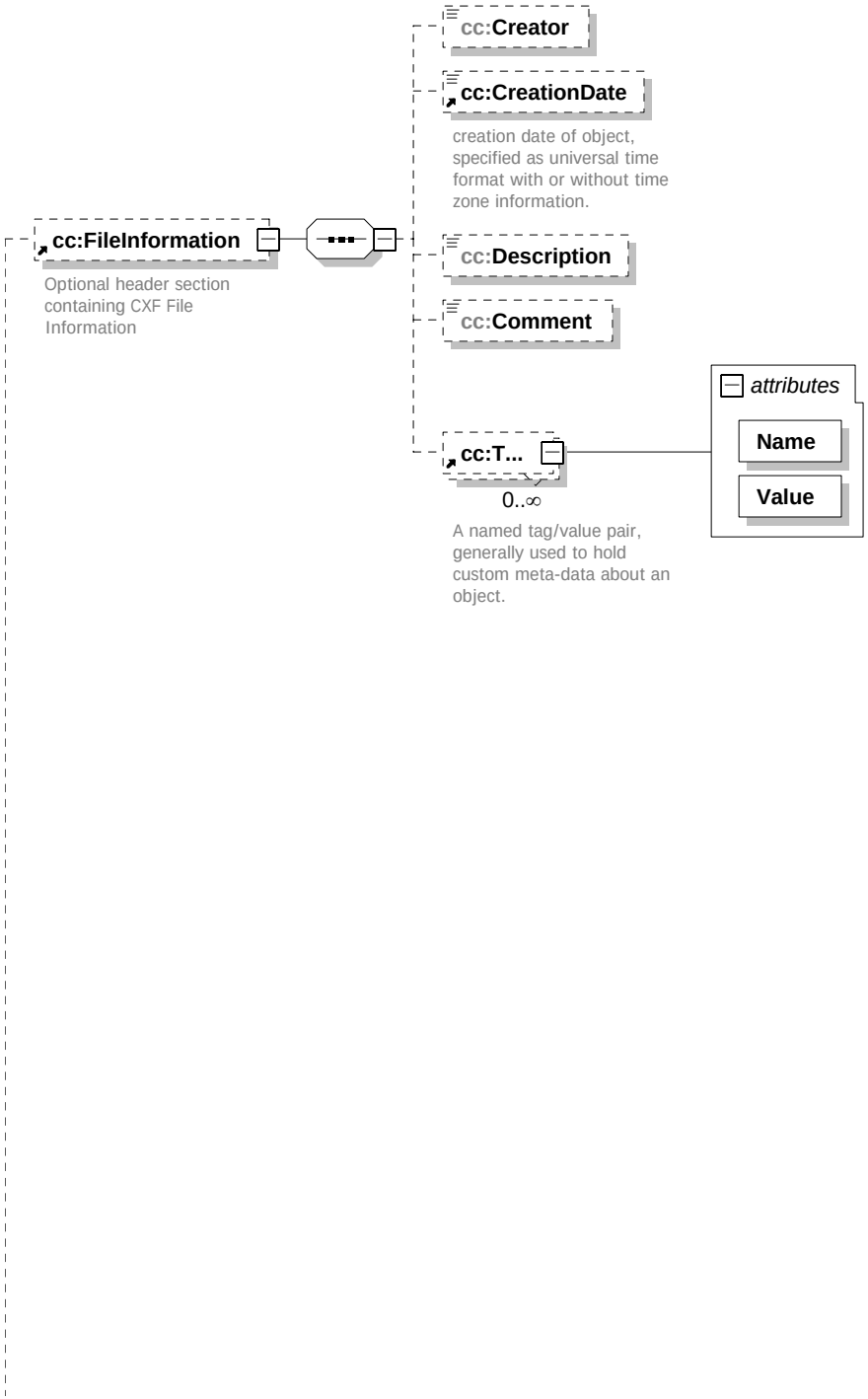
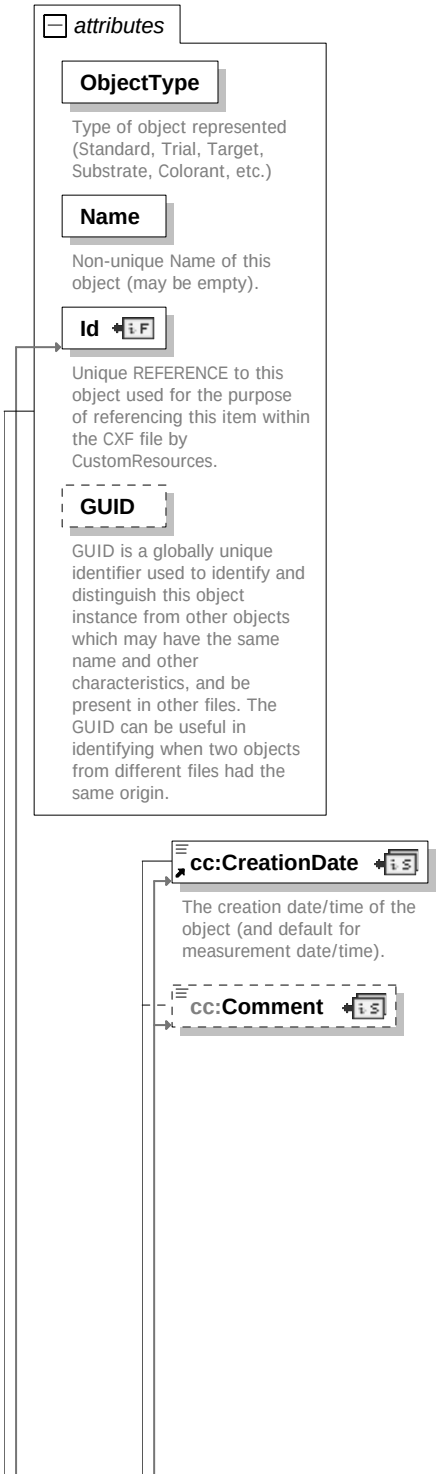
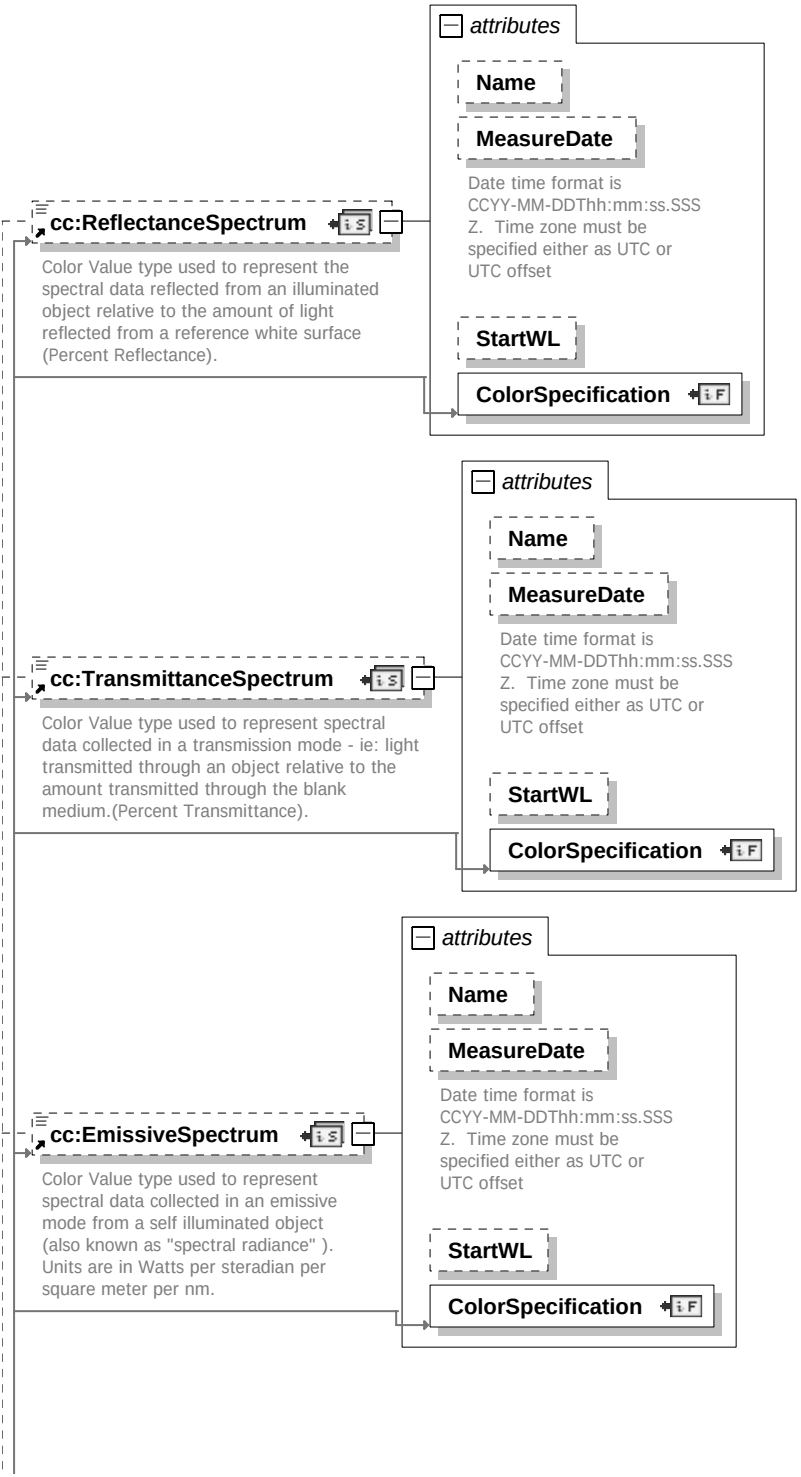
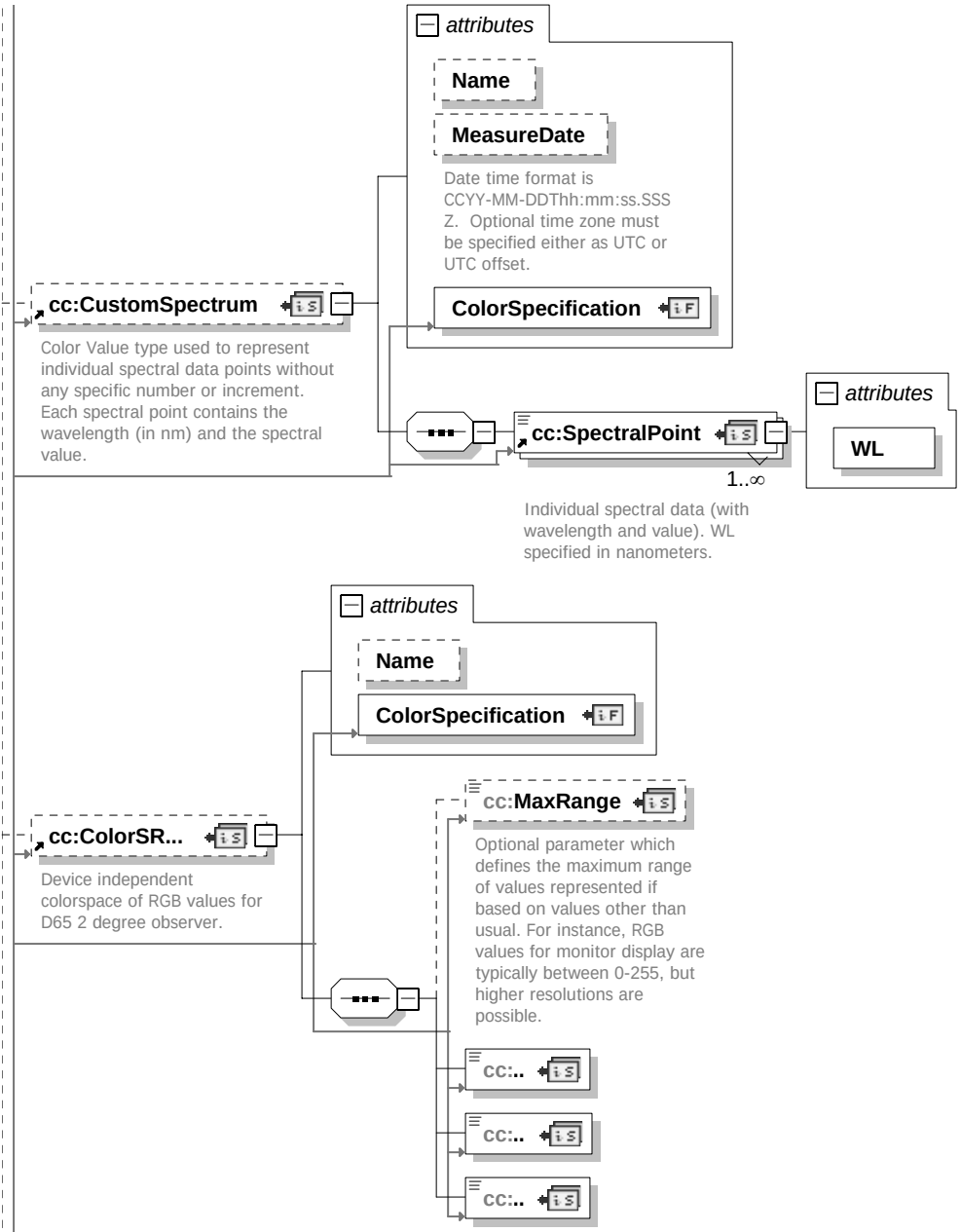
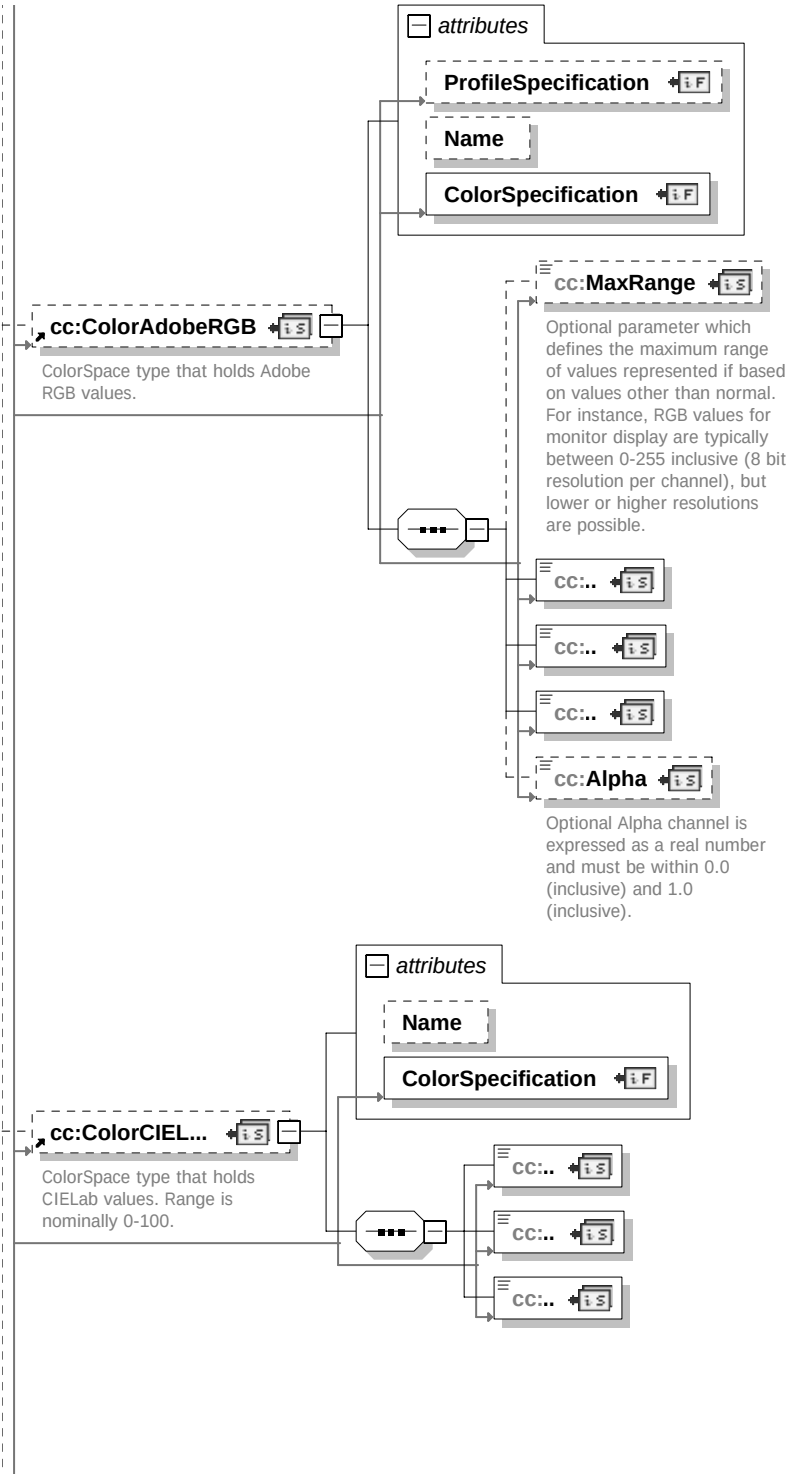
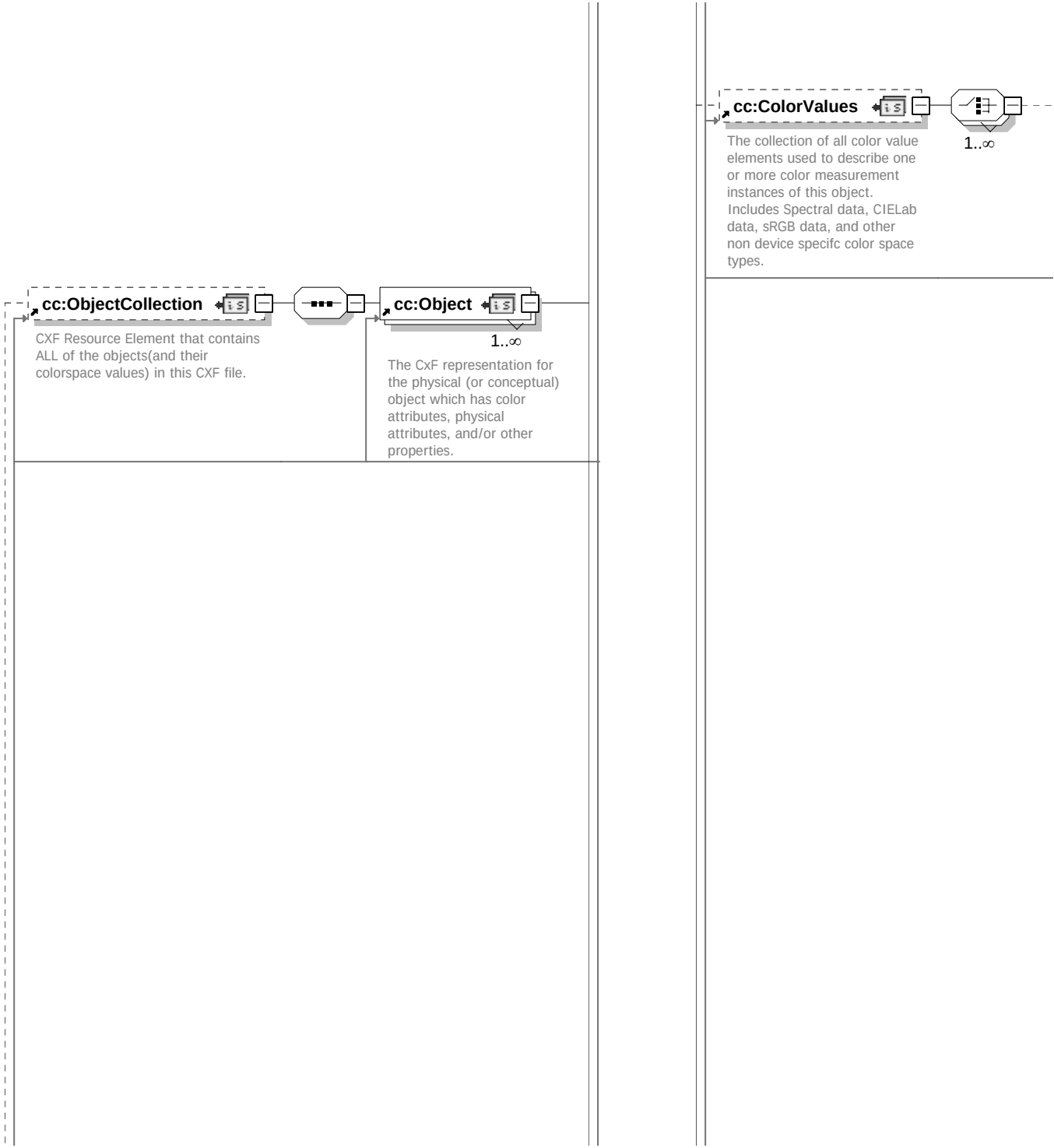

cc:Creator
cc:CreationDate
creation date of object, specified as universal time format with or without time zone information.
cc:FileInformation
Optional header section containing CXF File Information
cc:Description
cc:Comment
attributes
Name
Value
cc:T...
0..∞
A named tag/value pair, generally used to hold custom meta-data about an object.

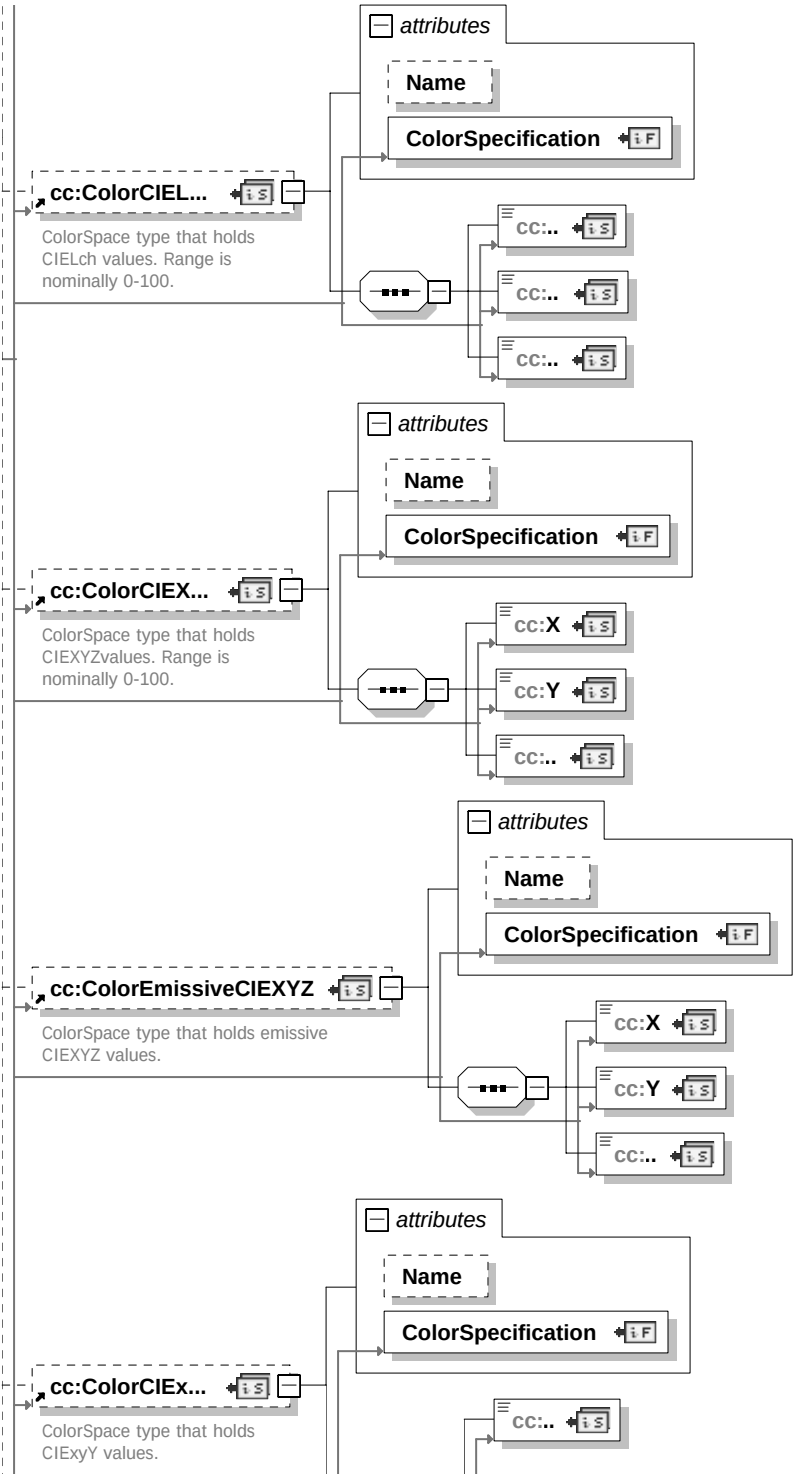

attributes
ObjectType
Type of object represented (Standard, Trial, Target, Substrate, Colorant, etc.)
Name
Non-unique Name of this object (may be empty).
Id
Unique REFERENCE to this object used for the purpose of referencing this item within the CXF file by CustomResources.
GUID
GUID is a globally unique identifier used to identify and distinguish this object instance from other objects which may have the same name and other characteristics, and be present in other files. The GUID can be useful in identifying when two objects from different files had the same origin.
cc:CreationDate
The creation date/time of the object (and default for measurement date/time).
cc:Comment

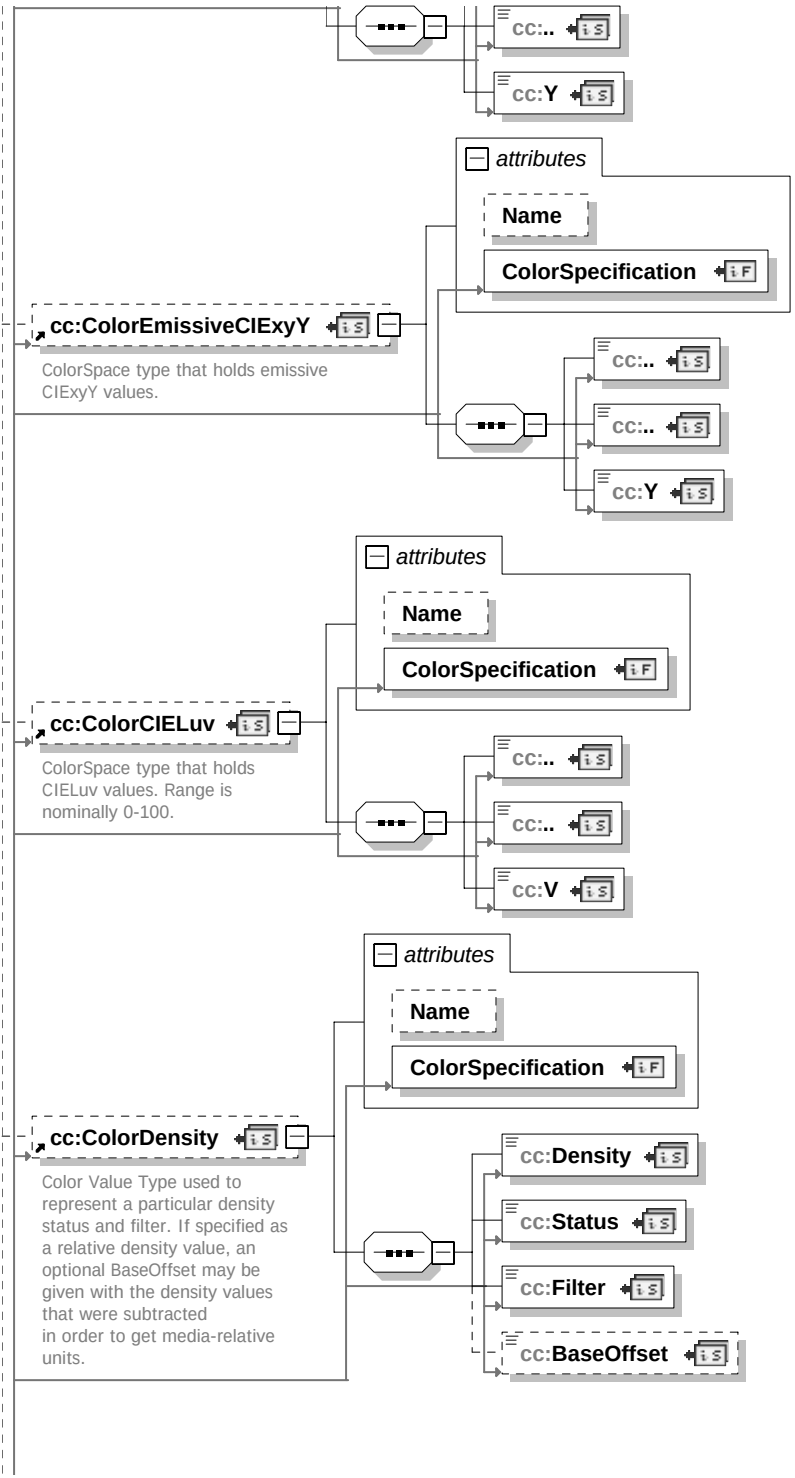

attributes
Name
MeasureDate
Date time format is CCYY-MM-DDThh:mm:ss.SSS Z. Time zone must be specified either as UTC or UTC offset
StartWL
ColorSpecification
cc:ReflectanceSpectrum
Color Value type used to represent the spectral data reflected from an illuminated object relative to the amount of light reflected from a reference white surface (Percent Reflectance).
attributes
Name
MeasureDate
Date time format is CCYY-MM-DDThh:mm:ss.SSS Z. Time zone must be specified either as UTC or UTC offset
StartWL
ColorSpecification
cc:TransmittanceSpectrum
Color Value type used to represent spectral data collected in a transmission mode - ie: light transmitted through an object relative to the amount transmitted through the blank medium.(Percent Transmittance).
attributes
Name
MeasureDate
Date time format is CCYY-MM-DDThh:mm:ss.SSS Z. Time zone must be specified either as UTC or UTC offset
StartWL
ColorSpecification
cc:EmissiveSpectrum
Color Value type used to represent spectral data collected in an emissive mode from a self illuminated object (also known as "spectral radiance"). Units are in Watts per steradian per square meter per nm.

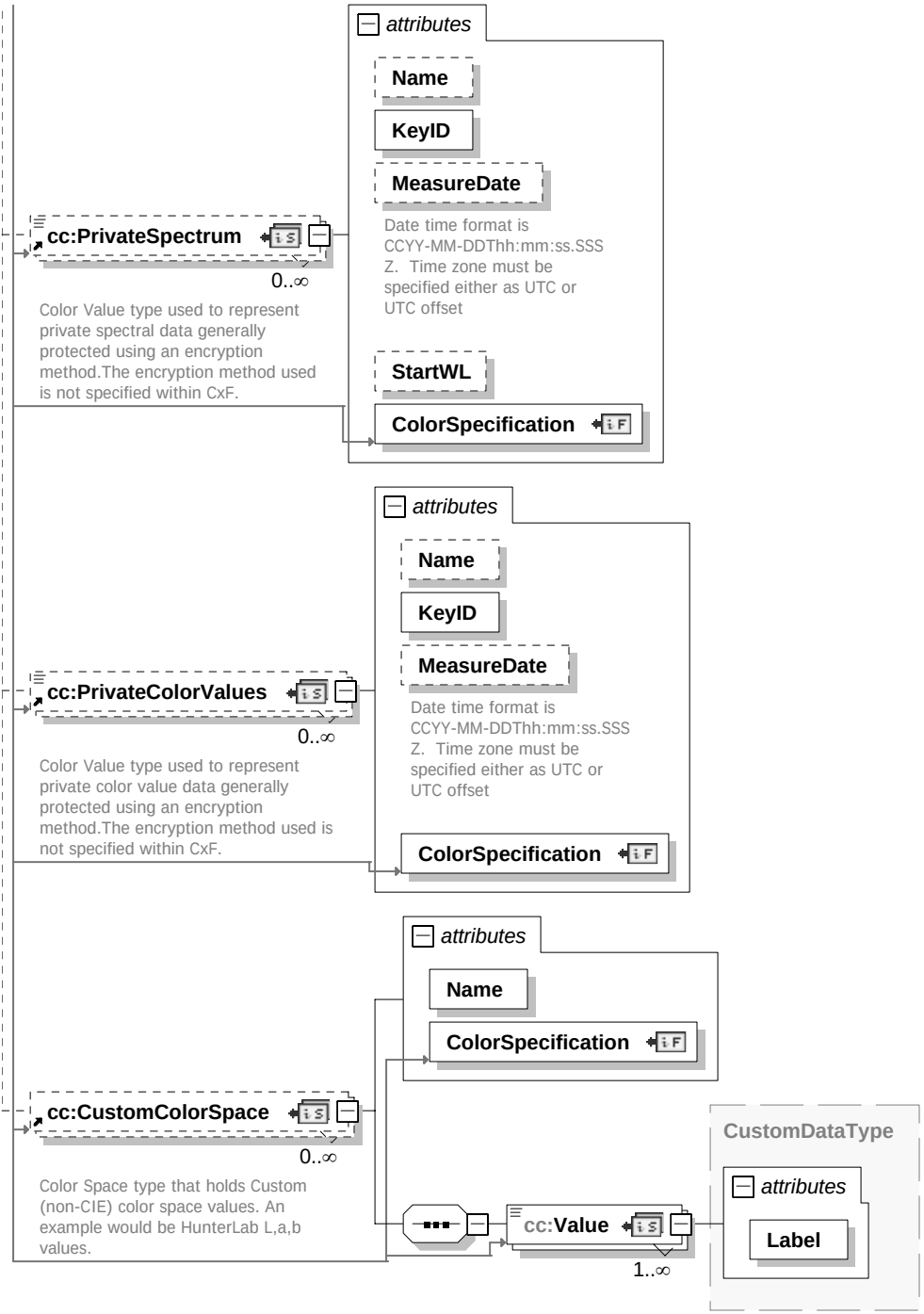

attributes
Name
MeasureDate
Date time format is CCYY-MM-DDThh:mm:ss.SSS Z. Optional time zone must be specified either as UTC or UTC offset.
ColorSpecification
cc:CustomSpectrum
Color Value type used to represent individual spectral data points without any specific number or increment. Each spectral point contains the wavelength (in nm) and the spectral value.
cc:SpectralPoint
1..∞
Individual spectral data (with wavelength and value). WL specified in nanometers.
attributes
WL
attributes
Name
ColorSpecification
cc:ColorSR...
Device independent colorspace of RGB values for D65 2 degree observer.
cc:MaxRange
Optional parameter which defines the maximum range of values represented if based on values other than usual. For instance, RGB values for monitor display are typically between 0-255, but higher resolutions are possible.
cc:..
cc:..
cc:..

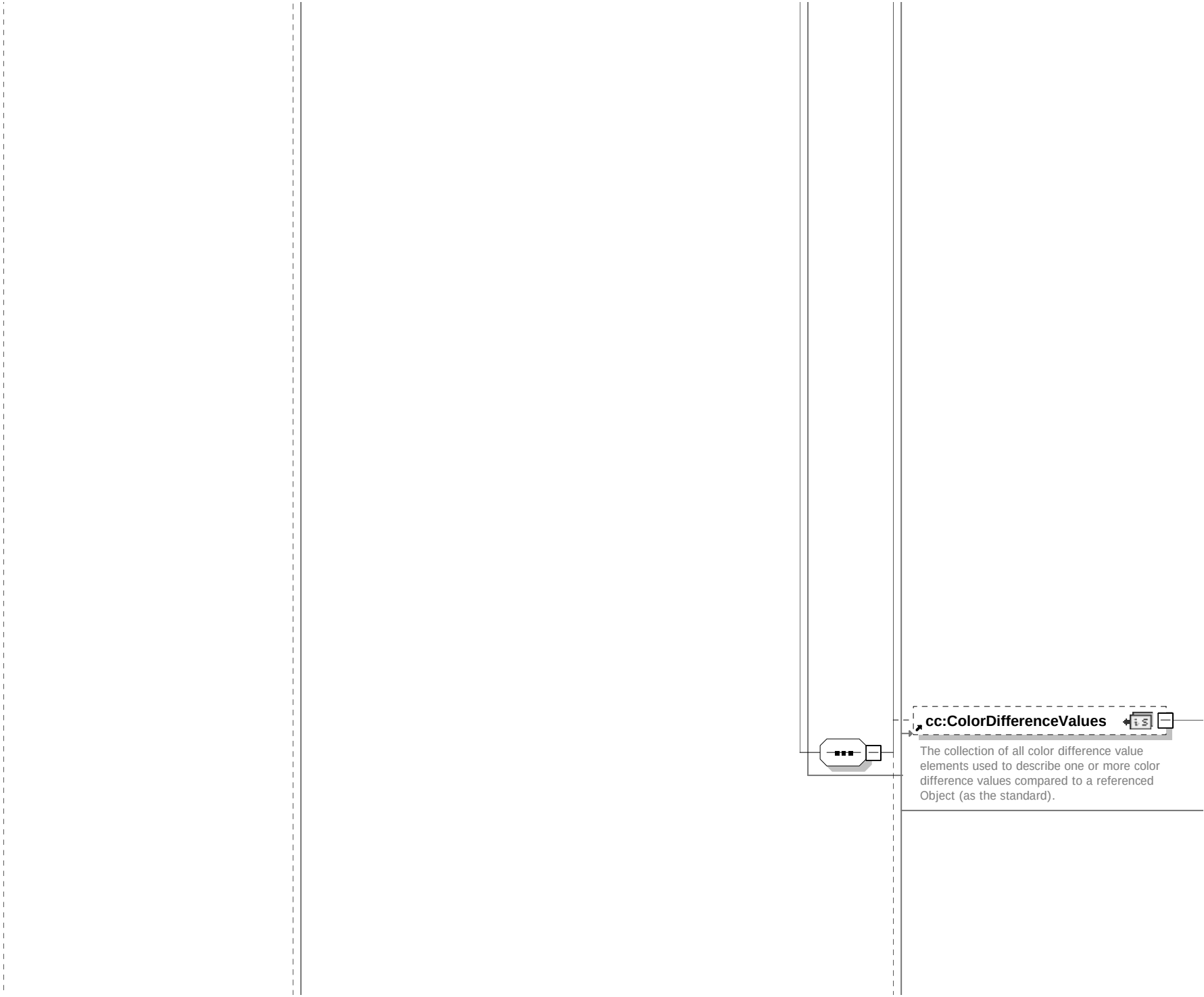

attributes
ProfileSpecification
Name
ColorSpecification
cc:ColorAdobeRGB
ColorSpace type that holds Adobe RGB values.
cc:MaxRange
Optional parameter which defines the maximum range of values represented if based on values other than normal. For instance, RGB values for monitor display are typically between 0-255 inclusive (8 bit resolution per channel), but lower or higher resolutions are possible.
cc:..
cc:..
cc:..
cc:Alpha
Optional Alpha channel is expressed as a real number and must be within 0.0 (inclusive) and 1.0 (inclusive).
attributes
Name
ColorSpecification
cc:ColorCIEL...
ColorSpace type that holds CIELab values. Range is nominally 0-100.
cc:..
cc:..
cc:..

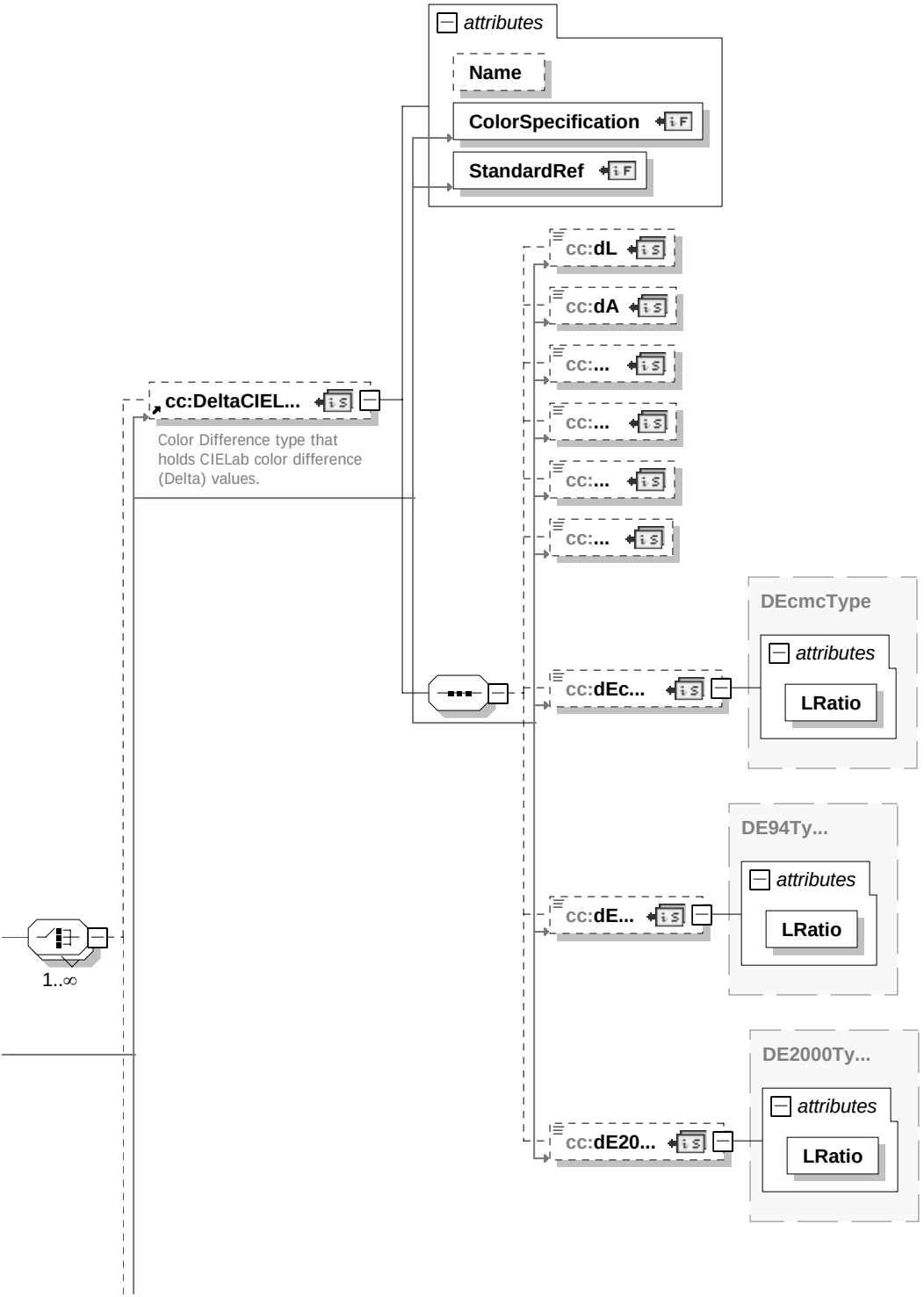

cc:ObjectCollection
CXF Resource Element that contains ALL of the objects(and their colorspace values) in this CXF file.
cc:Object
1..∞
The CxF representation for the physical (or conceptual) object which has color attributes, physical attributes, and/or other properties.
cc:ColorValues
1..∞
The collection of all color value elements used to describe one or more color measurement instances of this object. Includes Spectral data, CIELab data, sRGB data, and other non device specifc color space types.

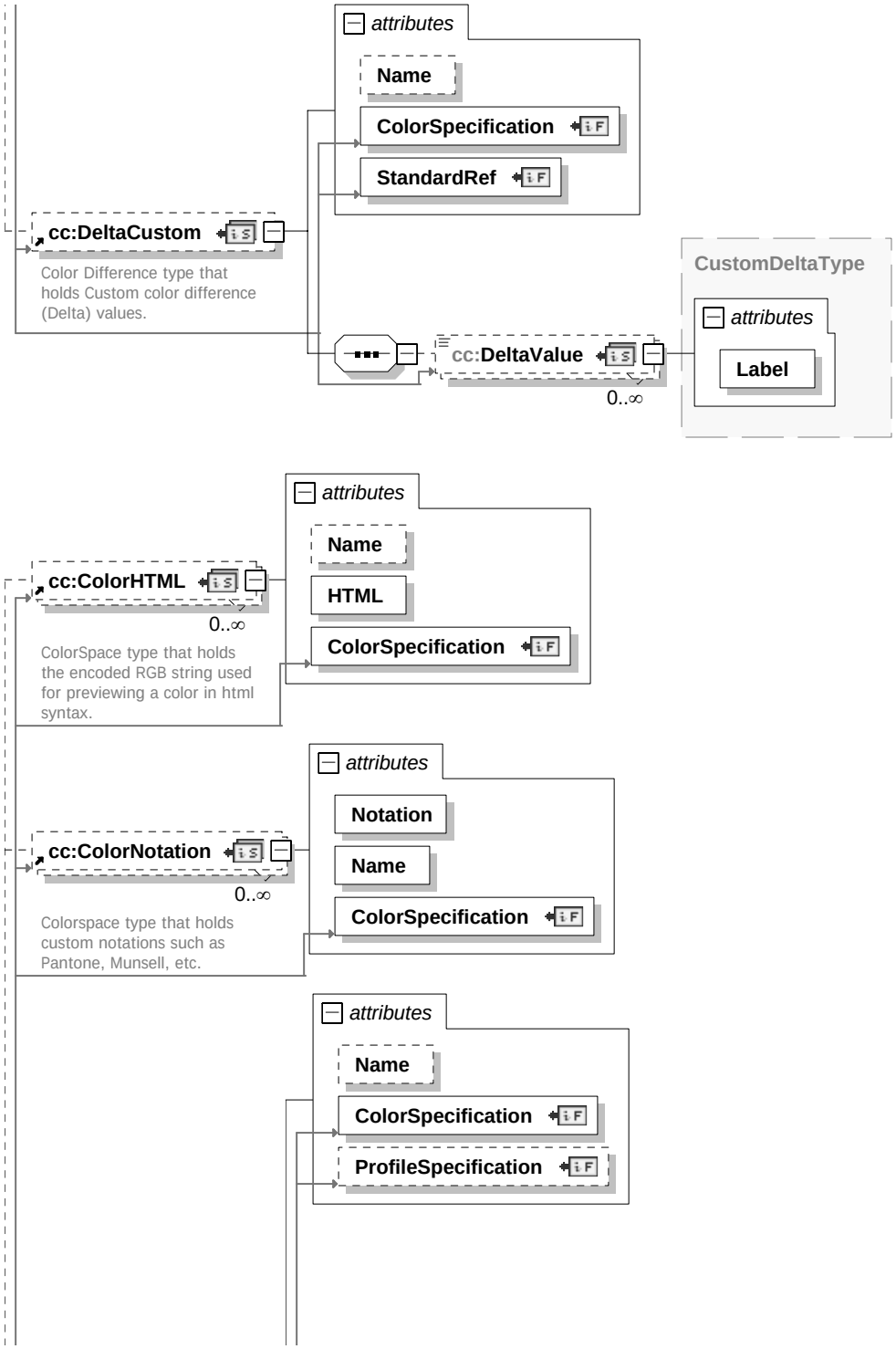

attributes
Name
ColorSpecification
cc:ColorCIEL...
ColorSpace type that holds CIELch values. Range is nominally 0-100.
cc:...
cc:...
cc:...
attributes
Name
ColorSpecification
cc:ColorCIEX...
ColorSpace type that holds CIEXYZvalues. Range is nominally 0-100.
cc:X
cc:Y
cc:...
attributes
Name
ColorSpecification
cc:ColorEmissiveCIEXYZ
ColorSpace type that holds emissive CIEXYZ values.
cc:X
cc:Y
cc:...
attributes
Name
ColorSpecification
cc:ColorCIEx...
ColorSpace type that holds CIExyY values.
cc:...

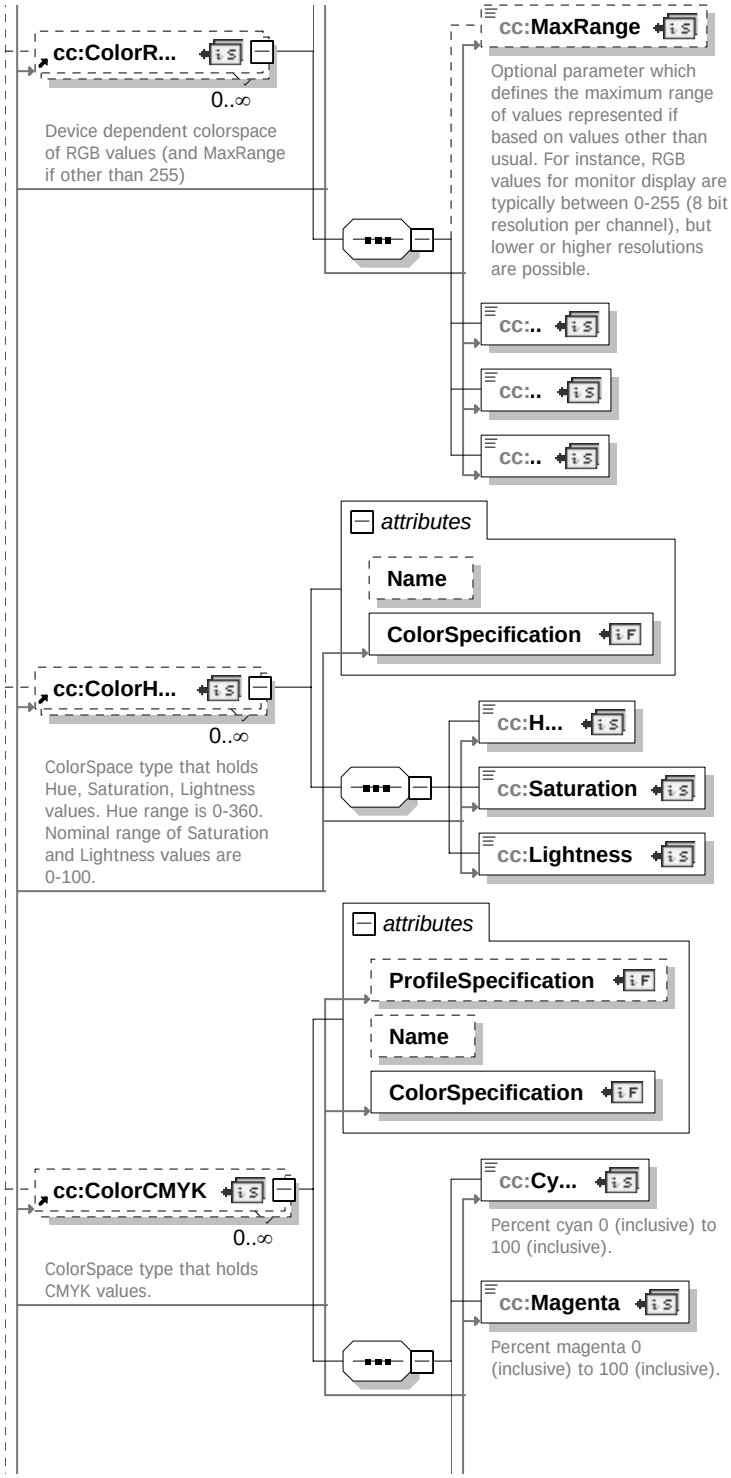

cc:..
cc:Y
attributes
Name
ColorSpecification
cc:ColorEmissiveCIExyY
ColorSpace type that holds emissive CIExyY values.
cc:..
cc:..
cc:Y
attributes
Name
ColorSpecification
cc:ColorCIELuv
ColorSpace type that holds CIELuv values. Range is nominally 0-100.
cc:..
cc:..
cc:V
attributes
Name
ColorSpecification
cc:ColorDensity
Color Value Type used to represent a particular density status and filter. If specified as a relative density value, an optional BaseOffset may be given with the density values that were subtracted in order to get media-relative units.
cc:Density
cc:Status
cc:Filter
cc:BaseOffset


attributes
Name
KeyID
MeasureDate
Date time format is CCYY-MM-DDThh:mm:ss.SSS Z. Time zone must be specified either as UTC or UTC offset
StartWL
ColorSpecification
cc:PrivateSpectrum
0..∞
Color Value type used to represent private spectral data generally protected using an encryption method.The encryption method used is not specified within CxF.
attributes
Name
KeyID
MeasureDate
Date time format is CCYY-MM-DDThh:mm:ss.SSS Z. Time zone must be specified either as UTC or UTC offset
ColorSpecification
cc:PrivateColorValues
0..∞
Color Value type used to represent private color value data generally protected using an encryption method.The encryption method used is not specified within CxF.
attributes
Name
ColorSpecification
cc:CustomColorSpace
0..∞
Color Space type that holds Custom (non-CIE) color space values. An example would be HunterLab L,a,b values.
cc:Value
1..∞
CustomDataType
attributes
Label


cc:ColorDifferenceValues
The collection of all color difference value elements used to describe one or more color difference values compared to a referenced Object (as the standard).

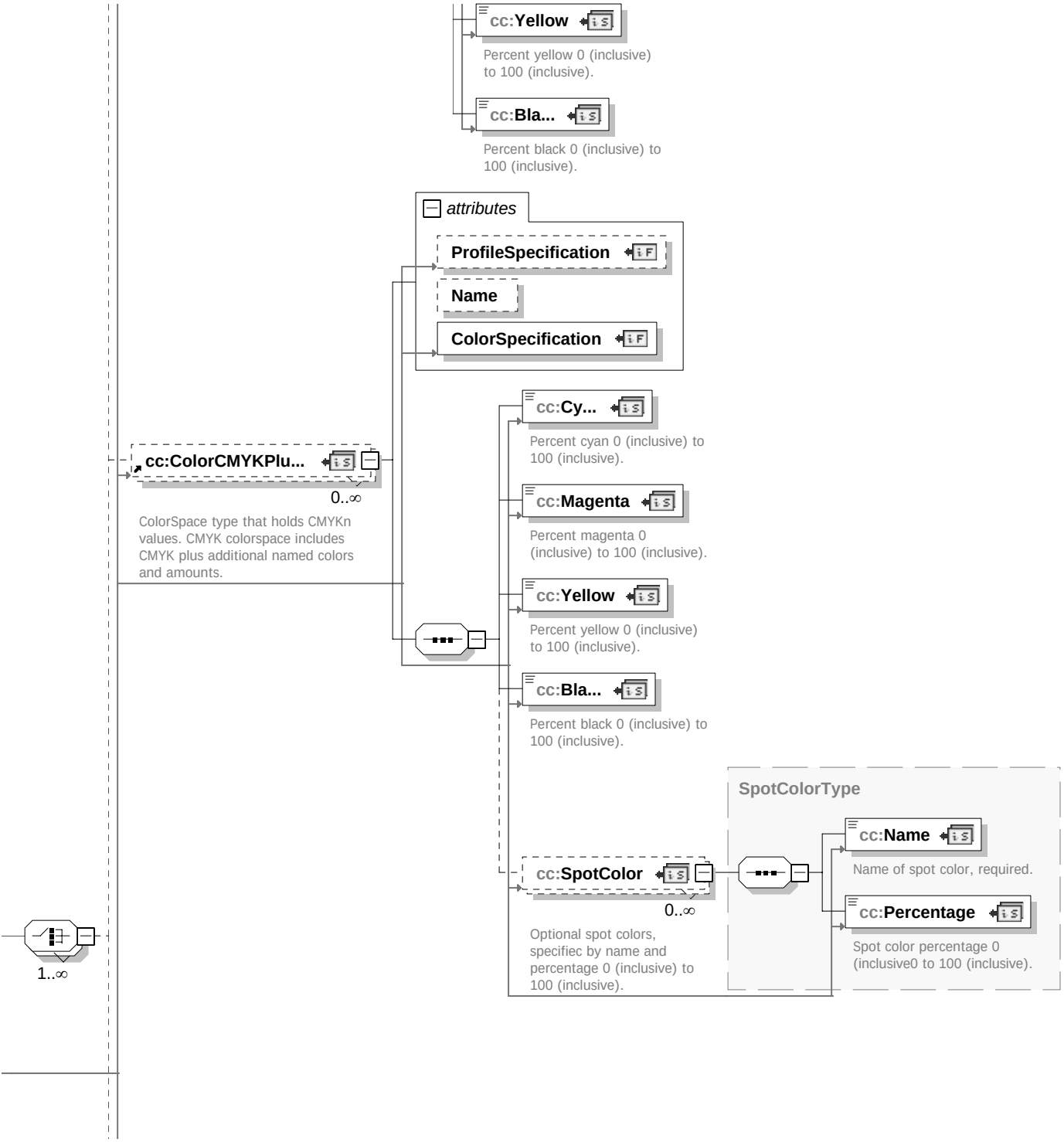

attributes
Name
ColorSpecification
StandardRef
cc:DeltaCIEL...
Color Difference type that holds CIELab color difference (Delta) values.
cc:dL
cc:dA
cc:...
cc:...
cc:...
cc:...
cc:dEc...
DEcmcType
attributes
LRatio
cc:dE...
DE94Ty...
attributes
LRatio
cc:dE20...
DE2000Ty...
attributes
LRatio
1..∞


attributes
Name
ColorSpecification
StandardRef
cc:DeltaCustom
Color Difference type that holds Custom color difference (Delta) values.
cc:DeltaValue
0..∞
CustomDeltaType
attributes
Label
attributes
Name
HTML
ColorSpecification
cc:ColorHTML
0..∞
ColorSpace type that holds the encoded RGB string used for previewing a color in html syntax.
attributes
Notation
Name
ColorSpecification
cc:ColorNotation
0..∞
Colorspace type that holds custom notations such as Pantone, Munsell, etc.
attributes
Name
ColorSpecification
ProfileSpecification

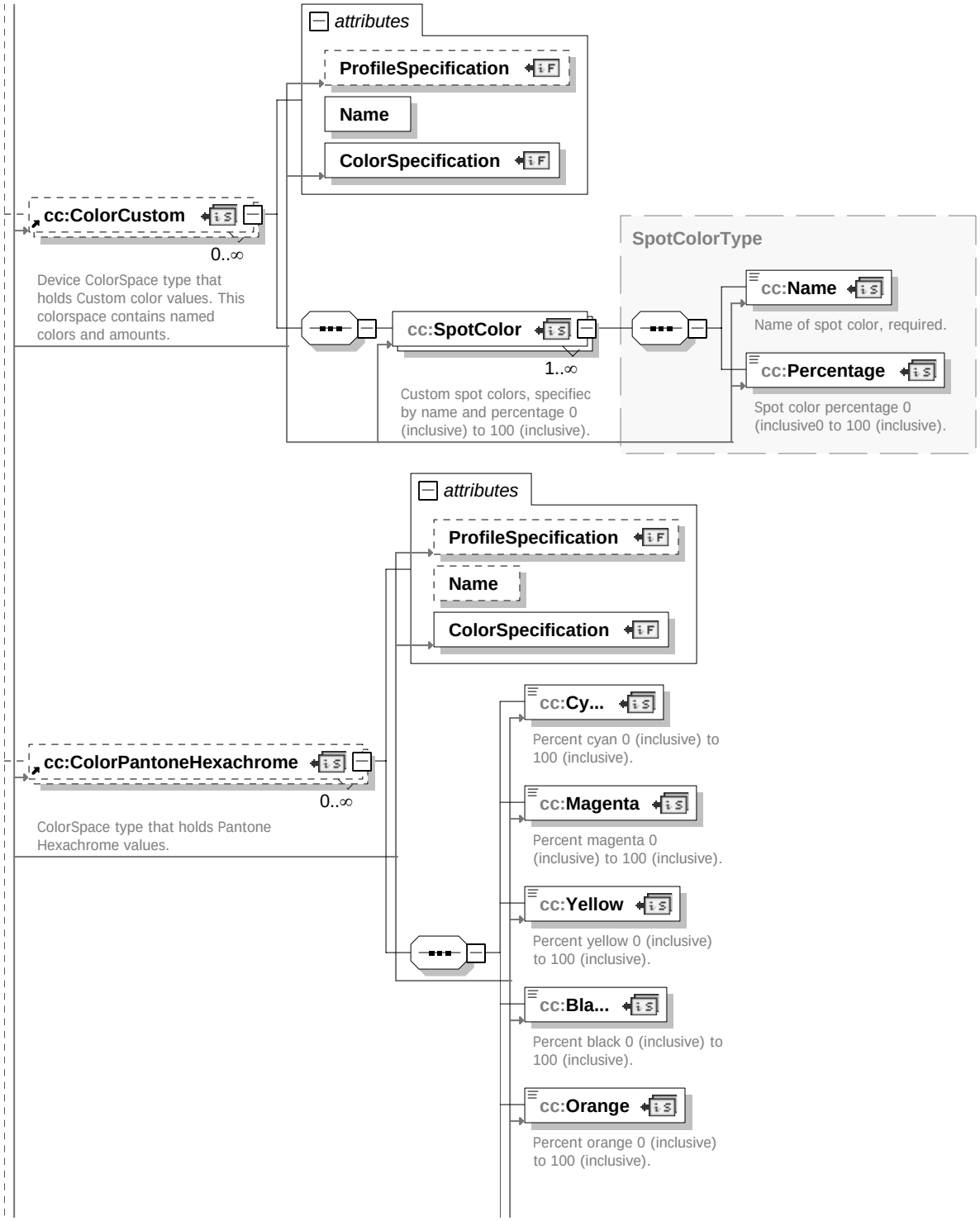

cc:ColorR...
0..∞
Device dependent colorspace of RGB values (and MaxRange if other than 255)
cc:MaxRange
Optional parameter which defines the maximum range of values represented if based on values other than usual. For instance, RGB values for monitor display are typically between 0-255 (8 bit resolution per channel), but lower or higher resolutions are possible.
cc:..
cc:..
cc:..
attributes
Name
ColorSpecification
cc:ColorH...
0..∞
ColorSpace type that holds Hue, Saturation, Lightness values. Hue range is 0-360. Nominal range of Saturation and Lightness values are 0-100.
cc:H...
cc:Saturation
cc:Lightness
attributes
ProfileSpecification
Name
ColorSpecification
cc:ColorCMYK
0..∞
ColorSpace type that holds CMYK values.
cc:Cy...
Percent cyan 0 (inclusive) to 100 (inclusive).
cc:Magenta
Percent magenta 0 (inclusive) to 100 (inclusive).

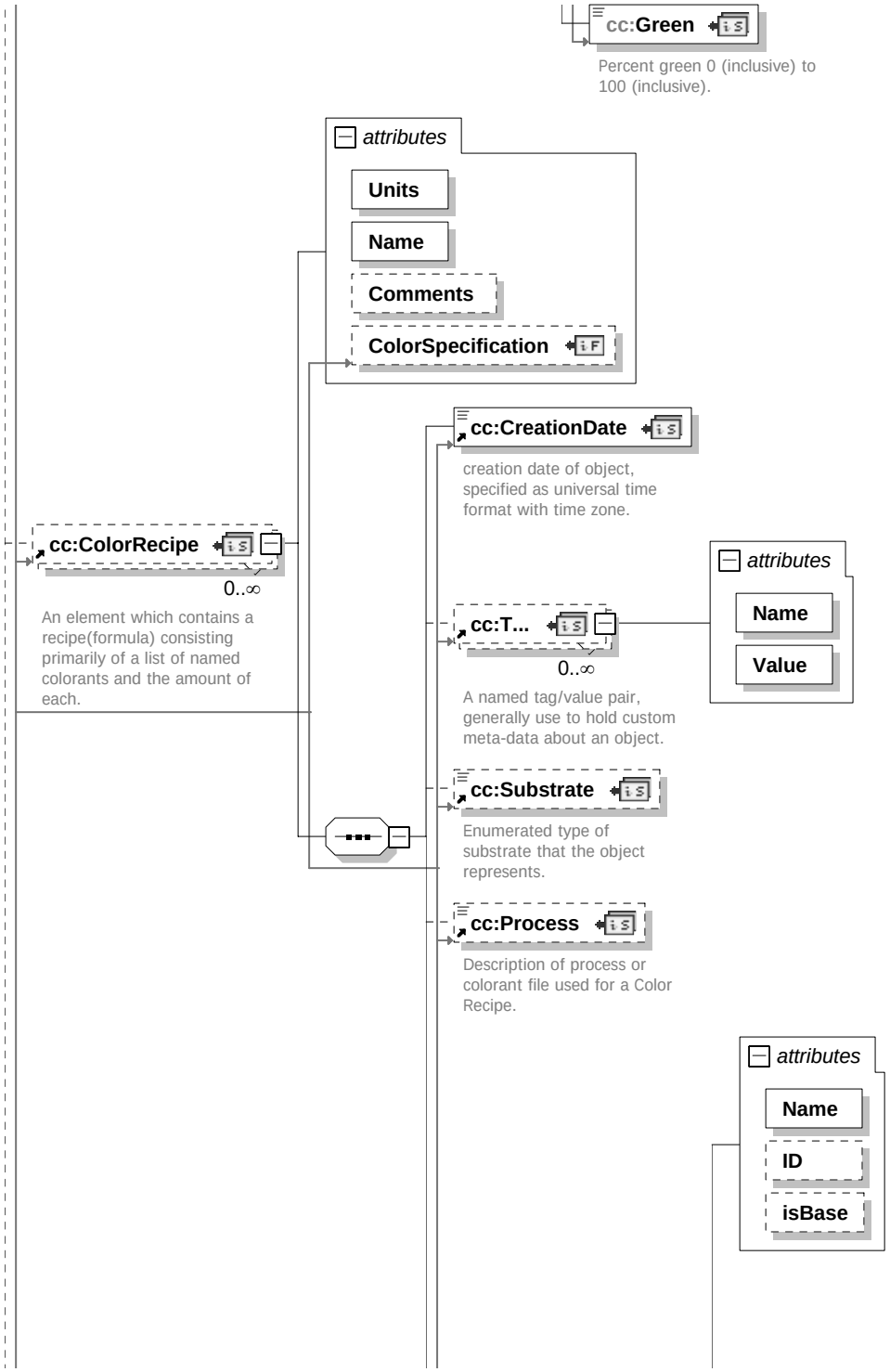
cc:DeviceColorValues

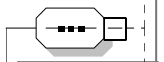
The collection of all color value elements used to describe one or more device dependent color space descriptions of this object. Includes RGB, HTML, CMYK, Recipes and other device specifc color space types.


cc:Yellow
Percent yellow 0 (inclusive) to 100 (inclusive).
cc:Bla...
Percent black 0 (inclusive) to 100 (inclusive).
attributes
ProfileSpecification
Name
ColorSpecification
cc:ColorCMYKPlu...
0..∞
ColorSpace type that holds CMYKn values. CMYK colorspace includes CMYK plus additional named colors and amounts.
cc:Cy...
Percent cyan 0 (inclusive) to 100 (inclusive).
cc:Magenta
Percent magenta 0 (inclusive) to 100 (inclusive).
cc:Yellow
Percent yellow 0 (inclusive) to 100 (inclusive).
cc:Bla...
Percent black 0 (inclusive) to 100 (inclusive).
SpotColorType
cc:Name
Name of spot color, required.
cc:Percentage
Spot color percentage 0 (inclusive0 to 100 (inclusive).
cc:SpotColor
0..∞
Optional spot colors, specifiec by name and percentage 0 (inclusive) to 100 (inclusive).
1..∞

CxF
Root element of CXF

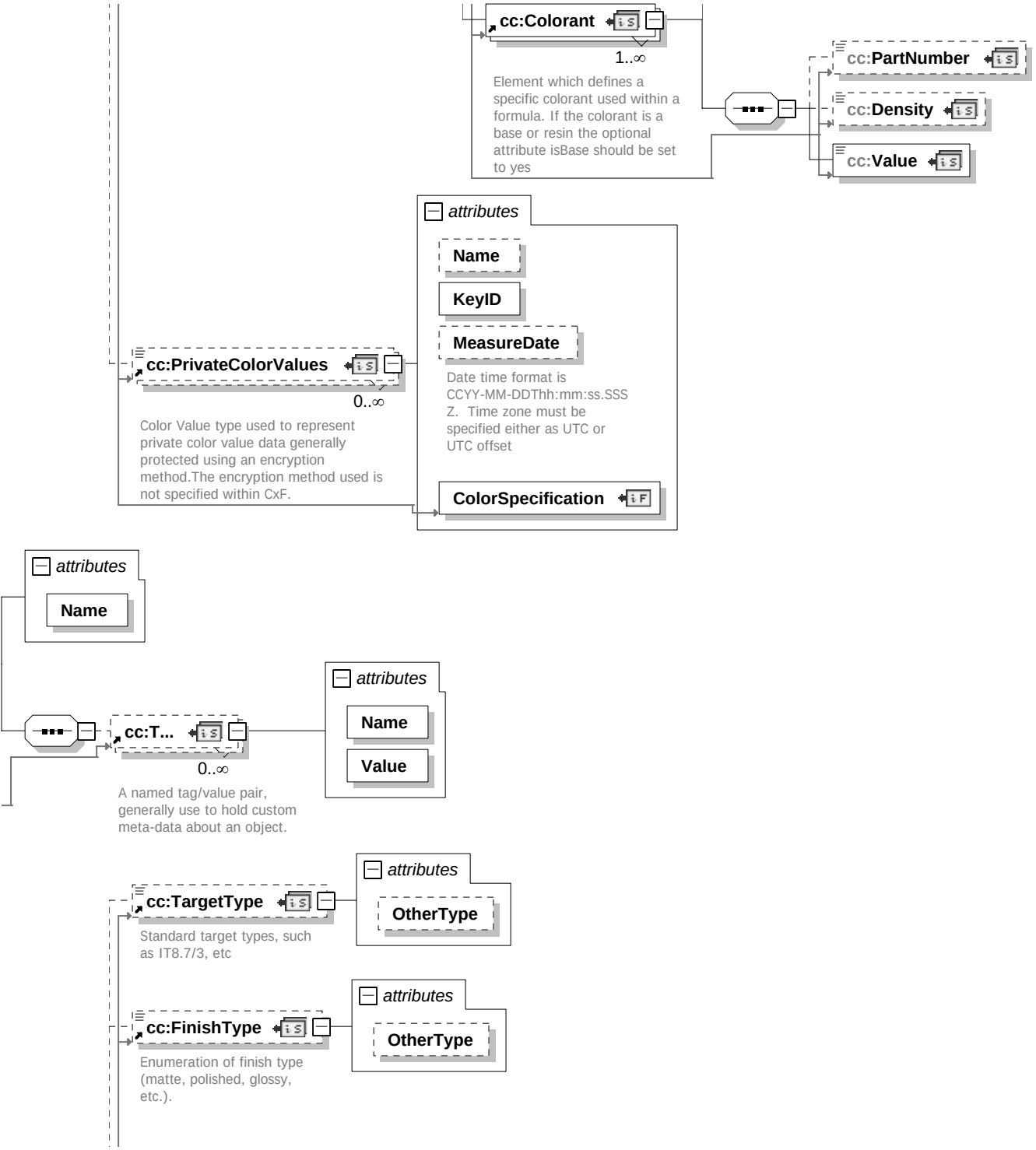

attributes
ProfileSpecification
Name
ColorSpecification
cc:ColorCustom
0..∞
Device ColorSpace type that holds Custom color values. This colorspace contains named colors and amounts.
cc:SpotColor
1..∞
Custom spot colors, specifiec by name and percentage 0 (inclusive) to 100 (inclusive).
SpotColorType
cc:Name
Name of spot color, required.
cc:Percentage
Spot color percentage 0 (inclusive0 to 100 (inclusive).
attributes
ProfileSpecification
Name
ColorSpecification
cc:ColorPantoneHexachrome
0..∞
ColorSpace type that holds Pantone Hexachrome values.
cc:Cy...
Percent cyan 0 (inclusive) to 100 (inclusive).
cc:Magenta
Percent magenta 0 (inclusive) to 100 (inclusive).
cc:Yellow
Percent yellow 0 (inclusive) to 100 (inclusive).
cc:Bla...
Percent black 0 (inclusive) to 100 (inclusive).
cc:Orange
Percent orange 0 (inclusive) to 100 (inclusive).

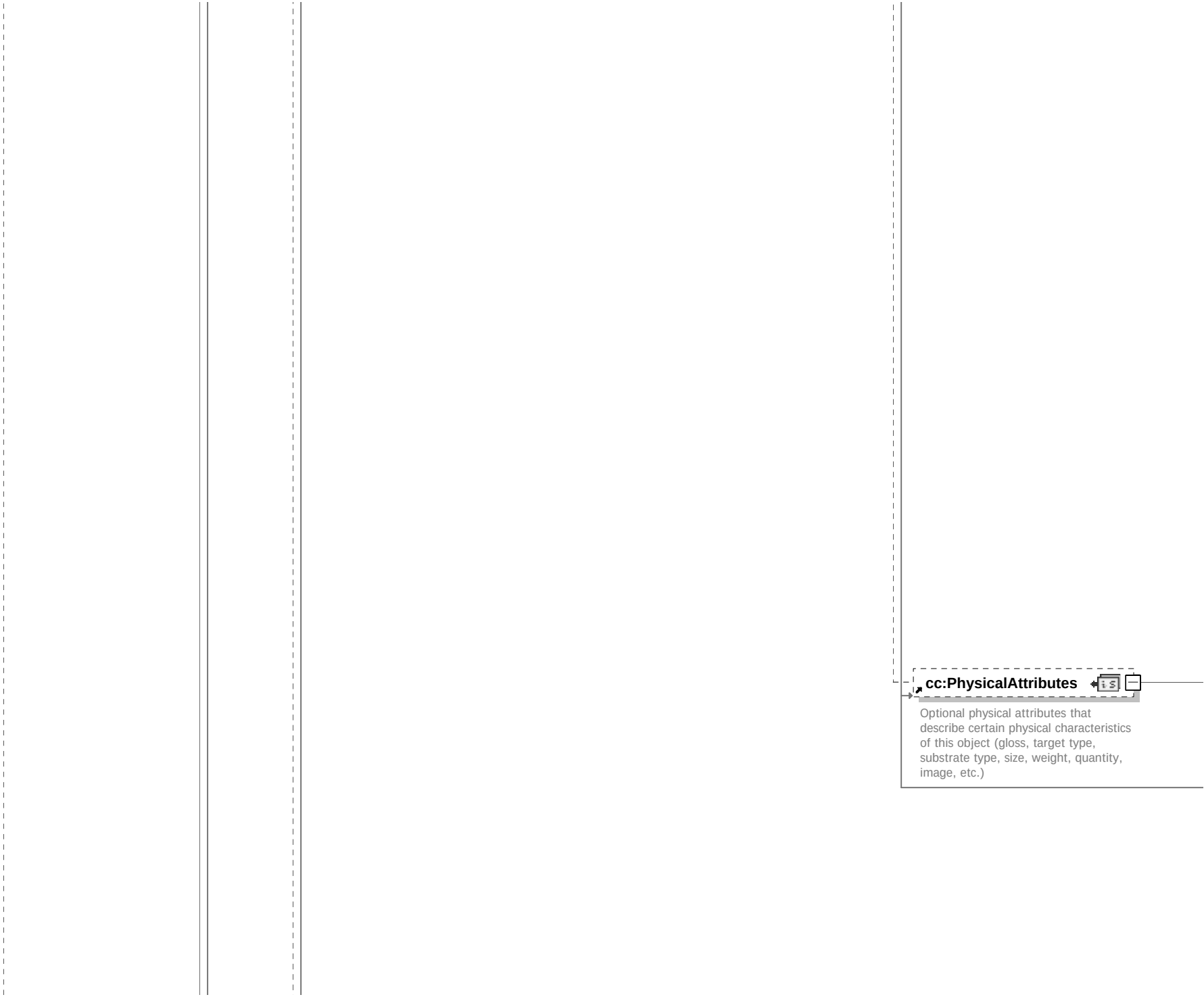

cc:Green
Percent green 0 (inclusive) to 100 (inclusive).
attributes
Units
Name
Comments
ColorSpecification
cc:CreationDate
creation date of object, specified as universal time format with time zone.
cc:ColorRecipe
0..∞
An element which contains a recipe(formula) consisting primarily of a list of named colorants and the amount of each.
cc:T...
0..∞
A named tag/value pair, generally use to hold custom meta-data about an object.
attributes
Name
Value
cc:Substrate
Enumerated type of substrate that the object represents.
cc:Process
Description of process or colorant file used for a Color Recipe.
attributes
Name
ID
isBase

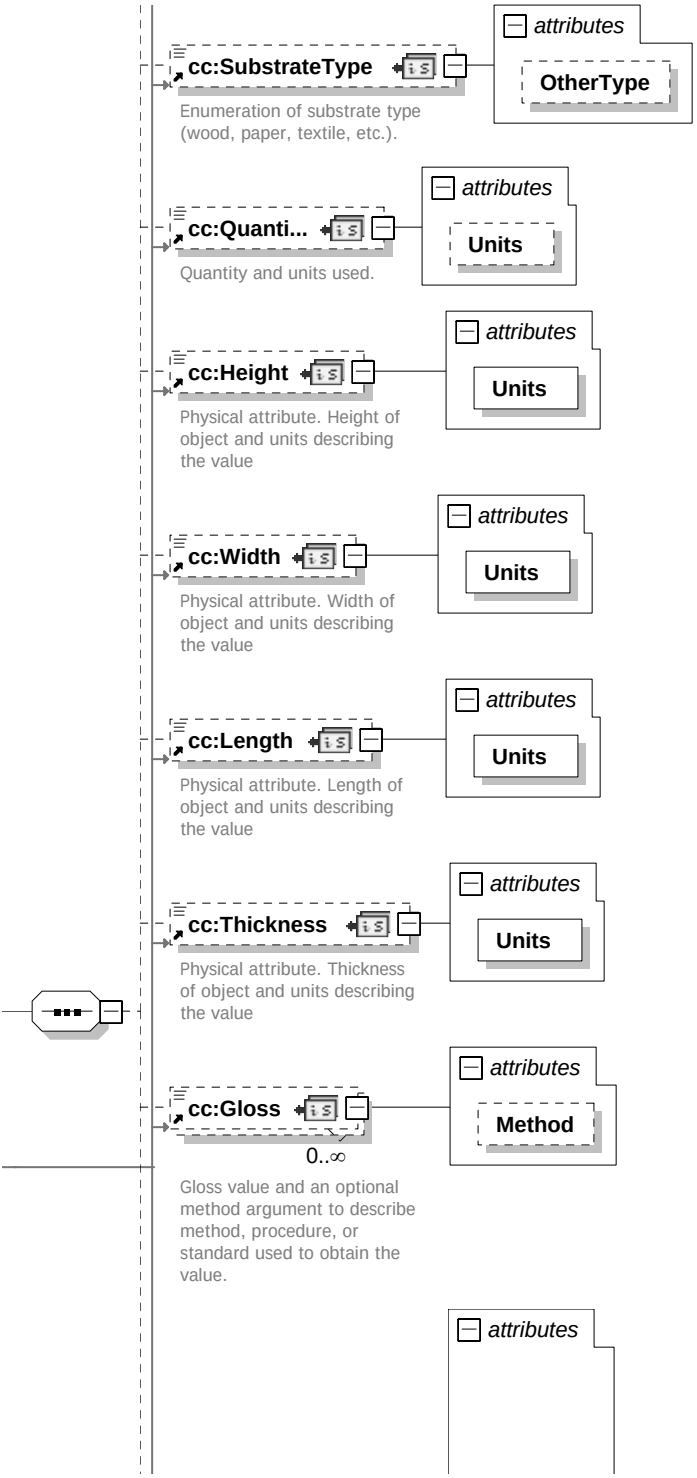


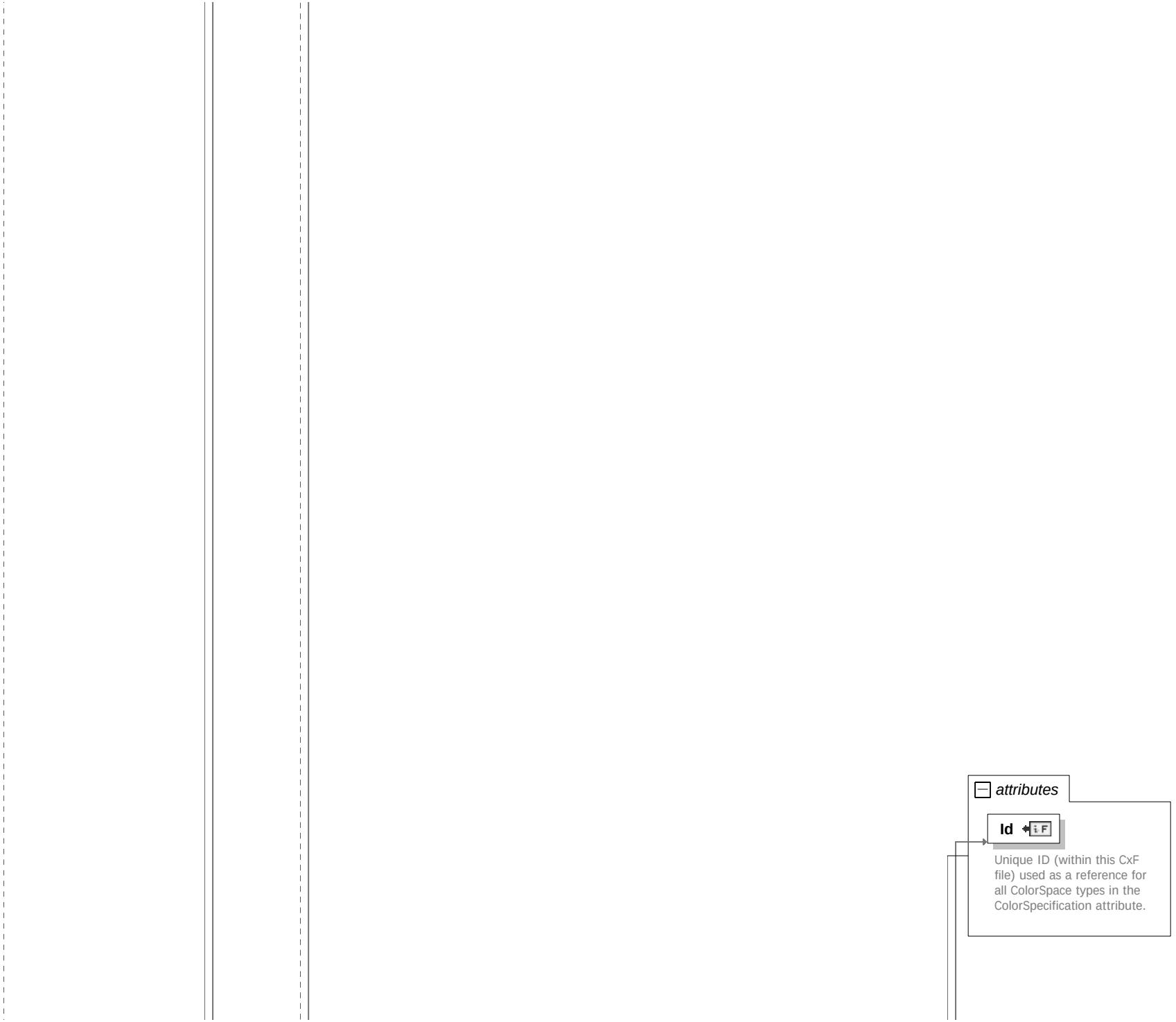
0..∞

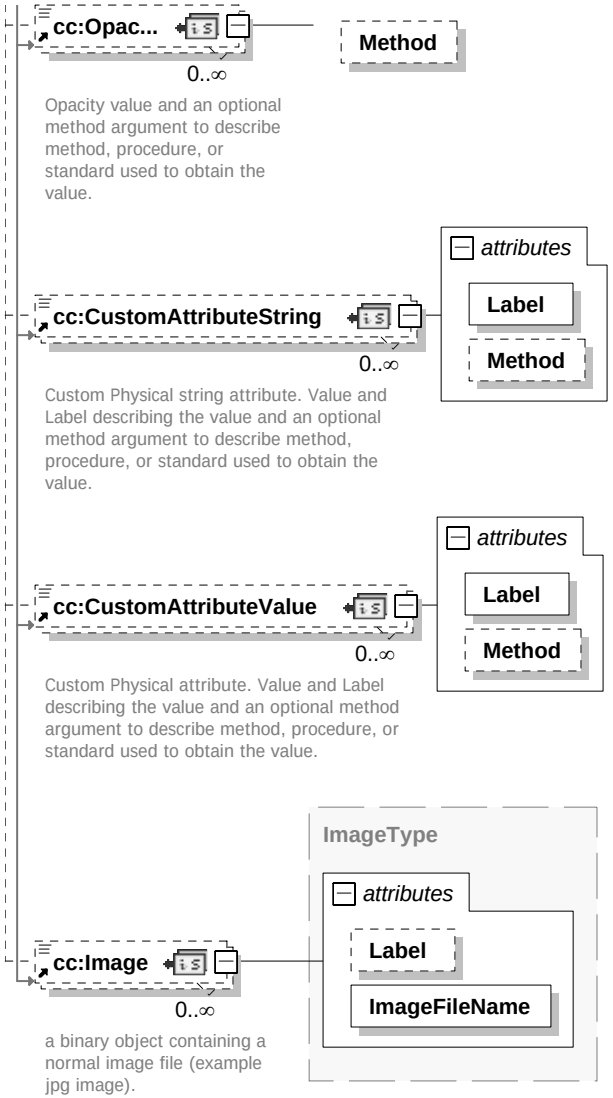
Named Collection(s) of Tags (name/value pairs) which allow customization or inclusion of additional information regarding this object and its properties.

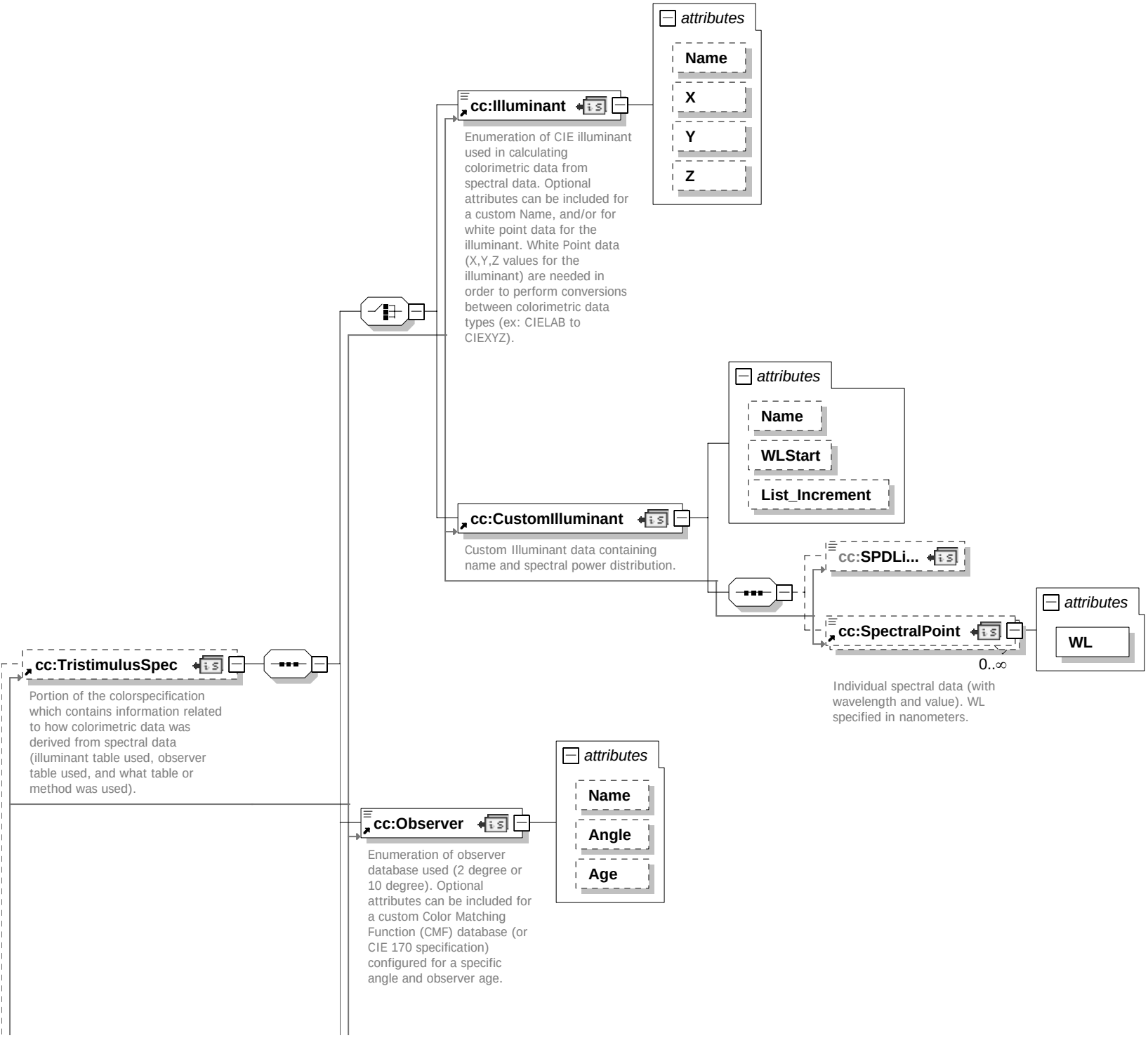

cc:Colorant
1..∞
Element which defines a specific colorant used within a formula. If the colorant is a base or resin the optional attribute isBase should be set to yes
cc:PartNumber
cc:Density
cc:Value
attributes
Name
KeyID
MeasureDate
Date time format is CCYY-MM-DDThh:mm:ss.SSS Z. Time zone must be specified either as UTC or UTC offset
ColorSpecification
cc:PrivateColorValues
0..∞
Color Value type used to represent private color value data generally protected using an encryption method.The encryption method used is not specified within CxF.
attributes
Name
cc:T...
0..∞
A named tag/value pair, generally use to hold custom meta-data about an object.
attributes
Name
Value
cc:TargetType
Standard target types, such as IT8.7/3, etc
attributes
OtherType
cc:FinishType
Enumeration of finish type (matte, polished, glossy, etc.).
attributes
OtherType

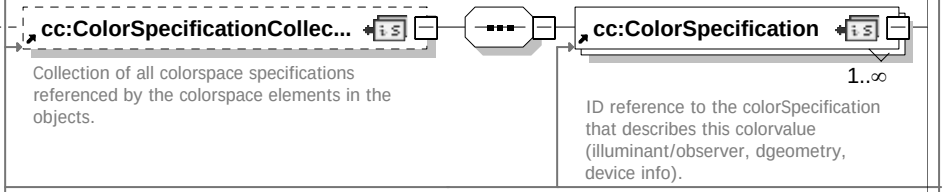

cc:PhysicalAttributes
Optional physical attributes that describe certain physical characteristics of this object (gloss, target type, substrate type, size, weight, quantity, image, etc.)

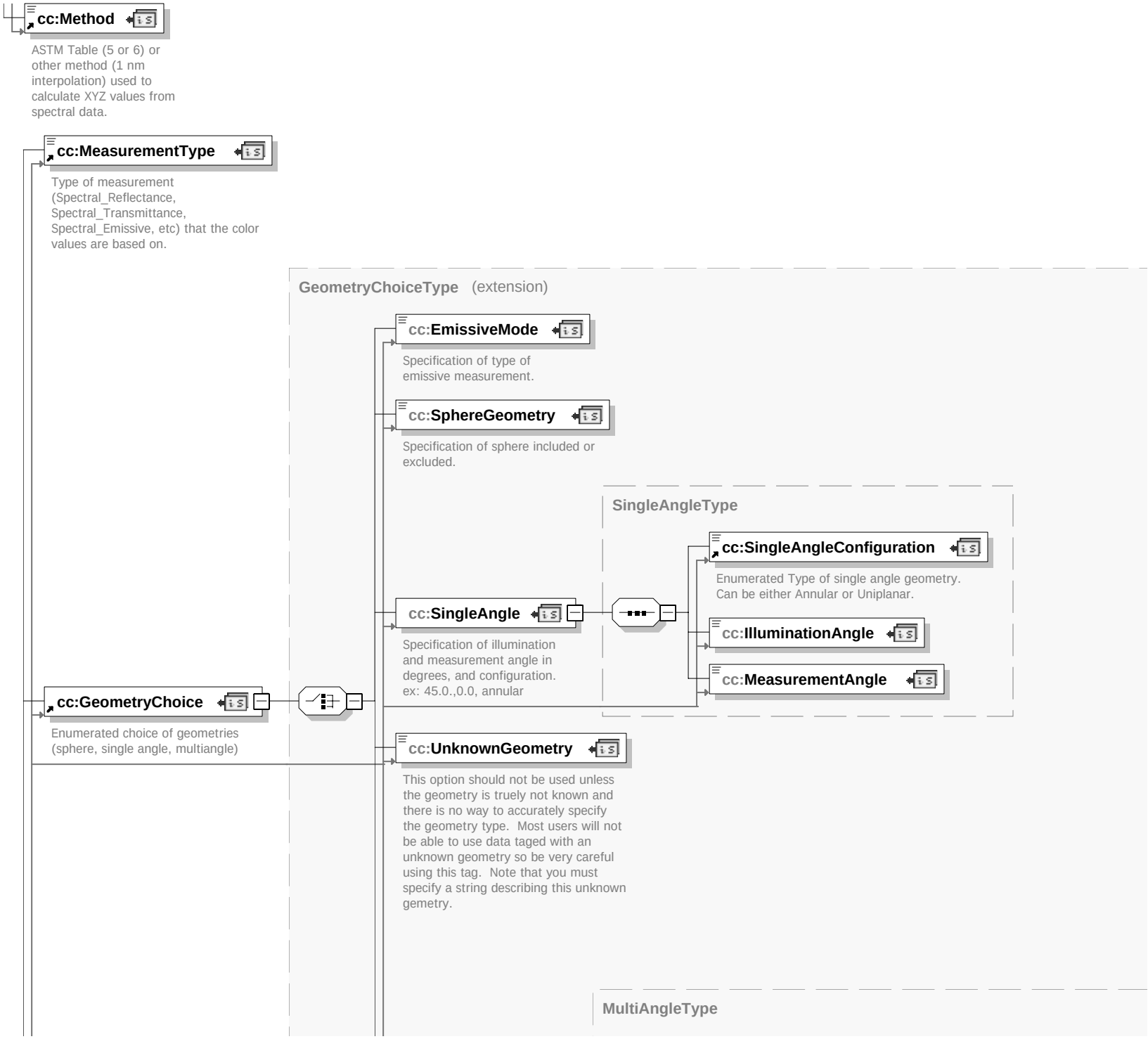

cc:SubstrateType
Enumeration of substrate type (wood, paper, textile, etc.).
attributes
OtherType
cc:Quanti...
Quantity and units used.
attributes
Units
cc:Height
Physical attribute. Height of object and units describing the value
attributes
Units
cc:Width
Physical attribute. Width of object and units describing the value
attributes
Units
cc:Length
Physical attribute. Length of object and units describing the value
attributes
Units
cc:Thickness
Physical attribute. Thickness of object and units describing the value
attributes
Units
cc:Gloss
0..∞
Gloss value and an optional method argument to describe method, procedure, or standard used to obtain the value.
attributes
Method
attributes

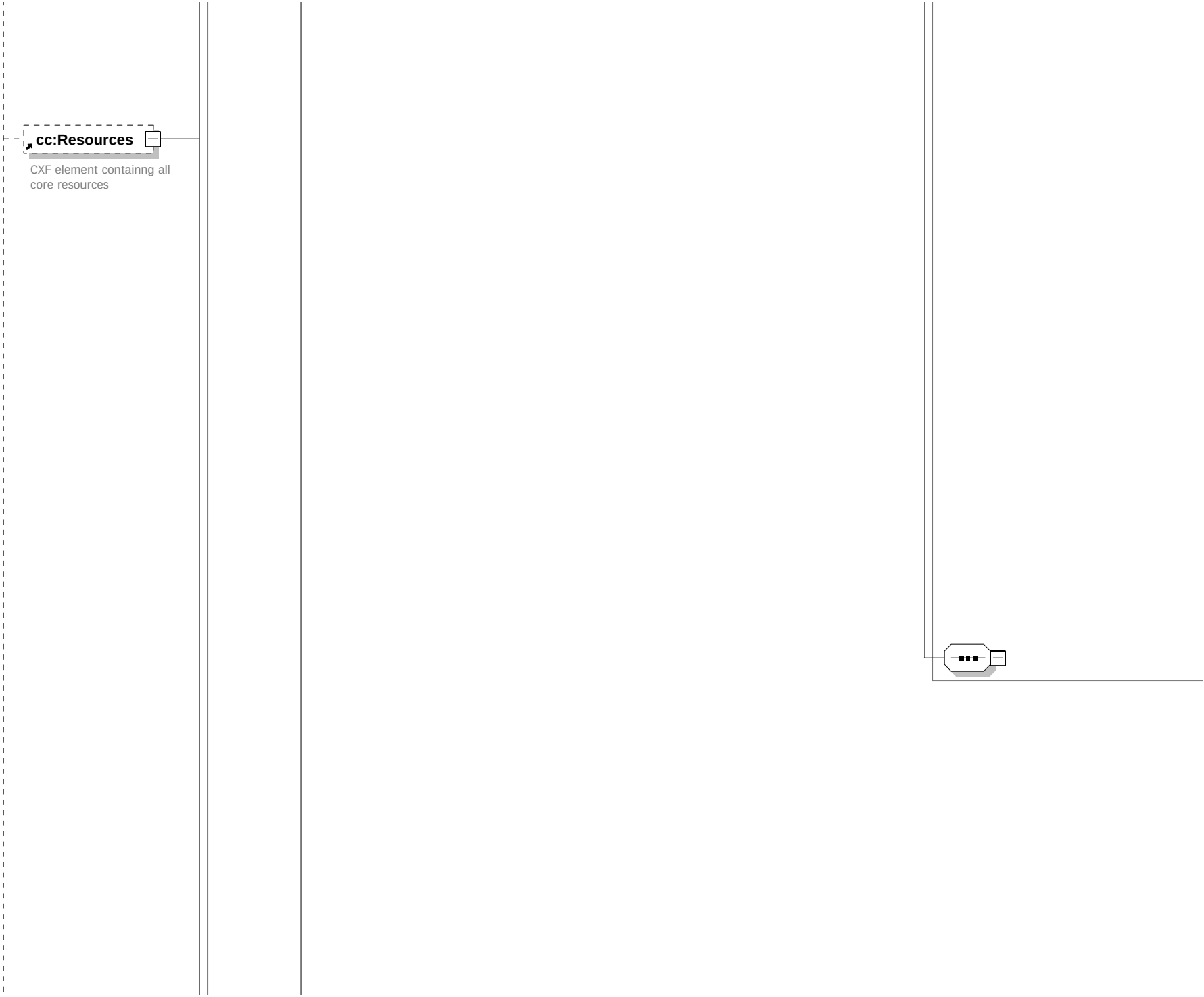

attributes
Id
Unique ID (within this CxF file) used as a reference for all ColorSpace types in the ColorSpecification attribute.

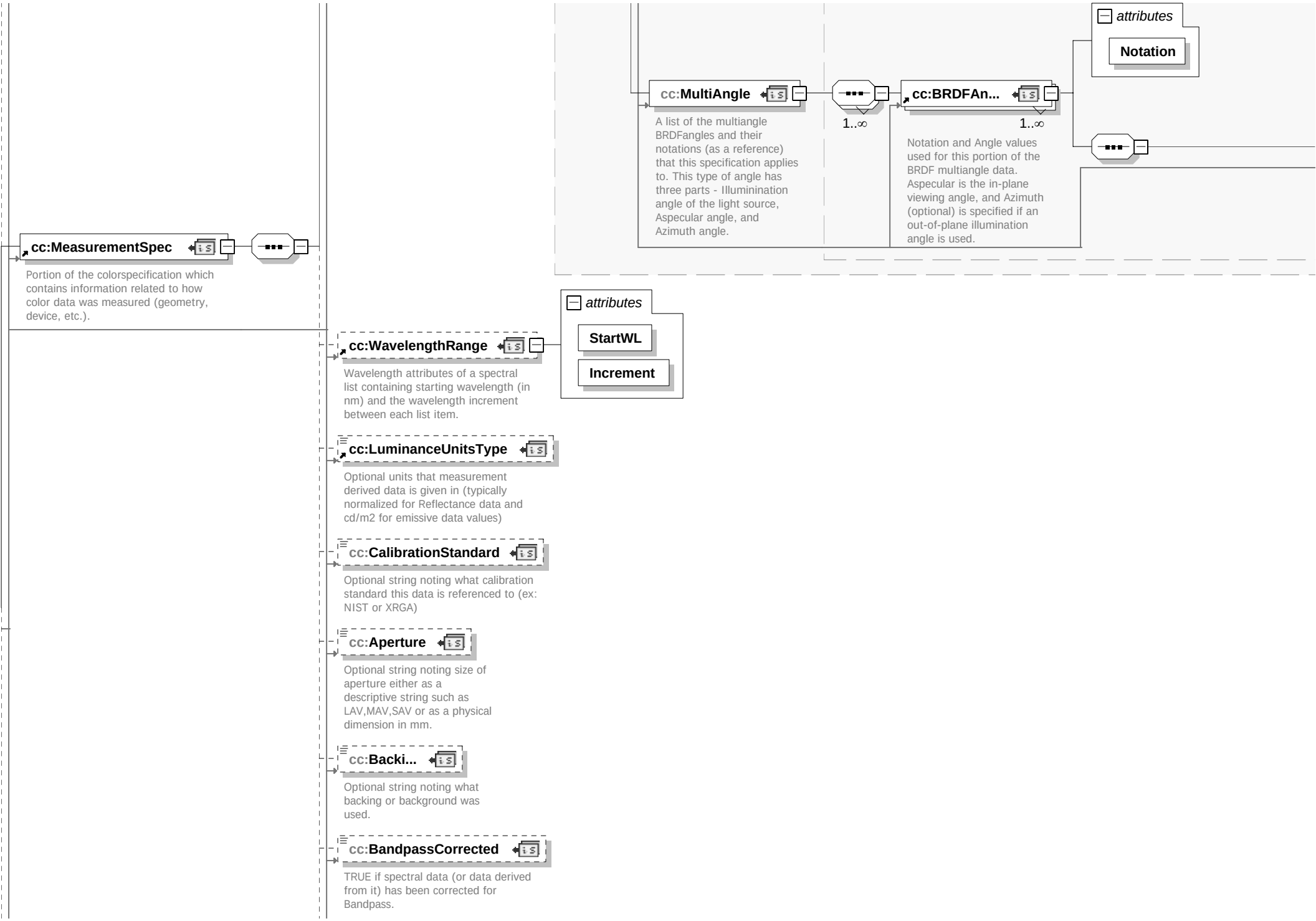

cc:Opac...
0..∞
Method
Opacity value and an optional method argument to describe method, procedure, or standard used to obtain the value.
attributes
Label
Method
cc:CustomAttributeString
0..∞
Custom Physical string attribute. Value and Label describing the value and an optional method argument to describe method, procedure, or standard used to obtain the value.
attributes
Label
Method
cc:CustomAttributeValue
0..∞
Custom Physical attribute. Value and Label describing the value and an optional method argument to describe method, procedure, or standard used to obtain the value.
ImageType
attributes
Label
ImageFileName
cc:Image
0..∞
a binary object containing a normal image file (example jpg image).

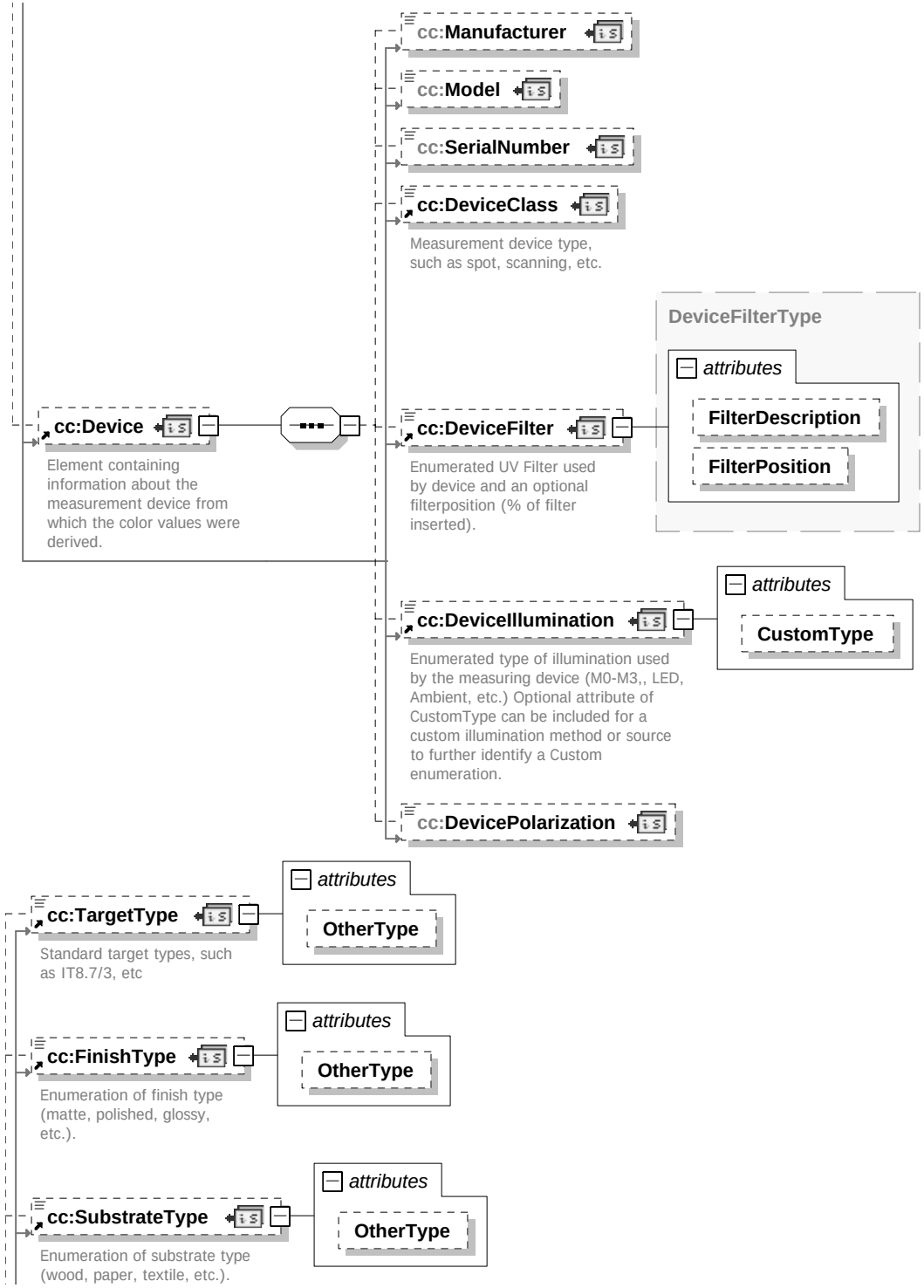

attributes
Name
X
Y
Z
cc:Illuminant
Enumeration of CIE illuminant used in calculating colorimetric data from spectral data. Optional attributes can be included for a custom Name, and/or for white point data for the illuminant. White Point data (X,Y,Z values for the illuminant) are needed in order to perform conversions between colorimetric data types (ex: CIELAB to CIEXYZ).
attributes
Name
WLStart
List_Increment
cc:CustomIlluminant
Custom Illuminant data containing name and spectral power distribution.
cc:SPDLi...
cc:SpectralPoint
0..∞
Individual spectral data (with wavelength and value). WL specified in nanometers.
attributes
WL
cc:TristimulusSpec
Portion of the colorspecification which contains information related to how colorimetric data was derived from spectral data (illuminant table used, observer table used, and what table or method was used).
attributes
Name
Angle
Age
cc:Observer
Enumeration of observer database used (2 degree or 10 degree). Optional attributes can be included for a custom Color Matching Function (CMF) database (or CIE 170 specification) configured for a specific angle and observer age.

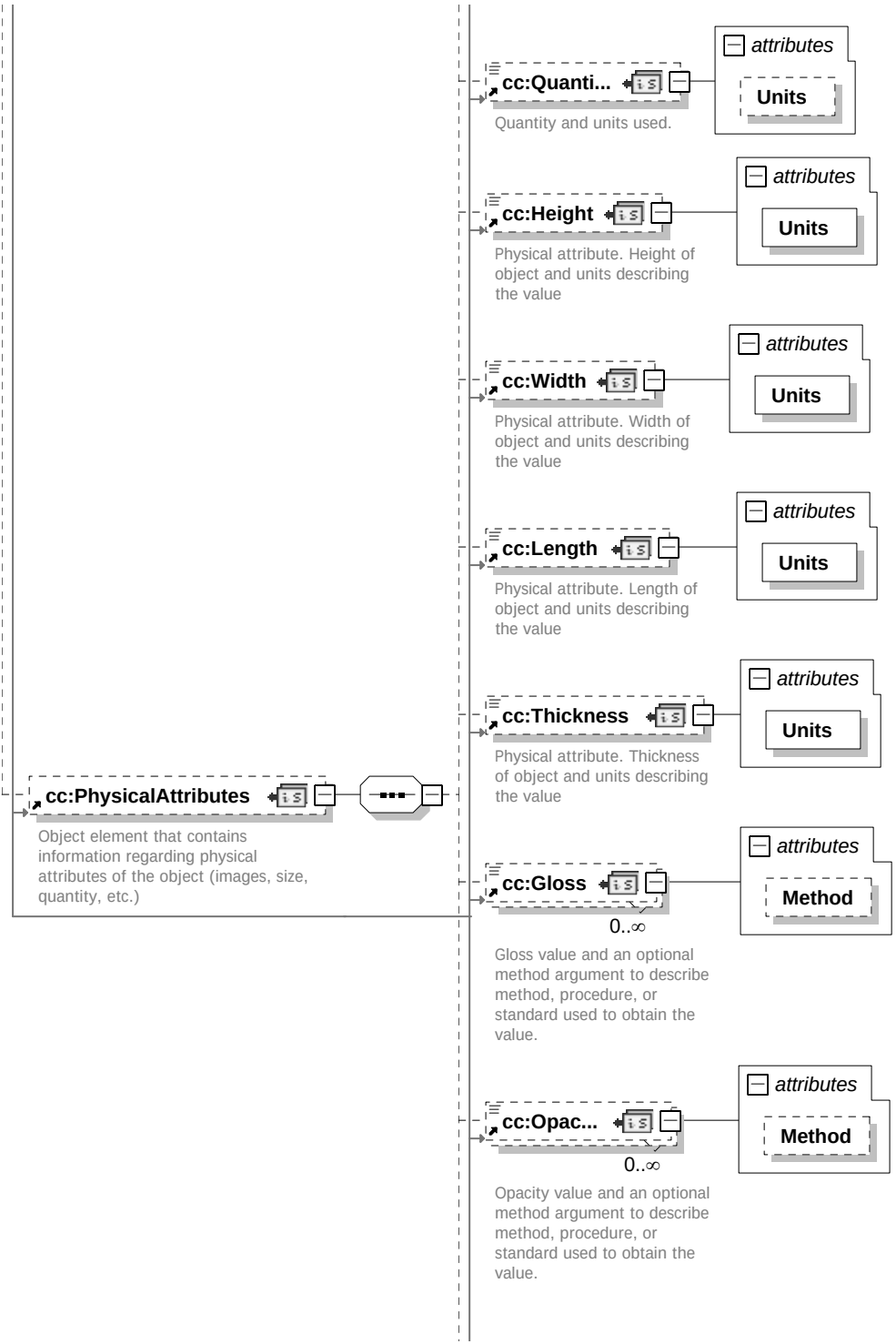

cc:ColorSpecificationCollec...
Collection of all colorspace specifications referenced by the colorspace elements in the objects.
cc:ColorSpecification
1..∞
ID reference to the colorSpecification that describes this colorvalue (illuminant/observer, dgeometry, device info).

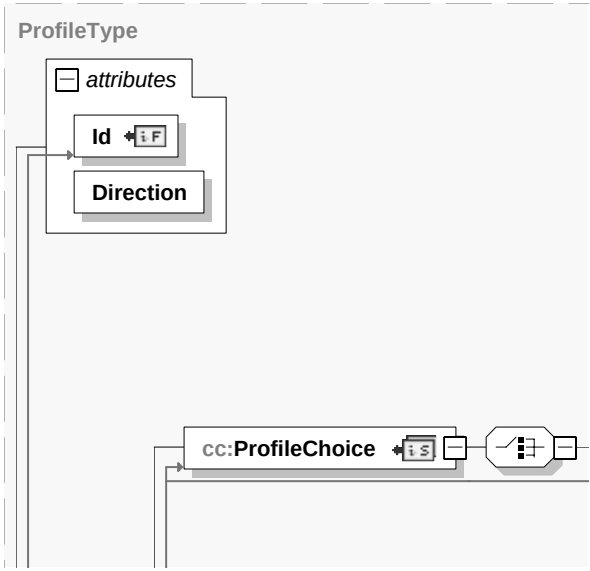

cc:Method
ASTM Table (5 or 6) or other method (1 nm interpolation) used to calculate XYZ values from spectral data.
cc:MeasurementType
Type of measurement (Spectral_Reflectance, Spectral_Transmittance, Spectral_Emissive, etc) that the color values are based on.
GeometryChoiceType (extension)
cc:EmissiveMode
Specification of type of emissive measurement.
cc:SphereGeometry
Specification of sphere included or excluded.
SingleAngleType
cc:SingleAngleConfiguration
Enumerated Type of single angle geometry. Can be either Annular or Uniplanar.
cc:SingleAngle
Specification of illumination and measurement angle in degrees, and configuration. ex: 45.0.,0.0, annular
cc:IlluminationAngle
cc:MeasurementAngle
cc:GeometryChoice
Enumerated choice of geometries (sphere, single angle, multiangle)
cc:UnknownGeometry
This option should not be used unless the geometry is truely not known and there is no way to accurately specify the geometry type. Most users will not be able to use data taged with an unknown geometry so be very careful using this tag. Note that you must specify a string describing this unknown gemetry.
MultiAngleType

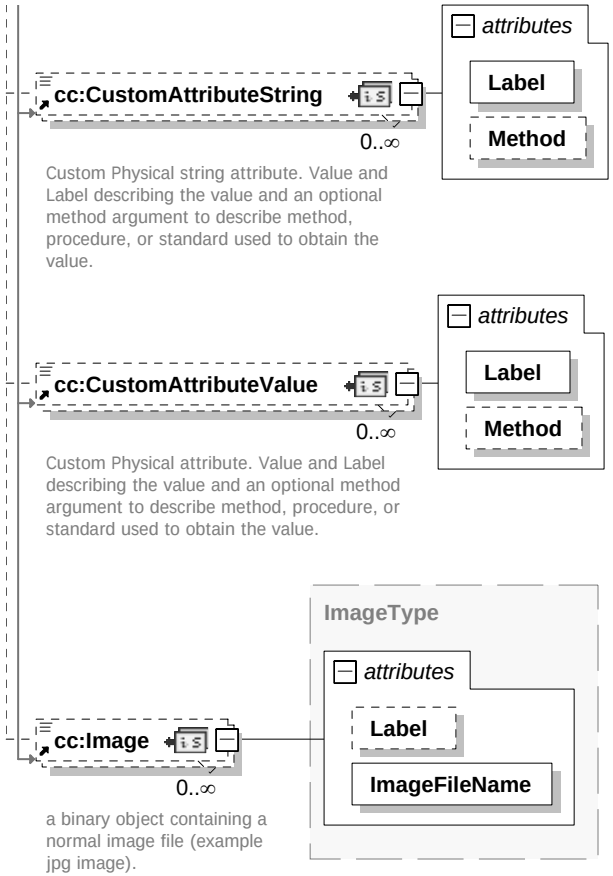

cc:Resources
CXF element containng all core resources

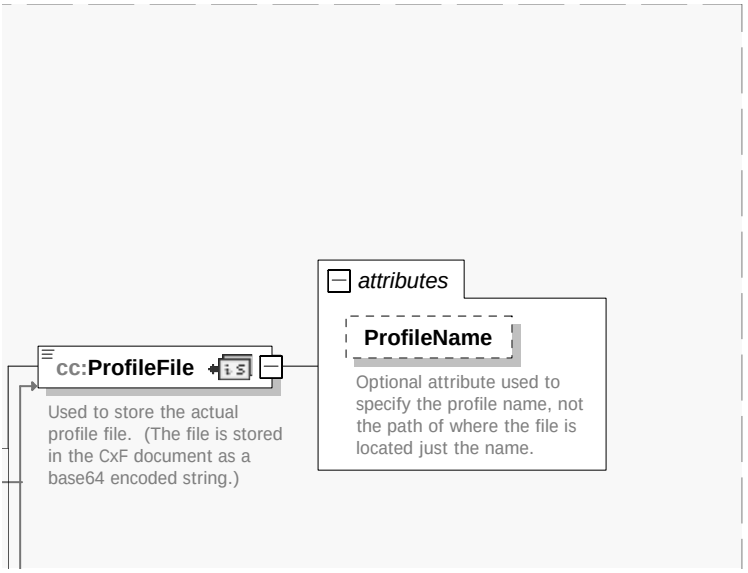

cc:MeasurementSpec
Portion of the colorspecification which contains information related to how color data was measured (geometry, device, etc.).
cc:MultiAngle
A list of the multiangle BRDFangles and their notations (as a reference) that this specification applies to. This type of angle has three parts - Illuminination angle of the light source, Aspecular angle, and Azimuth angle.
1..∞
cc:BRDFAn...
1..∞
Notation and Angle values used for this portion of the BRDF multiangle data. Aspecular is the in-plane viewing angle, and Azimuth (optional) is specified if an out-of-plane illumination angle is used.
attributes
Notation
attributes
StartWL
Increment
cc:WavelengthRange
Wavelength attributes of a spectral list containing starting wavelength (in nm) and the wavelength increment between each list item.
cc:LuminanceUnitsType
Optional units that measurement derived data is given in (typically normalized for Reflectance data and cd/m2 for emissive data values)
cc:CalibrationStandard
Optional string noting what calibration standard this data is referenced to (ex: NIST or XRGA)
cc:Aperture
Optional string noting size of aperture either as a descriptive string such as LAV,MAV,SAV or as a physical dimension in mm.
cc:Backi...
Optional string noting what backing or background was used.
cc:BandpassCorrected
TRUE if spectral data (or data derived from it) has been corrected for Bandpass.

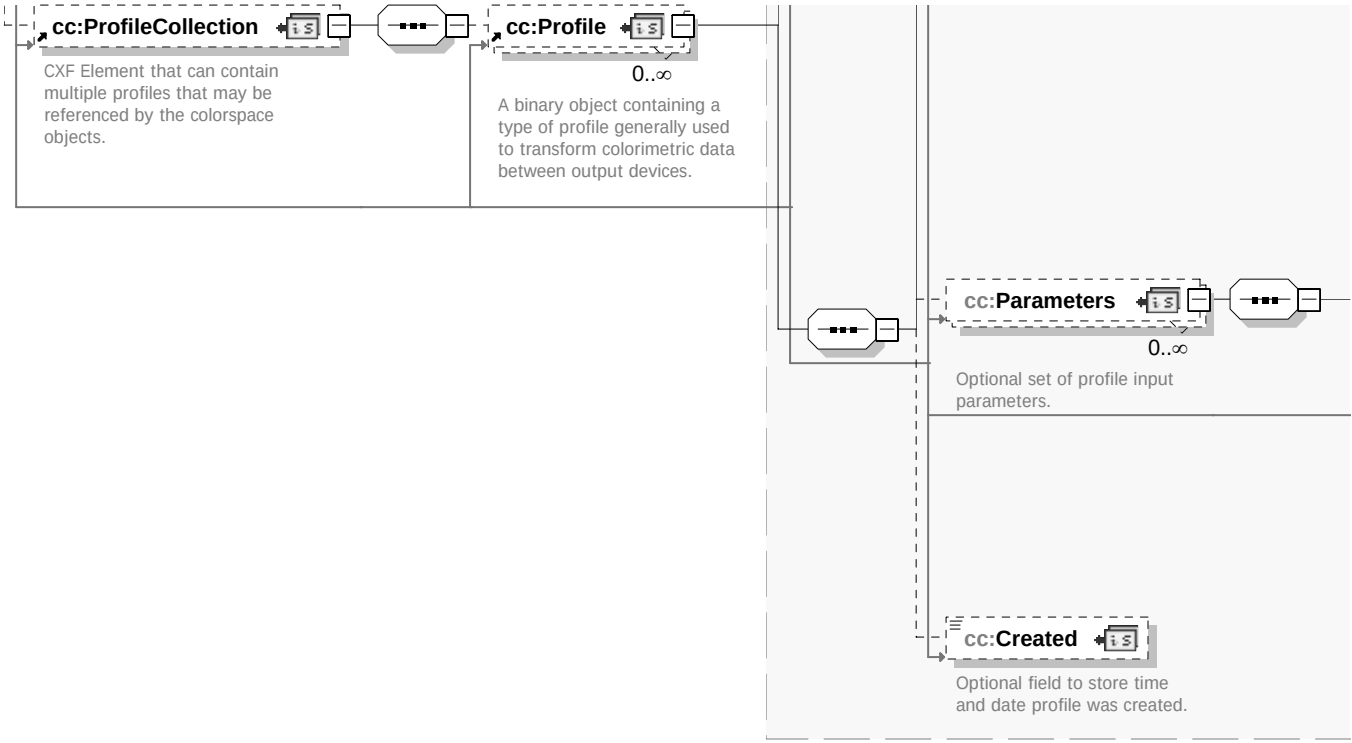

cc:Manufacturer
cc:Model
cc:SerialNumber
cc:DeviceClass
Measurement device type, such as spot, scanning, etc.
DeviceFilterType
attributes
FilterDescription
FilterPosition
cc:Device
Element containing information about the measurement device from which the color values were derived.
cc:DeviceFilter
Enumerated UV Filter used by device and an optional filterposition (% of filter inserted).
attributes
CustomType
cc:DeviceIllumination
Enumerated type of illumination used by the measuring device (M0-M3,, LED, Ambient, etc.) Optional attribute of CustomType can be included for a custom illumination method or source to further identify a Custom enumeration.
cc:DevicePolarization
attributes
OtherType
cc:TargetType
Standard target types, such as IT8.7/3, etc
attributes
OtherType
cc:FinishType
Enumeration of finish type (matte, polished, glossy, etc.).
attributes
OtherType
cc:SubstrateType
Enumeration of substrate type (wood, paper, textile, etc.).

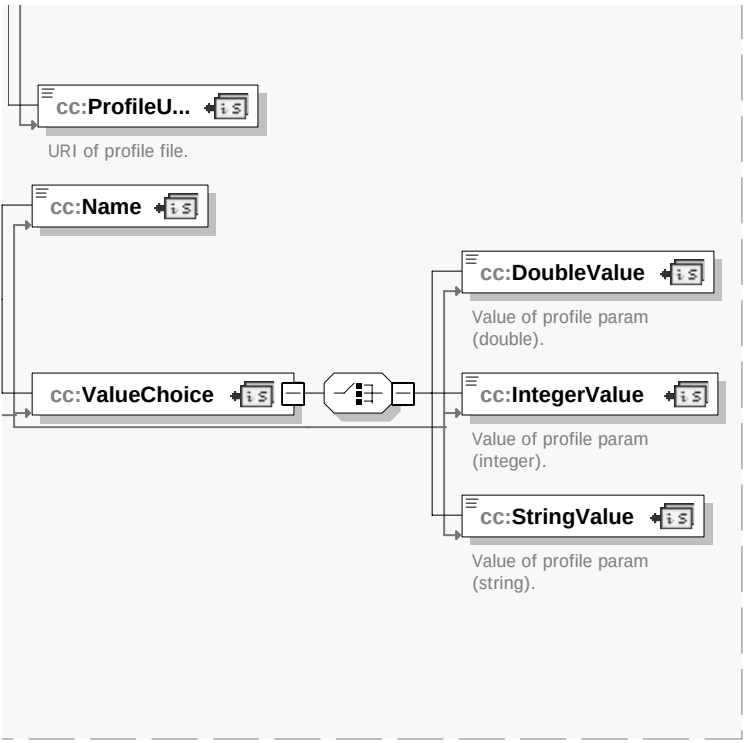

cc:PhysicalAttributes
Object element that contains information regarding physical attributes of the object (images, size, quantity, etc.)
cc:Quanti...
Quantity and units used.
attributes
Units
cc:Height
Physical attribute. Height of object and units describing the value
attributes
Units
cc:Width
Physical attribute. Width of object and units describing the value
attributes
Units
cc:Length
Physical attribute. Length of object and units describing the value
attributes
Units
cc:Thickness
Physical attribute. Thickness of object and units describing the value
attributes
Units
cc:Gloss
0..∞
Gloss value and an optional method argument to describe method, procedure, or standard used to obtain the value.
attributes
Method
cc:Opac...
0..∞
Opacity value and an optional method argument to describe method, procedure, or standard used to obtain the value.
attributes
Method

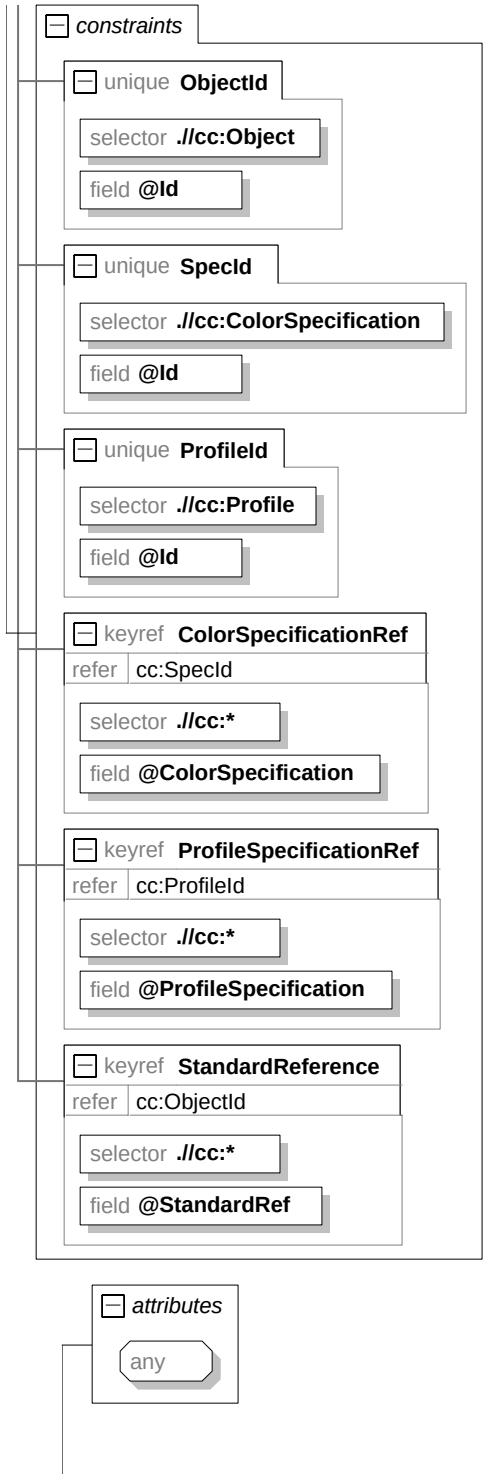

ProfileType
attributes
Id
Direction
cc:ProfileChoice

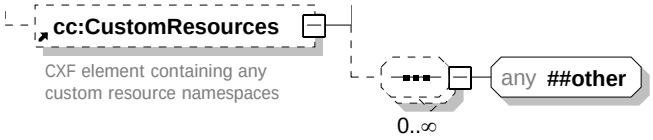

cc:CustomAttributeString
0..∞
Custom Physical string attribute. Value and Label describing the value and an optional method argument to describe method, procedure, or standard used to obtain the value.
attributes
Label
Method
cc:CustomAttributeValue
0..∞
Custom Physical attribute. Value and Label describing the value and an optional method argument to describe method, procedure, or standard used to obtain the value.
attributes
Label
Method
cc:Image
0..∞
a binary object containing a normal image file (example jpg image).
ImageType
attributes
Label
ImageFileName


cc:ProfileFile
Used to store the actual profile file. (The file is stored in the CxF document as a base64 encoded string.)
attributes
ProfileName
Optional attribute used to specify the profile name, not the path of where the file is located just the name.


cc:ProfileCollection
CXF Element that can contain multiple profiles that may be referenced by the colorspace objects.
cc:Profile
0..∞
A binary object containing a type of profile generally used to transform colorimetric data between output devices.
cc:Parameters
0..∞
Optional set of profile input parameters.
cc:Created
Optional field to store time and date profile was created.


cc:ProfileU...
URI of profile file.
cc:Name
cc:ValueChoice
cc:DoubleValue
Value of profile param (double).
cc:IntegerValue
Value of profile param (integer).
cc:StringValue
Value of profile param (string).


constraints
unique ObjectId
selector .//cc:Object
field @Id
unique SpecId
selector .//cc:ColorSpecification
field @Id
unique ProfileId
selector .//cc:Profile
field @Id
keyref ColorSpecificationRef
refer cc:SpecId
selector .//cc:*
field @ColorSpecification
keyref ProfileSpecificationRef
refer cc:ProfileId
selector .//cc:*
field @ProfileSpecification
keyref StandardReference
refer cc:ObjectId
selector .//cc:*
field @StandardRef
attributes
any


cc:CustomResources
CXF element containing any
custom resource namespaces
any ##other
0..∞