



IFC - Back to Basic

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- ▶ Brenner for å lære bort



Agenda

Introduksjon

IFC Classes

IfcName, IfcDescription

IFC struktur

Property Sets

IFC eksport

Introduksjon

- ▶ IFC er en åpen standard for å utveksle BIM data
 - ▶ Ikke et filformat, men en åpen kode
 - ▶ Kan åpnes som en tekstfil
- ▶ IFC bør ikke brukes som en fil for videre modellering
 - ▶ Kun som levering/underlag av data



BuildingSmart – IFC dokumentasjon

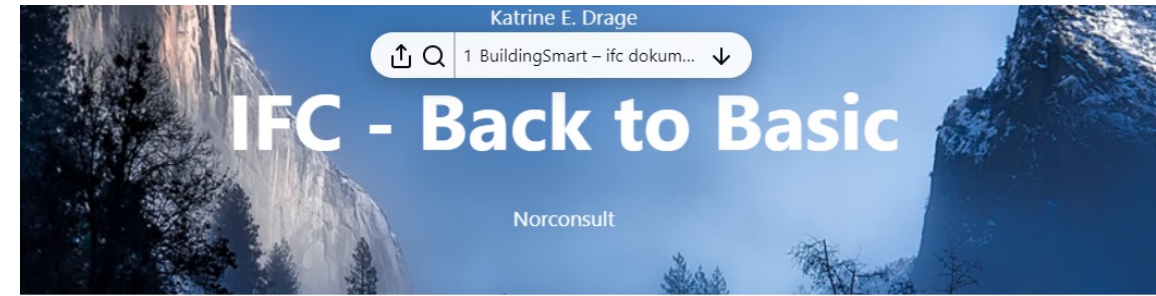


BuildingSmart sin dokumentasjon rundt IFC er komplisert

IFC 4 er lettest å “lese”



Dette dokumentet er din gode venn!



Innholdsfortegnelse

Forside

- 1 BuildingSmart – ifc dokumentasjon
- 2 IFC Export Classes
- 3 IFC struktur parametere
- 4 Property Sets
- 5 Eksport IFC fra Revit



1 BuildingSmart – ifc dokumentasjon

Building Smart sin dokumentasjon rundt IFC er komplisert og overveldende for mange siden det er ment for utviklere og ikke normale Revit brukere. Dette dokumentet er ment for å kunne hjelpe til med å forstå Building Smart sin standard og ta i bruk IFC på en korrekt måte uten å måtte forstå alt det tekniske bak IFC dokumentasjonen.

BuildingSmart har dokumentasjon på både IFC 2x3 og IFC 4, pr dags dato blir både IFC2x3 og IFC4 brukt i prosjektene, og du må undersøke hva du skal levere. Når det gjelder Building Smart sin dokumentasjonen for IFC 4, så er denne lettere å lese/navigere i enn IFC2x3, derfor vil vi anbefale å bruke denne uavhengig av hvilket format som skal leveres.

Enheter/Kategorier

- ▶ Valg av kategori / IFC class
- ▶ Property sets
- ▶ IFC class styre geometrien til objektene

The screenshot displays the IFC 4.0.0.0 documentation website. The top navigation bar includes sections like 'Cover', 'Contents', 'Foreword', 'Introduction', '1. Scope', '2. Normative references', '3. Terms, definitions, and abbreviated terms', '4. Fundamental concepts and assumptions', '5. Core data schemas', '6. Shared element data schemas', '7. Domain specific data schemas', '8. Resource definition data schemas', 'A. Computer interpretable listings', 'B. Alphabetical listings', 'C. Inheritance listings', 'D. Diagrams', 'E. Examples', and 'F. Change logs Bibliography Index'.

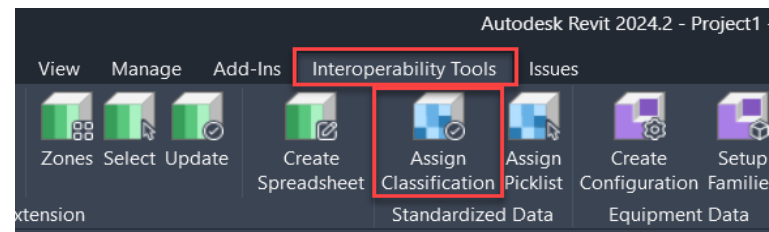
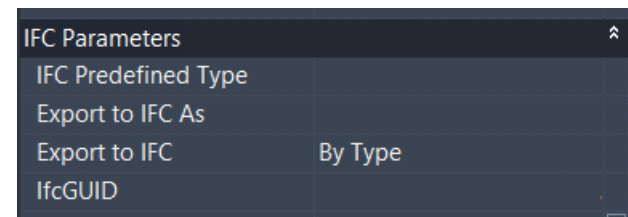
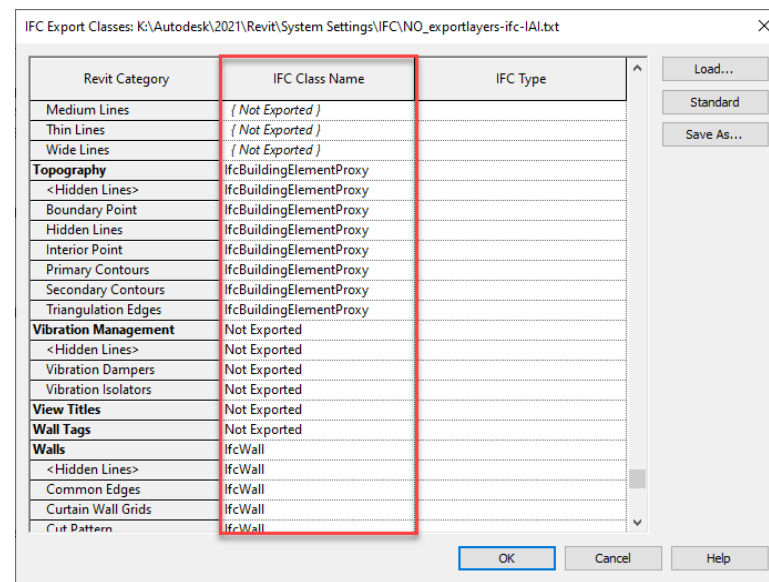
The main content area is titled '6.1.3.1 IfcBeam'. It features a 'Natural language names' table with three entries: 'Balken / Unterzug', 'Beam', and 'Poutre'. Below this is a 'Change log' table with columns for 'Item', 'SPF', 'XML', 'Change', and 'Description'. The table shows a change for 'IfcBeam' in version 4.0.0.0, specifically a 'MODIFIED' change to 'Instantiation changed to OPTIONAL' and an 'ADDED' change to 'PredefinedType'.

The 'Entity definition' section states: 'An IfcBeam is a horizontal, or nearly horizontal, structural member that is capable of withstanding load primarily by resisting bending. It represents such a member from an architectural point of view. It is not required to be load bearing.' It includes two notes: one defining the beam according to ISO 6707-1 and another stating that the representation of load-bearing beams is provided by subtypes of IfcStructuralMember.

The 'Semantic definitions at the entity' section explains that there are two main representations for beam occurrences: one with IfcMaterialProfileSetUsage and one without. The first representation is used for beams with a profile defined along a directrix, while the second is used for beams with non-uniformly changing profile sizes or 3D geometric representations.

IFC Classes

- ▶ IFC Class Name og Revit Category
- ▶ To måter
 - ▶ IFC mapping table
 - ▶ Export to IFC As (eller IfcExportAs)
- ▶ Navnet på IFC Class må følge BuildingSmart sin dokumentasjon



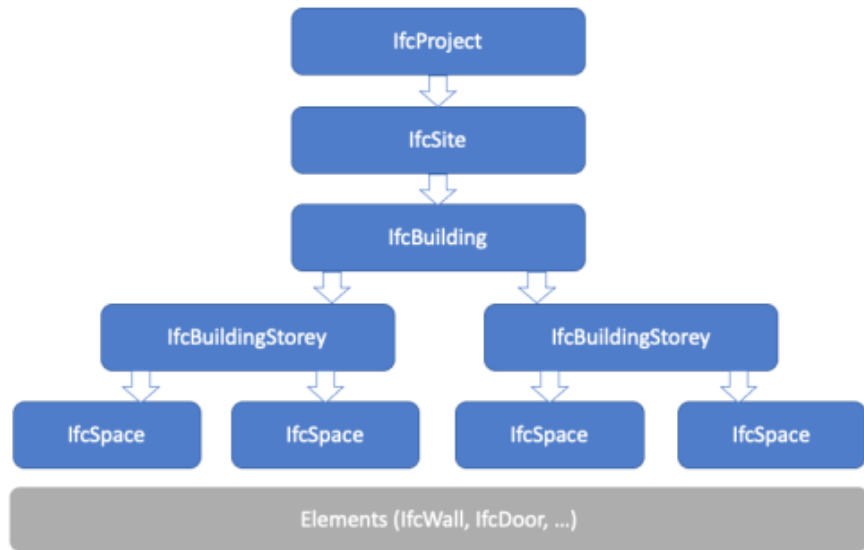
Export to IFC As

The image displays two side-by-side 'INFO' panels in Revit, each showing the properties of a different element. The left panel is for 'Footing.-1.1' and the right panel is for 'Wall.-1.1'. Both panels have a table with columns for Material, Profile, Relations, Classification, and Hyperlinks. The 'IFC Type' field in both panels is highlighted in blue. Below each panel is a 'Data' dropdown menu. Red arrows point from the 'IFC Type' field in the left panel to the 'IfcFooting' option in the left 'Data' dropdown. Similarly, red arrows point from the 'IFC Type' field in the right panel to the 'IfcWallType' option in the right 'Data' dropdown.

Material	Profile	Relations	Classification	Hyperlinks
Identification		Location		Quantities
Property			Value	
Model			Project1	
Discipline			Architectural	
Name			Basic Wall:Innervegg Betong 200:658199	
Phase			Project Status	
Type			Basic Wall:Innervegg Betong 200	
Type Name			Basic Wall:Innervegg Betong 200	
Predefined Type			NOTDEFINED	
Model Categories				
Description				
Material			NO_Betong - Plasstøpt 200 mm	
Layer			24	
System			Extrusion	
Application			Autodesk Revit 2022 (ENU)	
IFC Entity			IfcFooting	
IFC Type			IfcTypeProduct	
GUID			3tD501iQHfJQKOjBq0XsL7	
BATID			658199	

Material	Profile	Relations	Classification	Hyperlinks
Identification		Location		Quantities
Property			Value	
Model			Project1	
Discipline			Architectural	
Name			Innervegg	
Type			Basic Wall:Innervegg Betong 150	
Type Name			Basic Wall:Innervegg Betong 150	
Description				
Material			NO_Betong - Plasstøpt 150 mm	
Layer			24	
System				
Building Envelope			False	
Geometry			Extrusion	
Application			Autodesk Revit 2022 (ENU)	
IFC Entity			IfcWallStandardCase	
IFC Type			IfcWallType	
GUID			3tD501iQHfJQKOjBq0XsXw	
BATID			658329	
Model Categories				

IFC struktur



IFC struktur

Project Information

Family: System Family: Project Information Load...

Type: Edit Type...

Instance Parameters - Control selected or to-be-created instance

Parameter	Value
Organization Description	
Building Name	Byggets navn
Author	
ISY Rebar Area	
IFC Parameters	
IfcSite GUID	26J_F91ST8JeF1b3VaP2d\$
IfcBuilding GUID	26J_F91ST8JeF1b3VaP2dy
IfcProject GUID	26J_F91ST8JeF1b3VaP2dz
IfcDescription	
IfcLongName	
IfcName	Prosjektets navn
SiteDescription	
SiteLandTitleNumber	
SiteLongName	
SiteName	Tomtens navn
General	
BIM koordinator	initialer
Other	
Project Issue Date	Issue Date
Project Status	Project Status
Client Name	Kunde
Project Address	Enter address here
Project Name	Project Name
Project Number	523XXXXX
BuildingDescription	
BuildingID	
BuildingLongName	

OK Cancel

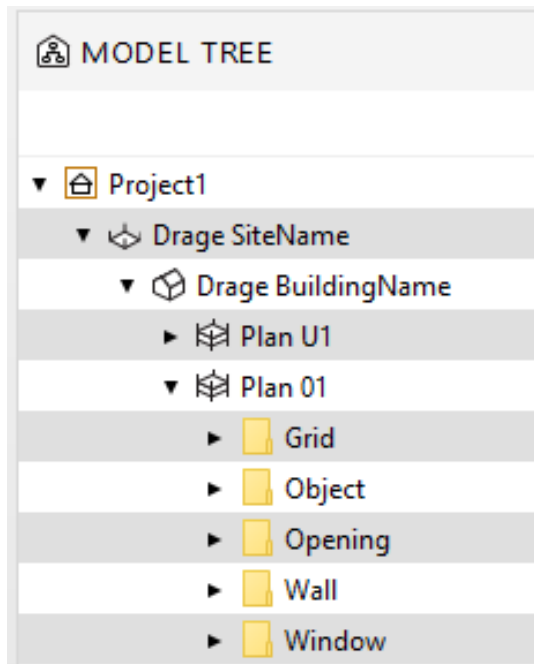
IFC-Parameters

These are the IFC parameters for the project structure

Project: (IfcProject)	Name: Project Number LongName: Project Name Description: IfcDescription	(Optional) (Optional)
Site: (IfcSite)	Name: SiteName LongName: SiteLongName Description: SiteDescription LandTitleNumber: SiteLandTitleNumber	(Optional) (Optional)
Building: (IfcBuilding)	Name: Building Name LongName: BuildingLongName Description: BuildingDescription BuildingID: BuildingID	(Optional) (Optional) (On own Property Set)
Level: (IfcBuildingStory)	This data is added to the level with its own property set: EntranceLevel: Entrance level (Yes/No) AboveGround: All the levels above ground (Yes/No)	

Name = Short name, can be a code
Long Name = Full name
Description = Description
BuildingID = Building number

IFC struktur



IFC-Parameters

These are the IFC parameters for the project structure

Project: (IfcProject)	Name: 523XXXXX LongName: Project Name Description: Drage IfcDescription	(Optional) (Optional)
Site: (IfcSite)	Name: Drage SiteName LongName: Drage SiteLongName Description: Drage SiteDescription LandTitleNumber: Drage SiteLandTitleNumber	(Optional) (Optional)
Building: (IfcBuilding)	Name: Drage BuildingName LongName: Drage BuildingLongName Description: Drage BuildingDescription BuildingID: Drage BuildingID	(Optional) (Optional) (On own Property Set)
Level: (IfcBuildingStory)	This data is added to the level with its own property set: EntranceLevel: Entrance level (Yes/No) AboveGround: All the levels above ground (Yes/No)	

Drage SiteName

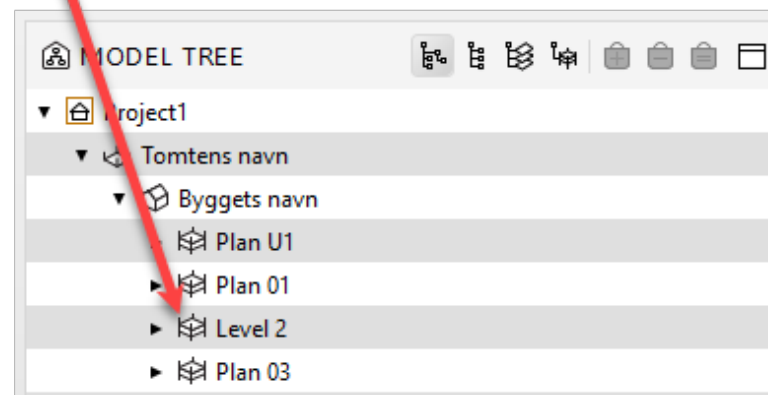
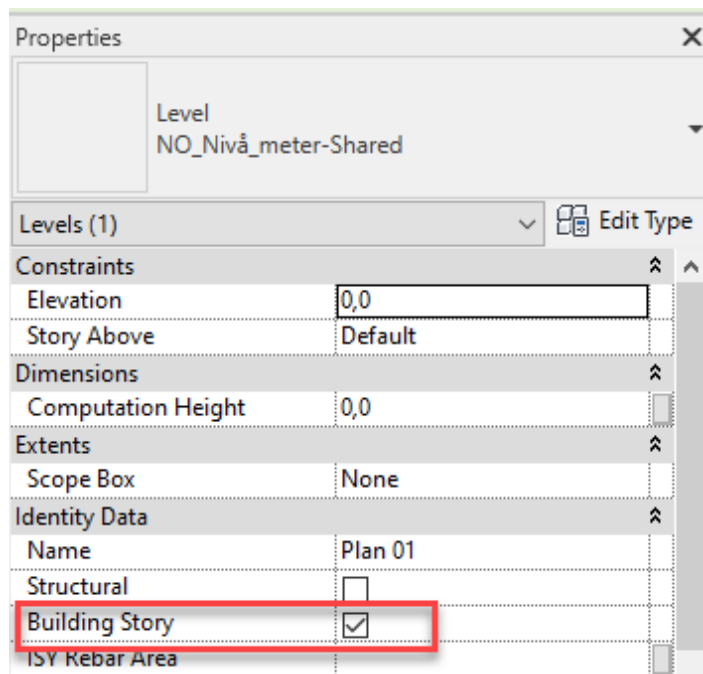
Property	Value
Model	Project1
Long Name	Drage SiteLongName
Discipline	Architectural
Application	Autodesk Revit 2024 (ENU)
Name	Drage SiteName
Description	Drage SiteDescription
GUID	26J_F91ST8JeFib3VaP2dS
IFC Entity	IfcSite
IFC Schema	IFC2X3
Number	Drage SiteLandTitleNumber

Drage BuildingName

Property	Value
Model	Project1
Long Name	Drage BuildingLongName
Discipline	Architectural
Application	Autodesk Revit 2024 (ENU)
Name	Drage BuildingName
Description	Drage BuildingDescription
GUID	26J_F91ST8JeFib3VaP2dy
IFC Entity	IfcBuilding
IFC Schema	IFC2X3

IfcBuildingStorey - Levels

- ▶ Definerer etasjer i IFC filen
 - ▶ Building Story
 - ▶ Navn endres med IfcName



IfcName, IfcDescription, IfcPresentationLayer

IfcName

- Overstyrer Name i IFC filen

IfcDescription

- Styrer Description i IFC filen

IfcPresentationLayer

- Overstyrer layer i IFC filen

IfcName

Properties

Basic Wall
Innervegg Betong 150

Walls (1) Edit Type

Comments

Mark

ISY Rebar Area

Phasing

Phase Created New Construction

Phase Demolished None

IFC Parameters

Contract Number

Control Area

Model Maturity Index

Phase

Status Constructed

IfcDescription

IfcCadLayer

Other

IfcName Innervegg

IfcLongName

INFO

Footing.-1.1

Profile	Relations	Classification	Hyperlinks
Identification	Location	Quantities	Material
Property	Value		
Model	Project1		
Discipline	Architectural		
Name	Basic Wall:Innervegg Betong 200:...		
Phase	Project Status		
Type	Basic Wall:Innervegg Betong 200		
Type Name	Basic Wall:Innervegg Betong 200		
Predefined Type	NOTDEFINED		
Model Categories			

INFO

Wall.-1.1

Profile	Relations	Classification	Hyperlinks
Identification	Location	Quantities	Material
Property	Value		
Model	Project1		
Discipline	Architectural		
Name	Innervegg		
Type	Basic Wall:Innervegg Betong 150		
Type Name	Basic Wall:Innervegg Betong 150		
Description			
Material	NO_Betong - Plasstept 150 mm		

IfcDescription

Properties	
Basic Wall Innervegg Betong 150	
Walls (1) Edit Type	
Volume	0,468 m ³
Identity Data	
Image	
Comments	
Mark	
ISY Rebar Area	
Phasing	
Phase Created	New Construction
Phase Demolished	None
IFC Parameters	
Contract Number	
Control Area	
Model Maturity Index	
Phase	
Status Constructed	
IfcDescription	My Description
IfcCadLayer	

INFO			
Wall.-1.1			
Profile	Relations	Classification	Hyperlinks
Identification	Location	Quantities	Material
Property	Value		
Model	Project1		
Discipline	Architectural		
Name	Innervegg		
Type	Basic Wall:Innervegg Betong 150		
Type Name	Basic Wall:Innervegg Betong 150		
Description	My Description		
Material	NO_Betong - Plasstøpt 150 mm		
Layer	24		
System			

Property Sets

Uten User Defined Property Sets

- IFC filen inneholde geometri av elementene
- Men et minimalt utvalg av parameterere

Parametere til IFC leveransen

- Schedules
- Tekstfil

Parameteren må ha en verdi for å bli med i ifc eksporten

Property Sets – Tekstfil

Samle alle parametere i en fil

- Enkelt å oppdatere for hele prosjektet

Tekstfilen lagres i oppdragsmappen

- Tilgjengelig for alle fag

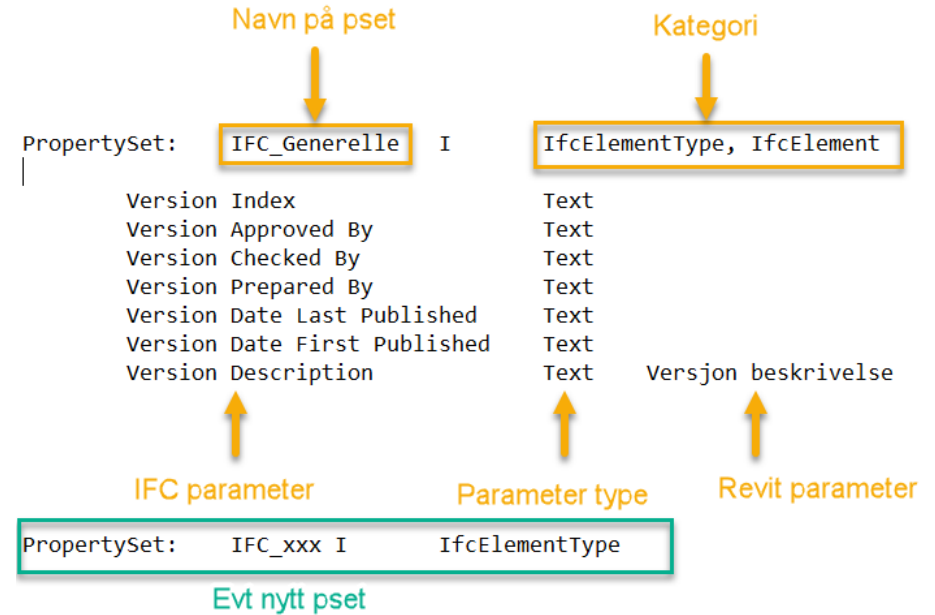
User Defined Property Set
mal

- C:\ProgramData\Autodesk\ApplicationPlugins\IFC 202x.bundle\Contents\202x\DefaultUserDefinedParameterSets.txt

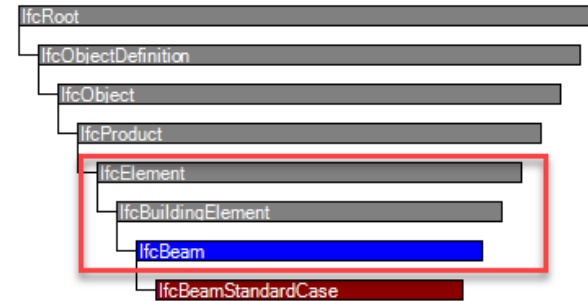
Kan være tidkrevende å sette opp

Property Sets - Tekstfil

- ▶ IFC_Generelle er navnet på Property Setet
- ▶ Type eller Instance avgjøres av kategorien IfcElementType eller IfcElement
- ▶ Oppramsning av parametere der hver nye linje begynner med Tab



Entity inheritance



Parameter Properties

Parameter Type

- Project parameter
(Can appear in schedules but not in tags)
- Shared parameter
(Can be shared by multiple projects and families, exported to ODBC, and appear in schedules and tags)

Select... Export...

Parameter Data

Name: Approved by Date Type

Discipline: Common Instance

Type of Parameter: Text Values are aligned per group type Values can vary by group instance

Property Sets - Tekstfil

IFC 4 og IFC 2x3 har ikke likt oppsett
Better Safe Than Sorry

```
PropertySet: Test T IfcWall, IfcWallType, IfcDoor, IfcDoorStyle  
Testproperty Text Revit Property Name (optional, if not =Testproperty)
```



Property Sets – Schedules

- ▶ Schedules er enkelt å sette opp
- ▶ Kan slettes eller redigeres av andre...
- ▶ Egner seg ikke for store prosjekter

<IFC_TFM>			
A	B	C	D
RefCompOcc	RefCompType	RefPriSysOcc	RefString
DIZ079	DIZ.016	2442.016	=2442.016-DIZ079%DIZ.016
DIZ065	DIZ.016	2442.016	=2442.016-DIZ065%DIZ.016
DIZ021	DIZ.008	2442.008	=2442.008-DIZ021%DIZ.008
DIZ069	DIZ.008	2442.008	=2442.008-DIZ069%DIZ.008
DIZ046	DIZ.006	2442.006	=2442.006-DIZ046%DIZ.006
DIZ031	DIZ.006	2442.006	=2442.006-DIZ031%DIZ.006

General | Additional Content | **Property Sets** | Level of Detail | Advanced

- Export Revit property sets
- Export IFC common property sets
- Export base quantities
- Export schedules as property sets
 - Export only schedules containing IFC, Pset, or Common in the title

Common Property Sets

- ▶ BuildingSmart har definerte egenskapssett
- ▶ Ikke anbefalt å krysse av for common property sets
 - ▶ Risiko for filer fulle av ukontrollert informasjon
- ▶ Lage et user defined Property Sets
 - ▶ Legge til ønskede parametere fra Building Smart
- ▶ Om parametere ikke finnes i Revit filen
 - ▶ Legges til fra shared parameter filen
IFC Shared Parameters-RevitIFCBuiltIn_ALL.txt

PsetName	Properties			
Pset_WallCommon	Template	PropertyName	Value	Reference
	Single Value	Reference	IfcIdentifier	
	Single Value	AcousticRating	IfcLabel	
	Single Value	FireRating	IfcLabel	
	Single Value	Combustible	IfcBoolean	
	Single Value	SurfaceSpreadOfFlame	IfcLabel	
	Single Value	ThermalTransmittance	IfcThermalTransmittanceMeasure	
	Single Value	IsExternal	IfcBoolean	
	Single Value	ExtendToStructure	IfcBoolean	
	Single Value	LoadBearing	IfcBoolean	
	Single Value	Compartmentation	IfcBoolean	
	Enumerated Value	Status	IfcLabel	

General Additional Content Property Sets Level of Detail Advanced

Export Revit property sets

Export IFC common property sets

Export base quantities

Export schedules as property sets

Export only schedules containing IFC, Pset, or Common in the title

Export user defined property sets

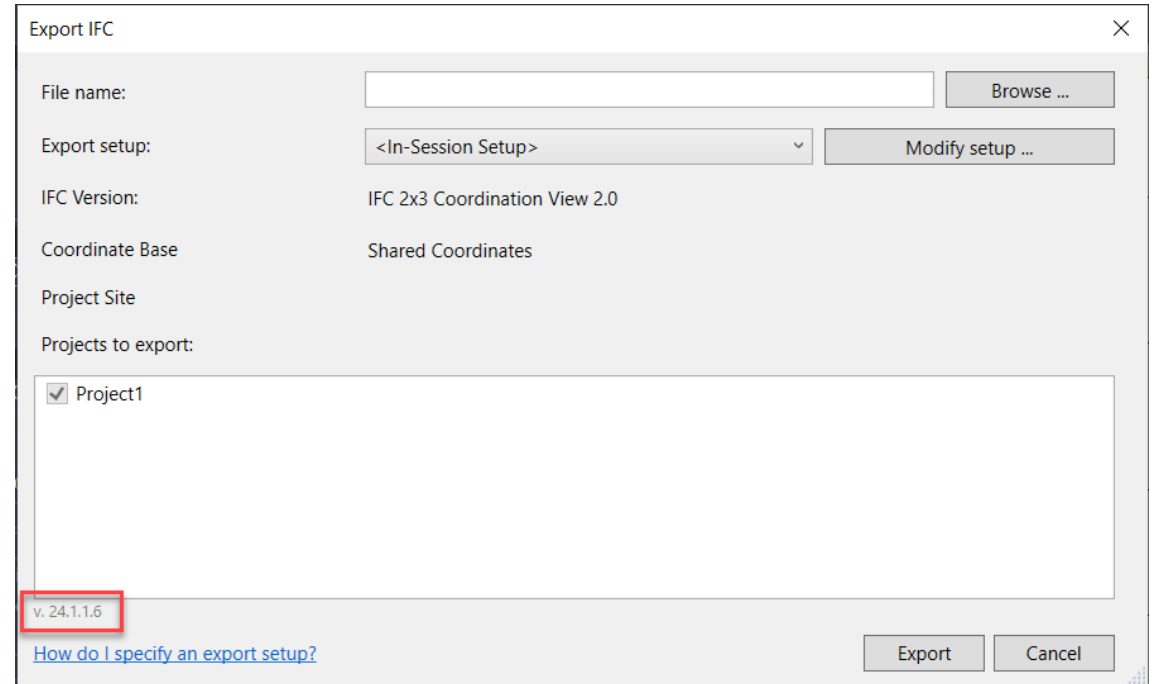
C:\Program Files\Autodesk\Revit 2022\AddIns\IFCExporterUI\DefaultUserDefined Browse ...

Export parameter mapping table

Browse ...

IFC eksport fra Revit

- ▶ Oppdatert IFC skriver
- ▶ IFC filen kan se forskjellig ut i forskjellige programvarer
 - ▶ Navisworks og Solibri viser parametere likt
 - ▶ Navisworks har grafiske utfordringer
 - ▶ FZK viser IFC filen korrekt i henhold til Building Smart



Export Setup

- ▶ Sett opp en firma spesifik eksport
 - ▶ Sikrer lik setup for alle
 - ▶ Lik IFC fil ved hver leveranse
 - ▶ Unngår endring av plassering eller property sets
- ▶ Kontroller alltid IFC filen

Oppsummering

Export to IFC As

IfcName

IFC struktur

Property Sets

IFC eksport

Kilder:

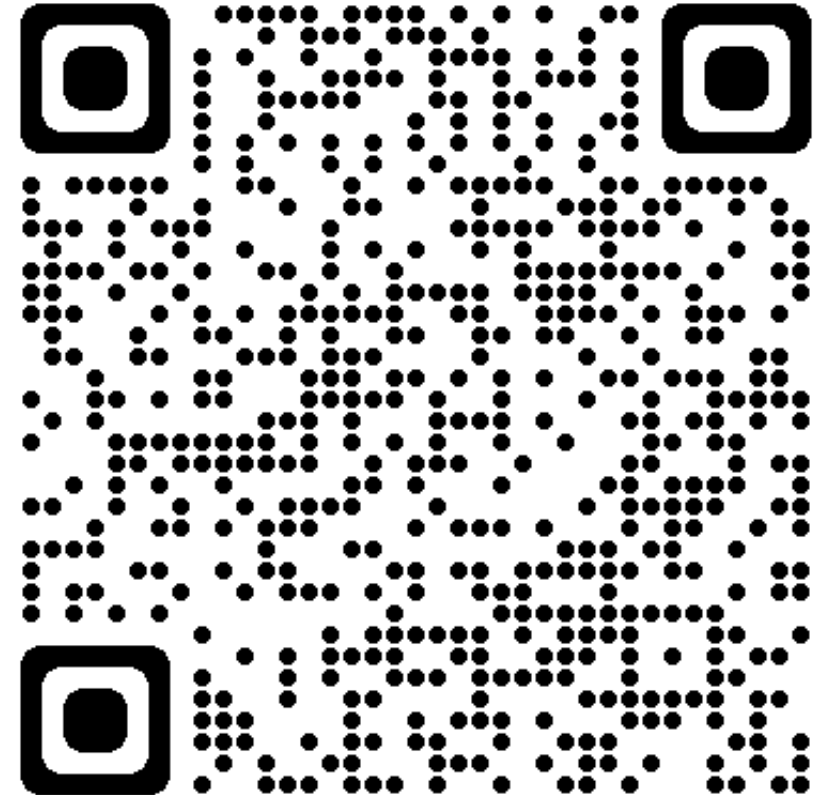
<https://damassets.autodesk.net/content/dam/autodesk/www/pdf/revit-ifc-open-bim-manual-en.pdf>

<https://technical.buildingsmart.org/standards/ifc/>

<https://bim-me-up.com/>

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<https://norconsult.wrep.it/ifcbacktobasic>



Every day we improve everyday life