PHD for MATERIAL Components and Ingredients
[OV-07 Logical Data Model Subject Area]
System Architect
Sun Jun 18, 2006 14:57

Comment ---
This diagram depicts the material components, including container and contents, as well a separable objects for their make up of ingredients, substances, chemicals, and elements.

Product Hazard Data for MATERIAL Components and Ingredients

MATERIEL-CATALOG-ITEM-MATERIAL-PERIOD
Materiel_Catalog_Item_Identifier (FK)
Material_Identifier (FK)
Materiel_Catalog_Item_Material_Period_Start_Date
Materiel_Catalog_Item_Material_Period_Stop_Date
-Business Description ---
A contiguous time when the characteristics of the related MATERIAL are approved, authorized, or acknowledged to encompass the characteristics set forth in related MATERIEL-CATALOG-ITEM.

has satisfying material shown via

MATERIEL-CATALOG-ITEM
Materiel_Catalog_Item_Identifier
Materiel_Catalog_Item_Unique_Identifier
Materiel_Catalog_Item_Description_Text
Materiel_Catalog_Item_Estimated_Usefull_Life_Code
Materiel_Catalog_Item_Unit_Of_Issue_Code
Materiel_Catalog_Item_Manufacturer_Part_Number
Materiel_Catalog_Item_Bill_Materiel_Indicator
Materiel_Catalog_Item_Stratification_Code
Materiel_Catalog_Item_Specification_Text
Property_Plant_Equipment_Indicator_Code
Warranty_Type_Code
Depreciation_Plan_Identifier (FK)
Acquisition_Element_Type_Identifier (FK)
Supply_Class_Code (FK)
Manufacturer_Identifier . Organization_Unique_Identifier (FK)
-Business Description ---
A specific materiel item that can be purchased or produced by the DoD, unique either by composition (i.e., a computer configuration) or container (i.e., Pepsi in 12oz. can vs. 20oz bottle).

is the primary

is the component

MATERIEL-CATALOG-ITEM-COMPONENT
Primary_Materiel_Catalog_Item_Identifier . Materiel_Catalog_Item_Identifier (FK)
Component_Materiel_Catalog_Item . Materiel_Catalog_Item_Identifier (FK)
Materiel_Catalog_Item_Component_Quantity
-Business Description ---
A non-expendable item of material which is installed or affixed to material catalog item. It must be integral to the functioning of the main unit and not have the capacity to stand alone. Examples: memory board for a computer and probe for a photo ionizer. Adapted from Federal Materiel Management Desk Reference definition for "Component Part".

is the manufacturer of

MATERIAL-MANUFACTURER
Material_Identifier (FK)
Organization_Unique_Identifier (FK)
Material_Manufacture_Part_Number
-Business Description ---
The approved, authorized, or acknowledged creation of a MATERIAL by an ORGANIZATION.

is

ORGANIZATION
Organization_Unique_Identifier
Organization_Name
Organization_Description_Text
Organization_Category_Code
Organization_Primary_Industry_Category_Code
Organization_Primary_Activity_Code
Organization_Electronic_Fund_Transfer_Account_Number
Organization_Tax_Identifier
Organization_Classification_Code
Organization_Duration_Type_Code
Organization_DUNS_Number
-Business Description ---
An administrative structure with a mission.

has manufacturer identified by

has materiel catalog entry shown via

MATERIAL
Material_Identifier
Material_Appearance_Details_Text
Material_Appearance_Summary_Text
Material_Comments_Text
Material_Hazards_Emergency_Overview_Text
Material_Lot_Batch_Indicator
Material_Producer_Supplied_Name
Material_Type_Name
Material_Odor_Name . Odor_Name (FK)
-Business Description ---
A kind of distinctly identifiable physical matter about which the Department of Defense wants to track information.

Examples include gasoline, friable asbestos, hexavalent chromium, dry ice, the secret ingredient in a popular soft drink, a D battery, a depleted Uranium alloy, Coca Cola in a 12 oz Aluminum can, a 12 oz Aluminum can, a 5 gal can of eggshell white latex paint, a specific batch of jet fuel, and a six-pack of 16-oz bottles of ACME Orange Soda.

is manufactured as

is contained as

Material_Type_Name

Material_Lot_Batch_Indicator

CHEMICAL-ABSTRACT-SERVICE-REGISTRY-ITEM
Chemical_Abstract_Service_Registry_Item_Number
-Business Description ---
An assignment by the Chemical Abstract Service (CAS) to designate, at any given time, exactly one CHEMICAL. Over time, the same registry item can have been re assigned to another CHEMICAL. Therefore, over time, the same CHEMICAL-ABSTRACT-SERVICE-REGISTRY-ITEM may apply to more than one CHEMICAL, and the same CHEMICAL can be identified as more than one CHEMICAL-ABSTRACT-SERVICE-REGISTRY-ITEM.

has substance identified via

CHEMICAL-ABSTRACT-SERVICE-REGISTRY-ITEM-ASSIGNMENT
Chemical_Abstract_Service_Registry_Item_Number (FK)
Chemical_Identifier (FK)
Chemical_Abstract_Servce_Registry_Item_Assignment_Status_Code
-Business Description ---
A designation of a CHEMICAL as a CHEMICAL-ABSTRACT-SERVICE-REGISTRY-ITEM.

INGREDIENT-PERCENTAGE
Ingredient_Greater_Substance_Identifier (FK)
Ingredient_Contained_Substance_Identifier (FK)
Ingredient_Percentage_Measurement_Type_Name
Ingredient_Percentage_Type_Name
Ingredient_Percentage_Quantity
-Business Description ---
A comparative extent that the relevant INGREDIENT contributes to the relevant overall SUBSTANCE.

The percentage may be for one end of a range of allowable percentages. For example, the percentage of Sodium Chloride in saline solution might be at least 3% by weight.

Note that the sum of the INGREDIENT-PERCENTAGEs for all INGREDIENTs of a SUBSTANCE may total more than 100% since overlapping INGREDIENTs may be identified for the same SUBSTANCE. For example, the Toluene may make up 60% of a SUBSTANCE, Xylene may make 40% of the same SUBSTANCE, and Carbon-14 may make up 3% of the SUBSTANCE.

contributes to substance in

INGREDIENT
Ingredient_Contained_Substance_Identifier . Substance_Identifier (FK)
Ingredient_Greater_Substance_Identifier . Substance_Identifier (FK)
Ingredient_Considered_De_Minimus_Indicator
Ingredient_Considered_EPCRA_Hazardous_Indicator
Ingredient_Considered_Impurity_Indicator
Ingredient_Is_Stabilizer_Indicator
Ingredient_Non_Numerical_Percent_Text
Ingredient_Non_Numerical_Percent_Calculation_Text
-Business Description ---
A SUBSTANCE that is a direct constituent of another SUBSTANCE.

For example, SUBSTANCE water is an INGREDIENT of SUBSTANCE 95% solution of Isopropyl Alcohol. SUBSTANCE Sodium Chloride is an INGREDIENT of SUBSTANCE saline solution. Elemental Tin is an INGREDIENT of pewter. Copper Oxide is an INGREDIENT of green paint.

Note: A SUBSTANCE that is used in the manufacture of a second SUBSTANCE, but which does not retain its original molecular characteristics in the manufactured SUBSTANCE, is not a direct constituent.

contains

has role as constituent shown by

has CAS registry identified via

SUBSTANCE
Substance_Identifier . Material_Identifier (FK)
Substance_State_Complexity_Type_Name
Substance_Clarity_Name
Substance_Color_Name
Substance_Considered_Environmentally_Persistent_Indicator
Substance_Inert_Indicator
Substance_Gross_Structural_Type_Name
Substance_Radioactive_Decay_Rate
Substance_Radioactive_Decay_Rate_Unit_Of_Measure_Identifier . Unit_Of_Measure_Identifier (FK)
Substance_Self_Reactive_Indicator
Substance_Solid_Percent_By_Volume_Quantity
Substance_Solid_Percent_By_Weight_Quantity
Substance_Stable_Indicator
Substance_Stability_Normal_Conditions_Text
Substance_Volatile_Organic_Compound_Volume_Percent_Quantity
Substance_Volatile_Organic_Compound_Volume_Non_Numeric_Quantity_Text
Substance_Volatile_Organic_Compound_Weight_Percent_Quantity
Substance_Volatile_Organic_Compound_Weight_Non_Numeric_Quantity_Text
Substance_Water_N_Octanol_Partition_Coefficient_Quantity
-Business Description ---
A MATERIAL having no inherent limit in extent; therefore without size or shape. E.g., green paint, hydrochloric acid, dry ice, or Coke syrup.

has single physical state shown via

OBJECT
Object_Identifier . Material_Identifier (FK)
Object_Separability_Indicator
Object_Volatile_Organic_Compound_As_Applied_Ratio_Quantity
Object_Volatile_Organic_Compound_As_Applied_Ratio_Unit_Of_Measure_Identifier . Unit_Of_Measure_Identifier (FK)
Object_Volatile_Organic_Compound_As_Applied_Test_Method_Details_Text
Object_Volatile_Organic_Compound_As_Applied_Test_Method_Name
Object_Volatile_Organic_Compound_As_Applied_Test_Method_Summary_Text
-Business Description ---
A MATERIAL that is inherently limited in extent. That is, it is a kind of discrete item, such as a D battery, a 55 gallon drum of green paint, or a 10 oz ball of C4 explosive.

E.g.,
12 oz Coke in an Aluminum Can
Aluminum Can
Steel Can
6 pack of 12 Oz Coke in an Aluminum Can

contains

OBJECT-COMPONENT
Object_Identifier (FK)
Object_Component_Distinguishing_Identifier
Object_Component_Containment_Role_Indicator
Object_Component_Material_Identifier . Material_Identifier (FK)
Object_Component_Object_Count_Quantity
Object_Component_Temperature_Quantity
Object_Component_Temperature_Unit_Of_Measure_Identifier . Unit_Of_Measure_Identifier (FK)
Object_Component_Volume_Quantity
Object_Component_Volume_Unit_Of_Measure_Identifier . Unit_Of_Measure_Identifier (FK)
Object_Component_Weight_Quantity
Object_Component_Weight_Unit_Of_Measure_Identifier . Unit_Of_Measure_Identifier (FK)
-Business Description ---
A direct and clearly distinct constituent of the related OBJECTas such an item will be received, not as it might exist after creative maintenance and repair.

E.g., the green paint in a 55 gallon drum of green paint, a specific kind of mother board on a specific kind of lap top computer, a large crow bar in a tank repair tool kit, the 55 gallon drum in a 55 gallon drum of green paint, the 12 oz can of Coke in a 6-pack, or the plastic ring holding a 6-pack of Cokes together.

Note: If the parent OBJECT is a kit, each kit child OBJECT will be identified by the Object_Component_Material_ Identifier.

MATERIAL-LOT
Material_Lot_Identifier . Material_Identifier (FK)
Material_Lot_Batch_Number
Material_Lot_Creation_Date
Material_Lot_Original_Material_Identifier . Material_Identifier (FK)
-Business Description ---
A separable quantity of MATERIAL (either a quantity of a SUBSTANCE (such as jet fuel) or a group of individual OBJECTs (such as canned meat) that were created at the same time in the same way with the same components, therefore, having potentially identical characteristics that might vary from those of another such group.

For a SUBSTANCE, such a group is typically called a batch. For an OBJECT, such a group is typically called a lot. Some individual OBJECTs, such as cans of paint are grouped according to the batch contained therein.

Object_Separability_Indicator

Object_Component_Containment_Role_Indicator

Substance_Gross_Structural_Type_Name

Substance_State_Complexity_Type_Name

COMBINATION-SUBSTANCE
Combination_Substance_Identifier . Substance_Identifier (FK)
Combination_Substance_Type_Name
-Business Description ---
A SUBSTANCE that has direct constituents of other SUBSTANCEs that retain their own chemical properties and makeup as before they were included in the COMBINATION-SUBSTANCE. Physical properties of a COMBINATION-SUBSTANCE, e.g., the melting point, may differ considerably from those of its constituents.

Included are mixtures, alloys, emulsions, suspensions, colloids, nanoparticle matrixes, solutions, and combinations of isomers having the same molecular formula.

Examples are gasoline, air, freeze dried Neapolitan ice cream, a slurry of wood chips in oil, stainless steel, Toluene and water, Xylene (mixed isomers).

CHEMICAL
Chemical_Identifier . Substance_Identifier (FK)
Chemical_Type_Name
-Business Description ---
A macroscopically homogenous SUBSTANCE that exists as such regardless of its physical state.

Examples are gasoline, the secret ingredient in a popular soft drink, and depleted Uranium alloy.

SUBSTANCE-PHYSICAL-STATE
Substance_Physical_State_Identifier . Substance_Identifier (FK)
Substance_Physical_State_Nominal_Pressure_Quantity
Substance_Physical_State_Nominal_Pressure_Unit_Of_Measure_Identifier . Unit_Of_Measure_Identifier (FK)
Substance_Physical_State_Nominal_Temperature
Substance_Physical_State_Nominal_Temperature_Unit_Of_Measure_Identifier . Unit_Of_Measure_Identifier (FK)
Substance_Physical_State_Original_Substance_Identifier . Substance_Identifier (FK)
Substance_Physical_State_Specific_Gravity_Quantity
Substance_Physical_State_Type_Name
-Business Description ---
A SUBSTANCE with only one basic observable structure. That is, a SUBSTANCE that is entirely in the form of a gas, liquid, solid, or plasma at standard temperature and pressure or other specified temperature or pressure.

Examples include gaseous carbon dioxide, dry ice (solid carbon dioxide), friable asbestos, and heavy water.

INSEPARABLE-OBJECT
Object_Identifier (FK)
Inseparable_Object_Maximum_Volume_Capacity_Quantity
Inseparable_Object_Maximum_Volume_Capacity_Unit_Of_Measure_Identifier . Unit_Of_Measure_Identifier (FK)
Inseparable_Object_Maximum_Weight_Capacity_Quantity
Inseparable_Object_Maximum_Weight_Capacity_Unit_Of_Measure_Identifier . Unit_Of_Measure_Identifier (FK)
Inseparable_Object_Tare_Weight_Quantity
Inseparable_Object_Tare_Weight_Unit_Of_Measure_Identifier . Unit_Of_Measure_Identifier (FK)
Packaging_Type_Identifier (FK)
-Business Description ---
An OBJECT that consists only of one or more component parts that are not easily detachable, and that retain their distinct character before, during, and after use.

Typically, an INSEPARABLE-OBJECT is used as a container, A device, or a tool.

CONTAINING-COMPONENT
Object_Identifier (FK)
Containing_Component_Distinguishing_Identifier . Object_Component_Distinguishing_Identifier (FK)
Containing_Component_Pressure_Quantity
Containing_Component_Pressure_Unit_Of_Measure_Identifier . Unit_Of_Measure_Identifier (FK)
-Business Description ---
An OBJECT-COMPONENT that acts, at least in part, as a vessel for at least one other OBJECT-COMPONENT when such an item will be received, not as it might exist during or after use, creative maintenance, or repair.

E.g., the 55 gallon drum of a drum of green paint.

Note: A MATERIAL can act as a CONTAINING-COMPONENT of one OBJECT and also act as a NON-CONTAINING-COMPONENT of a second OBJECT. For example, the MATERIAL Bottle is a CONTAINING-COMPONENT of the OBJECT Bottle-of-orange-soda. The MATERIAL Bottle also is a NON-CONTAINING-COMPONENT of the OBJECT 24-pack-of-emptied-bottles, a waste or byproduct OBJECT.

NON-CONTAINING-COMPONENT
Object_Identifier (FK)
Object_Component_Distinguishing_Identifier (FK)
Non_Containing_Component_Contained_Indicator
-Business Description ---
A OBJECT-COMPONENT that does not act, at least in part, as a vessel for at least one other direct OBJECT-COMPONENT of the relevant OBJECT when such an item will be received, not as it might exist during or after use, creative maintenance, or repair.

E.g., the green paint within a drum of green paint, a plastic label on a drum of green paint, a lead seal on a munitions container, a rope that ties parts of an OBJECT together when it is received, or crumpled tissue used as insulating and cushioning material for fruit in a box of fruit.

Note: A MATERIAL can act as a NON-CONTAINING-COMPONENT of one OBJECT and also act as a CONTAINING-COMPONENT of a second OBJECT.

categorizes

PACKAGING-TYPE
Packaging_Type_Identifier
Packaging_Type_Code
Packaging_Type_Description_Text
Packaging_Type_Name
-Business Description ---
A category that can be applied to a container, receptacle, or vessel within which can be placed a SUBSTANCE, an OBJECT, or a set of identical or otherwise related OBJECTs.

Chemical_Type_Name

ISOTOPE
Isotope_Identifier . Substance_Identifier (FK)
Chemical_Element_Identifier (FK)
Isotope_Atomic_Mass_Quantity
Isotope_Neutron_Quantity
Isotope_Radioactive_Indicator
-Business Description ---
A SUBSTANCE consisting entirely of atoms of one CHEMICAL-ELEMENT having the same number of neutrons in each atoms' nucleus.

contains

CHEMICAL-ELEMENT
Chemical_Element_Identifier . Chemical_Identifier (FK)
Chemical_Element_Atomic_Mass_Quantity
-Business Description ---
A CHEMICAL consisting entirely of unbonded atoms, each having the same number of protons in the atom's nucleus.

ionizes into

CHEMICAL-ELEMENT-OXIDATION-STATE
Chemical_Element_Oxidation_State_Identifier . Substance_Identifier (FK)
Chemical_Element_Identifier (FK)
Chemical_Element_Oxidation_State_Plus_Minus_Indicator
Chemical_Element_Oxidation_State_Count_Quantity
-Business Description ---
A SUBSTANCE consisting entirely of ions of one CHEMICAL-ELEMENT, each having donated or received the same number of electrons during its ionization.

For example, the CHEMICAL-ELEMENT-OXIDATION-STATE Hexavalent Chromium (Chromium VI) has donated six electrons during ionization; therefore, it has an oxidation state of "+6".

Isotope_Radioactive_Indicator

has containing compound shown via

RADIOISOTOPE
Radioisotope_Identifier . Isotope_Identifier (FK)
Radioisotope_Half_Life_Quantity
Radioisotope_Half_Life_Unit_Of_Measure_Identifier . Unit_Of_Measure_Identifier (FK)
-Business Description ---
An ISOTOPE that undergoes spontaneous nuclear disintegration.

CHEMICAL-COMPOUND-ELEMENT
Chemical_Compound_Identifier (FK)
Chemical_Element_Identifier (FK)
-Business Description ---
The inclusion of one or more atoms of the relevant CHEMICAL-ELEMENT within a molecule of the relevant CHEMICAL-COMPOUND.

has contained element shown via

CHEMICAL-COMPOUND
Chemical_Compound_Identifier . Chemical_Identifier (FK)
Chemical_Compound_Molecular_Formula_Text
Chemical_Compound_Molecular_Weight
-Business Description ---
A CHEMICAL consisting entirely of molecules consisting of more than one bonded atom, each molecule having the same number of atoms of a given atomic number, and each having those atoms bonded and arranged within the molecule in the same way. Distinct isomers, such as dextrose and levulose, are separate CHEMICAL-COMPOUNDs.

E.g., m-Xylene; o-Xylene.

Substance_Physical_State_Type_Name

GAS
Gas_Identifier . Substance_Physical_State_Identifier (FK)
Gas_Lower_Concentration_Explosive_Limit_Percent_Quantity
Gas_Upper_Concentration_Explosive_Limit_Percent_Quantity
-Business Description ---
A SUBSTANCE that is in a form that exhibits very low density and viscosity, relatively great expansion and contraction with changes in pressure and temperature, the ability to diffuse readily, and the spontaneous tendency to become distributed uniformly throughout any container.

LIQUID
Liquid_Identifier . Substance_Physical_State_Identifier (FK)
Liquid_Apparent_Fluidity_Indicator
Liquid_pH_Description_Text
Liquid_pH_Quantity
Liquid_Relative_Evaporation_Rate
Liquid_Viscosity_Quantity
Liquid_Viscosity_Unit_Of_Measure_Identifier . Unit_Of_Measure_Identifier (FK)
-Business Description ---
A SUBSTANCE that is in a form that exhibits readiness to flow, little or no tendency to disperse, and relatively low compressibility.

SOLID
Solid_Identifier . Substance_Physical_State_Identifier (FK)
Solid_Granulated_Indicator
-Business Description ---
A SUBSTANCE that is in a form that has definite shape and volume at standard temperature and pressure.

Solid_Granulated_Indicator

GRANULATED-SOLID
Solid_Identifier (FK)
Granulated_Solid_Amorphous_Indicator
Granulated_Solid_Apparent_Density_Quantity
Granulated_Solid_Apparent_Density_Unit_Of_Measure_Identifier . Unit_Of_Measure_Identifier (FK)
Granulated_Solid_Apparent_Specific_Surface_Area
Granulated_Solid_Apparent_Specific_Surface_Area_Unit_Of_Measure_Identifier . Unit_Of_Measure_Identifier (FK)
Granulated_Solid_Powder_Indicator
-Business Description ---
A SOLID that consists of small solid particles, each having a size, shape, and micro structure.