OPEN IFC VIEWER VALIDATION PLUGIN

Validation Plugin is available on click to Validation icon in PLUGINS tab of top ribbon panel:



Just after click on the icon, the tool will be initialized with available Validation Tasks on several validation levels



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1. DAI VALIDATIONS

SDAI-Level Validation Tasks described within ISO 10303-22 specification, following validation tasks are implemented in ODA SDAI 24.2:

a. Global Rules validation

IFC Model Global Rules validation according to EXPRESS Schema definitions.

b. String Width validation

Checks if STRING attribute value size is correct according to attribute type definition.

c. Binary Width validation

Checks BINARY attribute value size is correct according to attribute type definition.

d. References Validation

Checks if references are to instances of correct EXPRESS type.

e. Aggr Uniqueness Validation

Checks if all aggregate items are unique within aggregation instance.

f. Array Not Optional Validation

Checks if ARRAY attributes have not unset items, for appropriate ARRAY types.

g. Aggr Size Validation

checks if AGGREGATIONs size is correct in accordance to type defined within schema.









h. Required Explicit Attributes Assignment Validation

Checks required (non-optional) attributes have assigned values.

i. Inverse Attributes Validation

Checks inverse attributes back links types correctness.

j. Where Rules for Attributes Validation

Checks if application instance attribute value satisfies Where Rules defined within defined type of attribute.

k. Where Rules for Entities Validation

Checks if application instance satisfies all its Where Rules defined within EXPRESS schema entity definition.

I. Header Section Validation

Non-standard validation of Header Section loaded from Step Physical File, is positioned as ODA SDAI validation.

2. IFC VALIDATIONS

IFC Format-dependent validation tasks

a. Plane Angle Unit Validation

Validation if plane angle units are defined within the IFC model. This validation task has healer which can repair incorrect model.

b. PSD/QTO Validation

Validation of Property and Quantity Sets assignment correctness within an IFC model, implementation is based on ODA PSD/QTO Engine which is a part of ODA IFC SDK.







3. IDS VALIDATIONS

A subset of IFC Validations for IDS files stored into defined folder

a. The folder which contains IDS files for validations can be defined in File/Options/Plugins/Validation tab:

| | BCF Tools Model Validat | tion | | |
|--|--|----------------|---------------|-------|
| Import COS General Appearance | IDS files folder: Pictogram visualisation Validation timer | E:/ODASVN/Unit | Tests/IDS/0.9 | |
| Reset | | Ok | Close | Apply |



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b. All IDS files from the folder will be loaded using ODA IDS API, and validation tasks for Validation Engine will be initialized:

| Validation | |
|---------------------------------|------|
| DS Validations | 4 |
| TV 1-1-1 ARC-BRS yml | Sa a |
| | |
| | |
| Stockwerk / Geschoss / Etage | |
| V Gehäude | |
| | |
| = ✓ 1-1-2 BRS-ARC.xml | |
| ✓ Räumliche Zone | |
| ✓ Türen / Tore | |
| √ Zone | |
| Gebäude | |
| Raum | |
| - IDS Aedes example.xml | |
| Beglazing | |
| E DS_ArcDox.xml | |
| Project requirements | |
| name1 | |
| name2 | |
| name3 | |
| name4 | |
| IDS_SimpleBIM_examples.xml | |
| Room requirement 1 | |
| Wall requirement | |
| Exterial wall requirement | |
| 🗉 🛄 IDS_aachen_example.xml | |
| Aachen test | |
| IDS_demo_BIM-basis-ILS.xml | |
| lokale positie | |
| Bouwlaagindeling en -naamgeving | |
| Classificatiesystematiek | |
| IDS_random_example.xml | |
| binder | |
| ramen | + |
| | |
| Validate | |
| Close | |
| | |



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c. After desired validations selected, validation process can be started by pressing Validate button on the form, validation process will start:

| | + |
|----------|---|
| Validate | |
| Close | |





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A Validation Report window will appear just after validation process finished:



Right table contains a list of validations, columns of table contain:

- Instance Handle of instance within IFC model and its entity definition from EXPRESS schema.
- Attribute/WR Failed attribute or Where Rule identifier (name). Where Rule expression defined within EXPRESS schema may be shown on the screen from right-click menu on the table cell.
- Validation task Name of validation task as it hard-coded in ODA IFC SDK or defined within IDS file (only for IDS validation tasks).
- Result Result of validation task processing for the application instance/model. Result may be Error (failed), OK (passed) or Unknown (Validation task can't be processed in some circumstances, as not enough data to process etc.).



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Left Tree component allows different filters for received validation data to appear in right table:

- Results sub nodes allow report lines filtering by validation result.
- Validation Tasks sub nodes allow report lines filtering by validation task names.

Desired configuration should be applied by press on 'Apply filters' button, following filters configuration will show Errors and Unknown validations of aggregation sizes:

| ilters | Instance | Attribute/WR | Validation task | Result |
|----------------------------------|--------------------------------|-------------------|-----------------------------|------------------|
| Results | = #321018 lfcBSplineCurveWith | | | |
| ✓ Unknown (473) | | ControlPoints | Aggregation size validation | Unknown |
| Errors (5490) | = #321081 lfcBSplineCurveWith | | | |
| OK (1981449) | | ControlPoints | Aggregation size validation | Unknown |
| DAI Validations | = #321138 lfcBSplineCurveWith | | | |
| Model Validations | | ControlPoints | Aggregation size validation | Unknown |
| GlobalRulesValidation | = #321344 IfcBSplineCurveWith | | | |
| HeaderSectionValidation | 607 | ControlPoints | Aggregation size validation | Unknown |
| Instance Validations | = #321401 lfcBSplineCurveWith | | | |
| WhereRulesEntitiesValidation | | ControlPoints | Aggregation size validation | Unknown |
| RequiredExplicitAttrsAssignedVal | = #321464 lfcBSplineCurveWith | | | |
| BinaryWidthValidaion | 19. | ControlPoints | Aggregation size validation | Unknown |
| WhereRulesAttrsValidation | = #321521 IfcBSplineCurveWith | | | |
| ArrayNotOptionalValidation | | ControlPoints | Aggregation size validation | Unknown |
| InverseAttrsValidation | = #321727 lfcBSplineCurveWith | ControlPoints | | |
| AggrSizeValidation | | ControlPoints | Aggregation size validation | Unknown |
| Reference validation | = #321784 If CBSplineCurveWith | ControlDates | | 1 to be a second |
| Aggroniqueness validation | - #221047 IfcPCplipaCupyoWith | ControlPoints | Aggregation size validation | Unknown |
| | #521847 incespinecurvewith | ControlDoints | Aggregation size validation | Linknown |
| | = #321904 lfcRSplineCurveWith | ControlPoints | Aggregation size validation | UNKIOWI |
| | a vozrody nebopiniecu vevidi | ControlPoints | Addregation size validation | Linknown |
| Apply filters | | controll official | Aggregation size tandation | * |
| | | | | |
| ave as text Save as HTML | | | | Close |



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After filtration, validation report may be saved as text file (Save as text... button):

| Lister - [e:\Model Validation\rac_basic_sample_project_4 | _hi.ifc.txt] | | | _ | | × |
|--|--------------------------------------|----------------------------------|------------------|------|--------|------------|
| <u>F</u> ile <u>E</u> dit <u>O</u> ptions En <u>c</u> oding <u>H</u> elp | | | | | | 3 <u>%</u> |
| Automatically generated validation log f This file contains information about res File name: E:/ODASUN/UnitTests/Ifc4/rac_ File schema: IFC4 Validation time: 69723 msec Date: Mon Mar 27 22:06:45 2023 | file Sults of va] _basic_samp] | lidation tasks le_project_4_M |) hi.ifc | | | ^ |
| Used validation tasks Name Description | | | | | | |
| AggrSizeValidationTask Aggregat | :ion size va | alidation | | | | |
| #1000 IfcRationalBSplineSurfaceWithKnots validation Unknown | s Cor | ntrolPoints | Aggregati | on s | ize | |
| #1072 IfcRationalBSplineSurfaceWithKnots | s Cor | ntrolPoints | Aggregati | on s | ize | |
| #1357 IfcRationalBSplineSurfaceWithKnots validation Unknown | s Cor | ntrolPoints | Aggregati | on s | ize | |
| #1429 IfcRationalBSplineSurfaceWithKnots validation Unknown | s Cor | ntrolPoints | Aggregati | on s | ize | |
| #30061 IfcBSplineCurveWithKnots Unknown | ControlPoir | nts | Aggregation size | vali | dation | |
| #30086 IfcBSplineCurveWithKnots Unknown | ControlPoir | nts | Aggregation size | vali | dation | |
| #30169 IfcBSplineCurveWithKnots Unknown | ControlPoir | nts | Aggregation size | vali | dation | |
| #30224 IfcBSplineCurveWithKnots Unknown | ControlPoir | nts | Aggregation size | vali | dation | |
| #30238 IfcBSplineCurveWithKnots Unknown | ControlPoir | nts | Aggregation size | vali | dation | |
| #30264 IfcBSplineCurveWithKnots | ControlPoir | nts | Aggregation size | vali | dation | ~ |



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Or as good-looking HTML report (Save as HTML):

| ← → C ① Файл Е: | /Model%20Validatio | n/rac_basic_sample_projec | Q | B | ☆ | ≡ſ | ₹ | 0 | |
|---|---|---|---|----------------------|---------------------------------|----|---|---|--|
| | | | | | | | | | |
| ODA SD | DAI SE |)K | | | | | | | |
| | | | | | | | | | |
| tomatically generated validation log file DA SDAI version: 24.3 e name: E:/ODASVN/UnitTests/Ifc4/rac_basic_sar e schema: IFC4 lidation Time: 69723 msec te: Mon Mar 27 22:07:03 2023 | mple_project_4_hi.ifc | | | | | | | | |
| seu validation tasks | | | | | | | | | |
| Name | Description | | | | | | | | |
| Name AggrSizeValidationTask | Description Aggregation size value | Idation | | | | | | | |
| AggrSizeValidationTask | Description Aggregation size valu | idation | | | | | | | |
| AggrSizeValidationTasks | Description Aggregation size val Attribute/WR/Type | idation Validation Task | | Re | sult | | | | |
| AggrSizeValidationTask AggrSizeValidationTask alidation issues list Instance #1000 IfcRationalBSplineSurfaceWithKnots | Description Aggregation size val Attribute/WR/Type ControlPoints | idation Validation Task Aggregation size validation | | Re | sult known | | | | |
| AggrSizeValidationTasks AggrSizeValidationTask alidation issues list Instance #1000 IfcRationalBSplineSurfaceWithKnots #1072 IfcRationalBSplineSurfaceWithKnots | Description Aggregation size val Attribute/WR/Type ControlPoints ControlPoints | Idation Idation Task Aggregation size validation Aggregation size validation | | Re | sult known | | | | |
| AggrSizeValidationTasks AggrSizeValidationTask alidation issues list Instance #1000 IfcRationalBSplineSurfaceWithKnots #1357 IfcRationalBSplineSurfaceWithKnots | Description Aggregation size val Address Attribute/WR/Type ControlPoints ControlPoints ControlPoints | idation Validation Task Aggregation size validation Aggregation size validation Aggregation size validation | | Re Un Un | sult known known | | | | |
| AggrSizeValidationTasks AggrSizeValidationTask alidation issues list Instance #1000 IfcRationalBSplineSurfaceWithKnots #1357 IfcRationalBSplineSurfaceWithKnots #1359 IfcRationalBSplineSurfaceWithKnots | Description Aggregation size val Aggregation size val Attribute/WR/Type ControlPoints ControlPoints ControlPoints ControlPoints | idation Validation Task Aggregation size validation | | Re Un Un Un | sult known known known | | | | |

Reports contain following information

- Header with information about IFC file, its EXPRESS schema, version of ODA SDAI, which was used for validation, time spent on validation and validation date
- **D** Table with names and descriptions of validation tasks used for validations
- **Table with validation results, a copy of table from validation report window**





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