

BDNS in BIM tools IFC bSDD workflow

BDNS / IFC summit
September 17, 2025

Objectives

- Introduce methods for **applying BDNS to BIM/IFC workflows.**
- Explain **how bSDD and IDS contribute to data consistency** and reliable information delivery.
- Present a workflow and an application that enables easy and **effective use of BDNS, bSDD, and IDS.**

An introduction to bSDD and IDS

An introduction to bSDD and IDS


buildingSMART Data Dictionary:

- A collection of interconnected data dictionaries that define terminology used to describe the built environment.
- Can manage international classifications, national standards, and company-specific systems, and is published by independent organizations.
- Defines classes and attributes (properties) used to describe the built environment.
- Functions as a reference library for definitions shared in IDS and IFC. By using bSDD, it becomes possible to distribute standards and provide semantic clarity. It is equivalent to OIR in ISO19650.
- Improves the quality and consistency of BIM.

An introduction to bSDD and IDS

buildingSMART Data Dictionary:

- The bSDD can provide a comprehensive representation of the information libraries.




Dictionary

Building Device Naming Syntax


Organization
Building Device Naming Initiative

License
No license (rights reserved)

Version 2.1.0  Preview

Not the latest!

This dictionary has status **Preview**.
The content might change and is not ready to be used as a reference.
[Read more about statuses →](#)

Version history 

What term are you looking for?

Search also in descriptions

Login / Register

Building Device Nami... > Building Device Nami... > 2.1.0

Dictionary

English

Change request

Building Device Naming Syntax

Name

Dictionary code

Version

Identifier (URI)


More info

Organization

Organization code

bdns

2.1.0

<https://identifier.buildingsmart.org/uri/bdns/bdns/2.1.0> 







Building Device Naming Initiative

bdns

Show more

Classes (888)

Filter classes

Name	Code	Definition	Identifier (URI)
 av equipment - audio assistive equipment	AAE		
 valve - air admittance valve	AAV		
 chiller - air cooled chiller	ACCH		

An introduction to bSDD and IDS

Many different varieties of controllers.

controller

- access control
- irrigation controller
- room controller
- pv data acquisition system
- ⋮

Parent-child relationships

Building Device Nami... > Building Device Nami... > 2.1.1 > controller

Class

Name	controller
Code	CNTRL Copy
Identifier (URI)	https://identifier.buildingsmart.org/uri/bdns/bdns/2.1.1/class/CNTRL Copy
Definition	
Description	controller
Synonyms	
Related IFC entities	IfcController
Parent class	
Child classes	access control - RFID controller , controller - irrigation controller , controller - room controller , pv data acquisition system , pv microgrid controller... Show all

BDNS abbreviation

Related IFC entities

An introduction to bSDD and IDS

You can set attributes and properties as needed.

Name

Code

Identifier (URI)

Definition

Description

Synonyms

Related IFC entities

Parent class

Child classes

Flesh

flesh

Copy

https://identifier.buildingsmart.org/uri/onest/fruitvegs_onest/1.0/class/flesh

Copy

Apple flesh is characterized by a balance of sweetness and acidity and are rich in juice. They contain high levels of vitamin C, potassium, and dietary fiber, and are useful for maintaining good health and beauty. They are versatile and can be enjoyed raw, in juice, in cooking, and in desserts.

IfcSpace

Show more

Properties (10)

Filter properties


X

^

Name	Data type	Units	Definition	Dictionary	Identifier (URI)
^ Cost					
Farmer's suggested retail price	Character			Fruit and vegetables ONESTRUC	<div>Copy</div> ^
^ Dimensions					
Height	Character			Fruit and vegetables ONESTRUC	<div>Copy</div> ^
Volume	Character			Fruit and vegetables ONESTRUC	<div>Copy</div> ^
^ Identification					
Post-harvest ripening	Character			Fruit and vegetables ONESTRUC	<div>Copy</div> ^
Name of farmer	Character			Fruit and vegetables ONESTRUC	<div>Copy</div> ^

An introduction to bSDD and IDS

Information Delivery Specification

- Equivalent to PIR, AIR, EIR in ISO19650.
 - IDS files that specifically state what information is required for BIM.
 - Identify the required information from the bSDD and create an IDS tailored to the specific needs.
 - Define PIR using IDS, and mechanically validate whether data meets those requirements
- 
- Enable the creation of an IDS based on information requirements that comply with the Naming Specification Syntax of BDNS.

```
20240925061306_buildingSMART-RIR (1).ids X
C:\Users\YoshiyukiMiyauchi\Downloads> 20240925061306_buildingSMART-RIR (1).ids
1 <?xml version="1.0" encoding="UTF-8" standalone="yes"?>
2 <ids:ids xmlns:xs="http://www.w3.org/2001/XMLSchema" xmlns:xsi="http://www.w3.org/2001/XMLSchema-inst
3 <!--edit with ONESTRUCTION Inc.-->
4 <ids:info>
5   <ids:title>buildingSMART Regulatory Information Delivery Specification</ids:title>
6   <ids:copyright>buildingSMART. Licenced under CCL 4 BY-NC-SA</ids:copyright>
7   <ids:version>v2024-09-19</ids:version>
8   <ids:description>buildingSMART Regulatory Information Delivery Specification</ids:description>
9   <ids:author>regulatory@buildingSMART.org</ids:author>
10  <ids:date>2024-09-19</ids:date>
11  <ids:purpose>Supporting Regulatory Assessment</ids:purpose>
12  <ids:milestone>All</ids:milestone>
13 </ids:info>
14 <ids:specifications>
15   <ids:specification ifcVersion="IFC2X3 IFC4 IFC4X3" name="Regulatory.DefinedType.SpatialZone" desc
16   <ids:applicability minOccurs="1" maxOccurs="unbounded">
17     <ids:entity>
18       <ids:name>
19         <ids:simpleValue>IFCSPATIALZONE</ids:simpleValue>
20       </ids:name>
21     </ids:entity>
22     <ids:attribute>
23       <ids:name>
24         <ids:simpleValue>PredefinedType</ids:simpleValue>
25       </ids:name>
26       <ids:value>
27         <ids:simpleValue>USERDEFINED</ids:simpleValue>
28       </ids:value>
29     </ids:attribute>
30   </ids:applicability>
31   <ids:requirements>
32     <ids:attribute cardinality="required" instructions="Identification">
33       <ids:name>
34         <ids:simpleValue>ElementType</ids:simpleValue>
35       </ids:name>
36       <ids:value>
37         <xs:restriction base="xs:string">
38           <xs:enumeration value="ACCESSIBLEROUTE" />
39           <xs:enumeration value="FIREENGINEACCESSWAY" />
40           <xs:enumeration value="ACCESSROAD" />
41           <xs:enumeration value="ACCESSWAY" />
42           <xs:enumeration value="FIREENGINELOT" />
43           <xs:enumeration value="VEHICULARSERVICEROAD" />
```

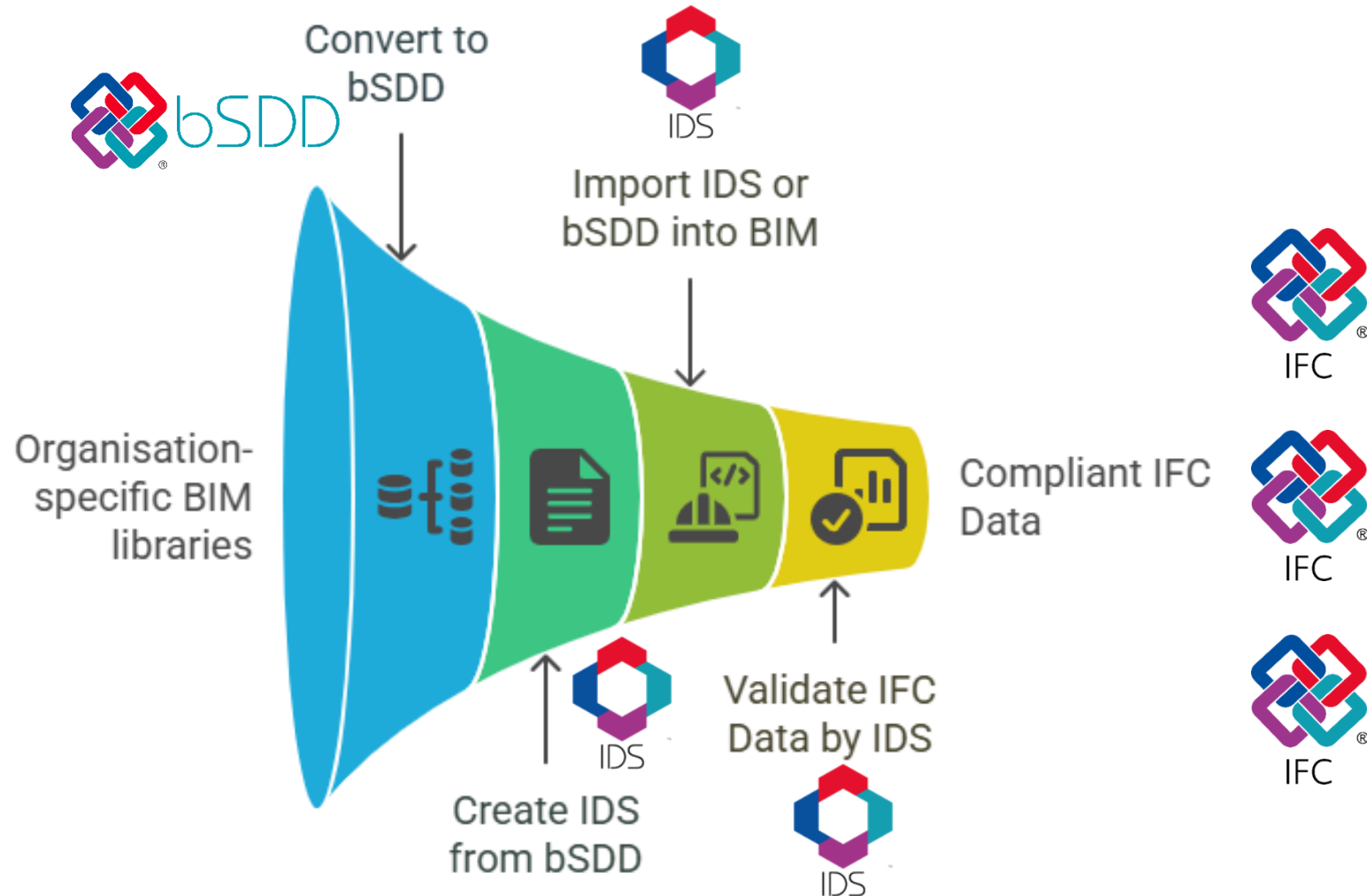

An introduction to bSDD and IDS

Information Delivery Specification



An introduction to bSDD and IDS

Summary



Workflow to use BDNS, bSDD & IDS

Workflow to use BDNS, bSDD & IDS

STEP1 : Import BDNS libraries into bSDD. (Done!)

BDNS / BDNS_Abbreviations_Register.csv

pisuke removed CTFS

b4f1c17 - yesterday History

Preview Code Blame

891 lines (891 loc) · 71.7 KB

Raw Copy Download Edit

Search this file

	asset_description	asset_abbreviation	can_be_connected	dbo_entity_type	ifc4.3	ifc2x3
1	access control - RFID controller	RFIDC	1		IfcController	IfcController
2	access control - RFID reader	RFIDR	1		IfcCommunicationsApplianceSCANNER	IfcElectricApplianceSCANNER
3	access control - access control system	ACS	1		IfcDistributionSystemSECURITY	
4	access control - audio intercom	AIC	1		IfcSwitchingDevice	IfcSwitchingDevice
5	access control - biometric reader	BIOR	1		IfcCommunicationsApplianceSCANNER	IfcElectricApplianceSCANNER
6	access control - door release button	RTE	1		IfcSwitchingDeviceCONTACTOR	IfcSwitchingDevice
7	access control - proximity reader - generic	PROXR	1		IfcCommunicationsApplianceSCANNER	IfcElectricApplianceSCANNER
8	access control - video intercom	VIC	1		IfcSwitchingDevice	IfcSwitchingDevice
9	actuator	ACT	1		IfcActuator	IfcActuator
10	actuator - frost protection switch	FPSW	1		IfcActuatorELECTRICACTUATOR	IfcActuatorELECTRICACTUATOR
11	actuator - motorized window operator	WDO	1		IfcActuatorELECTRICACTUATOR	IfcActuatorELECTRICACTUATOR
12	actuator - switch actuator	SWACT	1		IfcActuatorELECTRICACTUATOR	IfcActuatorELECTRICACTUATOR
13	air conditioning unit	ACU	1	HVAC/AHU	IfcUnitaryEquipmentAIRCONDITIONINGUNIT	IfcUnitaryEquipmentAIRCONDITIONINGUNIT
14	air conditioning unit - computer room AC unit	CRAC	1	HVAC/AHU	IfcUnitaryEquipmentAIRCONDITIONINGUNIT	IfcUnitaryEquipmentAIRCONDITIONINGUNIT
15	air conditioning unit - direct expansion cooling unit	DX	1	HVAC/AHU	IfcUnitaryEquipmentAIRCONDITIONINGUNIT	IfcUnitaryEquipmentAIRCONDITIONINGUNIT

Dictionary

Building Device Naming Syntax

Building Device Naming

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English Change request

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bdns

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2.1.0

Identifier (URI)

https://identifier.buildingsmart.org/uri/bdns/bdns/2.1.0

Copy

More info

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Organization code

bdns

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Classes (888)

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Workflow to use BDNS, bSDD & IDS

STEP2 : Create IDSs by referring to the bSDD



What term are you looking for?


Search also in descriptions

Building Device Naming Syntax

Dictionary code: bdns
Version: 2.1.0
Identifier (URI): https://identifier.buildingsmart.org/uri/bdns/bdns/2.1.0

Classes (888)

Name	Code	Definition	Identifier (URI)
av equipment - audio assistive equipment	AAE		
valve - air admittance valve	AAV		
chiller - air cooled chiller	ACCH		



IDS File List

- 20240925061306_buildingSMART-808.ids
- AFRY Presentation.ids
- TEST POS.ids
- Widows Requirements.ids
- WaterPipe_Construction_PIR.ids
- FTIA Road IDS.ids
- pepiet4qto_v100.ids
- 20241120112935_openBIM-Bauverfahren-BA...
- IDS_demo_BIM-basis-ILS.ids
- IDS_wooden-windows.ids
- OBO-BSP-ZZ-ZZZ-EP-XXX-XX-0002.ids
- OBO-BSP-ZZ-ZZZ-EP-XXX-XX-0001.ids
- OBO-BSP-ZZ-ZZZ-EP-EST-XX-0001.ids
- OBO-BSP-ZZ-ZZZ-EP-ARQ-XX-0001.ids
- Bridge_Design_PIR.ids

Entity

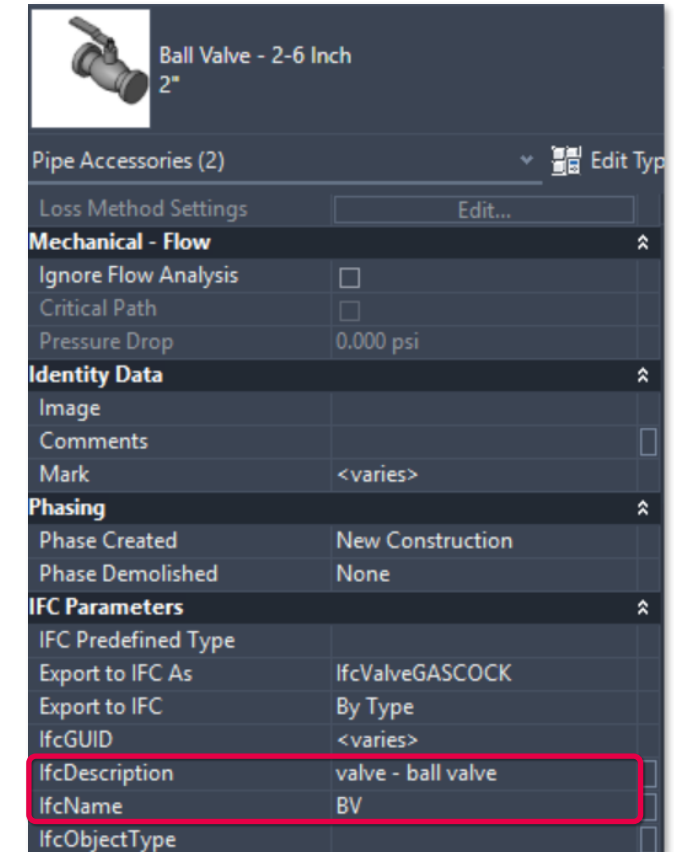
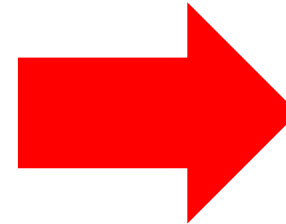
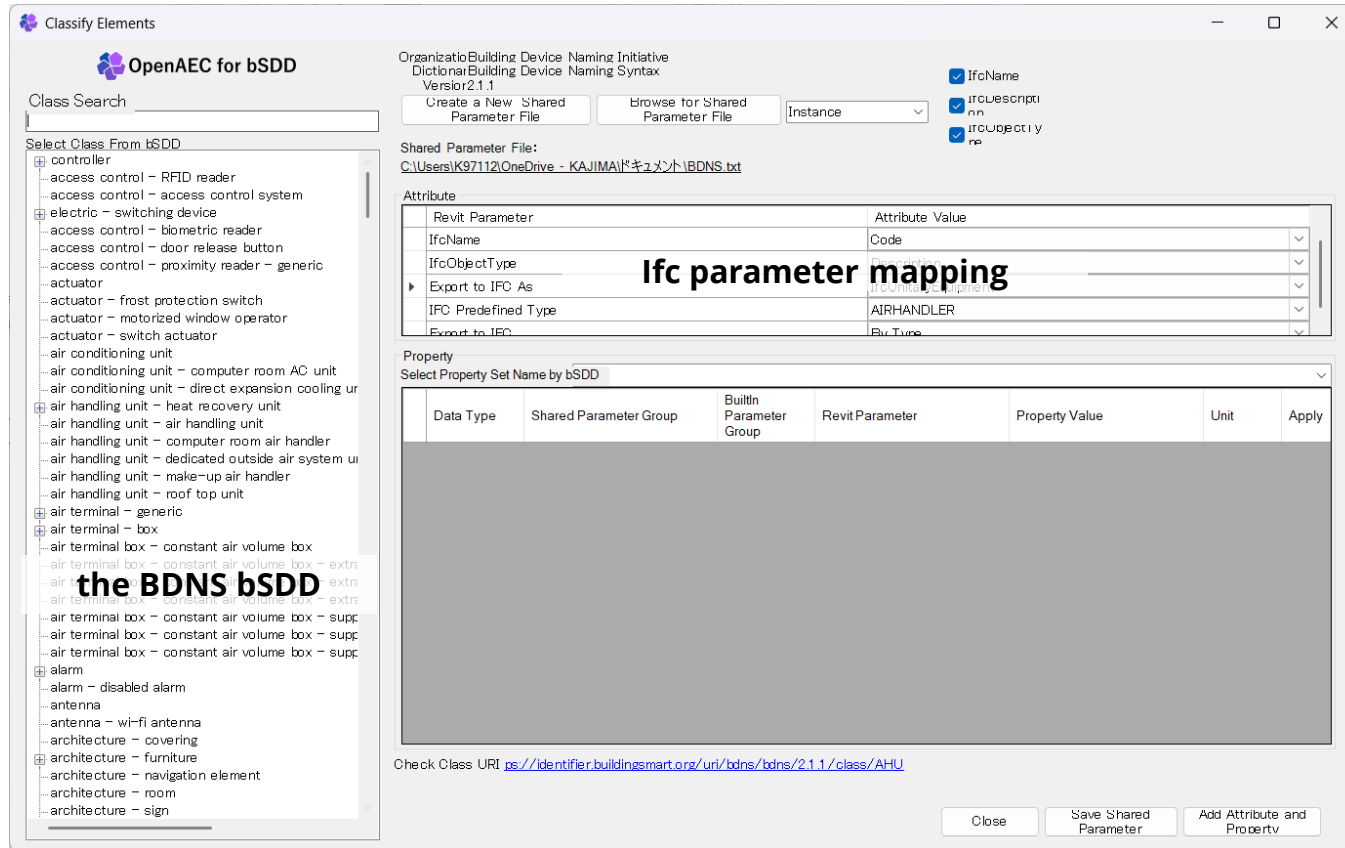
Name: IFCSPATIALZONE

```
<ids:info>
  <ids:title>Valve</ids:title>
</ids:info>
<ids:specifications>
  <ids:specification ifcVersion="IFC4X3_ADD2" name="IfcValve">
    <ids:applicability minOccurs="0" maxOccurs="unbounded">
      <ids:entity>
        <ids:name>
          <ids:simpleValue>IFCVALVE</ids:simpleValue>
        </ids:name>
        <ids:predefinedType>
          <ids:simpleValue>NOTDEFINED</ids:simpleValue>
        </ids:predefinedType>
      </ids:entity>
    </ids:applicability>
    <ids:requirements>
      <ids:attribute cardinality="required">
        <ids:name>
          <ids:simpleValue>Name</ids:simpleValue>
        </ids:name>
        <ids:value>
          <xs:restriction base="xs:string">
            <xs:pattern value="
(VLV|PCV|TMUV|TP|TPE|AV|BFP|BDV|BFV|CHWV|CDWV|CV|CVM|CVO|DPCV|ENV|FV|FCV|HWW|L
CV|MUV|MMV|PA|PICV|PWV|RCV|RTV|SGV|SPRV|SPV|TCV|WHAV)-\d+" />
          </xs:restriction>
        </ids:value>
      </ids:attribute>
    </ids:requirements>
  </ids:specification>
```

Figure. An Example of IDS

Workflow to use BDNS, bSDD & IDS

STEP3 : Import bSDD or IDS into BIM data by authoring tool



Setup for adding attributes to **Revit objects from the BDNS bSDD in Revit add-in.**

Workflow to use BDNS, bSDD & IDS

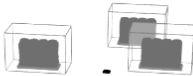
STEP4 : Validate IFC data by IDS

OpenAEC

buildingSMART IoT Interoperability Project / Project1.ifc

Ai Yamamoto
Owner

ViewMode: Solid



2

Check Validation Results

Validation has been completed. You can check the details of success items and error items. Reports can be downloaded as PDF. To fix errors, please proceed to STEP 3

IfcValve

Fail

Checks Passed by IFC Class: 2 passed of 7 total Applicable Elements Passed: 2 passed of 7 total

Warning: Specification IFC version does not match this IFC file's version. Please verify the version.

Applicability

• Is IfcClass 'IFCVALVE' with PredefinedType 'NOTDEFINED'

Requirements

FAIL

Requirement

Description: AttributeName 'Name' must have Value 'Matches pattern '(VLV|PCV)-\d+''
Information Type: attribute

IFC Class (I)	Subtype (P)	Attribute N	Description	expressId	Tag
IfcValve	NOTDEFINED	PCV-1	valve - press...	7213	1219662
IfcValve	NOTDEFINED	PCV-11	valve - press...	35217	1229760
IfcValve	NOTDEFINE	Level Valve		22765	1223041

Attribute value 'Ball Valve - 2-6 Inch:2":1220669' does not match requirements

Attribute value 'Level Valve - 2.5-3 Inch - Flanged:2 1/2":1223041' does not match requirements

Effectiveness of using bSDD & IDS for BDNS.

- The bSDD and IDS can support the accuracy of information assignment by providing information templates and enabling automated checks.
- The objective of the BDNS initiative is to promote data consistency and facilitate data structuring through an industry-wide naming convention framework.
- The bSDD and IDS standards will contribute to achieving this goal.

Next steps

- **Strengthening bSDD**

Register other ontologies like brickshcema and align with BDNS and IFC to enable the use of **bSDD as a semantic hub**.

- **Development of IDS**

Create and deliver IDS based on the "**Smart Buildings Guide for information managers,**" including **BDNS syntax** and other elements.