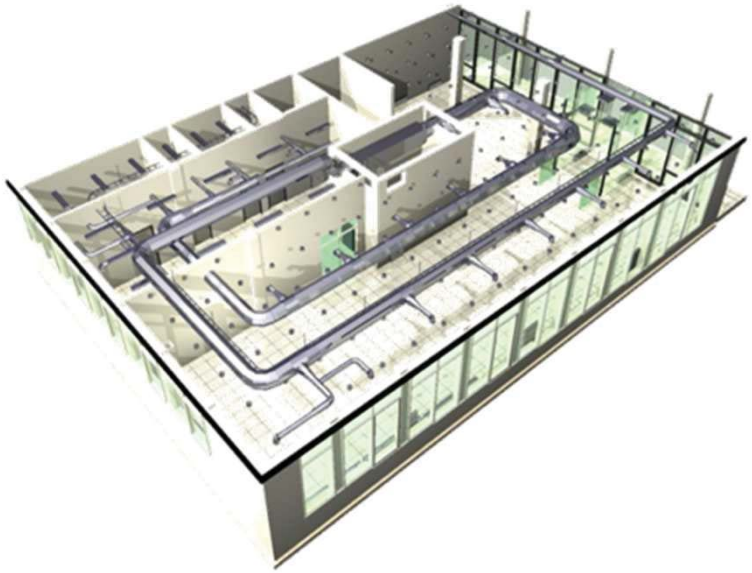

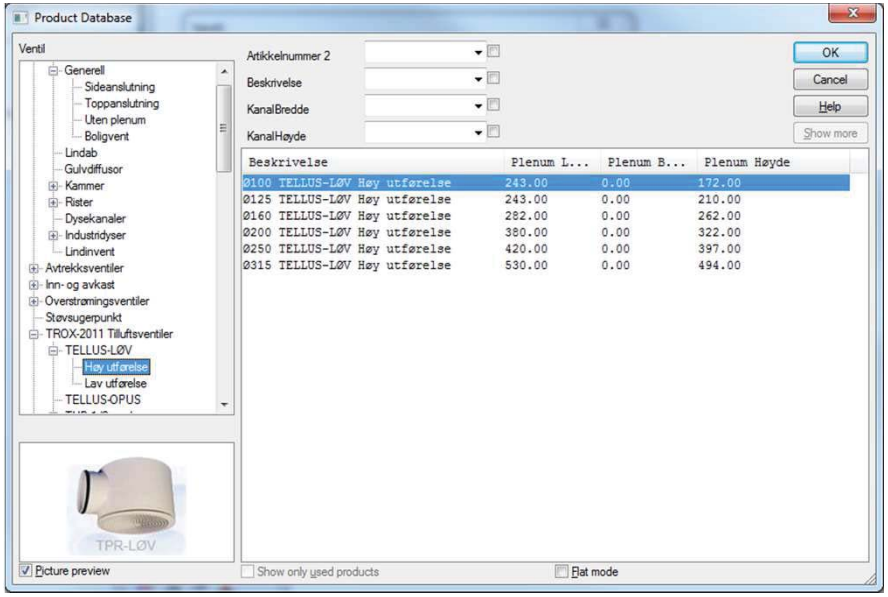

OPEN BIM™ buildingSMART DDS-CAD

Product Libraries in Ifc format

ISG implementers agreement – Ifc for Product Libraries

Prepared by Bjørn K Stangeland for the buiildingSMART conference in Waltham, February 2013

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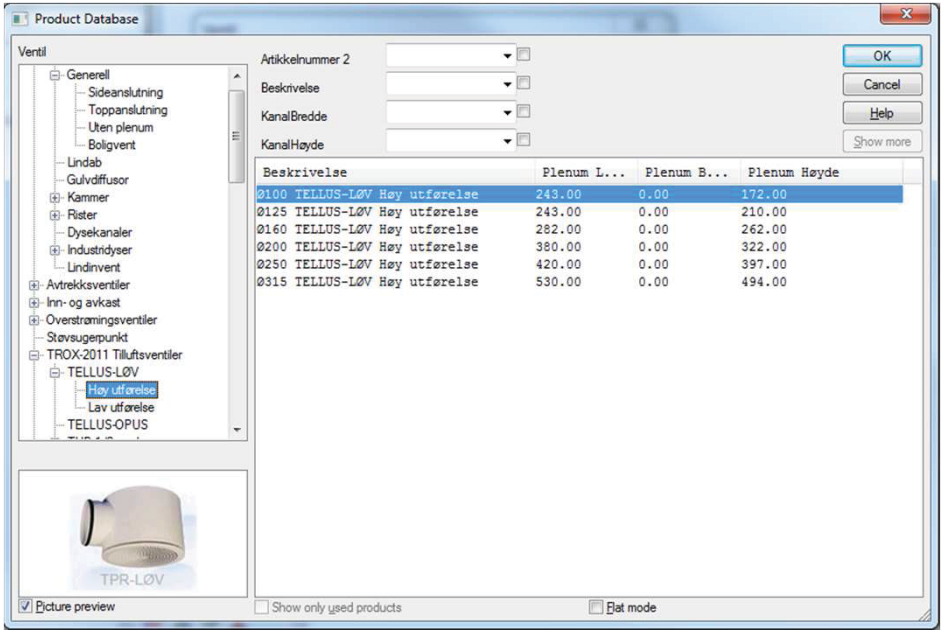
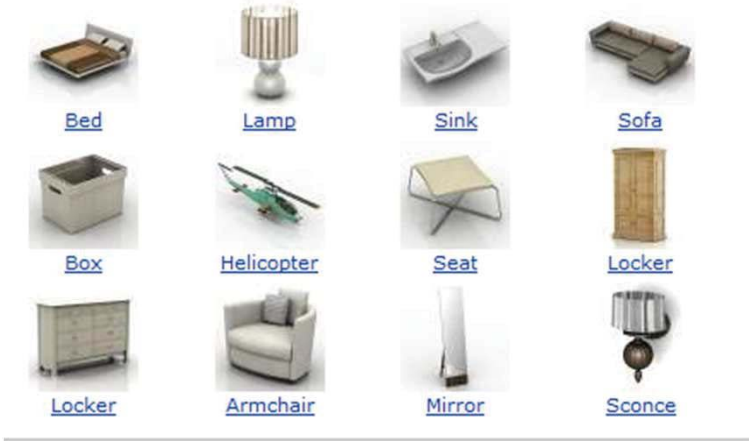
Requirements for a “Product Library”

Product library: A storage were information about products can be found and accessed.

- BIM authoring tools use proprietary product libraries for selecting and inserting “objects”.
- Products (objects) could be generic or manufacturer specific.
- Products physical appearance and shape are often defined by 2D and 3D geometry.
- A product’s properties are being used by “intelligent” BIM applications (calculations etc.)
- Products are “grouped” for easier browsing by end-users.
- Products often contains a “pre-view” or a “photo” for end-users to see.
- Reference to the product library source are often maintained after a product has been “drag & dropped” into a BIM model (properties are accessed from the library when needed)





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buildingSMART and product libraries

- The Ifc format are currently being used to distribute information about **buildings**.
- A building is composed by a number of **products** being **assembled**.
- An Ifc file without buildings, spaces, systems etc. is basically a **product library**

Product data - Information about one single product according to the relevant template.
Product library - A place were product data for many products can be stored and accessed
Templates - Which information is mandatory and optional for a given product type.
Data Dictionary - Database with "terminology", uniquely specifying properties in several languages. A property's GUID can be used in any data format for reference.

Software vendors simply need to agree how to read an Ifc file when it's identified as being a product library.
Ifc is **the** open standard file format to distribute and share product data!

Btw: Ifc models for a building should NOT contain ALL properties for every single object
Relevant product properties from a manufacturers could/should be kept, maintained and accessed in product libraries (may be a project specific product library)

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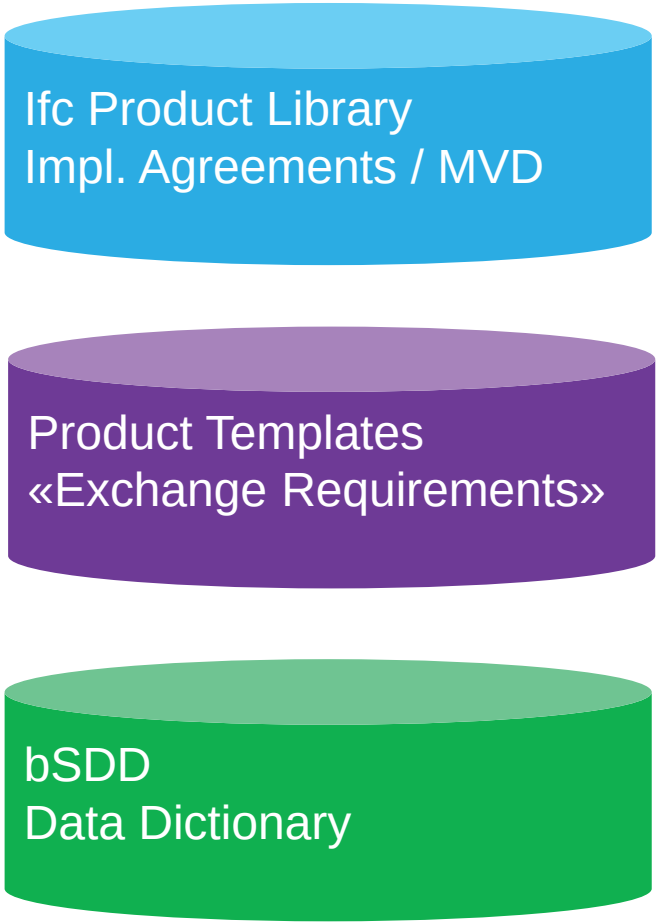
Three important components in an Ifc Product Library

- Ifc files can contain a number **products** including their properties, geometric representation, preview pictures, document references, product names and description etc.
- Ifc used to **distribute and share** product information between buildingSMART compliant software.

- Product templates describe **optional and mandatory properties** for different product "types".
- Templates may vary for special interest groups (Architects, Engineers, Cost estimators, Logistic planners, FM personnel etc.)
- **MVD-XML** can probably be used to define these **ER's**

- **bSDD** is used to uniquely **identify properties** independent of which format the property resides is.
- **bSDD** used for **language translation** of property descriptions, enumerators and values.
- **bSDD** for **mapping** between various classification systems.



buildingSMART
International Alliance for Interoperability

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buildingSMART – complementary projects

Templates - Which information is mandatory and optional for a given product type.

- SPie (**USA**) – *"Provides **templates** that identify, for a **given type of product**, a standard set of **properties that should be included** in a BIM model object."*
- BS 5491 on Construction Object Libraries (**UK**): Identification, Shape and Attributes
- **Japan** : Some organizations and manufacturer of AEC industry are researching on BIM Object Libraries.
- **France**: AFNOR has set up a new commission called PPBIM for "Products Properties for BIM".
- **Australia**: Product Data is the most important issue – format, terminology, engagement of manufacturers.
- **Singapore**: Explore the setting up of national database of building objects and standardized data structure with National Spatial Data Infrastructure (NSDI)
- **Benelux**: "National Concept Library" initiative with more than 100 participants from around 40 organizations, including the Ministry of Infrastructure, large contractors, software vendors.
- Standards **Norway** committee SN/K 529 BIM Object Libraries intends to release the first hearing version for a national object library standard. buildingSMART Norway convenes the work.

There are several similar on-going initiatives in several other countries

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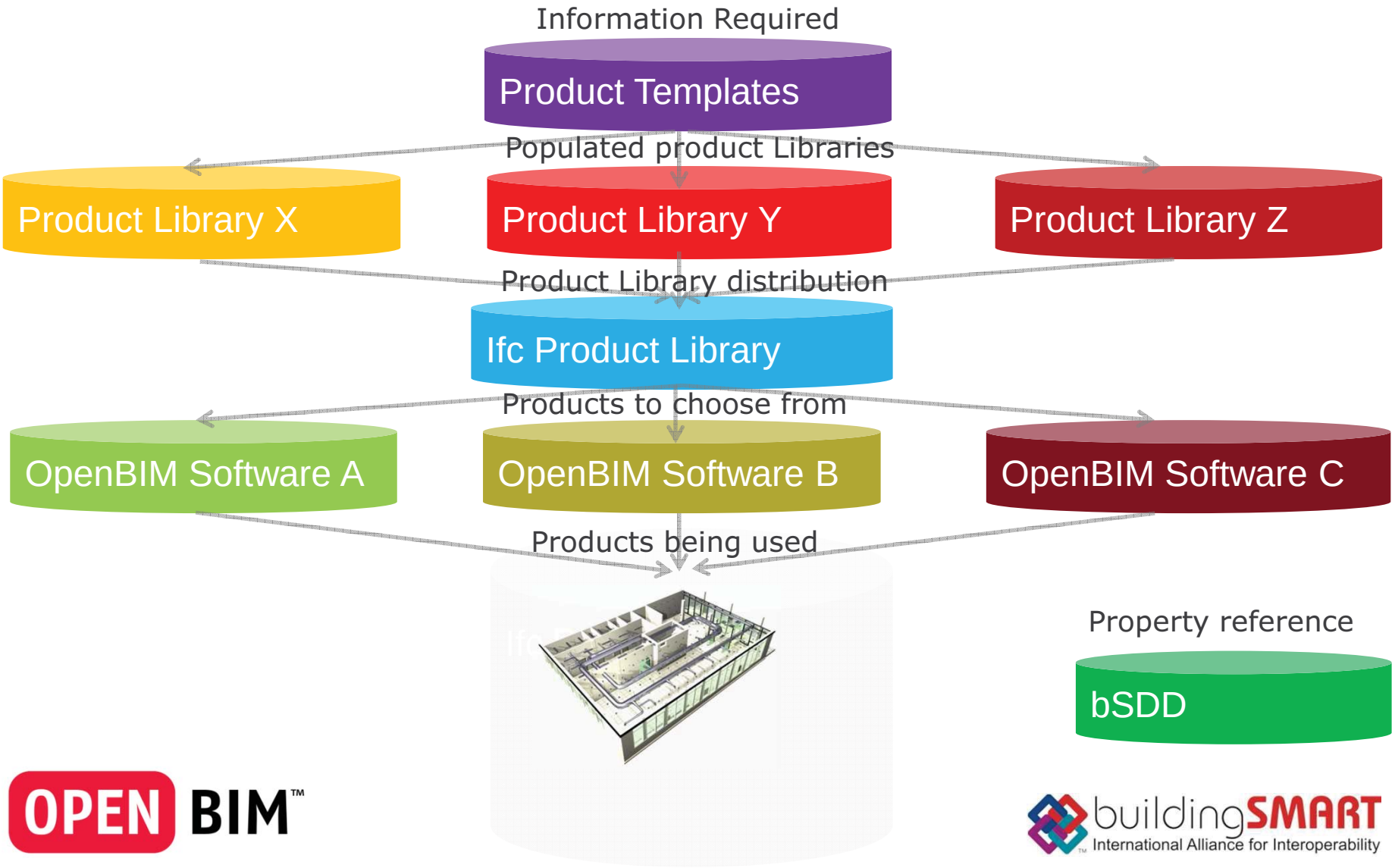
Standards and providers of data and functionality



Property reference

bSDD

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What is "Ifc for Product Libraries" ?

An **Implementers Agreement** for how to read an Ifc file containing products.

- Main topic: How an **Ifc file** containing one or more products should be structured.
- Product Libraries can be represented in **Ifc4, Ifc2x3 and simple IfcXML**
- **Type objects** as the container for all properties, including various geometry
- **Properties** and property sets.
- **Multiple geometric representations** of the same object
- Both **2D and 3D** and several **detail levels supported**
- "**Virtual geometry**" can be attached to objects (access zones, operation zones, etc.)
- Products can have multidisciplinary "connection **ports**" (pipes, ducts, cables etc.)
- **Preview/thumbnail pictures** (GIF, PNG or whatever)
- **External document** references (i.e.URL's with PDF's for certificates, product sheets etc.)
- **Grouping mechanism** to i.e. allow more "user friendly" search and browsing.
- buildingSMART Data Dictionary (**bSDD**) references.
- **Classification** of objects/products/properties in general

- Limitation: Until Ifc has a **parametric tier**, most objects will have static geometry.

- Implementers agreement accepted by ISG in Boston, March 2013
- **Proof of concept implementation** can be tested with a preview version of the DDS-CAD Viewer with some examples of Product Libraries in Ifc format.

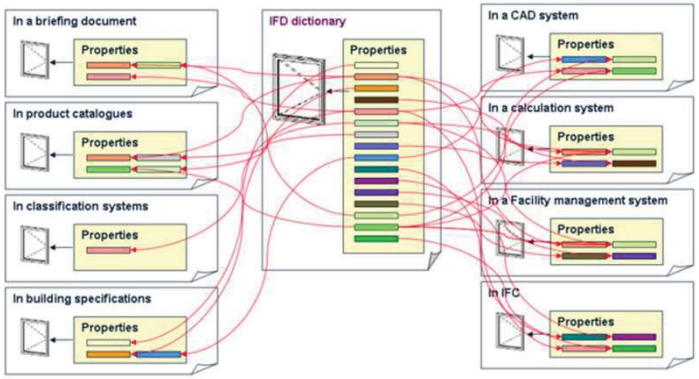
buildingSMART Data Dictionary (bSDD)

Potential usage of bSDD for properties with Product Libraries

- bSDD can be used to define **properties** both defined and **NOT defined in Ifc**
- bSDD is not necessary inside Ifc product libraries for properties already defined by Ifc
- bSDD can be used to **identify "values"** in properties (i.e. material name)
- bSDD can be **used in "none-Ifc formats"** and storages to identify properties and "values". Short term, this is **probably the most "valuable" usage of bSDD.** All Ifc properties are populated in bSDD and could be used for mapping properties in other formats to both Ifc Product Library and Ifc BIM models today!

Other usage of bSDD with Product Libraries

- **Language translation** of property descriptions, enumerators and values.
- **Mapping** between various classification systems.



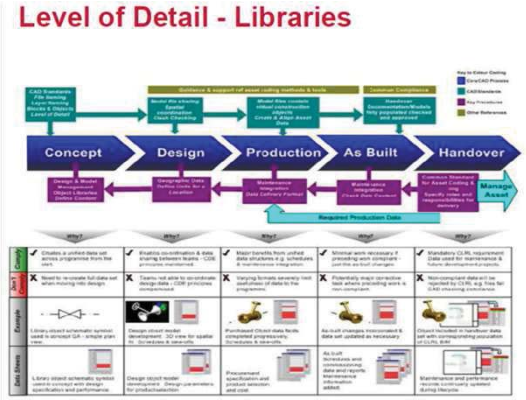


Fig from Arto Kiviniemi

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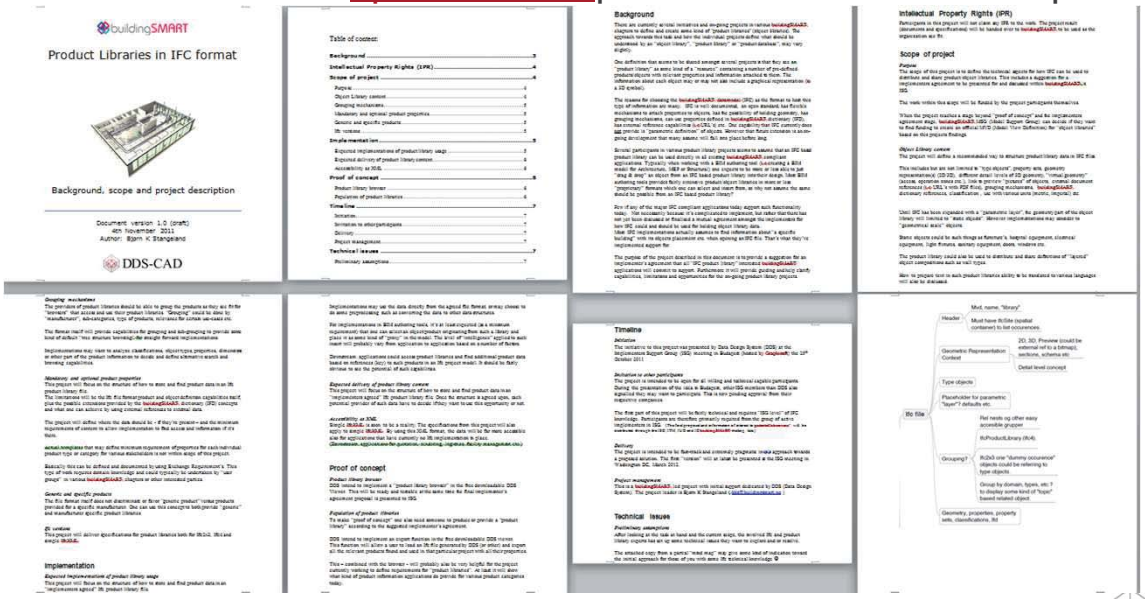
Product Libraries in Ifc format project

Oct. 25th 2011 : Project **idea** presented for buildingSMART ISG meeting in Budapest
Nov. 4th 2011 : DDS published a project description with **scope** and timeline
Dec. 17th 2011 : Experimenting and **implementatio**n was started.
Dec. 31st 201 : First implementations **tested**.
Feb. 17th 2012 : Early implementation in the DDS Viewer was made **downloadable**
Mar. 5th 2012 : The project status was presented at ISG meeting in Washington DC
Mar. 6th 2012 : ISG set up a **task force** to create an Implementers Agreement
Mar. 20th 2012 : First export to "**Simple IfcXML**" in addition to Ifc4 are tested
Mar. 21st 2012 : Project status presented at buildingSMART meeting in Oslo
Sep. 24th 2012 : ISG accepted the proposed **Implementers Agreement** (Helsinki)
Oct. 14th 2012 : Asking ITM for approval (Tokyo)
Jan. 5th 2013 : DDS-CAD MEP beta version with direct usage of Ifc product libraries
Mar. 12th 2013 : Extended specification presented for ISG as Implementers Agreement



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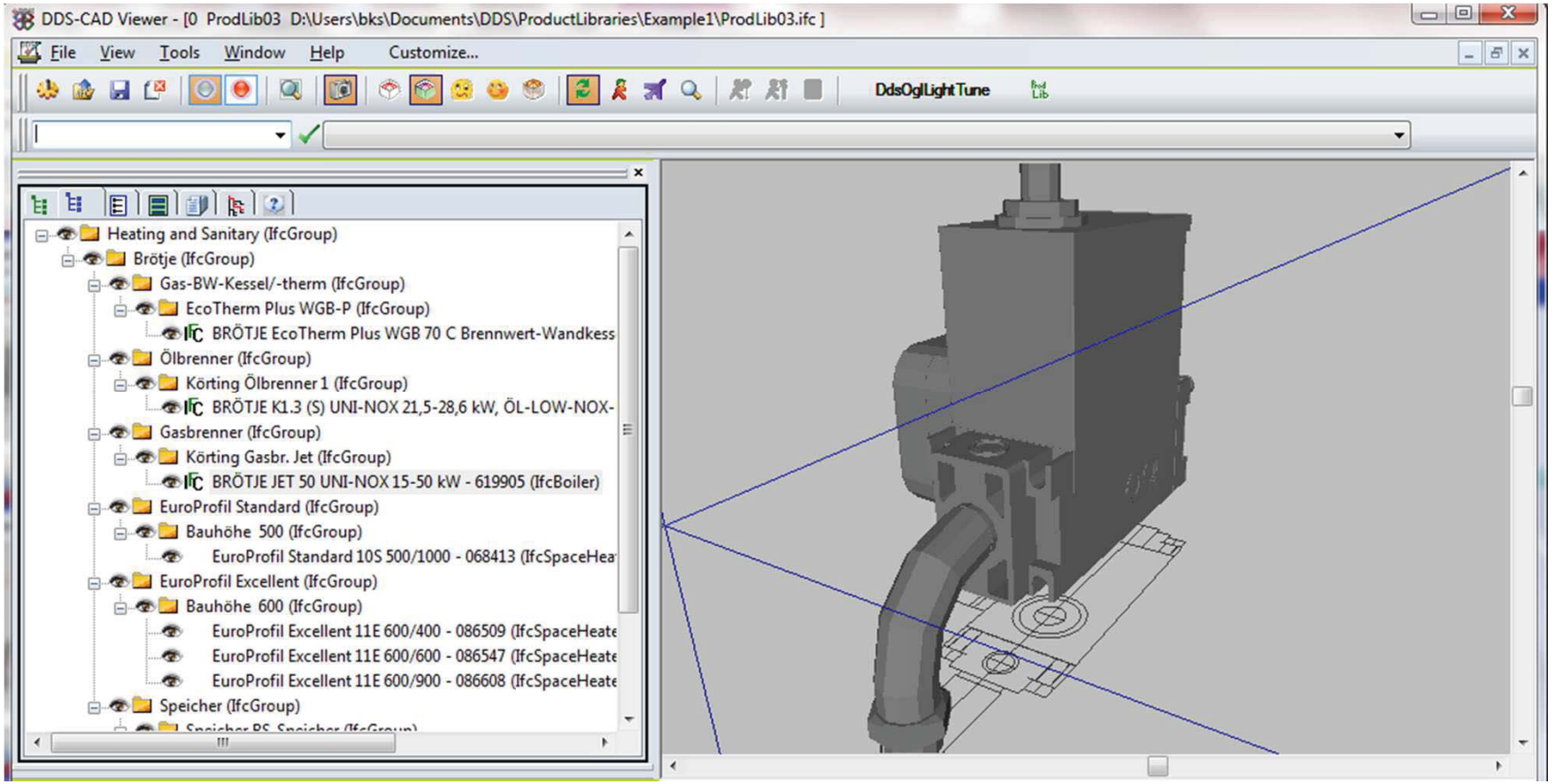
Proof of concept implementation

DDS-CAD proprietary product catalogs can be exported to Ifc Product Catalogues
The format currently used is Ifc4
DDS-CAD Viewer can be downloaded from (ftp://ftp.dds.no/pub/install/IfcViewer/PreView/)



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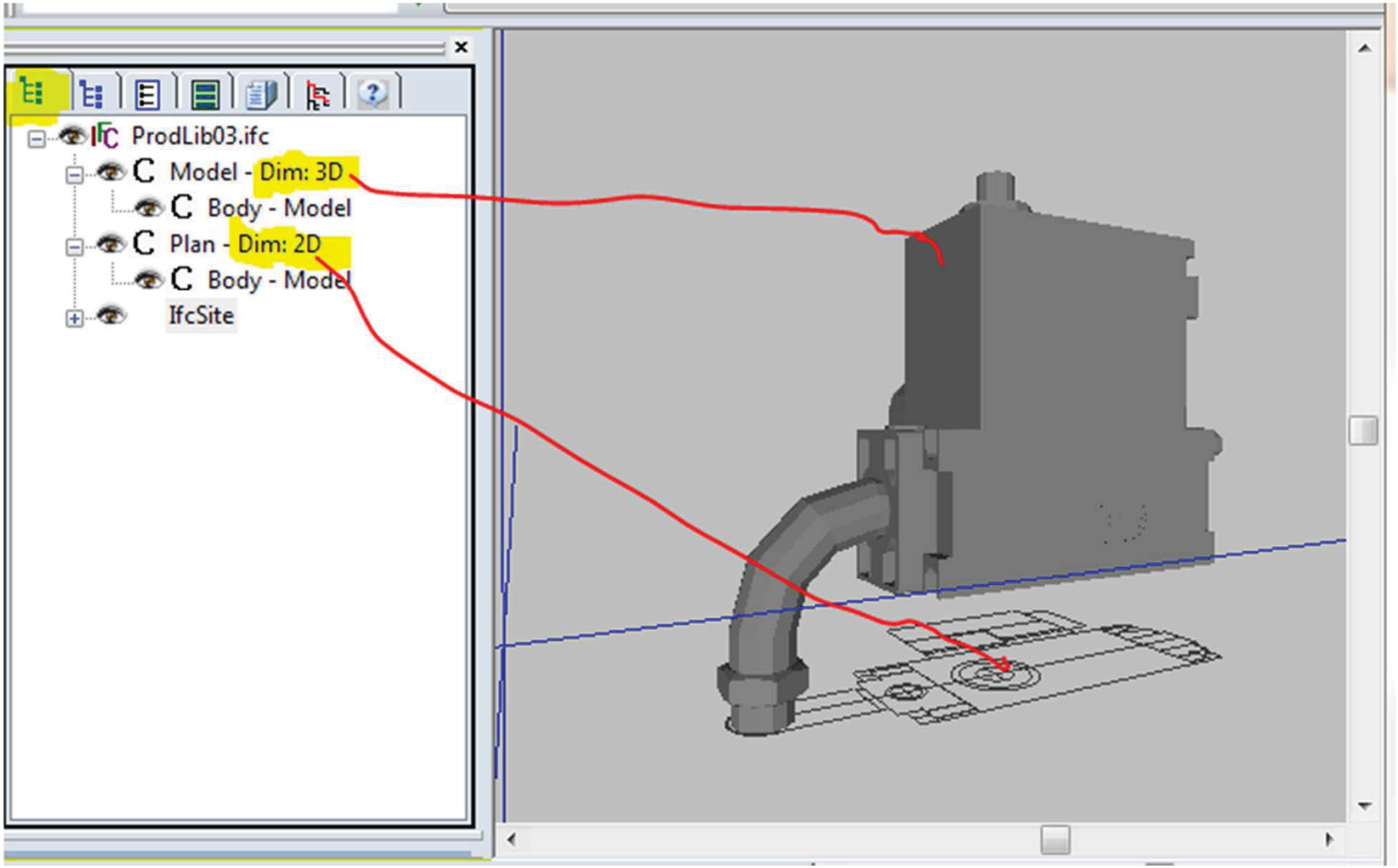
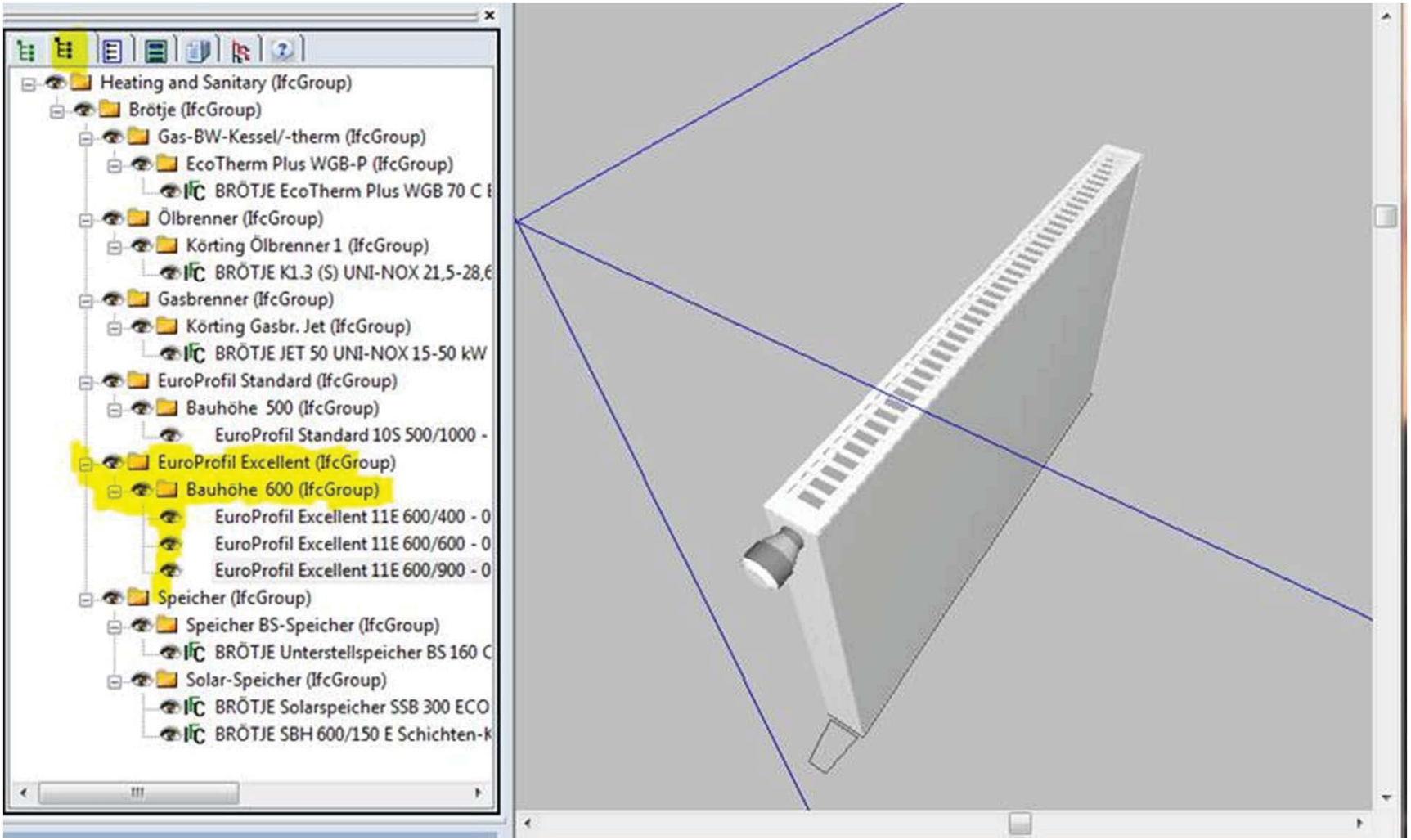
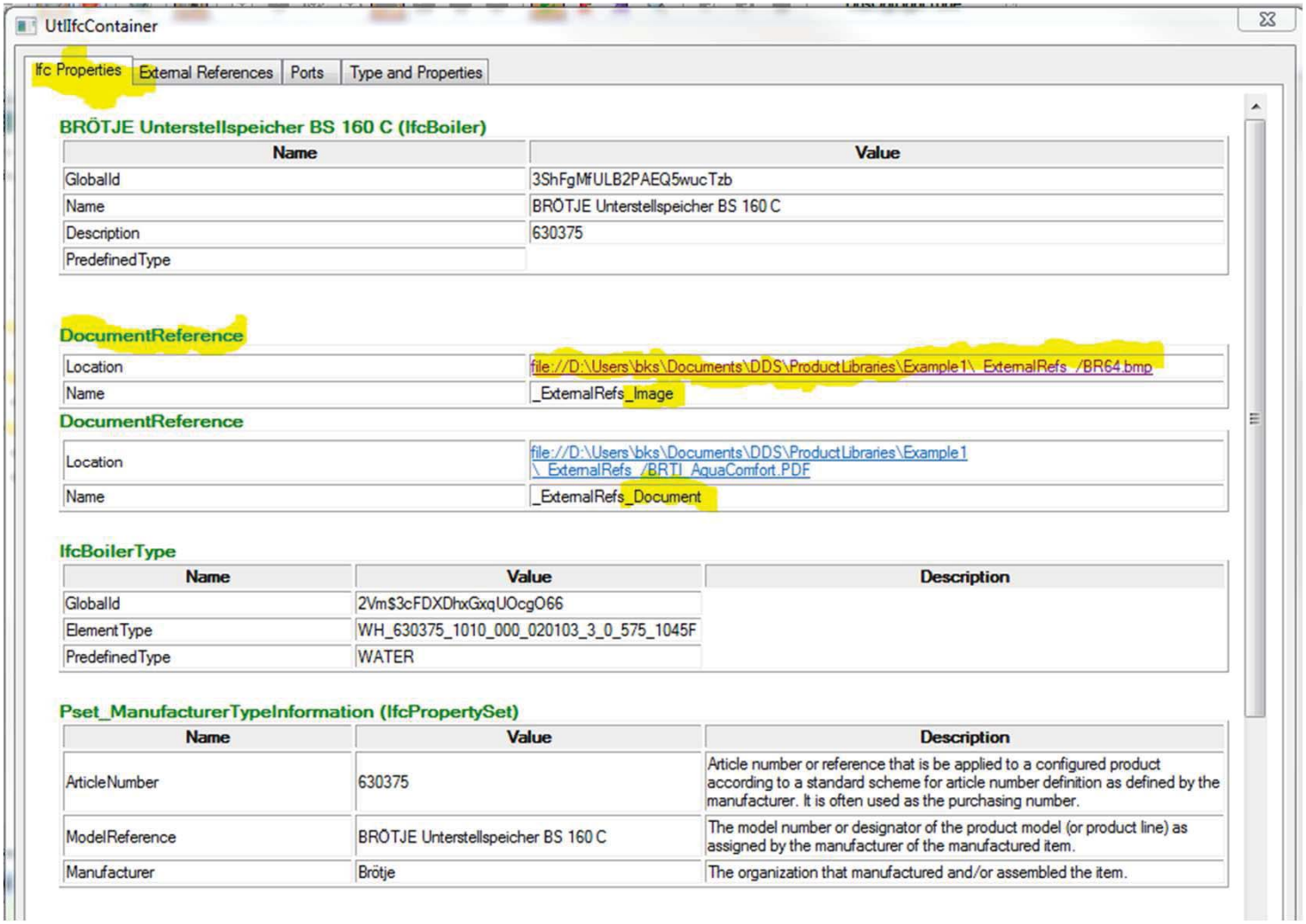
Several geometric representations of one object



Similar objects grouped for easy browsing

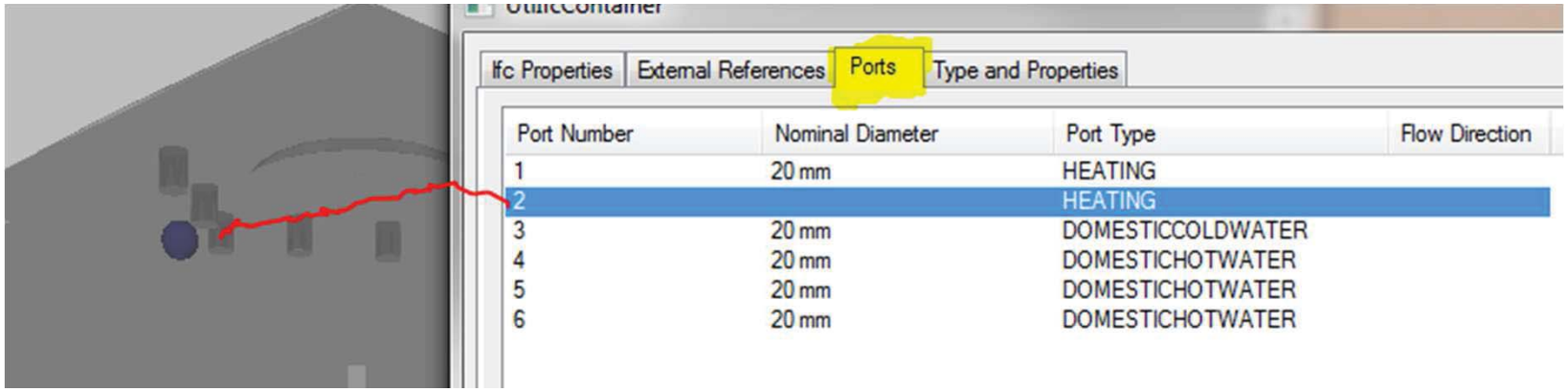


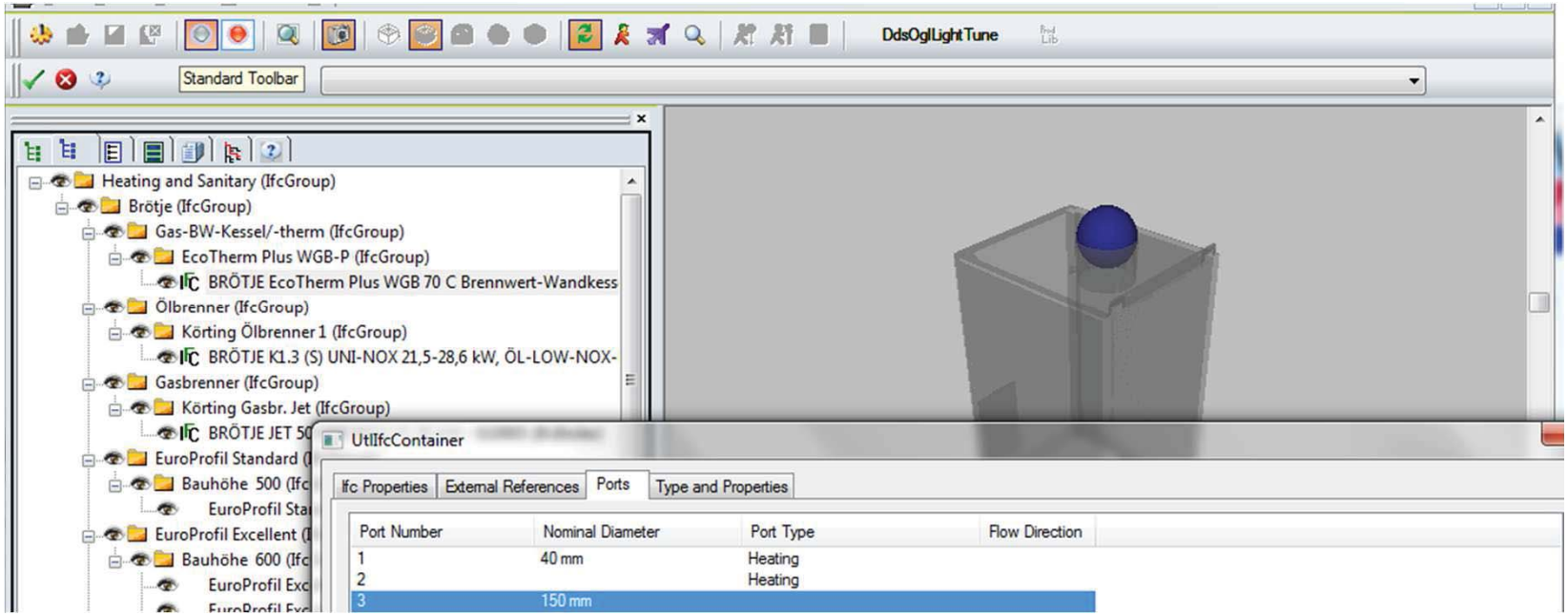
Properties and external references



Product picture and external document references

Connection capabilities (ports), important for MEP





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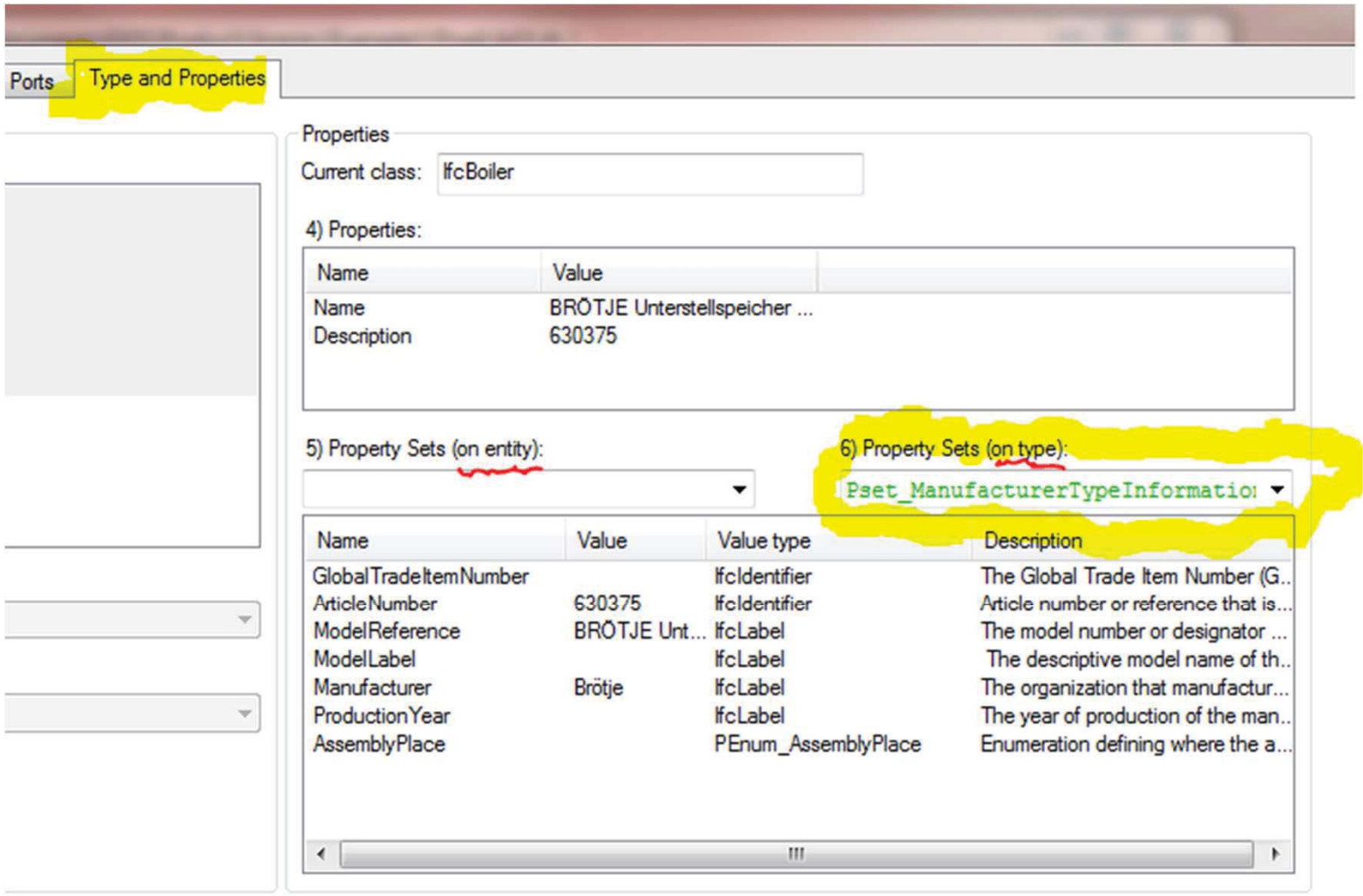
List of applicable property sets for each object type



The end

Questions ?

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