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Cheesecloth	Cd
Chenille Fabric	Ce
Chevlot	Cf
Chiffon	Cg
Chinchilla	Ch
Chino	Ci
Chintz	Cj
Corduroy	Ck
Covert	Cl
Crash	Cm
Crepe	Cn
Cretonne	Co
Denim	Cp
Dimity	Cq
Dobby	Cr
Doeskin	Cs
Domett Flannel	Ct
Donegal (Tweed)	Cu
Dotted Swiss	Cv
Doupion	Cw
Drill	Cx
Duck	Cy
Duvetyn (Suede Cloth)	Cz
Faille	C! (exclamation point)
Flannel - Wool	C" (quotation mark)
Flannel - Worsted	C# (number, pound, hash)
Flannelette	C$ (dollar sign)
Foulard	C% (percent)
Frise	C& (ampersand)

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Fustian	C' (apostrophe or single quote)
Gaberdine	C((left parenthesis)
Gingham	C) (right parenthesis)
Habutai	C* (asterisk)
Herringbone	C+ (plus)
Homespun	C, (comma)
Honan	C- (hyphen, minus, or dash)
Hopsacking	C. (period, dot)
Houndstooth	C/ (slash or divide)
Huckaback	C: (colon)
Ixtle	C; (semicolon)
Jacquard	C< (less than)
Kersey	C= (equals)
Lawn	C> (greater than)
Mackinaw	C? (question mark)
Madras	C@ (at symbol)
Melton	C{ (opening brace)
Moire (Watered Silk)	C| (vertical bar or pipe)
Monk's Cloth	C} (closing brace)
Mousseline de Soie	C0 (zero)
N/A	C1
Nainsook	C2
Net	C3
Ninon	C4
Organdy	C5
Organza	C6
Ottoman	C7
Oxford	C8
Percale	C9

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Pin Check	DA
Plain Weave Fabric	DB
Plisse	DC
Pongee	DD
Poplin	DE
Provence	DF
Rajah	DG
Repp	DH
Royal Oxford	DI
Sailcloth	DJ
Sateen	DK
Satin	DL
Seersucker	DM
Serge	DN
Shantung	DO
Sharkskin	DP
Shetland	DQ
Suede	DR
Surah	DS
Taffeta	DT
Terry Cloth	DU
Ticking	DV
Tricotine	DW
Tropical	DX
Tropical Worsted	DY
Tussah	DZ
Tweed	Da
Twill	Db
Velvet	Dc
Velveteen	Dd

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Venetian	De
Vichy	Df
Viyella	Dg
Voile	Dh
Whipcord	Di
Zibeline	Dj
Other	Dk

5.4 Woven Fabric List Values for Required Fields that are not Material Identifiers

The following fields are required but not included in the Material Identifier algorithm.

5.4.1 "Material Name"

This is a text field describing the supplier's given name for the material.

5.4.2 "Material Identification"

This is a text field describing the supplier's identifier for the material.

5.4.3 "Width"

This is a float number representing the width of the fabric. The unit of measure is the following field.

5.4.4 "Width UOM"

This value represents the Unit of Measure for the prior "Width" field and is a single list field. Valid values are "CM" (Centimeter), "IN" (Inch), "MM" (Millimeter), "FT" (Foot), "M" (Meter), and "YD" (Yard).

5.4.5 "Cuttable Width"

This has a Float attribute type with no pre-defined list values. This is further described by the following field.

5.4.6 "Cuttable Width (UOM)"

This is a Single List attribute type with either "CM" (Centimeters) or "IN" (Inches). This describes the prior field.

5.4.7 "Country of Origin"

This is a single list. See section 11.1 for the list of possible 2-digit country code values.

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5.5 Woven Fabric List Values for Optional Fields

5.5.1 "Material Description"

This is a free-form text description of the Material - unique from the additional Material attributes.

5.5.2 "Filament Count"

This is an integer type with no pre-defined list values.

5.5.3 "Finishing"

This is a multi-choice list with the following possible values: (select zero, one, or many values)

Value	Description
Antimicrobial	Antibacterial additives used to treat fabric.
Antistatic	Finish used to make fabric resistant to static cling.
Brushing	This process, applied to a wide variety of fabrics, is usually accomplished by bristle-covered rollers. The process is used to remove loose threads and short fiber ends from smooth-surfaced fabrics and is also used to raise a nap on knits and woven fabrics.
Calendering	Calendering is a final process in which heat and pressure are applied to a fabric by passing it between heated rollers, imparting a flat, glossy, smooth surface. Luster increases when the degree of heat and pressure is increased.
Crepe and Crinkled Effects	Process of creating a crinkled or wrinkled fabric effect.
Embossing	Embossing imparts a raised design that stands out from the background and is achieved by passing the fabric through heated rollers engraved with a design.
Flame Retardants	Finish which makes fabric resistant to flame.
Mercerizing	A process that eliminates all of the small "hairs" of yarn, which adds to its luster. This yarn is then additionally run through a caustic solution, which further smooths and adds gloss to the yarn surface by burning off additional fabric hairs.
Mildew proof	A process which makes fabric resistant to mildew.
Moisture Management	A process which makes fabric moisture wicking or moisture resistant.
Mothproof	A process which makes fabric resistant to moths.
Nano Finishing	Umbrella term for finishing that uses nanotechnology.
Other	See Finishing Other for description.
Resin	Finish which makes fabric wrinkle resistant.
Scratch & Sniff	Finish which makes fabric scented upon scratching the surface.
Shearing	Shearing or singeing smooths the fabric by removing the fine protruding fibers on the surface of the fabric.
Singeing	Shearing or singeing smooths the fabric by removing the fine protruding fibers on the surface of the fabric.

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Softening	Finish which makes the fabric hand feel softer.
Soil Release	The finish that allow stains to leave the fabric faster & makes fabric cleanable without significant loss of soil release properties.
Sueding	The Suede finish is a matte texture with a uniquely soft touch that offers high-quality color consistency.
Wash & Wear	Wrinkle resistant finish.
Water & oil Repellency	Finish which makes fabric resistant to oils and water permeating the fabric.
Wrinkle Resistant	Finish which makes fabric resistant to wrinkles.

5.5.4 "Finishing Other"

This is a text field.

5.5.5 "Dye Class"

This is a multi-choice attribute type with the following list values: (zero, one, or many values may be selected)

Value	Description
Acid	A dye that is typically applied to a textile at low pH.
Aniline	Dyes derived chemically from aniline or other coal tar derivatives.
Anthraquinone	Dyes that have anthraquinone as their base and the carbonyl group (>C=O) as the chromophore. Anthraquinone-based dyes are found in most of the synthetic dye classes.
Azo	Dyes characterized by the presence of an azo group (-N=N-) as the chromophore. Azo dyes are found in many of the synthetic dye classes.
Basic	Basic dyes are water-soluble and are mainly used to dye acrylic fibers. They are mostly used with a mordant. A mordant is a chemical agent which is used to set dyes on fabrics by forming an insoluble compound with the dye. With mordant, basic dyes are used for cotton, linen, acetate, nylon, polyesters, acrylics and modacrylics.
Developed	Dyes that are formed using developer. The substrate is first dyed in a neutral solution with a dye base, usually colorless. The dye is then diazotized with sodium nitrate and an acid and afterwards treated with a solution of B-naphthol, or a similar substance, which is the developer. Direct dyes are developed to produce a different shade or to improve wash fastness or light fastness.
Direct	Direct dyes color cellulose fibers directly without the use of mordants. They are used for dyeing wool, silk, nylon, cotton, rayon etc. These dyes are not very bright and have poor fastness to washing although they are fairly fast to light.
Disperse	The only water-insoluble dyes that dye polyester and acetate fibers.
Gel	Passing a wet-spun fiber that is in the gel state (not yet at full crystallinity or orientation) through a dyebath containing dye with affinity for the fiber. This process provides good accessibility of the dye sites.

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Indigo	Dye with an indigo color.
Macromodecular	A group of inherently colored polymers. They are useful both as polymers and as dyes with high color yield. The chromophores fit the recognized CI classes, i.e., azo, anthraquinone, etc., although not all CI classes are represented. Used for mass dyeing, hair dyes, writing inks, etc.
Mordant	The mordant or chrome dyes are acidic in character. Sodium or potassium bichromate is used with them in the dyebath or after the process of dyeing is completed. This is done for getting the binding action of the chrome. They are mostly used for wool which gets a good color fastness after treatment with mordant dyes. They are also used for cotton, linen, silk, rayon and nylon but are less effective for them.
Pigment	Although pigments are not dyes in a true sense, they are extensively used for coloring fabrics like cotton, wool and other manmade fibers due to their excellent light fastness. They do not have any affinity to the fibers and are affixed to the fabric with the help of resins. After dyeing, the fabrics are subjected to high temperatures.
Premetallized	Acid dyes that are treated with coordinating metals such as chromium. This type of dye has much better wet fastness than regular acid dye. Premetallized dyes are used on nylon, silk, and wool.
Reactive	Reactive dyes react with fiber molecules to form a chemical compound. These dyes are either applied from alkaline solution or from neutral solutions which are then alkalized in a separate process. Sometimes heat treatment is also used for developing different shades. After dyeing, the fabric is washed well with soap to remove any unfixed dye. Reactive dyes were originally used for cellulose fibers only but now their various types are used for wool, silk, nylon, acrylics and their blends as well.
Solution dyed	Reducing water and chemicals when dyeing fabrics.
Sulfur	Sulfur Dyes are insoluble and made soluble by the help of caustic soda and sodium sulfide. Dyeing is done at high temperature with large quantities of salt so that the color penetratesthe fiber. After dyeing the fabric is oxidized for getting desired shades by exposure to air or by using chemicals. Excess dyes and chemicals are removed by thorough washing. These dyes are fast to light, washing and perspiration and are mostly used for cotton and linen.
Vat	Vat dyes are insoluble in water and cannot dye fibers directly. However, they can be made soluble by reduction in alkaline solution which allows them to affix to the textile fibers. Subsequent oxidation or exposure to air restore the dye to its insoluble form. Indigo is the original vat dye. These dyes are the fastest dyes for cotton, linen and rayon. They are used with mordants to dye other fabrics such as wool, nylon, polyesters, acrylics and modacrylics.

5.5.6 "Dyeing Process"

This is a multi-choice attribute type with the following list values. (zero, one, or many values may be selected)

Value	Description
Fiber Dye	Dyeing individual fibers.

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Greige / Grey / Gray Goods	Dyeing greige goods (entire fabrics).
Heather / Marl	Dyeing individual fibers then marling or heathering/twisting them.
Jet Dyed	Jet dyeing is a process that can be used for batch dyeing operations.
Piece Dyed	Dyeing individual pattern pieces of a garment.
Yarn Dyed	Dyeing individual yarns.

5.5.7 "Function"

This is a multi-choice attribute type with the following list values

Value	Description
2 or 4 way stretch	This defines how many directions the fabric can stretch in.
Anti-bacterial	Antibacterial additives used to treat fabric.
Breathable	Breathable fabrics will let air circulate through.
Cold Resistant	This will give fabric a more insulated property, making the wearer resistant to the cold temperature.
DWR	Durable water repellent, or DWR, is a coating added to fabrics at the factory to make them water-resistant (hydrophobic).
Fire Resistant	Makes fabric resistant to flame/fire.
Moisture-wicking	Draw moisture away from body.
Reflective	Fabric reflects light back to the source.
Waterproof	Fabric will not be permeated by water.
Windproof	Fabric is resistant to wind going through the fabric.

5.5.8 "Ply"

This is an integer.

5.5.9 "Printing Method"

This is a multi-choice attribute type with the following list values. (zero, one, or many values may be selected)

Value	Description
Hand Print - Batik	Batik is a technique of wax-resist dyeing applied to cloth by hand.
Hand Print - Block	Block printing is a printing process that involves applying text or images with a block dipped in dye by hand.

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Hand Print - Tie	Tie-dye is a process of tying and dyeing a piece of fabric or cloth which is made from knit or woven fabric, usually cotton; typically using bright colors. Tie-dyeing is accomplished by folding the material into a pattern and binding it with string or rubber bands.
Machine Print - Flat Screen	Flat-screen printing is a semi-continuous and reciprocating process. The screen is first moved into position over the fabric or garment, the squeegee is pressed against the mesh and drawn over the image area, and then the screen is lifted away from the fabric or garment to complete the process.
Machine Print - Rotary Screen Roller	Rotary screen printing is so named because it uses a cylindrical screen that rotates in a fixed position rather than a flat screen that is raised and lowered over the same print location.
Other	Denotes Other printing method provided in Printing Other attribute.

5.5.10 "Printing Other"

This is a text field.

5.5.11 "Printing Process"

This has an Integer attribute type with no pre-defined list values.

Value	Description
Printed-Digital	Digital printing refers to methods of printing from a digital-based image directly to a variety of media.
Printed-Discharge	Discharge printing is a screen printing process where the same techniques and equipment are used but instead of normal ink, discharge inks are used, which remove the shirt's dye instead of putting a color on top of the shirt.
Printed-Overprints	Print additional matter on (a stamp or other surface already bearing print).
Printed-Resist	A method of printing textiles by roller printing a pattern in resist paste on a white fabric, placing the fabric in a dye bath, and subsequently removing the resist to leave a white pattern on a colored ground.
Printed-Transfer	Transfer printing is the term used to describe textile and related printing processes in which the design is first printed on to a flexible non-textile substrate and later transferred by a separate process to a textile.

5.5.12 "Printing Process Other"

This is a text field.

5.5.13 "Roll Length"

This is a Float value.

5.5.14 "Roll Length UOM"

This is a Single List value. Valid values are "CM" (Centimeter), "IN" (Inch), "FT" (Foot), and "M" (Meter)

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5.5.15 "Surface Process"

This is a single list:

Value	Description
Film Lamination	Process of bonding a thin, transparent film to the fabric.
Foil (Electroplate Colors)	Foil stamping, also known as foil printing, is a versatile printing technique that involves applying a metallic or pigmented foil to a surface in order to create a decorative finish.
Metallic	Metal prints are made by a process called dye sublimation.
Plate Emboss	Embossing is done by pressing a sheet of paper (or other substrate) into a female die that has a design engraved or etched into it. This is usually done with a male counterpart underneath the paper, so that the paper is sandwiched between the two and the design is transferred to the paper.
Release Paper	Release papers are papers coated with a release agent and are used in a wide range of applications such as for protection of adhesive surfaces of various adhesive products.
Roller Emboss	Embossing involves making reliefs, using a roller, on surfaces of paper, fabric etc., so that the image is imprinted in either a raised or lowered design.

5.5.16 "Fiber Content Notes / Trademarks"

This is a free form text field used to describe supplemental details and/or applicable trademarks.

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6 Leather

Leather is a durable and flexible material created by tanning animal rawhide and skins. The attribute definitions that follow describe the use of Leather in Footwear, Apparel, Accessories, and Automotive. The two-digit header value for this is LT. Note that List Value descriptions are not typically included in this section, for the reason that the attribute names were considered sufficiently self-describing.

6.1 Leather Required Attributes

Attribute Name	Attribute Description	Material Identifier	Attribute Selection Type
Dyeing Characteristics	The level of dye penetration.	Y	Single List
Finish Basic	The surface or coating applied on the leather to cover flaws, add color or protective coating.	Y	Single List
Grain Surface Characteristics	The treatment applied to the surface of leather to change the texture of the grain.	Y	Single List
Hand Feel	The tactile feeling of the leather.	Y	Single List
Hide Configuration	The shape or cut of the hide.	Y	Single List
Hide Quality Grade	The standards set for determining the quality of a hide by measuring the amount of flaws, marks and holes to determine how much is cuttable.	Y	Single List
Leather Type	The type of tannage and finish style of leather.	Y	Single List
Oil Content (%)	The oil content measured to designate the percentage to the weight of the leather, to help understand what the abilities are for shoemaking.	Y	Single List
Raw Material Base	The raw form to which a tannery purchases their hides prior to completion.	Y	Single List
Raw Material Type	The raw form of the animal that the skin originates.	Y	Single List
Tannage	Tanning is a process that stabilizes the proteins, particularly collagen, of the raw hide to increase the thermal, chemical and microbiological stability of the hides and skins, making it suitable for a wide variety of end applications. Tannage is the specific chemical/process used in the tanning of Leathers.	Y	Single List
Temper	The pliability or softness of the leather.	Y	Single List
Thickness (mm)	The thickness of the material or distance between opposite sides of the material, measured in millimeters.	Y	Single List

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Material Name	The name of the Material as designated by the supplier.	N	Text
Material Identification	The supplier's alpha-numeric identification of the Material.	N	Text
Country of Origin	This is where the raw material comes from (Country).	N	Single List

6.2 Leather Optional Attributes

Attribute Name	Attribute Description	Attribute Selection Type
Material Description	A free-form text description of the Material - unique from the additional Material attributes.	Text
Finish Special	The surface or coating that is more unusual or may also be layered over the basic finish, applied on the leather.	Single List
Gore Friendly	Meets the initial Gore measurement for breathability.	Yes/No
Leather Working Group Rating	The rating of a tannery as evaluated and awarded from the Leather Working Group.	Single List
Prints & Patterns	Unique patterns applied.	Single List
Raw Material Sub Type	The sub-type of the animal that the skin originates.	Single List
SATRA Value	This is a five-point grading system based on a visual inspection and assigned a value based on usability.	Single List
Size of Hides (Square Feet)	The size range of the surface area of the full or cut hide, measured in square feet.	Single List
Special Added Characteristics	Additional physical or chemical special treatments applied to leather, typically for performance or specialized use.	Multi-Choice List
Surface Sheen	The visual appearance of the surface of the finished leather.	Single List
Surface Texture	Natural or added treatments to define the texture of the surface.	Single List

6.3 Leather Material Identifier List Values and Identification Codes

This section describes the attribute values for required list values that are also used for like-kind material identification codes. Section 3.3 describes the process of encoding attribute values.

6.3.1 "Dyeing Characteristics" Possible Values: (one value must be selected)

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Value	Description	2-Digit Code
Dyed Through	The dye has fully penetrated the hide.	AA
Grain Dyed Only	The dye is applied to the top (grain) only.	AB
Grain-Flesh Dyed	The dye is applied to the top and bottom only.	AC

6.3.2 "Finish Basic" Possible Values: (one value must be selected)

Value	2-Digit Code
Brush Off	BA
Casein	BB
Combo Oil-Wax	BC
Full Aniline	BD
Hand Stained	BE
Machine Stained	BF
Oiled	BG
Pigmented	BH
Resin	BI
Semi Aniline	BJ
Waxed	BK
N/A	BL

6.3.3 "Grain Surface Characteristics" Possible Values: (one value must be selected)

Value	2-Digit Code
Buffed Grain	CA
Corrected Grain	CB
Flesh Out/Reverse	CC
Flesh Out/Reverse Buffed	CD
Flesh Out/Reverse Split	CE
Full Grain	CF

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Grain and Flesh Buffed	CG
Hair On	CH
Shearling	CL
Polished Grain	CI
Split	CJ
N/A	CK

6.3.4 "Hand Feel" Possible Values: (one value must be selected)

Value	2-Digit Code
Draggy	DA
Dry	DB
Oily	DC
Other	DD
Rough	DE
Silky	DF
Soft	DG
Waxy	DH
N/A	DI

6.3.5 "Hide Configuration" Possible Values: (one value must be selected)

Value	Description	2-Digit Code
Belly	Area of the hide up to the hair-break that runs from the front to hind shank	EA
Butt or Bend	One side of the hide (split at the back bone) below the shoulder and between the belly and the backbone	EI
Double Butts or Double Bends	Both sides of the hide below the shoulder and between the belly and the backbone	EJ
Crop	One side of the hide (split at the back bone) Including the butt, shoulder, excluding the belly	EK
Croupon	Same a double butt or double bend	EL
Culatta	Lower section of the hide (below shoulders), including the butt or bend, belly and hind shanks	EB
Dosset	Area of the hide excluding bellies	EM
Full Hide	The entire hide	EC
Full Quill	Area from an Ostrich hide that includes the quill marks (AKA diamond)	ED

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Smooth Quill	The area from an Ostrich hide that is without the quill (Diamond section) marks	EN
Shoulder	One side of the upper area (split at the back bone) above the Bends or Butts	EF
Double Shoulder	Both sides of the upper area above the Bends or Butts	EO
Side	Area of the hide on either side of the back-bone	EG
Other	Value not listed above	EH

6.3.6 "Hide Quality Grade" Possible Values: (one value must be selected)

Value	Description	2-Digit Code
#1/A	A hide free from holes, cuts, deep scores or gouges more than half way through the hide, mechanical grain defects (as defined) and having a correct pattern. Exceptions: Brands and rear shanks containing one hole, regardless of the size within the confines of a brand, or cut below the hock that measures less than 1 inch in length. Holes less than 4 inches from the edge of the hide which can be trimmed without spoiling the pattern of the hide shall not result in a downgrade	FA
#2/B	A hide that contains either: 1. One to four holes, cuts, deep scores or gouges in an area located inside a straight line drawn through the break in the hair of the fore and hind shanks. 2. A grain defect no larger than 1 square foot.	FB
#3/C	A hide that contains either: 1. Five or more holes, cuts, deep scores or gouges in an area located inside a straight line drawn through the break in the hair of the fore and hind shanks. 2. One hole or cut over 6 inches in length. 3. An area of warts or open grub holes larger than 1 square foot.	FC
TR	Tannery Run	FD
LG/Economy	Low Grade	FE

6.3.7 "Leather Type" Possible Values: (one value must be selected)

Value	Description	2-Digit Code
Action	Leather with a thin PU coating and usually smooth or slightly embossed to resemble a cowhide texture, typically used for white athletic footwear.	GA

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Bomber	Heavily distressed finished leather to resemble the look and feel of a well-worn Bomber jacket	GQ
Bonded	Scrap leather shavings or bits that have been bonded together with an adhesive or binder to create an economical product, typically with a heavy finish.	GR
Box Calf	Smooth, firm and glossy leather made from Calf and typically used for men's dress shoes and Equestrian boots	GB
Chamois	Very soft tempered, oiled, pliable and porous leather typically made from sheepskin, traditionally made from the Chamois (French mountain goat). Typically used for drying and waxing automobiles.	GC
Crazy Horse	Buffed, oiled and waxed pull up leather that exhibits a natural distressed vintage look.	GD
Hair On	Leather that has been processes to leave the hide hair intact	GE
Napa	A broadly used definition of soft and supple full grain leather	GF
Nature Milled	Leather that has been milled or tumbled to plump up the natural surface variations.	GG
Nubuck	Top grain, high quality hides that has been buffed to create a velvety soft surface with a slight nap.	GH
Oil Embossed	The hide is put under pressure to create a new surface grain.	GI
Patent	Leather with a high gloss finish, mostly coated with a synthetic material. Traditional patent is coated with lacquer.	GJ
Pull Up	Leather that has been treated with oils and waxes to create a pull effect that lightens in color when pulled or stretched.	GK
PU Coated (Bicast)	Split leather that has been coated with a synthetic coating.	GS
Shell Cordovan	High quality veg tan leather from horse hinds, known to be most durable, yet dressy and comfortable. Used mostly in high quality men's dress shoes.	GT
Shrunken	Leather that has been shrunken to show a wrinkle effect.	GL
Softy	A broad definition for leathers that are especially soft, similar to calf, goat and eel.	GM
Suede	Leather made from the split hide that has a soft nap	GN

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Vachetta	Full grain cowhide veg tan leather with a high fat content and is without finishes, and typically wears to a nice patina with age.	GO
Other	Value not listed above	GP

6.3.8 "Oil Content Percent" Possible Values: (one value must be selected)

Value	2-Digit Code
0-5	HA
3-7	HB
6-8	HC
7-11	HD
9-12	HE
11-14	HF
13-15	HG
14-17	HH
16-18	HI
17-23	HJ
19-24	HK
25+	HL

6.3.9 "Raw Material Base" Possible Values: (one value must be selected)

Value	Description	2-Digit Code
Crust	A hide that has been processed to leather prior to finishing	IA
Raw Hide	A hide that has not been processed into leather	IB
Split	The bottom side of a leather hide that has been machine split, commonly used for suede.	ID
Wet Blue	A hide that has been processed to leather prior drying, dyeing or finishing. Light Blue is created from the Chromium III tanning agent.	IE
Other	Value not listed above	IF

6.3.10 "Raw Material Type" Possible Values: (one value must be selected)

Value	2-Digit Code
Bovine	JA

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Buffalo	JB
Camel	JC
Deer	JD
Elk	JO
Equine (Horse)	JP
Fish	JE
Goat	JF
Kangaroo	JG
Lamb	JH
Moose	JQ
Ostrich	JI
Oxen	JJ
Pig	JK
Reptile	JL
Sheep	JM
Water Buffalo	JR
Other	JN

Note that the term "Bovine" covers a variety of animals including Buffalo and Water Buffalo. The most-specific term should be used where possible.

6.3.11 "Tannage" Possible Values: (one value must be selected)

Value	2-Digit Code
Aluminum	KA
Brain	KB
Chrome	KC
Full Vegetable	KD
Hair On	KE
Mineral Combined	KF
Syntan	KG
Vegetable Re-tan	KH

6.3.12 "Temper" Possible Values: (one value must be selected)

Value	2-Digit Code
Firm	LA
Hard	LB

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Medium	LC
Medium Hard	LD
Medium Soft	LE
Regular	LF
Soft	LG

6.3.13 "Thickness" Possible Values: (one value must be selected)

Value	2-Digit Code
0.5-0.7	MA
0.6-0.8	MB
0.7-0.9	MC
0.8-1.0	MD
0.9-1.1	ME
1.0-1.2	MF
1.1-1.3	MG
1.2-1.4	MH
1.3-1.5	MI
1.4-1.6	MJ
1.5-1.7	MK
1.6-1.8	ML
1.7-1.9	MM
1.8-2.0	MN
1.9-2.1	MO
2.0-2.2	MP
2.2-2.4	MQ
2.4-2.6	MR
2.6-2.8	MS
2.8-3.0	MT
3.0-3.2	MU

6.4 Leather List Values for Required Fields that are not Material Identifiers

6.4.1 "Material Name"

This is a text field describing the supplier's given name for the material.

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6.4.2 "Material Identification"

This is a text field describing the supplier's identifier for the material.

6.4.3 "Country of Origin"

This is a single list. See section 11.1 for the list of possible 2-digit country code values.

6.5 Leather Values for Optional Fields

The following fields are optional and are not a part of the Material Identifier algorithm.

6.5.1 "Material Description"

This is a free-form text description of the Material - unique from the additional Material attributes.

6.5.2 "Finish Special"

This is a single list with the following possible values: (select zero or one value)

- Antique
- Crackle
- Foil Laminated
- Glazed
- Hand Brush
- Metallic
- Pearlized
- Vintage
- Water Repellent

6.5.3 "Gore Friendly"

This is a Boolean (Yes or No) value.

6.5.4 "Leather Working Group Rating"

This is a single list with the following possible values: (select zero or one value)

- Bronze
- Evaluation
- Gold
- Silver
- Not Rated

6.5.5 "Prints & Patterns"

This is a single list with the following possible values: (select zero or one value)

- Abstract
- Animals
- Brush Strokes
- Bubbles, Round Shapes
- Butterflies and Birds
- Camera
- Camo
- Cocktails

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- Desert and Cactus
- Fire
- Floral
- Fruits
- Geometric and Tribal
- Heather Effect
- Leaves
- Letters and Numbers
- Lightening
- Lips, Lipstick, Eyes
- Love
- Marble
- Music
- Palm Trees
- Pixels
- Plaid
- Pop Art
- Skull
- Space
- Stars
- Stripes
- Thrones
- Tiles
- Tie Dye Effects
- Vintage and 80s
- Water
- Other

6.5.6 "Raw Material Sub Type"

This is a single list with the following possible values: (select zero or one value)

- Bovine-Bison
- Bovine- Bull
- Bovine-Calf
- Bovine-Cow
- Bovine-Heifer
- Bovine-Steer
- Buffalo-Calf
- Buffalo-Regular
- Buffalo-Small
- Water Buffalo-Calf
- Water Buffalo-Regular
- Water Buffalo-Small
- Goat-Kid
- Reptile-Caiman
- Reptile-Crocodile
- Reptile-Lizard
- Reptile-Snake
- Reptile-Teju
- Reptile-Other

6.5.7 "SATRA Value"

The SATRA grading system is known as the 'five-point grading system'. This requires that every skin in the delivery is visually inspected and assigned to one of a number of pre-determined bands of usability. Each band represents a spread of five percentage points.

This is a single list with the following possible values: (select zero or one value)

Value	Description
A	Quality coefficient between 100 to 95.1
B	Quality coefficient between 95 to 90.1
C	Quality coefficient between 90 to 85.1
D	Quality coefficient between 85 to 80.1
E	Quality coefficient between 80 to 75.1
F	Quality coefficient between 75 to 70

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6.5.8 "Size of Hides (Square Feet)"

This is the size range of the surface area of the full or cut hide, measured in square feet. This is single list field with the following possible values:

- 00-06
- 03-07
- 06-08
- 07-09
- 08-10
- 09-11
- 10-12
- 11-13
- 12-14
- 12-18
- 13-15
- 14-16
- 15-17
- 16-18
- 17-19
- 18-20
- 19-21
- 20-22
- 21-23
- 23-25
- 24-28
- 25-27
- 28-32
- 29-31
- 32-36
- 40-44
- 44-48
- Other

6.5.9 "Special Added Characteristics"

This is a Multi-choice list with the following possible values: (select, zero, one, or many values)

- Fire Resistant
- Flame Resistant
- Gore-Tex Waterproof
- Non-Waterproof
- Waterproof
- Waterproof Bally
- Waterproof Maser 15K
- Waterproof Maser 25K

6.5.10 "Surface Sheen"

This is a single list field with the following possible values: (select, zero, one, or many values)

- Bright
- Burnished
- Dull-Matte
- Glossy
- Polished
- Shiny
- Two Tone Effect

6.5.11 "Surface Texture"

This is a single list field with the following possible values: (select, zero, one, or many values)

- Heavy Emboss
- Light Emboss
- Crackle
- Crinkled
- Milled
- Natural Shrunken
- Pebble
- Scratched
- Scrunched
- Smooth
- Snuffed
- Tipped
- Tooled
- Tumbled
- Washed
- Other

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7 Synthetic Material

Synthetic material is man-made. It is chemically produced. Examples include polyester, rayon, and acrylic. The attribute definitions that follow describe the use of Synthetic material in Footwear, Apparel, Accessories, and Automotive. The two-digit header value for this is SN. Note that List Value descriptions are not typically included in this section, for the reason that the attribute names were considered sufficiently self-describing or familiar to an individual with relevant background in this material type.

7.1 Synthetic Required Attributes

Attribute Name	Attribute Description	Material Identifier	Attribute Selection Type
Material Type	Description of surface material.	Y	Single List
Substrate	The base layer of the material.	Y	Single List
Surface Process	The process of how the upper layer is made.	Y	Multi-Choice List
Thickness (mm)	Thickness measurement.	Y	Single List
Additional Treatment	Treatments that effect performance or protection of material.	Y	Multi-Choice List
Finishing	Application that creates the surface characteristic, usually a texture or feel.	Y	Single List
Material Name	The name of the Material.	N	Text
Material Identification	The supplier's identification code for the Material.	N	Text
Width	Horizontal measurement of material surface.	N	Integer
Width UOM	Horizontal measurement unit.	N	Single List
Country of Origin	The country where the material product is produced.	N	Single List

7.2 Synthetic Optional Attributes

Attribute Name	Attribute Description	Attribute Selection Type
Material Description	A free-form text description of the Material - unique from the additional Material attributes.	Text

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Finishing Other	Description of "Other" reference per Finishing.	Text
Material Type Other	Description of "Other" reference per Material Type.	Text
Backing	Indicates if the base material has a supporting layer such as Jersey Knit or Woven	Boolean

7.3 Synthetic Material Identifier List Values and Identification Codes

This section describes the attribute values for required list values that are also used for like-kind material identification codes. Section 3.3 describes the process of encoding attribute values.

7.3.1 "Material Type" Possible Values: (one value must be selected)

Value	Description	2-Digit Code
Polyurethane (PU)	Polyurethane (PU) is a composite material made of one or more layers of PU and a woven or non-woven textile (Substrate) backing such as bi-cast or ground leather.	PU
Polyvinylchloride (PVC)	PolyVinyl Chloride (PVC), commonly known as "vinyl", is a shiny material made of the (PVC).	PV
Thermoplastic Polyurethane	Thermoplastic polyurethane (TPU) is any of a class of polyurethane plastics with many properties, including elasticity, transparency, and resistance to oil, grease and abrasion.	TP

7.3.2 "Substrate" Possible Values: (one or many values may be selected)

Value	2-Digit Code
Woven	WV
Non Woven	NW
Microfiber	MF

7.3.3 "Surface Process" Possible Values: (one or many values may be selected)

Value	2-Digit Code
3D	AA
Dry Lamination	AB
Embossed	AC

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Foaming	AD
Laminated	AE
Laser Cut	AF
Perforated	AG
Pouring	AH
Printed	AI
Pull Up	AJ
Release Paper	AK
Roller Emboss	AL
Scrunched	AM
Two-Tone	AN
Wet Lamination	AO
Other	AP

7.3.4 "Thickness (mm)" Possible Values: (one value must be selected)

Value	2-Digit Code
0.3-0.4	BA
0.4-0.5	BB
0.5-0.6	BC
0.6-0.7	BD
0.7-0.8	BE
0.8-0.9	BF
1.0-1.1	BG
1.1-1.2	BH
1.2-1.3	BI
1.3-1.4	BJ
1.4-1.5	BK
1.5-1.6	BL

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1.6-1.7	BM
1.7-1.8	BN
1.8-1.9	BO
1.9-2.0	BP
Other	BQ

7.3.5 "Additional Treatment" Possible Values: (one or many values may be selected)

Value	2-Digit Code
Anti-Bacterial	CA
Anti-Microbial	CB
ESD - Anti-Static	CC
ESD - Static Dissipative	CD
ESD - Conductive	CE
Breathable	CF
Cold Resistant	CG
DWR (Durable water repellent)	CH
Fire/ Flame Resistant	CI
Non Wicking	CQ
Reflective	CJ
Temperature Reactive	CK
Water Resistant	CL
Waterproof	CM
Windproof	CN
Other	CO
None	CP

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7.3.6 "Finishing" Possible Values: (one value must be selected)

Value	2-Digit Code
Anodized	DW
Antiqued	DA
Buffed	DB
Burnished	DC
Crazy Horse	DD
Foil	DE
Glitter	DF
Grain	DX
Matte	DG
Metallic	DH
Metallic Foil	DY
Milled or Tumbled	DI
Napa	DJ
Natural	DK
Nubuck	DL
Patent	DM
Pearlized	DN
Pebble Grain	DO
Polished	DP
Rub off	DQ
Smooth	DR
Spray Finish	DS
Suede (Velouring)	DT
Waxy	DU
Other	DV

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7.4 Synthetic List Values for Required Fields that are not Material Identifiers

7.4.1 "Material Name"

This is a text field describing the supplier's given name for the material.

7.4.2 "Material Identification"

This is a text field describing the supplier's identifier for the material.

7.4.3 "Width"

This is an integer describing the horizontal measurement of the material surface.

7.4.4 "Width UOM"

This value represents the Unit of Measure for the prior "Width" field and is a single list field. Valid values are "CM" (Centimeter), "IN" (Inch), and "MM" (Millimeter).

7.4.5 "Country of Origin"

This is a single list. See section 11.1 for the list of possible 2-digit country code values.

7.5 Synthetic Values for Optional Fields

The following fields are optional and are not a part of the Material Identifier algorithm.

7.5.1 "Material Description"

This is a free-form text description of the Material - unique from the additional Material attributes.

7.5.2 "Finishing Other"

This is a free-form text description of "Other" reference per Finishing.

7.5.3 "Material Type Other"

This is a free-form text description of "Other" reference per Material Type.

7.5.4 "Backing"

This is a Boolean value indicating if the base material has a supporting layer such as Jersey Knit or Woven.

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8 Thread

A filament, a group of filaments twisted together, or a filamentous length formed by spinning and twisting short textile fibers into a continuous strand. The attribute definitions that follow describe the use of Thread for the construction, fastening, and decoration of apparel and footwear. The two-digit header value for this is TH.

8.1 Thread Required Attributes

Attribute Name	Attribute Description	Material Identifier	Attribute Selection Type
Fiber	A unit of matter, either natural or manufactured, that forms the content of fabrics and other textile structures.	Y	Multi-Choice List
Thread Construction	A type of construction (e.g., weave or twist) creating a thread type of various properties.	Y	Single List
Thread Finish	One of two ways of finishing (coating or not coating) the thread to add lubricity and needle heat stabilization.	Y	Boolean
Thread Size Numbering System	systems of measurements to determine weight or size of thread of a fixed length	Y	Single List
Thread Use	Intended structural use of the thread.	Y	Single List
Yarn Type	A continuous length of interlocked fibers.	Y	Single List
Color Standards Company	Supplier designated organization that defines the color value, this may be in-house	N	Single List
Country of Origin	The country where the material product is produced.	N	Multi-Choice List
Material Name	The supplier-provided name of the material.	N	Text
Raw Material Country of Origin	The country where the primary raw material originates.	N	Multi-Choice List
Unit as finished/sold	A way to measure/calculate end use	N	Single List

8.2 Thread Optional Attributes

Attribute Name	Attribute Description	Attribute Selection Type
Tex Count	A common method to measure the weight in grams of thread of a fixed length of 1,000 meters	Single List

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Ticket Number	Commercial numbering system to determine thread size as determined by the thread maker by the following mathematical formula: 1,000/Tex Count X 3	Single List
Color Standards Identifier	Color code for this product as defined by the above-selected color standards company.	Text
Color Standards "Other" value	Value of 3rd party Color Standards Company if not in list value	Text
Added Finish/Features	Additional chemical and/or physical treatments applied typically for aesthetics, performance or specialized use.	Multi-Choice List
Material Description	A free-form text description of the material provided by the supplier.	Text
Material Identification	The supplier's identification code for the material.	Text
Recommended Application	Determined by construction usage type	Single List
Decitex	A common method to measure the weight in grams of thread of a fixed length of 10,000 meters	Single List
Denier	A common method to measure the weight in grams of thread of a fixed length of 9,000 meters	Single List

8.3 Thread Identifier List Values and Identification Codes

This section describes the attribute values for required list values that are also used for like-kind material identification codes. Section 3.3 describes the process of encoding attribute values.

8.3.1 "Fiber" Possible Values: (one or many values may be selected)

Value	2-Digit Code
Acrylic	AA
Carbon	AB
Cotton	AC
Linen	AD
Meta-Aramid	AF
Silver	AG
Gold	AH
Aluminum	AI
Alloy	AJ

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Nylon	AK
Para-Aramid	AL
Polyester	AM
Polyethelene	AN
Polypropylene (PP)	AO
Polytetraflouroethylene (PTFE)	AP
Polytrimethylene Terephthalate (PTT)	AQ
Rayon	AR
Silk	AS
Thermoplastic Elastomer (TPE)	AT
Thermoplastic Polyurethane (TPU)	AU
Polybutylene Pthalate (PBT)	AV
Polyvinyl Alcohol (PVA)	AW

8.3.2 "Thread Construction" Possible Values: (one value to be selected)

Value	Description	2-Digit Code
Air Entangled	Entangled multiple continuous filaments	BA
Braided	Interlacing three or more yarns	BB
Monocord	Single strand with one continuous filament	BC
Monofilament	Single strand with multiple continuous filaments	BD
Spun	Twisted staple fiber	BE
Textured	Process (crimped, coiled, looped, curled) to add bulk to multiple continuous filaments	BF

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Mulitfilament	2 or more strands of multiple continuous filaments	BG
Core Spun	Wrapped multiple continuous filaments with staple fiber	BH

8.3.3 "Thread Finish" Possible Values: (one value to be selected)

This is a Boolean value, with either "Y" for Yes or "N" for No.

8.3.4 "Thread Size Numbering System" Possible Values: (one value to be selected)

Value	Description	2-Digit Code
Tex Count	grams per 1,000 meter length	CA
Decitex	grams per 10,000 meter length	CB
Denier	grams per 9,000 meter length	CC
Ticket Number	divide 1,000 by the Tex Count number and multiply by 3	CD

8.3.5 "Thread Use" Possible Values: (one value to be selected)

Value	Description	2-Digit Code
Construction	Thread for fastening or stitching materials together	DA
Embroidery	Thread for embroidery work	DB
Decorative	Thread for decorative use	DC
Quilting	Thread for quilting	DD
Applique	Thread for applique use	DE

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8.3.6 "Yarn Type" Possible Values: (one value to be selected)

Value	Description	2-Digit Code
Staple Fiber	Cut or finite length of strands or fibers	EA
Continuous Filament (CF)	Indefinite length of strands or fibers	EB

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8.4 Thread List Values for Required Fields that are not Material Identifiers

8.4.1 "Country of Origin"

This is a Multi-Choice list indicating where the material is converted and finished. See section 11.1 for the list of possible 2-digit country code values

8.4.2 "Raw Material Country of Origin"

This is a Multi-Choice list indicating country or countries where the primary raw material originates. See section 11.1 for the list of possible 2-digit country code values

8.4.3 "Material Name"

This is the supplier-provided name of the material, which is a text value.

8.4.4 "Unit as finished/sold"

This is a way to measure/calculate end use. This is single list field with the following possible values:

- Weight/Ounce
- Weight/lbs.
- Weight/grams
- Weight/Kilo
- Length/yards
- Length/meters

8.5 Thread Values for Optional Fields

The following fields are optional and are not a part of the Material Identifier algorithm.

8.5.1 "Tex Count"

This is a single list selecting amongst common methods to measure the weight in grams of thread of a fixed length of 1,000 meters. The list has the following possible values, which indicate Grams per 1,000 meters length:

- 14
- 16
- 18
- 21
- 27
- 30
- 40
- 45
- 50
- 60
- 70
- 80
- 90
- 105
- 120
- 135
- 150
- 180
- 210
- 240
- 270
- 300
- 350
- 400
- 450
- 500
- 600
- 700

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8.5.2 "Ticket Number"

This is a commercial numbering system to determine thread size as determined by the thread maker using the following mathematical formula: 1,000/Tex Count X 3. This single list has the following possible values:

- 214
- 188
- 167
- 143
- 111
- 100
- 75
- 67
- 60
- 50
- 43
- 38
- 33
- 29
- 25
- 22
- 20
- 17
- 14
- 13
- 11
- 10
- 9
- 8
- 7
- 6
- 5
- 4

8.5.3 "Color Standards Company"

This is a single list describing the supplier-designated organization that defines the color value. This may be in-house. The list has the following possible values:

- Pantone
- Color Standards International
- Archroma
- Munsell
- Coloro
- SCOTDIC Colours Ltd.
- In-House
- Other

Note that if "Other" is selected, then the next value should be populated.

8.5.4 "Color Standards 'Other' Value"

This is a text field value describing the name of a third party color standards company if not in the prior set of list values.

8.5.5 "Color Standards Identifier"

This is a text field that contains the color code for this product as defined by the above-selected color standards company.

8.5.6 "Added Finish/Features"

This Multi-Choice list describes additional chemical and/or physical treatments applied typically for aesthetics, performance, or specialized use. The list has the following possible values:

Value	Description
Anti-Bacterial	Prevents the growth or spread of bacteria (which causes odor)
Anti-Microbial	Kills or stops growth of bacterial, fungi, algae, microorganisms and some viruses
Anti-Static	Prevents or reduces build-up of static electricity

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Bonded	Resin coating to help protect thread from rigorous sewing
Flame Resistant (FR)	Resistant to catching fire or melting, will self-extinguish or resist ignition and provides insulation
Fusible	Able to be melted
Non-Wicking	Does not absorb liquid, vapor or moisture
UV Resistant	Protects against ultraviolet light that causes degradation through prolonged exposure
Water Repellent	Hydrophobic action to protect from liquid saturation
Waxed	Coating of natural wax for repellency
DWR	Durable Water Repellent

8.5.7 "Material Description"

This is a free-form text description of the Material - unique from the additional Material attributes.

8.5.8 "Material Identification"

This is a text field describing the supplier's identifier for the material.

8.5.9 "Recommended Application"

This is a single list selecting a value determined by the construction usage type.

- Extra Light Weight
- Light Weight
- Light/Medium Weight
- Medium Weight
- Medium/Heavy Weight
- Heavy Weight
- Extra Heavy Weight

8.5.10 "Decitex"

A common method to measure the weight in grams of thread of a fixed length. The single list has the following possible values, which indicates Grams per 10,000 meters length:

- 140
- 160
- 180
- 210
- 270
- 300
- 400
- 450
- 500
- 600
- 700
- 800
- 900
- 1050
- 1200
- 1350
- 1500
- 1800
- 2100
- 2400
- 2700
- 3000
- 3500
- 4000
- 4500
- 5000
- 6000
- 7000

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8.5.11 **"Denier"**

A common method to measure the weight in grams of thread of a fixed length of 9,000 meters. The single list has the following possible values:

- 126
- 144
- 162
- 189
- 243
- 270
- 360
- 405
- 450
- 540
- 630
- 720
- 810
- 945
- 1080
- 1215
- 1350
- 1620
- 1890
- 2160
- 2430
- 2700
- 3150
- 3600
- 4050
- 4500
- 5400
- 6300

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9 Printed Tags

Describes printed hang tags used for product branding and price marking. Labels may contain an RFID inlay, which is described in the next section. The two-digit header value for this is LP.

9.1 Printed Tag Required Attributes

Attribute Name	Attribute Description	Material Identifier	Attribute Selection Type
Material Type	Indicates the category of material (paper, plastic, fabric, or other)	Y	Single List
Finish	Paper type	Y	Single List
FSC Paper Stock	Indicates if the paper stock is certified by the Forest Stewardship Council	Y	Boolean
FSC Certified Facility	Indicates that the facility printing the label is certified, and thus allows the FSC logo to be printed on the finished.	Y	Boolean
PRINTING METHOD / PRESS TYPE	Utilized printing technology	Y	Multi-Choice List
AAFA RSL Compliance	Product meets RSL requirements	Y	Boolean
Material Supplier Description	Supplier's description	N	Text
Weight or caliper unit of measure	Paper thickness UOM	N	Single List
Paper thickness value	Paper thickness value	N	Text
Material color	Color of the material	N	Text
Finished width and length UOM	Unit of measure used when describing finished width and length	N	Single List
Finished Width	Finished product width	N	Float
Finished Length	Finished product length	N	Float
SIDES PRINTED	Indicates the number of sides printed and if they are the same	N	Single List
Front Side	Printing type for front side	N	Single List
Front Spot Number of Colors	Number of colors for front spot	N	Integer
Varnish Type	Varnish type	N	Single List
CORNERS	Type of cornering	N	Single List
ATTACHING HOLE	Indicates if attaching hole is present	N	Boolean

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Shipped Form Factor	Indicates form factor of packaged product	N	Single List

9.2 Printed Tag Optional Attributes

Attribute Name	Attribute Description	Attribute Selection Type
FSC Paper Type	Indicates type of FSC-certified content, if any	Single List
Other recycled paper stock?	Populate this value if not FSC Paper Stock	Boolean
Post-consumer % recycled content	The percentage of post-consumer waste.	Float
Other certifications	If not FSC certified, what other certifications are relevant?	Text
Back Side	Applicable only when sides printed = 2	Single List
Back Spot Number of Colors	Applicable only when sides printed = 2	Integer
Folded	Indicates if the tag is designed to be folded	Boolean
Folded when shipped	Tag is pre-folded prior to shipment	Boolean
Multi-layered	Indicates if the product is multilayered	Boolean
Foil stamping	Indicates if the product is foil stamped	Boolean
Embossing	Indicates if the product is embossed	Boolean
Debossing	Indicates if the product is debossed	Boolean
Scoring	Indicates if the product is scored	Boolean
Varnish Style	Only required if varnish type is not equal to "None"	Single List
Special Embellishments	Indicates is special embellishments are included, such as painted edges, distress, or glitter.	Text
Adhesive	Indicates what type of adhesive is used, if applicable	Single List
Attaching Hole Size	Indicates the diameter in millimeters of the attaching hole size	Float
Grommet	Indicates if the product has a grommet	Boolean
Grommet size	Diameter of Grommet in millimeters	Float
Grommet Color	Color of Grommet	Text
Grommet Material	Grommet material	Text
String	Indicates if a string is attached	Boolean
String Length (MM)	Length of the string in millimeters, measured from the hole to the knot	Float
String Color	Color of the string	Text

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String Material	String material	Text
Pin	Indicates if a pin is present	Boolean
Pin Color	Indicates the color of the pin, if present	Text
Pin Shape	Indicates the shape of the pin, if present	Text
Crocking Requirement	Indicates product testing requirement	Single List
Crocking Wet Value	Indicates the level of transference of the color to the finished product	Float
Crocking Dry Value	Indicates the level of transference of the color to the finished product	Float
Includes RFID Inlay	Indicates if the label includes a UHF RFID Inlay	Boolean

9.3 Printed Tag Identifier List Values and Identification Codes

This section describes the attribute values for required list values that are also used for like-kind material identification codes. Section 3.3 describes the process of encoding attribute values.

9.3.1 "Material Type" Possible Values: (Single List)

Value	2-Digit Code
Paper	AA
Plastic	AB
Fabric	AC
Other	AD

9.3.2 "Finish" Possible Values: (Single List)

Value	2-Digit Code
Uncoated	BA
C1S (coated 1 side)	BB
C2S (coated 2 side)	BC
Other	BD

9.3.3 "FSC Paper Stock" Possible Values: (Boolean)

This is a Boolean value, with either "Y" for Yes or "N" for No.

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9.3.4 "FSC Certified Facility" Possible Values: (Boolean)

This is a Boolean value, with either "Y" for Yes or "N" for No.

9.3.5 "Printing Method / Press Type" Possible Values: (Multi-Choice List)

Value	2-Digit Code
Combination	CA
Digital	CB
Dye-sublimation	CC
Flexographic	CD
Inkjet	CE
Laser (b/w)	CF
Laser (color)	CG
Offset	CH
Other	CI
Rotary	CJ
Screen	CK
Thermal	CL

9.3.6 "AAFA RSL Compliance" Possible Values: (Boolean)

This is a Boolean value, with either "Y" for Yes or "N" for No.

9.4 Printed Tag List Values for Required Fields that are not Material Identifiers

9.4.1 "Material Supplier Description"

This is a text field describing the supplier's given name for the material.

9.4.2 "Weight or caliper unit of measure"

This is a single list indicating the paper thickness unit of measure. Valid values are:

- GSM
- Point

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9.4.3 "Paper thickness value"

This is a text field describing the thickness, given the above-provided unit of measure.

9.4.4 "Material color"

This is a text field describing the material color.

9.4.5 "Finished width and length UOM"

This is a single list value. Valid values are:

- Inches
- Millimeters

9.4.6 "Finished Width"

This is a Float value indicating the finished product width, using the unit of measure provided above.

9.4.7 "Finished Length"

This is a Float value indicating the finished product length, using the unit of measure provided above.

9.4.8 "Sides Printed"

This is a single list value. Valid values are:

- 1 Side
- 2 Sides Same
- 2 Sides Different

Note that "1 Side" refers to front-only printing and "2 Sides" indicates front and back.

9.4.9 "Front Side"

This is a single list value. Valid values are:

- Spot
- CMYK
- Pantone

9.4.10 "Front Spot Number of Colors"

This is an integer indicating the number of front spot colors.

9.4.11 "Varnish Type"

This is a single list value. Valid values are:

- UV
- Aqueous
- Solvent Based
- None

Note that if the "None" value is selected, then the "Varnish Style" optional attribute should be populated.

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9.4.12 "Corners"

This is a single list value. Valid values are:

- Square
- Rounded
- Special Die-cut

9.4.13 "Attaching Hole"

This is a Boolean value, with either "Y" for Yes or "N" for No.

9.4.14 "Shipped Form Factor"

This is a single list value. Valid values are:

- Cut Single Ticket
- Folded
- Sheets
- Rolls
- Fanfold
- Other

9.5 Printed Tag Values for Optional Fields

The following fields are optional and are not a part of the Material Identifier algorithm.

9.5.1 "FSC Paper Type"

This is a single list value. Valid values are:

- FSC Mixed
- FSC Recycled
- FSC Virgin

If the product is not FSC certified, then this field need not be populated.

9.5.2 "Other recycled paper stock?"

This is a Boolean value, with either "Y" for Yes or "N" for No. Populate this value if the product is not FSC paper stock.

9.5.3 "Post-consumer % recycled content"

This is a Float less than or equal to one that indicates indicating the percentage of post-consumer waste. (E.g. 50% would render as "0.50".)

9.5.4 "Other certifications"

This is a text field describing other product certifications.

9.5.5 "Back Side"

This is a single list value. Valid values are:

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- Spot
- CMYK
- Pantone

This is only applicable when "Sides Printed" is equal to either of the "2 sides same" or "2 sides different" values.

9.5.6 "Back Spot Number of Colors"

This is an integer value

9.5.7 "Folded"

This is a Boolean value, with either "Y" for Yes or "N" for No and indicates if the tag is designed to be folded.

9.5.8 "Folded when shipped"

This is a Boolean value, with either "Y" for Yes or "N" for No and indicates if the tag is pre-folded prior to shipment.

9.5.9 "Multi-layered"

This is a Boolean value, with either "Y" for Yes or "N" for No.

9.5.10 "Foil stamping"

This is a Boolean value, with either "Y" for Yes or "N" for No.

9.5.11 "Embossing"

This is a Boolean value, with either "Y" for Yes or "N" for No.

9.5.12 "Debossing"

This is a Boolean value, with either "Y" for Yes or "N" for No.

9.5.13 "Scoring"

This is a Boolean value, with either "Y" for Yes or "N" for No.

9.5.14 "Varnish Style"

This is a single list value. Valid values are:

- Gloss
- Matte
- Satin
- Soft Touch
- Blister Coating
- Other

This is only applicable when the varnish type is not equal to "None"

9.5.15 "Special Embellishments"

This is a text field describing special embellishments such as painted edges, distress, or glitter.

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9.5.16 "Adhesive"

This is a single list value. Valid values are:

- Permanent
- Removable
- Garment

9.5.17 "Attaching Hole Size"

This is a Float value indicating the hole diameter in millimeters.

9.5.18 "Grommet"

This is a Boolean value, with either "Y" for Yes or "N" for No.

9.5.19 "Grommet size"

This is a Float value indicating the hole diameter in millimeters.

9.5.20 "Grommet Color"

This is a text field describing the color of the grommet, if applicable.

9.5.21 "Grommet Material"

This is a text field describing the grommet material, if applicable.

9.5.22 "String"

This is a Boolean value, with either "Y" for Yes or "N" for No.

9.5.23 "String Length (MM)"

This is an integer value indicating the number of millimeters from the hole to the knot.

9.5.24 "String Color"

This is a text field describing the string color, if applicable.

9.5.25 "String Material"

This is a text field describing the string material, if applicable.

9.5.26 "Pin"

This is a Boolean value, with either "Y" for Yes or "N" for No.

9.5.27 "Pin Color"

This is a text field describing the pin color, if applicable.

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9.5.28 "Pin Shape"

This is a text field describing the pin shape, if applicable.

9.5.29 "Crocking Requirement"

This is a single list value indicating product testing requirements. Valid values are:

- Wet
- Dry
- None
- Both

9.5.30 "Crocking Wet Value"

This is a Float value indicating the level of transference of the color to the finished product.

9.5.31 "Crocking Dry Value"

This is a Float value indicating the level of transference of the color to the finished product.

9.5.32 "Includes RFID Inlay"

This is a Boolean value, with either "Y" for Yes or "N" for No. Note that the next section defines attributes for RFID inlays.

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10 RFID Inlays

This is the component that enables UHF RFID identification and communication. It is inside a label, hang tag, or other container. An RFID inlay may be embedded in a printed tag, which is described in the prior section. The two-digit header value for this is RF.

10.1 RFID Inlay Required Attributes

Attribute Name	Attribute Description	Material Identifier	Attribute Selection Type
Silicon Manufacturer (MDID)	The MDID is a 9-bit value encoded in TID memory that uniquely identifies the chip manufacturer. For additional information see: https://www.gs1.org/epcglobal/standards/mdid	Y	Single List
Silicon Model	This indicates the model of integrated chip, or silicon. The 12-bit Tag Model Number is used to describe this. For more information see: https://www.gs1.org/services/tid-decoder	Y	Text
RFID Inlay Length (in MM)	Length of inlay	Y	Float
RFID Inlay Breadth (in MM)	Breadth of inlay	Y	Float
RFID Inlay Provider	Company selling inlay	N	Text
RFID Inlay Manufacturer	Company producing inlay	N	Text
RFID Inlay Model	Model of inlay as defined by the RFID Inlay Provider	N	Text
RFID Data Encoding Format	Describes the nature of the data encoded in the RFID tag, e.g. what standard identification key is used.	N	Single List

10.2 RFID Inlay Optional Attributes

Attribute Name	Attribute Description	Attribute Selection Type
RFID Inlay Thickness (in MM)	Thickness of inlay	Float
ARC Certified	RFID Inlay is certified by Auburn University RFID Lab's ARC program. The list of RFID tags certified is available at https://rfid.auburn.edu/temp/inlays/arc-enrolled-inlays.php	Boolean
ARC Specs	The ARC Specs met by the RFID Inlay. Information available at https://rfid.auburn.edu/temp/suppliers.php/	Multi-Choice List

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TIPP Grade	Indicates what GS1 TIPP grade the RFID Inlay has been successfully tested against. Note that testing also depends on the items that this RFID inlay is applied to. See: https://www.gs1.org/standards/epc-rfid/tagged-item-performance-protocol-tipp-guideline	Multi-Choice List
RFID Data Protection Status (EPC memory bank)	This indicates the level of write protection applied to the tag. For more information on Permalocked and (reversibly) Locked states, read the *EPC Write-Protection Recommendation*	Single List
Etched Tag?	Indicates if tag manufacturing includes etching process.	Boolean
Other Certification	Indicates if an additional tag performance and/or tag quality certification has been issued for this product.	Boolean
Other Certification Entity	Name of certification entity	Text
RFID Antenna Material	Conductive material used for antenna, which harvests energy to power the chip	Single List
RFID Inlay substrate	Material on which the chip and antenna are positioned	Single List
PET Free	Encompasses PET presence anywhere in tag	Boolean
Additional Wireless Capabilities	Indicates if any other wireless communication types are enabled in this inlay beyond UHF RFID.	Multi-Choice List
Inlay Adhesion	Indicates if an adhesive is on the face of the inlay. This is for attachment to a parent tag enclosure.	Single List
Hard Tag	Indicates if the inlay is rigid and if yes, housing material is identified	Multi-Choice List
On-Metal	Indicates if the inlay is designed to be placed directly onto difficult to read surfaces.	Multi-Choice List
E2 Allocation Class	Indicates GS1 EPC TDS compliant encoding	Boolean
Embedded	Indicates if inlay will be embedded in product	Single List

10.3 RFID Inlay Identifier List Values and Identification Codes

This section describes the attribute values for required list values that are also used for like-kind material identification codes. Section 3.3 describes the process of encoding attribute values.

10.3.1 "Silicon Manufacturer (MDID)" Possible Values: (single list)

The MDID value is encoded into the integrated chip (silicon) memory by the chip manufacturer. Note that this list may be refreshed by viewing *https://www.gs1.org/epcglobal/standards/mdid*. The list provided below is up-to-date as of the time of the publication of this document, however the values may be appended in the future. In that case, the appended values found at the above web page may be used. Note that the binary value found from the table is rendered as text and used as the identification code.

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Value	Code
Impinj	000000001
Texas Instruments	000000010
Alien Technology	000000011
Intelleflex	000000100
Atmel	000000101
NXP Semiconductors	000000110
ST Microelectronics	000000111
EP Microelectronics	000001000
Motorola (formerly Symbol Technologies)	000001001
Sentech Snd Bhd	000001010
EM Microelectronics	000001011
Renesas Technology Corp.	000001100
Mstar	000001101
Tyco International	000001110
Quanray Electronics	000001111
Fujitsu	000010000
LSIS	000010001
CAEN RFID srl	000010010
Productivity Engineering GmbH	000010011
Federal Electric Corp.	000010100
ON Semiconductor	000010101
Ramtron	000010110
Tego	000010111
Ceitec S.A.	000011000
CPA Wernher von Braun	000011001

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TransCore	000011010
Nationz	000011011
Invengo	000011100
Kiloway	000011101
Longjing Microelectronics Co. Ltd.	000011110
Chipus Microelectronics	000011111
ORIDAO	000100000
Maintag	000100001
Yangzhou Daoyuan Microelectronics Co. Ltd	000100010
Gate Elektronik	000100011
RFMicron, Inc.	000100100
RST-Invent LLC	000100101
Crystone Technology	000100110
Shanghai Fudan Microelectronics Group	000100111
Farsens	000101000
Giesecke & Devrient GmbH	000101001
AWID	000101010
Unitec Semicondutores S/A	000101011
Q-Free ASA	000101100
Valid S.A.	000101101
Fraunhofer IPMS	000101110
ams AG	000101111
Angstrem JSC	000110000
Honeywell	000110001

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Huada Semiconductor Co. Ltd (HDSC)	000110010
Lapis Semiconductor Co., Ltd.	000110011
PJSC Mikron	000110100
Hangzhou Landa Microelectronics Co., Ltd.	000110101
Nanjing NARI Micro-Electronic Technology Co., Ltd.	000110110
Southwest Integrated Circuit Design Co., Ltd.	000110111
Silictec	000111000
Nation RFID	000111001
Asygn	000111010
Suzhou HCTech Technology Co., Ltd.	000111011
AXEM Technology	000111100
Guangzhou Syschip Technology Co., Ltd	000111101
MaxWave Microelectronics Ltd.	000111110
IDRO Co., Ltd	000111111

10.3.2 "Silicon Model" Value: (Text)

The "Tag Model Number" (TMN) is a 12 bit value encoded in the TID that indicates the silicon model. This may be verified using the utility found here: *https://www.gs1.org/services/tid-decoder*. Note that the utility decodes the TMN into a Hexadecimal value, which can then be converted into its binary equivalent to confirm the model number. As with the MDID, the 12 bit binary value will be rendered as text and used as the identification code.

10.3.3 "RFID Inlay Length (in MM)" Value: (Float)

This is a Float numeric value indicating the length of the inlay in millimeters.

10.3.4 "RFID Inlay Breadth (in MM)" Value: (Float)

This is a Float numeric value indicating the breadth of the inlay in millimeters.

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10.4 RFID Inlay List Values for Required Fields that are not Material Identifiers

10.4.1 "RFID Inlay Provider"

This is a text field containing the selling company name.

10.4.2 "RFID Inlay Manufacturer"

This is a text field containing the producing company name.

10.4.3 "RFID Inlay Model"

This is a text field containing the model of the inlay as defined by the RFID Inlay Provider.

10.4.4 "RFID Data Encoding Format"

This describes the nature of the data encoded in the RFID tag, such as what standard identification key is used. This is a single list value with the following possible entries:

- SGTIN-96
- SGTIN-198
- SSCC-96
- SGLN-96
- SGLN-195
- GRAI-96
- GRAI-170
- GIAI-96
- GIAI-202
- GSRN-96
- GSRNP-96
- GDTI-96
- GDTI-174
- CPI-96
- CPI-VAR
- SGCN-96
- Other
- N/A

Select "N/A" if not encoding data in the EPC memory bank of the RFID tag.

10.5 RFID Inlay Values for Optional Fields

The following fields are optional and are not a part of the Material Identifier algorithm.

10.5.1 "RFID Inlay Thickness (in MM)"

This is a Float value indicating the inlay thickness in millimeters.

10.5.2 "ARC Certified"

This is a Boolean value, with either "Y" for Yes or "N" for No. The list of RFID tags certified is available at https://rfid.auburn.edu/temp/inlays/arc-enrolled-inlays.php

10.5.3 "ARC Specs"

This Multi-Choice value indicates what ARC specifications are certified for the RFID Inlay. Further information may be found at https://rfid.auburn.edu/temp/suppliers.php/. The appended content listed on that page may be included in the following list of specification values, which were updated at the time of publication:

- F
- G
- I
- K
- L
- M
- N
- Q
- T
- U
- H
- V

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- E
- W1
- W2
- W3
- W4
- W5
- W6
- Other

10.5.4 "TIPP Grade"

This Multi-Choice value indicates what GS1 TIPP grade that the RFID Inlay has successfully been tested against. Further information may be found at *https://www.gs1.org/standards/epc-rfid/tagged-item-performance-protocol-tipp-guideline.* The appended content provided by expansion of the TIPP grades may be included in the following list of specification values, which were updated at the time of publication:

- S05V
- S05B
- S15B
- S15D
- S20B
- S20A
- S25A
- S35A
- S30F
- M05B
- M10B
- M15B
- M20D
- M25C
- M30E
- M35E
- J04V
- Other

10.5.5 "RFID Data Protection Status (EPC memory bank)"

This indicates the level of write protection applied to the tag. This is a single list value with the following possible entries:

- Permalocked
- Locked
- Encrypted
- None

For more information on Permalocked and (reversibly) Locked states, read the *EPC Write-Protection Recommendation*

10.5.6 "Etched Tag"

This is a Boolean value, with either "Y" for Yes or "N" for No.

10.5.7 "Other Certification"

This is a Boolean value, with either "Y" for Yes or "N" for No.

10.5.8 "Other Certification Entity"

This is a text value listing the other certification authority.

10.5.9 "RFID Antenna Material"

This is a Single List value with the following possible values:

- Aluminium
- Copper
- Conductive Ink
- Conductive Paste
- Graphene
- Silver
- Other

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10.5.10 "RFID Inlay Substrate"

This is Single List value indicating the material on which the chip and antenna are positioned. Valid values are:

- PET
- Paper
- Fabric
- Other

10.5.11 "PET Free"

This is a Boolean value, with either "Y" for Yes or "N" for No.

10.5.12 "Additional Wireless Capabilities"

This is Multi-Choice List value indicating what, if any, additional wireless capabilities the inlay has beyond that of UHF (or RAIN) RFID.

- BLE
- HF
- NFC-type1
- NFC-type2
- NFC-type3
- NFC-type4
- NFC-type5

10.5.13 "Inlay Adhesion"

This is Single List value. Valid values are:

- Wet Inlay
- Dry Inlay

10.5.14 "Hard Tag"

This is Multi-Choice List value indicating if the inlay is housed in a rigid housing material. Valid values are:

- ABS
- Glass
- Ceramic
- Carbon Fiber
- PCB
- Parylene
- Other

10.5.15 "On-Metal"

This is Multi-Choice List value indicating if the inlay is designed to be placed directly onto difficult-to-read surfaces. Valid values are:

Value	Description
Glass	Empty glass container or glass item
Liquid	Filled glass or plastic container
Metal	Consumer durable product or foil packaging
Organic	Proteins

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10.5.16 "E2 Allocation Class"

This is a Boolean value, with either "Y" for Yes or "N" for No.

10.5.17 "Embedded"

This is a Single List indicating if the inlay is intended to be embedded in a product. Valid values are:

Value	Description
Not-Embedded	Part of product packaging (intended to be removed after point of sale)
Embedded-removable	In-product but removable (e.g. care-label)
Embedded-permanent	In-product and not removable (e.g. thread)

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11 Resources

11.1 Links to ISO Country Code Information

Country code references shall use the 2-digit country identifier defined by ISO. For more information on ISO country codes refer to the following websites.

- ISO Website: www.iso.org/iso/country_codes
- Wikipedia: en.wikipedia.org/wiki/ISO_3166-1

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