buildingSMART	exchange requirements for the "Basic HandOver to Facility Management"					IFC Model View Definition	
Object Type / Attribute Groups / Property	**Definitions and notes**	**Examples and further explanations**	**Comments**	**Export**	**Import**	**Ref. File**	**IFC Model Representation**	**Comments**
Meta data								
Exchange file							HEADER section	
Exchange purpose	Designation of the exchange file to be "HandOver to Facility Management"	ViewDefinition [CoordinationView, FMHandOverView]' -- system to assign the standard view definition name	*[COBIE2]: defined by external specification*	**M**		x	file_description(('ViewDefinition [CoordinationView, FMHandOverView]'), '2;1');	to be done automatically by the application
Author	Name of the creator of the FM HandOver data set	user setting - application need to provide UI	*[COBIE2]: reqd - worksheet.Created.By*	**M**		x	file_name with field author	The UI of sending application shall enable the user to fill in the data
Company	Company name of the Author	user setting - application need to provide UI	*[COBIE2]: reqd - Contact.Company*	**M**		x	file_name with field organization	The UI of sending application shall enable the user to fill in the data
Originating application	Name of the software application that created the data set	system setting by software vendor, shall be specific, i.e. including version information	*[COBIE2]: reqd if created by external system worksheet.ExtSystem*	**M**		x	file_name with field originating_system	The version and/or build number should be as specific as possible.
Date of creation	Time stamp of the creation time	2008-04-12T15:27:46	*[COBIE2]: reqd - worksheet.CreatedOn*	**M**		x	file_name with field time_stamp	to be done automatically by the application
Project		there has to be exactly one project object in the exchange file	*[COBIE2]: project information required only if created by external system. See Facility worksheet*				**IfcProject**	
Project Attributes								
Software unique id	Object identifier (formated as GUID or UUID) to uniquely identify the software object	70ce2f2b-a5f8-4ab7-bc7f-6a838a353f25, has to be maintained by the application (e.g. for re-export)	*[FM-10]: software key, does not yield any human interpretation* *[COBIE2]: reqd if created by external system Facility.ExtProjectIdentifier*	**M**		x	IfcProject.GlobalId	70ce2f2b-a5f8-4ab7-bc7f-6a838a353f25 is exchanged using compression 1mpYyhfVXAjxn$QeEADJyb
Number (or ID)	User assigned (short) name or number	delivery contracts may demand a certain naming convention	*[COBIE2]: optional - put in Attribute worksheet if used*	**M**		x	IfcProject.Name	
Name	User assigned name (full name)	for informational purposes only	*[COBIE2]: reqd - Facility.ProjectName*	**M**		x	IfcProject.LongName	
Description	*OPTIONAL User assigned optional description*	*not required for export*	*[General]: Optional, not checked*	**O**		x		
Phase	*OPTIONAL Design stage*	*conceptual design, detailed design, ..., for informational purposes only*	*[COBIE2]: optional - put in Attribute worksheet if used*	**O**		-	IfcProject.Phase	
Project units								
Length unit	Default length unit for all length measures in the data set	[m], [mm], [inch], [feet]	*[COBIE2]: reqd - Facility.LinearUnit*	**M**		x	IfcProject.UnitsInContext (IfcUnitAssignment) with IfcSIUnit.Name = METRE	
Area unit	Default area unit for all length measures in the data set	[m²], [square feet]	*[COBIE2]: reqd - Facility.AreaUnit and Facility.AreaMeasurement*	**M**		x	IfcProject.UnitsInContext (IfcUnitAssignment) with IfcSIUnit.Name = SQUARE_METRE	
Volume unit	Default volume unit for all length measures in the data set	[m³], [cubic feet]	*[COBIE2]: reqd - Facilty.VolumeUnit*	**M**		x	IfcProject.UnitsInContext (IfcUnitAssignment) with IfcSIUnit.Name = CUBIC_METRE	
Project decomposition								
Site contained in Project	Link to the top-level node of the spatial structure, being a site	either the project has a link to site, or to the building, but not both in parallel	*[General]: having a site object is optional in Basic FM HandOver* *[FM-10]: one side allowed* *[COBIE2]: one site allowed per COBie2 file*	**M/O**		x	IfcRelAggregates	
Building contained in Project	Link to the top-level node of the spatial structure, being a building	either the project has a link to site, or to the building, but not both in parallel	*[General]: has to be given, if there is no site* *[FM-10]: one or several buildings allowed* *[COBIE2]: one building allowed per COBie2 file*	**M/O**		-	IfcRelAggregates	NOTE in the ArchitecturalHandOver it is restricted to one site object in the IFC file only
Site		there can be zero or one site object in the exchange file	*[COBIE2]: site information required only if created by external system. See Facility worksheet*				**IfcSite**	
Site Attributes								
Software unique id	Object identifier (formated as GUID or UUID) to uniquely identify the software object	70ce2f2b-a5f8-4ab7-bc7f-6a838a353f25, has to be maintained by the application (e.g. for re-export)	*[COBIE2]: reqd if created by external system Facility.ExtSiteIdentifier*	**M**		x	IfcSite.GlobalId	

buildingSMART	exchange requirements for the "Basic HandOver to Facility Management"					IFC Model View Definition	
Object Type **Attribute Groups** **Property**	**Definitions and notes**	**Examples and further explanations**	**Comments**	**Export**	**Import**	**Ref. File**	**IFC Model Representation**	**Comments**
Number (or ID)	User assigned unique number or key of the site (short name), If possible should follow coding rules of used FM guidelines		*[General]: different to the software key (GUID)* *[COBIE2]: optional - put in Attribute worksheet if used*	**M**		x	IfcSite.Name	
Name	User assigned name (long name)		*[COBIE2]: reqd - Facility.SiteName*	**M**		x	IfcSite.LongName	
Description	*User assigned optional description*	*not required for export*	*[COBIE2]: optional - put in Attribute worksheet if used*	**O**		x	ifcSite.Description	
Longitude	*Geo location*	*(not required for export) geographic longitude in geodetic system WGS84, e.g. Chicago Harbor Light - 87.35.40 ("-" = W)*	*[General]: not supported by most alphanumeric CAFM applications - but will be important in future for GIS integration* *[FM-10]: optional, not checked* *[COBIE2]: optional - put in Attribute worksheet if used*	-		x	IfcSite.Longitude	
Latitude	*Geo location*	*(not required for export) geographic latitude in geodetic system WGS84, e.g. Chicago Harbor Light 41.53.30 ("+" = N)*	*[General]: not supported by most alphanumeric CAFM applications - but will be important in future for GIS integration* *[FM-10]: optional, not checked* *[COBIE2]: optional - put in Attribute worksheet if used*	-		x	IfcSite.Latitude	
Elevation	*Site height datum*	*(not required for export) elevation above the height datum*	*[FM-10]: optional, not checked* *[COBIE2]: optional - put in Attribute worksheet if used*	-		x	IfcSite.RefElevation	
Site Address		REQUIRED (if there is no building address)						
Address	Address lines	depending on local usage, street number, street name, etc.	*[General]: to be used as default (i.e. if there are no specific building address data)* *[COBIE2]: n/a*	**M/O**		x	IfcSite.SiteAddress.AddressLines	
City	Town or city name		*[COBIE2]: n/a*	**M/O**		x	IfcSite.SiteAddress.Town	
State	State, Region, or "Länder"	optional in many countries	*[COBIE2]: n/a*	**M/O**		x	IfcSite.SiteAddress.Region	
Zip	Postal code		*[COBIE2]: n/a*	**M/O**		x	IfcSite.SiteAddress.PostalCode	
Site Classification								
Classification	*Site Classification*	*NOT used for Basic FM HandOver View, requires to specify a classification system*	*[General]: In particular interesting for data exchange between CAFM inventory data* *[FM-10]: optional, not checked* *[COBIE2]: n/a*	**O**		-	IfcClassificationReference (through relationship IfcRelAssociatesClassification)	
Classification Item Key	*Key of classification item within the classification system*		*[FM-10]: optional, not checked* *[COBIE2]: n/a*	**O**		-	IfcClassificationReference.ItemReference	
Classification Item Name	*Clear name of the classification item*		*[FM-10]: optional, not checked* *[COBIE2]: n/a*	**O**		-	IfcClassificationReference.Name	
Classification System Name	*Name of the classification system*		*[FM-10]: optional, not checked* *[COBIE2]: n/a*	**O**		-	IfcClassification.Name (through IfcClassificationReference.ReferencedSource)	
Classification System ID	*Identifyer of the classification system*		*[FM-10]: optional, not checked* *[COBIE2]: n/a*	**O**		-	IfcClassification.Source (through IfcClassificationReference.ReferencedSource)	In IFC2x3 there is an implementer agreement to store the unique Id (encoding name, edition, version, etc.) in Source field
Site Base Quantities							IfcElementQuantity (through	
Site Perimeter	*Total perimeter of the side*	*NOT used for Basic FM HandOver View*	*[COBIE2]: n/a*	**O**		-	IfcQuantityLength.Name="GrossPerimeter"	
Site Gross Land Area	*Total area of the building site, as projected to the horizontal plane.*	*NOT used for "Basic FM HandOver View"*	*[FM-10]: Gesamtfläche Liegenschaft* *[COBIE2]: n/a*	**O**		-	IfcQuantityArea.Name="GrossArea"	
Site Properties							IfcPropertySet (through relationship	

buildingSMART	exchange requirements for the "Basic HandOver to Facility Management"					IFC Model View Definition	
Object Type / Attribute Groups / Property	**Definitions and notes**	**Examples and further explanations**	**Comments**	**Export**	**Import**	**Ref. File**	**IFC Model Representation**	**Comments**
~~*Site Common Properties*~~	*Properties that are specified in the standard property definitions (or a relevant subset of) as defined in IFC site common properties*	*NOT used for "Basic FM HandOver View"*	*[General]: relevant subset of required properties need to be defined outside of the standard properties* *[FM-10]: n/a* *[COBIE2]: n/a*	-			IfcPropertySet with Name = "Pset_SiteCommon"	
~~*Site Catalogue properties*~~	*Property that is specified by an external catalogue. Names are valid in the local context (e.g. by country, jurisdiction, building owner), only applicable in local context by additional agreements*	*NOT used for international "Basic FM HandOver View"* *The German BRF (FM guideline) defines several properties such as area ratios ("GFZ", "GRZ") and administrative data ("Gemarkungsnummer", "Gemarkungsname", "Flur", ...)*	*[General]: In particular interesting for data exchange between CAFM* *[FM-10]: local property set agreement for German BfR Gbestand* *[COBIE2]: n/a*	-			IfcPropertySet with Name = /* to be decided in local context */ and locally defined properties	In IFC2x3 there is an implementer agreement to store the link to the catalogue as this functionality is not defined in the IFC documentation (on the basis of existing attributes).
~~*e.g. "tatsächliche GRZ"*~~	*"Grundflächenzahl" Ratio between the buildable area and the total area of a site*	*NOT used for international "Basic FM HandOver View"*	*[General]: In particular interesting for data exchange between CAFM* *[FM-10]: requested is the correct name, the classification via "description field" not used for exchange from CAD/BIM* *[COBIE2]: n/a*	-			IfcPropertySingleValue .Name="tatsächliche GRZ", .Description="D_Merkmalkatalog_BFR || ZL008.11.2.102" .Value=0.65	
Spatial Decomposition								
Site contained in Project	"backlink" to the project as highest node in the project structure		*[General]: one project object allowed*	**M**		**x**	IfcRelAggregates with RelatingObject = IfcProject	
Building contained in Site	Reference to all buildings that are situated on this site.		*[FM-10]: one or several buildings allowed* *[COBIE2]: one building allowed per COBie2 file*	**M**		**x**	IfcRelAggregates with RelatedObject = IfcBuilding	
~~Site contained in Site~~	*NOT ALLOWED Needed in case a site is split into smaller parts.*	*NOT allowed for "Basic FM HandOver View"*	*[General]: used for project structures, where a site has partial sites, not included in Architectural HandOver* *[FM-10]: one site is allowed per ifc file (same as in the coordination view)* *[COBIE2]: one site allowed per COBie2 file*	**N**		-	IfcRelAggregates with RelatedObject = IfcSite	
Building		there can be one or several building objects in the exchange file	*[COBIE2]: building information identified in Facility worksheet*				**IfcBuilding**	
Building Attributes								
Software unique id	Object identifier (formated as GUID or UUID) to uniquely identify the software object	70ce2f2b-a5f8-4ab7-bc7f-6a838a353f24, has to be maintained by the application (e.g. for re-export)	*[General]: software key, does not yield any human interpretation* *[COBIE2]: reqd if created by external system Facility.ExtFacilityIdentifier*	**M**	x	**x**	IfcBuilding.GlobalId	
Number (or ID)	Unique number or key of the building (short name), If possible should follow coding rules of used FM guidelines.		*[FM-10]: required* *[COBIE2]: optional - put in Attribute worksheet if used*	**M**		**x**	IfcBuilding.Name	
Name	Designer assigned name (long name)		*[FM-10]: required* *[COBIE2]: reqd - Facility.ProjectName*	**M**		**x**	IfcBuilding.LongName	
Description	*OPTIONAL Designer assigned description*	*not required for export*	*[COBIE2]: optional - Facility.Desription*	**O**		**x**	IfcBuilding.Description	
Building Address		REQUIRED ONLY (if there is no site address)						
Address	*Address lines*	depending on local usage, street number, street name, etc.	*[General]: to be used, if there is no address assigned to the site (or if no site is present in the exchange file)* *[COBIE2]: n/a*	**O**		-	IfcBuilding.BuildingAddress.AddressLines	
City	*Town or city name*		*[COBIE2]: n/a*	**O**		-	IfcBuilding.BuildingAddress.Town	
State	*State, Region, or "Länder"*	optional in many countries	*[COBIE2]: n/a*	**O**		-	IfcBuilding.BuildingAddress.Region	
Zip	*Postal code*		*[COBIE2]: n/a*	**O**		-	IfcBuilding.BuildingAddress.PostalCode	
Building Classification								

buildingSMART	exchange requirements for the "Basic HandOver to Facility Management"					IFC Model View Definition	
Object Type / Attribute Groups / Property	**Definitions and notes**	**Examples and further explanations**	**Comments**	**Export**	**Import**	**Ref. File**	**IFC Model Representation**	**Comments**
Classification	*Building Classification*	*OPTIONAL for "Basic FM HandOver View", requires to specify a classification system*	*[General]: In particular interesting for data exchange between CAFM* *[FM-10]: not required for BIM/CAD (only for CAFM to CAFM exchange)* *[COBIE2]: reqd - Facility.Category*	**O**		-	IfcClassificationReference (through relationship IfcRelAssociatesClassification)	
Classification Item Key	*Key of classification item within the classification system*		*[COBIE2]: reqd - Facility.Category first value of delimited list*	**O**		-	IfcClassificationReference.ItemReference	
Classification Item Name	*Clear name of the classification item*		*[COBIE2]: reqd - Facility.Category second value of delimited list*	**O**		-	IfcClassificationReference.Name	
Classification Name	*Name of the classification system*		*[COBIE2]: n/a*	**O**		-	IfcClassification.Name (through IfcClassificationReference.ReferencedSource)	
Classification System ID	*Identifyer of the classification system*		*[COBIE2]: inplicit: regional specification (Omniclass Table 11 in NA)*	**O**		-	IfcClassification.Source (through IfcClassificationReference.ReferencedSource)	In IFC2x3 there is an implementer agreement to store the unique Id (encoding name, edition, version, etc.) in Source field
Building Base Quantities		*NOT used for "Basic FM HandOver View"*					IfcElementQuantity (through relationship IfcRelDefinedByProperties)	
~~*Height*~~	*total height of the building*		*[General]: for Architectural (CAD) HandOver only the stories should have height, it should be summed up after import* *[COBIE2]: n/a*	-		-	IfcQuantityLength.Name="Height"	
~~*Net Area - All Spaces*~~	*sum of all usable space areas*		*[General]: for Architectural (CAD) HandOver only the spaces should have area, it should be summed up after import* *[COBIE2]: n/a*	-		-	IfcQuantityArea.Name="NetArea"	
~~*Gross Area - All Stories*~~	*sum of all gross floor areas*		*[General]: for Architectural (CAD) HandOver only the spaces should have area, it should be summed up after import* *[COBIE2]: n/a*	-		-	IfcQuantityArea.Name="GrossArea"	
~~*Gross Volume*~~	*gross volume of all areas enclosed by the building*		*[General]: for Architectural (CAD) HandOver only the spaces should have volumes, it should be summed up after import* *[COBIE2]: n/a*	-		-	IfcQuantityArea.Name="GrossVolume"	
Building Properties							IfcPropertySet (through relationship	
Building Common Properies	*Properties that are specified in the standard property definitions (or a relevant subset of)*		*[General]: relevant subset of required properties need to be defined out of the standard properties*	**O**			IfcPropertySet with Name = "Pset_BuildingCommon"	
Building age	*Year of construction*	*OPTIONAL for "Basic FM HandOver View"*	*[COBIE2]: optional - put in Attribute worksheet if used*	**O**		**x**	IfcPropertySingleValue (Pset_BuildingCommon, YearOfConstruction)	
Landmark status	*landmark or not*	*OPTIONAL for "Basic FM HandOver View"*	*[COBIE2]: optional - put in Attribute worksheet if used*	**O**		**x**	IfcPropertySingleValue (Pset_BuildingCommon, IsLandmarked)	
~~Building Catalogue Properties~~	*Property that is specified by an external catalogue.*	*The German BRF (FM guideline) defines several properties such as area ratios ("NF", "BGF")*	*[General]: In particular interesting for data exchange between CAFM* *[FM-10]: not required for BIM/CAD (only for CAFM to CAFM exchange)*	-		-	IfcPropertySet with Name = /* to be decided in local context */	
~~*Last refurbishment*~~	*Year of last refurbishment*	*NOT used for international "Basic FM HandOver View", may be added in local adaptations*	*[FM-10]: not required for BIM/CAD (only for CAFM to CAFM exchange)* *[COBIE2]: optional - put in Attribute worksheet if used*	-		-	IfcPropertySingleValue .Name="letzte Instanthaltung", .Description="D_Merkmalkatalog_BFR || ZB001.14..101" .Value=1982	
Spatial Decomposition		A building can only be contained in a project, a site, or another building, however the last is disallowed within the "Basic FM HandOver View"						
Building contained in Project	"backlink" to the project or site as the higher node in the project structure		*[COBIE2]: one project allowed per COBie2 file*	**M/O**		-	IfcRelAggregates with .RelatingObject = IfcProject and .RelatedObjects = [SELF, other buildings]	
Building contained in Site	either contained in a site, or if no site is available, directly in the project		*[COBIE2]: one building allowed per COBie2 file*	**M/O**		**x**	IfcRelAggregates with .RelatingObject = IfcSite and .RelatedObjects = [SELF, other buildings]	

buildingSMART	exchange requirements for the "Basic HandOver to Facility Management"					IFC Model View Definition	
Object Type / Attribute Groups / Property	**Definitions and notes**	**Examples and further explanations**	**Comments**	**Export**	**Import**	**Ref. File**	**IFC Model Representation**	**Comments**
~~Building contained in Building~~	*NOT ALLOWED*	*Needed in case a building is split into wings or other sections - define each wing as a building on site.*		N		-	IfcRelAggregates with RelatedObject = IfcBuilding	
Building Storey contained in Building	mandatory in the "Architectural HandOver" view, there has to be at least one storey		*[COBIE2]: one or many floors allowed in COBie2*	M		x	IfcRelAggregates with RelatedObject = IfcBuildingStorey	
Building Storey		there can be one or several stories in the exchange file	*[COBIE2]: building story informaiton identified in Floor worksheet*				**IfcBuildingStorey**	
Building Storey Attributes								
Software unique id	Object identifier (formated as GUID or UUID) to uniquely identify the software object	70ce2f2b-a5f8-4ab7-bc7f-6a838a353f23, has to be maintained by the application (e.g. for re-export)	*[FM-10]: software key, does not yield any human interpretation* *[COBIE2]: reqd if created by external system Floor.ExtIdentifier*	M		x	IfcBuildingStorey.GlobalId	
Number (or ID)	Unique number or key of the building (short name), If possible should follow coding rules of used FM guidelines.		*[FM-10]: required, short name or number* *[COBIE2]: n/a*	M		x	IfcBuildingStorey.Name	
Name	Designer assigned name (long name)		*[FM-10]: optional* *[COBIE2]: reqd - Floor.Name*	M		x	IfcBuildingStorey.LongName	
Description	*OPTIONAL Designer assigned description*	*not required for export*	*[COBIE2]: optional - Floor.Description*	O		x	IfcBuildingStorey.Description	
Elevation	Building Story datum (relative to building)	height difference to the building height, e.g. +2,80 being 2,80 m above the 0,00 reference point for the building	*[FM-10]: required as "Höhenkote"* *[COBIE2]: optional - Floor.Elevation*	M		x	IfcBuildingStorey.Elevation	
Building Storey Base Quantities							IfcElementQuantity (through	ensure IfcElementQuantity.Name=
Net Height	Height of the story from the top of the slab to the bottom of the ceiling		*[COBIE2]: optional - put in Attribute worksheet if used*	M		x	IfcQuantityLength.Name="NetHeight"	
Storey Height	Height of the story from the top of the slab below to the bottom of the slab above		*[COBIE2]: optional - Floor.Height*	M		x	IfcQuantityLength.Name="GrossHeight"	
~~*Net Area - all spaces*~~	*sum of all usable areas of spaces in that storey*		*[FM-10]: for Basic FM HandOver View" only the spaces should have areas, it should be summed up after import* *[COBIE2]: n/a*	-		-	IfcQuantityArea .Name="NetArea"	
~~*Gross Area - all spaces*~~	*sum of all gross floor area of spaces in that storey*		*[FM-10]: for Basic FM HandOver View" only the spaces should have areas, it should be summed up after import* *[COBIE2]: n/a*	-		-	IfcQuantityArea .Name="GrossArea"	
~~*Net Volumne - all spaces*~~	*net volume of all areas enclosed by the building storey*		*[FM-10]: for Basic FM HandOver View" only the spaces should have volumes, it should be summed up after import* *[COBIE2]: n/a*	-		-	IfcQuantityVolume.Name="NetVolume"	
~~*Gross Volume - all spaces*~~	*gross volume of all areas enclosed by the building storey*		*[FM-10]: for Basic FM HandOver View" only the spaces should have volumes, it should be summed up after import* *[COBIE2]: n/a*	-		-	IfcQuantityVolume.Name="GrossVolume"	
Building Storey Classification								
~~*Classification*~~	*NOT APPLICABLE Building storey classification*	*NOT used for "Basic FM HandOver View", requires to specify a classification system fro stories*	*[General]: In particular interesting for data exchange between CAFM*	-		-	IfcClassificationReference (through relationship IfcRelAssociatesClassification)	
~~*Classification Item Key*~~	*NOT APPLICABLE Key of classification item within the classification system*		*[COBIE2]: reqd - Floor.Category = floor, roof, external*	-		-	IfcClassificationReference.ItemReference	
~~*Classification Item Name*~~	*NOT APPLICABLE Clear name of the classification item*		*[COBIE2]: n/a*	-		-	IfcClassificationReference.Name	
~~*Classification System Name*~~	*NOT APPLICABLE Name of the classification system*		*[COBIE2]: n/a*	-		-	IfcClassification.Name (through IfcClassificationReference.ReferencedSource)	

buildingSMART	exchange requirements for the "Basic HandOver to Facility Management"					IFC Model View Definition	
Object Type / Attribute Groups / Property	**Definitions and notes**	**Examples and further explanations**	**Comments**	**Export**	**Import**	**Ref. File**	**IFC Model Representation**	**Comments**
~~Classification System ID~~	*NOT APPLICABLE Identifyer of the classification system*		*[COBIE2]: n/a*	-		-	IfcClassification.Source (through IfcClassificationReference.ReferencedSource)	In IFC2x3 there is an implementer agreement to store the unique Id (encoding name, edition, version, etc.) in Source field
Building Storey Properties							IfcPropertySet (through relationship	
~~Building Storey Common Properties~~	*NOT APPLICABLE Properties that are specified in the standard property definitions (or a relevant subset of)*	*NOT used for international "Basic FM HandOver View"*	*[General]: relevant subset of required properties need to be defined out of the standard properties* *[COBIE2]: required COBie2 properties are identified for every Floor in the COBie2 file*	-		-	IfcPropertySet with Name = "Pset_BuildingStoryCommon"	
~~Building Storey Catalogue Properties~~	*NOT APPLICABLE Properties that are specified according to an external catalogue*		*[General]: In particular interesting for data exchange between CAFM* *[COBIE2]: n/a*	-		-	IfcPropertySet with Name = /* to be decided in local context */	
~~Heatable Area~~	*NOT APPLICABLE heated area of the storey*	*NOT used for international "Basic FM HandOver View", may be added in local adaptations*	*[FM-10]: not required for BIM/CAD (only for CAFM to CAFM exchange)* *[COBIE2]: optional - put in Attribute worksheet if used*	-		-	IfcPropertySingleValue .Name="beheizbare Fläche", .Description="D_Merkmalkatalog_BFR || ZG004.12..103 || beheizbare Fläche" .Value=1045,25	Name may have only a local context, so .Name="HeatableArea" is applicable as well. The minimum information for BFR Gbestand is .Description is: "D_Merkmalkatalog_BFR || ZG004.12..103"
~~Load capacity~~	*NOT APPLICABLE Load capacity of the floor*	*NOT used for international "Basic FM HandOver View", may be added in local adaptations*	*[FM-10]: not required for BIM/CAD (only for CAFM to CAFM exchange)* *[COBIE2]: optional - put in Attribute worksheet if used*	-		-	IfcPropertySingleValue .Name="Deckentragfähigkeit", .Description="D_Merkmalkatalog_BFR || ZA005.11..108 || Deckentragfähigkeit" .Value=12,5	Name may have only a local context, so .Name="LoadCapacity" is applicable as well. The minimum information for BFR Gbestand is .Description is: "D_Merkmalkatalog_BFR || ZA005.11..108"
Spatial Decomposition		A building storey can only be contained in a building, or another building story, however the second is disallowed within the "Architectural HandOver to FM" view						
Building Storey contained in Building		mandatory relation for the spatial structure		**M**		**x**	IfcRelAggregates with .RelatingObject = IfcBuilding, and RelatedObjects=[SELF, other storeys]	
~~Building Storey contained in Building Storey~~	*NOT ALLOWED*	*Needed in case a building storey is split into smaller parts*	*[General]: no sub stories contained in other stories.*	**N**		-		
Space contained in Building Storey		mandatory relation for the spatial structure	*[COBIE2]: spaces assigned to single floor in COBie2*	**M**		**x**	IfcRelAggregates with .RelatingObject=SELF, and .RelatedObject = [IfcSpace1, 2, ... n]	
Spatial Container								
Elements contained in Building Storey		Elements for inventories (FFE, MEP, etc.) shall be contained in spaces	*[General]: as exception handling the building story container needs to be checked for elements* *[FM-10]: components are assigned to a space, exceptions are door/window, and components spaanning over several spaces* *[COBIE2]: components assigned to individual spaces in COBie2*	-	**M**			
Space			*[COBIE2]: space informaiton identified in Space worksheet*				**IfcSpace**	
Space Attributes								
Software unique id	Object identifier (formated as GUID or UUID) to uniquely identify the software object	70ce2f2b-a5f8-4ab7-bc7f-6a838a353f23, has to be maintained by the application (e.g. for re-export)	*[FM-10]: software key, does not yield any human interpretation* *[COBIE2]: reqd if created by external system Floor.ExtIdentifier*	**M**		**x**	IfcSpace.GlobalId	
Short Name (ID)	Designer assigned name or short number	"EG-001.1"	*[FM-10]: required* *[COBIE2]: reqd - Space.Name*	**M**		**x**	IfcSpace.Name	
Long Name	Room number (long)	"Office"	*[FM-10]: required* *[COBIE2]: reqd - Space.Description*	**M**		**x**	IfcSpace.LongName	

buildingSMART	exchange requirements for the "Basic HandOver to Facility Management"					IFC Model View Definition	
Object Type / Attribute Groups / Property	**Definitions and notes**	**Examples and further explanations**	**Comments**	**Export**	**Import**	**Ref. File**	**IFC Model Representation**	**Comments**
Description	*OPTIONAL Designer assigned description, "Corner office with harbor view"*	*not required for export*	*[COBIE2]: optional - put in Attribute worksheet if used*	O		x	*IfcSpace.Description*	
Internal/External	Indication whether it is an internal or external space		*[FM-10]: required* *[COBIE2]: optional - put in Attribute worksheet if used*	M		x	IfcSpace.InteriorOrExteriorSpace	
Space Classification								
Space Classification	Classification	classifying the space type according to the local classification system, in Germany DIN277	*[General]: requires to specify a classification system*	M		x	IfcClassificationReference (through relationship IfcRelAssociatesClassification)	
Classification Item Key	Classification notification key	HNF1	*[COBIE2]: reqd - Space.Category first value of delimited list*	M		x	IfcClassificationReference.ItemReference	
Classification Item Name	Classification notification (clear) name	Wohnen	*[COBIE2]: reqd - Space.Category second value of delimited list*	M		x	IfcClassificationReference.Name	
Classification System Name	Name of the classification system	DIN277-2	*[COBIE2]: n/a*	M		x	IfcClassification.Name (through IfcClassificationReference.ReferencedSource)	
Classification System Edition	Edition or version of classification system	z.B. DIN277 - Name: DIN277-2, Edition: 2005	*[General]: A common way of naming the editions has to be agreed upon for the major space classification systems.* *[FM-10]: regional specification (DIN277-2)* *[COBIE2]: regional specification (Omniclass Table 13 in NA)*	O		x	IfcClassification.Edition (through IfcClassificationReference.ReferencedSource)	
~~*Classification System ID*~~	*Identifyer of the classification system*	*unique identifier for a classification edition - not yet available*	*[COBIE2]: n/a*	-			IfcClassification.Source (through IfcClassificationReference.ReferencedSource)	In IFC2x3 there is an implementer agreement to store the unique Id (encoding name, edition, version, etc.) in Source field
Space Base Quantities							IfcElementQuantity (through	ensure IfcElementQuantity.Name=
Height	(constant) height of the room	*OPTIONAL for "Basic FM HandOver View"*	*[General]: definitions of base quantities taken from German QTO project PM-4* *[COBIE2]: optional - put in Attribute worksheet if used*	O		x	IfcQuantityLength.Name= "Height"	
FinishFloorHeight	*(constant) height of the flooring of the room*	*OPTIONAL for "Basic FM HandOver View"*	*[COBIE2]: optional - put in Attribute worksheet if used*	O		-	IfcQuantityLength.Name= "FinishFloorHeight"	
FinishCeilingHeight	(constant) clear height of the room (from top of flooring to bottom of (suspended) ceiling)		*[COBIE2]: optional - put in Attribute worksheet if used*	M		x	IfcQuantityLength.Name= "FinishCeilingHeight"	
Perimeter	(constant) width of the room	*OPTIONAL for "Basic FM HandOver View"*	*[General]: definitions of base quantities taken from German QTO project PM-4* *[COBIE2]: optional, derived from space coordinates*	O		x	IfcQuantityLength.Name= "GrossPerimeter"	
GrossFloorArea	*sum of all floor areas covered by the space*	*OPTIONAL for "Basic FM HandOver View"*	*[General]: definitions of base quantities taken from German QTO project PM-4* *[COBIE2]: optional - Space.GrossArea. Provision of this optional information grants higher ratings than files without optional information.*	O		x	IfcQuantityArea.Name= "GrossFloorArea"	
NetFloorArea	sum of all usable floor areas covered by the space		*[General]: definitions of base quantities taken from German QTO project PM-4* *[COBIE2]: optional - Space.NetArea. Provision of this optional information grants higher ratings than files without optional information.*	M		x	IfcQuantityArea.Name= "NetFloorArea"	
GrossCeilingArea	*sum of all ceiling areas of the space*	*OPTIONAL for "Basic FM HandOver View"*	*[General]: definitions of base quantities taken from German QTO project PM-4* *[COBIE2]: optional - put in Attribute worksheet if used*	O		x	IfcQuantityArea.Name= "GrossCeilingArea"	
NetCeilingArea	sum of all ceiling areas covered by the space		*[General]: definitions of base quantities taken from German QTO project PM-4* *[COBIE2]: optional - put in Attribute worksheet if used*	M		x	IfcQuantityArea.Name= "NetCeilingArea"	
GrossWallArea	*sum of all wall areas bounded by the space including the area that is normally covered by doors, windows or other opening*	*OPTIONAL for "Basic FM HandOver View"*	*[General]: definitions of base quantities taken from German QTO project PM-4* *[COBIE2]: optional - put in Attribute worksheet if used*	O		x	IfcQuantityArea.Name= "GrossWallArea"	

buildingSMART	exchange requirements for the "Basic HandOver to Facility Management"					IFC Model View Definition	
Object Type / Attribute Groups / Property	Definitions and notes	Examples and further explanations	Comments	Export	Import	Ref. File	IFC Model Representation	Comments
NetWallArea	sum of all wall areas covered by the space		[General]: definitions of base quantities taken from German QTO project PM-4 [COBIE2]: optional - put in Attribute worksheet if used	M		x	IfcQuantityArea.Name= "NetWallArea"	
GrossVolume	*Total volume that is enclosed by the space*	*OPTIONAL for "Basic FM HandOver View"*	[General]: definitions of base quantities taken from German QTO project PM-4 [COBIE2]: optional, derived from space coordinates & finish floor height	O		-	IfcQuantityVolume.Name= "GrossVolume"	
NetVolume	*Volume that is enclosed by the space, excluding the volume of construction elements inside the space.*	*OPTIONAL for "Basic FM HandOver View"*	[General]: definitions of base quantities taken from German QTO project PM-4 [COBIE2]: optional, derived from space coordinates & finish ceiling height	O		-	IfcQuantityVolume.Name= "NetVolume"	
Space quantities								
~~*FM catalogue quantity*~~	*Quantity that is specified by an external catalogue.*	*NOT used for "Basic FM HandOver View"* *Specific space quantities measured according to a local measurement standard, like DIN277 in Germany, BOMA or GSA in US, or similar*	[General]: In particular interesting for data exchange between CAFM [COBIE2]: n/a	-		-	IfcElementQuantity (through relationship IfcRelDefinedByProperties)	ensure that attribute IfcElementQuantity .MethodOfMeasurement is provided and that the value is agreed, e.g. "DIN-277"
Space properties								
Space Common Properies	Properties that are specified in the standard property definitions (or a relevant subset of)		[General]: relevant subset of required properties need to be defined out of the standard properties [COBIE2]: required COBie2 properties are identified for every space in the COBie2 file	M			IfcPropertySet with Name = "Pset_SpaceCommon"	
Flooring	name of flooring (material finish)	e.g. carpet, tiles, etc	[General]: to be used, if there is no covering object [FM-10]: required If there is no covering object, the space net area is also the flooring area [COBIE2]: reqd - min one Attribute worksheet "Flooring" row for each Space.Name	M/O		x	IjcPropertySingleValue with Name = "FloorCovering"	
Ceiling	name of ceiling (material finish)	painted, suspended ceiling, etc	[General]: to be used, if there is no covering object [FM-10]: required If there is no covering object, the space net ceiling area is also the flooring area [COBIE2]: reqd - min one attribute worksheet "Ceiling" row for each Space.Name	M/O		x	IjcPropertySingleValue with Name = "CeilingCovering"	
Cladding	name of cladding (material finish)	painted, wall paper, etc	[General]: to be used, if there is no covering object [FM-10]: required If there is no covering object, the space net wall area is also the cladding area [COBIE2]: reqd - min one attribute worksheet "Cladding" row for each Space.Name	M/O		x	IjcPropertySingleValue with Name = "WallCovering"	
Space Catalogue Properties	Properties that are specified according to an external catalogue.						IfcPropertySet with Name = /* to be decided in local context */	
Load capacity	*Load capacity of the floor*	*OPTIONAL for "Basic FM HandOver View"*	[General]: LoadCapacity should be included in standard space properties in future. [FM-10]: not required for BIM/CAD (only for CAFM to CAFM exchange) [COBIE2]: reqd - min one attribute worksheet "LoadCapacity" row for each Space.Name	O		-	IfcPropertySingleValue .Name="Deckentragfähigkeit", .Description="D_Merkmalkatalog_BFR || ZA005.11..108 || Deckentragfähigkeit" .Value=12,5	Name may have only a local context, so .Name="LoadCapacity" is applicable as well. The minimum information for BFR Gbestand is .Description is: "D_Merkmalkatalog_BFR || ZA005.11..108"
Spatial Decomposition		A space can only be contained in a site, a building story, or another space, however the last is disallowed within the "Architectural HandOver to FM" view	[COBIE2]: see zones					
Space contained in Building Storey	Space as part of the building structure		[COBIE2]: reqd - Space.FloorName	M		x	IfcRelAggregates with .RelatingObject = IfcBuildingStorey, and RelatedObjects=[SELF, other spaces]	

buildingSMART	exchange requirements for the "Basic HandOver to Facility Management"					IFC Model View Definition	
Object Type / Attribute Groups / Property	**Definitions and notes**	**Examples and further explanations**	**Comments**	**Export**	**Import**	**Ref. File**	**IFC Model Representation**	**Comments**
~~Space contained in Space~~	*Needed in case a building storey is split into smaller parts.*	*NOT allowed for "Basic FM HandOver View"*	*[General]: space nesting not allowed*	N		-		
Spatial Container								
Elements contained in Space	Furniture and equipment fully contained in space	required for furniture and MEP components, if fully enclosed by a space	*[General]: Required for export is assignment to space (only as fallback in extreme cases to storey (on import, both need to be supported)* *[COBIE2]: reqd - Component.SpaceNames*	M		x	IfcRelContainedInSpatialStructure with .RelatingStructure = SELF, and RelatedElements=[IfcFurnishingElement, IfcBuildingElementProxy, IfcDistributionElement, etc.]	mandatory for certain types of elements, e.g furniture
Coverings contained in Space	Covering elements of the space	to be included, if not to be defined by a simple property in the common property set, i.e. if a single space has two floorings (split by carpet and tiles.	*[General]: Use IfcRelContainedInSpatialStructure, not IfcRelCoversSpaces to express the spatial containment* *[FM-10]: required, if the flooring, ceiling or cladding does not cover all floor, ceiling or wall area of a space.* *[COBIE2]: n/a*	M		x	IfcRelContainedInSpatialStructure with .RelatingStructure = SELF, and RelatedElements=[IfcCovering, other covered elements]	mandatory for coverings (note: for simple configurations, where a space only has one flooring, one cladding, one ceiling the Space Standard Properties might be used)
Doors/Windows contained in Space	Doors, Windows assigned by a 1:1 containment relationship (optionally)	required for doors and windows, if already assigned to a single space	*[General]: Reference of doors, windows linked to the space (1) by containment - direct assignement of door , windowto one space, or (2) by boundary elements, i.e. linking one door , window to two spaces* *[FM-10]: either this containment is requires, or the boundary relation to one or two spaces.* *[COBIE2]: reqd - Doors/Windows identified within one or two spaces*	M/O		x	IfcRelContainedInSpatialStructure with .RelatingStructure = SELF, and RelatedElements=[IfcDoor, IfcWindow]	
Space Boundary								
Doors/Windows bounding Spaces	Doors, Windows assigned by a 1:2 boundary relationship (mandatory, if no containment)	required for doors and windows, if not already assigned to a single space	*[General]: for external doors and windows there is only one boundary to space (therefore unambiguous), for internal doors and windows there are two boundaries (to two spaces)* *[FM-10]: either the containment is requires, or this boundary relation to one or two spaces.* *[COBIE2]: reqd - min one Attribute worksheet "IsExternal" row for each appropriate object*	M/O		x	IfcRelSpaceBoundary with RelatingSpace=SELF, and RelatedElements=IfcDoor OR IfcWindow	mandatory, if not contained in space directly
Covering	Coverings are to be included as individual elements if there is not only a single ceiling, cladding and flooring, as included in the space property set. Particularly used, if there are two or several distinct floorings, claddings and/or ceilings	examples include elevated floors, suspended ceilings, wall claddings, etc. Used in particular, if a space has several floorings, ceilings, or claddings, each occupying a partial area.	*[General]: to be used, if coverings are not unique withon a space for ceiling, cladding, flooring* *[COBIE2]: simplified COBie2 models assume a space has a single type of covering. If needed break large spaces into multiple sub spaces that have common coverings*				**IfcCovering**	on import, the capability to interpret covering elements AND space properties for ceiling, cladding, flooring is mandatory
Covering attributes								
Software unique id	Object identifier (formated as GUID or UUID) to uniquely identify the software object	70ce2f2b-a5f8-4ab7-bc7f-6a838a353f31, has to be maintained by the application (e.g. for re-export)	*[FM-10]: software key, does not yield any human interpretation*	M		x	IfcCovering.GlobalId	
Name	Individual element name (for human reference)		*[FM-10]: required to identify the covering*	M		x	IfcCovering.Name	
Description	*Additional description*	*OPTIONAL for "Basic FM HandOver View"*		O		x	IfcCovering.Description	
Predefined Covering Type	Covering type as assigned to the individual element	being either "Ceiling, Cladding, Flooring"	*[FM-10]: required to identify the covering*	M		x	IfcCovering.PredefinedType	
Covering Type								
Covering Type	*Reference to the common covering type used for all occurrences of the covering*	*OPTIONAL for "Basic FM HandOver View"*	*[FM-10]: Types are also called "style", or "family" in CAD software*	O		-	IfcCoveringType (through relationship IfcRelDefinesByType)	
Name	*Individual type name (for human reference)*			O		-	IfcCoveringType.Name	
Description	*Additional description*			O		-	IfcCoveringType.Description	
Type	*Covering type as assigned to the type*	*being either "Ceiling, Cladding, Flooring"*	*[General]: if a covering type is provided at both, IfcCovering and IfcCoveringType, then the type at IfcCovering overrides.*	O		-	IfcCoveringType.ElementType	

buildingSMART	exchange requirements for the "Basic HandOver to Facility Management"					IFC Model View Definition	
Object Type / Attribute Groups / Property	**Definitions and notes**	**Examples and further explanations**	**Comments**	**Export**	**Import**	**Ref. File**	**IFC Model Representation**	**Comments**
Material	*Material as assigned to the type*	*material information as shown below for element materials*	*[General]: if a material is provided at both, IfcCovering and IfcCoveringType, then the material at IfcCovering overrides.*	O		-	IfcMaterial, or IfcMaterialLayerSet (through relationsip IfcRelAssociatesMaterial)	same definition of material as provided below for covering material
Classification	*Classification as assigned to the type*	*classification information as shown below for element classification*	*[General]: if a covering classification is provided at both, IfcCovering and IfcCoveringType, then the classification at IfcCovering overrides.*	O		-	IfcClassificationReference (through relationship IfcRelAssociatesClassification)	same definition of classification as provided below for covering classification
Properties	*Properties as assigned to the type*	*property set information as shown below for element properties*	*[General]: if a covering property is provided at both, IfcCovering and IfcCoveringType, then the property at IfcCovering overrides.*	O		-	IfcPropertySet (through relationship IfcRelDefinesByType and IfcCoveringType.HasPropertySets)	
Covering Material								
Material							IfcMaterial, or IfcMaterialLayerSet	
Material thickness	thickness of the material layer, many layers can be defined			M		x	IfcMaterialLayer.LayerThickness	
Material name	name of the material, for multi-layer coverings, each layer has a material name		*[FM-10]: required*	M		x	IfcMaterial.Name	
Covering Classification								
Classification	*Covering classification*	*OPTIONAL for "Basic FM HandOver View", requires to specify a classification system*	*[General]: In particular interesting for data exchange between CAFM*	O			IfcClassificationReference (through relationship IfcRelAssociatesClassification)	
Classification Item Key	*Key of classification item within the classification system*			O		-	IfcClassificationReference.ItemReference	
Classification Item Name	*Clear name of the classification item*			O		-	**IfcClassificationReference.Name**	
Classification System Name	*Name of the classification system*			O		-	IfcClassification.Name (through	
~~Classification System ID~~	*Identifyer of the classification system*			-		-	IfcClassification.Source (through	In IFC2x3 there is an implementer
Covering Base Quantities						-	IfcElementQuantity (through	ensure IfcElementQuantity.Name=
Gross Area	Total area of the covering in the elevation view.		*[General]: definitions of base quantities taken from German QTO project PM-4*	M		x	IfcQuantityArea.Name="GrossArea"	
Net Area	Area of the covering in the elevation view taking into account openings.		*[General]: definitions of base quantities taken from German QTO project PM-5* *[FM-10]: required*	M		x	IfcQuantityArea.Name="NetArea"	
Spatial Container								
Coverings contained in Space	A covering element has to be contained in a space (and not in a building storey)		*[General]: coverings must have a relationship to spaces*	M		x	IfcRelContainedInSpatialStructure with .RelatingStructure = SELF, and RelatedElements=[IfcCovering, other covered elements]	decide one relationship !
~~Covering covers Space~~		*usage of this relationship is disallowed in the "Architectural HandOver to FM" view*		-		-	IfcRelCoversSpace and/or IfcRelSpaceBoundary	
Window			*[COBIE2]: object classes must be strongly typed using the Type worksheet. Instances found in Component worksheet.*				**IfcWindow**	
Window Attributes								
Software unique id	Object identifier (formated as GUID or UUID) to uniquely identify the software object	70ce2f2b-a5f8-4ab7-bc7f-6a838a353f61, has to be maintained by the application (e.g. for re-export)	*[FM-10]: software key, does not yield any human interpretation* *[COBIE2]: reqd if created by external system Component.ExtIdentifier*	M		x	IfcWindow.GlobalId	
Name	Individual element name (for human reference)		*[COBIE2]: reqd - Component.Name*	M		x	IfcWindow.Name	
Description	*Additional description*	*OPTIONAL for "Basic FM HandOver View"*	*[COBIE2]: reqd - Type.Description, no separate description for specific component*	O		x	IfcWindow.Description	

buildingSMART	exchange requirements for the "Basic HandOver to Facility Management"					IFC Model View Definition	
Object Type / Attribute Groups / Property	Definitions and notes	Examples and further explanations	Comments	Export	Import	Ref. File	IFC Model Representation	Comments
Window Type			*[COBIE2]: Type worksheet holds all COBie2 types*					
Window type	Reference to the common window type used for all occurrences of the same window type	e.g one type for all Pivoting Windows 0,75x150	*[FM-10]: Types are also called "style", or "family" in CAD software* *[COBIE2]: reqd if created by external system Type.ExtIdentifier*	M		x	IfcWindowStyle (through relationship IfcRelDefinesByType)	
Name	Individual type name (for human reference)	e.g. "Klippfenster 0,76*1,51"	*[COBIE2]: reqd - Type.Name*	M		x	IfcWindowStyle.Name	
Description	*Additional description*	*OPTIONAL for "Basic FM HandOver View"*	*[COBIE2]: reqd - Type.Description*	O		-	IfcWindowStyle.Description	
Construction type	The construction type relates to the main material (or material combination) used for making the window, e.g. wood, aluminium, plastics, etc.	*OPTIONAL for "Basic FM HandOver View"*	*[General]: to be used in absense of an individual material definition attached using ifcRelAssociatesMaterial* *[COBIE2]: reqd - min one attribute worksheet "ConstructionType" row for each window type*	O		-	IfcWindowStyle.ConstructionType	
Configuration type	The configuration of the window panels, single panel, double panel, triple panel, and whether horizontal or vertical		*[FM-10]: required in combinationwith operation type* *[COBIE2]: reqd - min one attribute worksheet "ConfigurationType" row for each window type*	M		x	IfcWindowStyle.OperationType	
Operation type	The way the window is operated	sliding, pivoting, swinging, tilt&turn, etc.	*[General]: note that in a multi-panel window, each panel may have a different operation type* *[FM-10]: required in combinationwith configuration type* *[COBIE2]: reqd - min one attribute worksheet "OperationType" row for each window type*	M		x	IfcWindowPanelProperties.OperationType (through IfcWindowStyle.HasPropertySets	
~~Material~~	*Material as assigned to the type*	*OPTIONAL for "Basic FM HandOver View"* *material information as shown below for element materials*	*[General]: if a material is provided at both, IfcWindow and IfcWindowStyle, then the material at IfcWindow overrides.* *[COBIE2]: reqd - min one attribute worksheet "Material" row for each window type*	–		-	IfcMaterial, or IfcMaterialLayerSet (through relationsip IfcRelAssociatesMaterial)	same definition of material as provided below for window material
Classification	*Classification as assigned to the type*	*OPTIONAL for "Basic FM HandOver View"* *classification information as shown below for element classification*	*[General]: if a window classification is provided at both, IfcWindow and IfcWindowType, then the classification at IfcWindow overrides.* *[COBIE2]: see Classification below*	O		-	IfcClassificationReference (through relationship IfcRelAssociatesClassification)	same definition of classification as provided below for window classification
Properties	*Properties as assigned to the type*	*OPTIONAL for "Basic FM HandOver View"* *property set information as shown below for element properties*	*[General]: if a window property is provided at both, IfcWindow and IfcWindowType, then the property at IfcWindow overrides.* *[COBIE2]: properties of individual components that differ from type must be reported as properties of the Component.*	O		-	IfcPropertySet (through relationship IfcRelDefinesByType and IfcWindowStyle.HasPropertySets)	
Window Classification			*[COBIE2]: see Classification below*					
Classification	*Covering classification*	*OPTIONAL for "Basic FM HandOver View", requires to specify a classification system*	*[General]: In particular interesting for data exchange between CAFM*	O		-	IfcClassificationReference (through relationship IfcRelAssociatesClassification)	
Classification Item Key	*Key of classification item within the classification system*	*OPTIONAL for "Basic FM HandOver View*	*[COBIE2]: reqd - Type.Category first value of delimited list*	O		-	IfcClassificationReference.ItemReference	
Classification Item Name	*Clear name of the classification item*	*OPTIONAL for "Basic FM HandOver View*	*[COBIE2]: reqd - Type.Category first value of delimited list*	O		-	IfcClassificationReference.Name	
Classification System Name	*Name of the classification system*	*OPTIONAL for "Basic FM HandOver View*	*[COBIE2]: n/a*	O		-	IfcClassification.Name (through IfcClassificationReference.ReferencedSource)	
~~Classification System ID~~	*Identifyer of the classification system*	*OPTIONAL for "Basic FM HandOver View*	*[COBIE2]: regional specification (Omniclass Table 23 in NA)*	-		-	IfcClassification.Source (through IfcClassificationReference.ReferencedSource)	In IFC2x3 there is an implementer agreement to store the unique Id (encoding name, edition, version, etc.) in Source field
Window Material								
Material	base material for the window						IfcMaterial (through relationsip	
~~Material name~~	*name of the material*	*OPTIONAL for "Basic FM HandOver View", see IfcWindowStyle.ConstructionType*	*[COBIE2]: see previous note on Material Property*	-		-	IfcMaterial.Name	
Window base quantities							IfcElementQuantity (through	ensure IfcElementQuantity.Name=

buildingSMART — exchange requirements for the "Basic HandOver to Facility Management"						IFC Model View Definition	
Object Type / Attribute Groups / Property	**Definitions and notes**	**Examples and further explanations**	**Comments**	**Export**	**Import**	**Ref. File**	**IFC Model Representation**	**Comments**
Width	Width of the window lining, to be provided for rectangular windows.		*[General]: definitions of base quantities taken from German QTO project PM-4* *[COBIE2]: reqd - min one attribute worksheet "Width" row for each window type*	**M/O**		**x**	IfcQuantityLength.Name="Width"	
Height	Height of the window lining, to be provided for rectangular windows.		*[General]: definitions of base quantities taken from German QTO project PM-4* *[COBIE2]: reqd - min one attribute worksheet "Height" row for each window type*	**M/O**		**x**	IfcQuantityLength.Name="Height"	
Area	Area of the window, including frame and lining.	Note: the area contains both, framing and glazing. The glazing area is defined by Area * GlazingAreaFraction	*[General]: definitions of base quantities taken from German QTO project PM-4* *[COBIE2]: reqd - min one attribute worksheet "Area" row for each window type*	**M**		**x**	IfcQuantityArea.Name="Area"	
Window properties							IfcPropertySet (through relationship	
Window Common Properies	Properties that are specified in the standard property definitions (or a relevant subset of)		*[General]: relevant subset of required properties need to be defined out of the standard properties* *[COBIE2]: object properties are assigned against Type.*	**M**			IfcPropertySet with Name = "Pset_WindowCommon"	
Fire resistance	String according to national building code	e.g. F30	*[COBIE2]: reqd - min one attribute worksheet "FireRating" row for each window type*	**M**		**x**	IfcPropertySingleValue with Name = "FireRating"	
Glazing area	Provided as a fraction of the total window area	e.g. 0.8 (for 80%)	*[FM-10]: Note that the glazing area has to be calculated by GlazingAreaFraction * Area* *[COBIE2]: reqd - min one attribute worksheet "GlazingPct" row for each window type*	**M**		**x**	IfcPropertySingleValue with Name = "GlazingAreaFraction"	
Internal/External	Indication whether it is an internal or external (part of the facade) window	TRUE (external) or FALSE (internal)	*[COBIE2]: reqd - min one attribute worksheet "IsExternal" row for each window type*	**M**		**x**	IfcPropertySingleValue with Name = "IsExternal"	
Window Manufacturer Properties	*Properties that are specified in the manufacturer property definitions (or a relevant subset of)*	*OPTIONAL for "Basic FM HandOver View"*	*[General]: relevant subset of required properties need to be defined out of the standard properties* *[COBIE2]: manufacturer items are evaluated only on COBie2 construction files*	**O**		-	IfcPropertySet with Name = "Pset_ManufacturerTypeInformation"	
Article Number	*Article number or reference*	*OPTIONAL for "Basic FM HandOver View"*	*[COBIE2]: reqd (only construction) - Component.SerialNumber*	**O**		-	IfcPropertySingleValue with Name = "ArticleNumber"	
Model Name	*The name of the manufactured item as used by the manufacturer.*	*OPTIONAL for "Basic FM HandOver View"*	*[COBIE2]: optional - put in Attribute worksheet if used*	**O**		-	IfcPropertySingleValue with Name = "ModelReference"	
Model Number	*The model number and/or unit designator assigned by the manufacturer*	*OPTIONAL for "Basic FM HandOver View"*	*[COBIE2]: reqd (only construction) - Type.ModelNumber*	**O**		-	IfcPropertySingleValue with Name = "ModelLabel"	
Manufacturer	*The organization that manufactured and/or assembled the item.*	*OPTIONAL for "Basic FM HandOver View"*	*[COBIE2]: reqd (only construction) - Type.Manufacturer*	**O**		-	IfcPropertySingleValue with Name = "Manufacturer"	
Year of Production	*The year of production of the manufactured item.*	*OPTIONAL for "Basic FM HandOver View"*	*[COBIE2]: optional - put in Attribute worksheet if used*	**O**		-	IfcPropertySingleValue with Name = "ProductionYear"	
Spatial Container								
Windows contained in Building Story	A window can be contained in a building storey, if there is a boundary relationship to one or two spaces	either contained in building storey, or space (exactly one of both has to be provided)	*[FM-10]: if contained in building story, a space boundary to 1..2 spaces required* *[COBIE2]: components may only be installed within spaces in COBie2*	**M/O**		**x**	IfcRelContainedInSpatialStructure with .RelatingStructure = IfcBuildingStorey, and RelatedElements=[IfcWindow, other contained elements]	on import, both - containment in space and containment in building storey has to be supported, if contained in building storey, the window space boundaries have to be analysed
Windows contained in Space	A window can be contained in a space, then no additional boundary relation is further analysed	either contained in building storey, or space (if already assigned to a single space in architectural CAD)	*[General]: would normally require additional input in CAD system (i.e. the user to select the space the window belongs to)* *[COBIE2]: reqd - Component.Spacenames, either using containment, or boundary relation (see below)*	**M/O**		**x**	IfcRelContainedInSpatialStructure with .RelatingStructure = IfcStorey, and RelatedElements=[IfcWindow, other contained elements]	on import, both - containment in space and containment in building storey has to be supported
Space boundary								

buildingSMART	exchange requirements for the "Basic HandOver to Facility Management"					IFC Model View Definition	
Object Type / Attribute Groups / Property	**Definitions and notes**	**Examples and further explanations**	**Comments**	**Export**	**Import**	**Ref. File**	**IFC Model Representation**	**Comments**
Window bounding Space	A window can bound a single space (if external window, or two spaces (if internal window)		*[FM-10]: required, if not already contained in space* *[COBIE2]: all components may be identified in one or more spaces in COBie2*	M/O		x	IfcRelSpaceBoundary with RelatingSpace=IfcSpace, and RelatedElements=SELF	on import to be analysed, if window is contained in storey
Door			*[COBIE2]: object classes must be strongly typed using the Type worksheet. Instances found in Component worksheet.*				**IfcDoor**	
Door Attributes								
Software unique id	Object identifier (formated as GUID or UUID) to uniquely identify the software object	70ce2f2b-a5f8-4ab7-bc7f-6a838a353f61, has to be maintained by the application (e.g. for re-export)	*[FM-10]: software key, does not yield any human interpretation* *[COBIE2]: reqd if created by external system Component.ExtIdentifier*	M		x	IfcDoor.GlobalId	
Name	Individual element name (for human reference)		*[COBIE2]: reqd - Component.Name*	M		x	IfcDoor.Name	
Description	*Additional description*	*OPTIONAL for "Basic FM HandOver View"*	*[COBIE2]: reqd - Type.Description, no separate description for specific component*	O		x	IfcDoor.Description	
Door Type			*[COBIE2]: Type worksheet holds all COBie2 types*					
Door type	Reference to the common door type used for all occurrences of the same dorr type	e.g one type for all single swing doors 0,885x2,01	*[FM-10]: Types are also called "style", or "family" in CAD software* *[COBIE2]: reqd if created by external system Type.ExtIdentifier*	M		x	IfcDoorStyle (through relationship IfcRelDefinesByType)	
Name	Individual type name (for human reference)	e.g. "Einflügeltür 0,76*2,01"	*[COBIE2]: reqd - Type.Name*	M		x	IfcDoorStyle.Name	
Description	*Additional description*	*OPTIONAL for "Basic FM HandOver View"*	*[COBIE2]: reqd - Type.Description*	O		-	IfcDoorStyle.Description	
Construction type	The construction type relates to the main material (or material combination) used for making the door.	e.g. wood, aluminium, plastics, etc.	*[COBIE2]: reqd - min one attribute worksheet "ConstructionType" row for each door type*	O		-	IfcDoorStyle.ConstructionType	
Operation type	The way the door is operated, including the configuration of single or double door.	single swing, double swing, single sliding, double sliding, revolving, etc-	*[COBIE2]: reqd - min one attribute worksheet "OperationType" row for each door type*	M		x	IfcDoorStyle.OperationType	
~~*Material*~~	*Material as assigned to the type*	*OPTIONAL for "Basic FM HandOver View"* *material information as shown below for element materials*	*[General]: if a material is provided at both, IfcDoor and IfcDoorStyle, then the material at IfcDoor overrides.* *[COBIE2]: reqd - min one attribute worksheet "Material" row for each door type*	-		-	IfcMaterial, or IfcMaterialLayerSet (through relationsip IfcRelAssociatesMaterial)	same definition of material as provided below for door material
Classification	*Classification as assigned to the type*	*OPTIONAL for "Basic FM HandOver View"* *classification information as shown below for element classification*	*[General]: if a door classification is provided at both, IfcDoor and IfcDoorType, then the classification at IfcDoor overrides.* *[COBIE2]: see Classification below*	O		-	IfcClassificationReference (through relationship IfcRelAssociatesClassification)	same definition of classification as provided below for door classification
Properties	*Properties as assigned to the type*	*OPTIONAL for "Basic FM HandOver View"* *property set information as shown below for element properties*	*[General]: if a door property is provided at both, IfcDoor and IfcDoorType, then the property at IfcDoor overrides.* *[COBIE2]: properties of individual components that differ from type must be reported as properties of the Component.*	O		-	IfcPropertySet (through relationship IfcRelDefinesByType and IfcDoorStyle.HasPropertySets)	same definition of properties as provided below for door property sets
Door Classification			*[COBIE2]: see Classification below*					
Classification	*Door classification*	*OPTIONAL for "Basic FM HandOver View", requires to specify a classification system*	*[General]: In particular interesting for data exchange between CAFM*	O		-	IfcClassificationReference (through relationship IfcRelAssociatesClassification)	
Classification Item Key	*Key of classification item within the classification system*	*OPTIONAL for "Basic FM HandOver View"*	*[COBIE2]: reqd - Type.Category first value of delimited list*	O		-	IfcClassificationReference.ItemReference	
Classification Item Name	*Clear name of the classification item*	*OPTIONAL for "Basic FM HandOver View"*	*[COBIE2]: reqd - Type.Category first value of delimited list*	O		-	IfcClassificationReference.Name	
Classification System Name	*Name of the classification system*	*OPTIONAL for "Basic FM HandOver View"*	*[COBIE2]: n/a*	O		-	IfcClassification.Name (through IfcClassificationReference.ReferencedSource)	

buildingSMART	exchange requirements for the "Basic HandOver to Facility Management"					IFC Model View Definition	
Object Type / Attribute Groups / Property	Definitions and notes	Examples and further explanations	Comments	Export	Import	Ref. File	IFC Model Representation	Comments
Classification System ID	*Identifyer of the classification system*	*OPTIONAL for "Basic FM HandOver View"*	*[COBIE2]: regional specification (Omniclass Table 23 in NA)*	-		-	IfcClassification.Source (through IfcClassificationReference.ReferencedSource)	In IFC2x3 there is an implementer agreement to store the unique Id (encoding name, edition, version, etc.) in Source field
Door Material								
Material	base material for the door						IfcMaterial (through relationsip	
~~*Material name*~~	name of the material		*[COBIE2]: see previous note on Material Property*	-		-	IfcMaterial.Name	
Door base quantities							IfcElementQuantity (through	ensure IfcElementQuantity.Name=
Width	Width of the door lining, to be provided for rectangular doors.		*[COBIE2]: reqd - min one attribute worksheet "Width" row for each door type*	M/O		x	IfcQuantityLength.Name="Width"	
Height	Height of the door lining, to be provided for rectangular doors.		*[COBIE2]: reqd - min one attribute worksheet "Height" row for each door type*	M/O		x	IfcQuantityLength.Name="Height"	
Area	Area of the door, including frame and lining.	Note: the area contains both, framing and glazing. The glazing area is defined by Area * GlazingAreaFraction	*[COBIE2]: reqd - min one attribute worksheet "Area" row for each door type*	M		x	IfcQuantityArea.Name="Area"	
Door properties							IfcPropertySet (through relationship	or assigned to the
Door Common Properies	Properties that are specified in the standard property definitions (or a relevant subset of)		*[General]: relevant subset of required properties need to be defined out of the standard properties* *[COBIE2]: object properties are assigned against Type.*	M			IfcPropertySet with Name = "Pset_DoorCommon"	
Fire resistance	String according to national building code	e.g. T90	*[COBIE2]: reqd - min one attribute worksheet "FireRating" row for each window type*	M		x	IfcPropertySingleValue with Name = "FireRating"	
Glazing area	Provided as a fraction of the total door area	e.g. 0.2 (for 20%)	*[COBIE2]: reqd - min one attribute worksheet "GlazingPct" row for each window type*	M		x	IfcPropertySingleValue with Name = "GlazingAreaFraction"	
Fire exit	Boolean choice whether fire exit door or not	FALSE	*[COBIE2]: reqd - min one attribute worksheet "IsFireExit" row for each window type*	M		x	IfcPropertySingleValue with Name = "FireExit"	
Internal/External	Indication whether it is an internal or external (part of the facade) door	TRUE (external) or FALSE (internal)	*[COBIE2]: reqd - min one attribute worksheet "IsExternal" row for each window type*	M		x	IfcPropertySingleValue with Name = "IsExternal"	
Door Manufacturer Properties	*Properties that are specified in the manufacturer property definitions (or a relevant subset of)*	*OPTIONAL for "Basic FM HandOver View"*	*[General]: relevant subset of required properties need to be defined out of the standard properties* *[COBIE2]: manufacturer items are evaluated only on COBie2 construction files*	O			IfcPropertySet with Name = "Pset_ManufacturerTypeInformation"	
Article Number	*Article number or reference*	*OPTIONAL for "Basic FM HandOver View"*	*[COBIE2]: reqd (only construction) - Component.SerialNumber*	O		-	IfcPropertySingleValue with Name = "ArticleNumber"	
Model Name	*The name of the manufactured item as used by the manufacturer.*	*OPTIONAL for "Basic FM HandOver View"*	*[COBIE2]: optional - put in Attribute worksheet if used*	O		-	IfcPropertySingleValue with Name = "ModelReference"	
Model Number	*The model number and/or unit designator assigned by the manufacturer*	*OPTIONAL for "Basic FM HandOver View"*	*[COBIE2]: reqd (only construction) - Type.ModelNumber*	O		-	IfcPropertySingleValue with Name = "ModelLabel"	
Manufacturer	*The organization that manufactured and/or assembled the item.*	*OPTIONAL for "Basic FM HandOver View"*	*[COBIE2]: reqd (only construction) - Type.Manufacturer*	O		-	IfcPropertySingleValue with Name = "Manufacturer"	
Year of Production	*The year of production of the manufactured item.*	*OPTIONAL for "Basic FM HandOver View"*	*[COBIE2]: optional - put in Attribute worksheet if used*	O		-	IfcPropertySingleValue with Name = "ProductionYear"	
Spatial Container								
Doors contained in Building Story	A door can be contained in a building storey	either contained in building storey, or space (exactly one of both has to be provided)	*[FM-10]: if contained in building story, a space boundary to 1..2 spaces required* *[COBIE2]: components may only be installed within spaces in COBie2*	M/O		x	IfcRelContainedInSpatialStructure with .RelatingStructure = IfcBuildingStorey, and RelatedElements=[IfcWindow, other contained elements]	on import, both - containment in space and containment in building storey has to be supported, if contained in building storey, the door space boundaries have to be analysed

buildingSMART	exchange requirements for the "Basic HandOver to Facility Management"					IFC Model View Definition	
Object Type / Attribute Groups / Property	**Definitions and notes**	**Examples and further explanations**	**Comments**	**Export**	**Import**	**Ref. File**	**IFC Model Representation**	**Comments**
Doors contained in Space	A door can be contained in a space	either contained in building storey, or space (if already assigned to a single space in architectural CAD)	*[General]: would normally require additional input in CAD system (i.e. the user to select the space the window belongs to)* *[COBIE2]: reqd - Component.Spacenames*	**M/O**		x	IfcRelContainedInSpatialStructure with .RelatingStructure = IfcStorey, and RelatedElements=[IfcWindow, other contained elements]	on import, both - containment in space and containment in building storey has to be supported
Space Boundary								
Door bounding Space	A door can bound a single space (if external door, or two spaces (if internal door)		*[FM-10]: required, if not already contained in space* *[COBIE2]: all components may be identified in one or more spaces in COBie2*	**M/O**		x	IfcRelSpaceBoundary with RelatingSpace=IfcSpace, and RelatedElements=SELF	on import to be analysed, if door is contained in storey
Furnishing			*[COBIE2]: object classes must be strongly typed using the Type worksheet. Instances found in Component worksheet.*				**IfcFurnishingElement**	
Furnishing Attributes								
Software unique id	Object identifier (formated as GUID or UUID) to uniquely identify the software object	70ce2f2b-a5f8-4ab7-bc7f-6a838a353f61, has to be maintained by the application (e.g. for re-export)	*[FM-10]: software key, does not yield any human interpretation* *[COBIE2]: reqd if created by external system Component.ExtIdentifier*	**M**		x	IfcFurnishingElement.GlobalId	
Name	Individual element name (for human reference)		*[COBIE2]: reqd - Component.Name*	**M**		x	IfcFurnishingElement.Name	
Description	*Additional description*	*OPTIONAL for "Basic FM HandOver View"*	*[COBIE2]: reqd - Type.Description, no separate description for specific component*	**O**		x	IfcFurnishingElement.Description	
Furnishing Type								
Furnishing type name		e.g. chair, desk, table, ...	*[COBIE2]: reqd if created by external system Type.ExtIdentifier*	**M**		x	IfcFurnishingElement.ObjectType	
Furnishing Type	Reference to the common furniture type used for all occurrences of the furniture	required reference to a common type (family, style, etc.)	*[General]: Types are also called "style", or "family" in CAD software* *[COBIE2]: Type worksheet holds all COBie2 types*	**M**		x	IfcFurnitureType (through relationship IfcRelDefinesByType)	
Name	Individual type name (for human reference)		*[COBIE2]: reqd - Type.Name*	**M**		x	IfcFurnitureType.Name	
Description	*Additional description*	*OPTIONAL for "Basic FM HandOver View"*	*[COBIE2]: reqd - Type.Description*	**O**		x	IfcFurnitureType.Description	
Type	*Furnishing type as assigned to the type*	*OPTIONAL for "Basic FM HandOver View"* *e.g. chair, desk, table, ...*	*[General]: if a furnishing type is provided at both, IfcFurnishingElement and IfcFurnitureType, then the type at IfcFurnishingElement overrides.* *[COBIE2]: reqd - min one attribute worksheet "Type" row for each furnishing type*	**O**		-	IfcFurnitureType.ElementType	
Material	*Material as assigned to the type*	*OPTIONAL for "Basic FM HandOver View"* *material information as shown below for element materials*	*[General]: if a material is provided at both, IfcFurnishingElement and IfcFurnitureType, then the material at IfcFurnishingElement overrides.* *[COBIE2]: reqd - min one attribute worksheet "Material" row for each furnishing type*	**O**		-	IfcMaterial, or IfcMaterialLayerSet (through relationsip IfcRelAssociatesMaterial)	same definition of material as provided below for furnishing material
Classification	*Classification as assigned to the type*	*OPTIONAL for "Basic FM HandOver View"* *classification information as shown below for element classification*	*[General]: if a furnishing classification is provided at both, IfcFurnishingElement and IfcFurnitureType, then the classification at IfcFurnishingElement overrides.* *[COBIE2]: see Classification below*	**O**		-	IfcClassificationReference (through relationship IfcRelAssociatesClassification)	same definition of classification as provided below for furnishing classification
Properties	*Properties as assigned to the type*	*OPTIONAL for "Basic FM HandOver View"* *property set information as shown below for element properties*	*[General]: if a furnishing property is provided at both, IfcFurnishingElement and IfcFurnitureType, then the property at IfcFurnishingElement overrides.* *[COBIE2]: properties of individual components that differ from type must be reported as properties of the Component.*	**O**		x	IfcPropertySet (through relationship IfcRelDefinesByType and IfcFunitureType.HasPropertySets)	
Furnishing Material								
Material	base material for furniture			**O**			IfcMaterial (through relationsip	or assigned to the IfcFurnitureType
Material name	name of the material		*[COBIE2]: see previous note on Material Property*	**O**		-	IfcMaterial.Name	
Furnishing Classification								

buildingSMART	exchange requirements for the "Basic HandOver to Facility Management"					IFC Model View Definition	
Object Type / Attribute Groups / Property	**Definitions and notes**	**Examples and further explanations**	**Comments**	**Export**	**Import**	**Ref. File**	**IFC Model Representation**	**Comments**
Classification	Furniture classification	*USED for "Basic FM HandOver View", requires to specify a classification system*	*[General]: In particular interesting for data exchange between CAFM* *[COBIE2]: reqd - Type.Category first value of delimited list*	M		-	IfcClassificationReference (through relationship IfcRelAssociatesClassification)	or assigned to the IfcFurnitureType (through relationship IfcRelDefinesByType)
Classification Item Key	Key of classification item within the classification system		*[COBIE2]: n/a*	M		-	IfcClassificationReference.ItemReference	
Classification Item Name	Clear name of the classification item		*[COBIE2]: regional specification (Omniclass Table 23 in NA)*	M		-	IfcClassificationReference.Name	
Classification System Name	Name of the classification system		*[COBIE2]: reqd - min one attribute worksheet "Material" row for each furnishing type*	M		-	IfcClassification.Name (through IfcClassificationReference.ReferencedSource)	
~~*Classification System ID*~~	*Identifyer of the classification system*		*[COBIE2]: see Classification below*	-		-	IfcClassification.Source (through IfcClassificationReference.ReferencedSource)	In IFC2x3 there is an implementer agreement to store the unique Id (encoding name, edition, version, etc.) in Source field
Furnishing properties							IfcPropertySet for IfcFurnishingElement	or assigned to the
Furniture Common Properies	Properties that are specified in the standard property definitions (or a relevant subset of)		*[General]: relevant subset of required properties need to be defined out of the standard properties* *[COBIE2]: object properties are assigned against Type.*	O		x	IfcPropertySet with Name = "Pset_FurnitureTypeCommon"	
Length	Overall length as provided by the manufacturer data.		*[COBIE2]: reqd - min one attribute worksheet "Width" row for each furnishing type*	O		x	IfcPropertySingleValue with Name = "NominalLength"	
Depth	Overall depth as provided by the manufacturer data.		*[COBIE2]: reqd - min one attribute worksheet "Height" row for each furnishing type*	O		x	IfcPropertySingleValue with Name = "NominalDepth"	
Height	Overall height as provided by the manufacturer data.		*[COBIE2]: reqd - min one attribute worksheet "Area" row for each furnishing type*	O		x	IfcPropertySingleValue with Name = "NominalHeight"	
Furnishing Manufacturer Properties	*Properties that are specified in the manufacturer property definitions (or a relevant subset of)*	*OPTIONAL for "Basic FM HandOver View"*	*[General]: relevant subset of required properties need to be defined out of the standard properties* *[COBIE2]: manufacturer items are evaluated only on COBie2 construction files*	O		x	IfcPropertySet with Name = "Pset_ManufacturerTypeInformation"	
Article Number	*Article number or reference*	*OPTIONAL for "Basic FM HandOver View"*	*[COBIE2]: reqd (only construction) - Component.SerialNumber*	O		x	IfcPropertySingleValue with Name = "ArticleNumber"	
Model Name	*The name of the manufactured item as used by the manufacturer.*	*OPTIONAL for "Basic FM HandOver View"*	*[COBIE2]: optional - put in Attribute worksheet if used*	O		x	IfcPropertySingleValue with Name = "ModelReference"	
Model Number	*The model number and/or unit designator assigned by the manufacturer*	*OPTIONAL for "Basic FM HandOver View"*	*[COBIE2]: reqd (only construction) - Type.ModelNumber*	O		x	IfcPropertySingleValue with Name = "ModelLabel"	
Manufacturer	*The organization that manufactured and/or assembled the item.*	*OPTIONAL for "Basic FM HandOver View"*	*[COBIE2]: reqd (only construction) - Type.Manufacturer*	O		x	IfcPropertySingleValue with Name = "Manufacturer"	
Year of Production	*The year of production of the manufactured item.*	*OPTIONAL for "Basic FM HandOver View"*	*[COBIE2]: optional - put in Attribute worksheet if used*	O		x	IfcPropertySingleValue with Name = "ProductionYear"	
Spatial Container								
~~*Furniture contained in Building Story*~~	*A furniture can be contained in a building storey*	Contained in building storey only in exceptional cases. I.e. on export certification checks on assignment to space, on import certification checks exception handling for furniture in building story	*[General]: for import the ability has to be provided to accept furniture on storey* *[COBIE2]: components may only be installed within spaces in COBie2*	-	M	-	IfcRelContainedInSpatialStructure with .RelatingStructure = IfcBuildingStorey, and RelatedElements=[IfcWindow, other contained elements]	on import, a funishing element assigned to the building storey has to be handled.
Furniture contained in Space	A furniture can be contained in a space	either contained in building storey, or space (assignment to space is required for all standard configurations)	*[General]: for export the ability to assign furniture to space is essential and has to be provided* *[COBIE2]: reqd - Component.Spacenames*	M		x	IfcRelContainedInSpatialStructure with .RelatingStructure = IfcStorey, and RelatedElements=[IfcWindow, other contained elements]	on export, the ability to assign furnishing elements to space is required.
Building service elements (MEP elements)		as far as it is in scope of the architectural software application, to be in scope of MEP software	*[COBIE2]: object classes must be strongly typed using the Type worksheet. Instances found in Component worksheet.*				**IfcDistributionElement** (and subtypes)	
MEP Attributes								

buildingSMART	exchange requirements for the "Basic HandOver to Facility Management"					IFC Model View Definition	
Object Type / Attribute Groups / Property	**Definitions and notes**	**Examples and further explanations**	**Comments**	**Export**	**Import**	**Ref. File**	**IFC Model Representation**	**Comments**
Software unique id	Object identifier (formated as GUID or UUID) to uniquely identify the software object	70ce2f2b-a5f8-4ab7-bc7f-6a838a353f81, has to be maintained by the application (e.g. for re-export)	*[FM-10]: software key, does not yield any human interpretation* *[COBIE2]: reqd if created by external system Component.ExtIdentifier*	M		x	IfcDistributionElement.GlobalId	
Name	Individual element name (for human reference)		*[COBIE2]: reqd - Component.Name*	M		x	IfcDistributionElement.Name	
Description	*Additional description*	*OPTIONAL for "Basic FM HandOver View"*	*[COBIE2]: reqd - Type.Description, no separate description for specific component*	O		x	IfcDistributionElement.Description	
MEP Type								
MEP type name			*[COBIE2]: reqd if created by external system Type.ExtIdentifier*	M			IfcDistributionElement.ObjectType	
MEP Type	Reference to the common MEP type used for all occurrences of the MEP element	REQUIRED for "Basic FM HandOver View" for MEP Software	*[FM-10]: Types are also called "style", or "family" in CAD software* *[COBIE2]: Type worksheet holds all COBie2 types*	M		x	IfcDistributionElementType(subtypes) (through relationship IfcRelDefinesByType)	for heating use IfcSpaceHeaterType, for sanitary objects use IfcSanitaryTerminalType, for sockets use IfcOutletType
Name	Individual type name (for human reference)	required human interpretable name	*[COBIE2]: reqd - Type.Name*	M		x	IfcDistributionElementType(subtypes) .Name	
Description	*Additional description*	*OPTIONAL for "Basic FM HandOver View"*	*[COBIE2]: reqd - Type.Description*	O		x	IfcDistributionElementType(subtypes) .Description	
Type	*MEP type as assigned to the type*	*OPTIONAL for "Basic FM HandOver View"* *type enumerator specific to the subtype of IfcDistributionElementType*	*[COBIE2]: reqd - min one attribute worksheet "Type" row for each furnishing type*	O		x	IfcDistributionElementType(subtypes) .ElementType	
Material	*Material as assigned to the type*	*OPTIONAL for "Basic FM HandOver View"* *material information as shown below for element materials*	*[General]: if a material is provided at both, IfcDistributionlement and IfcDistributionElementType, then the material at IfcDistributionElement overrides.* *[COBIE2]: reqd - min one attribute worksheet "Material" row for each furnishing type*	O		-	IfcMaterial, or IfcMaterialLayerSet (through relationsip IfcRelAssociatesMaterial)	same definition of material as provided below for MEP material
Classification	*Classification as assigned to the type*	*OPTIONAL for "Basic FM HandOver View"* *classification information as shown below for element classification*	*[General]: if a classification is provided at both, IfcDistributionElement and IfcDistributionElementType, then the classification at IfcDistributionElement overrides.* *[COBIE2]: see classification below*	O		-	IfcClassificationReference (through relationship IfcRelAssociatesClassification)	same definition of classification as provided below for MEP classification
Properties	*Properties as assigned to the type*	*OPTIONAL for "Basic FM HandOver View"* *property set information as shown below for element properties*	*[General]: if a property is provided at both, IfcDistributionElement and IfcDistributionElementType, then the property at IfcDistributionElement overrides.* *[COBIE2]: properties of individual components that differ from type must be reported as properties of the Component.*	O		x	IfcPropertySet (through relationship IfcRelDefinesByType and IfcDistributionElementType(subtypes) .HasPropertySets)	same definition of properties as provided below for MEP properties
MEP Material								
~~*Material*~~	*base material for MEP element*	*OPTIONAL for "Basic FM HandOver View"*		-		-	IfcMaterial (through relationsip IfcRelAssociatesMaterial)	
~~*Material name*~~	*name of the material*	*OPTIONAL for "Basic FM HandOver View"*	*[COBIE2]: n/a*	-		-	IfcMaterial.Name	
MEP Classification			*[COBIE2]: see classification below*					
Classification	FFE classification	REQUIRED for "Basic FM HandOver View" for MEP Software	*[General]: In particular interesting for data exchange between CAFM*	M		-	IfcClassificationReference (through relationship IfcRelAssociatesClassification)	
Classification Item Key	Key of classification item within the classification system		*[COBIE2]: reqd - Type.Category first value of delimited list*	M		-	IfcClassificationReference.ItemReference	
Classification Item Name	Clear name of the classification item		*[COBIE2]: reqd - Type.Category first value of delimited list*	M		-	IfcClassificationReference.Name	
Classification System Name	Name of the classification system		*[COBIE2]: n/a*	M		-	IfcClassification.Name (through IfcClassificationReference.ReferencedSource)	

buildingSMART	exchange requirements for the "Basic HandOver to Facility Management"					IFC Model View Definition	
Object Type / Attribute Groups / Property	**Definitions and notes**	**Examples and further explanations**	**Comments**	**Export**	**Import**	**Ref. File**	**IFC Model Representation**	**Comments**
~~*Classification System ID*~~	Identifyer of the classification system		*[COBIE2]: regional specification (Omniclass Table 23 in NA)*	-		-	IfcClassification.Source (through IfcClassificationReference.ReferencedSource)	In IFC2x3 there is an implementer agreement to store the unique Id (encoding name, edition, version, etc.) in Source field
MEP properties							IfcPropertySet for	or assigned to the
MEP Common Properies	*Properties that are specified in the standard property definitions (or a relevant subset of)*		*[General]: relevant subset of required properties need to be defined out of the standard properties* *[COBIE2]: object properties are assigned against Type.*	**M**		**x**	IfcPropertySet with Name = "Pset_DistributionFlowElementCommon", or other	
Reference	*Reference ID for this specific instance (e.g. 'WWS/VS1/400/001',*	*e.g. the "AKS Nummer"*	*[COBIE2]: optional - put in Attribute worksheet if used*	**M**		**x**	IfcPropertySingleValue with Name = "Reference"	
MEP Manufacturer Properties	*Properties that are specified in the manufacturer property definitions (or a relevant subset of)*	*OPTIONAL for "Basic FM HandOver View"*	*[General]: relevant subset of required properties need to be defined out of the standard properties* *[COBIE2]: manufacturer items are evaluated only on COBie2 construction files*	**O**		**x**	IfcPropertySet with Name = "Pset_ManufacturerTypeInformation"	
Article Number	*Article number or reference*	*OPTIONAL for "Basic FM HandOver View"*	*[COBIE2]: reqd (only construction) - Component.SerialNumber*	**O**		**x**	IfcPropertySingleValue with Name = "ArticleNumber"	
Model Name	*The name of the manufactured item as used by the manufacturer.*	*OPTIONAL for "Basic FM HandOver View"*	*[COBIE2]: optional - put in Attribute worksheet if used*	**O**		**x**	IfcPropertySingleValue with Name = "ModelReference"	
Model Number	*The model number and/or unit designator assigned by the manufacturer*	*OPTIONAL for "Basic FM HandOver View"*	*[COBIE2]: reqd (only construction) - Type.ModelNumber*	**O**		**x**	IfcPropertySingleValue with Name = "ModelLabel"	
Manufacturer	*The organization that manufactured and/or assembled the item.*	*OPTIONAL for "Basic FM HandOver View"*	*[COBIE2]: reqd (only construction) - Type.Manufacturer*	**O**		**x**	IfcPropertySingleValue with Name = "Manufacturer"	
Year of Production	*The year of production of the manufactured item.*	*OPTIONAL for "Basic FM HandOver View"*	*[COBIE2]: optional - put in Attribute worksheet if used*	**O**		**x**	IfcPropertySingleValue with Name = "ProductionYear"	
Spatial Container								
~~*MEP contained in Building Story*~~	*An MEP element can be contained in a building storey, to be used ONLY, if the MEP element spans between two or more spaces*	either contained in building storey, or space (exactly one of both has to be provided) - to building story shall not be included (as far as possible)	*[General]: for import the ability has to be provided to accept furniture on storey* *[COBIE2]: Components may only be placed within specifically named spaces*	-	**M**	-	IfcRelContainedInSpatialStructure with .RelatingStructure = IfcBuildingStorey, and RelatedElements=[IfcDistributionElement, other contained elements]	on import, a MEP element assigned to the building storey has to be handled.
MEP contained in Space	A MEP element is contained in a space	either contained in building storey, or space (assignment to space is required for all standard configurations)	*[General]: for export the ability to assign furniture to space is essential and has to be provided* *[COBIE2]: reqd - Component.SpaceNames*	**M**		**x**	IfcRelContainedInSpatialStructure with .RelatingStructure = IfcStorey, and RelatedElements=[IfcDistributionElement, other contained elements]	on export, the ability to assign MEP elements to space is required.
Any other furniture, fixture and equipment		as far as it is in scope of the architectural software application, to be in scope of MEP software known semantic types have to be exchanged as subtypes of furniture or distribution element. Proxies only supported as exceptional fallbacks	*[FM-10]: on export only in exceptional cases, on import a proper exception handling shall be provided.* *[COBIE2]: object classes must be strongly typed using the Type worksheet. Instances found in Component worksheet. All ifcTypes to be included except: IfcWallType, IfcSlabType, IfcBeamType, IfcColumnType, IfcMemberType, IfcPlateType, IfcRailingType, IfcStairFlightType, IfcCurtainWallType, IfcRampFlightType*				**IfcBuildingElementProxy**	
Proxy Attributes								
Software unique id	Object identifier (formated as GUID or UUID) to uniquely identify the software object	70ce2f2b-a5f8-4ab7-bc7f-6a838a353f81, has to be maintained by the application (e.g. for re-export)	*[General]: software key, does not yield any human interpretation* *[COBIE2]: reqd if created by external system Component.ExtIdentifier*	**M**			IfcBuildingElementProxy.GlobalId	
Name	Individual element name (for human reference)		*[COBIE2]: reqd - Component.Name*	**M**			IfcBuildingElementProxy.Name	
Description	*Additional description*	*OPTIONAL for "Basic FM HandOver View"*	*[COBIE2]: reqd - Type.Description, no separate description for specific component*	**O**			IfcBuildingElementProxy.Description	

buildingSMART	exchange requirements for the "Basic HandOver to Facility Management"					IFC Model View Definition	
Object Type / Attribute Groups / Property	**Definitions and notes**	**Examples and further explanations**	**Comments**	**Export**	**Import**	**IFC Model Representation**	**Comments**
Proxy Type			*[COBIE2]: Type worksheet holds all COBie2 types*				
Proxy type name			*[COBIE2]: reqd if created by external system Type.ExtIdentifier*	**O**		IfcBuildingElementProxy.ObjectType	
Proxy Type	*Reference to the common FFE type used for all occurrences of the FFE*	*OPTIONAL for "Basic FM HandOver View"*	*[General]: Types are also called "style", or "family" in CAD software* *[COBIE2]: Type worksheet holds all COBie2 types*	**O**		IfcBuildingElementProxyType (and subtypes) (through relationship IfcRelDefinesByType)	
Name	*Individual type name (for human reference)*		*[COBIE2]: reqd - Type.Name*	**O**		IfcBuildingElementProxyType(subtypes).Name	
Description	*Additional description*		*[COBIE2]: reqd - Type.Description*	**O**		IfcBuildingElementProxyType(subtypes).Description	
Type	*FFE type as assigned to the type*		*[COBIE2]: reqd - min one attribute worksheet "Type" row for each furnishing type*	**O**		IfcBuildingElementProxyType(subtypes).ElementType	
Material	*Material as assigned to the type*	*material information as shown below for element materials*	*[General]: if a material is provided at both, IfcBuildingElementProxy and IfcBuildingElementProxyType, then the material at IfcBuildingElementProxy overrides.* *[COBIE2]: reqd - min one attribute worksheet "Material" row for each furnishing type*	**O**		IfcMaterial, or IfcMaterialLayerSet (through relationsip IfcRelAssociatesMaterial)	same definition of material as provided below for MEP material
Classification	*Classification as assigned to the type*	*classification information as shown below for element classification*	*[General]: if a classification is provided at both, IfcBuildingElementProxy and IfcBuildingElementProxyType, then the classification at IfcBuildingElementProxy overrides.* *[COBIE2]: see classification below*	**O**		IfcClassificationReference (through relationship IfcRelAssociatesClassification)	same definition of classification as provided below for MEP classification
Properties	*Properties as assigned to the type*	*property set information as shown below for element properties*	*[General]: if a property is provided at both, IfcBuildingElementProxy and IfcBuildingElementProxyType, then the property at IfcBuildingElementProxy overrides.* *[COBIE2]: properties of individual components that differ from type must be reported as properties of the Component.*	**O**		IfcPropertySet (through relationship IfcRelDefinesByType and IfcDistributionElementType(subtypes).HasPropertySets)	same definition of properties as provided below for MEP properties
Proxy Material							
Material	*base material for FFE*	*OPTIONAL for "Basic FM HandOver View"*		**O**		IfcMaterial (through relationsip IfcRelAssociatesMaterial)	
Material name	*name of the material*	*OPTIONAL for "Basic FM HandOver View"*	*[COBIE2]: n/a*	**O**		IfcMaterial.Name	
Proxy Classification							
Classification	*Proxy classification*	*USED for "Basic FM HandOver View", requires to specify a classification system*	*[General]: In particular interesting for data exchange between CAFM*	**M**		IfcClassificationReference (through relationship IfcRelAssociatesClassification)	
Classification Item Key	*Key of classification item within the classification system*		*[COBIE2]: reqd - Type.Category first value of delimited list*	**M**		IfcClassificationReference.ItemReference	
Classification Item Name	*Clear name of the classification item*		*[COBIE2]: reqd - Type.Category first value of delimited list*	**M**		IfcClassificationReference.Name	
Classification System Name	*Name of the classification system*		*[COBIE2]: n/a*	**M**		IfcClassification.Name (through IfcClassificationReference.ReferencedSource)	
~~*Classification System ID*~~	*Identifyer of the classification system*		*[COBIE2]: regional specification (Omniclass Table 23 in NA)*	-		IfcClassification.Source (through IfcClassificationReference.ReferencedSource)	In IFC2x3 there is an implementer agreement to store the unique Id (encoding name, edition, version, etc.) in Source field
Proxy properties							
Proxy Common Properies	*Properties that are specified in the standard property definitions (or a relevant subset of)*	*OPTIONAL for "Basic FM HandOver View"*	*[General]: relevant subset of required properties need to be defined out of the standard properties* *[COBIE2]: object properties are assigned against Type.*	**O**		IfcPropertySet with Name = "Pset_BuildingElementProxyCommon", or other	

buildingSMART	exchange requirements for the "Basic HandOver to Facility Management"					IFC Model View Definition	
Object Type / Attribute Groups / Property	**Definitions and notes**	**Examples and further explanations**	**Comments**	**Export**	**Import**	**Ref. File**	**IFC Model Representation**	**Comments**
Reference	*Reference ID for this specific instance (e.g. 'WWS/VS1/400/001',*	*e.g. the "AKS Nummer"*	*[COBIE2]: optional - put in Attribute worksheet if used*	O			IfcPropertySingleValue with Name = "Reference"	
Proxy Manufacturer Properties	*Properties that are specified in the manufacturer property definitions (or a relevant subset of)*		*[General]: relevant subset of required properties need to be defined out of the standard properties* *[COBIE2]: manufacturer items are evaluated only on COBie2 construction files*	O			IfcPropertySet with Name = "Pset_ManufacturerTypeInformation"	
Article Number	*Article number or reference*		*[COBIE2]: reqd (construction) - Component.SerialNumber*	O			IfcPropertySingleValue with Name = "ArticleNumber"	
Model Name	*The name of the manufactured item as used by the manufacturer.*		*[COBIE2]: optional - put in Attribute worksheet if used*	O			IfcPropertySingleValue with Name = "ModelReference"	
Model Number	*The model number and/or unit designator assigned by the manufacturer*		*[COBIE2]: reqd (construction) - Type.ModelNumber*	O			IfcPropertySingleValue with Name = "ModelLabel"	
Manufacturer	*The organization that manufactured and/or assembled the item.*		*[COBIE2]: reqd (construction) - Type.Manufacturer*	O			IfcPropertySingleValue with Name = "Manufacturer"	
Year of Production	*The year of production of the manufactured item.*		*[COBIE2]: optional - put in Attribute worksheet if used*	O			IfcPropertySingleValue with Name = "ProductionYear"	
Spatial Container								
~~*Proxy contained in Building Story*~~	*An proxy can be contained in a building storey*	either contained in building storey, or space (exactly one of both has to be provided) - to building story shall not be included (as far as possible)	*[General]: for import the ability has to be provided to accept furniture on storey* *[COBIE2]: Components may only be placed within specifically named spaces*	-	M		IfcRelContainedInSpatialStructure with .RelatingStructure = IfcBuildingStorey, and RelatedElements=[IfcBuildingElementProxy, other contained elements]	on import, a FFE element assigned to the building storey has to be handled.
Proxy contained in Space	A proxy can be contained in a space	either contained in building storey, or space (assignment to space is required for all standard configurations)	*[General]: for export the ability to assign furniture to space is essential and has to be provided* *[COBIE2]: reqd - Component.SpaceNames*	M			IfcRelContainedInSpatialStructure with .RelatingStructure = IfcStorey, and RelatedElements=[IfcBuildingElementProxy, other contained elements]	on export, the ability to assign FFE elements to space is required.
Zone as a logical grouping of spaces		if in scope of the architectural software	*[COBIE2]: zones are rquired in COBie2 files. Zones defined shared space functionality.*				**IfcZone**	
Zone Attributes								
Software unique id	Object identifier (formated as GUID or UUID) to uniquely identify the software object	70ce2f2b-a5f8-4ab7-bc7f-6a838a353f81, has to be maintained by the application (e.g. for re-export)	*[FM-10]: software key, does not yield any human interpretation* *[COBIE2]: reqd if created by external system Zone.ExtIdentifier*	M		x	IfcZone.GlobalId	
Name	Individual element name (for human reference)		*[COBIE2]: reqd - Zone.Name*	M		x	IfcZone.Name	
Description	*Additional description*	*OPTIONAL for "Basic FM HandOver View"*	*[COBIE2]: n/a*	O		x	IfcZone.Description	
Zone Classification								
Classification	*Zone classification*	*OPTIONAL for "Basic FM HandOver View", requires to specify a classification system*	*[General]: In particular interesting for data exchange between CAFM*	O		-	IfcClassificationReference (through relationship IfcRelAssociatesClassification)	
Classification Item Key	*Key of classification item within the classification system*		*[COBIE2]: Primary key for zoning is Zone.Name and Zone.Category*	O		-	IfcClassificationReference.ItemReference	
Classification Item Name	*Clear name of the classification item*		*[COBIE2]: reqd - Zone.Category Default values: Circulation, Lighting, Fire, Historical, Occupancy, Ventilation*	O		-	IfcClassificationReference.Name	
Classification System Name	*Name of the classification system*		*[COBIE2]: n/a*	O		-	IfcClassification.Name (through IfcClassificationReference.ReferencedSource)	
~~*Classification System ID*~~	*Identifyer of the classification system*		*[COBIE2]: Classification system self-defined within COBie2 pick lists.*	-		-	IfcClassification.Source (through IfcClassificationReference.ReferencedSource)	In IFC2x3 there is an implementer agreement to store the unique Id (encoding name, edition, version, etc.) in Source field
Zone properties								

buildingSMART	exchange requirements for the "Basic HandOver to Facility Management"					IFC Model View Definition	
Object Type / Attribute Groups / Property	**Definitions and notes**	**Examples and further explanations**	**Comments**	**Export**	**Import**	**Ref. File**	**IFC Model Representation**	**Comments**
Zone Common Properies	*Properties that are specified in the standard property definitions (or a relevant subset of)*		*[General]: relevant subset of required properties need to be defined out of the standard properties* *[COBIE2]: n/a*	O		-	IfcPropertySet with Name = "Pset_ZoneCommon"	
Reference	*Reference ID for this specific instance (e.g. 'WWS/VS1/400/001',*		*[COBIE2]: n/a*	O		-	IfcPropertySingleValue with Name = "Reference"	
Spatial Zone Assignment								
Grouping of system components								
Spaces assigned to zone	*Assignement of individual spaces that belong to the zone for organizational or other purposes*	e.g. assigning all spaces to a flat, or to an office unit.	*[COBIE2]: reqd - Zone.SpaceNames*	M		x	IfcRelAssignsToGroup with .RelatingGroup = IfcZone, and .RelatedObjects = all IfcSpace's belonging to the zone	
Sub zones assigned to zone	*Assignment of sub zone to a parent zone*	*e.g. assigning the high security zone to the general security zone*		O		x	IfcRelAssignsToGroup with .RelatingGroup = IfcSystem, and .RelatedObjects = IfcZone (the sub zone)	
System as a logical grouping of elements		as far as it is in scope of the architectural software application, to be in scope of MEP software	*[COBIE2]: systems are rquired in COBie2 files. Systems define shared component functionality*				**IfcSystem**	
System Attributes								
Software unique id	Object identifier (formated as GUID or UUID) to uniquely identify the software object	70ce2f2b-a5f8-4ab7-bc7f-6a838a353f81, has to be maintained by the application (e.g. for re-export)	*[FM-10]: software key, does not yield any human interpretation* *[COBIE2]: reqd if created by external system Zone.ExtIdentifier*	M		x	IfcSystem.GlobalId	
Name	Individual element name (for human reference)		*[COBIE2]: reqd - Zone.Name*	M		x	IfcSystem.Name	
Description	*Additional description*	*OPTIONAL for "Basic FM HandOver View"*	*[COBIE2]: n/a*	O		x	IfcSystem.Description	
System Classification								
Classification	System classification	REQUIRED for "Basic FM HandOver View" for MEP Software	*[General]: In particular interesting for data exchange between CAFM*	M/O		x	IfcClassificationReference (through relationship IfcRelAssociatesClassification)	
Classification Item Key	Key of classification item within the classification system		*[COBIE2]: reqd - System.Category first value of delimited list*	M/O		x	IfcClassificationReference.ItemReference	
Classification Item Name	Clear name of the classification item		*[COBIE2]: reqd - System.Category first value of delimited list*	M/O		x	IfcClassificationReference.Name	
Classification System Name	Name of the classification system		*[COBIE2]: n/a*	M/O		x	IfcClassification.Name (through IfcClassificationReference.ReferencedSource)	
~~*Classification System ID*~~	*Identifyer of the classification system*		*[COBIE2]: regional specification (Omniclass Table 21 in NA)*	-		-	IfcClassification.Source (through IfcClassificationReference.ReferencedSource)	In IFC2x3 there is an implementer agreement to store the unique Id (encoding name, edition, version, etc.) in Source field
System properties								
System Common Properies	*Properties that are specified in the standard property definitions (or a relevant subset of)*		*[General]: relevant subset of required properties need to be defined out of the standard properties* *[COBIE2]: n/a*	O		-	IfcPropertySet with Name = "Pset_ZoneCommon"	
Reference	*Reference ID for this specific instance (e.g. 'WWS/VS1/400/001',*	*e.g. the "AKS Nummer"*	*[COBIE2]: n/a*	O		-	IfcPropertySingleValue with Name = "Reference"	
Component System Assignment								
Grouping of system components								
Components assigned to system	*Assignment of individual components that belong to the MEP system*	*e.g. assigning all MEP components belonging to a heating system, or a cold water system. Systems can have sub-systems.*	*[COBIE2]: reqd - System.ComponentNames*	M		x	IfcRelAssignsToGroup with .RelatingGroup = IfcSystem, and .RelatedObjects = all components (subtypes of IfcDistributionElement) belonging to the system, or IfcSystem's being sub-systems	

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Object Type / Attribute Groups / Property	**Definitions and notes**	**Examples and further explanations**	**Comments**	**Export**	**Import**	**Ref. File**	**IFC Model Representation**	**Comments**
Sub systems assigned to system	*Assignment of sub systems to a parent system*	*e.g. assigning the left wing heating system to the building heating system*		**O**		**x**	IfcRelAssignsToGroup with .RelatingGroup = IfcSystem, and .RelatedObjects = IfcSystem (the sub system)	
System Services Buildings								
System assigned to building structure	*Assignment of the system to the level of the building structure, it serves*						IfcRelAssignsToGroup with .RelatingGroup = IfcSystem, and .RelatedBuildings = levels of the building structure	
System assigned to story		*e.g. a horizontal system only serving one or several building stories*	*[COBIE2]: location of systems inferred from Component.SpaceNames referenced within System.ComponentNames*	**M/O**		**-**	with .RelatedBuildings = [1...n] IfcBuildingStorey	
System assigned to building		*e.g. a vertical system serving a whole building or building section*	*[COBIE2]: one building allowed per COBie2 file*	**M/O**		**x**	with .RelatedBuildings = [1...n] IfcBuilding	
System assigned to site		*e.g. an MEP system for delivering services on the site to the building*		**M/O**		**-**	with .RelatedBuildings = [1...1] IfcSite	

Legend

Property in black	required for "Basic FM Handover View"	see further explanations for restrictions, e.g only for MEP software, etc	a required property should be exported by the application, if provided as part of the data set by the user (e.g. by a property configuration, etc.). A required property should be imported, when part of the IFC data set.	**M**	**M**	M/O = one alternative is mandatory
Property in grey and italics	OPTIONAL for "Basic FM Handover View"	see further explanations for restrictions, e.g REQUIRED for MEP software, CAFM, etc		**O**	**O**	M/O = one alternative is mandatory
~~*Property in grey italic and strike through*~~	NOT USED for "Basic FM Handover View"			-	-	
~~Property in red and strike through~~	NOT ALLOWED for "Basic FM Handover View"		it is illegal to export such a property as part of the "Basic FM Handover View"	**N**	**N**	